EDUCATIONAL ECOSYSTEM

A MODEL FOR INCREASING THE COMPETENCES OF STUDENTS

AT THE FACULTY OF BIOLOGY OF SOFIA UNIVERSITY "ST. KLIMENT OHRIDSKI"

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EDUCATIONAL ECOSYSTEM INTRODUCTION

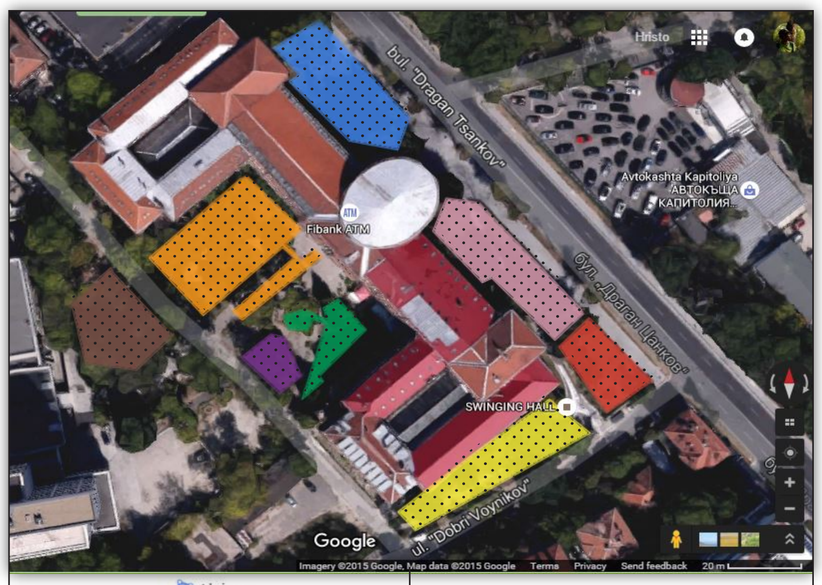
Educational Ecosystem (EE) is a new established or improved existing ecosystem consisting of different elements that support viable conditions for **introduction, reintroduction and conservation of flora and fauna species.** The purpose of EE is to **provide modern methods of theoretical and practical environmental and sustainability education to students at different age**. Another purpose of EE is to provide suitable living conditions for many flora and fauna species thus **increase the biodiversity and ecosystem functions and services in the urban environment**. The EE elements will be decided and designed according to the properties of the site, connected between each other and interacting as a **self-sustainable ecosystem**. They will have **educational, ecological, social and scientific role**.

Every element will have educational methods focused on providing knowledge about the local and global ecosystem dynamics and how to sustainably use and improve the surrounding environment. EE will be social gathering place for community activities such as **lectures, workshops, scientific conferences**, etc. The rich biodiversity of EE will increase the ecosystem functions and make the **ecosystem more resilient, reduce pollution and mitigate climate change**. EE will be interactive **living laboratory** allowing real-time observations and monitoring of ecosystem functions. The monitoring of various biotic and abiotic processes will result in research data collection that will enrich the urban ecology science, leading to **better understanding of the impact of urbanization**.

DESIGN OF EDUCATIONAL ECOSYSTEM FOR FACULTY OF BIOLOGY

Fig. 1 Location of Bulgaria and Sofia

Fig. 2 Location of Faculty of Biology in Sofia



Main Elements	Additional Elements
Alpinum	Water biotope
Bee Paradise	Green barriers
Compost zone	Green roofs
Decorative zone	Green walls
Edible garden	Social zones
Ex-situ zone	Habitats for fauna species
Natural zone	Water irrigation system
Sofia Field	Infrastructure improvements

Fig. 3 Educational Ecosystem elements landscape plan

- Biodiversity hotspot and wildlife corridor in the center of Sofia, Bulgaria **(Figure 1 - 2)**
- 16 educational ecosystem elements corresponding to the Faculty of Biology site properties (418 m^2 size) and projects **(Figure 3)**
- Ecological and Naturalistic design for maximum similarity to natural habitats combining the best techniques and tools from: conservation biology, sustainable ecosystem approach, urban landscape planning, permaculture and biodynamics
- Sustainable local building materials - recycled, re-used, donated (synergies)
- Local and global floral species specially chosen from specialists and experts
- Introduction, reintroduction, conservation, ecological compensation and monitoring of flora and fauna species **(Figure 4 - 6)**
- Productive landscape design **(Figure 5)**
- Educational, environmental, scientific, social and aesthetic function

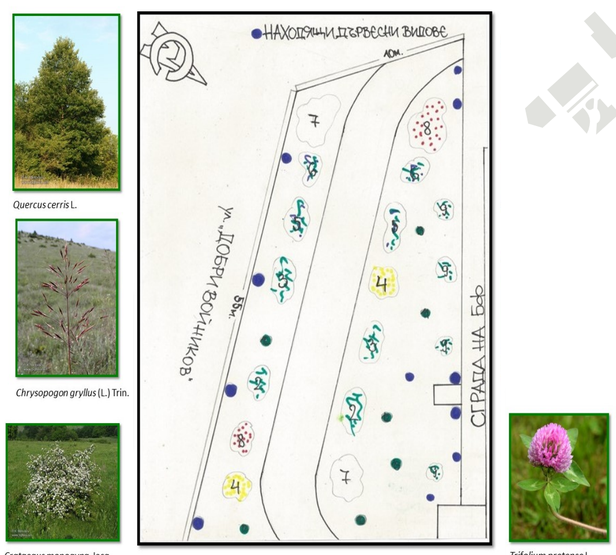


Fig. 4 Sofia Field landscape design

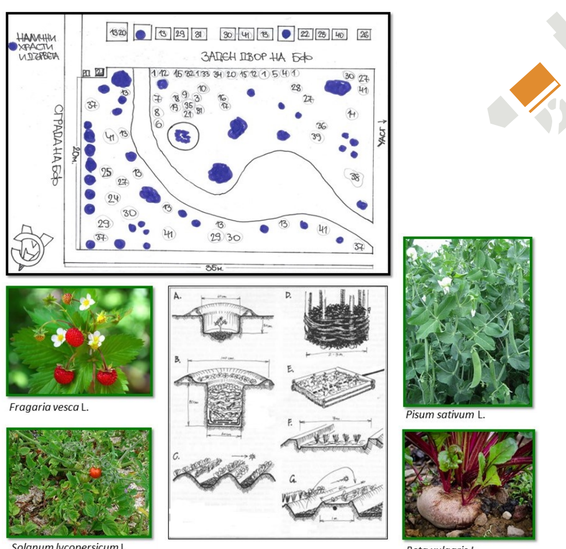


Fig. 5 Edible zone landscape design

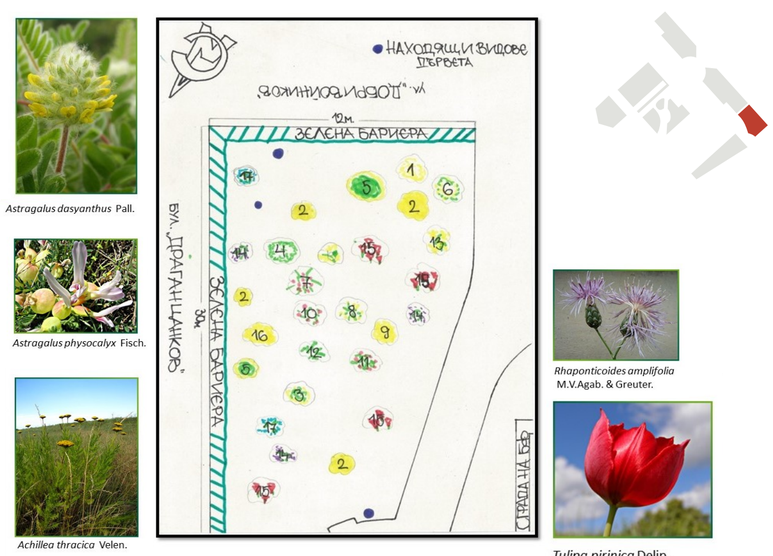


Fig. 6 Ex-situ zone landscape design

NEEDED RESOURCES & EXPECTED RESULTS

Period (year)	Needed resources	
	Financial (€)	Human
2016	111,209	9
2017	61,217	12

Table 1. Summarized financial and human resources needed for EE at BF

A two year financial budget plan has been made, stating preliminary financial and human resources (experts + workers) needed for the establishing, management and monitoring of the EE (Table 1).

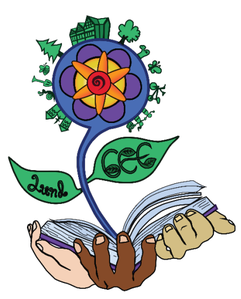
The expected educational, environmental and scientific results after 2 years operation of the EE are shown in Table 2.

Period (year)	Expected results		
	Educational	Environmental	Scientific
2016	220 students	Introduction of 114 sp. Reintroduction of 13 sp.	1 year biological monitoring
2017	400 students	Introduction of 22 sp. Reintroduction of 8 sp.	2 years biological monitoring

Table 2. Expected results from EE at BF after 2 years of operation

GLOBAL EDUCATIONAL ECOSYSTEMS FOR ALL NETWORK

Global Educational Ecosystems for All (GEEA) is a global environmental and sustainability education project aiming for establishing and managing EE in different parts of the world. The network of GEEA will allow many people to acquire theoretical and practical knowledge, resulting in more competent and aware society. It will be in great favor for the creation of ecologically important biodiversity rich places as well as for the improvement of the urban ecology and sustainability science.



The first established EE, part of GEEA is the Greenhouse Educational Ecosystem (GEE) in Greenhouse Accommodation for students, Lund, Sweden. Started in January 2015 as part of two local NGO organizations for sustainability, the project has conducted 22 educational meetings and 8 workshops, reaching 216 participants, mostly international students of Lund University.