Bundesministerium
für Bildung
und Forschung

GBRCN
GLOBAL BIOLOGICAL RESOURCE CENTRE NETWORK
DEMONSTRATION PROJECT

The Global Biological Resource Centre Network (GBRCN)

Aiming to improve the management and networking of collections of laboratory held living microorganisms and cultured cells

David Smith and Dagmar Fritze

SciColl, Brussels, February 2010





Summary

The GBRCN demonstration project

- **Objectives**
- **Partners**
- **Implementing best practice**
- **Impacts**

The GBRCN Demonstration Project

- Builds upon the OECD BRC initiative to address all organism domains, Animal; Plant; Microbes; Human derived material
- Initial focus on microorganisms
- Global co-ordination of laboratory-based microbial resource collections

- The German Government BMBF funds a small Secretariat to co-ordinate activities
  - Demonstrate that the GBRCN will deliver something new
  - A network to give better access to high quality materials
  - 22 candidate microbial domain BRCs in 15 countries contributing at their own cost

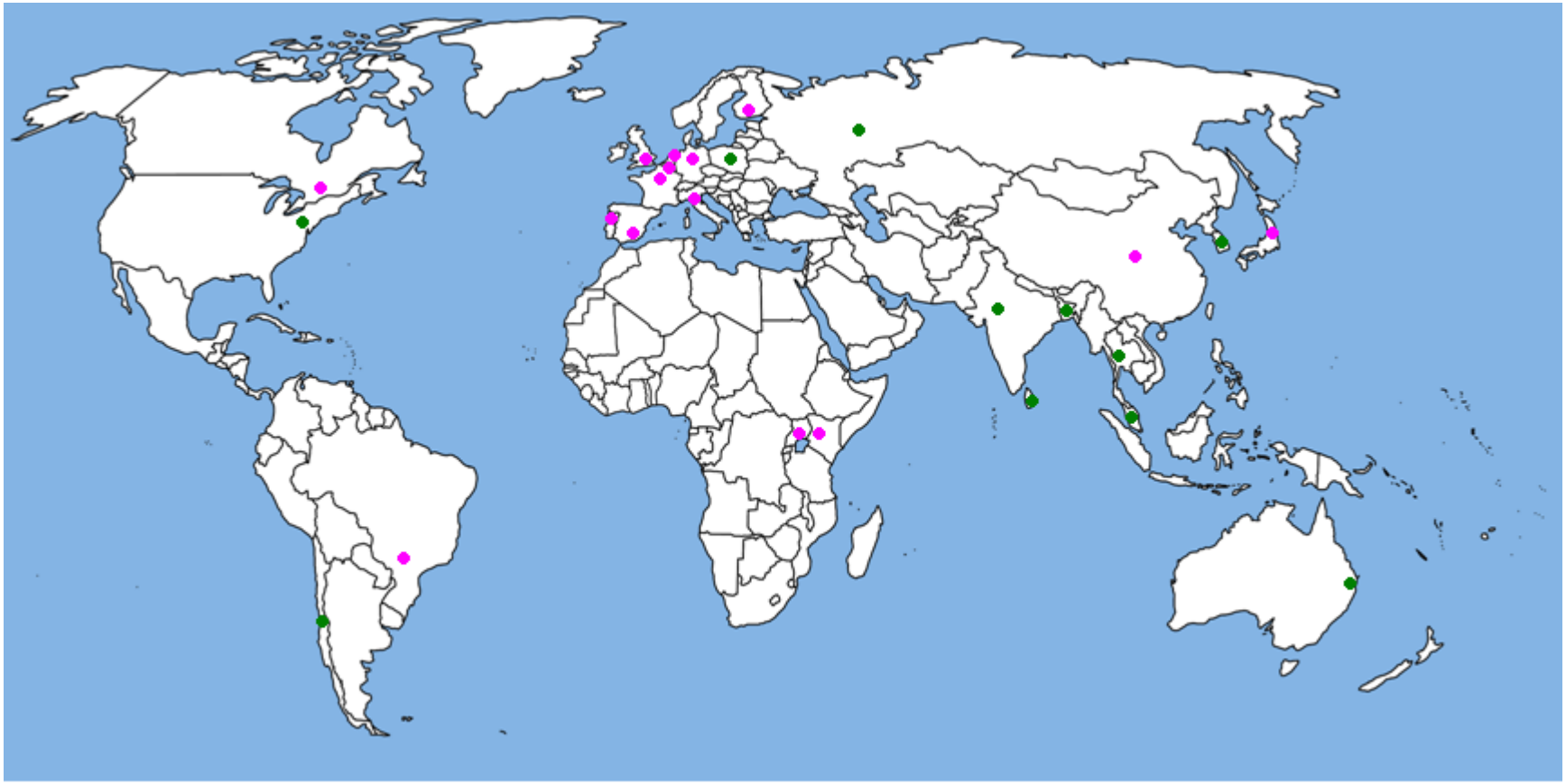
Demonstration Project Partners and key activities

GBRCN
GLOBAL BIOLOGICAL RESOURCE CENTRE NETWORK
DEMONSTRATION PROJECT

- Brazil • Belgium • Canada • China • Finland
- France • Germany • Italy • Japan • Kenya
- The Netherlands • Portugal • Spain • Uganda
- Microbial culture collections at different stages of development with different remits
- Developing a common operational framework
- Implement best practice
- Test mechanisms for third party independent review
- Establish governance structures and membership requirements

Establish the Global BRC Network 2012

Candidate BRCs



- GBRCN partners
- Interested in joining GBRCN

The future GBRCN goals:

- A network facilitating legal access to microbial resources
- User interface to develop improved output
- Common operations delivering best practice
- Harmonised mechanisms for compliance with legislation e.g. biosafety and biosecurity
- Common rules for materials and data exchange; user and member confidence
- A single voice to facilitate input to international initiatives
- A mechanism for capacity building
- A shared work programme to address key challenges

The aim to provide better defined resources and services with broader coverage to facilitate innovative research

Sharing the burden in networks

- Biodiversity yet to be discovered
  - Need to share tasks (e.g. currently 1400 years to describe estimated numbers of fungi - set a framework for metagenomics)
- Human Resources
  - Taxonomy: most Government controls rely on names – quarantine, biosafety, biosecurity, disease diagnosis
- Keeping pace with modern technologies
  - Partnerships
- More demands
  - Quality; Legislation; Biotechnology – common approaches
- Co-ordinated capacity building needed
  - Facilities; Technologies; Skills; Knowledge; Protocols; Policies

Support in the search of active molecules – building capacity in Guyana - The Iwokrama programme

- 2492 cultures (64 taxa)
- 332 isolates produced 2800 extracts
- 84 isolates were found to have potent anti-insect activity
- 14 showed potent anti-fungal activity
- 13 potent anti-bacterial activity

Endophytic fungi isolated from living symptom-less leaves of 12 tree species

A hit rate of 1 in 3; with 3 molecules ready for development into products

Building capacity in Africa

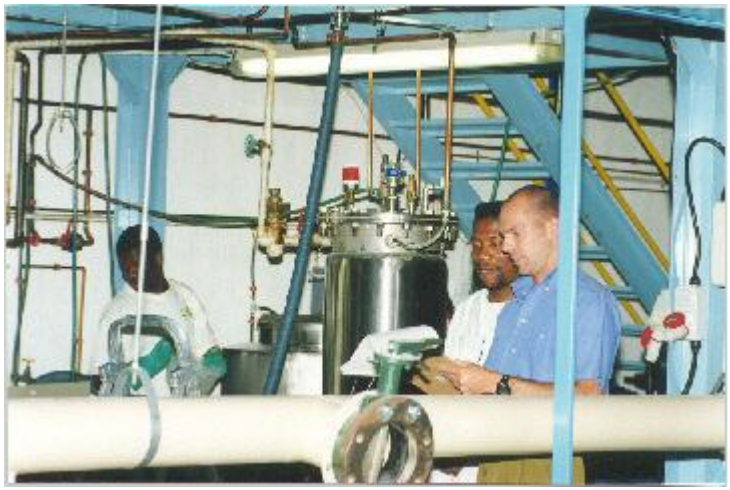
- **Desert locusts invade 20% of the world land surface**
- **Their swarms can cover more than 100 km²**

ULV application of Green Muscle

A fungus *Metarrhizium anisopliae* biocontrol

Biological Control Products SA (Pty) Ltd

Local capacity to:
Produce “Green Muscle”
Preserve the fungus



Transition of culture collections to BRCs

- Implement Best Practice to deliver authentic materials, preserved by state of the art techniques with validated information
- Assessment programme
- Share GBRCN protocols
- Training and facility enhancement
- Participation in research programmes to add value

The BRC - the next generation culture collection

OECD Best Practice Guidelines for BRCs

⌦ **General best practice guidelines for all BRCs**
- Organisational requirements
- Equipment use, calibration, testing and maintenance records
- Documentation management
- Data management, processing and publication
- Preparation of media and reagents
- Accession of deposits to the BRC
- Preservation and maintenance
- Supply
- Quality audit and quality review

⌦ **Best Practice Guidelines on Biosecurity for BRCs**
- Assessing biosecurity risks of biological material
- New acquisitions/ re-assessment of inventory
- Biosecurity risk management practices
- Physical security of BRCs
- Security management of personnel and visitors
- Incident response plan
- Material control and accountability
- Supply and transport security

⌦ **Best Practice Guidelines for the Micro-Organism Domain**
- Staff-qualifications and training
- Hygiene und biosafety
- Equipment use, calibration, testing and maintenance records
- … … … …
- Preparation of samples
- Information provided with the biological material supplied

⌦ **Best Practice Guidelines on Human-Derived Material**

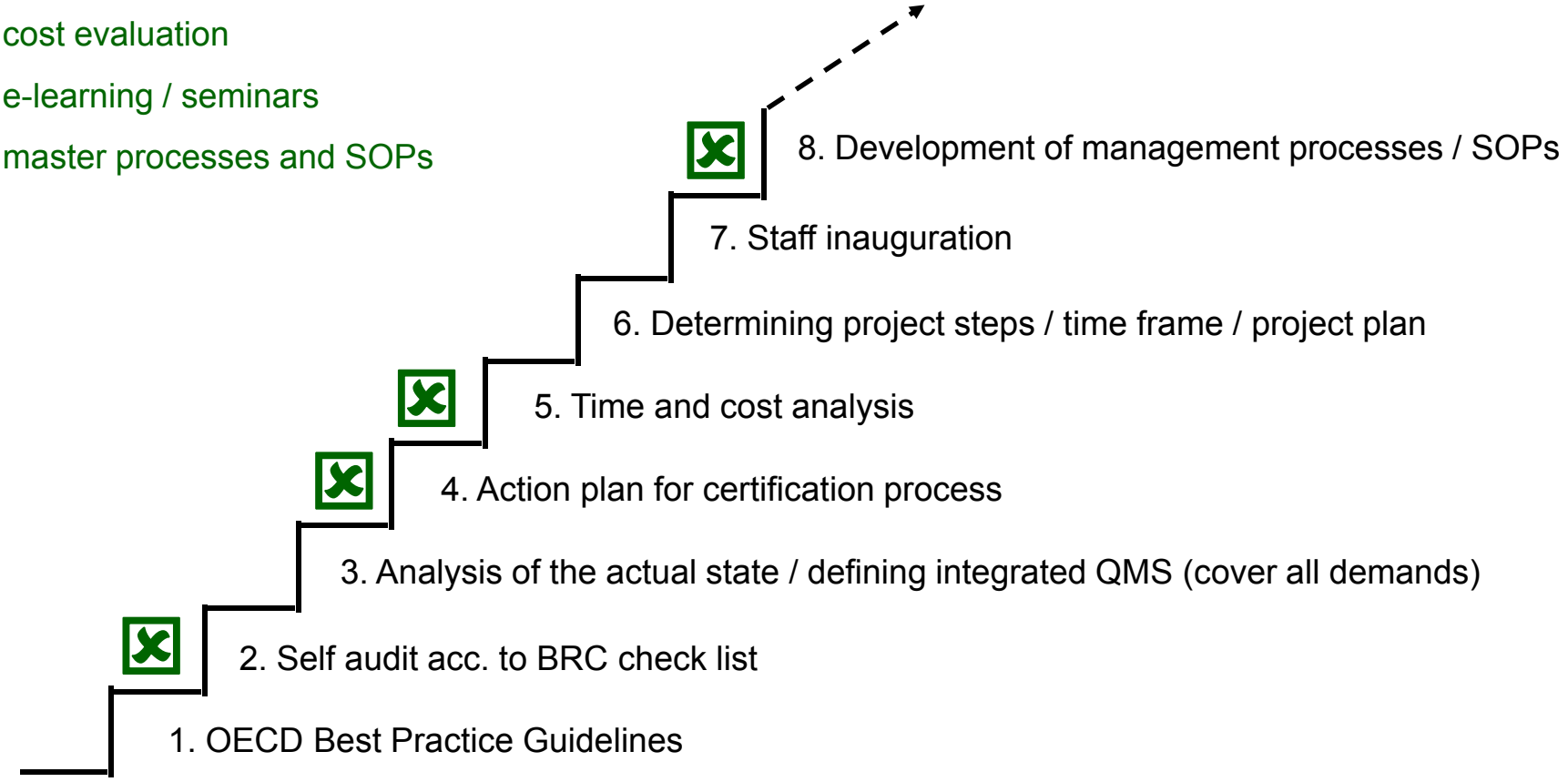
OECD Guidelines at http://www.oecd.org

Steps for implementing and auditing the OECD BRC Best Practices

GBRCN
GLOBAL BIOLOGICAL RESOURCE CENTRE NETWORK
DEMONSTRATION PROJECT

☒ possible assistance by GBRCN

- checklists
- master project plan
- cost evaluation
- e-learning / seminars
- master processes and SOPs



Steps for implementing and auditing the OECD BRC Best Practices

GBRCN
GLOBAL BIOLOGICAL RESOURCE CENTRE NETWORK
DEMONSTRATION PROJECT

☒ possible assistance by GBRCN

- checklists
- master project plan
- cost evaluation
- e-learning / seminars
- master processes and SOPs
- audit assistance by members
- contact to registrars

Revision audits

☒ 16. Certification audit -> 3rd Party Audit

15. Adoption of the system

☒ 14. Management-Review

☒ 13. QM-Assessment and weak point analysis

12. Internal Audits

☒ 11. Staff training and launch of the new inetgrated BRC QMS

10. Creating documentation

An audit checklist for Internal Audits

To ensure that the conformity to the specific requirements is succeeded **an internal audit is performed following a matrix** comprised by six columns:

- Chapter of the guide
- Requirement
- Procedure in Place
- Compliance
- Comments
- Score

Chapter	Requirement	Procedures in place	Compliance			Comments	Score
			Ye	No	NA		
	BRC general criteria						
	Certified BRCs must comply with: • Their national and international legislation, regulations and policies concerning acquisition, conservation, utilisation, including the fair and equitable sharing of benefits arising from utilisation of genetic resources, and distribution of biological resources and data related thereto. • The regulations of the relevant countries when moving biological materials across national boundaries. • The relevant national and international agreements, regulations, policies, frameworks and recommendations.						
	Certified BRCs have in place a mechanism that updates their knowledge of the above.						
4.	Organisational requirements						
	The BRC should meet the OECD definition and be compliant with appropriate national law, regulations and policies. The application for certification must describe and document the nature of the biological resources being held and for which certification is being sought. It must define the biological domain and therefore the domain specific criteria that apply e.g. micro-organisms or human materials.						
4.1.	Long-term sustainability						
4.1.1.	The BRC should provide evidence of a strategy for its long-term sustainability. Adequate and reliable sources of funding vary from government support, income from services and private support.						

Score:

- full compliance = 2
- Compliance with minor rework = 1
- non-compliance = 0

Managing Microbes

GBRCN member collections

- Associate culture collections
- Candidate members
- Implementation of the threshold level: the ABC of BRCs
  - **A**uthentication procedures implemented
  - **B**est practice in preservation
  - **C**onfirmed and validated information
- Certified BRCs - ISO 9001, AFNOR NF 596-900 – supplemented by OECD Best Practice
- Accredited BRCs – ISO 17025, ISO Guide 34 - supplemented by OECD Best Practice

The GBRCN Capacity building programme

GBRCN
GLOBAL BIOLOGICAL RESOURCE CENTRE NETWORK
DEMONSTRATION PROJECT

The elements

- The BRC - the human resources, facilities, technologies and knowledge necessary for development
- Network capacity

The programme must use existing opportunities whilst upgrading mechanisms and reducing costs

Phased implementation programme as we grow

- An initial focus on implementation of best practices
- Electronic tools e.g. an initial interactive self-check on compliance
- Information system
- A second phase could help develop network synergies

To be effective

- Engage current systems and funding mechanisms
- Requires co-ordination at an international level

Implementation through funded projects

European Microbial Resources Consortium – EMbaRC

European node of future GBRCN

Improved protocols, authentication, preservation

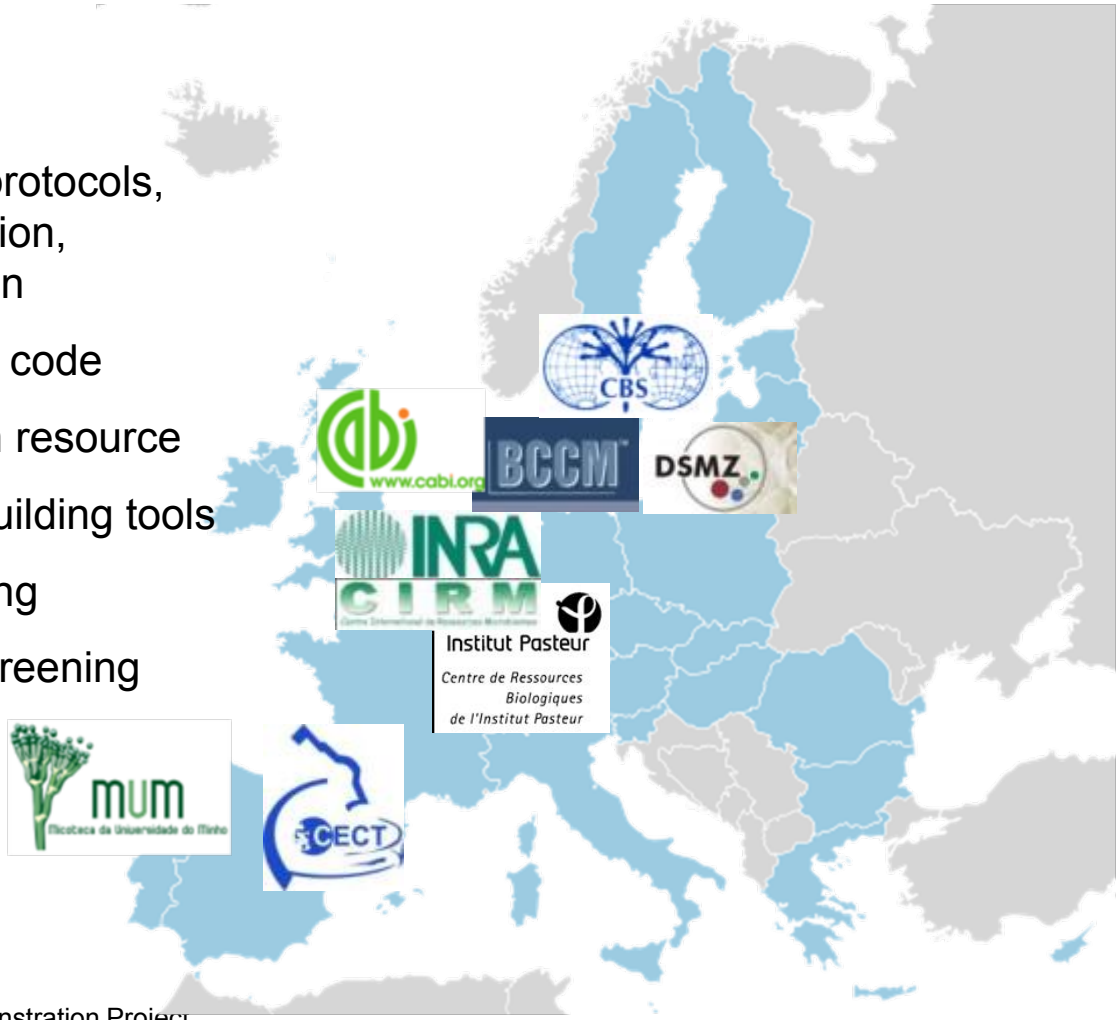
Biosecurity code

Information resource

Capacity building tools

DNA banking

Enzyme screening

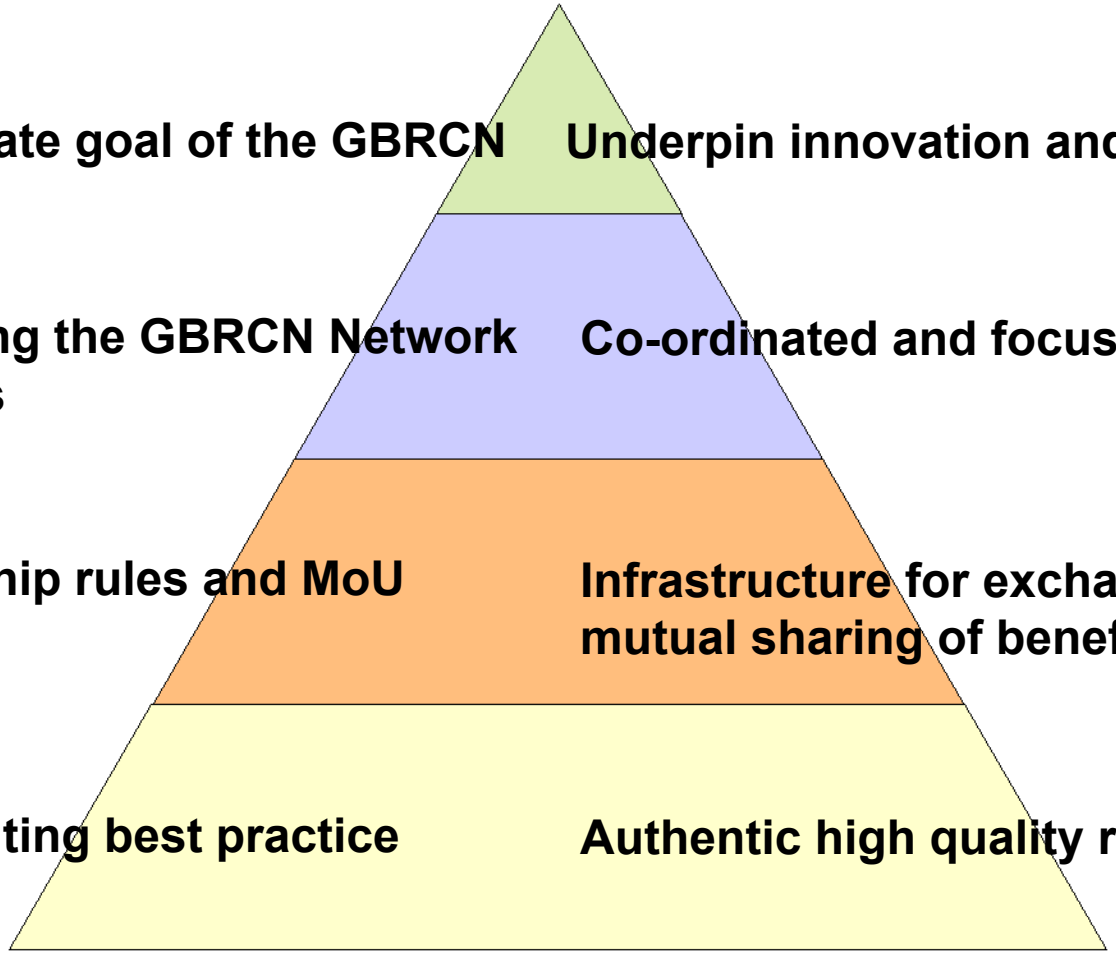


INRA, FR
Institut Pasteur, FR
CABI, GB
KNAW-CBS, NL
BCCM, BE
(3 legal entities: SPP-PS, UGent & UCL)
DSMZ, DE
UVEG-CECT, SP
UMinho-MUM, PT

Microbial Resources Research Infrastructure - MIRRI

- Enhancement of BRCS and broadening of resources and information
  - Investment by nations in facilities and human resources
- Co-ordination and focus of activities on resource and service provision towards key issues
  - guided by policy makers, programme funders and users
- Common policy on key issues of biosafety, biosecurity and legislation compliance
  - Facilitated and guided by policy makers
- Operational framework that facilitates exchange of materials and information
- Partners - 66 European BRCS – addition 400 globally
  - Policy makers, funders, International Organisations, Scientific communities, sector representatives

Underpinning life science research

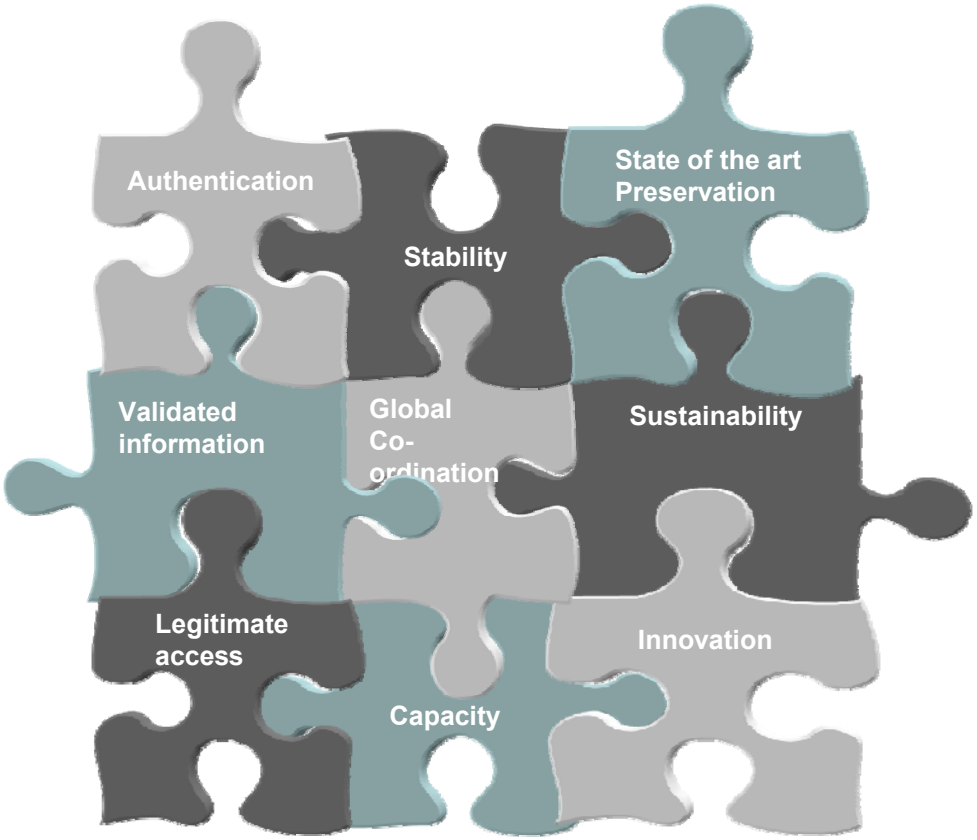


What a GBRCN will do for us

- The GBRCN will strengthen global collaboration between collections and their users
- Prepare the resource centres
  - To be engines of innovation and burden sharing for efficiency and help deliver innovative solutions
  - To enable targeted action to global challenges

The GBRCN bringing it all together

GBRCN
GLOBAL BIOLOGICAL RESOURCE CENTRE NETWORK
DEMONSTRATION PROJECT



http://www.gbrcn.org

Bundesministerium
für Bildung
und Forschung

BRCs underpin the life sciences

Need to work together to address the challenges

Thank you

- Come to the International Conference for Culture Collections Brazil 2010
  www.iccc12.info