

GBRCN Architecture, rationale and operation

Introduction

The components and infrastructure of the GBRCN Secretariat are defined in the GBRCN Memorandum of Understanding (GBRCN document GP-PM-0008). This GBRCN *Architecture, rationale and operation* document provides further information on the GBRCN structure and its operations. Applying common standards for operations to deliver access to high quality materials is a key objective of the GBRCN and therefore a need to take full advantage of cross network expertise and facilities. The scope is broad: it must be ensured that biodiversity is captured, maintained and utilised requiring sharing of expertise and technologies. The big issues of climate change, synthetic chemistry, biotechnology industry development, advances in the life sciences clearly imply the need to harness biological capacity to address issues of food, energy, health and poverty are clear. The GBRCN will provide an environment to address such key issues. It will be an engine of innovation and burden sharing for efficiency and delivering innovative solutions – the GBRCN architecture is designed to facilitate such processes.

There were several options considered for GBRCN architecture by the OECD Biological Resource Centre (BRC) Task Force and subsequently in the execution of the GBRCN Demonstration Project work. Ultimately the nature of the GBRCN, its need to relate closely to policy makers to enable it to remain close to user needs, whilst consisting of the biological resource centres themselves to provide resources for research in a co-ordinated way, necessitates Government participation and co-ordinated policy. An existing model that offers a proven way forward is GBIF. The guidance and commitment of countries is essential if materials and information are to flow across borders to underpin research into the global challenges.

In the GBRCN model, Governments of interested countries will sign up to the GBRCN Memorandum of Understanding (GBRCN document GP-PM-0008) as Participants who will guide the GBRCN in its deliverance of its key function and help ensure facilitating policy. They will form a Governing Board which will represent the Participants in the GBRCN Governance and who will be responsible for selection of host country for the Secretariat. The GBRCN Secretariat will be responsible for:

- Coordinating the common approaches for BRCs
- Managing the global network of national BRCs
- Coordinating the BRC initiative with other international initiatives
- Providing an intergovernmental forum on BRC issues
- Project development and management
- Outreach and publicity
- Organisation and delivery of capacity building programmes

It is essential for any network that participating entities employ similar practices and deliver a common front to their users. The OECD BRC Best Practice sets a baseline for operations and there may well be several approaches to deliver the desired final implementation mechanism. However, there are several areas where harmonised approaches are desirable to avoid confusion and to set minimum levels of operation where regulations or guidance are not available. For example, compliance with various international conventions can be problematic when they are not always applied universally or interpreted differently and implemented to different extents nationally. It will be interesting to see what can be done in this regard. It is difficult to see how BRCs can have one approach to compliance with the Convention on Biological Diversity if nations implement, for example, the requirements of

the Nagoya Protocol in different ways. To help coordinated implementation of the Protocol, the GBRCN can put in place best practice that enables tracking of biological materials and transparency in the terms and conditions for access and use. In other areas of legislation, common approaches to implement agreed principles on biosafety, biosecurity, ownership and management of IP enforced by existing national, regional and global legislation can be explored. It is essential that the GBRCN does not work in isolation and therefore it needs to work closely with policy makers and international organisations such as the CBD Secretariat, WHO and WIPO.

The GBRCN will be established as a legal entity in law but the complicating issue is that participation is global with each country recognising its own national law. Initially the Secretariat will be hosted in a country and be subject to the law of that country. If GBRCN activities are to be co-ordinated and operated in compliance within one legal framework some policy decisions are needed. Ultimately national law governs activities of any BRC and all the network can do is to agree guiding principles. Where specific pieces of law do not exist, agreed principles of operation can be written into the Cooperation Agreement (GBRCN MoU Annex II) so long as they do not contravene national law. Such principles must be accepted by the GBRCN Cooperating Entities and recognised by their Governments. The underlying principles for the GBRCN are common policies on access, use and distribution of genetic materials yet many countries still need to implement the Convention on Biological Diversity principles effectively. The increasing move of biotechnology to harness the potential of biodiversity gives *ex-situ* collections, BRCs, a role to play, but for a Global Biological Resource Centre Network to work, each nation needs a clear policy on the *ex-situ* conservation and utilisation of genetic resources.

Why does the GBRCN need a Secretariat? Most culture collection networks operate on a volunteer basis and rely on personal commitments to take forward actions. This will not work for the GBRCN. A small Secretariat should be established consisting of a restricted number of key staff that could include a Director, Operations manager or Executive secretary, IT support, a Quality manager and an Administrator/secretary. Costs for such need first of all to be met by grant in aid with the ultimate goal to find a more sustainable method of finance (see GBRCN MoU GP-WP-0008). Some of the deliverables could be associated with securing funding as stand alone projects. The Secretariat would manage delivery from some of these projects or would be responsible for work packages or a conduit for information and development. It is important that the Secretariat has access to IT support and quality management consultancy to enable to carry out the key functions of managing the network information system and the quality management system implementation and development. The Secretariat would be responsible to a Governing Board for the running of the network and delivering an agreed programme of work. A host organisation would need to be sought that could support the Secretariat but that would not have any responsibility directly for its running. The choice of host, its agreed work programme, its operational structure and staffing would be the responsibility of the Governing Board (see GBRCN MoU Document GP-PM-0008).

The GBRCN will be advised by a Scientific Advisory Board, which will meet twice per year and will support the GBRCN on strategy and operational issues, review proposals for further development of the GBRCN and proposals for new participants. The GBRCN MoU Document GP-PM-0008 lays down the basis for such operations and procedures.

GBRCN Architecture

Given common standards for operations to deliver access to high quality materials, the GBRCN must have the structure and capacity to fully take advantage of cross network expertise and facilities. The GBRCN will provide an environment to achieve this facilitating specialist groups or clusters to focus on delivering solutions to meet both BRC and its user community's needs. It will be an engine of innovation and burden sharing for efficiency and delivering innovative solutions, it requires the structure to facilitate this. Through the establishment of the GBRCN, countries are invited to constitute or reinforce their centres of biological resources in order to reach the acceptable quality level for their certification at the national level. This requires:

- A system to ensure the uptake of OECD BRC best practice;
- A common information linkage and data exchange system;
- BRC compliance with laws, regulations and standards in particular for access, distribution and exchange of biological material, where applicable, through common practices;
- The support of States, the scientific community and the private sector to advance international co-operation and economic development.

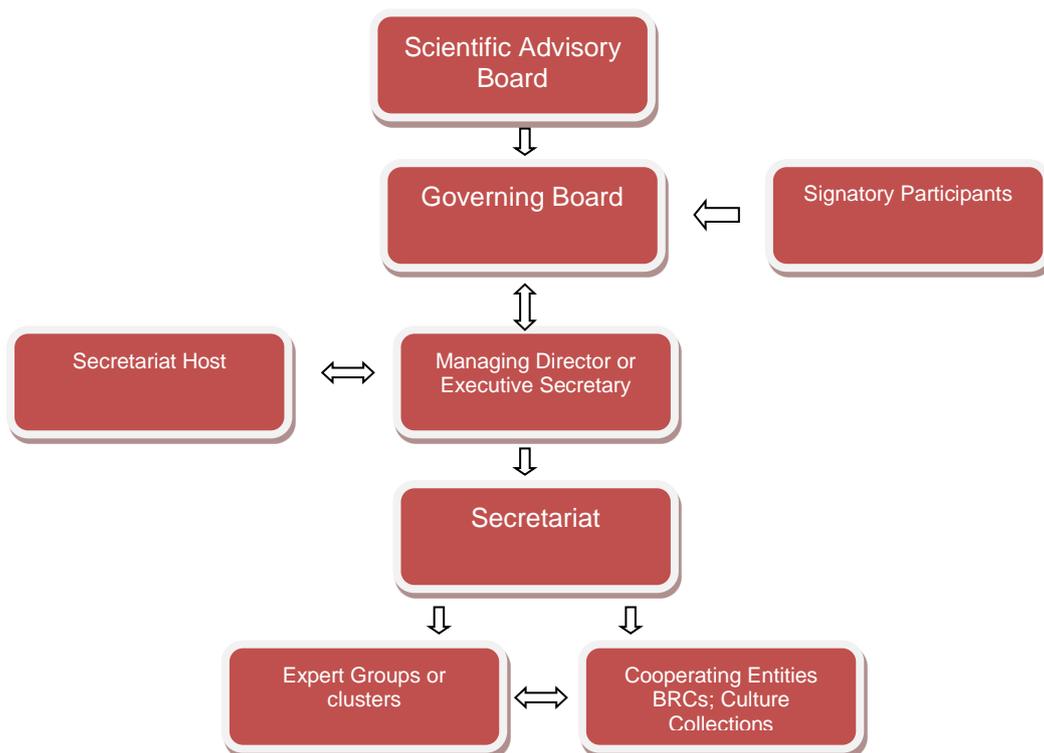
The prime benefactor of GBRCN is the user who gets a single point of access to high quality materials and a common understandable process from any cooperating BRC or culture collection. They get a consistent level of service and better access to authentic and reproducible materials in a transparent and traceable way. It will deliver a more comprehensive service. They are confident that the materials are fit for purpose and the assurance that national law, policies and procedures have been followed. The culture collection that becomes a BRC and joins the GBRCN signs up to the GBRCN Cooperating Agreement (Annex II of the GBRCN MoU). It consequently benefits by it being recognised that they operate to international scientifically based quality criteria and thus have an international mark of quality. Through the network they will have a raised profile, will share tasks to avoid duplication of effort and will enjoy collaborative research and development.

The GBRCN is foreseen as an international body with its own small secretariat, governing board and scientific advisory apparatus. However, to date the final form has yet to be decided. This document outlines the best option, while the GBRCN MoU describes the individual components. A number of options were discussed by the OECD BRC Task Force and a consensus opinion was sought at the closing workshop in Paris 13-14 December 2007. Consensus on the best alternative was not delivered, but the majority of participants at the final workshop considered that an independent body operating through an existing intergovernmental organisation (such as the Codex Alimentarius Commission-which operates through FAO and WHO, or an independent body within OECD). The GBRCN Demonstration Project considered this but soon recognised that a structure similar to GBIF with proven instruments such as its MoU and its operational mechanisms proven to work was the best way forward. Thus the GBRCN MoU Document GP-PM-0008 was developed to define the structure of the GBRCN and includes Governing Board, Advisory Board, Secretariat Host, Secretariat, Managing Director or Executive Secretary, Signatory Participants and the Cooperating Entities i.e. the BRCs and Culture Collections.

Potential for GBRCN finances

The GBRCN would save considerable money by soliciting donations either from the State in which it will be established or from established institutions to provide basic infrastructure. In the latter case, a bidding process among interested suitors would precede the conclusion of a separate agreement between the GBRCN and its Host in order to define their respective

responsibilities toward each other (see GBRCN MoU Document GP-PM-0008 Annex III for suggested process). The Participants must be satisfied that the host country will not exert an excessive influence within the GBRCN simply by virtue of being its physical host. This should not be confused with any natural, legitimate advantage that the country may have due to its excellence in the field of biological resource management. Furthermore, it is understood that the host country may derive some legitimate rewards, for example international prestige and offer employment of local support staff.



GBRCN organisational chart

State Participants will want to derive maximum benefits from their financial contributions, and they will be very reluctant to augment the national treasury of the host country, for example, in the form of customs duties and income or value added taxes. Thus, the host country will be well advised to offer the appropriate special status or exemptions that are compatible with its national laws, and to specify the details of these concessions in the Host Country Agreement. Details of host selection, the bidding process and support, facilities and resources provided can be found in Annex III of the GBRCN MoU. The GBRCN model business plan (GBRCN Document GP-WP-0068) provides the justification and detail for operation and financial commitments.

GBRCN Operations

The GBRCN will be advised by a Scientific Advisory Board, which will meet twice per year and will support the GBRCN on strategy and operational issues and review proposals for

further development of the GBRCN and proposals for new participants. It is envisaged that the GBRCN network, to work efficiently, would need to operate in clusters, either nationally based to manage national needs i.e. implement specific national directives, or specialist groups based around taxonomic groups or organism types or on specialist activities such as molecular techniques, information technology or legal requirements. It is also envisaged that existing regional groups would want to continue their activities together and thus contribute their knowledge and activity to the common good. Such regional groups would be the European Culture Collections' Organisation and the Asian Network for Microorganisms. Some may operate within and some external to the GBRCN. The Governing Board advised by its Scientific Advisory Board will agree a work programme, and its execution through the GBRCN clusters or expert groups would be facilitated by the Secretariat.

The governance structure might comprise a Governing Board at the top, supported by any necessary subsidiary bodies (such as a Scientific Advisory Board) and the Head of the Secretariat. The purpose of the Governing Board is to provide a mechanism for making collective decisions on the most important matters relating to the GBRCN. It would probably meet once or twice per year to review progress and decide on major issues. The Governing Board's primary responsibilities would include approving the GBRCN's work programme and annual budget and appointment of a Managing Director or Executive Secretary of the Secretariat. Once established, it may adopt bylaws, which are rules to address more detailed aspects of the GBRCN management (See paragraph 4 MoU).

The composition of the Governing Board would need to be agreed but it should represent the funders. Subsidiary bodies such as the Scientific Advisory Board would involve the participation of private parties and user representatives. The purpose of these bodies is to submit recommendations to the Governing Board based on expert analysis. The groups might also include States, accredited/certified BRC or even international organisations whose missions complement the work of the GBRCN. This would better enable the Governing Board to create synergies and avoid duplication through collaboration with such international organisations. The MoU (Document GP-PM-00080 is the instrument of establishment which addresses the basic voting issues and provides schemes adapted to their importance. Future preparatory work could include drafting model rules of voting procedure for the Governing Board to adopt in its Bylaws through a vote, but the Agreement should only include those rules that are necessary for the Governing Board to make its initial decisions.

The Managing Director or Executive Secretary will be a key individual whose duties traverse both the Governing Board and day to day role as the Chief Executive Officer of the GBRCN. The success of the GBRCN will, in large measure, depend on his/her abilities as scientist, manager, spokesperson and diplomat. The Governing Board will thus be strongly motivated to recruit a person of high standing in the field which, in turn, will make it necessary to have early agreement among the Participants about the salary range and other conditions of employment. To attract a person of sufficient calibre, it may be necessary to offer an employment contract of significant duration (e.g. 5 years) especially if the Director and his/her family will have to move from another country.

Recruitment of suitable staff will be challenging, since professional excellence will be a necessary, but not sufficient requirement for the GBRCN to be a success. There will be considerations of geographical/national balance, international contacts and experience, linguistic skills, familiarity with the laws and procedures of the Host country, etc. (see GBRCN MoU).

The functioning of the GBRCN is dependent on the sustainability of the constituent BRCs and Culture Collections. A generic business plan has been developed (GBRCN document GP-WP-0024 Generic BRC Business Plan) to help. However, the wide variety of these structures and their scope require differing financial models to support each. There are the traditional lines of income such as culture supply charges, identification and characterization of cultures and private, confidential or patent deposits. Among several potential new sources of revenue is the generation of genomics and proteomics data that complement and add value to biological materials themselves. The degree to which such activities may actually provide support sufficient to ensure financial sustainability of a BRC is unproven. However, it is generally expected that most BRCs, whether single large national centres or smaller distributed or specialized centres, require some degree of core funding by their respective national governments. The kinds of funding sources include support from industry, grants from agencies that support research, cost-recovery through fees-for-service, development of databases and other tools that complement the core role of BRCs, and even funding from charitable sources, especially those associated with public health or sustainable development. The GBRCN network, although not addressing elements that could be competitive, will support participant's financial development. The funding of the GBRCN Secretariat must not detract from sources supporting individual BRCs or collections.

The GBRCN infrastructure will support the development of BRCs in many ways most importantly in the development of excellence. Table 1 shows the stages of collection development leading to BRC status. One of the key work programmes and expert clusters of the GBRCN will focus on such development and capacity building.

Table 1: Stages of collection development leading to BRC status

Status of collection	Characteristics of collection status
<i>Basic level</i>	<ul style="list-style-type: none"> • Basic methods for Biological material preservation are available • Basic documentation level
<i>Intermediate level</i>	<ul style="list-style-type: none"> • Sound facilities • Knowledgeable and skilled human resources • Good technologies in place • Electronic catalogues and data management • Operating to international criteria • Wide stakeholder involvement • Involvement into regional/national networking
<i>High level</i>	<ul style="list-style-type: none"> • Sustainable human resource training relevant to BRC domains • Collection quality management is in place • IPR regulations, MTAs; biosafety and biosecurity standards are in place • Accredited or certified to the operational and quality ISO standards • Clear management program and collection's strategy in place • Sustainable fundraising mechanisms with governmental support • Raised user awareness in the domain of Biological Resources preservation • Regular monitoring and adjustment of collection needs • Leading activity in the regional/national/international networking
<i>BRC</i>	<ul style="list-style-type: none"> • High quality standards in operation and implementation of the OECD best practice • Functioning according to the OECD instruments

The sustainability of a microbial domain focused GBRCN Secretariat

A general benefit of operating GBRCN through a Host is the provision of infrastructure and practical services that the Secretariat will need to operate. It is in the interests of the GBRCN Secretariat and Participants who contribute to the budget to have the Host provide these at the lowest possible cost. Precise budget calculations for GBRCN depend on decisions that have yet to be made, such as how many employees will be needed, their remuneration packages and the location and quality of office facilities and meeting rooms. However, given its

foreseen functions, broad estimates are possible. Based upon the costs of other organisations' secretariats and mainly upon the level of finance needed by the current GBRCN Demonstration Project Secretariat, an initial Secretariat would need approximately €500,000 per year. To cover such costs, signatories to the GBRCN MoU would be expected to make contributions based upon per capita GDP (see Annex I to the GBRCN MoU).

The above contribution level would cover the estimated initial Secretariat and allow for its expansion as new countries (Participants) join. The additional income will allow for funds to be made available for some of the GBRCN work programmes or for support of capacity building, in particular the support of BRCs in countries of developing economies implement minimal best practices to enable legitimate access to their countries microbial diversity currently not available to science.

There are a number of uncertainties that need to be taken into account:

- Is a harmonised approach possible to create a legal operational framework?
- Can common agreement on the sharing materials and data be reached?
- Can a financial plan be devised to make the network sustainable?
- Can a suitable mechanism be established to share tasks and co-ordinate activities?
- Can a capacity building programme be supported?
- Will Governments support this initiative?

These issues are not insurmountable and will be addressed by the GBRCN.