

Botanical gardens are the main base for education for sustainable development

EMMA ARAPETYAN

Lviv National University after Ivan Franko, Ukraine; emarapetyan@gmail.com

Arapetyan E. (2015): Botanical Gardens are the main base for education for sustainable development. – Thaiszia – J. Bot. 25 (Suppl. 1): 7-11. – ISSN 1210-0420.

Abstract: Botanic Garden serves a number of interrelated functions: phytodiversity preservation, recreational, scientific, teaching, educational, cultural. They play main role of leading centers of education. Create out funds of plants are used in student research and post-graduate education, to develop culture of relations with nature. Botanical gardens were given a major role for the implementation of Program "Education for Sustainable Development". They become centers of environmental education and ecological education.

Keywords: botanical garden, plant collections, education for sustainable development.

Introduction

The environmental global changes forced to review pillars of educational strategy and make accent on ecological awareness. Clarification of educational strategies and educational activities to preserve the environment including flora diversity is reflected in the international documents. Decade Education for Sustainable Development (ESD) from 2005 to 2014 years held under the auspices by UNESCO. The continuation of this trend was the tenth meeting of the Conference of Parties (COP) that adopted the Convention on Biological Diversity (Nagoya, Japan, 2010).. These documents are declared changing educational strategy. Program "Education for Sustainable Development" was main strategic focus on ecological vector of education. Ecological education, its forms and methods are the basic principles of Education for Sustainable

Development. The term “ecology” was first used by the German biologist Haeckel in 1866 and translated as “the science of humanity House”. This environmental education population - priority direction outreach.

The main concept of ESD based on the national culture, national policies. Every nation and individuals will decide on this program from their point of view. For example, in German launched program to keep in the workplace green boxes for collection of waste paper. The focus of the educational program paid ESD information about local plant resources and problems of regional flora. Ecological education includes ecological knowledge. Ecological behaviour includes the concept of ecological moral, ecoethics and ecological culture of communication with nature, understanding of nature-human relationship.

ESD based on the premise of “learning by doing”. This motto is interesting to confirm the facts of biography of great men. The poet Johann Wolfgang von Goethe and composer Pyotr Ilyich Tchaikovsky loved flowers. They sowed the seeds of favourite flowers of violets and lilies of the valley in the forest. The famous filmmaker Alexander Dovzhenko planted pomology garden.

Environmental education of population is core focus of scientists all around the world. To implement this program a great role was given to botanical gardens (BG) which attract a large number of people. That is why botanical gardens were given a major role as the centres of ESD, ecological education and environmental education for plant diversity conservation.

Botanical Gardens in Ukraine play an important role in the study of plant diversity and its conservation *ex situ*. During decades plant collections have been forming on the territory of Botanical Gardens, primarily are introduced plants in the selection of new species. The accumulated research experience in the botanical garden confirms the possibility for a number of plants from different geographical origin to be introduced in cultural conditions of Ukraine. For example, in botanical garden of university grows and develops giant sequoia, hunnera in open soil condition or palm in green orchard under low positive temperatures in winter.

Collections of plants in BG have one major advantage - they are formed on taxonomically authentic material. Each collection is formed on the scientific basis with different principles (botany- geographical, floral, etc.) and have aim primarily preserve and increase species diversity of flora. Botanical Gardens in Ukraine are the centres of plant introduction, its reproduction and people familiar with the plant diversity of the world.

In Botanical Gardens of Ukraine for a long time were accumulated scientific and educational experience, established traditions. The rich diverse composition collections makes it possible to provide basic science information about the flora from different regions, is the source of knowledge about the flora of the various climatic conditions and is in the present conditions insurance fund types which in nature is not provided with protection. Plant diversity which are growing in BG are promoting in form excursion from spring to autumn for all pupils. Popularization of knowledge for all sections of the population based primarily on excursions in the natural environment. Transformation of the surrounding environment

provoked the need to revise educational strategy. The accents on submission of scientific information are changed on ecological education. Now botanical gardens become active centre of ESD and implementing this program according the key words of BGCI's 9-th International Congress on Education in Botanic Gardens (2015) "*Teaching & Learning, Science Communication, Social Inclusion & Community Engagement, Research & Evaluation, Professional Development*" (St. Louis, USA, 2015).

Botanical Garden educational work is based on stimulating interesting around nature of all sections of the population involving them in shaping the modern attitude to nature in terms that are most favourable to it. Training and educational training in BG has its advantages. Educational work perform by professionals in the wild in the supervisory form that involved not only the auditory receptors, but also visual parts, which significantly reinforces the theoretical knowledge of the course. Nature listeners are in a state of relaxation, which makes it easier to perceive and absorb new material. Information richness and variety of topics of lectures or workshops, excursions much larger due to the wide variety of surveillance material.

Botanic Garden of Ivan Franko National University of Lviv is a reservation of national importance and serves a number of interrelated functions. Firstly: the environmental protection including recreation, namely storage phytodiversity in cultural conditions of the region, which includes the creation of collections of plants, conservation and replenishment on a scientific basis (from a scientific point of view). Secondly: functions of education, which includes didactic, cultural-educational and educational activities. Format of EDS on base of BG is multivariate. The main mission of BG is educational and self-educational activity, acting science and interrelation place. The basic of EDS in BG are plant collections. Plant diversity in BG is presented by plant collections in open soil: native species of flora Ukraine, dendrology flora, aquatic flora and orchard house. Plant collections of botanical garden play a main role in the study of different groups of plants from different regions with the various climatic conditions. Collection funds of plants are an educational element to develop culture of relations with nature and formed aesthetic skills. They are represented in forms as planting area, topiary art, flower composition and etc.

Forms of knowing are different. Popularization of knowledge is based on public presentation plant collection funds, self-education, international program. Public presentation of plant collections from spring to autumn are cultured-raising and educational activities. Information richness and variety of topics of lectures or excursions much larger due to the wide variety of surveillance materials which involved as auditory receptors as visual. Public presentation of plant collections plays a sound role in the study of different groups of plants as arboretum as herbaceous flora. Each collection includes rare, endemic species of flora of Ukraine. Separately, it should be noted plants growing in greenhouse conditions. Currently BG has the unique collection different groups of tropical plants that have high scientific value. Plants collected from different regions of Earth. Some plants transferred from the greenhouse to open soil conditions during warm

period. Now these collections are in addition to scientific and more general environmental, educational function expanding vision of the world, forming a worldview. Self-education included different forms. Some of them are Information boards. They were made according to European standard and presented the Latin and Ukrainian names of plants and its phyto-geographic characteristic. Boards are powerful element of self-cultural-educational and educational activities. BG initiates international program involvement of colleagues from abroad. Implemented project "Salix" with representatives of botanic gardens from Poland. Within a few days held workshops on basket weaving, and created different objects /arch, bird, etc./ that have become permanent exhibits on the territory of Botanical Garden. Under the auspices of the European Organization for Plant Biology occur annually in Ukraine participated at the 'Fascination of Plants Day International "Day of Plants" and Botanical Garden annually to celebrate this day on the territory of the garden.

A powerful vector outreach and educational work is interaction with mass media (newspapers, magazines, TV, radio). Regular press coverage of plants with interesting collections of Botanical Garden has become a powerful resource for a wide range of people of all ages.

BG is the centre of learning and study plants. BG collections are educational basis for students from different college and university, pupils (children of school and preschool age), teachers and population. Collection of vegetable stock base station used as educational base for students. The training function is the classroom of students included in their teaching and research program based on BG. Collection funds of plants are used as scientist base in student research and post-graduate education as an educational element to develop culture of relations with nature.

The learning process has different levels: a) the excursions (flora Ukraine, plants greenhouse group, agricultural plants, species diversity of flora in the world, b) lectures and laboratory classes c) passing educational summer practice, g) performance science research (courses, postgraduate work) .

Educational work with children of school and pre-school age - the prerogative of educational staff botanical garden, because it is in childhood lays the matrix behaviour of children. Popularization of knowledge for all sections of the population based primarily on excursions in the natural environment. The content of each tour is taken into account in accordance with specific groups (age, specialization) and collector-exposure area plants are compelling source of knowledge about flora.

Using the plant collection fund on public presentations, which take place from early spring to autumn at weekends and different topics which not repeated for several years. Children's groups were involving for performances or competitions for them on various subjects (drawing, dancing). This approach is the fundamental cognitive base deepening botanical knowledge. This new type of representation of knowledge, providing access to scientific results to the public.

Visitation to the botanical garden forms aesthetic and cultural features. The variety of the landscape, such as the rates at which the beeches grow on the

slopes or the slopes which composed a collection of highly decorative creeping every green plants also a part of aesthetic education. Effective form of aesthetic education is topiary art, which reaches more start times of ancient Egypt and Persia and becomes more and more popular now in connection with their aesthetic appearance. At the garden presented cropped figures from conifers. Creating floral arrangements of varying complexity-from bouquets complex to compositions as globe - became part of the formation high quality skills.

Educational infrastructure of botanical garden activity is not limited only within the garden territory. Educational work is carry out outside the BG. Planting territory of University decorative flowering plants from the arboretum representatives induced of interesting to know with the world of plants.

The role of botanical garden in society has become much more significant, which is reflected in popularize knowledge about flora. BG is becoming increasingly important in the live of all sections of the population showing examples of scientifically based conservation centre for phytodiversity in cultural terms and acquiring the status of a leading environmental education centre and performing substantial role in educating environmentally literate people who own cultural skills to communicate with nature, the environment. Botanic Gardens are centres of phytodiversity preservation, raise ecological awareness and play role of leading centres of education. Plant collections of BG are a source of scientific information about the flora from different regions with the various climatic conditions and used in the organization of teaching and research work of students and to educate all sections of the population and is the educational element to create skills literacy related to flora and understanding of the integrity of nature and Homo sapiens. Thus botanical gardens are active centres of ecological education centres and centres of ecological behaviour.

References

- The tenth meeting of the Conference of the Parties, Nagoya, Aichi Prefecture, Japan, 18 - 29 October 2010.
- 9-th BGCI International Congress on Education in Botanic Gardens, April 26–May 1, 2015 in St. Louis, Missouri, <http://www.missouribotanicalgarden.org>.

Received: November 13th 2015
Revised: December 14th 2015
Accepted: December 15th 2015