Day One

Session 1
Introduction

Session 2
The Convention on Biological Diversity and Access and Benefit Sharing

Session 3
ABS Terminology and Traditional Ways of Using Biological Resources

Session 4
Status of Biodiversity and Genetic Resources in the Hindu Kush-Himalayan Region

Session 5
Importance of Biodiversity, Genetic Resources and Associated Traditional Knowledge

Session 1
Introduction

Registration, Opening and Introduction, Participants' Training Expectations, and Objectives of Training

Time: 2 hours

Objectives

To introduce participants, find out their expectations, and clarify the objectives of the training

- Registration of participants and resource persons
- Introduction of participants and resource persons
- Discovery of participants' expectations
- Discussion of training objectives in relation to participants' expectations
- Discussion of any issues of concern raised by the participants

Materials

- One bag per participant containing a pen, writing pad, the training schedule, and relevant documents/materials
- Wall clock
- Medium sized balloons of different colours, small pieces of paper, chairs
- General equipment and materials as described in the section 'How to use this manual'

Activities

Activity 1: Registration

Time: 15 minutes

Suggestions for the trainer

Introduce participants and resource persons at the start of the training; this helps create an environment of ease among all present. Make the introductions fun by using an icebreaker, which serves the dual purpose of making the session interesting and discovering the expectations of the participants. Choose the icebreaker carefully keeping the above in mind. There are many possible icebreakers. One is suggested here, or select or create one of your own. Innovative ideas can make the session more interesting.

(continued on next page)

Suggestions for the trainer (continued)

The objectives can be presented verbally or in a PowerPoint presentation. Call attention to the training schedule and briefly explain the content of the training and the way it is distributed over the days. When presenting the training objectives, compare them with the expectations expressed by the participants and the contents of the training. The comparison should give a picture of the extent to which the participants already have a comprehensive, strategic overview of ABS and whether or not they have expectations outside the scope of the training. If some expectations are not addressed in the objectives, make this clear. If the expectation is relevant but not explicitly addressed, explain that it can be discussed during a related session.

Registration is an informal session to record participants' names and addresses for future use and to distribute materials.

A bag/file should be prepared for each participant containing any materials required during the training such as writing pads and pens, the training schedule, and documents required for the training sessions, and handed to the participants during registration. A simple table can be used to record the name, address, and contact details of each participant. This form can be kept separately at the registration desk and participants should be asked to complete it by themselves.

Sample registration format

S.N.	Name of participant	Organisation	Address	Telephone/ e-mail

Activity 2: Exercise – Icebreaker, introductions, and discovery of participants' expectations

(adapted from Subedi 2008)

Time: 60 minutes

Aim

To introduce participants, resource person(s) and trainer(s)
To share expectations of the workshop

Method

Mutual introduction of the participants, discovery of expectations

Materials

Medium sized balloons of different colours, small pieces of paper, pens, chairs, meta cards, and markers

Steps

Step 1 Introduce the aim of the exercise.
Step 2 Give one balloon, a small piece of paper (just enough for the participant's name), and a pen to each participant, including the trainer and any resource persons.
Step 3 Split the participants into two teams and seat the teams facing each other.
Step 4 Ask the participants to write their name on the piece of paper, put it inside their balloon, and blow up the balloon and tie it. Ask them to make the balloon as big as possible.
Step 5 Place all the balloons on the floor between the groups.
Step 6 Place a chair in the centre between the two teams.
Step 7 Team members then take turns in picking a balloon, placing it on a chair in the centre, and sitting on it until it bursts. (The participants should not choose their own balloon if they recognise it). The trainer should encourage the participants to make as loud a noise as possible.
Step 8 After the balloon bursts, ask the participant to take the piece of paper and return to his/her chair.
Step 9 Members from Team A and Team B take it in turns to burst the balloons. This is repeated until all the members of both teams have had a turn and have a piece of paper with a name.
Step 10 Distribute meta cards to all the participants.
Step 11 After all the balloons have been burst, each participant is asked to find the person whose name is written on the paper from the balloon and find out their partner's name, organisation/group, and at least two expectations that s/he has of the training. They should write the partner's details and each of the expectations on separate cards.
Step 12 Then ask each participant to introduce their partner and share his/her training expectations.
Step 13 Pin the meta cards with expectations to a soft board or stick on the flip chart. Group the expectations and discuss in the class. The cards will be kept and reviewed on the last day of the training.

Activity 3: Agreement on group rules and norms

Discuss with participants the rules and norms to be observed to ensure a good atmosphere for the training. Write down the points raised on a flip chart or white board. Summarise on one sheet of paper and display on the wall throughout the training. Some typical ideas that might be included are listed below.

- Confidentiality
- Responsible for your own learning
- Responsible for your 'yes' and 'no'
- Deal with things that disturb participants first. No question or observation is weird.
- Respect for gender and culture
- Respect starting and ending times
- Inform when absent
- Mobiles off (else…)
- One speaker at a time
- Not all group work comes back to plenary
- Keep cases realistic

Activity 4: Training objectives

Time: 30 minutes

It is important that participants understand the objectives of the training and can compare these with their expectations. This provides them with a clear idea of what will be covered and an opportunity to modify their own expectations. The trainer may also consider tailoring the course where appropriate to take into account the starting position and expectations of the participants.

The main aim of the training is to enable participants (who may include a mixture of people from NGOs, local government staff, the media, and national level government resource persons) to effectively help communities and nations to access, and claim a fair share of the benefits derived from, genetic resources and associated traditional knowledge. The course aims to raise awareness of the obligations, rights, and responsibilities of government, civil society, local and indigenous communities, and the private sector in the access and benefit sharing, or ABS, process. At the end of the training the participants should understand the general objectives and exhibit observable behaviour as described below.

Objective 1 Grasp the potential significance and magnitude for communities and nations of owning and using their genetic resources.

Observable behaviour

- Participants are able to give a number of quantified examples of how owning genetic resources can impact on, and benefit, communities and nations.

Objective 2 Understand the potential pitfalls and the reasons why communities and nations tend not to exploit or receive a fair share of the benefits derived from their genetic resources and associated traditional knowledge.

Observable behaviour

- Participants are able to explain who wins and who loses in accessing genetic resources and associated traditional knowledge, and why; and can point out that communities and nations both lose if they receive an unfair share of benefits and if genetic resources remain unused or overused.

Objective 3 Understand how national laws, a regional framework, and international legal instruments can assist communities and nations to use their genetic resources and ensure a fair share of the benefits from their use.

Observable behaviour

- Participants are able to summarise the relevant legal instruments, and explain their intention and implications and how they can be used in accessing and obtaining benefits for communities and nations.
-

Objective 4 Understand how different actors (such as local governments, NGOs, researchers or private prospectors, customs officials, and the media) can assist or impede the exploitation of genetic resources by communities and nations and in ensuring that they receive a fair share of the benefits.

Observable behaviour

- Participants are able to identify the relevant actors who assist or impede communities or nations in ABS.

- Participants are able to explain and defend the ABS process, step-by-step, as outlined in the ABS Poster (Resource Materials for Session 9).
- Participants are able to understand the obligations, rights, and responsibilities of the various actors in the bioprospecting process.

Objective 5 Be able to synthesise fair, equitable, and inclusive ABS mechanisms.

Observable behaviour

- Participants' capacity in relation to negotiating skills and biodiversity documentation is enhanced.

Objective 6 Significantly improve conflict management and negotiation skills.

Observable behaviour

- Participants can explain the principles of negotiation using examples from genetic resources and associated traditional knowledge, such as focusing on interests, rather than positions; separating the people from the problem; finding (creative) options for mutual gain; and using fair criteria (which includes proposing and pursuing fair benefit shares).
- Participants display good (improved) negotiation skills in role plays, or can respond with sensible arguments to cases presented to them.

Objective 7 Have an open, proactive, and strategic attitude and have strategies for using genetic resources.

Observable behaviour

- Participants can present ideas about how to attract and regulate bioprospectors.
- Participants can explain the pitfalls of pure protectionism.
- Participants can explain the challenge of having innumerable genetic resources, of which only a few may be commercially significant in the near future (and that, therefore, there is no point in randomly documenting genetic resources).
- Participants can present ideas about how to prevent or follow-up on the poaching of genetic resources and about the conservation of genetic resources.

Activity 5: Other issues (housekeeping)

Time: 15 minutes

It is wise to keep aside some time to discuss any other issues that may need attention during the training. These issues may or may not be related to technical aspects of the training. Letting participants know that any issues that are important to them will be looked after is reassuring and is a way of making participants feel comfortable and engaged. The trainer may ask about time schedules, logistics, or any other issue. If a participant raises an issue, the trainer should seek a solution by discussing with the group. The important thing is to assure participants that their needs will be taken into consideration.

After this discussion, the trainer should continue with the next technical session.

Session 2
The Convention on Biological Diversity and Access and Benefit Sharing

Time: 45 minutes

Objectives

To introduce the Convention on Biological Diversity (CBD), the emergence of the access and benefit sharing (ABS) regime, and the relevant processes.

- To understand the history of the CBD and the ABS regime
- To know about governance mechanisms and the implementation of the CBD
- To be aware of the Conference of the Parties (COP), its chronology, and ABS related decisions
- To know about the guiding principles of the CBD and the Bonn Guidelines

Methodology

The person who presents the session can choose to do a verbal presentation, use a media tool such as PowerPoint, or come up with his/her own innovative methodology.

Materials

If a media presentation is used, prepare it in advance and ensure that the equipment is set up and ready to use before the session begins.

Suggestions for the trainer

Follow the chronology of the CBD ABS regime. Begin by talking about the status of genetic resources and associate traditional knowledge prior to 1992, followed by the international negotiations that led to the CBD. The resource materials cover the chronology beginning with the history of the CBD and its governance structure and institutions, followed by a description of the Conference of Parties (COP) and a chronology of the COP decisions related to the ABS regime. A copy of the CBD Bonn Guidelines – the guiding principles for implementation of the ABS regime – is also provided. Provide the participants with handouts or remind them that the resource materials are provided in the manual.

Attention!

This session is purely technical and the trainer should have an in depth knowledge of the content. If the trainer is not fully equipped to deal with the content, a resource person(s) can be invited to conduct the session.

Activities

Activity 1: Presentation on the CBD and ABS

The whole of this course is related to the Convention on Biological Diversity and its provisions for access and benefit sharing of genetic resources and associated traditional knowledge. The presentation should outline the main points of the CBD related to access and benefit sharing, the institutional mechanisms, and especially the functions of the Conference of Parties (COP) and the Secretariat and the guiding principles. The presentation should contain or be followed by an opportunity for discussion and explanations

Session 2 Resource Materials

Emergence of the Convention on Biological Diversity and Access and Benefit Sharing Agreements

Background

Prior to the adoption of the Convention on Biological Diversity (CBD) in 1992, access to genetic resources and associated traditional knowledge was considered free for all mankind. Resources and knowledge were often taken from communities and countries by organisations and individuals who monopolised the benefits. There were a few countries that had legal provisions for benefit sharing from the use of genetic resources in the country of origin, but this was largely carried out at the government level and the benefits did not reach the communities that owned the resources and held the associated traditional knowledge. There was no provision for the fair and equitable sharing of benefits, and benefits were mainly tangible in the form of royalties. The local community and country of origin could not obtain the desired benefits from their own resources. Communities and countries of origin were also not informed about their genetic resources and associated traditional knowledge. This prevented them from entering into the benefit-sharing stream for the use of genetic resources and associated traditional knowledge. The monopoly over benefits arising from the use of genetic resources and associated traditional knowledge made resource-providing countries aware of how access could be facilitated and benefits shared in a fair and equitable way.

After the CBD was ratified in 1993 (see below), it took five years until the first countries came up with ABS legislation (the Philippines and the Andean Pact member countries). Before the CBD entered into force the flow of genetic resources was in effect free, without any requirement for benefit sharing.

The Convention on Biological Diversity (CBD)

Today, access and benefit sharing from genetic resources and associated traditional knowledge is governed by the Convention on Biological Diversity (CBD); an international legal instrument on the sustainable use and conservation of biological diversity. The CBD has three main objectives: 1) conservation of biological diversity, 2) sustainable use of its components, and 3) fair and equitable sharing of benefits arising from the use of genetic resources. Issues of plant genetic resources for food and agriculture (PGRFA) had been debated since the International Undertaking on Plant Genetic Resources by the Food and Agriculture Organization (FAO) in 1983, and the Convention on Biological Diversity (CBD) was one response to this. The Convention was adopted at the Earth Summit in Rio de Janeiro in June 1992 and entered into force on 29 December 1993. As of 2009, there are 194 parties to the CBD, including all the countries of the Himalayan region (Afghanistan, Bangladesh, Bhutan, China, India, Myanmar, Nepal, and Pakistan).

The CBD guarantees individual states sovereign rights over biodiversity and patterns of utilisation. Each state is expected to regulate access to its genetic resources for environmentally sound purposes, and does not impose restrictions that are counter to the objectives of the CBD. In the preamble, the CBD recognises that traditional knowledge, innovations, and practices are of importance to the conservation of biological diversity, and that indigenous and local communities have a close and traditional dependence on biological resources. Their livelihood and lifestyles often depend upon biological resources and are shaped by such resources.

The CBD proposes that each Contracting Party develop (or adapt existing) national strategies, plans, or programmes to reflect the measures set out in the Convention. The CBD also recommends that the conservation and sustainable use of biological diversity be integrated as far as possible and as appropriate into relevant sectoral or cross-sectoral plans, programmes, and policies (CBD no date a).

Institutional Arrangements of the CBD

The institutional mechanisms of the CBD are summarised in Figure 1.

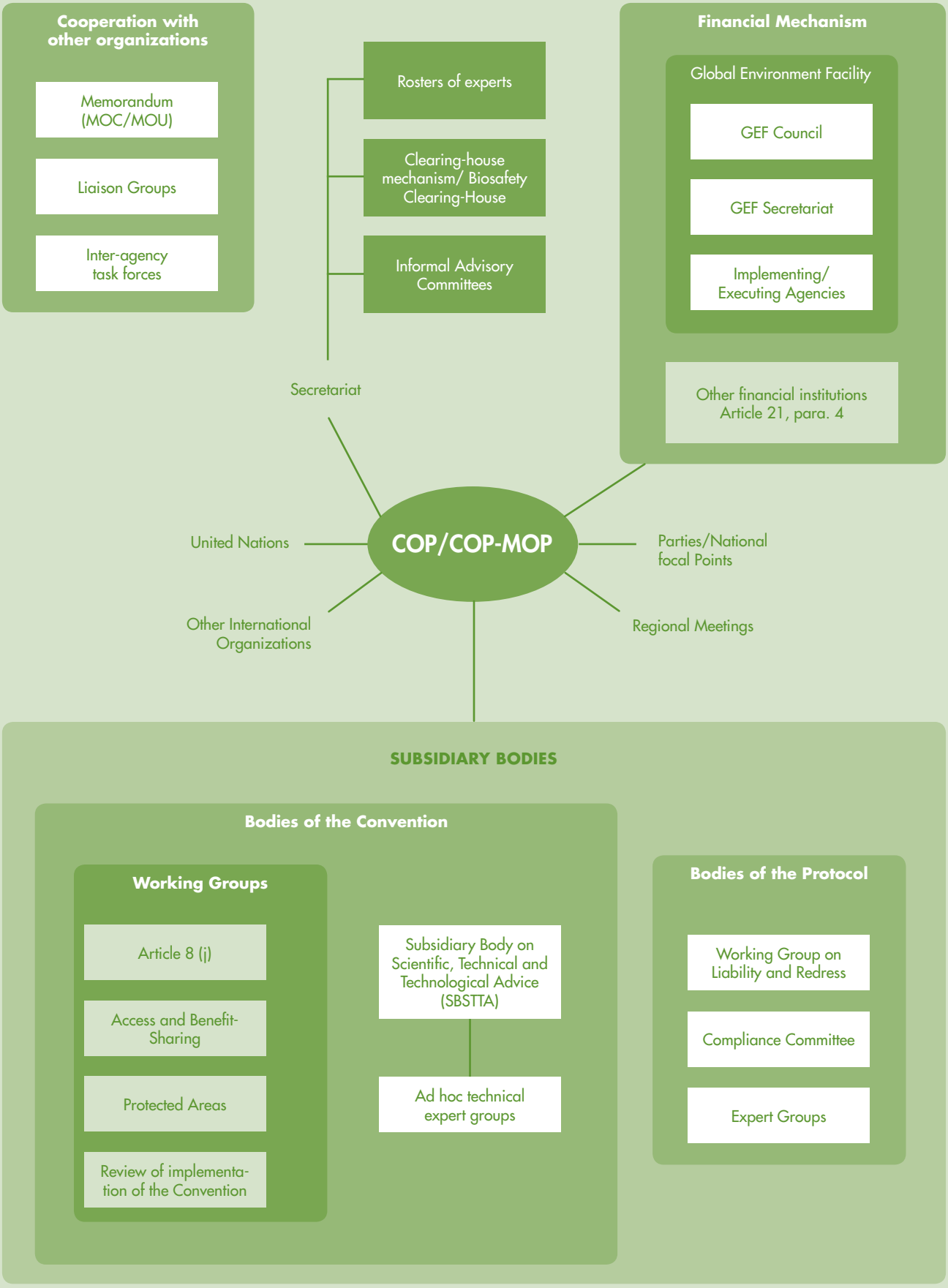
The Conference of the Parties

The governing body of the Convention is the Conference of the Parties (COP), established under Article 23. Its key functions are to keep under review the implementation of the Convention and to steer its development. Other important functions of the COP include adoption of the budget, the consideration of national reports, the adoption of protocols or annexes and the development of guidance to the financial mechanism. A list of functions of the COP under the Convention is set out in Article 23. The decisions taken at different meetings relevant to ABS are summarised in a separate handout below.

The CBD Secretariat

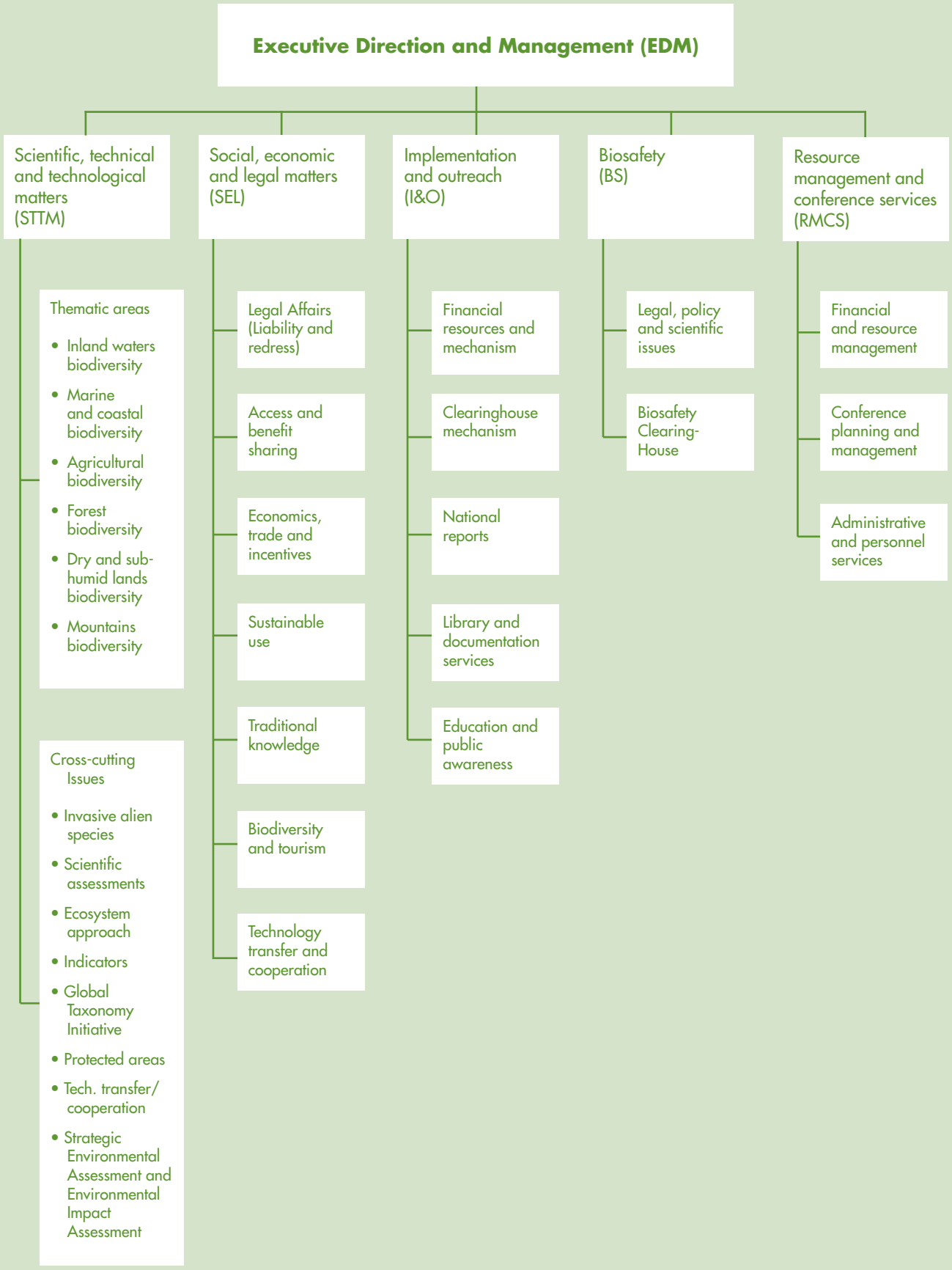
The CBD has a Secretariat whose principal functions are to prepare for, and service, meetings of the COP and other subsidiary bodies of the Convention and to coordinate with other relevant international bodies. The host institution of the Secretariat is UNEP. The Secretariat is located in Montreal, Canada. The Secretariat provides administrative support to various Convention bodies, represents the day-to-day focal point for the Convention, organises all meetings under the Convention, and prepares background documentation for those meetings. It plays a significant role in coordinating the work carried out under the Convention with that of other relevant institutions and conventions, and represents the Convention at meetings of other relevant bodies. The programmatic structure of the Secretariat is shown in Figure 2.

Figure 1: Institutions and institutional mechanisms of the Convention on Biological Diversity



Source: CBD 2005

Figure 2: Programmatic structure of the CBD Secretariat



Source: CBD 2005

Subsidiary Body on Scientific, Technical and Technological Advice

Article 25 of the Convention establishes an open-ended intergovernmental scientific advisory body, Subsidiary Body on Scientific, Technical and Technological Advice, SBSTTA, to provide the COP with advice and recommendations on scientific, technical and technological aspects of the implementation of the Convention.

Financial mechanism

Article 21 establishes a mechanism for the provision of financial resources to developing countries for the purposes of the Convention. In Article 20, developed countries undertake to provide "new and additional financial resources to enable developing country Parties to meet the agreed full incremental costs" of implementing the obligations of the Convention. Article 39 designates the Global Environment Facility (GEF) on an interim basis to operate the financial mechanism of the Convention, and the GEF continues to fulfil this function. The financial mechanism functions under the authority and guidance of, and is accountable to, the COP. Projects of the GEF are undertaken by Parties to the Convention and the Implementing Agencies of the GEF: the United Nations Environment Programme (UNEP), the United Nations Development Programme (UNDP) and the World Bank.

Clearing-house mechanism

Paragraph 3 of Article 18 anticipated the establishment of a clearing-house mechanism (CHM) to promote and facilitate technical and scientific cooperation. An informal advisory committee has been established for the CHM. COP 7 established a programme of work on technology transfer and technological and scientific cooperation with the aim of developing meaningful and effective action to enhance the implementation of Articles 16 to 19 of the Convention.

Additional subsidiary organs In the course of its consideration of specific issues, the COP has seen fit to establish a number of other subsidiary organs with limited and defined mandates. These include: Working Group on Biosafety; Working Group on Access and Benefit-sharing; Working Group on Article 8(j) and Related Provisions; Intergovernmental Committee for the Cartagena Protocol (ICCP); Working Group on Protected Areas; Working Group on Review of Implementation of the Convention; Compliance Committee under the Cartagena Protocol on Biosafety (CBD no date d; CCA no date). These bodies have been established to provide advice and recommendations on specific issues. In each case, the COP has decided the terms of reference of the organ, and has given guidance on its composition.

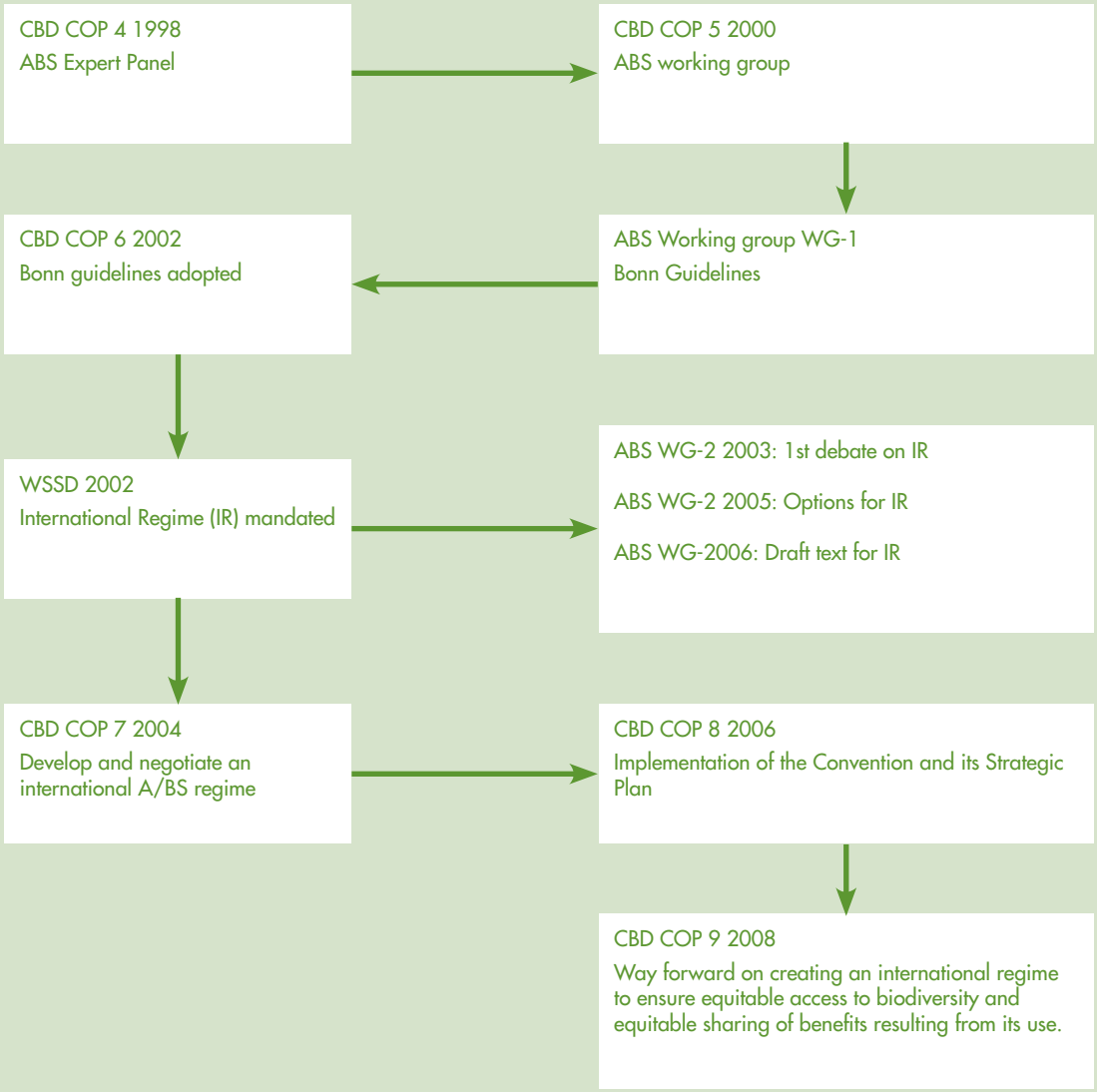
The Conference of Parties (COP) – Decisions and Issues

The governing body of the CBD is the Conference of Parties (COP), established by Article 23. The COP advances implementation of the Convention through decisions it takes at its periodic meetings. To date (2009), the COP has held nine ordinary meetings and one extraordinary meeting (to adopt the Biosafety Protocol). The CBD/COP meetings relevant to ABS and the decisions taken are outlined in Figure 3.

COP 6 took the decision to adopt the Bonn Guidelines (see below) on Access to Genetic Resources and the Fair and Equitable Sharing of the Benefits Arising out of their Utilisation in April 2002. In September 2002, the World Summit on Sustainable Development (WSSD) adopted a plan to implement national and international action on issues related to ABS. Encouraged by the United Nations General Assembly to negotiate an international regime on benefit sharing, CBD COP 7 acted upon the WSSD plan in February 2004. An Ad Hoc Open-ended Working Group on Access and Benefit Sharing started working in collaboration with the Ad Hoc Open-ended Inter-Sessional Working Group on Article 8(j) to develop and negotiate an international ABS regime and to report to COP 8 on its progress. The International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) also came into force on 29 June 2004. The COP 8 meeting held in 2006 led to further developments in the negotiation of an international regime on ABS and an agreement on a 'roadmap' to achieve the 2010 Biodiversity Target to significantly reduce the rate of loss of biological diversity, as a contribution to poverty alleviation and the Millennium Development Goals (MDGs). COP 8 prioritised the preservation, maintenance, and promotion of traditional knowledge relevant to biological diversity. Strategic plans were also developed at the meeting. The process of elaboration and negotiation of the international regime is highly complex and politically controversial. During 2005/06, the positions became polarised, with countries that provide genetic resources on one side and countries that use them on the other.

Since COP 8, there seems to be a new momentum. Working groups on various themes, as decided through COP meetings, are continuing their work and making considerable progress on elaborating and negotiating the international regime. The key questions are: how the ABS system will be supported; what the minimum requirements should be for access regulations and for fair and equitable sharing of benefits; and how traditional knowledge associated with genetic resources will be taken up by the ABS regime. These issues were discussed at the COP 9 meeting in Bonn in May 2008. During the COP 9 meeting, the path towards an international ABS regime was further cleared and the aim set to finalise the regime at COP 10 in 2010.

Figure 3: COP chronology and decisions in relation to ABS



The Bonn Guidelines (Guiding Principles for ABS)

The Bonn Guidelines (CBD 2002b) were adopted during COP 6 to serve as guiding principles for the implementation of access and benefit sharing under the CBD. The Guidelines facilitate and guide the implementation process, without compromising on the objectives of the CBD and its provisions. The Guidelines are intended to assist Parties in developing an overall access and benefit-sharing strategy, which may be part of their national biodiversity strategy and action plan, and in identifying the steps involved in the process of obtaining access to genetic resources and sharing benefits. Full details of the Guidelines are given in Section X of the 'Handbook of the Convention on Biological Diversity' (3rd edition) (CBD 2005).

The objectives of the Bonn Guidelines are as follows:

- To contribute to the conservation and sustainable use of biological diversity;
- To provide Parties and stakeholders with a transparent framework to facilitate access to genetic resources and ensure fair and equitable sharing of benefits;
- To provide guidance to Parties in the development of access and benefit-sharing regimes;
- To inform about the practices and approaches of stakeholders (users and providers) in access and benefit-sharing arrangements;
- To provide capacity-building to guarantee the effective negotiation and implementation of access and benefit-sharing arrangements, especially for developing countries, more so in particular least developed countries and small island developing States among them;
- To promote awareness about the implementation of relevant provisions of the Convention on Biological Diversity;
- To promote the adequate and effective transfer of appropriate technology to providing Parties, especially developing countries, in particular least developed countries and small island developing States among them, stakeholders and indigenous and local communities;
- To promote the provision of necessary financial resources to providing countries that are developing countries, in particular least developed countries and small island developing States among them, or countries with economies in transition with a view to contributing to the achievement of the objectives mentioned above;
- To strengthen the clearing-house mechanism as a mechanism for cooperation among Parties in access and benefit-sharing;
- To contribute to the development by Parties of mechanisms and access and benefit-sharing regimes that recognise the protection of traditional knowledge, innovations and practices of indigenous and local communities, in accordance with domestic laws and relevant international instruments;
- To contribute to poverty alleviation and be supportive to the realisation of human food security, health and cultural integrity, especially in developing countries, in particular least developed countries and small island developing states among them;
- Taxonomic research, as specified in the Global Taxonomy Initiative, should not be prevented, and providers should facilitate acquisition of material for systematic use and users should make available all information associated with the specimens thus obtained.

Session 3
ABS Terminology and Traditional Ways of Using Biological Resources

Time: 60 minutes

Objectives

To review and discuss important terminology in the context of access and benefit sharing and to discuss traditional ways of using biological resources.

- To discuss important terms related to ABS
- To understand genetic resources from a scientific perspective
- To review traditional ways of using biological resources
- To review the ABS Glossary to learn about the most commonly used ABS terms

Methodology

Individual and group exercises and review of ICIMOD's 'Glossary of Access and Benefit Sharing Terms'. The methodology used in this session depends on the trainer, who may be as innovative as s/he likes.

Materials

ICIMOD's Glossary of Access and Benefit Sharing Terms, flipcharts, markers, tape, board

Suggestions for the trainer

Prepare the individual and group exercises provided in advance. Follow them with a presentation on the theme. Clarify any questions during the presentation and discussion. You can vary the order, but it is suggested that Exercise 1 be carried out first, with each part of the exercise followed by a presentation and discussion on the individual topic; then Exercise 2, followed by a presentation on traditional ways of using biological resources, discussion, and clarification; and finally Exercise 3 with the review of the ABS glossary.

Remind participants that the resource materials for the session are provided in the manual.

Activities

Activity 1: Exercise – Biodiversity, traditional knowledge, genetic resources and bioprospecting

Time: 30 minutes

Aim

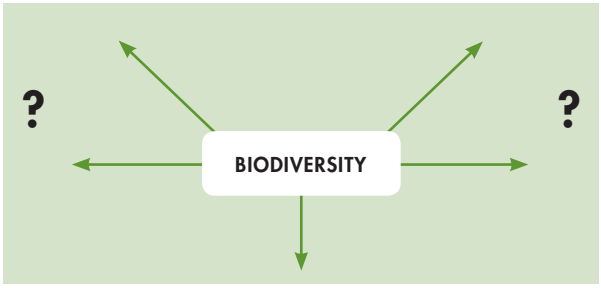
Participants are able to understand genetic resources from a scientific perspective.

To review the participants' understanding of biodiversity, genetic resources, and traditional knowledge and give participants an opportunity to reflect on this understanding

Method: Individual exercise
Materials: Flipcharts and pens

Steps

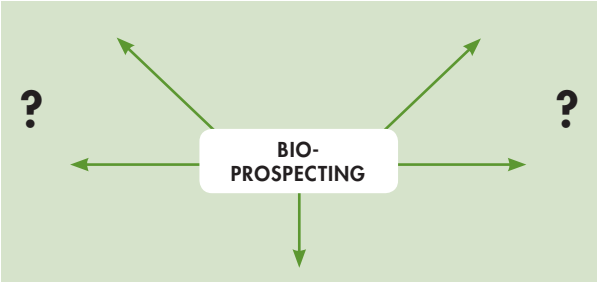
Step 1 Pin or stick the flipchart to the board.
Step 2 Write the word 'Biodiversity' in the middle of the chart and draw several arrows pointing to the word.



Step 3 Ask for a volunteer from among the participants. Ask the volunteer to either draw or write (in words or sentence) what they know about biodiversity on the chart. For example: 'plants'. Ask more volunteers in turn to add to what has been written.
Step 4 When most of the topics related to biodiversity have been covered or at least 10 participants have contributed, give the presentation on biodiversity.
Step 5 Open the floor for discussion.
Step 6 After closing the discussion and presentation on biodiversity, repeat the process for the topic 'traditional knowledge' again followed by a presentation and discussion.

Step 7 After closing the discussion and presentation on traditional knowledge, repeat the process for the topic genetic resources, again followed by a presentation and discussion

Step 8 After closing the discussion and presentation on traditional knowledge, repeat the process for bioprospecting, again followed by a presentation and discussion



Activity 2: Exercise – Traditional knowledge systems

Time: 20 minutes

Aim

To understand the evolution of traditional knowledge systems, and traditional ways of using biological resources and their linkages with ABS.

- Participants are able to understand traditional knowledge systems, their evolution, and the system of knowledge transmission through ancestors.
- Participants are able to understand the traditional uses of genetic resources and knowledge associated with them.
- Participants are able to understand the linkages between traditional ways of using biological resources and the ABS regime.

Method

Group exercise

Materials

Flipcharts and pens

Steps

Step 1 Split the participants into groups by allocating a random number based on the number of groups (e.g., for three groups, allocate each person a number from one to three).

Step 2 Introduce the aim of the exercise.

Step 3 Ask each group to identify genetic resources that are widely used in their community and ask them to discuss their origin, evolution, knowledge transmission process, and associated traditional knowledge. For example, the use of *Datura stramonium*. Hint: Think about traditional medicine and the use of medicinal plants, traditional healers, and traditional food.

Step 4 When all groups are finished with the exercise, open the floor for discussion. Each group will report during the discussions.

Step 5 Summarise, and clarify anything that still seems unclear with a short presentation on traditional ways of using biological resources.

Activity 3: Exercise – ABS Glossary

Aim

To ensure that participants are familiar with the common terms used in ABS activities.

Method

Group exercise

Materials

Copies of the ABS Glossary

Steps

Step 1 Distribute copies of the Glossary to all participants and allow them time for review.

Step 2 Introduce the aim of the exercise.

Step 3 Highlight key definitions and ask the participants to refer to them by citing page numbers.

Step 4 Ask participants if any of the definitions are unclear and discuss these.

Session 3 Resource Materials

Biodiversity – The Web of Life

An ecosystem is made up of all the living animals and plants (biodiversity) and the non-living matter in a particular place, like a forest or lake. All the living things in an ecosystem depend on all the other things – living and non-living – for continued survival, i.e., for food supplies and other needs. In some ways, the actions and reaction that take place within an ecosystem are like a spider web – when one strand is broken, the web starts to unravel. What affects one part of an ecosystem, affects the whole in some way.

The idea of the web of life is shown by the interdependence within an ecosystem. Animals and plants depend on a complex system of food for survival. In a typical prairie ecosystem, the web might work like this: The sun provides energy for the grass; grasshoppers feed on the grass; birds and frogs eat the grasshoppers; snakes eat birds, frogs and mice; owls and hawks will eat the birds as well as snakes, frogs and mice. When an animal dies, it is decomposed by worms, fungi, and bacteria action, and nutrients are released to the soil during the decaying process for the grass to use again. Connecting the many plants and animals with lines representing their functions and food chains within this web would create a tangled maze. It is clear that all forms of life in the ecosystem are dependent on all other living and non-living things for food, nutrients and energy (UI no date; CBD no date a).

Adapted from Capra 1996

What is Biodiversity?

Biodiversity is the word used to describe the variability among living organisms from all sources. It means the whole range of different living beings including plants, animals, birds, insects, fish, invertebrates, microorganisms, and so on.

Biodiversity



Means the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems (CBD)






What is Traditional Knowledge?

Throughout the ages, people have worked together in communities for their survival. In the process, they have invented many survival mechanisms, expanded our knowledge of the world, and developed systems for the management of resources. Such knowledge systems are developed from experience gained over centuries and adapted to the local culture and environment. This traditional knowledge is transmitted from generation to generation. Traditional knowledge is mainly of a practical nature, relating to agriculture, fisheries, health, horticulture, forestry, and environmental management.

Traditional knowledge

Traditional knowledge is the sum of knowledge, innovations and practices of indigenous and local communities around the world; developed from experience gained over the centuries and adapted to the local culture and environment; traditional knowledge tends to be collectively owned and takes the form of stories, songs, folklore, proverbs, cultural values, beliefs, rituals, community laws, local language, and agricultural practices, including the development of plant species and animal breeds (CBD).

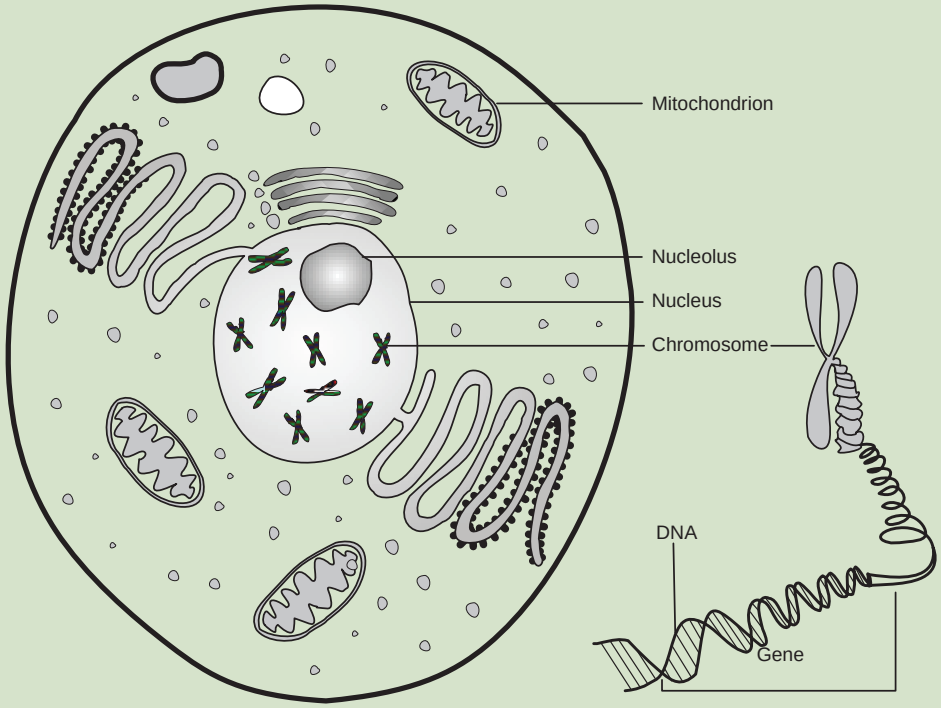
What are Genes?

Living beings

Animals

Plants

Humans



Typical animal cell showing the relationship between cell, cell nucleus, chromosomes, genes, and DNA

Living beings (animals and plants, including humans) are composed of living tissue, which is made up of numerous cells. Each cell is made up of several parts or organelles, each with specific functions, and including, for 'living beings', a cell nucleus, as shown in the diagram of a typical cell above. To understand the concepts of genes and genetic resources, it is important to look at the cell nucleus, the largest organelle and the 'brain' of the cell; and the centre for direction and coordination of the cell's metabolic and reproductive processes. The nucleus contains deoxyribonucleic acid (DNA) bound together with proteins to form bodies called chromosomes. The **genes** within these complexes are the cell's nuclear genome. Selected parts of the hereditary information in the DNA (particular genes) are transcribed into various forms of ribonucleic acid (RNA): messenger RNA, ribosomal RNA, and transport RNA. These all migrate to the cytoplasm through the nuclear pores; whereby the ribosomal RNA is first packaged into 'ribosomes' in a nuclear body called the nucleolus. Together the different forms of RNA are used to translate the 'message' into proteins, ultimately determining all of the components that together form the living organism.

What are genetic resources?

There are many varieties and species of rice crop. Each variety has distinct characteristics like shape, colour, odour, taste, and many others. Some perform well in drought and some in wetlands; some are pest and disease resistant and some are vulnerable. These characteristics are transferred from generation to generation. All of these characteristics are the result of the expression of the plant's genes. These characteristics are referred to as **genetic resources**.

Genetic Resources

The CBD defines genetic resources as genetic material of actual or potential value. It may be any material of plant, animal, microbial, or other origin containing functional hereditary units. This may include a whole organism, parts of an organism, or biochemical extracts from tissue samples that contain deoxyribonucleic acid (DNA) or, in some cases, ribonucleic acid (RNA). In the context of the ABS regime, this is the key element and is the ultimate biological information that can be used to develop and derive new products and transgenic biological material.

Farmers have developed different varieties of rice for different conditions (e.g., dry slopes, wetland, rich soil) and different needs (e.g., flavour, colour, cooking quality). The characteristics were developed by farmers (unknowingly) selecting for different genes.

Traditional Ways of Using Biological Resources

The idea of 'traditional ways of using biological resources' can be illustrated with an example. Communities in South Asia use turmeric in food, medicines (therapeutic and cosmetic), and ritual ceremonies. Turmeric is rubbed all over the body of slaughtered animals to be used as meat. This acts as an antibacterial agent so that the meat does not decay quickly. Turmeric is used in cooking for colour and for its health properties. During weddings, turmeric paste is applied to the bride and the groom for ritual and cosmetic purposes. Turmeric is the main ingredient in many cosmetics such as fairness creams, as it is believed to have chemical properties that enhance the fairness of the skin. This knowledge on the various properties of turmeric has been passed down from generation to generation.

What is Bioprospecting?

While **bioprospecting** seems to be a new phenomenon, it has existed in many forms since societies began trading with other nations. The colonist expeditions from Europe in the 18th Century went to different parts of the world to seek out exotic plants to bring back to their kingdoms. There were decorative flowers, medicinal herbs, and new food samples. These expeditions were a one way transfer of knowledge, with the biological explorers taking knowledge from local people in the different parts of the world. There was no exchange of knowledge and no offer of compensation to the communities they were invading. However, these explorers established infrastructures that would benefit their extractive practices. One of the most famous bioprospectors was Sir Joseph Banks, the botanical supplier of the Kew Gardens in the United Kingdom, established in 1772 as a centre for biological knowledge sharing. The knowledge sharing was with and among the elites, not to offer self-sufficiency to or for the benefit of the communities from where the biological materials were collected. For example, the East India Company employed botanists to find drugs and dying materials fit for European markets, instructing them to find and collect local knowledge and resources and bring them back to Britain and the Kew Gardens from the eastern Himalayan region. Since 1800, the patent office in the United States has supported the growth of pharmaceutical company and corporate interests in researching chemical extracts from plants. This has also taken place in many other parts of the modern world; by the 1930s, the Merck Corporation had started collecting samples, which led them to develop the well-known compound called quinine, used to treat malaria.

Bioprospecting

"The systematic search for genes, compounds, designs, and organisms that might have a potential economic use and might lead to product development"

Tamayo et. al (2004)

Referring to company practices such as these, Thomas Eisner coined the term bioprospecting in 1989. According to him, "bioprospecting is a systematic search for secondary metabolites with potentially therapeutic properties as a strategy for creating economic incentives for conserving biological diversity". Bioprospecting can also be summarised as the research, collection, and utilisation of biological and genetic resources (or as in the Bhutan Biodiversity Law 2003, the 'systematic search, classification, and research of new sources of chemical compounds, genes, proteins, and microorganisms with real or potential economic value') for the purpose of applying the knowledge derived therefrom for scientific and/or commercial purposes. In other words, bioprospecting consists of the collection of biological materials, such as plants and animals or their parts, comprising economically valuable species and genes that can be used in the development of new pharmaceutical products, improved food crops, or new compounds for industrial products, usually by companies from so-called developed countries. Today, bioprospecting is also understood as a two-way process that both searches for genetic resources in biologically diverse regions and promotes conservation through economic incentives.

Review of ABS Glossary

Some of the important ABS terms are discussed in Exercise 1. However, there are many other terms commonly used in ABS. ICIMOD has published a Glossary of Access and Benefit Sharing Terms, which provides a definition of many of the commonly used ABS terms. The Glossary is provided here as a resource for your reference. The sources of the definitions are given in the original publication.

ABS regime – The Conference of the Parties to the Convention on Biological Diversity (CBD) decided in 2004 to create an international regime on access to genetic resources and sharing of the benefits arising out of their utilisation through an ABS regime. Negotiations on an international ABS regime started in 2005, but it is predicted that it will take up to ten years to complete the establishment of such a regime.

Access – Access to genetic resources is not defined in the CBD or the Bonn Guidelines and, therefore, definition varies according to national legislation and practice. Access may consist of various activities including entering a location or place where genetic resources are found, surveying activities, obtaining or acquiring genetic resources, the use of genetic resources, and the study or systematic investigation of genetic resources for scientific and/or commercial purposes. The Organization of African Unity's (OAUs) African model legislation defines 'access' as acquisition of biological resources, their derivatives, community knowledge, innovations, technologies, or practices.

Accessing party – Sections 3 (1) and (2) of the Indian Biodiversity Act defines an 'accessing party' as any person (including foreigners, non-resident Indians, foreign companies) who intends to obtain any biological resource or associated knowledge occurring in a provider country for research, or for commercial utilisation, or for bio-survey and bio-utilisation, or the transfer of the results of any research relating to biological resources or associated traditional knowledge. The accessing party has to obtain prior approval of the National Biodiversity Authority.

Agrobiodiversity – The variety and variability of animals, plants, and microorganisms used directly or indirectly for food and agriculture including crops, livestock, forestry, and fisheries; agrobiodiversity comprises the diversity of genetic resources (varieties, breeds) and species used for food, fodder, fibre, fuel, and pharmaceuticals, and also includes the diversity of non-harvested species that support production (soil microorganisms, predators, pollinators), and those in the wider environment that support agro-ecosystems (agricultural, pastoral, forest, and aquatic), as well as the diversity of the agro-ecosystems themselves.

Benefit sharing – IUCN defines benefit sharing as sharing of whatever accrues from the utilisation of biological resources, community knowledge, technologies, innovations, or practices. It also means all forms of compensation for the use of genetic resources, whether monetary or non-monetary.

Monetary benefits may be upfront payments, access fees, milestone payments, license fees, research funding, salaries and infrastructure, joint ventures, and joint ownership of intellectual property rights; non-monetary benefits may include sharing of research results, collaboration in scientific research, participation in product development, collaboration in education and training, and technology transfer.

'Fair and equitable sharing of benefits' has been stressed in the benefit-sharing process. Section 21 (1) of the Indian Biodiversity Act defines it as 'benefits arising out of the use of accessed biological resources, their byproducts, innovations, and practices associated with their use and application and knowledge thereto, in accordance with mutually agreed terms and conditions between the person applying for such approval, local bodies concerned, and the benefit claimers'.

Benefits – Economic or academic advantages arising from research on the utilisation of genetic resources.

Biodiversity acts – National statutory legal instruments developed to implement CBD obligations, including regulation of the access and benefit sharing mechanism from genetic resources and associated traditional knowledge; these are currently operational, amongst others, in India and Bhutan.

Biodiversity management committee – A committee established under the national government for the management of genetic resources and associated traditional knowledge at the local level; Section 41 of the Indian Biodiversity Act stipulates that every local body shall constitute a biodiversity management committee within its area for the purpose of promoting

conservation, sustainable use, and documentation of biological diversity.

Biological diversity – Variability among living organisms from all sources including, inter alia, terrestrial, marine, and other aquatic ecosystems and the ecological complexes of which they are a part; this includes diversity within species, between species, and of ecosystems.

Biological resources – These include genetic resources, organisms or parts thereof, populations, or any other biotic component of ecosystems with actual or potential use or value for humanity. Section 1 (c) of the Indian Biodiversity Act defines it as 'plants, animals, and microorganisms, or parts thereof, their genetic material and byproducts (excluding their value added products) with actual or potential use value', but does not include human genetic material.

Biopiracy – Utilisation and/or appropriation of genetic resources that is not based on necessary access permits, or does not fulfil the agreed conditions and is therefore illicit.

Bioprospecting – The collection of biological materials such as genes, plants, and animals of economically valuable species for future pharmaceutical products, improved food crops, or new compounds for industrial products; the survey and collection of species, sub-species, genes, compounds, and extracts of biological resources for any purpose; includes characterisation, inventorisation, and bio-assay (expert submission from India to the Ad hoc Open Ended Working Group on ABS).

IUCN defines it as "the research, collection and utilisation of biological and genetic resources for purposes of applying the knowledge derived therefrom for scientific and/or commercial purposes".

Section 52 (e) of the Bhutan Biodiversity Act 2003 defines bio-prospecting as the "systematic search, classification, and research of new sources of chemical compounds, genes, proteins, and microorganisms with real or potential economic value for .....scientific and or commercial purposes".

Biosafety – Describes efforts to reduce and eliminate the potential risks resulting from biotechnology and its products; for the purposes of the Biosafety Protocol, this is based on the precautionary approach whereby the lack of full scientific certainty should not be used as an excuse to postpone action when there is a threat of serious or irreversible damage.

Biosphere Reserve – These are areas of terrestrial or coastal/marine ecosystems or a combination thereof, which are internationally recognised within the framework of UNESCO's programme on Man and the Biosphere (MAB), in accordance with the present statutory framework.

Biotechnology – Any technological application that uses biological systems, living organisms, or derivatives thereof to make or modify products or process them for specific use.

Biotrade – The collection, production, transformation, and commercialisation of goods and services derived from native biodiversity under the criteria of environmental, social, and economic sustainability.

Bonn Guidelines (BGL) – The guidelines adopted by Decision VI/24 of the 6th Conference of the Parties to the CBD in 2002; the aim of the Bonn Guidelines is to clarify regulations on ABS contained in the CBD. They provide guidance for drafting national legislation and for negotiating ABS agreements in the absence of national legislation. The BGL are an interpretative instrument and are not binding in themselves.

Byproduct – A molecule or a combination or mixture of natural molecules including crude extracts of live or dead organisms of biological origin that comes from the metabolism of living beings.

Any part taken from biological and genetic resources such as hides, antlers, feathers, fur, internal organs, roots, trunks, branches, leaves, stems, flowers and the like, including the compounds indirectly produced in a biochemical processor cycle.

Centre of origin – A geographical area where plants, animals, or microbial species, either domesticated or wild, first developed their distinctive properties and characteristics

Commercial utilisation of biological resources – Defined in Section 2 (f) of the Indian Biodiversity Act as 'end uses of biological resources for commercial utilisation such as drugs, industrial enzymes, food flavours, fragrances, cosmetics, emulsifiers, oleoresin, colours, extracts, and genes used for improving crops and livestock through genetic intervention', but does not include conventional breeding or traditional practices in use in agriculture, horticulture, poultry, dairy farming, animal husbandry, or beekeeping.

Community biodiversity registers – The community resource registry has, to date, been a loosely defined term referring broadly to the processes by which communities seek to protect resources and associated knowledge through some method of documentation. Although documentation is not necessarily a contemporary phenomenon per se (many societies have historically documented their knowledge in various ways), the registry has more recently arisen

out of community concerns for diminishing biological and cultural diversity and the increasing prevalence of bioprospecting activities.

Competent authorities – To facilitate access and benefit sharing from genetic resources, the Bonn Guidelines introduced the term 'competent authority'. Competent authorities refer to agencies or institutions designated by national legislation as competent to facilitate and negotiate the access and benefit sharing process and grant access.

Conference of the Parties (COP) – The governing body of the Convention on Biodiversity, the Conference of the Parties (COP), advances implementation of the Convention through the decisions it takes at its periodic meetings. Until 2007, the Conference of the Parties has held nine ordinary meetings, and one extraordinary meeting (the latter, to adopt the Biosafety Protocol, was held in two parts). To date, the COP has taken a total of 216 procedural and substantive decisions.

Convention on Biological Diversity (CBD) – An international treaty, enforced in 1993, that guarantees individual states sovereign rights over their biodiversity resources and the pattern of their utilisation; the Convention established three main goals: the conservation of biological diversity, sustainable use of its components, and the fair and equitable sharing of the benefits from the use of genetic resources. There are 190 parties to the Convention including all the Himalayan countries.

Country of origin – The country which possesses those genetic resources in or under in situ conditions.

Country providing genetic resources – The country supplying genetic resources collected from in situ sources, including populations of both wild and domesticated species or taken from ex situ sources which may or may not have originated in that country.

Cultivar – Variety of plant that has originated and persisted under cultivation or was specifically bred for the purpose of cultivation.

Cultural diversity – Culture takes diverse forms across time and space. This diversity is embodied in the uniqueness and plurality of the identities of groups and societies making up humankind. As a source of exchange, innovation, and creativity, cultural diversity is as necessary for humankind as biodiversity is for nature. In this sense, it is the common heritage of humanity and should be recognised and affirmed for the benefit of present and future generations.

Derivatives – A product including information developed, or part taken, or extracted from a biological or genetic resource, e.g., varieties, strains or breeds, blood, proteins, oils, resins, gums, genes, seeds, spores, bark, wood, leaf matter, or formulae; includes products incorporating material or formulae as above.

Designated authority – Authority designated by the competent authority to monitor and enforce the policy and legal instruments with respect to the access and benefit sharing from genetic resources

Disclosure – Referred to by Article 29 of Trade Related Aspects of Intellectual Property Rights (TRIPS) as a disclosure of the invention in a manner sufficiently clear and complete for the invention to be carried out by a person skilled in the art, and may require the applicant to indicate the best mode for carrying out the invention known to the inventor at the filing date or, where priority is claimed, at the priority date of the application.

In the CBD, disclosure is associated with Article 8 (j) and Article 15. The Bonn Guidelines provide voluntary guidelines for improving ABS agreements, and recommends that Parties encourage disclosure of origin as a mechanism for compliance with ABS requirements.

Domesticated or cultivated species – Species in which the evolutionary process has been influenced by humans to meet their needs.

Ecosystem – A dynamic complex of plant, animal, and microorganism communities and their nonliving environment, interacting as a functional unit.

Ex-situ conservation – The conservation of components of biological diversity outside their natural habitats (e.g., in gene banks).

Genetic diversity – The variety of genes within a particular species, variety, or breed.

Genetic material – The Convention on Biological Diversity defines genetic materials as materials of actual or potential value. They may be any material of plant, animal, microbial, or other origin, containing functional units of heredity. These may include a whole organism, parts of an organism, or biochemical extracts from tissue samples that contain deoxyribonucleic acid (DNA), or in some cases ribonucleic acid (RNA). In the context of an ABS regime, this is the key element and is the ultimate biological information that can be used to develop and derive a new product or transgenic biological material. This definition excludes sources that may contain units of heredity in other forms. Therefore, in the context of discussion on access and benefit sharing, a political decision to solve problems of definition becomes necessary.

Genetic resources – All genetic materials of actual or potential value; the value need not be commercial or monetary, but may be scientific or academic in nature.

Genetically modified organism (GMO) – A microorganism, plant, or animal whose genetic characteristics have been modified by inserting a modified gene or a gene from another variety or species; genetically modified organisms (GMOs) may be microorganisms designed for use as biopesticides, or seeds that have been altered genetically to give a plant better disease resistance or growth.

Habitat – A place where an organism or population naturally occurs; this definition excludes organisms that have been artificially introduced.

Indigenous peoples – Peoples in independent countries whose social, cultural, and economic conditions distinguish them from other sections of the national community, and whose status is regulated wholly or partially by their own customs or traditions, or by special laws or regulations

In-situ conservation – The conservation of ecosystems and natural habitats and the maintenance and recovery of viable populations of species in their natural surroundings and, in the case of domesticated or cultivated species, in the surroundings where they have developed their distinctive properties

Intangible component – Any knowledge, innovation, or individual or collective practice of actual or potential value associated with genetic resources, its derivatives, or the biological resource containing them, whether or not it is protected by an intellectual property system

Intellectual property (IP) – Refers to creations of the mind: inventions, literary and artistic work, and symbols, names, images, and designs used in commerce; intellectual property may be divided into two categories: industrial property, which includes inventions (patents), trademarks, industrial designs, and geographic indications of source; and copyright, which includes literary and artistic work such as novels, poems, plays, films, musical work, artistic work such as drawings, paintings, photographs, sculptures, and architectural designs; rights related to copyright include those of performing artists in their performances, producers of phonograms in their recordings, and broadcasters in their radio and television programmes.

Intellectual property rights (IPRs) – The legal protection given to persons over their creative endeavours; usually gives the creator an exclusive right over the use of his/her creation or discovery for a certain period of time; IPRs also refer to the recognition that the inventor should be granted a reward such as exclusive rights to use it or to earn royalties from renting out its use.

International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) – A global treaty adopted by the 31st session of the Food and Agriculture Organization (FAO) in November 2001 that aims to ensure food security and sustainable agriculture; the treaty came into force on 29 June 2004. It aims at conservation and sustainable use of plant genetic resources for food and agriculture and the fair and equitable sharing of benefits arising out of their use, in harmony with the CBD.

International Union for the Protection of New Varieties of Plant (UPOV) – An intergovernmental organisation established by the International Convention for the Protection of New Varieties of Plants, UPOV's mission is to provide and promote effective systems of plant variety protection. Its aim is to encourage the development of new varieties of plants for the benefit of society. The Convention was adopted in 1961 and revised as deemed necessary in 1972, 1978, and 1991. The objective of the Convention is the protection of new varieties of plants through intellectual property rights.

Invention – Section 1 (l) of the Patent Amendment Act of India refers to it as any invention or technology which has not been anticipated by publication in any document or used in the country or elsewhere in the world before the date of filing of a patent application with complete specification; i.e., the subject matter has not fallen in the public domain, or does not form part of the state-of-the-art.

Inventive step – A feature of an invention that involves technical advance as compared to the existing knowledge, or having economic significance, or both, that makes the invention not obvious to a person skilled in the art.

Landrace – A crop cultivar or animal breed that evolved with and has been genetically improved by traditional agriculturalists or farmers, but has not been influenced by modern breeding practices; also a cultivar that was grown by ancient farmers and their successors.

Local knowledge – see *'traditional knowledge'*

Material transfer agreements – A legal agreement between the owner of a genetic material and the recipient of the material; they are contracts which are used for the transfer of genetic materials and knowledge and which contain the terms and conditions on which the material is transferred.

Mutually agreed terms – The terms and conditions agreed by the contracting parties at the time of entering into a contract; various types of authorisations defining the conditions for access and benefit sharing by means of which users obtain access to/permission to collect, study, and utilise genetic resources commercially

National Biodiversity Authority – Defined by Section 8 (2) of the Indian Biodiversity Act as, "a body corporate having perpetual succession and a common seal, with a power to acquire, hold, and dispose of property, both movable and immovable, and to enter into contract and shall by the said name sue and be sued"

Patent – A form of intellectual property protection available for inventions, whether products or processes, that are new, involve an (non-obvious) inventive step, and are useful or capable of industrial application; a patent is a legal grant by the State to an inventor allowing the right to exclude others from making, using, exercising, and marketing his/her invention within its geographic territory for a stipulated duration in lieu of disclosing the invention in a patent specification.

A patent is an exclusive right granted for an invention, which is a product or a process that provides, in general, a new way of doing something, or offers a new technical solution to a problem.

Plant variety – A plant grouping within a single botanical taxon of the lowest known rank, defined by the reproducible expression of its distinguishing and other genetic characteristics

Prior art – The existing knowledge base before the invention was discovered, or before the invention was disclosed by filing a patent application

Prior informed consent (PIC) – Prior informed consent is not defined within the Convention on Biological Diversity, but authors have commonly identified the key elements as: (a) *prior:* before access to knowledge or genetic resources takes place, (b) *informed:* based on truthful information about the use that will be made of the knowledge or genetic resources that is adequate for the authority to understand the implications, and (c) *consent:* the explicit consent of the government, and stakeholders or rights holders according to national law. Thus, prior informed consent is an approval in advance for the use of one's genetic resources and any associated traditional knowledge.

Property rights – Rights to own, control, and alienate property within the system of property law established by the State; property rights may be over material or tangible property such as the land and crops. They may also be rights over intangible property, including knowledge, information, or innovations such as patent rights or a plant breeder's right.

Protected area – An area of land and/or sea especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means

Providers (providing countries) – All contracting parties to the CBD that provide access to resources situated in their country to users

Public domain – The information and knowledge already available in published or other forms; the realm of publications, inventions, and processes that are not protected by copyright or patent

Public registries – When information or knowledge is placed in the public domain and serves as a form of prior art or defensive disclosure, it is known as 'public registries'. The information in such registries can be accessed without permission and payment (e.g., traditional knowledge, the Documentation Library of the Ministry of Science and Technology Government of India).

Regime – A set of rules, policies, and norms of behaviour that cover any legal issue and that facilitates substantive or procedural arrangements for deciding that issue

Sovereign rights – Rights which appertain to independent sovereign states to legislate, manage, exploit, and control access to their natural resources; they include the right to determine the property regimes applicable to those resources, what rights of ownership can be entertained, and how ownership is established.

Sovereignty – The power of the State to independently regulate its own internal and external affairs; it is not ownership, it is the power to regulate ownership.

Species diversity – Refers to the variety of species

Species – A group of organisms capable of interbreeding freely with each other, but not with members of other species; (morphological definition) a group of individuals, animals, or plants that is morphologically, physiologically, or biochemically distinct from other groups in some characteristics

Sui generis – Literally one of 'its own kind'

Sustainable use – The use of components of biological diversity in a way and at a rate that does not lead to the long-term decline of biological diversity, thereby maintaining its potential to meet the needs and aspirations of present and future generations

Traditional knowledge – Refers to the knowledge, innovations, and practices of indigenous and local communities around the world; developed from experience gained over the centuries and adapted to the local culture and environment, traditional knowledge is transmitted orally from generation to generation. It tends to be collectively owned and takes the form of stories, songs, folklore, proverbs, cultural values, beliefs, rituals, community laws, local language, and agricultural practices, including the development of plant species

and animal breeds. Traditional knowledge is mainly of a practical nature, particularly in such fields as agriculture, fisheries, health, horticulture, and forestry.

World Intellectual Property Organization (WIPO) – A specialised agency of the United Nations dedicated to developing a balanced and accessible international intellectual property (IP) system which rewards creativity, stimulates innovation, and contributes to economic development while safeguarding the public interest; WIPO was established by the WIPO Convention in 1967 with a mandate from its member states to promote the protection of intellectual property throughout the world through cooperation among States, and in collaboration with other international organisations. Its headquarters is in Geneva, Switzerland.

World Trade Organization (WTO) – The world's primary organisation working towards setting the rules of trade between nations; at its heart are the WTO agreements negotiated and signed by the majority of the world's trading nations and ratified in their parliaments. The organisation is based in Geneva and currently has 150 countries as members.

Session 4
Status of Biodiversity and Genetic Resources in the Hindu Kush-Himalayan Region

Time: 45 minutes

Objectives

To review the status of biodiversity in the Hindu Kush-Himalayan (HKH) region and eastern Himalayas.

- To understand the status of biodiversity and associated traditional knowledge in the HKH and eastern Himalayan region.
- To know about the biodiversity hotspots in the Himalayas

Methodology

Group exercise and presentation

Materials

Brown paper, markers, tape, board

Suggestions for the trainer

This session is primarily technical. However, the start of the session can be livened up with a group inventory exercise on biodiversity (e.g., Exercise 1 – Inventory of biological resources at the local level). The outcome of the exercise should lead into a formal presentation on biodiversity status at the national and regional level. Make links between the biodiversity at the local level (outcome of the exercise) with the biodiversity at the national and regional levels, to help participants understand and value their own biodiversity and the enormous biodiversity in the region. Clarify anything that is unclear during the presentation and discussion.

Activities

Activity 1: Exercise – Inventory of biological resources at the local level

Time: 15 minutes

Aim

To help participants understand the enormous biodiversity that they possess in their own communities and to help them to make linkages with the national and regional biodiversity hotspots

- Participants are able to understand the enormous biodiversity at the local level and are able to identify the resources most commonly used for livelihoods.
- Participants are able to understand the status and richness of resources by inventorying them.
- Participants are able to compare the local situation with the national and regional situation in relation to the richness of biodiversity.

Method

Group exercise

Materials

Brown paper and marker pens

Steps

Step 1 Split the participants into groups by allocating a random number based on the number of groups (e.g., for three groups, allocate each person a number from one to three).

Step 2 Introduce the aim of the exercise.

Step 3 Distribute brown paper and marker pens to each group.

Step 4 Ask each group to identify biological resources in their community and make an inventory (list) of such resources. Try to assign a different theme to each group, e.g., food crops, insects, livestock, medicinal plants, aquatic plants and animals, fungi, and so on. Groups assigned food crops should list all the food crops found in their community on the brown paper and so on for each of the themes.

Step 5 When all groups are finished, ask them to hang their lists on the board or wall.

Step 6 Using these lists, each group should make a presentation on the status of biodiversity under that particular theme in their area/community.

Activity 2: Presentation on the status of biodiversity in the country, the Hindu Kush-Himalayan region in general and, if appropriate, the Eastern Himalayas in particular.

Allow for questions, clarification, and discussion.

Session 4 Resource Materials

Status of Biodiversity and Associated Traditional Knowledge in the HKH

Mountains globally are being recognised as storehouses of biocultural diversity (Stepp et al. 2005), a diversity which provides the basis of food and livelihood security for mountain communities. The Hindu Kush-Himalayan (HKH) region is one of the ten most biologically diverse regions in the world and has a huge range of species and genetic resources. All or part of four of the world's 34 biodiversity hotspots are located in the region (CI 2000). Table 1 illustrates the rich diversity of plants in the countries of the HKH region. These values refer to the countries as a whole, but a large proportion of the species are found in the mountainous areas.

Table 1: Plant Diversity in the countries of the Hindu Kush-Himalayan Region

Country	Geographical area (km^2)	Number of species of flowering plants and ferns
Afghanistan	652,090	4,500
Bangladesh	144,000	7,400
Bhutan	46,500	5,000
China	9,596,960	29,700
India	2,387,590	17,000
Myanmar	676,577	7,766
Nepal	147,181	5,568
Pakistan	796,095	6,000

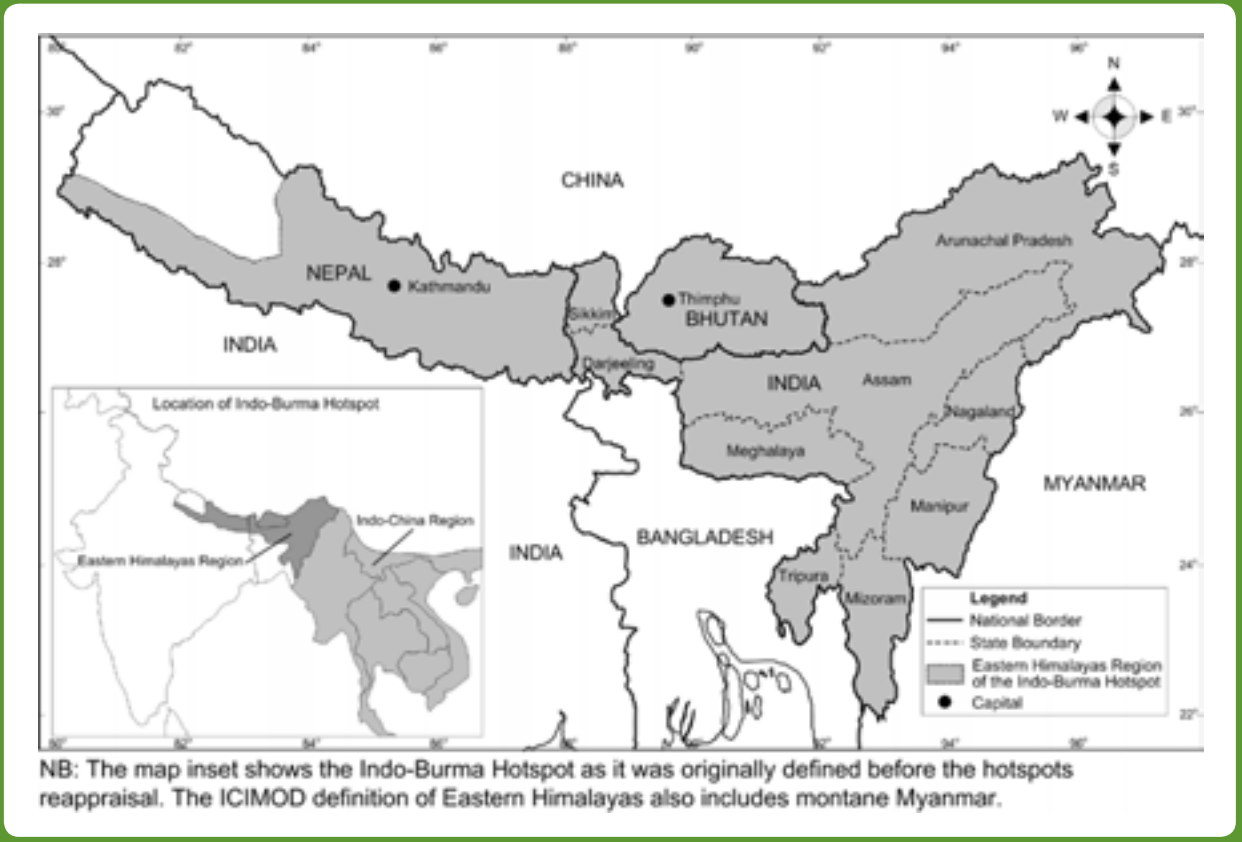
Source: Chen Guangwei 2002

Similarly, the region is a repository for a vast amount of traditional knowledge, especially knowledge about the biological resources, which is passed from generation to generation, mainly verbally. The greater Himalayan region is home to more than 210 million people with a great cultural and linguistic diversity. Some 1000 languages are spoken in the countries that have areas within the Hindu Kush-Himalayan region – Afghanistan has 45 living languages, Bangladesh 38, Bhutan 24, China 202, India 387, Myanmar 107, Nepal 123, and Pakistan 69 (Gordon 2005; Turin 2005, 2007) – and 600 of these are spoken in the mountain areas. Most traditional knowledge is held in one of these local languages. Loss of the language can also result in loss of this knowledge, but 400 of these 600 languages in the Himalayan region are spoken by less than 100,000 people (Turin 2007).

Biodiversity status in the eastern Himalayas

The Eastern Himalayan Region is particularly interesting. It comprises the lowlands of western Nepal and the montane regions of central and eastern Nepal; the State of Sikkim, the northern extent of West Bengal in India including Darjeeling District; Bhutan in its entirety; and the northeastern Indian states of Assam, Arunachal Pradesh, Manipur, Mizoram, Tripura, Meghalaya, and Nagaland (WWF-US 2005) (Figure 4). The ICIMOD area 'Eastern Himalayas' also includes the montane part of Myanmar. The Eastern Himalayas includes parts of the Himalaya and Indo-Burma biodiversity hotspots (CI 2000). This globally

Figure 4: Eastern Himalayan Region



NB: The map inset shows the Indo-Burma Hotspot as it was originally defined before the hotspots reappraisal. The ICIMOD definition of Eastern Himalayas also includes montane Myanmar.

Source: Based on WWF-US 2005

important ecoregion has very diverse species, genetics, ecosystems, and cultures.

Table 2 illustrates the richness of the biodiversity in the eastern Himalayas. Conservation targets are defined as 'outcomes', which represent a set of conservation targets in a hotspot that should be achieved to prevent biodiversity loss. 'Outcomes' can be species, sites, or landscapes. The species outcomes for the eastern Himalayas consist of those species that are globally threatened (i.e. critically endangered, endangered, and vulnerable). In total, there are 163 globally threatened species: 45 mammals, 50 birds, 17 reptiles, 12 amphibians, 3 invertebrates, and 36 plants. Of these 146 (90%) occur in northeastern India, including 70 species that are endemic to the Eastern Himalayan Region; 75 (46%) occur in Nepal; and 49 (29%) occur in Bhutan (WWF-US 2005).

Table 2: Total number of known species (1992–2002) in some eastern Himalayan countries

	Bhutan	India (whole country)	Myanmar	Nepal
Higher Plants	5,468	18,664	7,000	6,973
Mammals	160	390	300	181
Breeding Birds	209	458	310	274
Reptiles	29	521	262	119
Amphibians	1	231	80	50
Fish	3	5,749	281	13

Source: WWF-US 2005

In India's part of the eastern Himalayas, there are about 5800 plant species, of which roughly 2000 (36%) are endemic. In Nepal, there are around 7000 plant species, of which at least 500 (almost 8%) are believed to be endemic to Nepal. Bhutan possesses an estimated 5500 species, of which as many as 750 (15%) are considered to be endemic to the eastern Himalayas.

Mountain communities have contributed to the development of new food crop varieties and new breeds of livestock, and have pioneered the extensive use of the rich medicinal plant resources of the region. Examples include food crops such as carrots, mustard, gooseberries, apples, pears, apricots, oranges, lemons, and large cardamom, all of which have their origin in the Himalayas and are now grown throughout the world. In addition, biological resources are used for: medicinal purposes, e.g., kurki (*Neopicrorhiza scrophulariifolia*) and chiraito (*Swertia chirayita*); aesthetic purposes, e.g., jau (*Avena sativa*), dubo (*Cynodon dactylon*), coconut, bel (*Aegle marmelos*), pipal (*Ficus religiosa*), and paan (*Piper betle*); and cosmetic purposes and ritual purposes, e.g., babari phool (*Ocimum thyrisflorum*) and sandalwood (*Daphniphyllum himalense*). The rich biodiversity and associated traditional knowledge systems in the region are gaining in importance and the region is becoming a priority area in the National Biodiversity Strategy and Action Plans (NBSAP) of national and provincial governments.

Session 5
Importance of Biodiversity, Genetic Resources and Associated Traditional Knowledge

Time: 60 minutes

Objectives

To review and discuss the importance of biodiversity, genetic resources, and associated traditional knowledge in the Hindu Kush-Himalayan region.

- To be aware of the implications of biodiversity hotspots in the context of the ABS regime
- To highlight bioprospecting cases and potential bioprospecting opportunities
- To list issues related to benefit sharing
- To understand how ABS can present a poverty reduction opportunity

Methodology

Group exercise and presentation

Materials

Two case studies on bioprospecting (one in which benefits were shared and the other in which there was no sharing of benefits).

Suggestions for the trainer

Decide on a methodology for the session and prepare it in advance. The session is a technical one, but the group discussion during the start of the session can enhance the engagement of participants. Use real case studies about the utilisation of genetic resources and associated traditional knowledge for income generation and inequitable sharing of benefits for a group discussion at the beginning of the session before giving a detailed presentation on the theme of the session. The outcome of the exercise should serve as a pointer to the theme. Clarify anything that is unclear during the presentation and discussion.

(continued on next page)

Suggestions for the trainer (continued)

The session can be made more interesting by sharing real stories or cases of bioprospecting that have taken place either in the Eastern Himalayas or in other parts of the world where genetic resources and traditional knowledge have been used and have led to benefit sharing with countries or communities owning the utilised resources and associated traditional knowledge. It is important to present cases that have led to inequitable as well as equitable sharing of benefits. Good real life case studies will capture attention. Link the cases with the scope and magnitude of biodiversity resources for poverty alleviation and the potential of the ABS regime to ensure fair and equitable sharing of benefits in the future, which has been a main area of concern in the past.

Activities

Activity 1: Exercise – Case studies, discussion, and learning outcome

Time: 30 minutes

Aim

To help participants to understand the relevance of biodiversity, genetic resources, and associated traditional knowledge, and the implications of the ABS regime for the region.

- Participants are able to understand bioprospecting and the utilisation of genetic resources and associated traditional knowledge.
- Participants can make linkages between ABS and poverty reduction.
- Participants are able to understand the importance of the ABS regime in their region and its role in addressing concerns about inequitable benefit sharing.
- Participants are able to understand the implications of the ABS regime in relation to fair and equitable sharing of benefits.

Method

Group exercise

Materials

Handouts of case studies

Steps

Step 1 Split the participants into groups by allocating a random number based on the number of groups (e.g., for three groups, allocate each person a number from one to three).

Step 2 Introduce the aim of the exercise.

Step 3 Distribute the case studies among the groups.

Step 4 Ask each group to discuss the case studies and answer the following questions:

- What are the relevance of the genetic resources and associated traditional knowledge in this case?
- Who are the owners of the resources?
- Did the owners receive a benefit from the process?
- Was the benefit sharing fair and equitable, and, if so, how?
- What are the implications of the ABS regime as understood from the case?
- Are there any other relevant points that you noticed?

Step 5 When all groups are finished, open the floor for full discussion.

Step 6 The outcome of the exercise (answers to the questions about the case studies) should lead to further discussion and give the trainer an opportunity to clarify any technical aspects of the session theme.

Activity 2: Presentation on the importance of biodiversity, genetic resources, and associated traditional knowledge, including biospropecting and biopiracy.

Clarify the concepts referring to the results of the exercise, and allow for questions and discussions.

Session 5 Resource Materials

Case 1: Sharing the Benefits of Traditional Medicine

While working as a missionary in the Pacific Island of Samoa, Paul Cox fell ill and was cured by a women traditional healer who treated him with the root of a local tree. After returning to the USA, his mother died of breast cancer, motivating Paul to return to Samoa to find a drug to treat breast cancer.

In 1985, Paul came in contact with the US National Cancer Institute (NCI), which had recently isolated HIV. The NCI enquired of any traditional drug that could be used to treat HIV. Paul consulted the traditional healers and sent various samples to NCI, including a sample of the mamala tree (*Homalanthus nurtans*), from which the villagers make a medicinal tea used to treat hepatitis.

The NCI carried out a chemical analysis of the mamala tree and isolated the active ingredient prostratin. The NCI conducted a successful drug trial and applied for a patent, agreeing to give 30% of the royalties to the village in Samoa.

Source: Vastag 2006 (New Scientist)

Case 2: Biopiracy? No Benefit Sharing on Ayahuasca

For generations, Shamans from indigenous tribes throughout the Amazon basin have processed the bark of *Banisteriopsis caapi* Mort. to produce a ceremonial drink known as ayahuasca. The Shamans use ayahuasca (which means 'wine of the soul') in religious and healing ceremonies to diagnose and treat illness, meet with spirits, and divine the future.

American Loren Miller obtained a US Plant Patent (No.5,751 issued in 1986) granting him rights over an alleged variety of B. caapi Mort. which he had collected from a domestic garden in the Amazon and called 'Da Vine' and was analysing for potential medicinal properties. The patent claimed that Da Vine represented a new and distinct variety of B. caapi Mort., primarily because of the flower colour. The Coordinating Body of Indigenous Organisations of the Amazon Basin (COICA), which represents more than 400 indigenous tribes in the Amazon region, along with others, protested about the patent. They

said that ayahuasca had been known to natives of the Amazon rainforest, and that it is used in traditional medicine and had been cultivated for that purpose for generations, so Miller could not have discovered it and should not have been granted such rights, which in effect, appropriated indigenous traditional knowledge. On reexamination, the United States Patent and Trademark Office (USPTO) revoked the patent on 3 November 1999. However, the inventor was able to convince the USPTO on 17 April 2001 to reconfirm the original claims and restore the patent rights.

Source: TKDL no date

Importance of Biodiversity, Genetic Resources and Associated Traditional Knowledge

The livelihoods of millions of people in the Himalayas depend, and will continue to depend, on biological and genetic resources and traditional knowledge, which have evolved since time immemorial. An estimated 60% to 70% of the people in this region depend upon such resources and traditional knowledge about the region's rich biodiversity for survival. They have maintained and ensured their traditional knowledge by passing it from one generation to another. Biodiversity and associated traditional knowledge are a means of survival for mountain communities who promote and preserve their livelihoods and ecological security by maintaining these resources.

The concept of ABS may be of comparatively recent origin, but trade in genetic resources goes back thousands of years and has played a critical role in the development of the global pharmaceutical, biotechnology, and food industries (Oli and Dhakal 2008). Estimates on the economic benefits of such resources in the region have not been documented, but they may be substantial. The global economic importance of genetic resources is very substantial and has been estimated to be between US$ 500 billion and US$ 800 billion (Kate and Laird 1999). However, none, or only a miniscule percentage, of the benefits are shared with the providers of these resources (countries and communities). Thus ABS agreements can be a tool for poverty alleviation given the fact that both poverty and tremendous amounts of genetic resources are primarily found in the developing world, and financial and technological resources in the developed world. The ABS regime can facilitate the transfer of genetic resources in return for economic and technological gains for poverty alleviation. ABS agreements regulate access and use rights between different parties and can, therefore, act as instruments for the redistribution of benefits generated from the use of genetic resources and associated traditional knowledge. Industries using genetic resources are encouraged to pay higher research and development costs than in situations where there are no benefit sharing agreements. Similarly, local communities can receive direct benefits, which can be substantial.

Bioprospecting and Poverty Reduction

ABS agreements can facilitate access to and the use of genetic resources, and associated traditional knowledge. The objective of the ABS mechanism is to facilitate access and ensure fair and equitable sharing of benefits, thereby acting as an instrument for reducing poverty.

ABS in the Himalayas is very much needed owing to the tremendously rich biodiversity of the region and the potential for using these resources for poverty reduction. Implementation of the ABS regime will also encourage the sustainable utilisation of genetic resources; as they become economically important, the economic value attached to them will encourage sustainable use to ensure that they remain available in the future. Once the local and indigenous communities understand that the genetic resource will bring economic gains, they will be encouraged to conserve the resources.

Biopiracy and Inequitable Sharing of Benefits

The knowledge and use of specific plants, animals, microbes and other living and non-living organisms for medicinal, industrial, and other applications is an important component of traditional knowledge. With the growth in modern herbal medicines and anti cancer drugs based on plants such as turmeric and taxol, the cosmetic and food industries have also shown interest in plant and animal genetic resources, their cultivation, and processing. Such knowledge is being taken at an accelerated rate by the interested industries without compensation.

Compensated bioprospecting involves obtaining prior informed consent (PIC) from the source country or from the holder of the knowledge and genetic resources under mutually agreed terms (MAT) that promote the sustainable use of biodiversity. Where indigenous knowledge holders are involved, efforts are made to recognise and protect their rights, and benefits are shared.

Uncompensated bioprospecting does not share the benefits and, therefore, the genetic samples or information associated with it is taken without the PIC (or knowledge) of the holders. This is called biopiracy. Under such conditions, genetic resources and traditional knowledge have increasingly been misused. ABS mechanisms will safeguard such resources and knowledge and ensure the equitable sharing of benefits in the future.