Support to Building the Inter-American Biodiversity Information Network

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Biodiversity Information for Decision Making – International Experiences

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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 proposed project Building IABIN (Inter-American Biodiversity Information Network), and for assistance in supervision of the project, once it is approved. 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, in association with the UNEP World Conservation Monitoring Centre. The Principal author is Ian K Crain, for UNEP-WCMC.

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Report Summary

The development of, and widening access to, the Internet over the last decade provides a major opportunity to advance in the sharing and dissemination of biodiversity information, and a very large number of programmes and networks are now available. The purpose of this paper is to examine the needs and evolving use of biodiversity information for decision making and how that experience can assist and inform the development of IABIN.

As a framework for discussion, a generic decision making process is outlined with a series of logical steps from "issue awareness" through to "policy implementation", with a feedback loop to monitor effectiveness. IABIN is placed in a key role in support of the information flow and harmonisation required for good national and regional decision making, and in particular, in providing information for indicators needed to monitor effectiveness from a regional perspective.

Recent years have seen a burgeoning of Internet-accessible biodiversity information sources and networks of varying degrees of specialisation, supported by governments, intergovernmental organisations, Convention Secretariats, and NGOs. Many of these contend to be "complete", "definitive" or "authoritative" and are aimed at supporting national and regional decision makers. A recent study of international information-sharing networks that provide support to European decision-makers identified some 289 information sources and networks in 10 major categories:

Convention and Treaty Information Sources
Information on Protected Sites
Development projects and donor information
Clearing-House Mechanisms & Integrated Exchange Networks
Environmental Law Information
Global and Regional Long Term Ecological Monitoring
Taxonomic Reference Information
Species Status Information
Policy and Strategy Information
European Nature Conservation Information

These sources and networks are reviewed and the respective issues and concerns with each category are identified with particular reference to the role IABIN could

play in the region so as to integrate rather than duplicate, and avoid known pitfalls.

World-wide lessons learned are collated from both national and regional experiences.

Relatively few studies have been conducted of how international information sources are used in decision making. One such study for the UK is summarised as an example that is probably typical of European countries. Japanese experiences (detailed in Appendix 4) are strikingly different and provide an example of a country with more centralised processes.

Regional experiences are reviewed for Europe, including a review of the development of the EC Clearing House (Appendix 2), and for the South East Asia (Appendix 1). The regional experiences show considerable contrast, with Europe using complex formal structures, conventions and legal instruments, whereas South East Asia has found that a looser more stakeholder driven approach more successful. The European approach is particularly strong on the implementation of methods to harmonise biodiversity data through "Topic Centres", streamlined reporting mechanisms, and integrated networks such as EIONET, EUNIS and ReportNET.

Private sector experiences derived from the extractive industries show that biodiversity information is used by for:

- Strategic and operational planning (e.g. planning an exploration or exploitation programme);
- Choosing an industrial site (e.g. for a factory, or port);
- Environmental impact assessment (e.g. of major projects – dams, roads, industrial plants).

The types of information required most frequently include:

Environmental law
International conventions and treaties applicable in the region of interest and the way in which they affect the industry.

National laws controlling nature conservation and biodiversity
National requirements for Environmental Impact Assessment (EIA).

Protected and restricted land use
Internationally and nationally designated protected areas – their level of protection and limitation, and exact location (boundaries).

Protected species
Status and distribution of protected species – including key habitat requirements, threats and migratory patterns.

Ecosystems
Location of critical and important habitats (even if not officially protected or designated, such as mangroves, coral reefs, cloud forests, etc)

The study concludes that

- A vast number of international networks and information sources are now available to assist decision-making related to biodiversity conservation. Many of these are accessible through the Internet, and this type of access is growing in developed as well as developing countries. In spite of this progress in technical availability, many of the concerns identified 25 years ago still apply, particularly with regard to "appropriateness" for decision makers.
- Many networks overstate their scope, functionality and utility and this is an impediment for decision-makers in identifying appropriate sources.
- There are overlaps and duplications in the information content and scope of networks, but these are gradually being overcome through harmonisation initiatives, cooperative agreements and the evolution of *de facto* standards.
- Private sector decision makers often make use of third parties to assemble information from existing sources, indicating that current networks require specialized expertise, and do not have adequate tools for direct decision maker access.
- Public sector decision makers often focus narrowly on sources directly connected to their mandate, such as Convention Secretariat sites and may not be aware and cannot easily find additional information.
- The most effective networks for decision making are those that are well supported by harmonisation programmes and tools – such as standardised ecosystem (spatial) frameworks, species synonym files, controlled vocabularies, efforts at specifying common core datasets, and the like.
- The most effective networks have a clear purpose and defined scope in support classes of decisions and decision makers (rather than just to "exchange information"), and provide means of access and presentation suitable for national or regional level – such as by country.

- Few networks outside of Europe currently have performance measurement systems or have completed reviews of how the system is used.
- There is a lack of information available that is suitable for identifying long term trends or can be used for indicators, and there is a need to make better connections between national reporting and indicator development.

A series of recommendations follow from the experiences, some general and overarching and others deriving from respectively, regional, national and private sector experiences.

Overarching:

- IABIN should clearly define its scope and intended audience. Particularly it should identify the types of decisions and activities it intends to support and clearly define the **purpose** of information exchange.
- IABIN should work with its members to develop meaningful biodiversity indicators and provide means to more closely connect indicators and monitoring to reporting to Conventions.
- IABIN should adopt (or adapt) *de facto* technical standards for access and data exchange already in use by major international networks, and in this regard especially seek to be compatible with UNEP-WCMC, Millennium Ecosystem Assessment, BirdLife International, the WDPA, and GBIF.

Deriving from Regional Experiences:

- The model for IABIN should be for a relatively closely controlled network directed at primary identified information needs for national decision makers, similar to the Europe.
- IABIN should support the network with non-technical harmonisation initiatives and tools.
- IABIN should designate some national institutions as “Topic Centres” along the lines of the European model that would develop and support IABIN harmonisation tools in selected fields;
- IABIN should take cognisance of, and build on, the strengths of existing networks in the region, especially, REMIB, INBio, NatureServe and CRIA.

- In order to build an effective and trusting relationship amongst partners in IABIN the issue of data sharing should be approached with circumspection, and follow, for example, the IUCN-sponsored 'Global Biodiversity Commons' process.
- To be perceived as useful by its stakeholders, there is a strong need for stakeholder participation supported by detailed, trusted information based on objective analysis, preferably from a global perspective formulated in a way that is relevant to American issues.
- IABIN should avoid being excessively formal and bureaucratic in its interactions.
- Networks should grow rather than be created by projects. It is more important for informed, inclusive dialogue to lead to a shared perception of genuine needs, which can then be met by the judicious application of technology, than for skills and technologies to be offered at the front end.
- It is recommended that IABIN uses common themes such as measuring progress towards the 2010 Target as a milestone for bringing together the IABIN countries and thus building the Inter-American knowledge network of the participating countries.
- It is recommended that IABIN maintains a clearly defined role regarding the CBD CHM and its national focal points in the Americas. This could include developing supporting mechanisms that help participating states with implementation of national CHMs.
- It is recommended that IABIN pays particular attention to clear lines of communication between those involved with the technical and content aspects, respectively, amongst and between the regional and the national level.
- IABIN should put a strong focus on the development of a well balanced metadatabase and user needs for links to external biodiversity information sources. It should aim to provide at least the core services such as a catalogue or metadatabase in the most relevant languages of the American region (Spanish, English, Portuguese).

Deriving from National Experiences:

- IABIN should review how to support specific national needs for implementation of Conventions, including assistance with information management regimes to develop indicators that are relevant both nationally and regionally.

- IABIN should assist countries to achieve increased harmonisation to enable useful interpretation in a policy context. This means not only developing tools for harmonisation of the information *per se*, but also for methods and means of information management and analysis.
- A central national repository for biodiversity related information, especially in GIS format has been found to be effective (e.g. in Japan), especially in supporting national and regional EIA. IABIN should encourage and support such centres and assist with data management tools and harmonisation standards.
- Various countries have found effective alternative ways to coordinate biodiversity information – for example Japan uses a very formal approach with an high-level Inter-ministerial Council, while the UK has no such body, and finds a more loosely arranged government/NGO coordination to be effective. IABIN should be prepared to interact with a wide range of national structures.
- IABIN should be a focal point for facilitating the provision of information to the public.
- IABIN should help articulate national policy driving forces and determine in what ways the network can address them specifically through improved regional information exchange, rather than through general measures.

Deriving from Private Sector Experiences:

- The development of IABIN as a network specifically focussing on the Americas will, it is hoped, provide a more extensive and comprehensive regional information relevant to the extractive industries.
- The information requirements for the extractive industries are quite similar and include protected areas, international treaties and conventions, national environmental laws and regulations, and the location and typification of ecologically sensitive areas.
- IABIN should facilitate the availability of ecosystem and protected area information in GIS format suitable for downloading to overlay with industry sector information.
- IABIN should endeavour to be a coordinating resource for access to national environmental law and regulation.

- The catalogue or metadata function of IABIN is of importance to industry in order to locate data sets useful for environmental impact assessment and for case studies of habitat rehabilitation.
- Regarding all of the above information services, IABIN should concentrate on providing information not covered by global systems (e.g. national legislation and protected areas), and with continuously up-dated on-line availability rather than static resource packages on CD-ROM.

CHAPTER 1 INTRODUCTION

1.1 Background

It was recognised many years ago that scientific understanding of the Globe's environment including its biological diversity was essential to any efforts to achieve sustainable development and resource utilisation that protected future generations. The need for scientific cooperation and information sharing is therefore not new and predates the Convention on Biological Diversity (CBD) by decades. This concern was foremost at the Stockholm Conference of 1971 that led to the formation of the United Nations Environment Programme (UNEP) in 1972 and soon after, its environmental information arm, the Global Environmental Monitoring System (GEMS), providing the first major global overviews of data and trends.

The UN Forum on Environmental Information in Montreal in 1991 confirmed that in spite of GEMS and the GIS-based UNEP-GRID Project, environmental information was:

- Fragmented;
- Difficult to access;
- Of uncertain quality;
- Inconsistent;
- Lacking a scientific base in methods and models;
- Not suitable for decision making.

The Rio Summit's Agenda 21 in 1992 set the direction for the next decade with its Chapter 40 specific to Information for Decision Makers, which noted:

"The gap in the availability, quality, coherence, standardisation and accessibility of data between the developed world and the developing world has been increasing, seriously impairing the capacities of countries to make informed decisions concerning environmental and development." and

"There is a lack of capacity, particularly in developing countries, and in many areas at the international level, for the collection and assessment of data, for their transformation into useful information and for their dissemination."

These observations and concerns found themselves represented in Articles 16 through 18 of the CBD. "Closing the Data Gap" was the leading theme of information exchange and scientific cooperation efforts of the 1990s, that is, developing means to translate scientific results and observations into forms

suitable for national and regional decision-making, such as by assembling harmonized and summarised global databases, and assessments that include trend analysis, Geographic Information Systems and "visualisation" capacity. This has been done in parallel with efforts to increase the capacity of developing countries to employ technology in the management of biodiversity information. These efforts have been successful to varying degrees, and arguably considerable progress has been made.

The development of, and widening access to, the Internet over the last decade provides a major opportunity to advance in the sharing and dissemination of biodiversity information and a very large number of programmes and networks are now available. The purpose of this paper is to examine the needs and evolving use of biodiversity information for decision making and how that experience can assist and inform the development of IABIN. It is understood that the Bank is well informed on the experiences and practices within the Americas following the recent sub-regional studies of the GEF PDF Preparatory Block B Grant in 2003. This report therefore concentrates on experiences outside the region.

Following this Introduction, Chapter 2 outlines the nature of the decision making process and general global experiences in the context of IABIN (as sketched in Document 1 *IABIN in the Context of Key Programmes and Initiatives in Biodiversity Information Sharing*). Chapter 3 describes the current state globally of the networks and data sources that support biodiversity decision making. Chapter 4 describes experiences at national, regional and global levels in using these networks and information sources. Chapter 5 briefly discusses existing networks in the IABIN region, and Chapter 6 provides the conclusions and recommendations for IABIN that can be drawn from these experiences. The main document is augmented by four Appended Case Study Reports:

Appendix 1: *Case Study: Experience in developing the ASEAN Regional Centre for Biodiversity Conservation;*

Appendix 2: *Case Study: Experience in developing the regional EC Clearing House Mechanism;*

Appendix 3: *Case Study: Experiences in the use of Internet-accessible information in the oil and gas industry;*

Appendix 4: *Case Studies: Use of biodiversity information in the decision making process in Japan.*

The principal conclusions and lessons-learned are integrated into the main document, but the Case Study Appendices can be consulted for more detail with regard to, respectively, a regional information centre, a regional clearing house mechanism, information sharing in a industrial sector, and national experiences in Asia.

1.2 Biodiversity Decision Making - Purposes and Types

It is recognised that to effectively address many environmental concerns it is necessary to take a global view - e.g. such issues as climate change, air pollution, oceanic resources, biodiversity, de-forestation. While ultimately only sovereign nations have the power to make decisions and take actions regarding conservation of biodiversity, the decision making process is complex and involves intergovernmental agencies, the United Nations system, NGOs and civil society. Global issues are addressed though evolving "global environmental policies" reflected in international treaties and in improved environmental consciousness of the large international development agencies.

The principal players in establishing global environmental policy are:

The UN System, particularly the UN Environment Programme (UNEP), the Food and Agriculture Organisation (FAO), World Health Organisation (WHO), World Meteorological Organisation (WMO), and the UN Educational, Social and Cultural Organisation (UNESCO).

Scientific and International NGO's, e.g. IUCN, WWF, IOC, Earthwatch, WRI, Wetlands International, BirdLife International, Conservation International.

Development Banks e.g. World Bank, Asian Development Bank, Inter-American Development Bank.

International Alliances and Blocks - OECD, EU, NATO, ASEAN, OAS.

These entities interact in a complex way with national governments. Issues are often identified by international NGOs and global "think tanks", and pressures to address the issues come from public organisations, including national NGOs, political parties, unions and the like. National governments respond to these pressures through legislation and regulation, and actions.

The biodiversity decision-making process within a country is driven by a number of factors, including:

- Regional conventions and treaties;
- Global conventions and treaties;
- National economic and political priorities;
- National social pressures (public opinion as expressed through NGOs, advocacy groups, lobbies, etc);
- International social pressure (e.g. advocacy of the UN, other international agencies and international NGOs).

While there is no standard national decision making process, the process elements include *issue awareness*, *issue assessment* (including scientific assessment, and public consultation), *policy option development*, *consideration of consequences of options*, *decision and policy implementation* (legislation, regulation, programmes of work) and *monitoring of effectiveness*. The process would normally be a continuous loop with these elements operating in the above order - but the starting point and the initiative may begin from a number of sources - such as from a national NGO or lobby, involvement in international fora (such as the UN), the proposed accession to a treaty, an regional policy proposal made from a member country, and so on.

However the "issue awareness" may originate, the Government will normally designate a lead department or agency. The lead department will seek the partnership of relevant related departments, seek scientific assessment and policy feasibility advice from the other agencies and engage in public consultation e.g. through national NGOs. This results in policy proposals for consideration of the government, and briefing for representatives to treaty governing bodies.

Throughout the policy development process, international information sources and networks may be employed to inform the process on obligations, science, issues, and measures taken by other countries. Information is required at various points in the policy making process as noted above, and can be categorised into five broad **purposes** based on the intended use of the information. These are as follows:

1. Informing the national position on international policy issues

The information is used to develop the national position regarding emerging international policy proposals - such as a new Multilateral Environmental Agreement (MEA) or extensions and modifications to existing measures. The information is typically used as briefing support for national representatives on drafting committees and official international bodies.

2. Implementation of international obligations in response to MEAs

Once the country has become a party to a multi-lateral agreement, actions must be taken to meet the specified and implied obligations, including the enactment of legislation, regulatory measures, and action plans.

3. Meeting international reporting requirements

Most MEAs require regular national reports on progress towards implementation of the treaty. Compilation of these can be burdensome and there are clear overlaps in the demands of the different instruments, and implications for the establishment of monitoring programmes.

4. Implementing enforcement measures

This may involve determining how to establish national targets, and means of enforcement, including incentive measures and non-regulatory approaches.

5. Assessing emerging issues, status comparison

This often requires comparative information as national priorities and policies must be developed in a context that considers the regional and global picture. Thus it is necessary to seek information on species status and populations, protected areas and site designation specifics or neighbouring countries, and global and regional issues and that may have impact on the country.

It is clear that IABIN is aimed at facilitating information flow in support of all five of these purposes, particularly to providing regional value-added to trans-border and multi-national issues.

1.3 Decision Making and the Internet

The Internet provides the facility to transmit digital files between computers using existing telecommunication networks. The power and usefulness of the Internet arises from innovative ways to use that facility to exchange a huge range of file types (text, graphics, images, sound, video) between any two computers. This is enabled by a series of standards and protocols (such as ftp, http, html, TCP/IP) and software packages ("browsers" and "search engines") that can assist in locating and obtaining information. This has resulted in a significant advance in the availability and access to information, including biodiversity data. Information can now be easily "published" (made available) electronically, including quantitative and qualitative databases. Internet publishing is therefore ideally suited to biodiversity information as it often contains numeric, textual and graphic elements, and because the audience for the information is very wide and not easy to identify specifically with a distribution list.

Availability of the essential telecommunications technology and IT infrastructure is expanding rapidly throughout developing countries. Once biodiversity information is published on the Internet, it becomes instantly and equally available to all countries, institutions, and individuals. It is not surprising therefore that the technology is being embraced and endorsed as a prime means of "bridging the gap".

With all these positives, the Internet is not without some counterbalancing negatives. Making information available via the Internet is not cost-free. Placing a significant assessment report on the Internet may have costs comparable to

conventional publishing (less printing), and the development and maintenance of a biodiversity database with query access is a significant investment and one that requires (at the publisher's end) relatively high skill levels. An important role for IABIN will be to facilitate the use of Internet and associated technology to make the biodiversity information flow as easy to achieve as possible, and ensure that the tools are appropriate to decision-making as well as research.

CHAPTER 2 INFORMATION NEEDS OF DECISION MAKERS

2.1 The Decision Making Process

Section 1.2 outlined a generic national decision making process with 6 main elements: *issue awareness*, *issue assessment*, *policy option development*, *consideration of consequences of options*, *decision and policy implementation* and *monitoring of effectiveness*. Each element requires supporting information and hence an information system (or "decision support system"). Thus a conceptual national decision-making system could be drawn diagrammatically as follows.

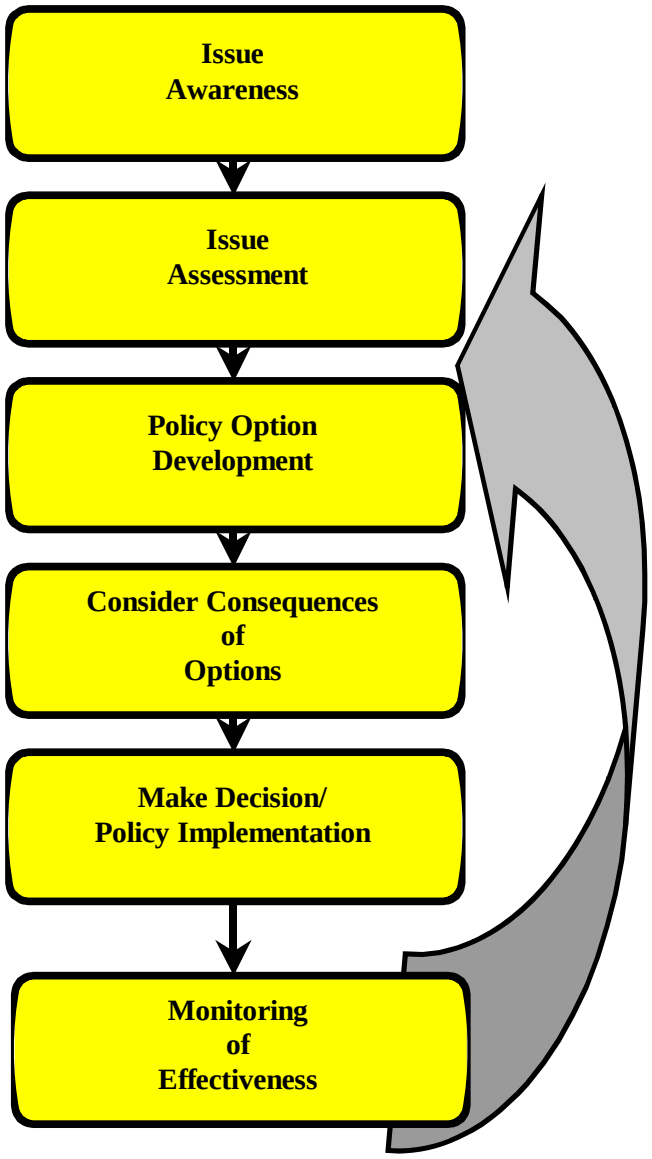

Figure 1: National Decision Making Process

2.2 Categories of Decision Makers

Figure 1 is referenced to a "national" decision making process, but essentially the same process is required for decision-making at all levels and in all sectors. Several extracts from key B-IABIN documents help to identify the range of decision makers intended in the IABIN context.

From the GEF Project Brief for B-IABIN:

"The project development objective is to:

(i) develop an Internet-based, decentralized network to provide access to scientifically credible biodiversity information currently existing in individual institutions and agencies in the Americas

(ii) provide the tools necessary to draw knowledge from that wealth of resources, which in turn will support sound decision-making concerning the conservation and sustainable use of biodiversity."

From the B-IABIN Project Implementation Plan (PIP)

"The objective of IABIN is to promote sustainable development and the conservation and sustainable use of biological diversity in the Americas through better management of biological information and better decision-making."

IABIN therefore seeks to support a broad spectrum of decision-makers from sub-national (sectoral or geographic) through to regional, to support effective policy decision-making from the local level (e.g. provincial) through to global policy assessment.

The major categories of decision-makers therefore are:

1. Operational

Protected area managers, water management officials, resource managers, private sector resource extraction managers (e.g. mine manager).

2. Sub-national

Provincial environmental and natural resource officials, provincial legislators.

3. National

National legislators, policy advisors and government officials involved in national planning and regulatory development, planners and strategists of large resource extraction companies, NGO policy developers and planners.

4. Regional and Global

National leaders, advisors and official representatives to international organisations and conventions, CEOs of multinational companies.

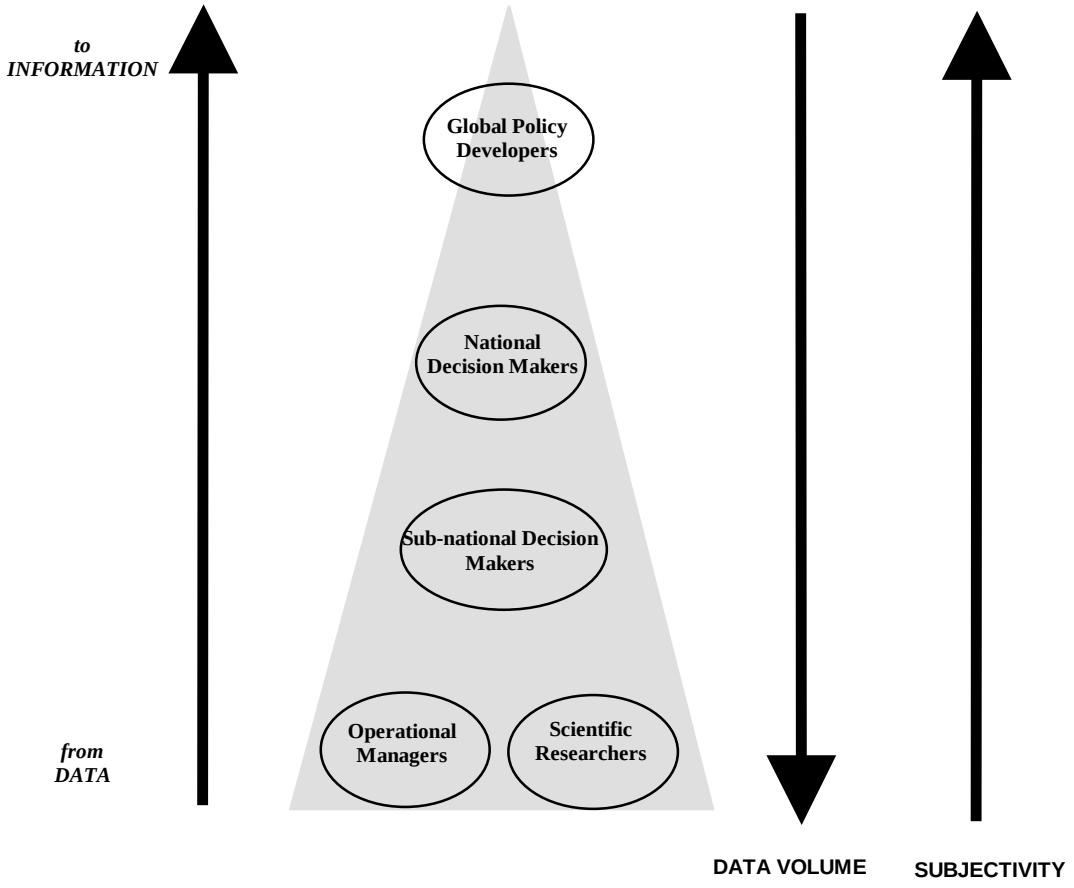

Figure 2: Transforming Scientific Data to Policy Information

The information management system that supports the decision making process seeks to provide information suitable for decision makers, that is integrated and summarised to a level appropriate to the jurisdictional scope of the decision maker. Taking the huge abundance of raw biological observational data and converting it into information suitable for decision makers (rather than for scientists and researchers) is the primary challenge to which IABIN must contribute, and can be expressed diagrammatically as in Figure 2 above.

It should be noted that, as data are generalised and summarised from the raw data, the total data volume decreases, but, due to the analysis and assessment process of

scientific researchers, analysts and policy developers, it becomes more "subjective", that is it has incorporated expert interpretation and opinion. As this process evolves, the nature of the information tends to change from large tabular databases to narrative assessments and consolidated indicators.

The databases that support the information management process are held by custodians in a wide range of national and sub-national institutions. It is the role of IABIN to support the **exchange** of information held in existing institutions (often at a relative low level of aggregation), and its **integration** into policy-ready information products and indicators.

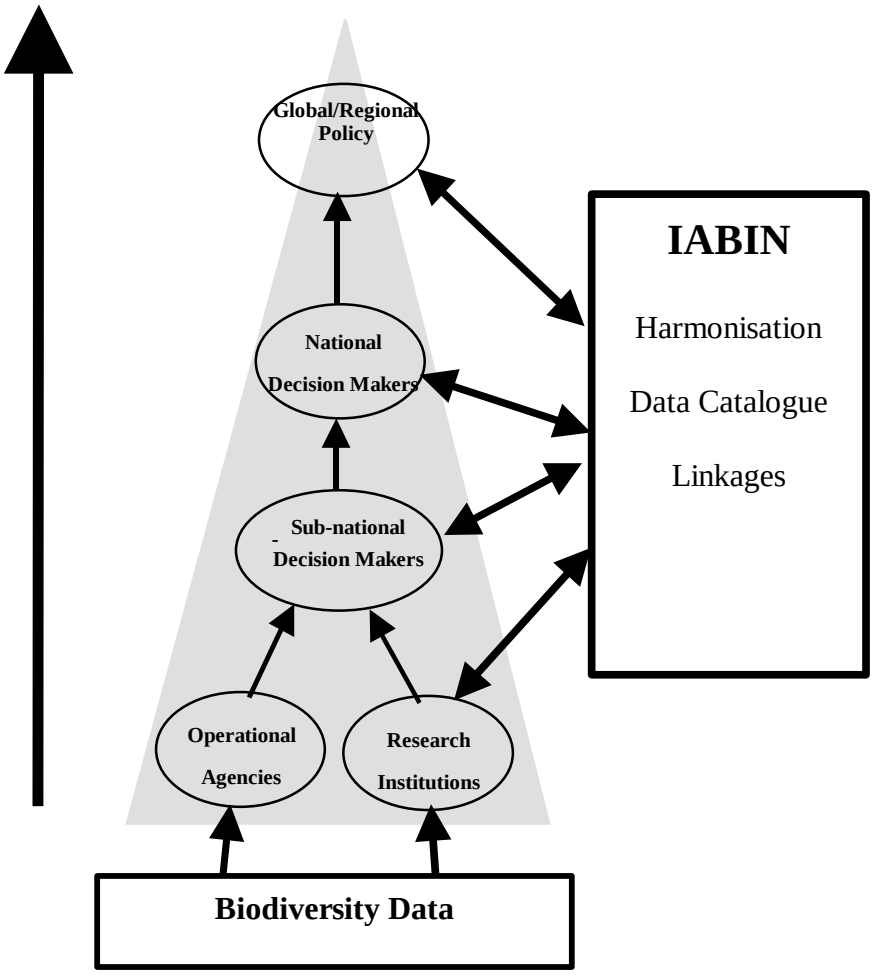

Figure 3: The role of IABIN in regional decision making

While all four levels of decision making are implied in the B-IABIN documents, it is certain that the initial focus will be on the top two levels –regional and global, and national decision makers. Information exchange and harmonisation between

operational managers and scientific researchers will serve to supply the information base to support the higher levels of decision making, and will logically operate through the proposed Thematic Networks, coordinated by IABIN.

2.3 Functional Needs

Much has been written over the last two decades that emphasises the need for biodiversity information to be "appropriate" for decision-making. On the other hand it is not clear what "appropriate" really means. There has been relatively little reported study of how major decisions with regard to biodiversity conservation are made – what datasets are actually used, what factors influence the decisions. A Dupont Corporation executive commenting on the reasons for the company's decision to phase out production of harmful CFCs summarised decision-maker information needs as follows (bold emphasis added by the author of this document):

- *good **consistent** data*
- *data that are well **understood***
- *sound mechanisms and **models** against which to test*
- *we also need to be sure... that we **can effect** some change*
- *there is a need for consistent communication not only of data but also of its **meaning** and **significance*** (Karrh, 1990).

These phrases are typical of those expressed by senior decision-makers. (See also Appendix 3 regarding the Oil and Gas Industry.) In summary decision-makers need to know:

- What is the problem – and what will be the consequences?
- Where is the problem?
- What are the facts – current state and trends (and what is the level of uncertainty)?
- What is the meaning (e.g. scientific interpretation)?

The principal implications are that biodiversity information needs to be:

- expressed in consistent time series (e.g. for indicators) that show trends and can be used to monitor the impact of decisions;
- expressed spatially – where is the problem and to what extent;
- related to social and economic impacts;

- harmonised and comparable across jurisdictions.

An essential function of IABIN will be to help reduce the **non-technical** barriers to information exchange by developing tools and practices to foster harmonisation and standardisation of information in order to enable useful integration and summarisation nationally and regionally.

CHAPTER 3 INFORMATION SOURCES AND NETWORKS

3.1 Overview

The essential base for good decision making at the national and regional levels as identified in the previous chapter is solid, reliable, consistent information. This Chapter reviews the current state of that information base, the networks that make it accessible, and the experiences, issues and problems with its use.

Recent years have seen a burgeoning of Internet-accessible biodiversity information sources and networks of varying degrees of specialisation, supported by governments, intergovernmental organisations, Convention Secretariats, and NGOs. Many of these contend to be "complete", "definitive" or "authoritative" and are aimed at supporting national and regional decision makers. A recent study of international information-sharing networks that provide support to European decision-makers (Rationalisation of International Nature Conservation Information Systems – RINCIS) identified some 289 information sources and networks in 10 major categories. (See also Document 1 - *IABIN in the Context of Key Programmes and Initiatives in Biodiversity Information Sharing*). The table below shows how these networks are distributed between the categories.

Category	No. of Networks
1 - Convention and Treaty Information Sources	21
2 - Information on Protected Sites	27
3 - Development projects and donor information	18
4 – Clearing-House Mechanisms & Integrated Exchange Networks	29
5 - Environmental Law Information	14
6 – Global and Regional Long Term Ecological Monitoring	24
7 - Taxonomic Reference Information	55
8 – Species Status Information	34
9 – Policy and Strategy Information	38
10 - European Nature Conservation Information	29

Most of these sources have been developed within the last five years and few if any standardised approaches have been established, and there are as yet few documented assessments or evaluations of use or utility. There is huge need for rationalisation of the large number of initiatives, and for a new development like IABIN to integrate rather than duplicate. In response to this need, a further 66

programmes or initiatives aimed at harmonising these networks also came to light during the RINCIS Study. These were mainly focussed in two categories – Conventions and Treaties, and Taxonomic Reference Sources.

The following sections summarise the key networks, programmes, issues and experiences in these categories.

3.2 CATEGORY 1 - Convention and Treaty Information Services

3.2.1 Introduction

This category covers information services provided by international treaty secretariats, and those intended to provide integrated information or harmonization across MEAs.

Key sources:

- Convention on Biological Diversity Secretariat Website;
- Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) Secretariat Website;
- Convention on the Conservation of Migratory Species of Wild Animals (CMS) Website;
- Ramsar Convention on Wetlands Website;
- UNEP-WCMC Harmonization of National Reporting Website;
- UNESCO World Heritage Centre.

3.2.2 Issues and Concerns

The rationale for improved harmonization is three-fold:

- To facilitate national implementation (including reporting) of the MEAs;
- To improve the overall effectiveness in meeting the objectives of the treaties, through synergies and co-ordinated actions;
- To explore the full value of data and information by improving access and compatibility.

While there are a number of different activities that could benefit from rationalisation and harmonization in the category, the most important are:

- Scientific developments: - harmonization and standardisation of definitions, terminology, classification systems, taxonomies;

- Procedures: - synchronisation and co-ordination of governing meetings, steps to encourage and make more feasible the consolidation of national focal points and memberships in subsidiary bodies,
- Information management: - improving access to national reports, case studies, lessons learned and other information filed by Parties, and providing seamless cross-treaty searching;
- Strategic measures: - rationalisation of scope, geographic coverage, and objectives to fill gaps and avoid overlaps;
- Reporting: - synchronising, streamlining, harmonizing and simplifying the reporting burden placed on parties.

By far the major emphasis has been on the last of these - that of harmonization and streamlining of reporting.

3.2.3 Emerging Standards and Practices of Relevance to IABIN

Efforts at harmonizing the conventions and streamlining the associated reporting obligations have progressed slowly and unsteadily over the last five years, in spite of many meetings and initiatives. Currently the process is losing momentum and is in need of increased focus, direction and sense of urgency, which might lead to the various convention governing bodies placing more priority on this issue.

Almost all of the major biodiversity-related conventions have reviewed their information management and reporting requirements in recent years with a view to streamlining national reporting and improving access and usability of information held. In spite of this, many simple practical measures (such as standardisation of country names or codes) have still not been implemented. The CBD Clearing House mechanism has implemented search engine that can search across a range of convention websites, and has in that context a “Controlled Vocabulary” under development to make such searches more effective and relevant. This is only at preliminary stages but might form a basis for a standardised vocabulary for IABIN. (See Document 8 - *International Initiatives in Biodiversity Vocabularies and Thesauri*)

Amongst the Conventions, Ramsar stands out as one of the best organised in regard to automation of reporting processes and providing access to site information. The databases of CITES provide a good model for the availability of statistical information (legal and illegal wildlife trade) and through Project Proteus of UNEP-WCMC are soon to be enhanced in terms of available trend analysis tools.

3.3 CATEGORY 2 – Information on Sites

3.3.1 Introduction

This category is concerned with information services that provide information on protected areas, and officially designated sites of various kinds (national and international), sites of particular conservation interest (even if not nationally designated), site based datasets (especially if long-term) and site conservation and management.

Key sources:

- Biosphere Reserve Integrated Monitoring Programme;
- BirdLife International - Important Bird Areas Database;
- Bern Convention Website;
- Natura 2000 Network;
- Ramsar Database;
- UNESCO Biosphere Reserve Directory;
- World Database of Protected Areas (WDPA).

3.3.2 Issues and Concerns

1. Harmonization

There are many global and international agreements and programmes of various sorts that either recognise or designate individual protected areas. Within Europe alone, there are ten of such agreements and programmes. There is one site in Europe that is covered by six different agreements and programmes. There is little real collaboration in reporting and information management, and each agreement and programme has different nomination and reporting requirements and timetables.

2. Potential duplication and competition

The number of players (and at times the degree of disorganisation and competition between them) poses real obstacles in compiling information on sites, developing associated information services, and in working towards some degree of harmonization. There is a need to ensure a clear definition of roles and responsibilities in order to reduce duplication of effort, reduced the burden on national agencies and provide cost-effective and cost-efficient solutions.

3. Access to information

There is no single source of (or portal to) information on all of the international programmes and agreements related to sites, making it difficult to understand all of the initiatives and the relationship between them. Similarly there is no easy access route to information on many of the site networks, and certainly no consistent access to site-based information.

4. Common framework for protected areas information

All over the world, protected areas have been established for very similar purposes, which means that again and again those involved in managing sites and systems have had to "reinvent" ways to share and manage information. A common framework, or a set of commonly agreed guidelines, may be appropriate not only to assist at the national level, but also to improve the ability for easier sharing of information internationally.

3.3.3 Emerging Standards and Practices of Relevance to IABIN

1. European Common Database of Designated Areas (CDDA)

During the early 1990s there were three separate programmes to compile information on protected areas in the European region. The European Environment Agency (and its precursor) were compiling information on European Union countries and a number of neighbouring countries, the Council of Europe was compiling information on the protected areas of the countries it represented, and WCMC was compiling information on behalf of IUCN and others.

In order to reduce duplication between the international organisations and secretariats and to reduce the burden placed on national agencies, the three organisations concerned agreed to work together on a Common Database on Designated Areas. This means that information for the relevant countries is compiled through collaboration, thereby avoiding separate requests to the countries or agencies concerned.

Currently data for nationally designated sites and sites covered by EC legislation are being compiled by ETC/NPB for the EEA, and data for internationally designated sites is being compiled by UNEP-WCMC. The information compiled on national sites is all being collected electronically over the Internet and UNEP-WCMC is reviewing digital boundary files it already has available with a view to developing future plans for joint compilation of boundary data. Additionally, a review is being made of how national agencies are currently managing their protected areas data and there is a discussion forum on the project on the EEA Website to facilitate the exchange of ideas and experiences. The long-established and successful mode of recording boundary information of UNEP-WCMC could be considered a de facto standard, and will likely be adopted by the WDPA.

2. World Database on Protected Areas

Since 1981 UNEP-WCMC and IUCN WCPA have been working together to collect and manage information on the world's protected areas. The information, compiled from both national and international sources, has been used for many purposes from assessment and priority setting to comparative analysis. An important emerging practice is the agreement on a defined "core dataset" of known quality, with data from identified sources. It is planned that this will be made publicly accessible in formats useful to a wide range of potential users including decision makers.

The intent is to provide complete coverage of nationally and internationally designated sites, and to provide the interfaces and tools that allow both use and analysis of this information on-line, and full access to other related data and information.

3. Natura 2000 and the Bern Convention

The Natura 2000 Network is a harmonization initiative to bring together site designations under both the EC Birds Directive and Habitats Directive. To this end a single integrated questionnaire has been developed. The work is currently being conducted by ETC/NPB to extend the harmonization further to incorporate the Bern Convention sites ("The Emerald Network"). The Natura 2000 Network and Emerald Network have merged their software. The key to Natura 2000 is the concept of "habitats" and ETC/NPB are working to harmonize habitat definition and to select a workable subset derived from the earlier CORINE "biotopes" and habitat classification.

4. Important Bird Areas

This programme, initiated by BirdLife International, is a worldwide project aimed at identifying, monitoring and protecting a network of critical sites for the world's birds. It is anticipated that up to 20,000 IBAs will be identified worldwide, using standard, internationally recognised criteria for selection. Many regional and national inventories have already been completed.

3.4 CATEGORY 3 - Development Projects and Other Donor Information

3.4.1 Introduction

This category includes information services that list or provide information on the status of nature conservation development projects, and/or information on

international policies and priorities for funding of donor projects (multilateral and bilateral).

Key sources

- Asian Development Bank Website;
- Inter-American Development Bank Website;
- Global Environment Facility - Project Information;
- OECD - Development Assistance Committee;
- United Nations Development Programme Website;
- World Bank – Accessible Information in Development Activities (AiDA)
-

3.4.2 Issues and Concerns

The major issues are the following:

- Vast amounts of development aid are provided by bilateral and multi-lateral donors every year. A portion of this is aimed at "environmental" projects some of which relate to nature conservation (or biodiversity). It is difficult at the current time to determine the extent of such aid or obtain a synthesis of general objectives or trends.
- Regional and national assessments of needs and priorities are conducted by major donors, often independently and redundantly. Increased sharing of information and experiences may lead to far more efficient use of resources.
- Aid programmes and projects in different sectors may have conflicting goals and impacts - even if conducted by a single donor (e.g. infrastructure development that has negative impact on biodiversity) Improved information sharing would open opportunities for collaborative projects.

In order to address these issues and concerns it is therefore imperative to be able to obtain a more complete picture of donor project spending and priorities, and use this information to rationalise development programmes and priorities, and bilateral and multilateral development assistance.

This need has been reflected in the most recent CBD COP Decision VI/16 that contains inter alia the following provisions:

"Invites parties and Governments, funding institutions and development agencies … to communicate to the Executive Secretary their funding procedures, eligibility criteria and programme priorities in relation to biological diversity." and

"Urges parties and Governments, the World Bank, the International Monetary Fund, The United Nations Development Programme and other relevant institutions to take concrete actions to review and further integrate biodiversity considerations in the development and implementation of major international initiatives …"

3.4.3 Emerging Standards and Practices

There are currently few significant programmes aimed at harmonizing, integrating or making more easily available coherent and consistent information on donor activities and projects related to nature conservation.

The GEF and the implementing agencies are closely co-operating in the provision of information on GEF-funded projects and programmes and their websites are closely linked and cross-referenced. Each implementing agency has a specific area of their website dealing with GEF issues and projects. In co-operation with UNEP, GEF has developed a Project Tracking and Mapping System that enables project information searches by key project parameters. Further enhancements are being developed. This database covers projects that are being implemented by all three implementing agencies.

3.5 CATEGORY 4 – Clearing-House Mechanisms and Information Exchange Networks

3.5.1 Introduction

In this category we discuss information services that are identified as "clearing-houses" or serve that sort of purpose, that is, facilitate the exchange of nature conservation information between members of a network, or are broadly open to all.

Key sources

- Convention on Biological Diversity – Clearing-House Mechanism;
- European Environment Information and Observation Network (EIONET);
- European Community Biodiversity Clearing-House;
- European Topic Centre on Nature Protection and Biodiversity;

- Global Biodiversity Information Facility;
- Pan-European Ecological and Landscape Diversity Strategy Guide.

3.5.2 Issues and Concerns

- The original intent of the CBD CHM was to facilitate "scientific and technical" collaboration - that is, to promote collaboration resulting in the sharing of techniques and technology to assist with biodiversity conservation. This was intended particularly as a "North-South" exchange to make available higher technologies for the sustainable use of biological resources. To-date the CBD-CHM has largely emphasised sharing of information on national measures to implement the Convention (action plans, policies and the like), and the intended technology transfer is not occurring.
- It is not at all certain that there is much value to "harmonization" of various clearing-house and de facto clearing-houses. Rather the issue is **rationalisation** and linkages. The large number of broadly based information networks means that on the one hand there is considerable duplication of information content and on the other hand no clear "one stop shop" for nature conservation information exchange. Rationalisation of the scope of various services along with clarifying the links would be beneficial.
- Expanding open-ended clearing-houses requires considerable effort to ensure consistent quality. With increasing volume and automation it becomes impossible to ensure that all resources are up-to-date or are "vetted" for content and quality. International organisations traditionally greatly underestimate the resources (technical and human) required to effectively maintain a clearing-house site.

3.5.3 Emerging Standards and Practices

The CBD Clearing-House Mechanism has emerged as the leader and de facto standard for this type of information exchange. Their recently released “tool-kit” provides guidance on good practices and means for establishing and maintaining national and regional biodiversity clearing houses. An associated “CBD Controlled Vocabulary” may also evolve into a more general standard to assist in integration. (See Document 8 - *International Initiatives in Biodiversity Vocabularies and Thesauri* for more details)

Through the CBD SBSTTA, IAC and informal meetings of various kinds national and regional clearing-houses establish a degree of harmonization in approach and content.

This process will continue with the development underway of more specialised thematic clearing-houses, such as the Biosafety Clearing-House, and the Global Invasive Species Programme.

The United Nations Environment Programme initiated an integrative programme called UNEP.Net, that was intended to be the principal mechanism for dissemination of UNEP related information - replacing and unifying UNEP-GRID and Infoterra, and drawing on the information dissemination activities of UNEP-WCMC, GRID-Arendal etc. UNEP.Net is essentially a set of technical protocols and standards that allow for interoperability of data services (rather than centralising them) with particular emphasis on map referenced data. Several pilot examples are now operating through UNEP-WCMC and GRID-Arendal. It should be emphasised that the harmonization efforts were towards the technicality of interoperability - not the harmonization of information content or semantics. As a result of recent restructuring in UNEP, the future of UNEP.net is now unclear, however the protocols for interoperability testing in pilots will surely be of value to IABIN. (See also Document 10 - *Experience in Developing Interoperable Systems for International Data Management and Sharing*)

3.6 CATEGORY 5 – Environmental Law

3.6.1 Introduction

This category includes information services that provide access to or reference to international and national environmental law, especially related to MEAs, and related national implementing laws.

Key sources:

- ECOLEX;
- EUR-Lex Portal;
- FAOLEX;
- IUCN – Environmental Law Information Service.

3.6.2 Issues and Concerns

- Even though ECOLEX is emerging as the de facto world centre, no organisation is specifically **mandated** to provide a comprehensive global source of information on a range of environmental legal material, including multilateral and bilateral agreements, national legislation, international “soft law” documents, and law and policy literature.

- National, regional and global organisations in some cases overlap in scope and intent, but differ in timeliness and completeness.
- Current attempts at harmonization (largely through ECOLEX) seem to be *ad hoc* and there is a lack of funding for improvement of maintenance systems and technology.
- There would appear to be considerable duplication of effort in the provision of information on international law. Although efforts are currently being made to incorporate into ECOLEX texts and information held by FAOLEX, relevant information is also held by other bodies and supplied by other information services, e.g. EUR-Lex, convention secretariats, CIESIN and SEDAC.

3.6.3 Emerging Standards and Practices

In spite of the acknowledged but un-mandated) central position of ECOLEX, to provide "a comprehensive global source of information on environmental law",

it does not provide links to the websites of convention secretariats, or to other related information outside its own databases. Also, texts of national and European Community legislation are currently not available.

There are plans to incorporate national legislation through a merger with FAOLEX and to add EC legislation. At the moment national legislation submitted to MEAs under articles of the conventions are not systematically referred to ECOLEX. The basic information structuring of ECOLEX could be considered the standard that IABIN could follow should they wish to organise similar regional and national information.

3.7 CATEGORY 6 - Global and Regional Long Term Ecological Monitoring

3.7.1 Introduction

This category deals with information sources that provide databases and data sets on long-term ecological monitoring, networks intended to assist, and related information on policies, standards and protocols.

Key sources:

- Biosphere Reserves Integrated Monitoring (BRIM);
- GTOS – Terrestrial Ecosystems Monitoring Sites (TEMS);
- International Long-Term Ecological Research Network (ILTER) Website;

- Natura 2000 Network.

3.7.2 Issues and Concerns

In summary, it could be said that currently long term monitoring activities are being carried out by too many disparate groups, attempting to measure too many things, at many different locations. Currently there is no general agreement on what should be "monitored" – the items to be measured, how often, at which locations, how measurements should be made etc. There is a need for a strategic or "top-down" approach that seeks to identify the purposes and goals of long-term monitoring, including the range of policy decisions it is to support.

The dismantling of the former UNEP-GEMS programme has left a significant void in the collection of consistent long-term monitoring of terrestrial ecosystems in a way that allows for the identification of trends, and therefore for assessing the effectiveness of MEAs and other measures. It is currently not clear how long-term monitoring supports Conventions, or what are the present and future needs of MEAs in this regard. The extent to which this will be addressed by the Millennium Ecosystem Assessment is still not clear, although it certainly will contribute.

3.7.3 Emerging Standards and Practices

A few standards and protocols are emerging (slowly), although most long term monitoring activities originated to address specific issues and established a network of sites for that purpose. Existing networks have different objectives, operate on different scales, collect different kinds of data, and so on.

GTOS has co-ordinated efforts to define variables, measurement methods, etc, and compile metadata on sites in the TEMS database. The database can be accessed through WWW and various search facilities are available. The three observing systems (GOOS, GCOS and GTOS) are collaborating through a Joint Data and Information Panel and have put in place common data and information policies. In addition they have establish the Global Observing Systems Information Centre (GOSIC) hosted in the University of Delaware, with the intention of making “G3OS” datasets available easily.

In November 2000, the International Co-ordinating Council of MAB called for re-orientation of the work on BRIM and a meeting was held in September 2001 to facilitate the implementation of this. The meeting was hosted by the GTOS Secretariat and was attended by representatives of Species 2000, ICP/IM, UNEP-WCMC, CIESIN, EuroMAB, UK-ECN, Wetlands International, UNEP-DEWA, as well as a number of national and academic experts. It was agreed that BRIM could provide primary datasets for various global biodiversity assessments such as the Millennium Ecosystem Assessment, assist the Ramsar Convention and other

conventions, and be of value to IGOs, NGOs and for policy development and assessment. The BRIM data policy identifies a need for a "data assimilation" mechanism to bring together existing information, and a metadatabase is proposed based on existing consensus-based standards.

The Millennium Ecosystem Assessment and the GEO Data Portal have both established some standard ways of organising national and regional data. These are discussed more fully in Document 3 – *Linking Biodiversity Information with Non-biological Networks*.

In Europe Natura 2000 and the Emerald Network are harmonised to ensure that standards will be consistent across both Networks. These activities are also integrated with the OECD environment questionnaire through joint working groups co-ordinated by ETC/NPB.

3.8 CATEGORY 7 – Taxonomic Information

3.8.1 Introduction

This category deals with information services that provide broadly based taxonomic reference information, and related standards, information exchange and capacity building in taxonomy.

3.8.2 Key sources

- All Species Inventory;
- Global Biodiversity Information Facility (GBIF);
- Integrated Taxonomic Information System (ITIS);
- International Plant Name Index (IPNI);
- International Species Information System (ISIS);
- Royal Botanic Gardens Kew - Global plant databases;
- Species 2000.

3.8.3 Issues and Concerns

See Document 7 - *Taxonomic Authority Archives, Networks and Collections* for more details.

There is a proliferation of efforts with overlapping goals.

Internationally the two major initiatives are Species 2000 and GBIF. The American-based All Species Inventory appears to sit outside the mainstream at present. Species 2000 has at least some operational components and is adopting a

pragmatic approach. Its further development is currently hampered by lack of funding and, apparently, to some extent by institutional rivalries.

GBIF is much more ambitious in scope than Species 2000 but is just becoming operational. The four main priority work programme areas (data interoperability; catalogue of known organisms; digitisation of collection data; and capacity building) are currently in progress in one form or another by other initiatives. These are: data interoperability by TDWG; catalogue of known organisms by Species 2000; museum and herbarium specimen information by a combination of ITIS, the Species Analyst and the European Natural History Specimen Information Network (ENHSIN); live animal specimen information by ISIS; and taxonomic capacity-building by BioNET-International and other components of the Global Taxonomy Initiative of the CBD.

3.8.4 Emerging Standards and Practices

The Global Biodiversity Information Facility (GBIF) has been established through an intergovernmental process with the aim of increasing access to the vast quantities of global biodiversity data, especially that which exists in museums and herbaria. The four priority work programme areas identified as the primary focus for the first three-year phase are to: create an Internet-based catalogue of known names of species; digitise data on species information in museums and herbaria; create interoperability of databases and search engines for accessing these data; and build capacity in nations for implementation. GBIF is essentially a scientific facility, and UNEP anticipates working alongside GBIF members in developing species information databases and related standards.

The International Plant Name Index is a joint initiative of the Royal Botanic Gardens, Kew, the Gray Herbarium, Harvard, and the Australian National Herbarium. It is a list of recognised plant names and incorporates Kew's Index Kewensis of plant generic names. The index does not, however, include synonyms or make judgements as to which name should be preferred. It cannot therefore be used as a taxonomic standard, although any plant names included in such a standard should feature in the index. The initiative involves three of the most powerful plant taxonomy institutions in the world, but does not include Missouri Botanic Gardens, who have their own system.

The International Organisation for Plant Information is currently at prototype stage of a Global Plant Checklist, which is intended to be an authoritative species list with accepted names, synonyms and distributions. It therefore differs from the International Plant Name Index. It is based jointly at the Royal Botanic Gardens, Sydney, Australia and Toronto, Canada and is a contributing database to Species 2000.

The Taxonomic Database Working Group (TDWG) is a relatively small group, under the auspices of the International Union for Biological Sciences (IUBS) that develops standards and protocols for taxonomic databases. These are couched in the form of recommendations rather than mandatory systems and refer to database design and information exchange rather than taxonomic standards themselves.

3.9 CATEGORY 8 – Species Status Information

3.9.1 Introduction

This category includes sources and services that provide information on the conservation status of species, species populations, distribution, threats, and related ecology, as well as species "checklists".

Key sources

- Biodiversity Conservation Information System;
- CITES Listed Species Database;
- European Nature Information System;
- Global Register of Migratory Species;
- IUCN Red-List;
- Natura 2000 Network;
- Species Information System;
- UNEP-WCMC Animals Database;
- UNEP-WCMC Threatened Plants Database.

There is considerable interrelation between species information systems and taxonomy reference systems and no clear-cut boundary. Systems to organise and make available information on specimens held in collections fall clearly between the two, and have mainly been discussed under Category 7.

3.9.2 Issues and Concerns

From a practical point of view, and particularly with respect to nature conservation, taxonomic information per se (authorities, citations, synonyms and higher level classifications) is by itself only of very limited use. Its value increases greatly when it becomes linked to other kinds of information, of which the most important are:

- Common names in various languages;
- Description;

- Biological information (population, distribution, ecology, physiology etc);
- Location of specimens (both museum and in living collections);
- Legal information (status in various MEAs, regional agreements and domestic laws);
- Genetic information (gene sequences etc);
- Information on forms of use or value to humans;
- Information on threats to the species;
- Bibliographic information.

Most "taxonomic" databases in reality already contain some additional (i.e. non-taxonomic) information, most often on location of specimens and geographical information. There are, however, important differences between a database that is fundamentally intended as a taxonomic resource and one whose main aim is to provide other information. The amount of information available itself varies enormously from species to species and there are far fewer established standards for most of it than there are for taxonomy. This has led to some specialized databases (such as FishBase, MammalBase, and BirdLife) where a greater degree of standardisation can be achieved for the information content and format for groups of species.

3.9.3 Emerging Standards and Practices

Beyond the core data items listed above, requirements and standards differ between species groups. Some convergence of common practices is occurring, for instance in the sharing of geographic distribution in GIS form. BirdLife International and UNEP-WCMC are the principal leaders in this regard.

UNEP-WCMC's species databases provide information on plants and animals. The plant database contains over 140,000 plant names linked to 190,000 distribution areas. The animal database has records for nearly 73,000 animal species. The databases include IUCN Red List Species, species listed in the CITES appendices and a number of others, including vertebrate species that are endemic (confined to) one country. These databases are currently being integrated and linked to GIS distribution files through the new Project Proteus.

Botanic Gardens Conservation International is essentially a co-ordinating body. In 1987, BGCI was founded to link botanic gardens as a co-operating global network for effective plant conservation. It now includes over 450 member institutions in 100 countries. It has developed a computer database and related standards on the rare plants in over 300 institutions to bring worldwide co-ordination to the individual efforts of each garden.

3.10 CATEGORY 9 - Policy and Strategy Information

3.10.1 Introduction

This category is concerned with information services that provide analysis and views on conservation policy, including the policy sources of UN and intergovernmental organisations, as well as policy "think tanks" and major NGOs.

Key sources

- :European Centre for Nature Conservation Website;
- European Environment Agency main Website;
- European Topic Centre on Nature Protection and Biodiversity;
- Pan-European Ecological and Landscape Diversity Strategy Guide;
- United Nations Commission on Sustainable Development;
- United Nations Environment Programme Website;
- World Resources Institute Website.

3.10.2 Issues and Concerns

Currently it can be said that there are no significant efforts to co-ordinate or organise the availability of information on global or regional policy issues and strategic directions. "Clearing-house mechanisms" and regional integrated sources such as EIONET are arguably attempts at integration. The question arises as to whether there is any value in attempting a consolidated policy forum.

3.10.3 Emerging Standards and Practices

Major Global assessments like the "GEO Process" and the Millennium Ecosystem Assessment bring together policy "think-tanks" such as WRI, with private foundations, intergovernmental organisation and NGOs in various groups and achieve a level of harmonization. These groupings however are ad-hoc - not permanent or structured - but may lead to the evolution of customary or standard ways of approaching assessments and developing strategic directions and policies.

3.11 CATEGORY 10 - European Nature Conservation Information

3.11.1 Introduction

This category is crosscutting to the others and was assembled because of the particular opportunity presented to look at information access in a regional context.

Key sources

- European Centre for Nature Conservation Website;
- European Community Biodiversity Clearing-House Mechanism;
- European Environment Agency main Website;
- European Environment Information and Observation Network (EIONET);
- European Nature Information System (EUNIS);
- European Topic Centre on Nature Protection and Biodiversity (ETC/NPB);
- Natura 2000 Network;
- Pan-European Ecological and Landscape Diversity Strategy Guide.

3.11.2 Players

The specific experiences with the EC Clearing House mechanism are detailed in Appendix 2: *Case Study: Experience in developing the regional EC Clearing House Mechanism,* but there are many more players. The structures developed and modified in light of some years of experience could be highly relevant to IABIN. The European Union and the wider pan-European region interact in a complex manner and are articulated in greater detail in Chapter 4. The European Environment Agency (EEA) is a key player, but there are many others, including the European Commission itself, UN Economic Commission for Europe (UNECE), the UNEP Regional Office for Europe (UN-ROE), and the Council of Europe.

The EEA is the principal agency for the delivery of environmental information and the co-ordination of projects and activities within the EU, as well as working with a number of countries outside the Union.. A particularly important role at the moment is to assist potential accession countries to adjust environmental policies and information systems in preparation for joining the Union.

The work of the EEA is assisted by a number of European Topic Centres (ETCs) of which the ETC - Nature Protection and Biodiversity is the most relevant to biodiversity. The EEA takes on a pan-European mandate at times, especially with regard to the production of assessments of the "State of the European Environment", sometimes referred to as the "Dobris Process", and assisting with harmonization for potential accession states.

The European Commission recently established a Biodiversity Expert Group (BEG) with a mandate to share information and promote the complementarity of actions taken at Community and Member State levels in the context of the implementation of the EC Biodiversity Strategy and its Action Plans. This

strategy concerns the EC response to the CBD in areas in which the EC has competence. The BEG includes representatives from the Member States, the Corporate Sector and NGOs. The BEG will promote the implementation of the Action Plans and monitor progress. The first meeting took place in Brussels in 2002. The responsibility for the BEG rests with the Commission, DG Environment.

The EC and its various bodies and agencies play a central and co-ordinating role in European nature conservation within the EU and is also an important actor at the wider pan-European and international levels. The European Community is a contracting party to some of the intergovernmental Conventions and Agreements, collaborates in the implementation of others, and attends all UNECE meetings within the "Environment for Europe process".

The UNECE leads the "Environment for Europe" process, an essential political framework for co-operation on environmental protection in Europe. It regularly brings together Environment Ministers and all organisations and institutions working with environmental issues in the region, including NGOs at pan-European conferences to formulate environmental policy. The Pan European Biological and Landscape Diversity Strategy (PEBLDS) is a direct result of the "Environment for Europe" process and represents part of the European response to the United Nations Convention on Biological Diversity.

3.11.3 Issues and Concerns

- The relationships between the principal players are complex. Jurisdictions and interests overlap, for example, the EEA has both an EU mandate and a pan-European role.
- Streamlining of reporting is a growing concern given the requirements not only of the EC, but of regional and global MEAs, and of statistical organisations.
- The EU is a party to (some) MEAs in a status similar to a "state" and hence has both reporting and implementation obligations in addition to member states.
- The identified directions for environmental policy in Europe require a wider perspective and hence a need to consider nature conservation in the context of other policies such as agriculture, fisheries, forests and water.

3.11.4 Emerging Standards and Practices

The principal harmonizing policy instrument in the context of EC Policy Development is the 6th Environmental Action Plan. This plan incorporates

Agenda 21 and connects this to both the Convention on Biological Diversity and the UNECE with the activities of the Commission. The new programme stresses the need for Member States to better implement existing environmental laws

Strategically a certain degree of inter-sectoral harmonization is incorporated within the framework of the Sustainable Development Strategy of the European Union. It contains a number of concrete proposals for how the European Union can improve its policy-making to make it more coherent and focussed on the long term, as well as a number of specific headline objectives and the measures needed to achieve them.

Currently EUNIS is involved in the development of a number of harmonization tools:

- Synonyms Module – development of a system of correspondence between species and their synonyms for the internal management of the EUNIS database and for the wider use of EUNIS data. The EUNIS Species Database is now available online at the EEA web site and incorporates the synonyms module.
- EUNIS Habitat Classification – development of a common reporting language on habitat types at European level: The EUNIS Habitat Classification builds upon previous initiatives (CORINE-Biotopes followed by the Palearctic Habitats Classification), but introduces agreed-upon criteria for the identification of each habitat unit and provides a correspondence with other classification-types. This database is now available online.
- Common Database on Designated Areas – a joint project between EEA, Council of Europe and UNEP-WCMC to co-ordinate and streamline information on designated areas resulting from various legal frameworks, whether at international, Community or national level. The sites are listed according to the official designations at national level.
- The EUNIS 50x50 km UTM grid – development of a 50x50 km grid model following the adoption of common principles for a common European Chorological Reference Grid (CGRS) during a meeting between ETC/NPB and European atlases of species in 1998. These atlases include Atlas Flora Europaeae, Atlas of Amphibians and Reptiles in Europe, Atlas of European Breeding Birds, European Mammal Atlas and European Invertebrates Survey. The model will be one of the main EUNIS tools to refer any spatial data at European level.

The European Environment Agency is working to develop an inventory of the requirements for Member States to monitor and report environmental data. A reporting obligations database (ROD) has been developed and populated for the subject areas of air, water, waste and biodiversity.

CHAPTER 4 EXPERIENCES FROM OUTSIDE THE AMERICAS

4.1 National Experiences

4.1.1 Overview

As noted in the introduction, relatively few studies have been conducted of how international information sources are used in decision making. One such study for the UK is summarised below as an example that is probably typical of European countries. Japanese experiences outlined briefly are strikingly different and provide an example of a country with more centralised processes. Details of the Japanese experience are detailed in Appendix 4: *Case Studies: Use of biodiversity information in the decision making process in Japan* and the related topic of national information management strategies in Document 6 - *National Strategies for Effective Biodiversity Information Management.*

4.1.2 UK Experience in Decision Making

National decision-making on biodiversity is greatly influenced by the "policy drivers" – the issues and pressures most relevant to the country. A recent study of UK biodiversity information needs and processes (*Assessment of Requirements of UK Policy-Makers for International Nature Conservation Information*) identified that the primary drivers for new or amended policy are as follows (in descending order of importance):

- EC Directives;
- EC policies and programmes;
- European regional conventions and treaties;
- Global conventions and treaties;
- National economic and political priorities;
- National social pressures (public opinion as expressed through NGOs, advocacy groups, lobbies, etc);
- International social pressure (e.g. advocacy of the UN, other international agencies and international NGOs).

1. Information Uses

Information is required at various points in the policy making process as noted above, and the results of the consultation process indicated that the information uses can be categorised into five broad headings based on the intended use of the information. These are given below, along with examples of use in each case.

a) Informing the UK position on international policy issues

The information is used to develop the UK position regarding emerging international policy proposals - such as new MEAs, or Directives, or extensions and modifications to existing measures. The information is used as briefing support for UK representatives on drafting committees and official international bodies.

Example: EC proposal on sustainable hunting of birds (under the Birds Directive).

The UK Department of Environment, Food and Rural Affairs (DEFRA) sought scientific information on the impact on species populations from the national Joint Nature Conservation Council, international sources such as BirdLife International, and on public opinion from international NGOs such as RSPB, in order to advise official delegates to the EC.

Example: Accession to the CBD.

Broad consultation was required for this umbrella treaty – hence an inter-departmental committee was formed. Information was sought from a broad range of international sources, including IUCN, WCMC, UN agencies, and international NGOs.

b) Implementation of international obligations in response to MEAs

Once the UK has become a party to a multi-lateral agreement actions must be taken to meet the specified and implied obligations.

Example: Implementation of the CBD.

The obvious implied obligation was for a national Biodiversity Action Plan (BAP). Information needs included guidance on the form and content of a BAP, plans and strategies of other countries, and international interpretations of Convention articles.

Example: Implementation of CMS obligations to prevent the taking of annexed species.

Information sought included guidance on species definitions from IUCN and WCMC Species databases, range state definitions, decisions under CMS Agreements (from CMS Secretariat), and measures taken in other countries (e.g. hunting and fishing regulations).

c) Meeting international reporting requirements

Most MEAs require regular national reports on the implementation of the treaty. Compilation of these can be burdensome and there are clear overlaps in the demands of the different instruments.

Example: Reporting to the CBD.

Information sought to respond to the reporting requirements includes: reporting instructions and interpretations from the CBD secretariat; access to reports of other countries; issue assessment and global status information on species, habitats, social and economic matters (such as "equitable sharing of benefits").

d) Enforcement measures

Information used to develop enforcement policies and measures.

Example: Enforcement of import restrictions on plants and animals under CITES.

The UK Customs and Excise Department uses: the WCMC species databases, and Royal Botanic Gardens, Kew, for reference on species identification; the CITES Secretariat for competent authorities (for permits) and identification guides; and IUCN-Traffic for trends and intelligence.

e) Assessing emerging issues, status comparison

International networks are used to obtain early warning, and a sense of "where do we stand".

Example: Assessing global trends towards sustainable development.

The DEFRA Sustainable Development Unit uses the UN-CSD information service (on occasion) and scans a wide range of web sources of national governments and international NGOs to identify actions and policies in other countries to inform UK Sustainable Development Strategy.

Example: Comparing relative state of nature conservation in Scotland to Europe.

Through a surveillance and monitoring process, Scottish Natural Heritage have established a number of measures of conservation status and natural quality for Scotland. They are currently seeking to compare these measures to the conservation status in European countries. This will require information from European national sources, and international agencies – available through EIONET, the EEA, Eurostat, the EC Clearing House Mechanism, and so on.

f) International comparisons for setting national priorities

National priorities and policies must be developed in a context that considers the regional and global picture. Thus it is necessary to seek information on species status and populations, protected areas and site designation specifics, global and regional issues and their impact on the UK.

Example: Development of UK Biodiversity Action Plan.

A multi-departmental initiative, this required information on the global population and international status of endangered and threatened species, especially with regard to endemism, so as to set priorities for species conservation and habitat protection and rehabilitation programmes in the UK. Information sources included the IUCN "Red Books", and databases of Wetlands International and BirdLife International.

2. Sources Used

Based on information obtained through a series of workshops augmented by a survey questionnaire, the sources used fell into seven major categories:

- The Convention secretariats;
- International NGO networks and repositories (such as Wetlands International, BirdLife, IUCN);
- Species status reference sources (such as UNEP-WCMC Species Databases, RBG-Kew, ICLARM-FishBase);
- Taxonomic reference sources (such as Web-of-Life, Species 2000);
- Information collections related to "sites" including the World Database of Protected Areas, Natura 2000 sites, and site-designation treaty services (such as WHC, Ramsar, and Bern);
- General Policy and programme implementation sources (such as the CSD, UN System-wide Earthwatch, the CBD Clearing House, WRI, IISD, WWF, UNEP);
- European sources (such as ECNC, EEA, and the European Commission DGs).

Several agencies mentioned the use of very specialised sources and networks - for example regarding a single species or group. These are often held or co-ordinated by individual interested scientists or academics.

Most sources are routinely accessed through the Internet, although some sources normally deliver printed outputs (such as IUCN-ELC), and a great deal of printed material is often collected at official MEA meetings. A least one Department indicated that access to the Internet was difficult.

Many workshop participants also referred to trusted experts, personal contacts and world authorities for information.

Surprisingly perhaps, rather little use seems to be made of metadata services (such as the UNEP Metadatabase, CEISIN, EEA Catalogue of Data Sources) or of referral services such as INFOTERRA. Bibliographic and abstracting services were principally used to find a likely "expert" to contact regarding particular issue or species.

Statistical databases that might be of use for indicators and comparisons are not used frequently (FAO, Eurostats, OECD, etc), and there was little awareness and no use of the "Global Observing Systems" - Global Terrestrial Observing System (GTOS), Global Oceans Observing System (GOOS), and Global Climate Observing System (GCOS).

Based on the analysis of the questionnaire returns the following are the ten most frequently used sources (no relative order implied):

- Bern Convention Secretariat and web-site;
- Convention on Biological Diversity Secretariat – main web-site;
- Convention on Biological Diversity Clearing House Mechanism web-site;
- Convention on the Conservation of Migratory Species (CMS) Secretariat and web-site;
- Ramsar Convention Bureau web-site;
- EUROPA - The European Union Online;
- European Commission, DG-Environment web-site;
- UNEP-World Conservation Monitoring Centre (UNEP-WCMC) web site;
- European Centre for Nature Conservation (ECNC) web site;
- WWF International web site.

It is noticeable that the majority of these sites are connected with major Multilateral Environmental Agreements (MEAs). This is perhaps a reflection of the UK's membership and active involvement in biodiversity conservation at the international level through these and numerous other MEAs. Also significant is the number of European-related information sources that figure in this list, reflecting the importance of the EC as a policy driver. The NGO web sites relate to organisations with quite varied portfolios of work relating to biodiversity conservation. Both ECNC and WWF are involved in work that spans many

sectors and countries. This is also true of the activities in which UNEP-WCMC is involved that are both international in geographic scope and broad-based within the domain of nature conservation.

From the above it could be inferred that policy makers are interested in information concerning international and regional initiatives that directly concern them, and that they also favour sources offering more generalised nature conservation information with links to more specific information.

The two most frequently visited websites appear to be:

- European Commission, DG-Environment site;
- EUROPA - The European Union Online.

An important issue regarding information provided online is the frequency with which this information is updated. This frequency may be intimately related to actual changes in the information itself. From the above information taken from the questionnaires it might be inferred that EU web sites are frequently visited because they are frequently updated, and that this frequent updating is necessary because of the constant evolution of EC law and policy relating to nature conservation.

Of the sources suggested on the questionnaire the following were the least visited (all returns indicated "never"):

- Earthtrends, The Environmental Information Portal;
- Global Terrestrial Observing System (GTOS);
- Infoterra - Global Environmental Information Exchange Network.

There are probably several reasons why these web sites have never been visited by the sample of policy makers questioned. It may be that these sites, which focus on nature conservation at the global level, do not provide useful information for national level policy makers. It may also be possible that the policy makers questioned were unaware of these sites. Also, some indicated in comments that they did not have the time to seek information sources beyond those pertaining to their immediate area of expertise.

3. Barriers to Information Use

A number of issues and problems were identified that restrict the effective use of international data sources and networks. The most significant are as follows:

a) Gaps and overlaps

Some key gaps identified:

- Information on sustainable use and markets for biodiversity;
- Information on national implementing legislation, strategies and measures in other countries;
- Case studies, good practices and "lessons-learned" in countries with comparable situations;
- Early warning of emerging issues and policy developments, especially in the EU.

b) Quality and reliability, appropriateness for policy

In spite of targeted programmes of harmonisation and integration over a number of years, there continues to be a gap between scientific observation and the need for integrated predictive cause-and-effect information needed by national decision makers.

b) Need for harmonisation and integration

A major concern of policy makers is the need for information to be comparable and compatible – i.e. capable of being integrated and summarised. This raises a number of issues regarding the requirements of stakeholders for increased harmonisation to enable useful interpretation in a policy context, with implications not only for harmonisation of the information *per se*, but also for methods and means of information management and analysis.

4.1.3 Japanese Experience

A detailed review of the Japanese experiences (and of some other countries in the region) can be found in the accompanying Appendix 4: *Case Studies: Use of biodiversity information in the decision making process in Japan.*). Internet accessible data is dominantly used in the context of specific projects, such as for formulating a conservation strategy for an area, addressing or preparing to address oil spills, watershed management and the like, or for environmental impact assessment for major infrastructure projects. In all cases information sources tend to be national and are integrated within additional data collection specific to the issue at hand. There is more experience in using biodiversity information by decision makers at the sub-national and operational level. Taking a spatial approach incorporating remote sensed imagery from central databases is a common theme.

The national government supports the Japan Integrated Biodiversity Information System (JIBIS) that links institutions and a Digital National Land Information system DLNI that coordinates the availability of spatial information (GIS and

remote sensing). The JIBIS is a government response to the ratification of the CBD. It holds only information from official government sources, including for instance, GIS data focusing on species distribution. There is a collaborative relationship with DNLI that aims to standardise digital formats for spatial data. JIBIS datasets were used extensively in the development of the National Strategy on Biodiversity Conservation (NSBC). The Ministry of Environment is the focal point for all biodiversity issues (and hosts the national CHM in the "Centre of Biodiversity") and serves to coordinate the biodiversity-related activities of other ministries. There is also an Inter-Ministerial Council on Global Environmental Conservation (in contrast to the UK which has no formal inter ministerial coordination body).

The updating process for the National Strategy has used a "Study Commission" process, not a standing network, that has invited inputs from NGOs and the public.

The information in the national networks is used in national and bi-lateral development projects, for example, when carrying out site selection activities. There are currently pilot projects examining how these data can be used more effectively in large-scale projects, such as dams or railway construction and for environmental impact assessment.

Japan does not participate in any network of information exchange with other countries in the region, preferring to deal with specific issues on a bi-lateral basis, such as coral reef conservation in Indonesia.

4.2 Regional Experiences

4.2.1 Overview

A number of different regions of the world have been developing means to share and integrate biodiversity information. The conceptual paradigm is that countries in the same geographic area will have similar issues and problems and can more effectively share information and solutions that are appropriate to regional ecological and cultural conditions. UNEP has set up 5 regional offices (Caribbean and Latin America, Europe, Asia and Pacific, North America, Africa,) and its programmes are often structured on this basis. Other unofficial and official regional associations have also arisen, such as the Association of South East Asian Nations (ASEAN), that can provide a focus for biodiversity information exchange and cooperative action to implement MEAs.

Europe stands at the forefront in formalising regional cooperation and represents one end of a spectrum of implementation of regional networks that runs through to informal cooperation between a small number of nearby institutions. The ASEAN

Regional Centre for Biodiversity Conservation is in approximately the middle of the spectrum, being an institution supported by a formal association of nations that have much less binding ties than, for example, the European Union. This might be considered similar to the IABIN's situation with respect to the OAS. Experiences in Europe are expanded below, while the ASEAN experience is detailed in Appendix 1: *Case Study- Experience in developing the ASEAN Regional centre for biodiversity Conservation*.

4.2.2 Europe

1. Biodiversity Decision Making in Europe

Europe represents a unique situation where there exists a form of legislation (the EC Directives) that is binding on member nations – essentially an additional level of government - as well as having a number of regional environmental treaties of various kinds. The European situation is very complex. Although centred on the European Environment Agency, there are many other players, including the European Commission itself, UN Economic Commission for Europe (UNECE), the UNEP Regional Office for Europe (UN-ROE), and the Council of Europe.

The three main institutions involved in decision-making in the EU are the European Parliament elected by the people of the Member States, the Council which represents the governments of the Member States and the Commission which is the executive and the body having the right to initiate legislation. These institutions are supported by other bodies such as the Economic and Social Committee and the Committee of the Regions (advisory bodies which help to ensure that the positions of the EU's various economic and social categories and regions respectively are taken into account).

An example of how these policy-making bodies interact in the context of biodiversity conservation policy is the development of the EC Biodiversity Strategy and Action Plans.

The Council of Ministers decided at a meeting on 18 December 1995 that "*with regard to matters within the field of its competence and in close co-operation with its Member States, the Community should elaborate a Community Strategy to identify gaps in the European Community conservation policy, and to promote biological diversity into the policies of the Community, complementary to strategies, programmes and plans of the Member States, in order to ensure the full implementation of this Convention*".

A request was sent to the European Commission to develop such a strategy and action plans setting out the ways and means for the implementation of the

strategy. These have been developed and adopted by the commission but are subject to approval by the European Parliament.

The EC Biodiversity Strategy was adopted by the Commission in 1998 and endorsed by the Council and Parliament in the same year. The strategy aims to, *"anticipate, prevent and attack the causes of significant reduction or loss of biodiversity at the source. This should help both to reverse present trends in biodiversity reduction or losses and to place species and ecosystems, which includes agro-ecosystems, at a satisfactory conservation status, both within and beyond the territory of the Union"*.

At the wider Pan-European level there are not the formalised structures as in the European Union. Instead policy-making is mainly carried out through the negotiation of bilateral or multilateral agreements, and through discussion and agreement in fora such as the "Environment for Europe" process. In addition the Pan-European Biological and Landscape Diversity Strategy (PEBLDS) process remains an attempt to bring focus to pan-European priorities in policy and action.

In the area of biodiversity conservation there are numerous legislative instruments in force, the most significant of which are:

- the Birds Directive (Council Directive 79/409/EEC of 2 April 1979 on the conservation of wild birds);
- the Habitats Directive (Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora);
- the Water Framework Directive (Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy).

As well as these three instruments, which are unique to the EU, there are numerous instruments which incorporate the provisions of international treaties and agreements into EU law, such as Council Regulation (EC) No 338/97 "on the protection of species of wild fauna and flora by regulating trade therein". This incorporates the provisions of the Convention on International Trade in Endangered Species.

In the wider European region, policy and legislative instruments largely take the form of conventions and agreements of a multilateral or bilateral nature. An example is the Bern Convention on the Conservation of European Wildlife and Natural Habitats, to which 45 European and African States and the European Community are parties. The Pan-European Biological and Landscape Diversity Strategy endorsed at the Third Pan-European Conference of Ministers of the

Environment establishes an international framework for co-operation on implementation of nature conservation policy in Europe. Another example is the Sofia Biodiversity Initiative that also arose as a result of the "Environment for Europe" Conference in Sofia in 1995. At this conference four initiatives for the implementation of the Environmental Action Programme (EAP) for Central and Eastern Europe (CEE) were launched: Environmental Impact Assessment, Economic Instruments, Local Air Pollution and Biodiversity.

The main goals of the Sofia Biodiversity Initiative (SBI) are to link together the EAP and PEBLDS process in the CEE region, to facilitate a sub-regional response to the Pan-European challenge in the field of conserving and restoring biological diversity, taking into consideration the specific conditions in CEECs. This is planned mainly through exchange of experience between the 15 CEECs, involving local communities and NGOs, developing and implementing biodiversity policies, as well capacity building at national and local level. This work contributes in a complementary way to the efforts of the EU and other European countries in the field of Biodiversity Conservation.

2. Networking in Support of Decision Making

The EEA is the principal agency for the delivery of environmental information and the co-ordination of projects and activities within the EU, but also operates in some respects with a pan-European mandate. It has the stated mission: *"to deliver timely targeted relevant and reliable information to policy-makers and the public for the development and implementation of sound environmental policies in the European Union and other EEA member countries."* EEA Member Countries extend beyond the EU to include much of Greater Europe. A particularly important role at the moment is to assist potential accession countries to adjust environmental policies and information systems in preparation for joining the Union.

The work of the EEA is assisted by a number of European Topic Centres (ETCs) of which the ETC- Nature Protection and Biodiversity (ETC-NPB) is the most relevant to biodiversity.

Three main strategic thrusts of the EEA are:

- To harmonise environmental information gathering and reporting;
- To streamline and reduce reporting burdens (and make better use of national data for multiple purposes);
- To integrate “sustainable development”, “State-of-the-environment” and environmental reporting into a coordinated decision-making process that utilises indicators.

The need for effective information exchange and for harmonisation and standardisation is therefore stronger in the European region than in any other, and it is a region where, as a result, one can point to a number of examples of good practices and successes.

The principal European Networks to support biodiversity decision-making are:

a) European Environment Information and Observation Network (EIONET)

EIONET is a collaborative network of the European Environment Agency and its Member Countries, connecting National Focal Points in the EU and accession countries, European Topic Centres, National Reference Centres, and Main Component Elements. These organisations jointly provide the information that is used for making decisions for improving the state of environment in Europe and making EU policies more effective. EIONET is both a network of organisations and an electronic network (e-EIONET).

The EIONET Institutions are:

- National Focal Points (NFP) (Institutions responsible for national co-ordination of activities related to the EEA Work Programme). The European Environment Agency is the first European Union body to welcome countries seeking accession to the EU as full members from the beginning of 2002. The current number of EEA member countries is 31. In each country, a National Focal Point (NFP) is responsible for co-ordinating the activities related to EEA work programme.
- 195 Main Component Elements (MCE) (Main institutions of the national networks, which are regular collectors and suppliers of environmental data);
- 285 National Reference Centres (NRC) (Institutions among MCEs nominated to co-operate with EEA on specific topics);
- 5 European Topic Centres (ETC) (Consortia, with one leading institution, contracted by EEA to execute tasks in the Work Programme).

EIONET links institutions and the network of national institutions below the NFP is designated and maintained by the participating nation. Hence these sub-networks differ in form and structure, particularly with regard to “National Reference Centres”.

b) European Nature Information System (EUNIS)

Developed and operated by the European Topic Centre for Nature protection and Biodiversity (ETC/NPB), EUNIS consists of a central unit integrating data models on species, habitats and sites, several secondary databases which are managed by different partners, and an increasing number of satellite databases. EUNIS is essentially the data exchange network for EIONET. It has two main aims:

- to facilitate use of data by promoting harmonisation of terminology and definitions;
- to be a reservoir of information on European environmentally important matters.

The Topic Centre also manages the information on Natura 2000 sites on behalf of the Commission. Information is confidential until released by Member States, so this database of key conservation sites is not currently open-access.

Additionally EUNIS and the ETC/NPB are involved in the development of a number of important harmonization tools:

- Synonyms Module – development of a system of correspondence between species and their synonyms for the internal management of the EUNIS database and for the wider use of EUNIS data. The EUNIS Species Database is now available online at the EEA web site, and incorporates the synonyms module. This database includes relevant information on a selection of Plant and Invertebrates species (at least those listed under the EC Habitats and Birds Directives and the Bern Convention) and all European Vertebrates. The EUNIS Species Database will soon integrate the Flora Europaea Database, adding a further 42287 records.
- EUNIS Habitat Classification – development of a common reporting language on habitat types at European level. The EUNIS Habitat Classification builds upon previous initiatives (CORINE-Biotopes followed by the Palearctic Habitats Classification), but introduces agreed-upon criteria for the identification of each habitat unit and provides a correspondence with other classification-types. This responds to the needs of both the EC Habitats Directive and Birds Directive and provides harmonisation across the Natura 2000 database of sites. This has resulted in an integrated questionnaire for reporting against both Directives, further extended to non-EU countries as the Council of Europe "Emerald Network". Natura 200 and Emerald network are both fully rationalised (a given site is recorded in one and only one network) and harmonised (standardised, comparable and compatible data items).

- Common Database on Designated Areas – a joint project between EEA, Council of Europe and UNEP-WCMC to co-ordinate and streamline information on designated areas resulting from various legal frameworks, whether at international, Community or national level. The sites are listed according to the official designations at national level. This list of designation types has about 600 individual designations registered according to national or sub-national law (of which about 350 are for EEA member countries).
- The EUNIS 50x50 km UTM grid – development of a 50x50 km grid model following the adoption of common principles for a common European Chorological Reference Grid (CGRS) during a meeting between ETC/NPB and European atlases of species in 1998. These atlases include Atlas Flora Europaeae, Atlas of Amphibians and Reptiles in Europe, Atlas of European Breeding Birds, European Mammal Atlas and European Invertebrates Survey. The model will be one of the main EUNIS reference frameworks for spatial data at European level.

c) EC Clearing House Mechanism

An important online source for biodiversity conservation information in the EU is the European Community Biodiversity Clearing-house Mechanism (EC-CHM). The website is mainly built as a portal site, with the core of its content stored in a metadatabase. This is a directory of information sources that is accessible by way of a free keyword search as well as through pre-cooked searches by simply browsing the site, starting from the central part of the front page. The aim for most services is to be accessible to primarily the EC desk officers and national CHM experts, for uploading news and documents or updating their own address information. Additional detail on the development and experiences with the EC CHM can be found in Appendix 2: *Case Study: Experience in developing the regional EC Clearing House Mechanism.*

The EC-CHM website is updated by the European Centre for Nature Conservation (ECNC) under instruction from the European Environment Agency (EEA) that decides the content of the site on the basis of advice from a taskforce group. The taskforce group is made up of representatives from the Member States, the European Commission, the European Topic Centre on Nature Protection and Biodiversity, the CBD Secretariat, and other specialist organisations such as UNEP-WCMC. The long-term intention of the EC-CHM is to become the prime access point for information on biodiversity and its conservation in the EU. Experiences with the EC Clearing House are expanded in the report, *EC Clearing House Mechanism – Experience in developing a regional clearing house mechanism*, that accompanies this Project.

d) Other European Networking Initiatives

To further streamline information flows, the European Environment Agency is working to develop an inventory of the requirements for Member States to monitor and report environmental data. A reporting obligations database (ROD) has been developed and populated for the subject areas of air, water and waste, and biodiversity. The ROD is an important element of a new integrating network referred to as "ReportNet" that seeks to streamline major information flows and integrate state of the environment reporting processes with indicator work and reporting to specific Directives and MEAs.

An additional source of information for decision makers is provided by the "Europa" website of the European Union itself. This is a high level access site that contains useful information relating to biodiversity conservation, for example information relating to Natura 2000 contained within the web pages of the Environment Directorate-General and can connect to relevant web-based information is also held by the Agriculture, Development, Fisheries and Regional Policy Directorates-General. Responsibility for the information contained in these pages lies with the appropriate unit of each Directorate-General. For example information relating to the EC Biodiversity Strategy and Action Plans and their implementation is the responsibility of the Nature and Biodiversity Unit of Directorate B (Environment quality and natural resources), of the Environment Directorate-General. There is also a central European law database that may be found though this means. Many UK decision makers indicated use of the Europa website as a first stop in obtaining information.

The Pan-European Biological and Landscape Diversity Strategy also seeks to harmonise biodiversity conservation by promoting a consistent approach and common objectives for national and regional action to implement the Convention on Biological Diversity. The Strategy introduces a co-ordinating and unifying framework for strengthening and building on existing initiatives. It does not aim to introduce new legislation or programmes, but to fill gaps where initiatives are not implemented to their full potential or fail to achieve desired objectives. Furthermore, the Strategy seeks to more effectively integrate ecological considerations into all relevant socio-economic sectors, and will increase public participation in, and awareness and acceptance of, conservation interests.

A harmonization initiative developed as a result of the PEBLDS is the European Biodiversity Monitoring and Indicator Framework (EBMI-F). This initiative aims to enhance the possibilities for creating more synergy among past, present and future biodiversity monitoring-to-reporting efforts at the European level in order to reach higher efficiency and effectiveness in communicating the state of, and trends in, Europe's biodiversity to the policy-makers concerned. The Council of

the PEBLDS has requested the European Nature Conservation Centre (ECNC) and EEA to develop and co-ordinate EBMI-F in order to support the implementation of PEBLDS. It will provide input into the next Ministerial Conference "Environment for Europe".

4.2.3 Summary Experiences with the European Networks

The EEA has recently completed "*Europe's Environment: the third assessment*". During this process of information gathering and assessment, the strengths and weaknesses of the existing European information networks were reviewed. Particularly there was examination of the effectiveness of improved harmonisation and streamlining measures introduced by the combined efforts of the EEA, the European Commission countries and international organisations over the past five years.

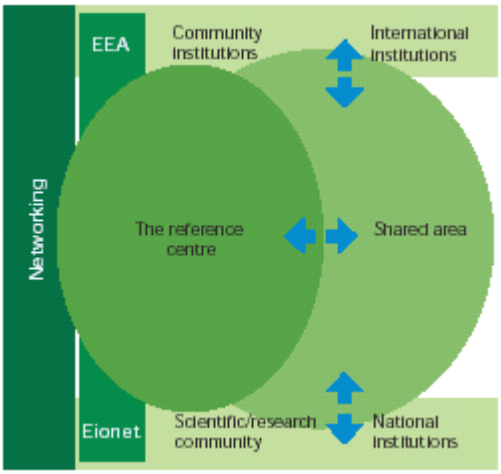

Figure 4: European Environment Information System (from EEA, 2003)

The above figure outlines the main conceptual components of environmental information sharing in Europe. As a result of streamlining efforts (and the harmonisation achievements identified in the foregoing) a new integrating network is under development referred to as "ReportNET, shown conceptually below.

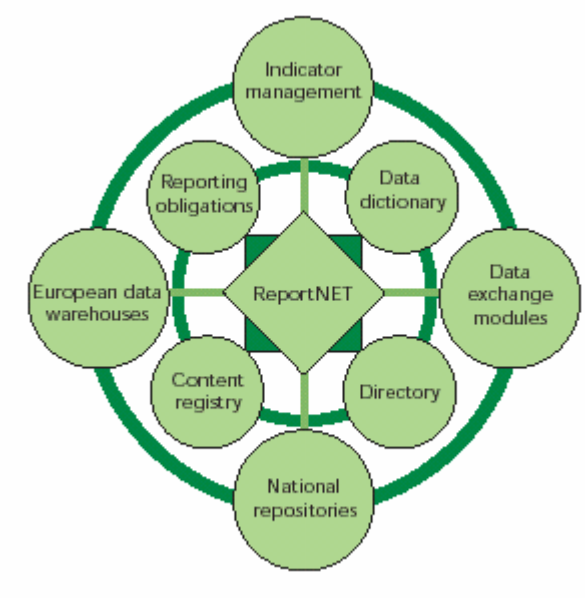

Figure 5: The ReportNET Concept (from EEA, 2003)

ReportNET is built on the basis of the key principles of a shared European Environment Information System. These are:

- harmonised collection;
- providing the data once and using it for many purposes;
- proceeding with a common validation and aggregation;
- delivering policy-relevant assessments.

To satisfy these principles, ReportNET includes components for reporting obligations, metadata, directory services, data repositories, indicator management and process monitoring. ReportNET deals with the functions that are needed by the **input** part of the EEIS. National databases in EIONET institutions are accessed through the "data exchange modules".

In assessing the effectiveness of this approach, a number of observations were made concerning data gaps – particularly "long-term series on biodiversity". In this regard it was noted (EEA, 2003) that: "*the most comprehensive datasets are being collected on species, habitats and sites for Natura 2000 (the birds and habitats directives) for the EU countries and for non-EU European countries in the related Emerald network of the Bern convention. Many of the datasets are being used by the EEA through the European nature information system (EUNIS).*" This indicates that the harmonisation initiatives and tools of the EEA and ETC/NPB have been effective.

On the other hand it was noted that monitoring and indicator development needed more effort in harmonisation in Europe and globally, so that time-series would be meaningful. Indicated challenges for future improvement included:

- Coordination across Europe on indicators and monitoring, relating this to European and global efforts;
- Making more use of harmonised reference tools: georeferences such as biogeographical regions; assessment criteria such as harmonised by IUCN (threats, management categories); species names; and habitat classifications (such as the EUNIS habitat classification);
- Broadening the scope of biodiversity to include other important species groups and habitat types;
- Developing more widely usable sets of general bio-indicators or biomarkers for environmental change;
- Ensuring set-up and maintenance of a selection of long-term harmonised monitoring programmes to identify trends in biodiversity conditions;
- Enhancing and maintaining open access to datasets and information held by countries and organisations, such as by using the national and EU Internet-based clearing house mechanism.

In general the approaches to harmonised and integrated reporting and questionnaires, the sharing of institutional information through EIONET, and data through EUNIS and the EC-CHM was seen as effective and required increased use of existing harmonization tools and standards, and better integration of environmental monitoring and reporting systems.

4.3 Private Sector Experiences

4.3.1 Overview

Private sector organisations, particularly major multinational corporations, require and use biodiversity information in corporate decision-making. Of primary importance are multi-national “extractive” and natural resource harvesting industries, such as oil and gas, mining, forestry, fisheries, hydro-electric generation, but there is an identified growing need for biodiversity considerations in the business decisions of various sectors of the manufacturing, chemical, pharmaceutical and retail industries, transportation, and of course in tourism.

Biodiversity information is used for:

- Strategic and operational planning (e.g. planning an exploration or exploitation programme);

- Choosing an industrial site (e.g. for a factory, or port);
- Environmental impact assessment (e.g. of major projects – dams, roads, industrial plants).

In making decisions when private sector corporations wish to:

- Avoid being in breach of international or national law;
- Maximize benefit/cost by avoiding costly on-going environmental conservation measures or habitat rehabilitation.

4.3.2 Information Requirements

The requirements and experiences of the Oil and Gas industry are further expanded in the accompanying Appendix 3: *Case Study: Experiences in the use of Internet-accessible information in the oil and gas industry*. The requirements of this industry group (along with mining) can be summarised as:

1. Environmental Law

International conventions and treaties applicable in the region of interest and the way in which they affect the industry.

2. National laws controlling nature conservation and biodiversity

National requirements for Environmental Impact Assessment (EIA).

3. Protected and restricted land use

Internationally and nationally designated protected areas – their level of protection and limitation, and exact location (boundaries).

4. Protected species

Status and distribution of protected species – including key habitat requirements, threats and migratory patterns.

5. Ecosystems

Location of critical and important habitats (even if not officially protected or designated, such as mangroves, coral reefs, cloud forests, etc).

Location of areas of special interest (e.g. turtle nesting grounds, biodiversity "hot-spots", important bird areas, etc).

Other industry groups have very similar requirements since they too need to decide on sites for facilities and plan operations, and they also need to be aware of

environmental consequences (costs). Locating a shoe factory in a developing country requires many of the same considerations (hence similar data sets) to locating a mine or a refinery, although the scale of the information may vary.

4.3.3 Modes of Obtaining Biodiversity Information

Private sector corporations very often make use of third party consultants to assemble biodiversity information relative of an issue or decision. Such consultants then make use of published and unpublished materials, national and international Internet accessible sources, and personal contacts. UNEP-WCMC has frequently operated in that role for oil and mining companies to prepare "country profiles" or assemble facts from a range of sources to assist in an EIA. The material is supplied in digital form, often with a GIS component that can be integrated with the corporation's own information, along with narrative expert assessment.

It would appear that corporations feel uncomfortable attempting to directly access international sources, presumably due to concerns with appropriate expert interpretation, and lack of knowledge of what is available and where to find it – in short because the information is not "appropriate for decision-makers" in their sector. It is difficult to imagine, for example, an oil company executive logging into "The Species Analyst" or the WCMC "Threatened Plants Database".

An alternative access method that has proven its worth is to develop industry-oriented access and analysis tools that are more customised to needs of a particular industry group. UNEP-WCMC has had considerable success with an Interactive mapping facility (iMAPS) custom designed to provide on-line access to a range of map-based information to an oil company industry group. (See more details in Appendix 3: *Case Study: Experiences in the use of Internet-accessible information in the oil and gas industry*). This has proved popular and useful for decision making in the oil industry. De facto standards have evolved for the presentation of material in simple GIS formats.

One disadvantage is that this is essentially based on "static' secondary datasets that are only updated at long intervals from primary sources – so that a retrieval may not find the latest boundary changes of a national park for example. Furthermore, if a type of information is needed that had not been anticipated, the company has to revert back to employing a consultant to find it, and/or to add it to the facility.

A recent cooperative Energy and Biodiversity Initiative (NGOs and the oil industry) prepared as one of its products a CD-ROM guide to "Online Biodiversity Information". This has been cited as very useful (see Appendix 3 for more details), but has the disadvantage of being rapidly out of date, as the

frequency of change of web addresses is very high, and new information resources are added daily. This type of guide would be much improved as an on-line "portal" or a service through the CBD-CHM, with designated responsibilities for maintenance.

A number of initiatives are underway to improve this situation. The World Commission on Protected Areas has agreed to further development of a World Database on Protected Areas. Under development through a consortium, it will provide a **distributed** Internet-accessible system wherein protected area information is updated continuously by the various national and international custodians. UNEP-WCMC has launched Project Proteus to provide the user-friendly access tools, not only to the WDPA and a broad range of information sources. This will then enable corporations to access these up-to-date datasets directly without the intermediate third party or a specialised interface. Project Proteus is being substantially funded by a group of major corporations (mining, oil, financial, and retail industries) so they will be able to ensure that decision-maker needs are met during the process.

An excellent example of the (potential) use of biodiversity information in decision-making concerns a pending decision by a mining industry group to voluntarily desist from mining exploration in World Heritage Sites and internationally designated protected areas with certain IUCN management categories. Participating companies must decide by determining the potential economic impact (opportunity cost lost) of such a ban. To make the decision they need up-to-date boundary maps of internationally designated protected areas (and associated attributes such as IUCN Management Category) downloadable in a suitable GIS format. The companies will then overlay the information with internal maps of geological prospect information and land holdings to assess the potential impact on planned programmes and estimated reserves. Currently such information can be assembled (several steps) from database sources, but not by a simple query. Extending the question to include national protected areas would be more problematic.

Private sector companies also need to share biodiversity information with each other (and with the conservation community). There is a considerable tradition of information sharing within the extractive industry, particularly with regard to information that must be made "public" as part of lease agreements with national governments. Such shared information banks (e.g. of geophysical data) are usually operated through third party agencies under an industry association. Interest is increasing in examining ways to share private sector biodiversity information in the same way (such as that gathered during EIAs). A third party broker with expertise in biodiversity would certainly make a good custodian and disseminator of such information. The principal issue is appropriate indexing and geo-spatial

referencing of the data (many media, including databases, reports and imagery) to allow for effective access through search engines, and proper linkages to other biodiversity information sources using access tools such as the embryonic Proteus. A feasibility study has recently been completed by UNEP-WCMC.

4.3.4 Data Gaps and Functional Requirements

While a great deal of information needed for private sector decision making can currently be garnered from existing networks, some important gaps remain. Principally these are:

- Up-to-date access to locations (boundaries) of **national and sub-national** protected areas;
- Access to **national** environmental legislation and regulation;
- Information (in GIS form) on sensitive ecosystems;
- Improved metadata – to assist in finding useful information sources;
- Improved access to case studies and assessment reports.

Functional improvements are needed as well, among them:

- Information correctly geo-referenced and downloadable in GIS form;
- Tools to improve access through various entry points – notably country, region, species (linked through common names), treaties and conventions;
- More focussed search engines relevant to biodiversity.

CHAPTER 5 SOME CONSIDERATIONS FOR THE IABIN REGION

5.1 Overview

As noted in the Introduction, it has been assumed that following the seven sub-regional studies under the GEF PDF Preparatory Block B Grant in 2003, that the Bank is well informed on current networks and opportunities in the Americas. A number of the key regional networks were summarised in Document 1 - *IABIN in the Context of Key Programmes and Initiatives in Biodiversity Information Sharing.* Only a few additional observations will be made here.

The most relevant regional networks are NatureServe, REMIB, CRIA and NABIN. While all of these cooperate in some ways, it cannot be said that they form a coherent non-overlapping whole. Each may have some potential strengths and experience that can be incorporated into IABIN. Some comments therefore on each follow:

5.2 NatureServe

NatureServe is a non-profit conservation organisation that provides scientific information and tools to help guide effective conservation action. It represents an international network of biological inventories - known as “natural heritage programmes” or “conservation data centres” - operating in the United States, Canada, Latin America and the Caribbean.

Potential contributions to IABIN include:

- Standards for biological inventory and biodiversity data management;
- Guides to natural resource decision-making;
- A biodiversity data model that reflects a set of inventory and data management standards and protocols referred to as “natural heritage methodology”;
- “Biotics 4” data management software.

5.3 REMIB

The Comision Nacional para el Conocimiento y Uso de la Biodiverstad (CONABIO) is a Mexican national Inter-Ministerial Commission. CONABIO sponsors and hosts the Red Mundial de Informacion sobre Biodiversidad (REMIB). In English, “The World Biodiversity Network”, REMIB is a computerised system of biological information that includes databases on curatorial, taxonomic, ecological, cartographic, bibliographic, ethno-biological information and catalogues on natural resources. It is based on an academic inter-institutional decentralised and international organisation, formed by research and

higher education centres, both public and private, that possess both biological collections and data banks.

Potential contributions to IABIN include:

- Identified partner institutions ("nodes") that possess databases on biodiversity and natural resources and associated researchers and experts;
- Established rules and procedures for participation in REMIB;
- A National System of Information on Biodiversity (SNIB).

5.4 INBio (Costa Rica)

The Costa Rican Instituto Nacionale Biodiversidad (INBio) is a non-governmental, non-profit, public interest organisation. Its mission is *"To promote an improved awareness of the value of biodiversity, to achieve its conservation, and to improve the quality of human life"*. It has five main programmes:

- National Inventory of Biodiversity;
- Information Management;
- Biodiversity Prospecting;
- Biodiversity Social Outreach Program;
- Conservation for Development.

INBio is considered one of the prime leaders in the conservation of biodiversity in the region, with strategic alliances locally and internationally, with governmental, academic, private and investigative sectors.

Potential contributions to IABIN include:

- A national inventory of biodiversity (and the associated data model);
- Information systems expertise and experience including the "ATTA" database;
- Databases that include GIS mapping of ecosystems;
- A "parataxonomist" programme that is a model for public involvement in biodiversity;
- Established collaborations within the region.

5.5 CRIA (Brazil)

The Centrade Referencia en Informacao Ambiental (CRIA) is a Brazilian national agency dedicated to the dissemination of electronic information for the scientific and technological community. It provides biological information of environmental

and industrial interest, with the intent of contributing to the conservation and sustainable use of Brazil's biological resources.

Potential contributions to IABIN include:

- Experience with development and use of distributed environmental information systems, for example, "SinBiota", an environmental information system for the State of Sao Paulo;
- Established regional collaboration, including working with the Biodiversity Research Centre of Kansas University on the development of "Lifemapper", and with the Species Analyst Network;
- Development of a tool for cataloguing invasive species information for the IABIN Invasives Information Network (I3N) Project, currently being tested by organisations in 11 countries of the region;
- CRIA frequently organises and hosts regional symposia and workshops related to biodiversity information sharing, such as "Trends and Developments in Biodiversity Informatics Symposium: Key Innovations in Biodiversity Informatics" in 2002, and the forthcoming "Inter-American Workshop on Environmental Data Access" to be held in March 2004. The papers and outcomes from this workshop should be a valuable resource to inform the B-IABIN project.

5.6 NABIN

The North American Biodiversity Information Network (NABIN) is described as *"a collaborative network of people and institutions involved in the management and use of biodiversity information"*. NABIN's stated goal *is "to improve access and integration of biodiversity information in North America for better conservation decision-making"*.

It has been partly supported by the trilateral (Canada, USA, Mexico) Centre for Environmental Co-ordination (CEC), as well as funding from several national sources. To date, it has particularly focused on technical standards and protocols for the exchange of information on museum specimens in North America.

Potential contributions to IABIN include:

- Experience with the development of The Species Analyst and associated data exchange standards and tools;
- Studies of means to unify TSA and REMIB.

There is currently no Web presence for NABIN, or widely available documentation of the tools and standards previously developed. Following a

review in 2003, the coordinating support from the CEC seems to have been reduced, and so the future of NABIN and its relationship to IABIN is now unclear.

Another potential useful contribution to IABIN is a GIS-based two level ecosystem classification map for North America that was developed by the CEC. This work could form a useful starting point to extend this consistent ecosystem spatial framework throughout the IABIN region. At the moment, the ecosystem map base is not widely used in CEC work or products, and was not made available through NABIN.

Recently the North American countries have coordinated efforts of their national atlas programmes to produce a compatible digital product. (see viewer at http://rnp782.er.usgs.gov/nor-amer-atlas/viewer.htm). Extension of this throughout the IABIN partnership would provide the consistent base needed for linking to non-biological networks (See Document 3 - *Linking Biodiversity Information with Non-biological Networks)*

CHAPTER 6 CONCLUSIONS AND RECOMMENDATIONS

6.1 Introduction

This Chapter summarises the conclusions and recommendations to the B-IABIN project derived from experiences elsewhere in the use of biodiversity information for decision making. These are integrated from the observations and experiences of Chapter 4 and the "lessons learned" of the four Case Study Appendices. The main document and the Appendices cover a wide range of national and regional experiences and have been prepared by different authors, who themselves have varying experiences and viewpoints. This is bound to lead to a variation in perspective, and lessons-learned that are somewhat contradictory. Of particular note is the emphasis on grass-roots informality coming from the ASEAN regional experience, and the formal structures recommended from the European experience. The main thrusts are presented here. Reference should be made to the Appendices for more background and context.

6.2 Conclusions

- A vast number of international networks and information sources are now available to assist decision-making related to biodiversity conservation. Many of these are accessible through the Internet, and this type of access is growing in developed as well as developing countries. In spite of this progress in technical availability, many of the concerns identified 25 years ago still apply, particularly with regard to "appropriateness" for decision makers.
- Many networks overstate their scope, functionality and utility and this is an impediment for decision-makers in identifying appropriate sources.
- There are overlaps and duplications in the information content and scope of networks, but these are gradually being overcome through harmonisation initiatives, cooperative agreements and the evolution of de facto standards.
- Private sector decision makers often make use of third parties to assemble information from existing sources, indicating that current networks require specialized expertise, and do not have adequate tools for direct decision maker access.
- Public sector decision makers often focus narrowly on sources directly connected to their mandate, such as Convention Secretariat sites and may not be aware and cannot easily find additional information.

- The most effective networks for decision making are those that are well supported by harmonisation programmes and tools – such as standardised ecosystem (spatial) frameworks, species synonym files, controlled vocabularies, efforts at specifying common core datasets, and the like.
- The most effective networks have a clear purpose and defined scope in support classes of decisions and decision makers (rather than just to "exchange information"), and provide means of access and presentation suitable for national or regional level – such as by country.
- Few networks outside of Europe currently have performance measurement systems or have completed reviews of how the system is used and by whom.
- There is a lack of information available that is suitable for identifying long term trends or can be used for indicators, and there is a need to make better connections between national reporting and indicator development.

6.3 Recommendations

6.3.1 General Overarching

- IABIN should clearly define its scope and intended audience. Particularly it should identify the types of decisions and activities it intends to support, for example:
- Supporting national implementation of specific Conventions
- Supporting the development of national Biodiversity Action Plans;
- Supporting the development of regional initiatives on biodiversity conservation to address specific issues of common concern.
- This means that IABIN should more clearly refine the general objective "*to provide access to … biodiversity information currently existing in individual institutions and agencies in the Americas"* to define the **purpose** of such information exchanges. In this way IABIN will be able to establish a performance measurement system against which any proposed programme, services or database can be evaluated. For instance this would ask "*How does this (proposed) service support national implementation of conventions?*"
- IABIN should work with its members to develop meaningful biodiversity indicators (that would contribute to the 2010 Targets for

example) and provide means to more closely connect indicators and monitoring to reporting to Conventions.

- IABIN should adopt (or adapt) *de facto* technical standards for access and data exchange already in use by major international networks, and in this regard especially seek to be compatible with UNEP-WCMC, Millennium Ecosystem Assessment, BirdLife International, the WDPA, and GBIF. (To put it in the reverse – IABIN should **never** adopt or use a technical or non-technical standard or protocol that is not already used by a major international network).

6.3.2 Deriving from Regional Experiences

- The model for IABIN should be for a relatively closely controlled network directed at primary identified information needs for national decision makers, similar to the European EIONET - ReportNET - EUNIS system, rather than a loosely structured "Clearing House".
- IABIN should support the network with non-technical harmonisation initiatives (and tools) including:

- A standardised keyword vocabulary (multilingual) compatible with the CBD Controlled Vocabulary and GEMET;

- A region-wide ecosystem spatial framework that extends the existing North American ecosystem map;

- Species synonymy files that build on existing international reference systems;

- Framework support for WDPA core data sets on protected areas;

- Consistent region-wide administrative boundary mapping and coding (for ease in integrating socio-economic data);

- Harmonisation frameworks to enable comparability of environmental statistics across the region (e.g. similar to the OECD/Eurostat standardised questionnaires);

- Modes of indexing, codifying and accessing national legislation related to biodiversity;

- IABIN should designate some national institutions as "Topic Centres" along the lines of the European model that would develop and support IABIN harmonisation tools in selected fields;

- IABIN should take cognisance of, and build on, the strengths of existing networks in the region, especially, REMIB, INBio, NatureServe and CRIA.
- In order to build an effective and trusting relationship amongst partners in IABIN the issue of data sharing should be approached with circumspection. In this, IABIN would be well advised to draw its operating principles from international experience – for example the IUCN-sponsored 'Global Biodiversity Commons' process – rather than from hemispheric ideas of equity.
- To be perceived as useful by its stakeholders, an intervention must be designed and implemented in ways that are responsive to their needs, and explained as such. This implies the strong need for stakeholder participation supported by detailed, trusted information based on objective analysis, preferably from a global perspective formulated in a way that is relevant to American issues.
- Participants and participating institutions should be selected by the stakeholders as being those that best responds to their needs.
- IABIN should avoid being excessively formal and bureaucratic in its interactions. It is important that the IABIN bodies carry out their work in an open atmosphere, allowing for the development of a network of focal points that are highly committed to the process, not least through holding personal meetings where bureaucratic procedures are avoided. It is recommended for that reason that IABIN invests in building the capacity of individual national focal points.
- Networks should grow rather than be created by projects. It is more important for informed, inclusive dialogue to lead to a shared perception of genuine needs, which can then be met by the judicious application of technology, than for skills and technologies to be offered at the front end. Hence investments should be formulated with an initial focus on consensus building, with implementation budgets available but not committed to any particular items.
- It is recommended that IABIN uses common themes such as measuring progress towards the 2010 target as a milestone for bringing together the IABIN countries and thus building the Inter-American knowledge network of the participating countries.
- In order to allow for cooperation between the regional and global CHM, it is recommended that IABIN maintains a clearly defined role regarding the CBD CHM and its national focal points in the Americas. IABIN should also continue to actively participate in the further

development of the CBD CHM. This could include developing supporting mechanisms that help participating states with implementation of national CHMs.

- IABIN should be a trigger for national action, for instance by developing a mechanism for national focal points to report back to IABIN on any national action that has been stimulated by the IABIN information facilities.
- It is recommended that IABIN pays particular attention to clear lines of communication between those involved with the technical and content aspects, respectively, amongst and between the regional and the national level.
- IABIN should put a strong focus on the development of a well balanced metadatabase that takes into account other related databases (such as the global CHM) and user needs for links to external biodiversity information sources. It should aim to provide at least the core services such as a catalogue or metadatabase in the most relevant languages of the American region (Spanish, English, Portuguese).

6.3.3 Deriving from National Experiences

- IABIN should review how to support specific national needs for implementation of Conventions, including assistance with information management regimes to develop indicators that are relevant both nationally and regionally. Identified needs include:
- Information on sustainable use and markets for biodiversity;
- Information on national implementing legislation, strategies and measures in other countries;
- Case studies, good practices and "lessons-learned" in countries with comparable situations;
- Early warning of emerging issues and policy developments.
- A major concern of policy makers is the need for information to be comparable and compatible – i.e. capable of being integrated and summarised. IABIN should assist countries to achieve increased harmonisation to enable useful interpretation in a policy context. This means not only developing tools for harmonisation of the information *per se*, but also for methods and means of information management and analysis.

- A central national repository for biodiversity related information, especially in GIS format has been found to be effective (e.g. in Japan), especially in supporting national and regional EIA. IABIN should encourage and support such centres and assist with data management tools and harmonisation standards.
- Various countries have found effective alternative ways to coordinate biodiversity information – for example Japan uses a very formal approach with an high-level Inter-ministerial Council, while the UK has no such body, and finds a more loosely arranged government/NGO coordination through a "Joint Nature Conservation Council" to be effective. IABIN should be prepared to interact with a wide range of national structures.
- Making information available to the public has been found to be an important function and IABIN could serve an important role in this regard in assisting countries in data dissemination, through metadata and improved broad access. Access through IABIN would add a level of public confidence to the data beyond "official" government releases.
- Countries are concerned with specific policy driving forces related to economic issue and international commitments. IABIN should help articulate these driving forces and determine in what ways the network can address them specifically through improved regional information exchange, rather than through general measures.

6.3.4 Deriving from Private Sector Experiences

- There is currently limited information available through the Energy and Biodiversity Initiative to support the Oil and Gas industry in the Americas. The development of IABIN as a network specifically focussing on the Americas will, it is hoped, provide a more extensive and comprehensive coverage of the region.
- The information requirements for the extractive industries are quite similar and include boundaries of protected areas, international treaties and conventions, national environmental laws and regulations, and the location and typification of ecologically sensitive areas. IABIN could therefore play a role in encouraging and facilitating countries on the location and boundaries of all existing and planned Protected Areas and non-protected sensitive habitats and species. This will provide the information required at the early stages of project identification and site selection. Information that has been specifically

identified as valuable for the planning process is clear definitions of sensitive environment types and a means of assessing the quality of information.

- IABIN should facilitate the availability of ecosystem and protected area information in GIS format suitable for downloading to overlay with industry sector information.
- IABIN should endeavour to be a coordinating resource for access to national environmental law and regulation.
- The catalogue or metadata function of IABIN is of importance to industry in order to locate data sets useful for environmental impact assessment and for case studies of habitat rehabilitation.
- Regarding all of the above information services, IABIN should concentrate on providing information not covered by global systems (e.g. national legislation and protected areas), and with continuously up-dated on-line availability rather than static resource packages on CD-ROM.

ANNEX 1 - Acronyms and Abbreviations

AiDA	Accessible Information in Development Activities (of World Bank)
ASEAN	Association of South East Asian Nations
BEG	Biodiversity Expert Group (of EC)
B-IABIN	Building the Inter-American Biodiversity Information Network (project)
BRIM	Biosphere Reserve Integrated Monitoring
CBD	Convention on Biological Diversity
CDDA	Common Data Base on Designated Areas
CD-ROM	Compact Disk - Read Only Memory
CEC	Commission for Environmental Cooperation (North America)
CEC	Commission for Environmental Cooperation (US, Canada, Mexico)
CEO	Chief Executive Officer
CFC	Chlorofluorocarbon
CGRS	European Chorological Reference Grid (from French)
CHM	Clearing House Mechanism
CIESIN	Center for International Earth Science Information Network
CITES	Convention on the International Trade in Endangered Species
CMS	Convention on Migratory Species
CONABIO	Commission National para el Conocimiento y Uso de la Biodiverstad (Mexico)
COP	Conference of the Parties
CRIA	Centrade Referencia en Informacao Ambiental (Brazil)
DEFRA	Department for Environment, Food and Rural Affairs (UK)
DG	Directorate General (of EC)
DNLI	Digital National Land Information (system)
EAP	Environmental Action Plan
EBMI-F	European Biodiversity Monitoring and Indicator Framework
EC	European Commission (or Community)
ECNC	European Centre for Nature Conservation
EEA	European Environment Agency

EIA	Environmental Impact Assessment
EIONET	European Environment Information and Observation Network
ENHSIN	European Natural History Specimen Information Network
ETC	European Topic Centre
ETC/NPB	European Topic Centre - Nature Protection and Biodiversity
EU	European Union
EUNIS	European Nature Information System
EUROMAB	European Man And Biosphere (Programme)
EuroStat	European Statistics Office
FAO	Food and Agriculture Organisation (UN)
FAOSTAT	Food and Agriculture Organisation Statistical service
G3OS	Collective for the 3 Global Observing Systems
GBIF	Global Biodiversity Information Facility
GCOS	Global Climate Observing System
GEF	Global Environment Facility
GEMS	Global Environment Monitoring System
GEO	Global Environmental Outlook
GIS	Geographic Information System
GOOS	Global Oceans Observing System
GOSIC	Global Observing Systems Information Centre
GRID	Global Resource Information Database (UNEP)
GTOS	Global Terrestrial Observing System
IABIN	Inter-American Biodiversity Information Network
IAC	Informal Advisory Committee (to CHM)
IBA	Important Bird Areas
ICLARM	International Centre for Living Aquatic Resources Management
ICP/IM	International Cooperative Programme/Integrated Monitoring
IGO	Inter-Governmental Organisation
ILTER	International Long Term Ecological Research (Network)
INBio	Instituto Nacionale Biodiversidad (Costa Rica)

IOC	International Oceanic Commission
IPNI	International Plant Name Index
ISIS	International Species Information System
ITIS	Integrated Taxonomy Information System
IUBS	International Union of Biological Sciences
IUCN	World Conservation Union
IUCN-ELC	IUCN Environmental Law Centre
JIBIS	Japan Integrated Biodiversity Information System
MA	Millennium Ecosystem Assessment
MCE	Main Component Element (of EIONET)
MDG	Millennium Development Goal
MEA	Multinational Environmental Agreement
NABIN	North American Biodiversity Information Network
NATO	North Atlantic Treaty Organization
NFP	National Focal Point
NGO	Non-Governmental Organisation
NK	Nippon Koei
NKUK	Nippon Koei United Kingdom
NRC	National Reference Centre (of EIONET)
NSBC	National Strategy on Biodiversity Conservation (Japan)
OAS	Organization of American States
OECD	Organization for Economic Cooperation and Development
PDF	Project Development Fund (of GEF)
PEBLDS	Pan European Biological and Landscape Diversity Strategy
PID	Project Implementation Document (World Bank)
PIP	Project Implementation Plan (of GEF)
RBG	Royal Botanic Gardens
REMIB	Red Mundial de Informacion sobre Biodiversidad (Mexico)
RINCIS	Rationalisation of Nature Conservation Information Systems (Project)
ROD	Reporting Obligations Database (of EEA)

SBI	Sofia Biodiversity Initiative
SBSTTA	Subsidiary Body for Scientific Technical and Technological Affairs (of CBD)
SEDAC	Socio-Economic Data Application Center
TDWG	Taxonomy Data Working Group
TEMS	Terrestrial Ecology Monitoring Sites (database of GTOS)
TEMS	Terrestrial Ecosystems Monitoring Sites
TN	Thematic Network (of IABIN)
TSA	The Species Analyst
UK	United Kingdom
UK-ECN	United Kingdom Environmental Change Network
UN	United Nations
UN-CSD	United Nations Commission for Sustainable Development
UN-ECE	UN Economic Commission for Europe
UNEP	United Nations Environment Programme
UNEP-DEWA	UNEP - Division of Early Warning and Assessment
UNESCO	United Nations Educational Scientific and Cultural Organization
UN-ROE	UN Regional Office for Europe
UTM	Universal Transverse Mercator (map projection)
WCMC	World Conservation Monitoring Centre
WDPA	World Data Base on Protected Areas
WHC	World Heritage Convention
WHO	World Health Organization
WMO	World Meteorological Organisation
WRI	World Resources Institute
WWF	World Wide Fund for Nature