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INFORMATION-SHARING AND THE BIOSAFETY CLEARING-HOUSE

GUIDELINES FOR NATIONAL PARTICIPATION IN THE BIOSAFETY CLEARING-HOUSE

Note by the Executive Secretary

The present information document conveys Guidelines for National Participation in the Biosafety Clearing-House, which were developed by the Secretariat and issued as Notification 2003-105, on 25 September 2003. The Guidelines were developed following a recommendation of the meeting of the Liaison Group of Technical Experts on the Biosafety Clearing-House, held in April 2003 in Montreal, Canada, with the intent of assisting Parties and other Governments in the use of the Biosafety Clearing-House.

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Guidelines for National Participation in the Biosafety Clearing-House

Prepared by the Secretariat of the Convention on Biological Diversity
September 2003

Introduction

The Biosafety Clearing-House was established in accordance with Article 20, paragraph 1, of the Cartagena Protocol on Biosafety, in order to facilitate the exchange of information and experience pertaining to living modified organisms and to assist Parties to implement the Protocol. As part of their obligations in implementing the Protocol, Parties are required to make several types of information available through the Biosafety Clearing-House.

The Biosafety Clearing-House comprises a central portal, and a distributed network of national components to assist Parties to fulfil obligations under the Protocol. Parties are able to make national information required under the Protocol available through the central portal of the Biosafety Clearing-House. This document provides guidelines to Parties and other Governments on the options available related to national participation in the Biosafety Clearing-House. The intent of the Guidelines is to assist Parties and other Governments in selecting one or more options that are appropriate to their needs and capacities.

The following four options are summarized in this document:

1. Register data in the central portal using the Management Centre

2. Register data locally using database templates and send data to the central portal

3. Make data available through a local website and allow the central portal to crawl to retrieve metadata

4. Store data on national biosafety clearing-house databases, and actively make those data available through the central portal using the biosafety clearing-house interoperability protocols.

It should be noted that these options are not mutually exclusive. For example, a Party or other Government may choose to register some types of information directly in the central portal using the Management Centre (Option 1), while choosing another option for other types of information. Alternatively, the same type of information may be registered using different options. In addition, the use of any of these options does not preclude the right of Parties or other Governments to submit information for the Biosafety Clearing-House to the Secretariat by fax, email or other offline mechanisms.

The following sections describe the details of each option with a focus on technical requirements. Annex A summarizes the specifications for each option, associated Internet connectivity requirements, and the minimum requirements and responsibilities with respect to technical capacity and resources. Annex B provides a decision tree to assist Parties and other Governments in selecting appropriate options, based on Internet connectivity and other considerations.

Option 1: Register data in the central portal using the Management Centre

The first option available to a Party or other Government is to have its Biosafety Clearing-House national focal points and/or other authorized national users use the Management Centre of the central portal to register data through the online forms. The Management Centre is a secure mechanism which allows a Government to register, delete, or edit its records directly in the Biosafety Clearing-House.

Parties or other Governments using this option may or may not have national websites acting as a national biosafety clearing-house. However, they would register data through the central portal of the Biosafety Clearing-House in order to fulfil obligations under the Protocol.

Technical Requirements

This first option does not have requirements for a high level of technical capacity; it does require, however, basic computer skills and a computer with an Internet connection. A modem connection speed of 33Kbps is the bare minimum, while 56Kbps or higher is preferable.

Option 2: Register data locally using database templates and send data to the central portal

Option 2 is based on storing data locally in a national database, and exporting or sending those data to the central portal. Ideally the database template developed by the Secretariat would be used, as it is designed to be compatible with the Biosafety Clearing-House databases of the central portal. However, it is also possible for a Party or other Government to develop its own database, or adapt an existing database, provided that it meets the same specifications with regard to the structure of each record type (preferably based on a relational database management system, such as MS SQL, Oracle or MySQL).

Data stored locally must then be sent periodically to the central portal. The database template developed by the Secretariat contains a function to export records to the central Biosafety Clearing-House databases. Alternatively, in cases of poor Internet connectivity, information could be sent by, for example, CD-ROM, in which case the Secretariat would transfer the data to the Biosafety Clearing-House upon receipt.

Technical Requirements

This option requires only a basic computer infrastructure. More advanced computer skills will be needed if a Party or other Government decides to develop its own national database, as opposed to using the template developed by the Secretariat. An Internet connection is not required if the data are sent to the Secretariat via formats such as CD-ROMs. If the data are sent via the Internet, the records can be exported regularly, assuming the availability of a stable Internet. Data can also be sent less frequently, after a number of new or revised records have accumulated. For Parties and other Governments using an Internet connection, a modem connection speed of 33Kbps is the bare minimum, while 56Kbps or higher is preferable.

Option 3: Make data available through a website and allow the central portal to crawl to retrieve metadata

In this option, a Party or other Government hosts a website that is available though a server with a fast and permanent Internet connection. The central Biosafety Clearing-House would, on a regular basis, search or "crawl" the website and extract metadata descriptors of the records for storage on the central Biosafety Clearing-House. To facilitate this retrieval, metadata must be formatted in XML (extensible mark-up language), using the Dublin Core as the document description standard, and using Resource

Description Framework (RDF) to specify semantic schemas (since it is the central Biosafety Clearing-House that initiates retrieval of the information, this approach is sometimes referred to as "pull technology") (see below under technical details for a more comprehensive discussion on the Dublin Core and RDF).

Technical Requirements

This option requires technical skills to design and maintain a website that is able to make data accessible to the central Biosafety Clearing-House databases. Resources for maintenance of hardware, software and Internet connectivity are essential. A permanent and fast Internet connection is required, ideally 1.5 Mbps or better. Less than 256 Kbps is not recommended for a web server.

Technical Details

This section provides summary guidance for users wishing to make website metadata under their custodianship available to the pilot phase of the Biosafety Clearing-House. Using these procedures, the Biosafety Clearing-House will be able to harvest information hosted on national or regional databases. A prerequisite is a basic level of knowledge of XML (extensible mark-up language: extensible because, unlike HTML, new mark-ups can be created to suit particular information needs).

The Biosafety Clearing-House does not store the full-text of the documents (a document refers to any relevant information in a variety of data formats, such as databases, electronic files, Internet resources or scientific information). Only some information (called **metadata**) about the document is registered.

There are two levels of document description. **Semantics:** This refers to agreements about content description standards. The Dublin Core is the description standard adopted by the Biosafety Clearing-House. Since some information required by the Cartagena Protocol cannot be described by the Dublin Core, the Biosafety Clearing-House uses extensions to the Dublin Core to define new elements related specifically to biosafety. **Structure:** The Biosafety Clearing-House uses the Resource Description Framework (RDF) model to specify semantic schemas so they can be shared.

RDF specifications describe a procedure to use the RDF syntax to encode metadata within HTML documents. By encoding metadata in the HTML document, information relevant to the document can be made available to the Biosafety Clearing-House. That is, the Biosafety Clearing-House will be able to retrieve metadata (or descriptive document information) by "crawling" through hypertext links to documents on the web site that are encoded with the RDF syntax.

Detailed examples and information on how to allow the Biosafety Clearing-House to harvest data are available in Module 4 of the Biosafety Clearing-House Toolkit (http://bch.biodiv.org/mod4/overview.html).

Option 4: Store data on national biosafety clearing-house databases, and actively make those data available through the central portal using biosafety clearing-house interoperability protocols

In this option, a Party or other Government maintains national Biosafety Clearing-House databases with a fast and permanent connection to the Internet through one or more servers. The databases must be designed to actively make metadata available to the central Biosafety Clearing-House and to allow access to full records through the central portal using biosafety clearing-house interoperability protocols (since it is the national database that actively provides the central Biosafety Clearing-House with the necessary information, this approach is sometimes referred to as "push technology").

Technical Requirements

This option requires technical skills to design and maintain national biosafety clearing-house databases (preferably in a relational database management system such as MS SQL, Oracle, or MySQL), and to maintain a server that is interoperable with the central Biosafety Clearing-House databases. Resources for maintenance of hardware, software and Internet connectivity are essential. A permanent and fast Internet connection is required, ideally 1.5 Mbps or better. Less than 256 Kbps is not recommended for a web server.

Technical Details

This section provides summary guidance for users wishing to make national biosafety clearing-house databases interoperable with the central Biosafety Clearing-House databases. The technical requirements include:

- National database – A national database would preferably be based on a relational database management system, such as MS SQL, Oracle, or MySQL.

- Internet connectivity – It is preferable that Internet connection be permanent and meet the speed of a T1 (1.5 Mbps) or better. Less than 256Kbps is not recommended for a "web" server.

- Dynamic website – The website must support dynamic web pages that will query the national database. A typical configuration may require an IP address range and a domain name; a router; a firewall; and a dynamic web server such as Microsoft IIS (ASP/ASP.NET), Apache Tomcat (JSP), or IBM Websphere (JSP).

- Internet security – On-line updates should use HTTPS (Http over Secure Socket Layer) with 128-bit encryption.

- Technical expertise – Technical knowledge in the following fields is highly recommended:
  - Relational database management systems (SQL)
  - Internet networking including security (TCP/IP).
  - Server administration.
  - Web page design (HTML plus related technologies).
  - Dynamic web page programming (ASP, ASP.NET or other, depending on the environment/platform: PHP, JSP, etc.).
  - XML (extensible mark-up language), SOAP (simple object access protocol) and RDF (Resource Description Framework) for interoperability.

Detailed information on making a national biosafety-clearing-house database interoperable with the Biosafety Clearing-House is available in Module 4 of the Biosafety Clearing-House Toolkit. Specifically, guidelines are available on how the Biosafety Clearing-House Web Service is accessed via the simple object access protocol 1.1 (SOAP). SOAP is a lightweight, XML-based protocol for the exchange of information in a decentralized, distributed environment.

With regard to security and authentication, the Biosafety Clearing-House Web Service provides only basic password-based submitter authentication. Additional security, including privacy and submitter authentication, are provided through another independent system.

The Biosafety Clearing-House Web Service **must** be accessed via SOAP 1.1 using HTTP over Secure Socket Layer (SSL). SSL provides privacy services to reduce the risk of inadvertent disclosure of registry-sensitive information, such as the submitter's user identifier and password.

Annex A – Summary of Options for National Participation in the Biosafety Clearing-House

Option 1 – Register data in the central portal using the Management Centre

Summary	Required Internet Connection	Minimum Requirements & Responsibilities
The BCH national focal point and other authorized national users log on to the Management Centre of the central portal and register all data using the online forms.	Modem connection/dial-up 33Kbps is the absolute bare minimum (56Kbps or higher (/128/256Kbps+) preferable)	- Regular use of the central portal

Option 2 – Register data locally using database templates and send data to the central portal

Summary	Required Internet Connection	Minimum Requirements & Responsibilities
(1) Government stores data in a national database, using the database template developed by the Secretariat, or alternatively constructing its own database that meets the same specifications (preferably based on a relational database management system (e.g., MS SQL, Oracle, MySQL)) (2) Government periodically exports that data to the central portal, using the export function developed by the Secretariat or its own export function that provides data in a useable format. Alternatively, the data can be sent to the Secretariat by CD-ROM.	- If exporting by Internet, modem connection/dial-up 33Kbps is the absolute bare minimum (56Kbps or higher (/128/256Kbps+) preferable) - No Internet connection needed if sending data by CD-ROM	- Regular use of the database template provided by the Secretariat

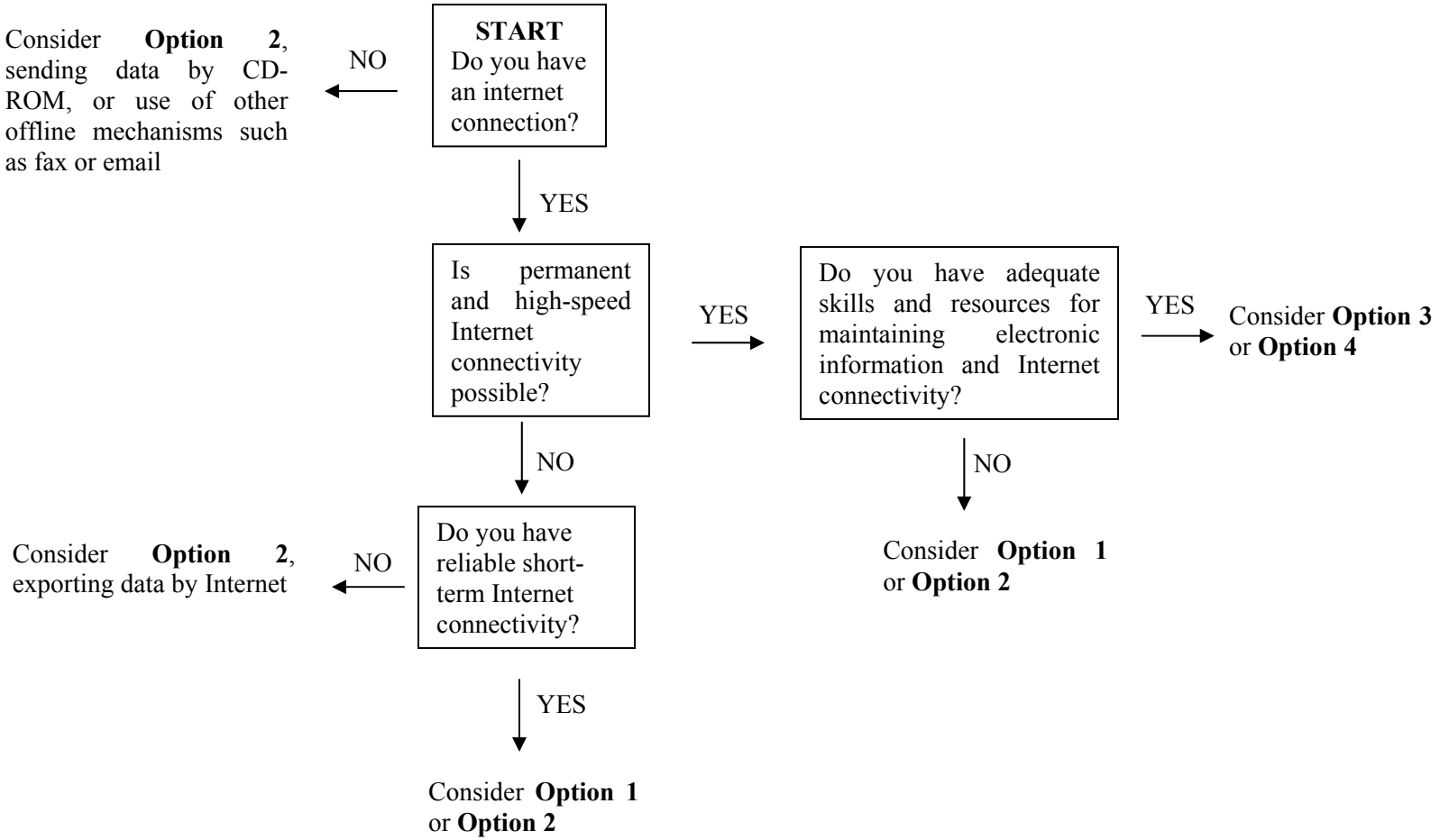
Option 3 – Make data available through a local website and allow the central portal to crawl to retrieve metadata

Summary	Required Internet Connection	Minimum Requirements & Responsibilities
(1) Government makes data available through a national website, and makes those data available through a server with a fast and permanent Internet connection. (2) Allows the BCH to harvest information on its website by formatting the data in XML, using the Dublin Core as the document description standard, and using Resource Description Framework to specify semantic schemas so they can be shared	- 24 hours a day, 7 days a week - Speed ideally 1,5 Mbps or better; less than 256Kbps is not recommended for a "web" server	- Technical skills to design a website, and to maintain a server (see text for details) - Resources to maintain hardware, software and Internet connectivity

Option 4 – Maintain national BCH databases that actively make data available through the central portal using BCH interoperability protocols

Summary	Required Internet Connection	Minimum Requirements & Responsibilities
(1) Government stores data in national databases, and makes those data available through a server with a fast and permanent Internet connection. (2) Uses BCH interoperability protocols to actively make data available through the central portal (see module 4 of the BCH Toolkit)	- 24 hours a day, 7 days a week - Speed ideally 1,5 Mbps or better; less than 256Kbps is not recommended for a "web" server	- Technical skills to design dynamic web pages, databases, and to maintain a server with a high level of security (see text for details) - Resources to maintain hardware, software and Internet connectivity

Annex B – Flowchart of general considerations for determining the appropriate option for establishment of national components for participation in the Biosafety Clearing-House[1]



[1] This diagram is intended only as one of many possible tools to assist national Governments in making decisions about national participation in the Biosafety Clearing-House. The questions asked are general in nature and cannot take into account the many detailed factors that must be considered in reaching a decision.
