

SEP-CEPDEC: Facilitating access and use of biodiversity data to underpin sustainable development in African and Asian francophone countries

Mélianie RAYMOND¹, Eric CHENIN², Régine VIGNES-LEBBE³, Anne Sophie ARCHAMBEAU⁴, Juan Carlos BELLO⁵,

1. Nodes Capacity Officer, Global Biodiversity Information Facility Secretariat, Copenhagen, mraymond@gbif.org

2. Executive Director, Sud Experts Plantes, France, eric.chenin@orleans.ird.fr

3. Scientific Coordinator GBIF-France, Université Pierre et Marie Curie-Paris6, MNHN Department Histoire de la Terre, Paris, vignes@ccr.jussieu.fr

4. GBIF-France, MNHN, Paris, archambeau@lis-02.snv.jussieu.fr

5. Programme Officer for Nodes, Global Biodiversity Information Facility Secretariat, Copenhagen, jbello@gbif.org

Abstract

Sud Expert Plantes (SEP) is an initiative launched by the French Ministry of Foreign Affairs to support the efforts of developing countries in Western and Middle Africa, the Indian Ocean and South East Asia to know, preserve and sustainably use their plants and associated genetic resources. The *Capacity Enhancement Programme for Developing Countries* (CEPDEC) has been designed by the *Global Biodiversity Information Facility* (GBIF) to help developing countries integrate the use of biodiversity data in education, science, policy, and decision-making at all levels.

SEP-CEPDEC, established in 2006 by the Institut de Recherche pour le Développement (IRD) and the GBIF Secretariat, is a three-year collaboration aimed at facilitating the access and use of biodiversity data among the 22 countries involved in SEP, within the framework of the United Nations Millennium Development Goals. Countries participating are: Benin, Burkina Faso, Cameroon, Guinea, Madagascar, Ivory Coast, Mali, Mauritania, Niger, Senegal, Togo, Burundi, Chad, Central African Republic, Congo, D.R. Congo, Gabon, Rwanda, Comoros, Cambodia, Laos and Vietnam. At the start of this project (2005), five of these countries were GBIF participants already (Benin, Burkina Faso, Cameroon, Guinea, Madagascar).

With GBIF-France as a mentor (www.gbif.fr), SEP-CEPDEC helps those countries that are already GBIF members to establish their own national biodiversity information facilities (nBIFs), while helping to build biodiversity informatics capacity among key institutions from the remaining SEP countries.

The SEP-CEPDEC collaboration provides all the SEP participants with training opportunities on the establishment of NBIFs, including the use of free and open-source GBIF Informatics Infrastructure to gain access to 196 million biodiversity data records currently published via the GBIF data portal (Feb. 2010) and to support further data publication. Workshops in 2010 will focus on data management and analysis.

SEP-CEPDEC contributes to growing the GBIF biodiversity data commons and promoting data sharing with countries of origin, ensuring biodiversity data are made freely and openly available as mandated by biodiversity-related conventions including the Convention on Biological Diversity (Decision VII/11).

Introduction

What is SEP?

Sud Expert Plantes (SEP) is an initiative of the French Ministry of Foreign Affairs, operated by the *Institut de Recherche pour le Développement* (IRD). Its objective is to support the endeavour of numerous developing countries to better know, preserve, and sustainably exploit their plants. This initiative has been mainly designed by scientists from the participating countries in Africa, the Indian Ocean and Asia. SEP aims at building upon and enhancing existing capacities and current programs, and it endeavours to help network the tropical botany community.

The initiative is scheduled on 4 years (2007-2010) and involves 22 countries in Africa, the Indian Ocean and Asia. It is structured in three complementary components, through which it addresses the issues of information standards, management, sharing and use:

1. Training & exchange seminars between scientists, policy makers and actors;
2. Support to institutions and networks;
3. Research projects.

What is GBIF?

The *Global Biodiversity Information Facility* (GBIF) is an international organisation supporting scientific research, conservation and sustainable development by making biodiversity data freely available online. GBIF has been established and paid for by its member countries in recognition of their common needs in this area, and to help build a common research infrastructure to mobilise the required data. Based on an open-access and open-source framework, GBIF has been instrumental in catalysing agreements on many of the standards, protocols and infrastructure components required to make disparate primary biodiversity datasets compatible, discoverable and accessible worldwide. GBIF's current membership of 54 countries and 44 international organisations collectively make available over 196 million primary biodiversity data records from 8000 datasets held by more than 280 institutions through the GBIF data portal (data.gbif.org).

It is well known that the greatest concentrations of biodiversity are found in developing countries, but most of the data and information about biodiversity are located in developed countries. GBIF seeks to help redress this asymmetry with regards to data about where species occur and about scientific names. Countries have, through GBIF, quick and easy access to data about their own biodiversity served by institutions around the world. The data can be used to form and analyse new hypotheses, in education, and in decision-making about in conservation and sustainable use of biodiversity. In practice, "electronic consultation" with GBIF will translate into savings of time, funds and resources.

Due to the immense potential of 'virtual collections' to enhance scientific knowledge and improve conservation and sustainable use of biodiversity, Parties to international treaties like the Convention on Biological Diversity (CBD) have repeatedly emphasised the importance of repatriation of information to countries of origin (e.g. CBD Art. 17 paragraph 2); and decisions CBD COP III/10 and COP IV/1.D have stressed the role that scientific institutions – particularly in the developed world – can play in mobilising these data. Countries of origin are invited to help improve GBIF data content, and thus the network's ability to repatriate data. Countries can do this by supporting in-country networks of data providers, and working with partners to mobilise their own data.

GBIF functions as a network of networks, with each participant country responsible for the establishment of a national-level biodiversity information facility. In order to share best practices,

experience and technical expertise between countries, GBIF runs a mentoring programme that supports such projects between its participants.

What is CEPDEC?

The *Capacity Enhancement Programme for Developing Countries* (CEPDEC) is a GBIF initiative that helps create effective capacity in developing countries to integrate the use of biodiversity data in education, science and decision-making at all levels. Acting as an umbrella for projects conducted in individual countries or groups of countries, CEPDEC builds upon the efforts of multiple partners, who together focus on helping developing countries move toward a sustainable future. It also works to foster communication among science, policy and society by enabling them to better access, manage, share and use biodiversity data.

A CEPDEC project generally is a partnership among the government of a developing country, development agencies and other donors in developed countries, the scientific community, biodiversity stakeholders, decision makers and GBIF. Countries involved in CEPDEC will be able to better meet national obligations to the CBD and respond to issues such as poverty alleviation, environmental stability and other Millennium Development Goals.

About SEP-CEPDEC

Several obstacles have been identified by the SEP participant scientists in Africa, the Indian Ocean and South East Asia that currently prevent countries from efficiently managing, sharing and using biodiversity data: mainly the lack or scarcity of awareness, technical skills, know-how and Internet access. In response to these common needs, the IRD and the GBIF Secretariat started a 3-year cooperation in 2006 between SEP and CEPDEC.

The SEP-CEPDEC collaboration involves the 22 francophone countries participating in SEP (see figure 1). Five of these countries were already GBIF participants at the start of the SEP-CEPDEC collaboration in 2006 (Benin, Burkina Faso, Cameroon, Guinea and Madagascar). The two overarching objectives of this collaboration are:

1. The establishment of GBIF national biodiversity information facilities (nBIFs); and
2. Sub-regional support in outreach and capacity building

The strategies for the implementation of these objectives developed with recommendations and inputs provided by the SEP Scientific Council members are shown in tables 1 and 2.

Table1: Strategy components towards the establishment of GBIF national BIFs

Objectives:	<ul style="list-style-type: none"> • Assist SEP countries that are GBIF members in the effective implementation of their national BIFs and related activities. • Facilitate sharing of expertise, best practices, tools, and technologies from more advanced GBIF nBIFs to the new nBIFs via the GBIF mentoring programme and activities. • Build good exemplars on how to build a national node to be used by other SEP countries.
Areas of work / support	<ul style="list-style-type: none"> • Procurement/strengthening of information technologies (IT) infrastructure (hardware, software, connectivity, etc.) • Needs gap analysis and data providers survey (assessment of the institutional landscape). • NBIF development and management (staff, contracts in place). • Training (including training of trainers) on e.g. digitization, imaging, data cleaning, geo-referencing, data sharing using GBIF standards and protocols. • Fostering digitisation (e.g. small grants for assisting specific digitisation activities). • Promoting data repatriation (digitisation and availability of biodiversity data from SEP-GBIF member countries held in biological collections around the world). • Mentoring (cross-cutting strategy, including training, sharing of expertise and best practices, technologies, etc.)
General considerations:	<ul style="list-style-type: none"> • Focused on SEP countries that are already GBIF members. • Eligible SEP-GBIF member countries ought to: <ul style="list-style-type: none"> a) express keen interest in moving towards full implementation of their GBIF nBIFs and associated activities, b) agree to share some of the costs during this process, and c) actively work towards ensuring long-term sustainability of the national node. • Training activities (including trainer of trainers) and materials produced to support the implementation of the nBIFs will be open to all SEP countries. • GBIF will look for additional funding opportunities to support the mentoring activities considered in this component. • GBIF annual calls for “Seed Money Grants” could be open for SEP countries (to submit proposals for digitization and building of electronic catalogues). • GBIF will promote and facilitate data repatriation activities increasing the knowledge base on the biodiversity of the SEP-GBIF countries.

Table 2: Strategy components for sub-regional support in outreach and capacity building

Objectives:	<ul style="list-style-type: none"> • Enhance the capacity of SEP countries and participant organizations in the use and sharing of biodiversity data by providing training opportunities and materials. • Encourage those SEP countries that are not GBIF members yet to join GBIF.
Areas of work / support	<ul style="list-style-type: none"> • Training scientists and researchers involved in SEP from countries that are not GBIF members will be able to participate at SEP-GBIF training events (also see component 1). • Access to training materials and other technical documentation and tools (GBIF technical papers and training materials) will be translated to French and will be made freely available to all SEP participants. • Transfer of IT technologies (and know how), while bridging the digital divide. • Adoption of open access and data sharing policies (it is recommended that all SEP projects and activities promote the adoption of GBIF Open Access to Biodiversity Data Agreements, and the CBD decision on open access made in Curitiba in 2006). [N.B. BT to provide exact reference to SEP members]. • Government representatives from SEP countries that are not GBIF members yet but have an expressed interest in learning from GBIF, could be invited to attend GBIF events (e.g., Governing Board meetings). • Staff from GBIF Secretariat will be available to attend regional/national meetings and make presentations to raise awareness about GBIF's work and benefits and encourage participation. • Communication materials about GBIF in French language will be produced in partnership with the French Government and the French GBIF Node (including posters, brochures, papers, public awareness materials, etc.)
General considerations:	<ul style="list-style-type: none"> • GBIF and the French Government will explore and look for opportunities to support training and supporting activities to include and benefit all SEP countries.

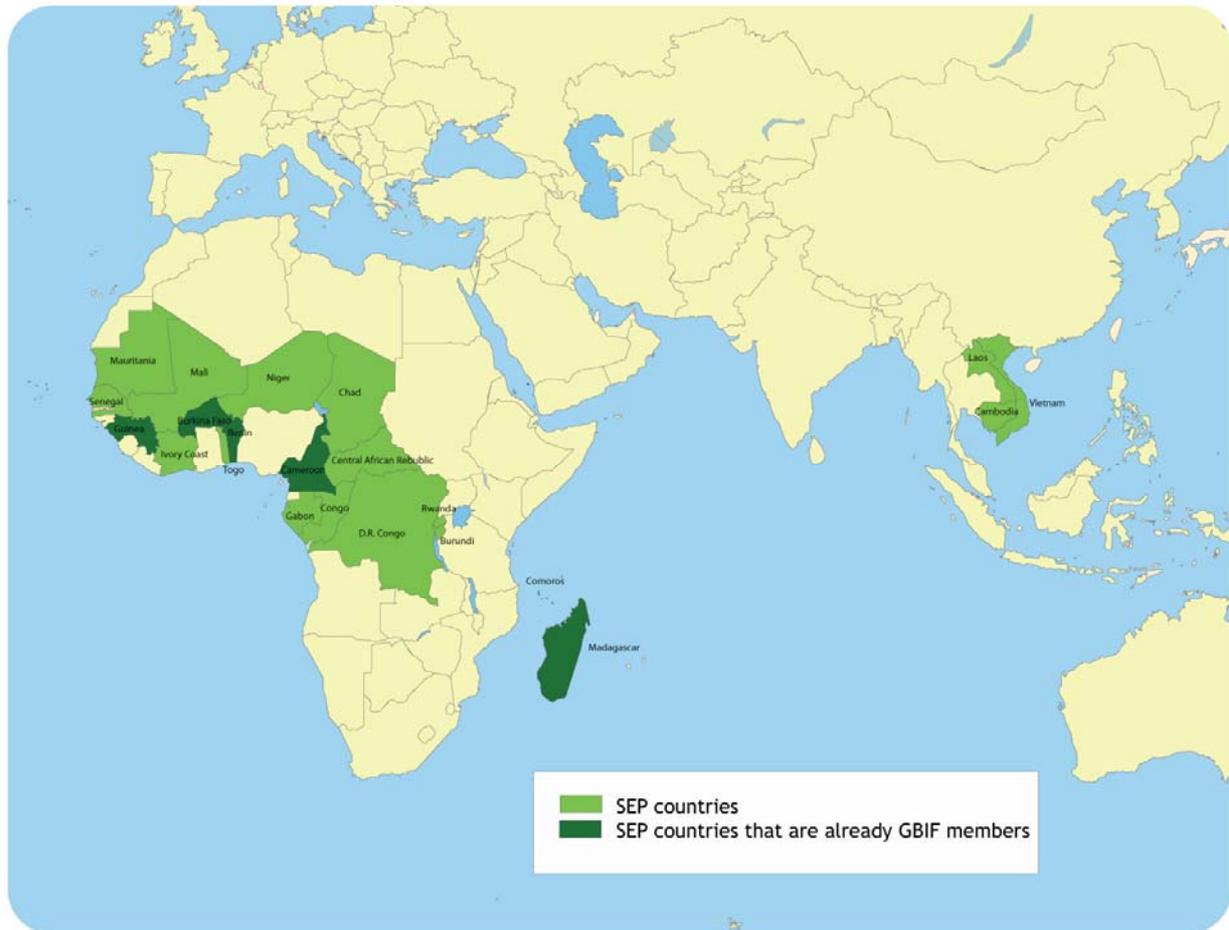


Fig. 1. Countries participating in the SEP-CEPDEC collaboration.

The SEP-CEPDEC programme, supported by GBIF France as the mentor nBIF, will assist in the planning and development of nBIFs in the five SEP countries that were already GBIF participants. Support is therefore based on the experience, best practices, lessons learnt, guidelines and tools developed and made available by the GBIF community.

The national networks are being established on the basis of an action plan developed during the CEPDEC pilot project to establish the Tanzania nBIF (www.tanbif.or.tz). An outline of the action plan is shown in Figure 2. This includes surveys of national data holders, data needs analysis, national stakeholders meetings, formalisation of the networks by the signature of a Memorandum of Cooperation between data holders and users, national implementation of the GBIF Informatics Infrastructure, regional training seminars, mentoring activities and the administration of seed grants for data digitisation activities. This has been adapted and elaborated to suit the national-level needs by each of the five participant countries. Once fully established, these nBIFs will provide information services to support policy and decision making on biodiversity issues in the countries. The nBIFs are further involved in regional GBIF activities to enable the flow of expertise, best practices, tools and technologies for biodiversity data-sharing both within and between countries.



Fig. 2. An overview of the SEP-CEPDEC action plan for the establishment of national biodiversity information facilities.

The other 17 SEP participant countries that were not GBIF members at the start of the SEP-CEPDEC collaboration (Ivory Coast, Mali, Niger, Senegal, Burundi, Chad, Central African Republic, Republic of the Congo, Democratic Republic of the Congo, Gabon and Rwanda; and Mauritania and Togo that recently joined GBIF) are benefitting from the training activities, materials, and guidelines prepared or adapted by GBIF-France and the GBIF Secretariat for Francophone audiences. During the 3 years of the project, these countries are also being involved in several outreach activities, with the understanding that by becoming GBIF Participants they will be able to fully benefit from GBIF as a global network (in areas ranging from capacity building to data repatriation).

A detailed listing of the benefits anticipated for the SEP-CEPDEC participant countries is presented in table 3.

Table 3. The anticipated benefits to the GBIF Participants and prospective participants in the SEP-CEPDEC programme.

Activities / areas of work	SEP countries that are already GBIF members (5)¹	SEP countries that are prospective GBIF members (17)²
• Implementation of information infrastructure	Yes	Encouraged
• Needs gap analysis and data providers survey	Yes	Encouraged
• Node development and management	Yes	Encouraged
• Training (training of trainers)	Yes	Yes
• Digitisation	Yes	Encouraged
• Data repatriation	Yes	Yes
• Mentoring	Yes	Benefits accrued
• Access to training materials and other technical documentation and tools in French	Yes	Yes
• Adoption of open access and data sharing policies	Yes	Yes
• Participation in GBIF events	Yes	Yes
• Access to communication and information materials	Yes	Yes

¹ Benin, Burkina Faso, Cameroon, Guinea, and Madagascar.

² Burundi, Cambodia, Chad, Central African Republic, Comoros, Ivory Coast, Congo, D.R. Congo, Gabon, Laos, Mali, Mauritania, Niger, Rwanda, Senegal, Togo, and Vietnam.

Progress to date

The SEP-CEPDEC collaboration has been the framework for a large amount of activity in 2008 and 2009. National stakeholders meetings have been held in Guinea, Benin, Burkina Faso and Madagascar, bringing together data holders and data users towards forming a network around a National BIF with support from GBIF France as the mentor country. These meetings have led to the signature of formal national agreements on data sharing between data holding institutions in Guinea and Burkina Faso.

National data holders' surveys and biodiversity data needs analyses are underway as part of the national action plans. In Guinea, for example, this process has involved email surveys and face-to-face interviews leading to the mapping of 18 national institutions that hold primary biodiversity data and 21 that are current users of biodiversity information.

As outlined in the national Action Plans, five-day regional training workshops were held in 2009 on the topic of digitisation and publication of biodiversity data on the internet. These were held in Dakar, in collaboration with L'Institut Fondamentale de l'Afrique Noir (IFAN), in Yaoundé with l'Institut de Recherche Agricole pour le Développement (IRAD), and in Antananarivo with the Centre National de Recherche sur l'Environnement (CNRE) and l'Université d'Antananarivo. These events were attended by a total of 95 participants from 17 countries. Training was provided by experts from the Museum National d'Histoire Naturelle, GBIF France and the GBIF Secretariat. A training workshop was also held in Bangkok on Biodiversity Informatics in conjunction with a regional GBIF Nodes meeting co-organised by the Asean Centre for Biodiversity (ACB). Representatives from Laos and Vietnam participated in this workshop and meeting.

GBIF provides training according to a 'train the trainers' approach, with those participants receiving training pledging to be involved as trainers in future events. This approach has been important in maximising the impact of these workshops.

The participation of the SEP member countries at the regional training workshops has proven a successful outreach mechanism, both raising the visibility of the GBIF Participant nBIFs in the region and in encouraging new countries to join GBIF. This has already been achieved by Mauritania that became a voting participant in GBIF in August 2009 and Togo that became an associate participant in October 2009. SINEPAD, the Secrétariat Intérimaire du Volet Environnement du NEPAD, also became an associate participant in GBIF in August 2009, following their participation in the regional training workshop in Dakar. Since signing the MoU, Mauritania has participated in the 16th GBIF Governing Board meeting in Copenhagen and has made contact with the Belgian nBIF. They have submitted a joint proposal for a mentoring project to establish the Mauritanian nBIF, which has recently been accepted enabling work to begin in 2010. SINEPAD has invited GBIF participation in its regional workshop in Douala, Cameroon, which was attended by Cameroon's nBIF Manager. Plans are being developed for more collaborative activities in 2010. Togo is also starting to work on putting together a mentoring programme for 2010, and has been active in discussions regarding the Nodes Portal Toolkit, an informatics tool to support countries in developing their national biodiversity data portals.

Despite the limited funds for this programme, which inevitably set the limit for scale of the activities which can be implemented, the SEP-CEPDEC project has been able to achieve this large amount of activity through successful partnerships with local organisations and the nBIFs. As a result, strong regional networks are emerging, which are crucial for enabling the necessary technology transfer, flow of expertise and best practices to successfully establish BIFs in the region. The high level of horizontal collaboration between the countries involved in the SEP-CEPDEC programme can be seen in activities such as the Node Manager from Cameroon, Prof. Gaston ACHOUNDONG, applying for NEPAD funding to support the implementation of GBIF in Central Africa; and an IT expert, Dr. Georges Edouard KOUAMOU, from Cameroon receiving training from GBIF France and then offering to assist GBIF Guinea with their national training activities.

SEP-CEPDEC is therefore actively contributing to growing the GBIF biodiversity data commons and promoting data sharing with countries of origin, ensuring biodiversity data are made freely and openly available as mandated by biodiversity-related conventions including the Convention on Biological Diversity (Decision VII/11). The SEP-CEPDEC programme is now considered a model for other projects and initiatives in developing countries by the GBIF Secretariat.

Future prospects

2010 is the final year of the current SEP-CEPDEC programme, but with the additional biodiversity focus generated from the UN-declared *International Year of Biodiversity*, it is hoped that the programme will be able to maintain momentum to its termination. National-level data digitisation projects are underway, and will be seen to completion with the publication of new datasets from the participant countries to the GBIF data portal. The focus for these digitisation activities has been to concentrate on producing some key datasets of strategic use in accordance with the needs identified in the national biodiversity needs analysis, which could form the basis to support funding proposals for future digitisation projects. A second trans-regional training workshop, to be held in Madagascar in April 2010, will bring together scientists from the participant countries and will centre on the uses of biodiversity data, including ecological niche modelling. The participant countries will also be implementing national biodiversity data portals in 2010 – 2011, with support from the GBIF Secretariat and GBIF France.

Concerns regarding the sustainability of the nBIFs that will be implemented as a result of this programme remain, despite the progress made, but the level of awareness already reached on the benefits of occurrence and other biodiversity data sharing and use should ensure the continuation of this endeavour. While the GBIF Secretariat will maintain national- and regional-level support for these BIFs, additional external funding will need to be sought in 2010 in order to support similar action plans for the new GBIF members in the region and to assist the consolidation of the national networks.

A ‘think tank’ has been set up to identify ways of sustaining SEP and enabling a continuation of the SEP-CEPDEC programme, including the possibility of making SEP a permanent program with multiple public and private donors. A future SEP-CEPDEC collaboration should provide an opportunity for the countries that have been involved in setting up their nBIFs in the current programme to share their expertise and lessons learnt with other countries in the region.

For more information on SEP, see www.sud-expert-plantes.ird.fr

For more information on GBIF, see www.gbif.org

References

CEPDEC Pilot Project in Tanzania. A GBIF multi-partner proposal. (2006) Global Biodiversity Information Facility, Copenhagen