

## Concept Note

### INTRODUCTION

Without plants, Earth would be a planet without life. Since its emergence 3.8 billion years ago with the first aquatic chlorophyllous organisms, photosynthesis is the vital process that has made the spread of life across the planet possible. It is estimated that marine plants alone produce 70% of the oxygen on Earth. Taken as a whole, plants constitute a vast source and reserve of carbon. Plants, which are autotrophic, form the basis of all food chains. For thousands of years, continuously adapting to the natural dynamics of their environment, plants have colonised aquatic and terrestrial environments, creating the conditions that led to the emergence and maintenance of animal life. Plants form the basis for defining terrestrial ecosystems.

To date, 350,000 flowering plants have been described, many of which are yet to reveal all their secrets, and it is estimated that another 70,000 could still be waiting to be discovered. The various morphological plant types include the trees that rapidly overran almost the entire land surface to form the first natural forests. These are home to most of Earth's biodiversity and are of major importance to maintaining the ecological balance.

Human life relies on plants in many ways. Besides oxygen, plants also contribute ecosystem services that benefit the whole planet; these contributions can be grouped into four main functions: ecological, cultural, social and economic.

The science of plants, which has long gone hand-in-hand with medicine, given the medicinal, even magical properties of plants, grew in popularity from the fifteenth century onwards. The great expeditions of the sixteenth century, with its flourishing commerce, fostered botany as a fully-fledged science; in 1545, the first botanical gardens for science and teaching were created in Pisa and Padua. Until the eighteenth century, it remained a largely descriptive science.

It was on the basis of observations of and experiments on farmed peas (*Pisum sativum* L.), that in the mid-nineteenth century Mendel laid the foundations of genetics, but it was not until the twentieth century that botany, as the science of plants is also known, diversified into a large number of increasingly specialized disciplines, ranging from plant physiology to plant ecology and phytosociology.

On the threshold of the twentieth century, progress in medicine along with the industrial revolution would force the biosphere to undergo major changes as a result of the world's growing population, new ways of exploiting natural resources, including agriculture, and the spread of a way of life based on using fossil fuels that would mark the transition from a traditional way of life to an increasingly globalized



consumer society. This unleashed the erosion of biodiversity and natural ecosystems at an unrivalled pace, along with its effects on the climate, among other aspects.

The international community gradually became aware of the threat to biodiversity and the ecosystems so vital to the human population. Today, problems relating to key ecological and climatic processes are viewed as major challenges for the future of the planet. More than ever, science and research are being called upon, particularly by governments, to understand these phenomena and find solutions. This has led to the creation of the Intergovernmental Panel on Climate Change (IPCC) and the recent Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) at the interface between politicians and scientists to advise on and deal with issues linked to climate and biodiversity respectively, at the global level.

Here at the beginning of the twenty-first century, botany has become a multi-faceted science, the aim of which, however, has evolved over the last few decades. Today, the scope of botany is no longer confined to the disciplines linked to the classification, development, evolution and ecology of plants. Plant physiology and genetics are grouped together under the general term 'plant biology'. The scope of application of botany has been restricted, however. Fungi have been excluded from the plant world and now form a separate group, while the study of algae is the aim of phycology. Botany and botanists focus on terrestrial plants, which include mosses, ferns, gymnosperms and angiosperms.

This change in the definition and aim of botany is largely down to technological advances made in the late 1980s (particularly in terms of computing and imaging), but also to: the multiplication of the areas of action as a result of the need to combine teamwork and a multi-disciplinary approach; interaction with a private sector that expresses new needs; the recognition of local and indigenous knowledge; numerous disputes regarding natural resources; climate change, etc.

The new perspectives provided by molecular biology and information technology, to cite but a few, are opening new disciplinary fields. There is renewed interest in research expeditions as sources of new knowledge. Long considered a science of the past and without a future, those called to study botany have become fewer and fewer in number. Fortunately, however, thanks to technological advances, new horizons are opening up to this science, for example in the fields of phytogeography (using geographic information systems), and phylogeny (using DNA sequences), in computer-assisted identification and digital worldwide herbaria. People are becoming more and more interested in plants and their role in the conservation of endangered species is not insignificant either. Therefore, botanists today are facing a world undergoing profound change, and their future requires some thought.

### **AIM OF THE CONFERENCE**

Botanists must not only adapt but also make their contribution to this century of sustainable development in order to address its economic, social and environmental challenges.

The aim of the conference is to develop a forward-looking perspective of botanists as a profession throughout the twenty-first century. The conference will provide a platform from which to, on the

one hand, identify the issues and challenges facing botany at the beginning of the twenty-first century and, on the other hand, envisage future opportunities and perspectives so that it can continue to make an essential scientific contribution to the society of today and tomorrow.

The conference will explain the issues by identifying training needs and promising trends, and by pointing out the discrepancies between the training available and the needs of society.

It will also provide a platform for defining how botany should interact with the general public and for improving its communication with that public.

### **SYNERGY WITH THE EXISTING STRATEGY AND PROGRAMME FRAMEWORKS**

The theme of the conference obviously falls within the global perspective of contributing to the implementation of the Convention on Biological Diversity (CBD) and its various instruments, such as the Nagoya Protocol. The conference is being held as part of the Decade on Biodiversity (2011-2020), which aims to promote the implementation of the “strategic plan” adopted at Nagoya, which in turn aims to “integrate biodiversity at all levels” and set the Aichi Targets. The conference will make a substantial contribution to reaching these targets and to implementing the Global Strategy for Plant Conservation.

The conference will also be relevant to the implementation of certain international initiatives, such as the REDD+ programme (United Nations Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries, including the role of conservation, sustainable management of forests and enhancement of forest carbon stocks).

### **CONFERENCE FORMAT**

#### ⇒ Target stakeholders

The conference will bring together participants who come from all regions of the world – *Africa, Arab States, Asia and the Pacific, Europe and North America, and Latin America and the Caribbean* – and who have a particular interest in the plant world. Participants from the public, private and voluntary sectors will represent the following (non-exhaustive) categories:

- ◆ Local communities
- ◆ Holders of traditional knowledge
- ◆ Political and administrative decision-makers
- ◆ Students
- ◆ Training institutions (universities, secondary-education institutions, etc.)
- ◆ Specialized institutions: museums, herbaria, arboretums, botanical gardens, etc.
- ◆ Research institutions/bodies
- ◆ NGOs and not-for-profit organizations
- ◆ Civil society

- ◆ Private sector
- ◆ bilateral and multilateral technical and financial partners
- ◆ international and intergovernmental bodies
- ◆ private companies

#### ⇒ Conference structure

Participants will spend three days exchanging and analysing knowledge and points of view on botany-related topics chosen for their relevance to current and future issues linked to sustainable development. An extra half-day will be dedicated to visiting a modern research tool: the great restored herbarium at the National Museum of Natural History, in Paris.

The conference will comprise:

- ◆ inaugural meeting: official and inaugural speeches
- ◆ plenary meetings: addresses, questions, debates/panellists-recommendations
- ◆ poster presentations
- ◆ visit to National Museum of Natural History, Paris

#### ⇒ Conference themes

The conference themes will be structured around the three pillars of sustainable development combined with the targets of the Global Strategy for Plant Conservation (GSPC): Knowledge, Conservation, Sustainable Use, Education, Awareness, and Strengthening Capacities.

The content and details of the sessions will be discussed by the scientific committee. A chairperson and a general rapporteur will be appointed during the opening session. Each thematic session will be led by a moderator assisted by two rapporteurs.

**Examples of questions** that could structure the three days of meetings:

**Session 1: Botanists and the economic challenges of the twenty-first century: *what knowledge is needed for a green and blue economy?*** Agro-biodiversity – agroforestry – ethnobotany – gardens and collections – plant conservation – seed banks – CITES – forests – environment – biotechnology – ecological restoration – engineering – pharmacology – biosphere reserves, (*GSPC: knowledge, conservation, sustainable use*).

**Session 2: Botanists and the environmental challenges of the twenty-first century: *what knowledge is needed to better understand and mitigate the effects of climate change, the destruction of environments, the extinction of species, and rapid and uncontrolled urbanization?*** Terrestrial ecology – invasive alien species – marine ecology – systematics – databases and management – publishing – gardens and collections – plant conservation – seed banks – CITES – forests – conventions – sustainable development – REDD+ – access and benefit-sharing – Congo Basin Forest Partnership – biosphere reserves – environment – ecological

restoration – papers (*GSPC: sustainable use, conservation, strengthening capacities, knowledge*).

**Session 3: Botanists and the social challenges of the twenty-first century: what strategies are needed to address globalization, urbanization, and the loss of traditional knowledge, and to better appreciate the dimensions of art and culture, and man and nature?** Participatory sciences – *Vigie-Nature* (Biodiversity Observatories) – Herbanauts – network – partnership – NGOs – protection – nature – training – transmitting knowledge – botany in the South – IUCN World Commission on Protected Areas – parks and gardens network – biosphere reserves (*GSPC: education and awareness, strengthening the public's capacities*).

**Session 4: Botanists of tomorrow: What types of training are needed for each issue? ICT, new tools, new concepts, specialized networks, new needs, etc.** (*GSPC: Strengthening capacities*).

**Final session: summary of the discussions and recommendations:** half a day. This session will be moderated by the conference chairperson assisted by the general rapporteur.

#### EXPECTED OUTCOMES OF THE CONFERENCE

The conference should lead to clear recommendations addressed to various stakeholders regarding the different themes discussed throughout the conference. From the discussions as a whole, the conference will agree on recommendations and proposals for research topics at the global level linked to the subject of the conference.

#### CONFERENCE LANGUAGES

English and French.

#### SCHEDULE:

**Conference dates: 22 to 25 September 2014** including a half day visit to the restored herbarium and the botany gallery of the National Museum of Natural History, Paris.

**Information on the call for papers:** on UNESCO website

**Procedure for submitting papers for selection:** online submission through UNESCO website

**Final papers** to be received on 16<sup>th</sup> August 2014 at the latest

#### SCIENTIFIC APPRAISAL

A drafting committee will be responsible for the collective publication, including the conference papers and report, under the coordination of a member of the **scientific committee**.