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Report on the expert meeting in preparation of the Fourth meeting of SBSTTA, April 13-15, 1999,

convened by the German Federal Agency for Nature Conservation at the International Academy for Nature Conservation, Isle of Vilm

Submission by the Government of Germany

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Isle of Vilm

Horst Korn & Jutta Stadler (Eds.)

- **Further advancement of the Global Taxonomy Initiative**
- **Alien species**
- **Sustainable use, including tourism**
- **"Terminator Technologies"**
- **Dryland, mediterranean, arid, semi-arid, grassland and savannah ecosystems**
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INTRODUCTION

The goals of the informal scientific workshop were the exchange and condensing of information on topics on the agenda of the upcoming fourth meeting of SBSTTA among national experts, mainly from EU member countries. The 21 participants, including members of the CBD Secretariat and the SBSTTA Bureaux, as well as representatives of the EU Commission, national ministries, agencies, scientific institutions and NGOs attended in their personal capacity as experts for the Convention.

The meeting was chaired by the SBSTTA-Bureaux member Mr. Martin Uppenbrink, the working sessions by Mr. Horst Korn and Mr. Francesco Mauro.

To each topic there was a short introduction given by a specialist followed by a discussion which was mainly based on the documents prepared for the SBSTTA meeting by the Secretariat of the Convention. In this report the main points of discussion are summarized and general recommendations as well as suggestions concerning the work of SBSTTA are given. The aim of this report is to help individuals and delegations in their preparation of the topics to be discussed at SBSTTA-4.

SUMMARY OF THE DISCUSSIONS AND RECOMMENDATIONS

1. Further advancement of the Global Taxonomy Initiative

Introduction to the Global Taxonomy Initiative by Mr. Torbjörn Ebenhard.

All participants underlined the importance of taxonomy for the implementation of the objectives of the CBD. Despite the fact that taxonomists provide valuable services to the CBD, it was pointed out that it is vital for the taxonomists to better "market" their "products" in order to get more public attention (e.g. better access to existing data, on-line information, development of easy to use guides, better presentation of results, co-operation with other fields of research).

Recommendations:

- three levels of action have to be taken into account:

  1. national level:

  The analysis of the causes of the taxonomic impediment and its effects should lead to the development of national action plans and the formulation of national priorities within taxonomy (as it is already done by some Parties). All information on existing research and how it can be accessed should be included in the national reports or disseminated via the national Clearing House Mechanisms (CHM).

  2. regional level:

  Regional scientific meetings and inventory surveys should lead to the setting of regional priorities (e.g. within the EU countries) and help avoiding repetition of work.

  3. global level:

  GEF is responsible for coordination and funding of global activities (GEF needs advice on priority setting, methodologies etc.). The CHM may serve as an information basis.

- SBSTTA should suggest the creation of the position for a Programme Officer for taxonomy which should have, inter alia, the following duties:
  - coordination of the different initiatives,
  - assess the needs at a regional/global level,
  - facilitate need assessments on a national level,
  - guidance and assistance with priority setting to GEF.

  The Programme Officer should be assisted by a liaison group

In order to overcome the crisis presently affecting taxonomy

- the Commissions for the International Codes of Nomencalture should unify and simplify the processes for nomenclature for "higher organisms" (excluding bacteria and viruses – too complicated due to different species definitions)
- a demand-driven approach in research has to be used (reasearch on the levels of species, popiulations, subspecies according to conservation needs),
- funding, capacity building and long term job opportunities have to be provided.

2. Alien species

Introduction to the topic "Prevention of impacts of Alien species and Introduction to the Global Invasive Species Programme (GISP)" by Ms. Ulrike Doyle.

The present threats caused by alien invasive species, which may even increase in the future due to the time lag effect, were discussed and the special problems arising out of the common market within EU countries were pointed out.

Recommendations:

To further elaborate on the topic the Secretariat with the assistance of a liaison group (later to be followed by an ad hoc technical expert group) and other relevant bodies should

- analyse all actions already taken by Parties (national reports),
- compile case studies and make them accessible through the CHM.

The work programme of SBSTTA should

- build on existing initiatives like DIVERSITAS (giving a clear mandate by defining needs and priority issues).

GEF should

- provide funding as outlined in relevant COP decisions.

An ad hoc technical expert group should

- elaborate on existing guidelines (like the IUCN guidelines on alien species). In addition, guidelines for genetically modified organisms should serve as a model for alien species,
- use the pragmatic approach developed in the US (calculating the costs and benefits for ecology and economy) as a model,
- emphasize the colaboration with other relevant conventions (e.g. UNCLOS, Antarctic Treaty, CITES, on EU level: Birds Directive, FFH Directive) and relevant organizations (e.g. IMO International Maritime Organization, ICES International Council for the Exploration of the Sea, WHO the World Health Organization),
- analyse the connections and overlappings with other topics of the agenda (e.g. tourism, Biodiversity Impact Assessment) and other sectors (e.g. trade),
- analyse existing methodologies for risk assessment and make suggestions for minimum standards,
- formulate suggestions for legislation on the introduction of alien species, risk assessment and liability.

Parties should be requested to

- rise public awareness for the importance of the topic,
- encourage research in management of invasive species:
  a) prevention of import,
  b) development of risk and cost assessment for deliberate introductions,
  c) control of invasive species already introduced in case of negative impacts.

- provide information about alien species related initiatives taken and experiences gained in their national reports and/or via their national CHM.

(EU member countries should

- consider the harmonization of legislation on the introduction of alien species, risk assessment and liability to serve as a model for other regions)

3. Sustainable use, including tourism

3.1 Sustainable use

Introduction to the agenda item “sustainable use” was given by Mr. Carlos Martin-Novella.

Eventhough the Secretariat elaborated on tourism as one example of the sustainable use of biodiversity participants felt that in the first place some general comments on sustainable use - as it is mentioned in the title of the paper - should have been given.

Recommendations:

SBSTTA should

- clearify what is meant by “sustainable use” in the context of the CBD (especially in comparison with the term “sustainable development“ which is used in the CSD) and define to what extent conservation is included in sustainable use,
- work out a methodology for the assessment of status and pressures on elements of biodiversity,
- develop indicators for sustainable use of biodiversity with the aim to influence the design and the implementation of sectoral policies.

After dealing with general issues of sustainable use SBSTTA should specify the general principles of sustainable use for different sectors. Tourism may serve as the first example. Then the applicability of these methodologies to other sectors should be examined.

3.2 Sustainable tourism

The introduction to tourism as one example of sustainable use was given by Mr. Michael Meyer.

A major point of discussion was the scope and limit of involvement of the CBD in tourism. Participants suggested that:

- the Secretariat with the support of a liaison group should compile case studies on sustainable tourism, evaluate existing guidelines (e.g. the commitments made by the WTTC Agenda 21, the Berlin Declaration on biological diversity and sustainable tourism etc.) and present a synthesis to SBSTTA-5 for its deliberations. SBSTTA-5 should present draft guidelines for tourism in sensitive areas to COP-5,

- SBSTTA should recommend ways and means how to involve all relevant stake-holders to minimize adverse impacts of tourism to the biological diversity in sensitive areas (e.g. codes of conduct, pledges, awareness rising, Environmantal Impact Assessment),

- SBSTTA should point out the connection of sustainable tourism to other topics on the agenda (e.g. Biodiversity Impact Assessment, alien species).

The following list of recommendations was discussed and the participants found that the points should be considered when the topic of sustainable tourism is further developed:

1. <u>Internalization of external costs</u>
   - Transparent calculation models on impacts on biodiversity
   - Reform of tourism statistics to account for ecological costs

2. <u>Carrying Capacity for Sustainable Tourism</u>

- Development of indicators for sustainable tourism
- Setting of carrying capacity limits for the development of tourism

3. Eco-Audit for tourism planning
   - Strict conditions for future tourism planning
   - Combination of EMAS and ISO

4. Awareness raising for tourists
   - General information about impacts on ecosystems and biodiversity
   - Environmental eductation for children and adults

5. Implementation of the commitments of the tourism industry
   - Monitoring and evaluation of implementation of the commitments made
   - Statements of CBD on the current state of implementation

6. Examples of best practice for sustainable tourism
   - Development of a list of examples of best pratice
   - Distribution of guidelines

7. Involvement of local communities and NGOs
   - Democratic and participatory approach in tourism planning and development
   - Concentrate on capacity building and small scale projects

8. Multi-stakeholder involvement
   - National and international networking and discussion
   - Support for Local Agenda 21 processes

9. Broad information and awareness raising for the public
   - Distribution of information on international processes

10. Consideration of differences of cultures
    - Realization of different environmental problems and perceptions

- Safeguarding of local cultural integrity

11. Co-operation with other international agreements
    - Commission on Sustainable Development
    - The Climate Convention
    - General Agreement on Trade in Services
    - (The United Nations Research Institute for Social Development)
    - (The United Nations System of Environmental and Economic Accounting)

4. "Terminator Technologies"

Because the invited speaker, Mr. Thomas Plän, was not able to attend the meeting his introduction to the topic which he submitted to the meeting was given to the audience as a paper copy. Due to the fact that at this point of time there was no Secretariats paper available, Mr. Plän's text served as the only basis for discussion.

Recommendations:

- SBSTTA should invite Parties and relevant organizations to submit case-studies on the effects of new technologies in plant gene expression to the Secretariat for further analysis and distribution via the CHM,

- social and ecological problems which may arise from such new technologies should be taken into account.

5. Dryland, mediterranean, arid, semi-arid, grassland and savannah ecosystems

An introduction to the topic focusing on mediterranean ecosystems was given by Mr. Francesco Mauro.

The participants found the Secretariats paper on the topic helpful as a general background document but missed facts on the status, trends and threats of biodiversity in these ecosystems. An analysis of existing gaps and needs for further research should have been included in the secretariats paper. In addition it was agreed upon that more precise and action oriented recommendations are needed.

Recommendations:

- A liaison group should be established to assist the Secretariat in the further elaboration of the topic,

- because of the huge variety of ecosystem types subsumed under the agenda item, SBSTTA needs to clarify the overlappings and differences to other thematic areas of the Convention (e.g. agrobiodiversity and sustainable use) taking into consideration that some ecosystem types can only be maintained by extensive use (like grazing),

- the ecosystem approach should be the framework for all further actions when dealing with the topic,

- because of the overlappings with other Conventions (e.g. Climate Change, Desertification Convention, Ramsar Convention, Bonn Convention etc.) which are in some cases further advanced or more specialized in their work programmes, SBSTTA should co-operate with their respective scientific bodies (e.g. identify actions in other conventions pertaining to the different classes of dryland ecosystems, analyse related activities, needs and combine this with the timeframes and finances of other work programmes of the CBD and other thematic areas),
- Parties should submit case studies on conservation and sustainable use of dryland ecosystems to the Secretariat to have a variety of examples of best practices.

6. Biodiversity Impact Assessment (BIA)

There was a controversial discussion on the definition of Biodiversity Impact Assessment. Some participants defined the Biodiversity Impact Assessment as a subdivision of the Environmental Impact Assessment (EIA) restricted to biodiversity, others wanted to have socio-economic factors to be taken into account as well.
Even if Biodiversity impact assessment is seen solely on a biological scale two possibilities have to be distinguished:
If biodiversity is considered as part of the environment it is only a subtype of the usual environmental impact assessment. On the other hand biodiversity may also be the active impact factor (e.g. invaders, unusual population growth or diminishment, change of biodiversity patterns). In this case a special, different type of impact assessment is necessary. In one case biodiversity is the object of an impact, in the other case biodiversity is the subject (the active part of the impact).

Recommendations:

SBSTTA should

- agree on a clear definition of Biodiversity Impact Assessment,
- underline the importance of Strategic Impact Assessment and further elaborate on the topic,
- recommend SBSTTA-5 to advise Parties to include information on BIA in their national reports or make them available via their national CHM.

The Secretariat, with the help of a liaison group, should

- analyse the relevant chapters of the national reports and the EU report on existing legal instruments and to carry out a comparative study on the methodologies used. Conclusions thereof should lead to the development of guidelines for Biodiversity Impact Assessment to be approved by COP,
- develop a demand-driven approach to what extent a Biodiversity Impact Assessment has to be done (e.g. down to the subspecies level when important for

conservation purposes).

7. Ad hoc technical expert groups

An Introduction to the topic was given by Mr. Horst Korn, evaluating the contents of the Secretariats paper and its implications. The differences between "ad hoc technical expert groups" and" liaison groups" were pointed out.
For the time being the disadvantage of ad hoc technical expert groups is that they can only start working after COP-5. Since the work should progress more quickly other means should be used right away (e.g. liaison groups) and eventually taken over by ad hoc technical expert groups.

For further specification of the terms of reference of the ad hoc technical expert group on alien species see chapter 2 of this report.

Recommendations
SBSTTA should

- request the secretary general to invite liaison groups to help him elaborating the topics foreseen for ad hoc technical expert groups. After approval of the terms of reference for the ad hoc techical expert groups by COP-5 work should be taken over by them.

Cross sectorial issues, like "alien species" should be given priority.

The topic "Drylands, meditarranean, arid, semi-arid, gransslands and savanna ecosystems should be taken care of in cross-cutting issues.

Work on Indicators and the "Ecosystems approach" should be dealt with in liaison groups to start work right away.
Work on coastal and marine biological diversity should be dealt with in an ad hoc technical expert group with two subgroups and not on two as stipulated in the

respective COP-4 decision.

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The Global Taxonomy Initiative

An introduction to the GTI

The UN Convention on Biological Diversity (CBD) covers all aspects of biodiversity. For many of these issues, taxonomy is fundamental. The Convention stresses the need to identify and monitor biodiversity, the need for environmental impact assessments, as well as the fundamental need to sustainably use biological resources. For all these issues, and for many others, such as bioprospecting, taxonomic knowledge is a necessary basis.

However, a global crisis is currently affecting taxonomy as a science. There is a serious lack of funding for taxonomy. Research in taxonomy is declining, and taxonomists have been proposed as an endangered profession. The number of taxonomic experts, teachers and students decrease steadily. Many museums and other institutions lack resources to maintain and develop their collections of specimens. The crisis is obvious in many Western countries, but even more so in most developing countries, where the needs are most prominent. The crisis is due partly to difficulties in communicating the need to use taxonomic knowledge in applied fields. There is thus a need to facilitate the identification of priority issues and possible actions to support taxonomy.

At CBD COP4, the Parties to the Convention decided to establish a Global Taxonomy Initiative (GTI, Decision IV/1/D). The issue of taxonomy had previously been discussed at several COPs and SBSTTA meetings. The GTI will focus on identifying the needs for taxonomy and propose appropriate action. To a large extent, the GTI has been furthered by national organizations and agencies outside the CBD process, especially so at expert meetings in Darwin (Feb 1998) and London (Sep 1998). The

Darwin meeting resulted in the Darwin declaration, that suggests action to be taken within the GTI by CBD, GEF, national governments and institutions. These suggestions were largely incorporated in Decision IV/1/D. The London meeting elaborated on the role of the GEF and suggested a number of framework projects for taxonomy to be funded by the GEF.

The Global Environment Facility (GEF) is obviously a very important driving force for the GTI, since two COP decisions have designated GEF as the primary funding agency for taxonomy, especially regarding capacity building in developing countries. The GEF still needs further guidance in its role within the GTI, especially concerning priorities among kinds of projects to be supported.

At the CBD level the GTI includes the erection of a position for a dedicated Taxonomy Programme Officer at the Secretariat, to coordinate CBD activities within the GTI and to assist national governments in their work. The development of the Clearing House Mechanism (CHM) as a taxonomic information system is essential.

The GTI is also directed at national governments and institutions, suggesting action to be taken. At the national level this includes developing a infrastructure for national collections, providing stable financial situations for taxonomic institutions, providing training programmes as well as job positions for taxonomists, enhancing the availability of taxonomic information and to encourage partnerships between developed and developing countries.

At the institutions level the GTI includes the development of national priorities in taxonomic needs, consideration of the needs of a wide range of users of taxonomic information, establishment of mechanisms for stable nomenclature, consortia for regional projects and bilateral training and research programmes.

Sweden has decided to support the implementation of the GTI in developing countries. The Swedish Scientific Council on Biodiversity, supported by Sida, has launched a three year project in support of the GTI, with a total funding at about 500,000 USD. Together with Australia, Sweden is thus providing funds for a

Taxonomy Programme Officer at the Secretariat. The project will also fund regional taxonomy conferences in Africa and Central America, encouraging national and regional priority settings and facilitating the formulation of projects to be supported by the GEF.

Sweden envisages the GTI to develop during the next three years, with regional taxonomy meetings taking place beginning late in 1999 and continuing through 2001, followed by a global meeting in 2002. It is especially important to point out the need for a European regional meeting; the taxonomic impediment is evident also in Western countries. The regional meetings should result in GEF applications that may initiate action in 2000. This processes should be coordinated and monitored by the Secretariat, and the Programme Officer will hopefully be employed within a few months. Implementation of actions suggested at the national and institutions level should start immediately – there is no need for further CBD decisions.

The Secretariat Note SBSTTA/4/6 describes the GTI process and suggests issues to be dealt with by the SBSTTA at its June meeting. The secretariat calls for amplification and operationalization of the COP Decision IV/1/D, with the development of a practical action plan. It is especially important to prioritize among all suggestions for action that has been put forth. The secretariat sees the need for tools to assist implementing CBD provisions, tools for information dissemination, tools for creation/strengthening of infrastructure, and a framework for development of training programmes. A liaison group is suggested, to assist the Programme Officer. The secretariat also would like SBSTTA to compile and prioritize among suggested framework projects for funding by the GEF.

Points raised in the workshop discussions on the GTI

The taxonomic impediment

How can stability of nomenclature be achieved? Cannot be implemented easily for practical and theoretical reasons; the progress of research in systematics should not be suppressed, since changes in nomenclature reflect new approaches and theories

in phylogenetics.

Contact and encourage the Commissions for the International Codes of Nomenclature (separate for plants, animals, fungi etc) to cooperate and to work out a unified and simplified code for all “higher organisms” (exclude bacteria and viruses – too complicated due to different species definitions). Details of the naming procedure should be made easier (no linguistic correctness of latinization, delete the names of revising authors in botany).

Most important, restrict publication of new names/taxa to a limited number of scientific periodicals. Do not accept publication in local, unknown, non-refereed, over-specialized journals in rare languages. Descriptions should be made in the actual lingua franca of science, English.

Regional or taxon-based revisions of high standard should be encouraged and supported (technical assistance, travel expenses, printing, distribution). They contribute more to stable nomenclature than any other simple measure. This also raises the question of job opportunities and manpower. Revisions can never be done within a 1-2 year project position. Quite a number of ”corner-stone” taxonomists must be available for this ”administration of names” and the subsequent use of the knowledge.

The number of job positions needed is frequently under-estimated. Even a good long-term employed taxonomist administers only 2000-5000 species (maximum). Given that 1.75 million species have been described so far, and perhaps 20-100 million remain to be discovered, the present number of job positions is insufficient to meet the needs.

Training of taxonomists is useless without providing attractive job opportunities. There is quite a number of skilled but unemployed young taxonomists. Details concerning the curricula of training and education programs should be discussed, since the typical traditional museum-related type of taxonomist is often unable to cope with the needs for cooperation, databanking, presentation and public awareness.

Avoid repetition of work through regional cooperation and distribution of work. If work is based on small geographical territories (such as German countries) it is repetitive, but also under-financed. Regions might be Scandinavia, British Islands, central Europe, West and or East Mediterranean, Eastern Europe. Within this framework only one specialist is needed for each main taxon. He/she should be sponsored and enabled to fulfill his/her tasks.

For practical reasons the species level should be the base for research, administrative and conservation work. For special questions and problems we also need to use the subspecific level, or even population level. This may be the case regarding hybridization, invading species, genetically modified populations, hidden intraspecific polymorphism (e.g. sturgeons, cod, salmon and other fish species, also in plants where cultivated stock may replace wild populations), host-related subspecies in parasites, polymorphisms of different kinds, marginal populations etc.

Marketing the products of taxonomy. Demonstrate the indispensability of taxonomic knowledge, results, beyond the level of TV entertainment. Establish national biodiversity expert groups to coordinate research, projects, databanks etc, beyond the present interests of professional societies and fund-hungry institutions. The ”rich” industrialized countries should sponsor developing countries in partnerships, e.g. EU for Africa, North America for Latin America etc.

The Global Environment Facility

The GEF and its process of application is still little known by individual scientists and institutions. Gap in communications, due to group interests.

Comments on the report ”The Global Taxonomy Initiative: Shortening the Distance between Discovery and Delivery”

The utopia of completeness in taxonomy should be given up. What we need is not complete, but sufficient coverage. A better balance needs to be achieved between the

investment in time and manpower for taxonomy and the amount of results of use to persons outside a small expert group.

Framework projects are useful for this purpose. They may cover urgent needs and provide data for practical problems to be solved.

Expert lists at international level (at least all of Europe) should be erected (basic information is already available) and, most important, be limited to active taxonomists.

Components of the GTI: CBD level

There is a need for a logical framework analysis of taxonomy within the CBD. What are the actual problems? What can be solved by the CBD process? What does already exist? New action must build on existing initiatives.

There is a need for a global directory of taxonomists.

Access to taxonomic information: Enhance libraries, encourage reading, enable collections to provide their material in databank frames.

CBD should facilitate the development of taxonomic tools needed for implementation, at the regional and national level, of other CBD provisions. Such tools include e.g. improved identification guides, utilizing the best information technology, and covering a wider range of taxa than is available today. Further, there is a need for a IT tool that can combine data of different kinds, e.g. specimen-based museum data, inventory data, habitat-related data, preferentially in a GIS-environment.

CBD should address the problem of taxonomy in relation to access to genetic resources and intellectual property rights. At this moment, taxonomic research is impeded in many countries by restricted access to genetic resources. This is counter-productive to the aims of the Convention regarding sustainable use, since there is a great need for taxonomic research on plants and animals that constitute resources. Taxonomy should rather widen its scope to descriptions of ethnological

and traditional use of species.

The CBD Clearing House Mechanism should be developed further to serve as a gateway to taxonomic information systems, building on initiatives such as Species 2000 and the OECD Global Biodiversity Information Facility. The relationship between CHM and GBIF should be formalized, and GBIF should receive clear instructions on the needs of the CBD.

The job description for the Taxonomy Programme Officer at the Secretariat should include the following:

- Compilation of taxonomic needs and activities described in existing national Action plans for biodiversity.
- Facilitation of further needs assessments in developing countries, including guidelines for needs assessments, ways to integrate taxonomy in a national strategy, identification of demands for taxonomy in other activities.
- Coordination of regional activities, assisted by a small liaison group.
- Compilation of national reports on taxonomic information systems in place. This requires a request for national reporting on taxonomy issues.

It would be valuable to have a report from GEF on activities carried out and being planned regarding the GTI and taxonomy in general.

Components of the GTI: National level

There is still a need to disseminate the importance of taxonomy for development and economy to the political level. Taxonomists at museums and other institutions should contribute to this process by demonstrating best examples of applied taxonomy. There is also a need to inform politicians about the taxonomic impediment, explaining why taxonomists and institutions presently may be unable to provide the taxonomic services required for implementing the CBD.

There are many small but valuable and indispensible museums and private

collections that are not sufficiently accessible, supported or active. This problem must be presented to responsible people at high positions. Funds must be established to activate this treasure. This is part of the responsibility of the developed countries that house material (types, documentation etc) collected in other countries. Access and research must be supported.

There is a need for taxonomists to market their products, and for potential users of such products to clearly formulate their needs. Decisions regarding infrastructure building and training must be demand driven.

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Prevention of Impacts of Alien species, Introduction to the Global Invasive Species Programme (GISP)

Problem acknowledged

The mixing of faunas and floras caused by people carrying species across biogeographical boundaries has, along with habitat destruction, been a major cause of extinctions throughout the world since the beginning of intercontinental trade. Invasive species are, next to habitat destruction, the most serious threat to autochthonous biodiversity, especially in isolated ecosystems (e.g. islands, catchment basins). Apart from their impact on all levels of biodiversity, they are also an increasing risk for economic, medical and ecological damage. There is still a lack of consciousness and therefore information has to be provided to the public, administrations, and users (professional, private) of biodiversity.

There is a time lag between the introduction of species and the beginning of their spreading or establishment. The number of invasive (i.e. established alien) species will therefore increase further, even if no new species are introduced.

The taxonomic impediment becomes very obvious concerning the identification of alien species.

Invasive species are a new category for international agreements.

Classification / typology

An alien species (introduced, non-indigenous, exotic, neozoans/neophytes) is a species (incl. sub-species or lower taxa) occurring as a result of human activity in an

area or ecosystem in which it is not native. Not every alien species becomes a threat for biodiversity. The proportion of exotics that cause serious trouble is difficult to estimate, but there exists a very rough rule of thumb called the "tens rule".

Relying on proposals of IUCN

The "Draft IUCN guidelines for the Prevention of Biodiversity Loss due to Biological Invasion" are supported. However, they do not take into consideration the impacts of biological invasions on human health and on economy.

Expert group

In April 1999 a Regional Expert Group "Invasive Species" was constituted in Berlin, establishing a partner for administration and conservation and a focus for interested scientists.

Regulation

Recommendations which should be emphasized:

- establish expert group
- encourage scientific research in all major taxonomic groups and all types of ecosystems
- encourage research in managment of invasive species:
  a) prevention of import
  b) development of risk and cost assessment for deliberate introductions
  c) control of invasive species already introduced in case of negative impacts

Modes of regulation

a) Public information
b) Harmonization of sectoral legislation (on a national level)
c) Cooperation of international agreements pertaining to the alien species problem (e.g. FFH directive, CITES, etc.)
d) Development of guidelines
e) Liability

For further details see:

UMWELTBUNDESAMT (Eds.) 1999: “Alien Organisms in Germany” - Documentation of a Conference on 5-6 March, 1998. - Texte 18/99 des Umweltbundesamtes, 142 pp. ISSN 0722-186X.

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“Terminator Technologies”

Instead of a foreword

CGIAR has decided against using “Terminator Technologies” in its breeding materials:

1. the potential risk that seed sterilization may spread to surrounding crops through pollen,
2. the possibility that sterilized seeds might be sold or exchanged from planting
3. the importance of farm-saved seed, particularly to resource-poor farmers,
4. potential negative impacts on genetic diversity
5. the importance of farmer selection and breeding fur sustainable agriculture.

What “Terminator Technologies” stand for?

They are techniques to control a wide variety of input and output (= production and processing) traits in crops. Some patents aim **to switch the plant's germination on or off**, e.g. the first patented “terminator technology” system TPS (Technology Protection System) of Delta & Pine Lands (D&PL) and USDA. TPS is a transgenic system comprised of a complex array of genes and gene promotors that is inserted into crops in order to prevent their seeds from germinating. The trait is inactive in the certified seed bought by farmers but becomes active at the end of the growing season. It affects the seed that is harvested, not the certified seed that is planted. Another example is AstraZeneca's Verminator technology that links plant growth and germination to repeated application of proprietary chemicals. Without specific patented chemicals, the plant does not grow.

Another “Terminator Technology” patent of Novartis aims at **genetic mutilation**, i.e. the deliberate disabling of natural plant functions that help to fight diseases. Genes which are natively regulated can be regulated exclusively by the application of a chemical regulator to the plant. Among the genes which Novartis can control in this manner are patented systemic acquired resistance (SAR) genes which are critical to fight off plant infections from many viruses and bacteria. Thus Novartis has created plants with natural healthy functions turned off.

Why “Terminator Technology” may be commercially interesting for seed companies? Are there technologies available serving the same aim?

Seed companies have been searching for ways to boost their certified seed sales for many years now, and this new technology may be just what they've been looking for. It is a way for them to be rewarded for their technology investments of millions of dollars by impeding farmers to have the seed collected in fall and used in the next spring without paying to the biotech companies. It is argued that because of an increased possibility of a return on investment in breeding research, it should pay off to develop more improved varieties in a broader range of crop species.

It is not the first protection system to disable the usage of the seed produced. The most common type of protection system is hybrid seed production. Although primarily a system for increased yield via hybrid vigor, it is also a protection system. Hybrids are seen in many cross-pollinated crops such as corn, sorghum, sunflower and canola. Reduction in performance and changes from the parent seed leads to little saving of hybrid seed. Farmers have to purchase new seed each year to ensure quality.

There are, however, great difficulties in producing hybrids for self-pollinated species such as cotton, soybeans, wheat and rice. Therefore sterilizing self-pollinating crops is certainly the most lucrative trait for a seed company to develop. Terminator

technoloies might give the seed biotechnology industry a reason to put more effort into improving self-pollinating crops.
A third way to secure biotechnology R&D investments for companies is to agree technology use agreements (TUA).

What is the biotechnology of "Terminator Technologies"?

In this method essentially a terminator gene (= germination inhibitor gene) is activated that produces a toxin that prevents seed germination. Besides the terminator gene, the D&PL/USDA-technology includes components of recombinase gene, blocking sequence, and a transiently active promoter. (Promotors control the spatial and temporal expression of genes by modulating their level of transcription). All these links are essential if the terminator chain is to work. Just prior to bagging, seed with the necessary genetic component of the terminator gene is treated with a chemical stimulant. After germination a series of actions trigger the sterility process which culminates in the terminator gene and transiently active promotor coming together to produce the toxin. The promotor is active only during the later part of seed embryo development.

The patented "Terminator Technology" of Monsanto selectively controls seed germination, wherein germination can be inhibited by expression of a germination inhibitor and, subsequently, germination can be induced via an inducible promoter that is operably linked to a germination restorer. Here the chemical stimulant induces germination by inducing the promoter that is operably linked to a germination restorer.

The Zeneca patented "Terminator Technology" comprises a recombinant DNA construct functional in plants comprising a disrupter gene encoding a product capable of disrupting cell function. This disrupter gene is being functionally linked to and controlled by an externally regulatable gene control region which includes a promoter which is inducible by the external application of a chemical inducer. If by this the promotor is induced a repressor protein is set free which inhibits the

expression of the disrupter gene.

Who owns the property rights?

The United States Department of Agriculture's Agricultural Research Service (USDA-ARS) and the Mississippi based seed company Delta & Pine Land (D&PL) together were granted a US patent (filed for in 1995) for the TPS technology in spring 1998. Two months after the patent was awarded, Monsanto signed an agreement to buy D&PL for 1.8 US billion. The takeover deal will likely close before the new year, after both companies get government and shareholder approval. Until then it is said, Monsanto does not have commercial access to TPS. D&PL says it is planning is to sell the process to other seed companies and make the technology broadly available. The USDA is moving to secure plant protection for its “Terminator Technology” commonly held with D&PL in 87 countries North and South.

Monsanto already has its own in-house, patented “Terminator Technology”, which it says it will patent in a 89 countries.

AstraZeneca says it will patent its “Terminator technology” in 77 countries.

Biosafety and biodiversity aspects

D&PL states that TPS prevents the possibility of transgene movement and crossing to wild relatives. If TPS-pollen happens to pollinate flowers of a wild, related species, it is said to render the seed produced non-viable (i.e. it would not germinate).

In addition the non-viable seed produced on TPS-plants is said to prevent the possibility of volunteer plants. Thus, sterile, genetically modified seed cannot contaminate a gene pool.

According to D&PL there is no correlation between TPS and lack of genetic diversity.

But there are concerns that pollen flow from Terminator-sterilised crops will transfer sterility to other crops and to inceptive wild relatives and impede them to regenerate (i.e. the spring off of the fertilized individuals will be sterile). If, however, the technology is transmitted through recessive genes, the trait can be inherited and multiplied throughout a plant population and result in irregular harvests and population declines over years.

How do farmers see "Terminator Technologies"?

Soybean producers in the US are lobbying that the 'terminator' gene should not be included in all varieties. Their main concern is a lack of adequate certified seed supplies in years when wide-spread replanting is required. If seed companies control supply it is worried that in years when growers need to reseed there might be a seed shortage. Currently, growers can use soybean seed from their grain bins, if certified seed supplies are short. The farmers are also concerned that in the future all improved varieties will contain terminator tech mechanisms.They urgently request at least some superior varieties being held free from these genes.

If terminator tech treated pollen in larger quantities infiltrate the fields with untreated varieties of the same crop (e.g. raoeseed), the following season the farmers concerned reaching into their bins to sow seed could discover - too late - that some of their seed is sterile.

The real question is, will farmers have a choice? The commercial seed industry is imploding, and a handful of multinationals already control a rapidly expanding share of major seed markets. After DuPonts buying of Pioneer Hi-Bred the US seed market becomes more or less divided between DuPont and Monsanto (who also discuss a merger). Some mergers of European multinationals have already happened, further buy-ins of SME breeders are expected. With the disappearance of SME and public sector plant breeders, farmers are becoming increasingly vulnerable and have fewer choices in the marketplace.

When will "Terminator Technologies" be on the market?

It will be a few years before TPS transgenic varieties will be commercialized. At the moment there are no TPS plants growing in the field, anywhere in the world. D&PL is bringing all the components together in cotton. Terminator cotton seed will probably not be ready for commercial use until 2004.

One has to notice that there is no market for the terminator gene by itself, so it must accompany an increase in yield or another benefit.

Which crops are main targets?

At present only cotton (see above) and tobacco seeds have been proven to respond to D&PL technology

Rice, wheat, barley, sorghum and soybeans are primary targets because they are not readily hybridized.

Canola (rapeseed) is not a likely candidate for early incorporation of TPS.

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Terms of reference of the ad hoc technical expert groups

- SBSTTA shall give advice to COP-5 on the terms of reference of ad hoc technical expert groups on thematic areas
- Five groups are proposed by the secretariat
- Basic elements and proposed structure of terms of reference of the groups are well defined
- Expert groups will not start working before COP-5!
- The secretary general has beside the ad hoc technical expert groups other and more flexible options to ask for advice (liaison groups based on the roster of experts)
- To gain time the secretary general will treat some topics like indicators and the ecosystems approach with the help of liaison groups.

No.	Topic	Basis for recommendation	Remarks
I	Marine and coastal biological diversity (i) Marine and coastal protected areas (ii) Mariculture	Implicit COP decision for the establishment of two ad hoc technical expert groups	COP-4 decision! One instead of two groups.
II	Inland water biological diversity	In line with the time frame [work programme] it is envisaged that the establishment of a ..... is required	Work programme under way
III	Drylands, mediterranean, arid, semi-arid, grasslands and savanna ecosystems	Since these issues are likely to need further development the establishment .... is proposed	New topic
IV	Alien species	Alien species will constitute an item for in-depth consideration by the COP-6	New topic
V	Forest biolocial diversity	In view of the mandate [work programme] the establishment of	Work programme under way

		.... is required	

“Expert meeting in preparation for the fourth meeting of SBSTTA”
April 13 - 15, 1999 on the Isle of Vilm

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Programme

Monday, 12.04.1999

Arrival on the Isle of Vilm

18.30 *Dinner*

Tuesday, 13.04.1999

08.00 *Breakfast*

09.00 MARTIN UPPENBRINK
Welcome of the participants
Introduction to the Federal Agency for Nature Conservation and the International Academy for Nature Conservation, Isle of Vilm
Opening of the meeting

09.20 Introduction of the participants

09.30 TORBJÖRN EBENHARD
The Global Taxonomy Initiative
Discussion

10.30 *Coffee / Tea break*

10.45 ULRIKE DOYLE
Prevention of impacts of alien species, Introduction to the Global Invasive Species Programme (GISP)
Discussion

12.00 *Lunch*

13.30 Guided tour in the nature reserve of the Isle of Vilm

15.15 *Coffee / Tea break*

15.30 THOMAS PLÄN
Consequences of the use of the new technology for the control of plant gene expression for the conservation and sustainable use of biological diversity
Discussion

16.15 CARLOS MARTIN-NOVELLA
Sustainable use of biological resources

MICHAEL MEYER
Tourism as an example of sustainable use of biological resources
Discussion

18.30 *Reception at the invitation of the Federal Agency for Nature Conservation, Germany*

Wednesday, 14.04.1999

07.45! *Breakfast*

08.30 Departure by ferry to Lauterbach
Full day excursion to Rügen Island (Jasmund National Park, Biosphere Reserve Southeast Rügen)

18.30 Return to Lauterbach

19.00 *Dinner*

20.30 REINHARD PIECHOCKI
The cultural history of the Isle of Vilm

Thursday, 15.04.1999

08.00 *Breakfast*

09.00 FRANCESCO MAURO
Conservation and sustainable use of terrestrial biological diversity (drylands, arid, semiarid, grassland and savannah ecosystems)
Discussion

10.15 *Coffee / Tea break*

10.30 N.N.
Biodiversity impact assessment
Discussion

12.00 *Lunch*

13.30 HORST KORN
Terms of reference for technical expert groups
Discussion

15.00 *Coffee / Tea break*

15.15 Final discussion

18.30 *Dinner*

Friday, 16.04.1999

07.30! *Breakfast*

08.20 Departure of the participants