Mission of the botanic garden in the Lake Baikal region

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Since biodiversity has varying patterns at continental and global scales (Mutke, Barthlott, 2005), Botanic Gardens activities vary with local and global tasks. The Botanic Garden of Irkutsk State University (BG ISU) is located in Irkutsk, Russia, considered for centuries the intellectual capital of Siberia. The BG ISU, an educational and scientific arm of Irkutsk State University, founded in 1940 in Irkutsk city, 70 kilometers west of Lake Baikal. As a living museum**,** the BGISU serves as an educational tool for students and public. It is the only botanic garden in Baikalian Siberia located in Asia's center. Siberia has been always considered as a prospective source of future economic development of Russia due to its vast territory and rich natural resources. The UNESCO nominated the Lake Baikal region as a World Natural Heritage Site in 1996. It brought a new vision and main priorities for sustainable development in the Lake Baikal region:

1) A rational use of natural resources;

2) Development of innovative economics;

3) Creation of tourism and recreation complexes.

Obviously, the BG ISU resources fit into all three above priorities. This article shows that a mission of the BG ISU garden is being changed from the university sub-division with rather narrow functions to the public oriented multifunctional science-based institution, which roles go beyond traditional limits. And both tangible and intangible aspects of BG's functioning are equally valuable for sustainable development and rational use of natural and cultural resources via education, creation of safe environment, nutrition, public health, reduction of poverty, socio-ecological and economic benefits for a society(community), including commercialization. All materials based on the author's experience (Kuzevanov, Sizykh, 2005) in development of the university botanic garden resources in a frontier environment of Siberia in times of global changes and a transition to market economy in Russia during last 20 years (Fig. 1).

By law, the BG ISU is included in a list of strictly protected natural territories like nature reserves and national parks in the Lake Baikal region since 1995. Being a part of the City's largest forest (>100 hectares) it was also nominated as a nature memorial of the city by the Irkutsk City Duma in 2006.

From the very beginning in 1940, the BG ISU was established as an experimental station for university students and professors. Due to it work on introduction of plants tolerant to severe Siberian climate it gradually became a source of new forms and varieties of fruit trees for local public. Through the accumulation of largest regional collections up to about 3000 plant taxa, the BG ISU works as a plant gene bank and an elite nursery for the Baikalian Siberia. Due to current trends it is becoming an innovative science-based complex, which can promote development of region by introduction of new economically valuable plants, preservation of biodiversity and rare plants, creation of a friendly and safe environment, greening and beautification of cities, educating and training of different groups of the public, propagation of valuable plants for local population.

Botanic gardens are associated with sense of peace and a peaceful life. They have been always recognized as tangible resources for the improvement of humans. Botanic gardens are innovative institutions that can help local people in many ways via plant introduction, a creation of friendly and secure environment, an improvement and beautification of settlements, a city greening, a restoration and a repatriation of rare plants, a tool for the "horticultural therapy"(Sizykh et al., 2006), and a continuous education and public awareness promotion, etc.

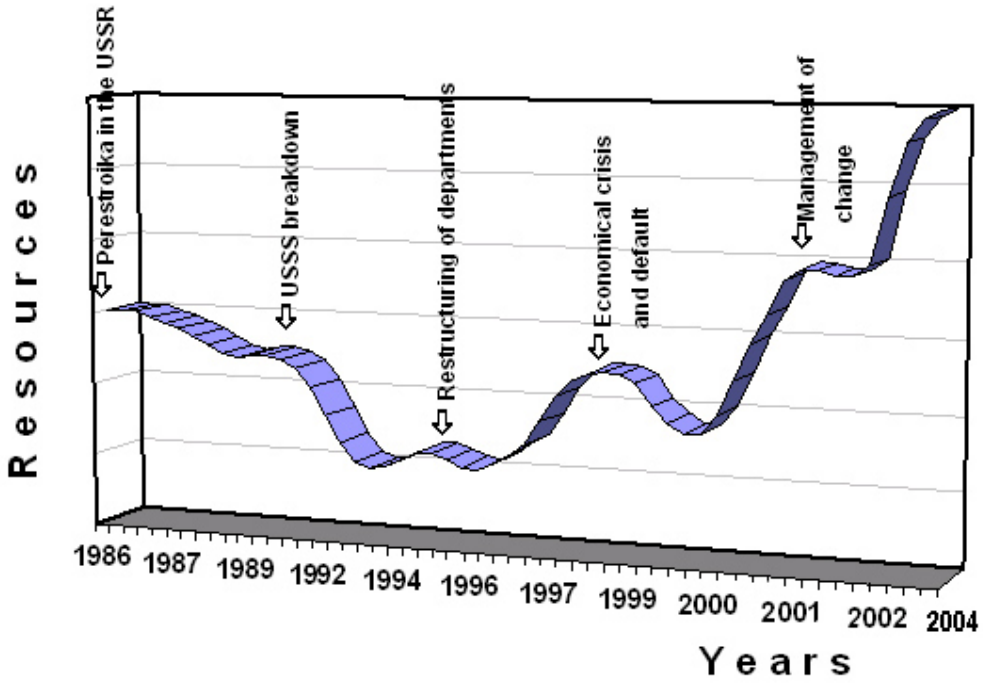

Fig. 1. A dynamics of resource potential of the Botanic Garden of Irkutsk State University during 1986-2004 (Kuzevanov, Sizykh, 2004). The resource potential (in relative units) was estimated by a group of 5 experts-managers as an integrated parameter of productive forces, including human resources, plant collections, an infrastructure, the basic assets for production and income. Two periods of dramatic decrease of resources are reactions to "perestroika" in the USSR after the "shock therapy" in 1990-1993 and on devaluation of national currency in 1998-1999 are visible. Minor deviations from the general trend are reactions to actions on internal re-structuring and change management activities

A traditional view on the BG (**Fig. 2**) which served as a pattern or the classical model and interface between nature and people is changing due to ongoing diversification of BGs and their active involvement in globalization. Moreover, we are seeing a process of the changing paradigm of the BGs especially in tangible and intangible aspects of their functioning as well as in their concept and practices for the community.

Fig. 2. The classical paradigm of Botanic Gardens as an interface between nature and people. Introduction of ecologically and economically valuable plants (edible, medicinal, ornamental and others) provides natural resources for the survival and improvement of human well-being. Feedback arrows provide sustainable development of botanic gardens and nature conservation

Since biodiversity is one of the fundamental cornerstones for human well-being and sustainable development, any institution involved in biodiversity issues should be an important bio-player in biodiversity conservation and use on national or international arenas depending on available resources and its mission. The involvement of any BG in national, inter-regional and international networks makes its position stronger and more flexible, due to ongoing exchanges of tangible and intangibles resources between world BGs.

Positioning of BG in a system of the circulation of plant genetic resources (tangibles) and associated knowledge, traditions, ideas and skills (intangibles) for conservation, mobilization and use of biodiversity (Fig. 3) can not be underestimated. BGs play complementary dualistic roles in biodiversity conservation and restoration as well as in ecological innovations for improvement of human well-being.

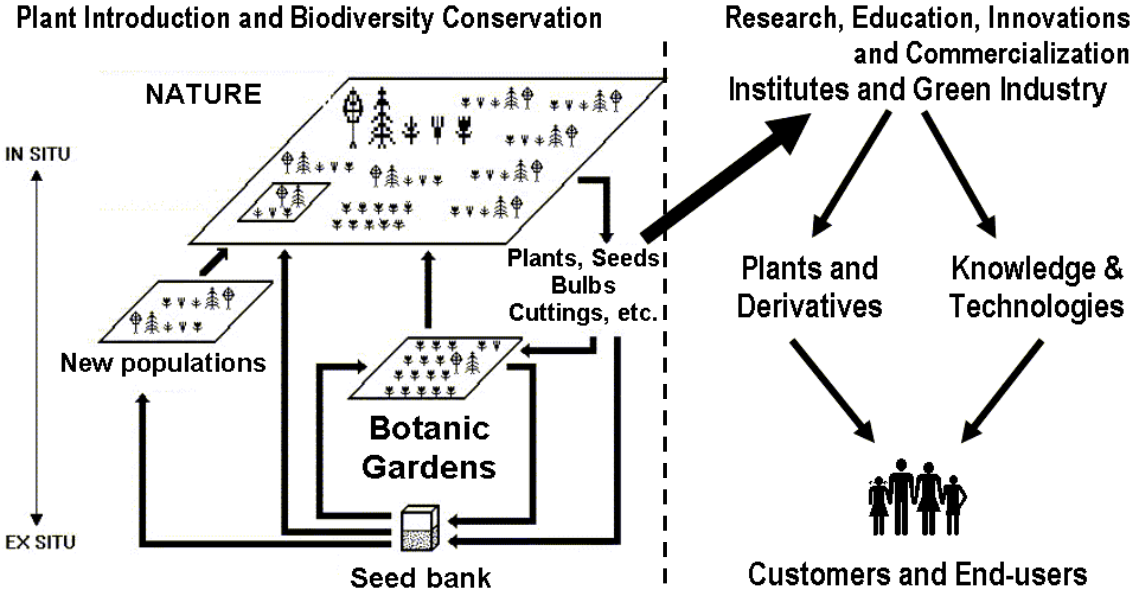

Fig 3. Positioning of the Botanic Gardens in a system of the *in-situ* and *ex-situ* circulation of plant genetic resources (tangibles) and associated knowledge, traditions, ideas and skills (intangibles) for conservation, mobilization and use of biodiversity. It shows a complementary dualistic role of the BGs as a part of biodiversity conservation and genetic resources turnover (left box) and other innovative outputs for improvement of human well-being (right box)

It is necessary to emphasize, that any modern BG is not just a beautiful park or a channel for the transfer of pure knowledge and theoretical skills because such knowledge and "know-how" cannot be delivered just through books or Internet. Only through practical works and activities, the BG can transfer skills and experience connected with traditions and best practices in certain regions. Such transfers and mutual sharing need a personal communication between humans in practical actions. Due to the intrinsic peaceful nature and a positioning of BGs in the society, they have an important factor of formation of peace traditions at young generation and steady transfer of these peaceful traditions through generations.

Summary and concluding remarks.

In new ecological and economic conditions of globalization and transition of Russia to free market economy, the BG ISU is becoming an intellectual and innovative part of regional ecologically significant resources and regional productive forces for human well-being in the Lake Baikal Region. Because of ongoing socio-ecological trends, a new type of the university botanic garden with the infrastructure for large public activities of local, national and international significance will be created in Irkutsk, the capital of Eastern Siberia. The science-based tourisms and recreation complex also will be the beneficiary of one of the natural wonders of the world, Lake Baikal.

Therefore, at present time principal missions of our university botanic garden are following:

- an educational and scientific tool for the university and schools;
- a strictly protected natural territory;
- a city's nature memorial;

- a living museum;
- a regional ecologically significant resource for city greening and horticultural innovations;
- a source of new forms and varieties of fruit trees for the public;
- a bio-player in biodiversity conservation and its rational use;
- a plant gene bank (and a seed bank);
- a public park;
- a tourism and recreation complex;
- a tool for the "horticultural therapy";
- a "mother" for orphans and children with special needs;
- a tool for a steady transfer of peaceful traditions through generations;
- a promoter of international cooperation.

Human activities keep many nations out of poverty but at the price of loss of biodiversity in certain countries, not necessarily located in the same regions. Therefore, a loss of biodiversity is considered to be a major threat for human developmental goals and for the progress of next generations. Only recently heads of five biodiversity related conventions came to the conclusion that "Biodiversity can indeed help alleviate hunger and poverty, can promote human health, and be the basis for ensuring freedom and equity for all" where botanic gardens play very important role (Waylen, 2006).

The role of BGs as intellectual and cultural centers is increasing. It is a challenging period of time when the roles of BGs go beyond the traditional limits.

In the new ecological and economic conditions of globalization, the role of BGs in Russia will be changed substantially due to their well-developed networks, traditions of free exchange of tangible and intangible resources, direct involvement in the community and direct contacts to the nature. Therefore, the Irkutsk Botanic Garden is becoming an important part of regional ecologically significant resources and elements of regional productive forces for human well-being and sustainable development in the Lake Baikal region.

References

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