



## **Support to Building the Inter-American Biodiversity Information Network**

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### **National Strategies for Effective Biodiversity Information Management**

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## **Support to Building IABIN (Inter-American Biodiversity Information Network) Project**

### **National Strategies for Effective Biodiversity Information Management**

#### **Project Background**

The World Bank has financed this work under a trust fund from the Government of Japan. The objective is to assist the World Bank in the completion of project preparation for the project ‘Building Inter-American Biodiversity Information Network (IABIN)’ and for assistance in supervision of the project. The work undertaken covers three areas: background studies on key aspects of biodiversity informatics; direct assistance to the World Bank in project preparation; and assistance to the World Bank in project supervision. The current document is one of the background studies.

The work has been carried out by Nippon Koei UK and the UNEP World Conservation Monitoring Centre.

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## **Report Summary**

Making use of biodiversity information to the benefit of each country depends upon domestic strategies, covering the entire information management cycle. This document describes worldwide examples of such strategies and associated information exchange systems. It is focused on selected case studies, and considers the regulatory, capacity building and institutional strengthening measures which may be used as guidance for the further development of IABIN.

The following aspects have been reviewed:

- a) an overview of relevant supporting initiatives (Chapter 2);
- b) examples of strategies and decision-support systems (Chapter 3);
- c) examples of initiatives of capacity building and institutional strengthening (Chapter 4); and
- d) international initiatives promoting information management strategies (Chapter 5).

A concluding section (Chapter 6) with a summary of findings and recommendations to IABIN on strategic planning is also provided.

Supporting initiatives contribute to the definition of a baseline upon which countries could initiate or deepen the development of strategies and decision-support systems (the UNEP BDM Project); define guidelines and actions leading to their implementation (information management components within NBSAPs); and establish the means by which scientific and technical co-operation, and information exchange may be achieved (CHMs).

Examples include countries from Europe (Norway, Spain and Italy), Australia and Asia (India and Thailand). They have all been through a process of self-assessment of capacities and needs as regards information management; have developed their NBSAPs with reference to information exchange issues; have established biodiversity CHMs; and have provisions for the continued training and capacity building of technical staff.

Countries in Europe have adopted similar approaches to information management, although their respective CHMs may look different. The benefits from adoption of a common policy framework, such as the Aarhus Convention, concerning free and facilitated access to information for everyone, can be seen in the relative weight of links that consider this and other regional and international conventions and treaties in their CHMs.

Australia's approach is focused on increasing the availability and accessibility of biodiversity data and information. It promotes the use of CHMs to disseminate information prepared by the provincial governments, local councils, research and educational centres,

industries, NGOs and individuals. The cases of India and Thailand show where efforts are made for connecting stakeholders using two different approaches: one, through a network of technical centres and a structure of nodes providing technical advice (India); and the other, through establishing a strong central node with capacity to respond to identified user needs (Thailand).

Concerning assistance and co-operation efforts, the EU countries have concentrated on helping other countries to establish their CHMs (e.g. the Partnering Role of the Belgium NFP). Their approach is focused more on technological rather than institutional aspects, and this includes the definition of adequate legislation on access to information at the regional and national scale.

Australia's approach promotes the development of self-sufficiency in assessing and understanding key biodiversity issues at the local level, also comprising the maintenance and inter-generational transfer of traditional knowledge by indigenous peoples. The situation of India and Thailand is different, in that they are still dependent on external assistance. The emphasis is on the development of capacity to respond to specific demands, through the establishment of nodes or similar mechanisms.

Around 30 different initiatives promoting effective information management have been developed and implemented at global level. A small group of them has been analysed in this document with the view to providing some practical guidance for the further development of the IABIN network, based on enhanced co-operation at regional level. They are relevant as examples of partnership and co-operation, leading to the constitution of thematic information networks, the bridging of major information gaps, and the building of local capacity in areas of information management.

The present review highlights the issues and themes which are important when planning for effective strategies of biodiversity information management at national and regional scale. These are: the existence of a sound policy framework; the clear definition of institutional roles and responsibilities; the identification of opportunities for regional collaboration, including policy integration; and the dissemination of successful joint initiatives.

IABIN should take all these issues into consideration, and concentrate its efforts and resources on some of the following actions: a) implementing a multi-national survey of institutions and a regional Electronic Resource Inventory (ERI); b) facilitating access to NBSAPs, with a focus on chapters relating to biodiversity information management; c) incorporating the IABIN concept into existing CHM and other toolkits; d) promoting capacity-building and institutional strengthening measures; and e) enhancing the level of community participation by means of a free and facilitated access to biodiversity information.

## CHAPTER 1 INTRODUCTION

### 1.1 Managing biodiversity information at national scale: initial considerations

Making best use of biodiversity information to the benefit of each country is dependent upon domestic strategies covering the entire information cycle, from priority-setting, through the delivery of decision-support products and services, to the monitoring of observed impacts of measures taken.

Effective information management strategies should serve a wide variety of stakeholders, from individuals needing information just occasionally, to policy-makers with more frequent and demanding needs. However, it is important to consider that it is the second type of user who normally drives the needs on which a strategy is originally based. This is relevant for the future development of IABIN, because this network has been conceived as being driven mainly by institutional users of biodiversity information (policy-makers), and must respond to national and regional needs in a truly consistent manner (see Document 1, for a general perspective on IABIN).

Information exchange systems are key to the success of any strategy leading to the comprehensive use of information in support of the decision-making process. These systems are a combination of specialised manpower, and information and communication technology. They should be planned to facilitate access to data and information spanning regulatory, institutional, environmental and purely biological and ecological themes.

With IABIN being an Internet-based network, special effort was made in identifying web-based CHMs, or similar systems for technical and scientific co-operation, and information exchange with a focus on biodiversity. When identified, they were regarded as the primary gateway through which a national strategy of information management may be reviewed, and its foundation more adequately understood.

The present document describes worldwide examples of such strategies and associated information exchange systems. It is focused on a number of selected case studies, and considers the regulatory, institutional strengthening and capacity-building measures that IABIN could eventually draw upon in order to increase its effectiveness. Aspects considered are as follows:

- a) Overview of relevant supporting initiatives (Chapter 2): this includes initiatives carried out to enable countries to develop sound information management strategies and information exchange systems (the UNEP GEF BDM Project); specific actions comprised within wider strategies or action plans which are required by instruments such as the CBD (NBSAPs); and programmes of scientific and technical co-operation, and information exchange, which constitute the basis of operational CHMs.

- b) Examples of strategies and systems (Chapter 3): selected case studies showing national and regional strategies of biodiversity-related information management, and associated decision-support mechanisms are described. These examples from Europe (Norway, Spain and Italy), Australia and Asia (India and Thailand). They were chosen after considering the following aspects:
- i) overall appearance and functionality of the CHM or related system;
  - ii) institutional situation of the agencies responsible for information management at national level;
  - iii) linked sites with information on legislation providing access to biodiversity resources, or associated data and information;
  - iv) linked sites with biodiversity statistics, targets and indicators; sites corresponding to repositories of biodiversity data, and holding non-biological data layers;
  - v) linked sites developed at sub-national (state or provincial) level;
  - vi) linked sites on international treaties and conventions signed by the country; and
  - vii) linked sites on initiatives for assessing the capacity of stakeholders to access and use biodiversity information.
- c) Examples of capacity-building and institutional strengthening (Chapter 4): this describes initiatives started by countries to enhance their own capacity for managing information. It also considers programmes of international co-operation or assistance, such as the Belgian Partnering Role Programme, and the Netherlands CHM National Focal Point Toolkit. Annex 3 includes a comparative description of the CHM and similar toolkits, and provides some initial recommendations to incorporate the IABIN concept into those assisting instruments.
- d) Value of international initiatives promoting successful strategies (Chapter 5): this chapter analyses a number of global initiatives promoting effective management of biodiversity information, with a focal theme of interest. The analysis is intended to extract some practical guidance for the further development of the IABIN network, which is based on the elements of national co-operation and integration resulting from the application of these international instruments.



- e) A final section (Chapter 6) provides a summary of the main findings and recommendations on IABIN for the promotion of effective strategic planning for biodiversity information management at the regional level.

## CHAPTER 2 OVERVIEW OF RELEVANT SUPPORTING INITIATIVES

### 2.1 UNEP GEF Biodiversity Data Management Project

UNEP and WCMC launched the BDM Project in 1995 with the aim to facilitate the building of national capacity for biodiversity data management and exchange as required by the CBD, specifically by its Article 7d. Funded by the GEF, one of the outputs of this initiative was a set of [documents](#) designed to raise the profile of information in biodiversity decision-making processes and help countries produce the necessary information for preparing their respective NBSAPs.

Ten countries were selected by UNEP to participate in the project: the Bahamas, Chile, China, Costa Rica, Egypt, Ghana, Kenya, Papua New Guinea, Poland and Thailand. Before its initiation, they had different capacities to gather and manage biodiversity information. The success of the project was that it greatly contributed to the definition of a knowledge base common to all of them, upon which national strategies and systems could be developed or improved.

WCMC's documents provided basic guidance for establishing the foundation of a comprehensive national biodiversity information management strategy responding to needs and capacities identified in a systematic manner. Key themes, processes and issues considered are the following:

- *A Guide to Effective Information Management*: a sound strategy of information management depends on access to data from many and varied stakeholders. It is thus essential to establish effective co-operation between them, in order to mobilise available resources. The BDM Project proposed the realisation of national and regional multi-stakeholder workshops leading to the participatory definition of priority issues, the identification of needs, the design of information products, the agreement of stakeholder roles, and their empowerment to ensure information is analysed and produced cost-effectively.
- *Survey of Institutions*: once key themes are defined by key stakeholders, it is then recommended to undertake a thorough survey of existing resources, capacities and needs at national level, with the aim to reduce duplication of effort, enhance cooperation and identify areas for investment. The BDM Project provided guidance on how to conduct such a survey effectively. A sample covering letter and questionnaire were proposed, and these could be adapted to the prevailing national conditions.
- *Electronic Resource Inventory (ERI)*: the intention was to document the array of standards in biodiversity data, and provide case studies or pointers to information sources such as lead institutions, bibliographic references and Internet addresses. This

stage within the BDM Project was completed and distributed on CD-ROM as planned. There were proposals to maintain it as an on-line service, but these were never funded.

One major lesson that may be learnt by IABIN from the implementation of the BDM Project (see, the example of Thailand in Section 3.3) is that an adequate integration of the outcomes of proposed activities within the project framework is essential. Priority issues, national needs, stakeholders role (and mechanisms for their empowerment) and type of information products should all be defined by people with the most comprehensive experience on, and understanding of the main influences on biodiversity knowledge management in each country.

The conduct of adequately balanced multi-stakeholder workshops is thus fundamental; these should indicate what may be carried out with existing resources, and what type of support (expertise, funds, ICT) is needed to fulfil targets at regional, national and sub-national scales. Institutional surveys might then be carried out to verify that what was proposed can successfully be achieved, and in what time, and that no major gaps remain to be covered. The periodic repetition of such surveys is highly recommended in order to monitor progress.

Countries in Latin America and the Caribbean have made outstanding progress in this direction, and so it might be reasonable to invest more on connecting the still somewhat disparate national initiatives, which have been undertaken in many of them. This might clearly be recognised as the principal contribution made by the BDM Project in the three countries in which it was carried out in the region (the Bahamas, Costa Rica and Chile).

IABIN can promote the use of tools and mechanisms formulated under the BDM Project umbrella in order to further harmonise the biodiversity information management of countries across the region. For example, a multi-national institutional survey of agencies and organisations related to the Thematic Networks (Specimens, Species, Ecosystems, Invasive Species, Pollinators and Protected Areas) may be conducted. An electronic catalogue including reference of available capacities, specialities and expertise, can then be compiled following the ERI approach.

## **2.2 National Biodiversity Strategies and Action Plans**

Article 6 of the CBD creates an obligation for national biodiversity planning. It is necessary for each country to identify its own priorities, within the framework of a general biodiversity strategy. It is also important to be able to identify which of the initiatives required under the umbrella of the Convention are already being undertaken, which can be further expanded with domestic resources, and which need external support from CBD funding mechanisms.

National biodiversity strategies serve to identify overall objectives and to indicate the major direction to be followed in the longer term in relation to the CBD thematic

programmes and cross-cutting issues. They should be implemented by means of action plans indicating, not only which activity should be carried out within a given period of time, but also who should do what and with what resources.

Information exchange is a major issue, cutting across CBD thematic programmes, and should be the subject of strategic planning at national scale. Some NBSAPs are already considering means of facilitating the information flow, and therefore promoting its use in support of the decision-making process (Chapter 3). Planning for the generation, dissemination and networking of biodiversity information includes the following aspects:

- The definition of targets concerning the gathering and use of biodiversity data and information at national level;
- The identification of actions leading to the accomplishment of such goals. This should be based on the findings of the survey of capacities and needs. They should consider the agreed priorities, and provide for the building of capacities and the strengthening of stakeholders and institutions with a role concerning the exchange of information (including the facilitated access to new technologies);
- The definition of tools and procedures for making the most effective use of biodiversity information in support of the decision-making process or for other purposes; and
- The identification of sensitive issues concerning information exchange, for example, the dissemination and use of knowledge generated by indigenous peoples.

Information exchange and sharing of experiences are also essential for the process of preparation of NBSAPs itself. [Decision II/7](#) of the COP urged the most active interaction between Parties on this, and asked the CBD Secretariat to make such information and experiences available through the CHM.

The COP has also encouraged Parties to take into account guidelines such as those provided in [National Biodiversity Planning](#) edited by UNEP, WRI and IUCN, when preparing and implementing their NBSAPs. This publication highlights the key use of information in national strategy development and implementation. Biodiversity planning is an open-ended process that develops continuously as further information and experience is gained. The process is cyclical, with the same steps repeated round after round. It is adaptive because participants learn from past experience about shifts in nature and society, and it also involves multiple stakeholders and sectors.

IABIN can facilitate access to NBSAPs across the region, with a focus on the TNs. Links may be established with specific chapters or sections within NBSAPs (e.g. on protected areas or invasive species). These links may then be connected to the institutional catalogue compiled as mentioned in the previous section.

### 2.3 Clearing-House Mechanisms

The CHM was defined by the CBD as a means to promote and facilitate technical and scientific co-operation in biodiversity. Its mandate comes from Article 18 of the treaty. It has been conceived with a view to ensuring that all governments have good access to the information and technologies they need for their work on biodiversity related subjects.

Underlying the clearing house concept is the philosophy that broad participation and ease-of-access must be a top priority. It specifically seeks to support the Convention's thematic and cross-cutting programmes by promoting co-operation in six key areas: tools for decision-making; training & capacity-building; research; funding; technology transfer; and the repatriation of information. Its development is guided by the three goals of the CHM Strategic Plan, *viz*:

- promotion and facilitation of scientific *co-operation*;
- development of a global mechanism for *information exchange*; and
- *network development*, including CHM Focal Points and stakeholder organisations.

The key characteristics of the CHM are as follows: compatibility with different levels of national capacity; needs-driven; structurally decentralised; provides access to information; supports decision-making; has no vested interest in controlling the expertise or information; and created for the mutual benefit of all participants. A number of COP decisions relate to the development and implementation of CHMs, provide guidance to the financial mechanism, promote co-operation with other treaties and organisations, and consider the information to be disseminated through the clearing-house mechanisms, among other dispositions.

Having an operational and fully functional CHM is key to countries for addressing issues relating to implementation of the treaty. The mechanism is an invaluable tool for promoting the strategic use of available resources, including information and technology, in the thorough application of measures required by the articles of the Convention or instruments elaborated by the SBSTAA and discussed by the COP.

The COP adopted certain guidance to Parties as regards the development of the CHM. Its structure should include regional (provincial, state) branches within countries, nominated thematic focal points and an established steering committee. Organisational improvements should be considered as a priority for the Parties in trying to improve implementation of CHMs in a manner that involves potential stakeholders. Co-operation at regional (supra-national) level would also appear to be valuable in promoting development of national CHMs, and this might be facilitated by the establishment of regional CHMs.

It has been recommended that in building up the content of information in CHM at national, sub-regional and regional level, the following should be included: country profiles; NBSAPs; laws and regulations; scientific & technological information; and financial resources. The COP requested Parties to link their national CHMs to the Secretariat CHM ([biodiv.org/chm](http://biodiv.org/chm)) via Internet if possible.

The CBD Secretariat decided to elaborate a guiding mechanism based on the “toolbox” or “toolkit” principle, whereby key tutorial information is provided in order to assist NFPs in the process of CHM planning ([Clearing-House Mechanism toolkit](#)). These toolkits consist of a number of modules with packed information, which span across institutional and technological themes (Annex 3).

As of 2004, 62 Contracting Parties (31.8% of the total) have established a national CHM website. The most favourable situation is in the European region, where 77% of the countries have a CHM website. There are currently 30 Parties with a significantly developed CHM functioning and operational procedures. A recent survey carried out by UNEP-WCMC on behalf of the CBD indicates that there is a priority need to develop solid strategies for CHM implementation at the national level. These strategies should address national CHM priorities, and be based on a realistic assessment of available funding. Strategies should be discussed with all stakeholders and should be endorsed by the CHM National Steering Committee, or equivalent.

In 2002, an MoC to establish a framework of collaboration between IABIN and the CHM of the CBD ([www.iabin.net/binary\\_docs/documents/governance/iabin-cbd\\_mou.pdf](http://www.iabin.net/binary_docs/documents/governance/iabin-cbd_mou.pdf)) was signed. Identified common goals described in this document include facilitating the development and implementation of technologies, and best practices that are necessary in order to share knowledge and information relevant to biodiversity conservation and sustainable management.

A revision of progress made under the umbrella of this memorandum was carried out during the Third IABIN Council Meeting ([www.iabin.net/english/meetings-workshops/meetings/ic3.shtml](http://www.iabin.net/english/meetings-workshops/meetings/ic3.shtml)). Its purpose was to harmonise the vision of IABIN, CHM and GBIF for biodiversity information networking across the Americas, and jointly plan complementary activities that support the goals of these initiatives.

IABIN should fulfil the recommendations resulting from this meeting, paying attention to aspects of implementation of best practices concerning information management, and integration of good quality information distributed across the region (with a focus on TNs, as is already happening, for example, with the Invasive Species Information Network, I3N).

## 2.4 The Aarhus Convention

The UNECE Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters was adopted in Aarhus at the Fourth Ministerial Conference in the “Environment for Europe” process. The treaty entered into force on October 2001 and progress of ratification has been relatively rapid.

The Aarhus Convention is a new kind of environmental agreement. It links environmental rights and human rights. It establishes that sustainable development can be achieved only through the involvement of all stakeholders, linking government accountability and environmental protection. It clearly focuses on interactions between the public and public authorities in a democratic context, and it is forging an innovative process for public participation in the negotiation and implementation of international agreements.

The Aarhus Convention has inspired the improvement of related legislation at national level across Europe. The overall intention is to adapt regulatory regimes concerning the subjects of the Convention in a way that responds to its dispositions and facilitates the achievement of its goals.

The [first meeting of the Parties](#) adopted the Lucca Declaration as well as a number of decisions on PRTR, GMOs, compliance, capacity building, access to justice, electronic information tools, work programmes, among others. Parties requested the secretariat to continue with its efforts to develop a CHM and capacity-building service ([Decision I/10](#)) as a means to adequately address the need for co-ordinated and systematic assistance to the implementation of the Convention, primarily in countries in transition.

Contracting Parties established a task force to facilitate the implementation of the treaty by preparing draft recommendations on the more effective use of electronic information tools to provide public access to environmental information ([Decision I/6](#)). The commitments of the task force are as follows:

- a) exploring the opportunities and benefits offered by information communication technologies; and
- b) sharing related experiences, know-how and information, pertaining to the region’s and countries’ needs.

Among the results of the activities organised under the auspices of this task force, there is a list of actions to further the use of electronic tools in the implementation and promotion of the Convention, and a compendium of good practice examples and priorities prepared by the Regional Environmental Centre for Central and Eastern Europe (REC) ([rec.org/e-aarhus](http://rec.org/e-aarhus)). Through workshops, e-fora, good practice documentation and a website, the Task Force is exploring mechanisms to improve access to environmental information and to enhance the opportunities for community participation in decision-making.

Some countries across the Americas have already established a policy framework for a facilitated and free access to information by all interested users, although still in a rather non-specific manner in the majority of them. IABIN can encourage countries to review their policy situation, and explore mechanisms for enhanced community participation by means of a better access and use of biodiversity-related information.

This process might even be more effective if carried out by blocks of nations with comparable information management policy frameworks. These blocks may or may not coincide with previously defined regional blocks (e.g. the Andean Pact or MERCOSUR), although greater institutional similarities should be expected to exist between countries with a longer tradition of co-operation.



## CHAPTER 3 EXAMPLES OF STRATEGIES AND SYSTEMS

### 3.1 Europe

**Norway:** the Norwegian information management strategy is based on a national policy of open and free access to data and information (including targets, rates and indicators) for everyone. The Directorate for Nature Management (DN) is the national body that has the scientific responsibility for managing the Norwegian countryside. The DN is also in charge of monitoring the state of the environment periodically. This takes place through co-operating with, and providing advice and information to, sectors of the population and other public authorities both in Norway and other countries.

The Department for Environmental Information and Monitoring is responsible for co-ordinating the Norwegian strategy of environmental monitoring, the systematic gathering and storing of data, and making environmental data available. The latter action is specifically required by the Freedom of Information Act No. 45 of 1993, which follows European regulations and the provisions of the Aarhus Convention.

The Norwegian CHM (<http://www.naturforvaltning.no/>) is a bi-lingual (English and Norwegian) gateway to data and information on themes under the domain of the Directorate: [Animals and plants](#); [Outdoor Activities](#); [Nature and land use](#); and [International environmental cooperation](#). It has been designed with the view to facilitating access to good quality information, with purposes of consultation and monitoring of the overall performance of the country in terms of conservation and sustainable use of biodiversity.

The site is linked to others containing data and processed information, such as [Environment.no](#), which includes the State of the Environment of Norway, with detailed environmental data and statistics. [Norwegian National parks](#) is the link which provides descriptive information on Norwegian heritage and national parks.

An important task for the DN is to pursue [International environment cooperation](#), including the follow up of international conventions and agreements ratified by Norway, and provision of [Norwegian Environmental Assistance](#) to other parties, in accordance with the [Strategy for Environment in Development Cooperation](#).

**Spain:** the [General Directorate for Nature Conservation](#) (DGCN), which is part of the Ministry of the Environment (MIMAM), is the agency in charge of promoting activities of biodiversity conservation and sustainable use of forests across Spain. The 19 Autonomic Communities are the ultimate bodies responsible for implementing these activities at sub-national level.

Among its duties, the DGCN develops basic legislation on nature conservation matters, represents Spain in international and community meetings and fora, and co-ordinates the

integration and joint application of norms and directives with the respective authorities at Autonomic level. The Directorate is responsible for the administration and management of the Spanish CHM (in Spanish), which can be found at the following address: [mma.es/conserv\\_nat/](http://mma.es/conserv_nat/)

Spain has passed legislation on the Right of Access to Environmental Information (Law 33/95), which has recently been adapted with the view to including general obligations emanating from the Aarhus Convention.

The Directorate co-ordinates different working lines, which pursue the gathering and dissemination of data and information on Spanish nature. These are used in the generation and actualisation of [inventories and statistics](#), including a Data Bank and an Inventory of Wetlands, among other resources.

Biodiversity conservation and sustainable use is the responsibility of the [General Sub-Directorate for Biodiversity Conservation](#). This department collaborates with the authorities at Autonomic level (and other interested actors) in the preparation of biodiversity related [strategies and plans](#). Co-ordination is required in areas such as the conservation of threatened species, the management of natural protected areas and the Natura 2000 network, and the conservation of the marine ecosystem and wetlands in Spain.

The DGCN is also responsible for international co-operation in implementation of the Convention on Biological Diversity and other global and regional instruments ([mma.es/conserv\\_nat/presentacion/html/cooperacion.htm](http://mma.es/conserv_nat/presentacion/html/cooperacion.htm)). The CHM is linked to other, non-biological sites on aspects such as environmental quality, shores and hydrological resources. There is not any visible connection with CHMs or similar systems established at sub-national (Autonomic) level.

**Italy:** the Italian CHM is maintained and administered by the Ministry for the Environment and Territorial Custody (MINAMBIENTE). The site (in Italian) can be found at the following address: [minambiente.it/Sito/home.asp](http://minambiente.it/Sito/home.asp). The mechanism describes the main areas of Ministerial action, and is connected with departments in charge of international co-operation, designation and management of protected areas, and sustainable development, among others.

Biodiversity conservation activities are the responsibility of the Directorate for Nature Conservation. This department co-ordinates national action with regard to *in situ* conservation (protected areas declared at national level and sites included in the Natura 2000 network), fauna and flora preservation, and the application of CITES and other species related conventions (e.g. CMS). Users may get information on protected area legislation, designation types and management categories, wetlands and other themes.

The Directorate for Sustainable Development co-ordinates activities relating to the application of Agenda 21 and the Aarhus Convention, among others. The link to Aarhus

provides the basis for the free and facilitated access to environmental information, and considers ways for promoting its use in support of decision-making processes across Italy.

### 3.2 Australia

Australia's [Biodiversity Clearing House Mechanism](#) can be found on the web site of the Department of the Environment and Heritage ([deh.gov.au](#)), under the Environmental Theme [Biodiversity](#). The Department is also in charge of ten other themes, including [Parks & Reserves](#), [Inland Waters](#), [Coasts & Oceans](#), [Heritage](#), [Land Management](#) and [Antarctica](#).

When clicking on the [Biodiversity](#) theme, users have access to a site with detailed information resources, including the CHM. The DEH has developed the [Clearing House Information Manager](#) to raise awareness and understanding of both the CBD and the [National Strategy for the Conservation of Australia's Biological Diversity](#), while facilitating access to a range of related information. This site contains both archived information and documents, in addition to a section for recently uploaded information (less than 60 days old). The Manager has around 25 sub-categories within biodiversity.

The National Strategy is a very comprehensive policy instrument that includes an Action Plan with objectives, targets and indicators. As per information exchange, and taking intellectual property rights into consideration, it requires that while information on Australia's biodiversity accumulates, it is disseminated in ways that are readily accessible for planning, development, management and decision-making, in both private and public sectors, including through computer networks. Strong emphasis is made in order to ensure continued availability of accurate and persuasive information about the benefits, costs and means of biodiversity conservation.

Extending awareness to the development of a sense of community involvement and action is key for the Australians. Everybody has an important role to play in biodiversity conservation by providing expertise and assistance at all levels. There is space, therefore, for wide participation of all stakeholders, regardless of the role they currently are playing in the community.

The Biodiversity web site is linked with the [Australian Biodiversity Information Facility](#) (ABIF), which is part of an ongoing study of biodiversity resources. ABIF is a gateway to on-line taxonomic and biological information on species that occur in Australian territory ([ABIF-Fauna](#) and [ABIF-Flora](#)). The Biodiversity web site is connected with sites describing the [National Objectives and Targets for Biodiversity Conservation 2001-2005](#), and tools for [Involving Industry and the Community](#) in conservation action, among others.

The DEH web site is linked to a variety of sites holding regulatory, institutional, political and purely biological information. These include a connection with ERIN ([deh.gov.au/erin/](#)) that provides environmental information for policy developers and decision makers. ERIN is a national facility, using the latest computing technology to

provide access to a vast reservoir of information on the Australian environment, and the analytical tools to interpret it. The information is drawn from many different sources and includes maps, species distributions, documents and satellite imagery, covering environmental themes ranging from endangered species to drought and pollution.

The DEH also co-ordinates the implementation of the National Strategy at all scales, with recommendations relating to the thematic programmes and cross-cutting issues considered by the Convention. Special attention is paid to the role of Councils concerning the implementation of conservation action at local level. The Department has developed [the Biodiversity Toolbox](#), which is designed to provide Councils with the necessary tools, resources and contacts to integrate biodiversity conservation into all aspects of their operations. Central to this is the [Benchmarking Biodiversity Conservation Framework](#), a five-step benchmarking system which allows councils to track performance towards conserving the local biodiversity.

Provinces and territories have also developed and implemented CHMs. The one established by Victoria ([nre.vic.gov.au/plntanml/biodiversity/](http://nre.vic.gov.au/plntanml/biodiversity/)) is a good example of a user-friendly and comprehensive system. Another clearing-house, which was developed by the New South Wales National Parks & Wildlife Service, can be found at: [nationalparks.nsw.gov.au/npws.nsf/](http://nationalparks.nsw.gov.au/npws.nsf/).

### 3.3 Asia

**India:** In 1982 India established the [Environmental Information System](#) (ENVIS) as a programme, which has become the Indian CHM. Since inception, its focus has been on providing environmental information to decision makers, policy planners, scientists and engineers, research workers, etc., all over the country.

ENVIS is a decentralised system with a network of distributed subject oriented Centres that ensure smooth integration of national efforts in environmental information collection, collation, storage, retrieval and dissemination to all actors concerned. Presently the network consists of a Focal Point at the Ministry of Environment and Forests and [25 ENVIS Centres](#) set up in different organisations and institutions in the country. These Centres have been established in the areas of pollution control, terrestrial and offshore ecology, environmentally sound and appropriate technology, bio-degradation of wastes and environment management, among other themes.

To strengthen ENVIS capacity to disseminate data and information pertaining to the environment and sustainable development, ENVIS India is in the process of establishing 85 Nodes by involving organisations, institutions, universities and government departments working in diverse areas of the environment. The responsibilities of both ENVIS Centres and Nodes include: linking all information sources, and creating a data bank on selected parameters in the subject area assigned; identifying information gaps;

publishing newsletters and bulletins; and developing library facilities and providing support to the focal point on the subject area.

A group of seven Technical Committees has been constituted under an ENVIS Advisory Committee to guide and monitor the ENVIS Nodes establishment in a number of programmes. They include [Flora, Fauna and Biodiversity](#), [State of Environment Report](#) and [Media, Environment Education and Sustainable Development](#), among others.

The decentralised nature of the system can be seen in the [State of Environment Report](#), which have been prepared at State level and may be consulted on-line. For instance, the report of Tamil Nadu constitutes a valuable benchmark for future environmental reporting and also serves as a database for policy-making and preparation of management plans. It includes a database on resources, energy sector, agriculture, tourism, land degradation, forests, biodiversity, air pollution, management of fresh water and recommendations for further policy action.

**Thailand:** progress made by Thailand on information management is a direct result of the country's participation in the BDM Project. Outputs of this project included the following:

- a) National Institutional Survey: this survey was first conducted in 1996, but was updated in 2002, and its results are now being managed electronically. More than 300 institutions and experts were contacted. Survey results are currently available, and include a report on its findings – which could be used to compare progress made since the first survey was carried out. A meta-database with information about institutions, experts and biological collections (e.g. butterflies) is now available on-line.
- b) Guideline on Biodiversity Data Management: this tool was developed as a measure for improving the management and availability of biodiversity information, and includes the following: Guideline on the Development of Efficiency in Data Management; Biodiversity Information Network (BINET); and Biodiversity Data Management Standards (BDMS).
- c) Biodiversity Data Management Action Plan: this comprises four policies, 15 measures and 51 activities. Elements of this plan have been incorporated into the National Biodiversity Strategy of 1997.

The Office of Natural Resources and Environmental Policy and Planning (OEPP) is the CBD NFP, and serves as the National Reference Unit (NBRU) to ARCBC. Within the OEPP, there is a Database and Information System Section, which is responsible for maintaining and updating the newly implemented BINET, the English version of which may be found at [onep.go.th/bdm/index\\_eng.html](http://onep.go.th/bdm/index_eng.html). The mechanism is linked to sites on biodiversity, wetlands, alien species, the BDM Project itself, publications and a number of databases (experts, institutions and datasets).

The BINET may be accessed through the OEPP main site ([onep.go.th/eng/](http://onep.go.th/eng/)) which includes a number of links of special interest, such as the State of the Environment Thailand page (all versions between 1995-2001), and a site on Policy and Plan.

Concerning the harmonisation of reporting, stakeholder meetings have been facilitated in Thailand to consider key data holders in relation to information requirements of major conservation-related conventions. It is envisaged that further discussions will result in a model being developed that addresses reporting needs in a Thai context.

### **3.4 Observations of differences between different countries**

Before comparing the strategies and decision-support systems considered here, it is relevant to mention that no attempt was made to evaluate their performance. The analysis was focused on the apparent comprehensiveness of the strategy – i.e. the stages within the information cycle considered, and the ease-of-use and accessibility of information held by biodiversity-based CHMs.

A measure of effectiveness would be possible only with the definition of targets (which some national strategies already include), and the aid of indicators showing whether targets have been met, with the support of the CHM, in a given period.

The language barrier should be considered, given that very few CHMs have been developed in two or more different languages. Two of the CHMs reviewed here (Spain and Italy) do not have an English version, and so their use would be limited. The Norwegian, Indian and Thai sites are bi-lingual, and their English version was the one taken for the analysis. However, some of the functionality and components of the original version were unavailable in the translated version (e.g. Thai databases), and this limits the value of the analysis to a certain degree.

The main findings of the review are as follows:

- EU countries have adopted a similar approach to information management, although their respective CHMs look different. This may be due to a better understanding of CBD recommendations with regards to technical and scientific co-operation and information exchange using electronic tools. Agencies responsible for the maintenance and updating of the biodiversity CHMs are directorates or departments within ministries, which have access to technical staff and financial resources.
- Benefits from adopting a common policy framework – such as Aarhus, relating to a free and facilitated access to information for everyone can be perceived in the relative importance of links considering this and other regional and international conventions and treaties.
- External assistance and co-operation of EU countries are focused on the promotion of enabling activities, such as the development and implementation of CHMs.



Experience gained at EU level is being transferred to non-EU, as well as to other countries with economies in transition or in development (see the Belgian Partnering Role, in Chapter 4).

- Other countries worthy of consideration include the Netherlands – the design of its CHM resembles closely the CBD banner, Belgium, UK and Germany. They show how an homogeneous regional approach produces clear benefits to a wider audience – in terms of basic policy integration. As a demonstration of this, and language permitting, a stakeholder in Spain or Italy might use the Belgian CHM to check and understand biodiversity-related issues in Belgium, and *vice versa*.
- Australia's approach is much more focused on increasing the availability and accessibility of biodiversity information, the needs and methods for its conservation, and the current and potential benefits which derive from it. It does that through the promotion of public information programmes in consultation with community and indigenous groups. It encourages the use of CHMs to disseminate information prepared by the provincial governments, local councils, research and educational centres, industries, NGOs and individuals.
- Australia pays attention to the improvement of scientific knowledge and access to information for everyone. National targets comprise the development of a highly distributed network of databases that is accessible to scientists, planners, decision-makers and the community. By 2005, it is expected that there will be a 50% increase in the awareness by the community of the concept and significance of biodiversity and actions that can be taken to conserve species, communities and ecosystems.
- The proactive approach to local participation is an aspect of the Australia's policy that is very relevant to IABIN. However, it is important to say that the diversity of resources and facilities that may be found in the DEH web site can be rather intimidating to less experienced users, which may limit its value to non-institutional stakeholders.
- The cases of both India and Thailand show the efforts made for connecting a large country through a network of technical centres and a structure of nodes which provide technical advice (India), and a centralised but highly efficient national node (Thailand). Both require significant financial assistance and expertise, but if successfully implemented, they would greatly facilitate the decision-making process in each country.
- Nothing is mentioned on which steps have been taken to ensure the balanced distribution of expertise and ICT. Connectivity to the Internet is a key issue to consider in developing nations like India and Thailand. It is interesting to see how a

proactive policy may resolve this issue, e.g. India has made good progress in the planning and establishment of its own software industry.

- In all, a sound policy framework, a balanced consideration of all issues that relate to biodiversity conservation, a user-friendly CHM, and good access to training and capacity-building opportunities should be considered if a network like IABIN is expected to meet the needs of stakeholders from all over the region.
- IABIN can do a lot by assisting countries to carry out a systematic revision of policy issues and available capacity at national level. It may later help to connect national initiatives, promoting a consistent approach to biodiversity-related knowledge management. The Thematic Networks may then be used to trigger such connection between countries, or groups of countries across the region.



## CHAPTER 4 EXAMPLES OF CAPACITY BUILDING AND INSTITUTIONAL STRENGTHENING

### 4.1 Europe

It is certainly difficult to find evidence of programmes of capacity-building and institutional strengthening, targeted at national level users in EU countries. As has already been mentioned, national capacities in information exchange appear to be well developed, and access to technical and financial resources is not restricted. On the other hand, programmes of technical and scientific co-operation directed to users in non-EU and other developing countries are more frequent.

The partnering role, for example, is a mechanism by which one Party “parents” for a limited time only some general information for non-web connected CHM-NFPs, either as text and/or images. This parenting should normally occur until the parented country has its own access to the Internet. The type and amount of information and its presentation will be a matter for discussion between partners. Often, this involves the development of “mirror sites” in selected institutions, that hold duplicate information, the maintenance of which will latter be the full responsibility of the parented organisation.

Since 1998, the Belgian National Focal Point (Belgian NFP) has been hosting the CHM of the Democratic Republic of Congo at the request of the NFP. Based on this experience, an offer was made to other countries to join this partnership. Other countries have followed, and the Belgian NFP is now hosting the [Clearing-Houses of 12 African countries](#). “Mirror-sites” have been put on the server of the [System-wide Genetic Resources Programme \(SGRP\)](#) of the [CGIAR](#).

In 1999, Chad asked whether the Belgian CHM could train a person to become National Focal Point for their CHM. As other countries were also interested in training, Belgium broadened its partnership role to organise webmaster training courses for national CHMs. Nowadays, a four to five-weeks training course is organised twice per year for webmasters of national CHMs. The ultimate goal of the partnership is that the CHM will be maintained by the receiving country’s own structures.

The Netherlands CHM has developed a Toolkit with AIDEnvironment to develop websites based on the CBD model. Technical resources and experts are available to assist Parties and governments to develop their CHM website using an out-of-the-box approach. The toolbox includes an easy-to-use database with contents that can easily be updated, allowing webmasters to cut and paste information coming from other CHM-related sources, websites and publishers as needed. In addition, links to other websites can be made without complex technical adjustment. The websites can be developed in several languages (Annex 3).

## 4.2 Australia

A key action within Australia's defined targets for Biodiversity Conservation 2001-2005 consists of improving scientific knowledge and access to information. This includes the following two major objectives:

- a) Verify, and make accessible, existing scientific knowledge and scientific collections;  
and
- b) The community understands the concept of biodiversity and actions that can be taken to conserve species, ecological communities and ecosystems.

At the local level, the principal element is [the Biodiversity Toolbox](#), which begins with a [Self Assessment Checklist](#) to determine where each Council should start with the process of local biodiversity planning. The [Benchmarking Biodiversity Conservation Framework](#) is designed to guide councils through a series of steps to ensure that biodiversity conservation is a key priority. Each benchmark is broadly defined to provide some direction while encouraging local innovation.

Many councils have made a start or achieved outstanding progress towards biodiversity conservation, already attaining some benchmarks of the framework. [Benchmark 2](#) establishes the baseline position of each Council. They could then use information and data available both locally and in the [Tools and Resources](#) page to identify or map: the distribution of local endemic species; the location of remnant vegetation; local endangered and threatened species and ecological communities; the location and health of known habitat; and relevant threatening processes. Collected data is compiled in specifically designed databases, and finally digitised maps are developed with GIS technology, in order to allow visual reflection of improvements in biodiversity and natural resources over time.

Another key action is to maintain and record ethno-biological knowledge, through ensuring that indigenous communities have access to resources to enable them to preserve such knowledge in an active manner. The country has proposed to do this by establishing mechanisms to facilitate the inter-generational transfer of this type of knowledge. A measure to indicate the degree to which this target is met is the number of jurisdictions that have negotiated mechanisms with indigenous people to facilitate such transfer. It is unclear the kind and characteristics of the proposed mechanisms.

## 4.3 Asia

ENVIS started implementing the World Bank assisted Environment Management Capacity Building Technical Assistance Project (EMCBTAP) aimed at structuring the ENVIS scheme by extending its reach through involvement of institutions and organisations in state governments, academia, the corporate sector and NGOs.

The project also aims at broadening ENVIS with a view to including other areas, themes, local conditions, issues, information and data needs of the country pertaining to environment. This is planned to be achieved through enlargement of participant organisations, called EMCB-Nodes, in various sectors and through the introduction of modern means of ICT. This programme is a continuation of the Sustainable Development Networking Programme India (SDNP-India).

The BDM Project is an ongoing activity in Thailand, and has continued producing results of value for improving information exchange activities across the country. It is focused on further developing tools and procedures, such as the survey form for assessing national capacities and needs. For example, now a bi-lingual version of the form is available making wider the audience to which the survey is directed. BINET is still in a prototype phase, and will soon be expanded.

#### **4.4 Observations on differences between different countries**

EU countries concentrate their assistance and co-operation efforts on helping non-EU and other countries to establish their CHMs, following the model proposed by the CBD. The approach appears to be focused on technological rather than on institutional aspects (including the definition of adequate legislation on the access to information at regional and national scale). The Partnering Role and CHM Toolkit are of value, as long as an exit strategy for donors is available, that is, parented countries have the funds and capacity to maintain the CHM and other resources once the ‘parents’ finish their contribution.

Australia's approach, albeit limited to its territory, encourages the development of self-sufficiency in assessment and understanding of key biodiversity issues at local level (this includes the maintenance of ethno-biological knowledge by indigenous peoples). The technical aspect is thus secondary, and might be adapted to local needs and capacities, rather than the other way round.

The situation of India and Thailand is different, in that they are still too reliant on external aid. The emphasis, however, is on the development of capacity to respond to specific demands, through the constitution of a network of thematic nodes (India), or the development of a strong and efficient national hub.

Considering the reality in Latin America and the Caribbean, and the reasonable progress made by countries on matters of ICT advance, it may be adequate for IABIN to concentrate capacity-building and institutional strengthening efforts on improving the regulatory framework which influences information exchange across the region. Ensuring free and facilitated access to biodiversity information is an essential stage, and may be more effective if carried out with the type of tools and elements seen in the Australian case, e.g. the Self-assessment Checklist, and the Benchmarking Biodiversity Conservation Framework.

## CHAPTER 5 VALUE OF INTERNATIONAL INITIATIVES IN PROMOTING EFFECTIVE STRATEGIES

### 5.1 Information exchange initiatives which promote effective strategies

Around 30 different initiatives promoting effective information management have been developed and implemented at global level, and are considered in Section 1. A group of nine are analysed here in some more detail, with the view to providing practical guidance for the further development of the IABIN network. This is based on the elements of national co-operation and partnership, resulting from the application of these international instruments (Table 1).

**Table 1: Selected information management initiatives with practical value for the further development of IABIN.**

Notes: S – species data and information; E – environmental data and information; Ec – ecosystem data and information; GIS – Geographic Information System; T – taxonomic information; ScI – scientific publications and documents; So – socio economic data and information

<i>Name</i>	<i>Type</i>	<i>Service</i>	<i>Focus</i>	<i>Web site</i>
BCIS	Partnership	Data; meta-data	S; E; Ec; GIS	<a href="http://biodiversity.org">biodiversity.org</a>
BioNET	Partnership	LOOPS	T	<a href="http://bionet-intl.org">bionet-intl.org</a>
BOoW	Programme	Information	S; E; Ec	<a href="http://unesco.org/mab/CBD/">unesco.org/mab/CBD/</a>
CONBIO	Partnership (academic)	Services to members	ScI	<a href="http://conbio.net">conbio.net</a>
DIVERSITAS	Programme	Network and projects	S; E; So	<a href="http://diversitas-international.org">diversitas-international.org</a>
ELDIS	Programme	Portal	So; E	<a href="http://eldis.org">eldis.org</a>
GBIF	Partnership	Data; meta-data	T	<a href="http://gbif.org">gbif.org</a>
ITIS	Partnership	Network	T	<a href="http://itis.usda.gov">itis.usda.gov</a>
Species 2000	Partnership	Portal	T; S	<a href="http://species2000.org">species2000.org</a>

Aspects that are relevant to IABIN include the following:

- *Strategy-oriented*: they all take a strategic approach to the management of information, and consider the entire information cycle, but focus on determined themes or issues (e.g. taxonomic for GBIF, ITIS and BioNET; biodiversity conservation for BCIS; ecosystems and socio-economic for DIVERSITAS and ELDIS).
- *Encourage networking*: they promote enhanced co-operation between key stakeholders at national level. For example, GBIF is focused on the development of a

network of data nodes with harmonised capacity to give access to taxonomic and biogeographic data held at museums, herbaria and related institutions. BioNET encourages the implementation of sub-regional LOOPs (Locally Organised and Operated Partnerships) of institutions in developing countries that are dedicated to making regions self-sufficient in their taxonomic needs.

- *Filling the information gap:* special emphasis is made on bridging the gap of knowledge about biodiversity. For example, BioNET is dedicated to supporting sustainable development by helping developing countries to overcome the so-called *taxonomic impediment* by becoming self-reliant in taxonomy.
- *Building national capacity to deliver user-driven information products and services:* this is key to countries within the scope of IABIN, as it is the policy relevance that products and services may have to decision-makers. Examples include the guided assembling of thematic maps (BCIS) and sectoral reports (BOoW and DIVERSITAS), and training in the use software packages, such DiGIR and Darwin Core for the registration of data sources (GBIF).
- *Approach to information management is decentralised:* data custody and quality control is the responsibility of the institution holding the datasets. The contribution of each institution to a common knowledge pool responds to schemes and procedures previously agreed between all partners. This often involves the signature of Memoranda of Understanding.
- *Administration is facilitated:* a centralised unit in charge of administering the initiative and ensuring the continuous delivery of information products and services is usually established with the balanced contribution from all partners. This entity is in charge of maintaining and keeping up-to-date an on-line mechanism of information exchange. For example, BCIS has a Secretariat that supports the members' network, working together toward providing data and information that is key to decision-making.
- *Time-line is flexible:* initiatives are not necessarily thought of as being permanent, and may be discontinued after a pre-determined period of time. Their impact is therefore relatively easy to monitor, and it may also be simple to introduce changes to improve performance. For example, GBIF was established with a defined timetable, during which determined goals and targets have to be met. These targets are periodically reviewed by all participants in this initiative (government representatives, partners).
- *Getting financial support is achievable:* co-operation and integration do facilitate financial support from aid agencies and donors. On occasion, this is further facilitated by the type of initiative, e.g. ELDIS where one of the partners is DANIDA. Besides, networking with the purpose of knowledge mobilisation is increasingly relevant to donors, particularly when partnerships include components of capacity-building. For

instance, GBIF has established a seed-funding programme, whereby the Facility provides up to 20% of funds needed to capture and disseminate taxonomic names electronically.

## CHAPTER 6 SUMMARY OF FINDINGS AND RECOMMENDATIONS

### 6.1 Key issues and themes

The present analysis highlights the issues and themes which are important when planning for effective strategies of biodiversity information management at national and regional scale. They have all been considered by countries selected as case studies, and include the following:

- *Sound policy framework*: having a policy framework, which provides for a free and facilitated access to biodiversity information is an essential stage within effective national strategies. Promoting a harmonised approach to knowledge management across the LAC region is desirable, and would greatly contribute to the flow of data and information between countries, as it is already happening in the EU as a result of the application of the Aarhus Convention.
- *Clear definition of roles and responsibilities*: effective strategies are those with a neat definition of the institutional roles and responsibilities in terms of the generation, storage, processing and dissemination of biodiversity information and associated environmental data. Selected case studies show that sound information management also depends on institutional stability.
- *Identification of capacity building and institutional strengthening needs*: the importance of this issue cannot be over-emphasised. Effective national strategies depend on the existence of strong agencies and institutions, and staff with the capacity to facilitate access to information by all users, especially those that need it to make informed policy decisions.
- *Opportunities for regional collaboration and integration*: benefits from a common regional approach to information management are clear, although the process of policy harmonisation may take a long time to proceed. This process might be facilitated by identifying opportunities for a gradual regional collaboration and integration, e.g. through the implementation of pilot initiatives of the sort proposed by IABIN under the TN's scheme.
- *Dissemination of joint successful initiatives*: examples of joint successful initiatives involving institutions and expertise from two or more countries should be disseminated as widely as possible. These can consist of actions or activities relating to any aspect within the information management cycle – from data gathering and processing, to the delivery of user-driven information products, and so its conclusions may serve to demonstrate that collaboration and integration is ultimately feasible.

## 6.2 Recommendations

IABIN can make a substantial contribution to the development of sound national strategies, and their integration at regional level. This can be achieved through the following activities:

- *Multi-national institutional survey and ERI:* IABIN co-ordinating agencies can conduct a regional survey of institutions related to their TNs of the sort proposed under the BDM Project scheme. The Network can then keep an electronic catalogue of profiles of these institutions, including specific information on available capacities, specialities and expertise, among other aspects.
- *Facilitated access to NBSAPs:* IABIN can facilitate access to all NBSAPs that have been elaborated throughout the region. This is key to promotion of a harmonised regional approach to strategic biodiversity planning. Again, this action may be concentrated on the TNs, and so the chapters or sections within NBSAPs that are relevant to these themes may be extracted or connected through the Internet.
- *Incorporating the IABIN concept into available toolkits:* Annex 3 includes a Comparative Evaluation of Toolkits for Development of CBD Clearing-House Mechanisms.
- *Promotion of capacity building and institutional strengthening:* this is an essential need all across the LAC region. IABIN should generate a suite of capacity-building and institutional strengthening opportunities, which may include the sort of mechanisms reviewed in this document. A number of institutions throughout the Americas are in an excellent position to provide training-on-request (on aspects of both planning and implementation), thus potentially reducing travel and other costs. The development of tools such as Australia's Self-Assessment Checklist and the Benchmarking Biodiversity Conservation Framework can be promoted at regional level.
- *Enhanced community participation:* IABIN should explore mechanisms for enhanced community participation in biodiversity decision-making by using electronic means. This may involve promoting the development of a common regional approach to free and facilitated access to information across the region of the Aarhus type. A regional revision of instruments (policies, laws, etc.) that exist at national level might be sufficient as a first stage within this process.



## ANNEX 1 - Key Contacts

### **Aarhus Convention Secretariat**

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### **Australia**

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**CHM National Focal Point**

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## ANNEX 2 - Acronyms and Abbreviations

ARCBC	ASEAN Regional Centre for Biodiversity Conservation
ABCD Schema	Access to Biological Collection Data
CBD	Convention on Biological Diversity
BCH	Biosafety Clearing-House
BCIS	Biodiversity Conservation Information System
BioNET	Global Network for Taxonomy
BooW	Biodiversity Observations on the Web
CGIAR	Consultative Group on International Agricultural Research
CHM	Clearing-House Mechanism
CONBIO	Society for Conservation Biology
COP	Conference of the Parties
DANIDA	Danish Agency for International Development
DiGIR	Distributed Generic Retrieval Information Resources protocol
EC CHM	European Community Clearing-House Mechanism
EU	European Union
GBIF	Global Biodiversity Information Facility
GEF	Global Environment Facility
GMOs	Genetically Modified Organisms
GTI	Global Taxonomic Initiative
IABIN	Inter-American Biodiversity Information Network
IDA Programme	Interchange Data among Administrations
ITIS	International Taxonomic Information System

IUCN	The World Conservation Union
LDPA	Lightweight Directory Application Protocol
MERCOSUR	Common Market of the Southern Cone
MoC	Memorandum of Co-operation
NBSAPs	National Biodiversity Strategies and Action Plans
NFPs	National Focal Points
PRTR	Pollutant Release and Transfer Register
SBSTTA	Subsidiary Body on Scientific, Technical and Technological Advice
UK	United Kingdom
UNECE	United Nations Economic Commission for Europe
UNEP	United Nations Environment Program
UNEP- WCMC	UNEP World Conservation Monitoring Centre
WRI	World Resources Institute

## ANNEX 3 – Comparative Evaluation of Toolkits for Development of the CBD Clearing-House Mechanism

### 1. Introduction

Section 2.3 of this document (Clearing-House Mechanism) indicates that an increased linkage between IABIN and CHM implementation is under active consideration. One of the most immediate implications of ongoing discussions is that IABIN and CHM should complement to each other, with the first providing support for the operation of the second at the national scale. The countries of the region therefore need to understand how CHMs normally operate, and should be aware of the different stages that have to be fulfilled, in order to proceed with their development and successful implementation.

The CBD Secretariat decided to elaborate a guiding mechanism based on the “toolbox” or “toolkit” principle, whereby key tutorial information is provided in order to assist NFPs in the process of CHM planning. These toolkits consist of a number of modules with packed information, which span across institutional and technological themes. They give details on the mechanisms that are available for registering and integrating biological (observational, curatorial, ecological, etc.) and non-biological datasets, and provide annotated lists of the protocols, formats and vocabularies which should be followed to disseminate standardised information using electronic means.

The following toolkits are currently available:

1. The CBD Clearing-House Mechanism toolkit
2. The CBD Biosafety Clearing-House toolkit
3. The Netherlands CHM National Focal Point toolkit;
4. The European Community Clearing-House Mechanism (EC CHM) toolkit; and
5. The Global Biodiversity Information Facility (GBIF) Portal toolkit.

Another initiative is the “partnering” programme established by the Belgian CHM. Although not a toolkit *per se*, it offers extensive support and advice on the design and implementation of operational CHMs.

This group of instruments is analysed in the present Annex, with the view to identifying opportunities for enhanced co-operation between IABIN, the CHM and GBIF (as well as other related initiatives) concerning the integration of toolkits and assisting programmes of complementary regional value.

An IABIN role within such a process may include any of the following four non-exclusive options:

- a) IABIN uses existing toolkits where possible, further promoting and endorsing their use;
- b) IABIN works to share experience on the use of these instruments where available across the region;

- c) IABIN works with the developers of these toolkits to include a specific component on this network; and
- d) IABIN develops its own toolkit.

The text of this Annex is based heavily on the description of the above listed toolkits and the Partnering programme, as they may be found principally on their respective websites. They are characterised, and their similarities and differences are highlighted as appropriate. Such a comparative analysis has been focused on the following aspects:

- *Overall appearance* (Section 3.1): this describes the geographic or thematic focus of toolkits, and their most notable characteristics (type of assistance provided, the comprehensiveness of explanatory texts and supporting tools, structure of modules and their functional relationships).
- *Key components* (Section 3.2): essential elements (definitions, modules, software, standards and vocabularies, etc.) of toolkits are identified, and their functionality and ease-of-use described. Structural and functional gaps that might exist in each toolkit are pin-pointed, and some recommendations for their bridging provided.
- *Relative value as assisting mechanisms* (Section 3.3): this section comments on each of the reviewed toolkits and their value as assisting mechanisms for NFPs and other users. This analysis is focused on IABIN and its needs, in terms of making use of the “toolkit” approach by the network – i.e. what can be learned or extracted, emulated or avoided from each.
- *Recommendations to IABIN* (Section 3.4): initial recommendations are provided on the best strategy for the network in terms of using any of the available toolkits or developing one of its own.

## 2. Description of toolkits

### 2.1 CHM Clearing-House Mechanism toolkit

The defined purpose of the CHM toolkit developed by the CBD Secretariat is to assist Parties and other governments to establish national CHMs. Building on a previous model released early on in the development of the CHM, the toolkit addresses all three objectives identified in the CHM Strategic Plan ([UNEP/CBD/COP/5/INF/3](#)):

1. The promotion and facilitation of technical and scientific co-operation;
2. The development of a global mechanism for exchanging and integrating information on biodiversity; and
3. The development of the CHM Focal Points and their partners.

In support of these broad objectives, this toolkit is aimed at:

- Facilitating the establishment of national CHMs, and promoting their active participation in initiatives related to technical and scientific co-operation;
- Synergising partnerships to assist with the technical development of national CHMs;
- Assisting in the design and establishment of national CHM websites; and
- Making recommendations on the use of and adherence to formats, protocols and standards for the improved exchange of biodiversity-related data, information and knowledge.

The toolkit supports the idea of CHMs as the key components of integral strategies to more effectively link stakeholders with the necessary expertise, knowledge and resources in support of CBD implementation activities. It is designed as a work in progress, taking note of major new initiatives relating to technical and scientific co-operation and new formats, protocols and standards for the smooth exchange of information. It is available in English only both via the Internet (<http://www.biodiv.org/chm/toolkit>) and on CD ROM.

The CHM toolkit does not provide direct technical support to the development of national CHMs, but rather the information needed to understand what needs to be done, and the tools and mechanisms that are available to help achieve it. It has been organised into six modules, which inform and educate users on best practices for the establishment of the key elements of national CHMs:

- Introducing tools in support of participation in the thematic areas and cross-cutting issues of the Convention;
- Assisting in the development of electronic dialogue and communication to synergise new collaborative initiatives and promote exchange of ideas and knowledge;
- Assisting in the establishment of national CHMs by discussing potential activities, functions and responsibilities;
- Providing information on creating and structuring national CHM websites, with a focus on establishing partnerships with existing national CHMs;
- Offering information on existing technical toolkits, to facilitate the technical implementation of national CHM websites;
- Providing information on the use and adherence to formats, protocols and standards, particularly metadata and controlled vocabularies, to foster the creation of worldwide biodiversity information networks; and
- Providing links to expertise, partners, literature and resources.



These six modules span several topics, from introducing the CHM concept itself and describing the service it provides to stakeholders (Introduction), through explaining how CHMs can be developed (Module 2), to giving specific guidance on supporting initiatives (Modules 3 & 4). It also indicates the relevance of internationally accepted formats and vocabularies (Module 5), and describes what they are, and why it is important to develop metadata standards (Modules 6).

At present, 12 out of 33 Parties to the CBD across the LAC region have developed a CHM website, although it is unclear to what extent the respective NFPs have used the toolkit to obtain technical and practical guidance.

## 2.2 CBD Biosafety Clearing-House toolkit

The aim of the Biosafety Clearing-House (BCH) is to provide access to information that is relevant to the operation of the CBD Biosafety Protocol ([www.biodiv.org/biosafety/](http://www.biodiv.org/biosafety/)). The BCH website ([bch.biodiv.org](http://bch.biodiv.org)) has been created to assist governments and other users to fulfill their information-sharing obligations under this Protocol, and authorised users can register their information with the BCH databases through the BCH Management Centre ([bch.biodiv.org/member/](http://bch.biodiv.org/member/)). Users may search the BCH databases for information on:

- a) National contacts ([bch.biodiv.org/contacts/](http://bch.biodiv.org/contacts/));
- b) Laws and regulations ([bch.biodiv.org/laws/](http://bch.biodiv.org/laws/));
- c) Decisions and regulations ([bch.biodiv.org/decisions/](http://bch.biodiv.org/decisions/));
- d) Capacity building ([bch.biodiv.org/capacitybuilding/](http://bch.biodiv.org/capacitybuilding/));
- e) Roster of experts ([bch.biodiv.org/roster/](http://bch.biodiv.org/roster/));

The BCH toolkit ([bch.biodiv.org/toolkit\\_homepage/home.html](http://bch.biodiv.org/toolkit_homepage/home.html)) is available in English and five other languages, including Spanish and French (there is not a Portuguese version yet). It has been organised into five modules that cover the following aspects:

- Introduction to the Central Portal of the BCH, and descriptions of various website resources available ([bch.biodiv.org/mod1/overview](http://bch.biodiv.org/mod1/overview));
- How to search the BCH database for specific categories of information, and an initial description of the different types of information that is readily available ([bch.biodiv.org/mod2/overview](http://bch.biodiv.org/mod2/overview)).
- How to make information available to BCH, including the role and responsibilities of BCH NFPs ([bch.biodiv.org/mod3/overview](http://bch.biodiv.org/mod3/overview)).
- Support for making data in other databases accessible and interoperable with the BCH ([bch.biodiv.org/mod4/overview](http://bch.biodiv.org/mod4/overview)).

- How to use common formats and controlled vocabularies in finding and registering information to the BCH database, also addressing the role of metadata standards ([bch.biodiv.org/mod5/overview](http://bch.biodiv.org/mod5/overview)).

To obtain access to Module 1 of the BCH toolkit, users should enter the BCH itself, and then the Toolkit Home Page. This initial module allows users to easily find very detailed information about the resources they may be searching for, by rolling the cursor around the BCH website, and the toolkits modules in an interactive way. Overall, the whole site was designed as a set of interactive instructional modules that simulate the pilot phase to facilitate learning about the BCH information sharing tools.

Although the BCH toolkit was developed with regard to the BCH, some sections may be relevant to CHM development. Moreover, the technical sections of the toolkit may be used as a reference for CHM NFPs envisaging the development of interoperable information systems or joint national CHM/BCH web sites.

Currently, Mexico is the only country in the LAC region, which has established a specific national biosafety website or database. There is no concrete information on whether the country has utilised the toolkit as a guide, nor if other nations are planning their respective BCH sites with its support.

### **2.3 The Netherlands CHM National Focal Point toolkit**

The Netherlands CHM website ([www.biodiversity-chm.nl](http://www.biodiversity-chm.nl)) was designed according to the principle that end-users should be able to act as a “webmaster” and, where possible, also be able to update the content of the site as necessary and appropriate, without the need for high technical expertise or steep learning curves. It was developed by the National Reference Centre for Agriculture, Nature and Food Security (EC-LNV) working in co-operation with AIDEnvironment, a non-profit development organisation based on the Netherlands.

An interesting aspect of the approach to biodiversity knowledge management taken by the Netherlands is the close similarities of the national CHM website with the CBD banner. This reflects the country adherence to basically the same website architecture, in order to emphasise that it is an integral component of the international CHM network.

The site contains an easy-to-use database, the contents of which may easily be updated, therefore allowing its maintenance at minimal cost. This database allows webmasters to cut and paste information from other CMH-related sources, websites and publishers as needed. In addition, links to other websites may be made without complex technical adjustments. The website was developed in Dutch and English, and could be extended to several more languages.

The Netherlands CHM has developed the toolkit with AIDEnvironment to help others to establish websites based on this model. Technical resources and expertise are available

from The Netherlands CHM and AIDEnvironment ([www.aidenvironment.org/chm](http://www.aidenvironment.org/chm)). The main characteristics of the service provided by this partnership are as follows:

- The CHM website is easy and fast to set-up: all software is set up on a webserver, no adaptations or installation steps have to be performed by the NFPs.
- Major functions are built in (search, picture and document upload, sitemap).
- The development of the website requires no long learning trajectories or expensive software. All software that is used is in the public domain and provided as open source.
- Little extra compute knowledge is taken as a minimum level of needed skills to maintain the CHM.
- The focus is completely on content, not on technical aspects. Once installed, technical support needed is low.
- Customisation to specific functionalities is possible and clients can choose whether to extend functionality when needed.
- Design can be adapted to local standards for sensitive presentation and can be best optimised for maximum performance in countries with low network availability.

#### **2.4 European Community Clearing-House Mechanism Portal toolkit**

The EC CHM (<http://biodiversity-chm.eea.eu.int>) has been developed by the European Environment Agency (EEA) for the European Commission under the IDA Programme. This regional mechanism brings together biodiversity information from all across the European Union, as the European Community's contribution to the CHM.

Its main objectives are as follows:

- To provide a tool to promote scientific and technical co-operation across the EU Member States;
- To facilitate access to information on EC progress in implementing the Convention's objectives;
- To contribute to education and public awareness about the CBD; and
- To provide information for the compilation of national and Community biodiversity-related reports, and on progress in implementing measures for biodiversity conservation and sustainable use.

The EC CHM Portal toolkit (a Demo may be found at [bucovina.finsiel.ro](http://bucovina.finsiel.ro)) was developed by packaging functions of the EC CHM Portal for use by the interested Member States. The EC CHM is also making the toolkit available to other interested governments.

The toolkit offers the following information and functions:

- A hierarchical directory of articles, documents, links, images, audio and video components.
- Full content management functions accessible by authenticated users via user-friendly web pages.
- An information workflow that is entirely supervised by the webmaster team.
- Search function
- Ability to compile news/syndicated news via Rich Site Summary (RSS) from collaborating sites ( [www.eionet.eu.int/EIONET\\_Tech/RSS](http://www.eionet.eu.int/EIONET_Tech/RSS)).
- Ability to export website contents in an XML format.
- Support for the management of meetings and other events, and an event calendar.
- Helpdesk ticketing system available for end users.
- Wide documentation on activities organized by the proper EC CHM.

The EC CHM Portal toolkit has been developed in Zope (<http://www.zope.com>), a high-performance application server, and includes a web server and a content management system. The Zope programme is based on the Python language, which makes it compatible with most operating systems in use today. The toolkit is open-source and can be obtained from the EEA free of charge. Zope may be obtained from [www.zope.org](http://www.zope.org) free of charge.

## **2.5 Global Biodiversity Information Facility (GBIF) toolkit**

The GBIF Portal toolkit ([www.gbif.org/serv/gbif-tools](http://www.gbif.org/serv/gbif-tools)) was developed using the EC CHM toolkit as a guide. It has been customised in several ways to support the mandate for data sharing and interoperability ([gbif.org/GBIF\\_org/what\\_is\\_gbif](http://gbif.org/GBIF_org/what_is_gbif)) of the GBIF. Its generic functions are basically the same as those of the EC CHM toolkit and include the following:

- Ability to compile news/syndicated news via Rich Site Summary (RSS) from collaborating sites.
- An events calendar
- A hierarchical directory of articles, documents, links, images, audio and video components.

- Submissions of the above content by any authorised user, and workflow for approval by the webmaster.
- A complete search function.
- Ability to download features for web tools.
- General information about GBIF
- Ability to receive and incorporate suggestions and feedback from users.

In addition, the GBIF Portal toolkit includes data management components which support data sharing within the GBIF network. These functions comprise as follows:

- Repository for taxonomic and curatorial shared datasets (typically specimen and observation data). These datasets may be in any format, including spreadsheet, database file or XML (the latter recommended for querying).
- Advertising datasets from the repository towards the UDDI-based central metadata registry of GBIF (<http://registry.gbif.net/uddi/web>). This is done using the SOAP protocol, and querying/indexing data with the DiGIR protocol. Shared datasets are described in the Dublin Core Metadata Initiative (<http://dublincore.org>).
- Querying and downloading of datasets from the repository through an HTML user-interface or via the DiGIR protocol.

The GBIF Portal toolkit is available in English only, although Spanish users may find some general guidance on the website of the Spain node of GBIF ([www.gbif.es/](http://www.gbif.es/)). It has also been developed in Zope, and works under both Linux and Windows. The Portal toolkit and the data repository component can be installed independently from each other. They power the GBIF website and are presently available for downloading from that website.

The GBIF Portal toolkit installation at the GBIF Secretariat has been integrated with CIRCA group collaboration tool ([circa.gbif.net/Public/irc/gbif/Home/main](http://circa.gbif.net/Public/irc/gbif/Home/main)), which allows users to exchange information and expertise. CIRCA provides an LDAP based directory of users and organisations, and their respective roles. It also gives access to a number of mailing lists, newsgroups, and private document-sharing areas for the GBIF committees. CIRCA is a product of the EC and is available for free, but currently only for European public administrations.

At present, Argentina, Colombia, Costa Rica, Mexico and Peru have designated GBIF national nodes across the LAC region. These nodes comprise a number of institutions (museums, herbaria, universities, etc.), which have become data providers and so they are, or will be using the tools developed under the GBIF umbrella (the DiGIR provider, the Data Repository Tool and the Portal Toolkit).

## 2.6 Belgian CHM Partnering role

One of the concrete recommendations of the [International Expert Meeting in Bonn](#) on “Building the Clearing-House” concerned the “Parenting” or “Partnering Role” which aims at facilitating the web presence of CHM NFPs which have not yet been able to develop websites, by those who already have the facilities and expertise.

The partnering role is a mechanism by which one Party “parents” for a limited time only some general information for non-web connected CHM-NFPs, either as text and/or images. This parenting should normally occur until the parented country has got its own access to the Internet. The kind and amount of information and its presentation will be a matter of discussion between partners. Often, this involves the development of “mirror sites” in selected institutions, that hold duplicate information, the maintenance of which will latter be the full responsibility of the parented organisation.

The Belgian NFP ([bch-cbd.naturalsciences.be/belgium/cooperation/partnership](http://bch-cbd.naturalsciences.be/belgium/cooperation/partnership)) has hosted since 1998 the CHM of the Democratic Republic of Congo. Based on this experience, other countries followed and the Belgian NFP is now hosting the [Clearing-Houses of 12 African countries](#). “Mirror-sites” have been put on the server of the [System-wide Genetic Resources Programme](#) (SGRP) of the [CGIAR](#).

In 1999, Chad asked whether the Belgian CHM could train a person to become NFP for their its CHM. As other countries were interested in training, Belgium broadened its partnership role to organise webmaster training courses for national CHMs. Nowadays, a four to five-weeks training course is organised twice a year for webmasters of national CHMs. The ultimate goal of the partnership is that the CHM will be maintained by the receiving country’s own structures. During the course, the participants learn how to build an internet-based CHM, to present the most relevant biodiversity related information, and other ways to promote technical and scientific co-operation within their countries.

The Belgian NFP for the Cartagena Protocol on biosafety is also proposing a training programme for webmasters for the Biosafety CHM of partner countries, in collaboration with the Belgian CHM.

## 3. Comparison of toolkits

### 3.1 Overall appearance

The toolkits considered in this Annex offer interested users (Parties to the CBD, other governments, scientific institutions, and a wide range of other stakeholders) conceptual and technological solutions to advance in the installation of CHMs, as the key component of national strategies for effective biodiversity information management. These toolkits have their own focus and characteristics, which can be described as follows:

- a) The *CHM toolkit* can be regarded as the umbrella initiative under which the other toolkits and programmes have flourished. It provides a general introduction to a wide range of subjects that NFPs should be aware of when planning for a CHM, and introduces the other tools and support mechanisms that are considered in this

document. It has been structured in a way that is simple to manage, allowing users to understand the reasons to promote the transfer of technology, and the exchange of biodiversity information in an orderly manner. The six consecutive modules and the introduction are easy to read, and provide the essential background information on each topic. A seventh module – although not considered as such, is the one giving access to documents, graphics and the controlled vocabulary of the CBD.

- b) The *BCH toolkit* is one of the two thematic toolkits reviewed here (the other is the GBIF toolkit), and is focused on the provision of guidelines on both how to use the BCH website, and how to contribute data and tools necessary for linking databases. This toolkit is very interactive and provides extensive written and graphic support to users. Its value is greater because it has been developed in several languages, including Arabic and Chinese.
- c) The *Netherlands CHM National Focal Point toolkit* should be seen as a regionally focused initiative that is concerned with the development of easy-to-maintain CHM websites by Parties to the CBD and other governments. The toolkit may be applied widely – it is not restricted to specific countries or regions, and its value resides in that it promotes the establishment of CHMs whose appearance and functionality closely resemble the model officially proposed by the CBD Secretariat.
- d) The *EC CHM Portal toolkit* is another regionally-oriented initiative, but restricted to countries within the Pan-European region. It has been thought to provide support principally for the development and management of websites, but also includes a number of supporting elements, such as an events calendar, news tools, and other services. Its location is not that simple to identify.
- e) The *GBIF Portal toolkit* is another thematic toolkit, and is very similar to the EC CHM toolkit upon which it is based. It is a taxonomic-oriented instrument, and so it promotes mechanisms and procedures leading to the dissemination and exchange of curatorial and observational data and information held by museums, herbaria and universities. Many of these tools have been developed by GBIF's constituency (e.g. the DiGIR software package); others are external (e.g. the ABCD Schema, developed by CODATA and TDWG).
- f) The *Belgian CHM Partnering Role* is a capacity-building programme that is again concerned with the development of fairly basic web facilities for those in the initial stages of CHM development over the Internet. This is associated with the provision of training courses. Although not specifically indicated, the programme has a clear regional focus on the Sub-Saharan African region. One relevant characteristic is that in some cases it involves the implementation of “mirror” sites that are hosted by European institutions. This is temporary, until the recipient country develops the minimum capacity and infrastructure necessary to migrate the mechanism to its final location.



### 3.2 Key components

A consolidated analysis of the five toolkits and the Partnering Role programme permits the identification of the structural and functional aspects that may be regarded as fundamental for IABIN to establish its strategy concerning with the use and promotion of the available toolkits, or the development of a network's instrument. These aspects are as follows:

- a) *Provision of concise background information*: as the umbrella initiative, the CHM toolkit provides the essential concepts and terms that NFPs should be aware of when planning for clearing-house mechanisms. The two thematic instruments (the BCH and GBIF toolkits) are focused on specific CBD programmes (e.g. Biosafety) or issues cutting-across them (such as the GTI). The GBIF toolkit, for example, promotes and disseminates procedures and protocols ensuring the active capture and storage of taxonomic and biogeographic specimen-related information. The remaining two toolkits, and the Belgian CHM Partnering Role programme give much less details about conceptual matters, and so they should be considered as training and capacity building initiatives, which also include the provision of ICT.
- b) *Cross-reference and links between toolkits and programmes*: instruments described here are linked to each other, and therefore they provide detailed cross-references. For instance, Bookmarks 2 to 5 of Module 3 of the CHM toolkit describe other toolkits, and the first Bookmark of Module 4 mentions the Belgian CHM Partnering Role programme. The EC CHM toolkit is the basis upon which the GBIF toolkit was developed, and so this shows the benefits, which result from replicating experiences that have proven to be effective for other initiatives and organisations.
- c) *Identification of basic needs*: an important characteristic of the initiatives described here is that they all indicate the necessary conditions that Parties should fulfil in order to implement CHMs or other instruments for scientific and technical cooperation and information exchange. The CBD CHM toolkit is the one which provides the most general description about the policy and institutional factors that should be first put in place at the national scale. The training initiatives, on the other hand, are mainly focused on assisting Parties to identify key actors and resources, and their distribution and availability throughout countries. Only then would it be possible to continue with the process of assessing needs and capacities, and the definitive installation of CHMs and related tools.
- d) *Consolidated metadata and controlled vocabularies*: the concepts of metadata and controlled vocabularies are closely related to each other. CHMs should use “data on data” (metadata) to describe information registered on its site. In this manner, they enhance the capacity of users to search, locate and retrieve posted information that is available to the public. Controlled vocabularies are developed with the intent to provide users with a list of terms to be used as descriptors, for web pages on the



CBD's and related web sites. These lists can also be used by NFPs to describe the contents of their respective CHM web sites. For instance, the use of the Convention Controlled Vocabulary ([biodiv.org/doc/cbd-voc.aspx](http://biodiv.org/doc/cbd-voc.aspx)) will assist in the searching, locating and retrieval of information by linking similar documents and resources with a unique term. Secondly, it will standardise the description of web sites, and so assist in efforts to make information interoperable. Lastly, because terms are taken from official Convention documents, the terms can be translated more easily.

- e) *Rosters of experts*: reviewed instruments are an excellent source of knowledge and expertise relating to biodiversity information management. The BCH web site, for example, is the most complete gateway, not only to datasets on biosafety issues, but also to a roster of experts into which the international community could tap. The Netherlands and EC toolkits, and the Belgian CHM partnering role also consider the access to expertise and resources extensively.

No major structural or functional gaps were identified. Nevertheless, some aspects that should be the subject of further revision by the implementing agencies are the following:

- a) *Indication of funding opportunities*: Bookmarks 2 & 3 of Module 4 is the only one considering the very relevant aspect of funding opportunities available to Parties for planning and implementing CHMs. References about this point in the other toolkits are far less obvious. In particular, contracting the advisory services of the partnership between the Netherlands CHM and AIDenvironment involves a cost, which oscillates between €1,000-9,000, depending on the version to be adopted. No clear indication is given on how this cost might be covered by the recipient country.
- b) *More complete details of specific instruments*: this is specifically relevant to those thematic instruments that consider a diversity of tools and procedures encouraging the exchange of information (notably, the BCH and GBIF toolkits). Sometimes, the guidelines that are necessary to fully understand the way in which such instruments operate are difficult to find, especially for inexperienced users. The EC NFP CHM toolkit remains somewhat hidden in the website of this regional initiative.
- c) *Better definition of software solutions*: often, recommended technical solutions are demanding in terms of facilities, hardware and capacity needed to use the proposed tools effectively. For example, the GBIF toolkit promotes the download of software packages provided and supported by the initiative, but without precise information on the conditions that interested users should fulfil to make the most effective use of them. It is clear that to enhance the long-term positive impact of these tools, opportunities for training should be made widely available.

### 3.3 Relative value as assisting mechanisms

At present, a relatively small proportion of LAC countries have operational CHMs (36.4%) and there is no concrete indication on how many of these have effectively used any of the tools and programmes considered in this document as assisting mechanisms.

The number of countries participating in GBIF across the Americas is also reduced (five), but in this case, the value of its specific toolkit may be less difficult to recognise, as it should be used to register data providers (until now, only 1 out of 67 is coming from the LAC region).

The analysis conducted here shows the principal lessons that might be learned or extracted by IABIN from each of the toolkits and programmes:

- a) The *CHM toolkit*: this instrument may be seen as an annotated list of basic ideas that relate to technical and scientific co-operation, and information exchange. Its greatest value is that it provides a concise description of fundamental concepts to understand what should be achieved to establish biodiversity-related clearing house mechanisms. It also identifies links with related initiatives, and thus users may find the essentials to proceed (either initiate or deepen) with the planning and implementation of CHMs. This toolkit does not give direct technical support of any kind, and its use is restricted to English speakers (there is not a Portuguese or a Spanish version).
- b) The *BCH toolkit*: this toolkit provides a set of tutorial modules created to help users to understand the BCH website. Guidance is practical, and it is focused on how to find and register information, and how to connect and organise data. It is a highly specialised instrument – i.e. is comparable with the GBIF toolkit, and therefore its use might be limited to people with a relatively high level of knowledge on, and comprehension of the issues and themes of biosafety and/or bioinformatics.
- c) The *Netherlands CHM National Focal Point toolkit*: this is basically a training-on-request package with a strong component on technology transfer. The toolkit *per se* is available only to Parties contracting the services of the Netherlands CHM and AIDEnvironment. Nevertheless, it is important to highlight the concept behind this programme, which is the generalised development of CHM websites not requiring long learning curves or expensive software (all software is in the public domain and provided as open source). Another interesting aspect of the programme is that it promotes the same website architecture in use by the CBD, in order to emphasise the complementarity of the international CHM network. On the negative side, the cost might be a limiting factor for countries interested in receiving the training. No clear indication is provided on how this cost may be borne.

- d) The *EC CHM Portal toolkit*: the main problem with this instrument is that it is still in the pilot phase and its demo is difficult to find (i.e. the server on which it is based is normally down). It also promotes the use of software in the public domain.
- e) The *GBIF Portal toolkit*: this is a package of tools and mechanisms for promoting the registration of standardised databases held at museums, herbaria, universities and other scientific institutions, and the distribution of biodiversity curatorial and observational data through the Internet. As with the BCH toolkit, users of the GBIF toolkit should have a reasonable level of expertise in using the sort of instruments that conform the package, although some training is provided by the initiative. The toolkit should be used by data providers that are normally distributed across the countries that participate in GBIF, and include individual agencies and institutions, and thematic networks (e.g. Species 2000).
- f) The *Belgian CHM Partnering Role Programme*: this initiative is similar to the Netherlands CHM National Focal Point toolkit. It also provides training-on-request and includes a strong component on transfer of technology. Two major differences appear: one, it seems to be more proactive in terms of its collaborative approach to countries requiring assistance (i.e. the cost is not specifically mentioned); second, the geographic focus looks restricted to the Sub-Saharan African region. Besides, it does not follow the architecture proposed by the CBD.

### 3.4 Recommendations to IABIN

An overall recommendation which result from the present analysis is that IABIN should promote the use of existing toolkits across the LAC region instead of developing its own toolkit (option a, described in the Introduction). There is space also for options b and c, which are that IABIN works to share experience on the use of these instruments where available across the region, and collaborates with the developers of these toolkits to include a component on this network.

More specific recommendations to IABIN include the following:

- a) A multi-national survey on the level of use of described toolkits and programmes should be achieved across the region. Identified cases where these instruments have successfully facilitated the development of CHMs should be identified and properly described.
- b) Special reference to IABIN should be incorporated into the introductory modules of available toolkits (e.g. Module 2 of CHM toolkit), and links to the network's website should be established in the web pages of all of the other initiatives.
- c) An IABIN component within existing toolkits can be focused on the TNs defined to show its functionality as an information sharing initiative. An example of

datasets that may be used to demonstrate the validity of IABIN, might be the combination of GIS data on invasions by exotic or problem species, and the impacts they cause to native biodiversity. These can be associated with some kind of decision-support system leading, for example, to their definitive eradication.

- d) Mention should be made of the existence and availability of common formats, controlled vocabularies and metadata, specially in areas where complementarity and harmonisation is more feasible (e.g. the identification of data repositories of common value to IABIN and GBIF).
- e) Consolidated contacts should be established with the Netherlands NFP and AIDEnvironment, the Belgian CHM and the EC CHM with the view to identifying opportunities to incorporate the IABIN “concept” into the two toolkits and the Partnering programme. Attention must be paid to finding opportunities to finance activities of training-on-request across the LAC region.
- f) The previous point is key to countries across the region, and thus IABIN should make an effort to ensure that training and capacity-building opportunities are well described, and that the target audience can obtain the information in a timely manner.