THE DESIGN GUIDELINES FOR THERAPEUTIC SENSORY GARDENS

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Abstract
The research topic is sensory, healing, rehabilitation and horticultural gardens, and the related discourses. The first part of the paper describes the historic development of the rehabilitation and health gardens in Latvia. Then he research paper takes a look at the main aspects which dominate in the rehabilitation and sensory visual and functional garden sites in the world. The quest to create contemporary landscape sites for health reasons is still one of the main subjects to explore and find definitions for. The methodology used in this paper is descriptive, from the perspective of historical relaxation gardens and health sites. The aim of this research is to define the main development lines of health sites in Latvia, trying to answer such questions as: How we can start developing sensory gardens and what is needed for their development in the future? To achieve the goal, it is necessary to absorb the world experience and exchange best practices, find innovative solutions, and adapt advanced rehabilitation center area landscapes to individual needs. When creating the healing gardens, the aesthetic and functional criteria have to be applied. Depending on the availability of the natural environment, health and satisfaction will be enhanced.

Key words: Horticultural therapy, Sensory gardens, Healing gardens, Rehabilitation, Sanatorium.

Introduction
The world experience shows that architecture is closely linked with other fields of science, such as, biology, mathematics, philosophy, aesthetics, psychology, physics and others. Professional and well-landscaped outdoor sites or well-designed indoor interiors can be both functionally effective and also strengthen and improve health processes – it is a new architectural trend, called ‘Design and health’ (Dilani, 2001). The study and analysis of how the environment affects the human and vice versa, including also the relationships between individuals and different groups, is called the environmental psychology. Both positive and negative lessons - learned from environmental psychology - are useful not only to the landscape architects, but also to designers, architects and urban planners. In the landscape architecture the design and positive health processes are intertwined in the healing or health gardens (Cooper and Barnes, 1999). There is an increased interest in human and environmental studies all over the world, and the studies reveal many interesting facts proving that a person’s interaction with environment improves his or her mental and physical health. Most gardens give aesthetic pleasure, but sensory and therapeutic gardens are created to functionally reveal all five of the human senses: vision, touch, smell, taste and hearing (Fig. 1.).

The sensory gardens are developed near the kindergartens, hospitals, schools, as well as the care-homes and other medical facilities. The surrounding environment affects not only the way of thinking, but also the person’s intellectual development. Already in 1810 in his book ‘Theory of Colours’ J.V. Goethe published the research on how optics affects human psyche. Unlike the physicist Newton, he emphasized the role of emotions and experience in how we perceive the colours (Goethe, 1810). The healing power of nature, the sun and fresh air have already been used in the previous centuries in planning and landscaping the

Source: graph created by the author (2013)

Figure 1. Examples of the five human senses.
garden near the medieval monasteries, infirmaries, 19th century Pavilion type hospitals, 20th century shelters and sanatoriums. The plants, light, water and other nature elements can cause in a person many different feelings.

In most of the medical institutions of Latvia, the green area is obsolescent and non-functional. Latvian landscaped sites need new and innovative ideas. One of the solutions is the development of Latvian therapeutic gardens. And thus the research subject is: Therapeutic and rehabilitation gardens. The present article discusses the landscape rehabilitation areas and their functional significance in Latvia and abroad. The aim of the present research is to analyze and summarize the available historical papers, scientific research literature, publications, documents, and electronic resources on the Latvian health resort gardens, as well as the global experience of the medical treatment’s impact on people. On the basis of the worldwide therapeutic gardens that are used in scientific research, the author surveyed and analyzed the newly formed Latvian therapy gardens and identified the most important features of rehabilitation and sensory gardens. The study provides a scientific research article on rehabilitation gardens in the world. It summarizes the historical and presently available documents on the Latvian current rehabilitation gardens. The author also looked into some further opportunities to create the rehabilitation gardens in the landscape sites of Latvia.

Materials and Methods

The research paper is based on international scientific studies on therapeutic gardens, as well as on the analysis of Latvian therapeutic gardens. The literature on the Latvian health resort parks, healing gardens and sensory trails has been summarized and analysed. The study has been conducted on the healing effect of the international therapeutic gardens on humans. To complete the research tasks, the articles on the history of health resorts of Latvia, scientific research literature, publications, documents and electronic media have been analysed. Using the gathered scientific information and analytical matrix, the sensory garden guidelines for Latvia have been developed. The research is based on the current development tendencies of the rehabilitation gardens, but also taking into account the historical relaxation sites. The study analyzes the rehabilitation garden literature of the period from 1800 to 2013. The study deals with two historical health resort rehabilitation gardens of this country that have already been closed, as well as four newly created gardens, that currently are the only existing ones in Latvia.

Results and Discussion

International trends in developing rehabilitation and sensory gardens

In creating health gardens and parks it is important to take into account the fact that the outdoor site needs to be a place where one can also have an aesthetic pleasure and emotional feelings. The design of outdoor site needs to be thought out, so the visitor has a strong desire to explore the garden till its last trail and plant. As every work of art, also the health garden’s value is its ‘open ending’ for further exploration of reality. People tend to grasp a thing from all of its sides – similarly, how a person relives the nature in its body. The same way, in a rehabilitation garden it cannot be said where nature ends and a person begins (Merleau–Ponty, 1967).

The rehabilitation garden’s space is traditionally divided into geometrical squares with trails and a fountain in the central part of the garden. The selection of rehabilitation garden’s plants includes many plants that are daily used as herbal teas, spices, food or flowers. In the mid-20th century in western countries the healing rehabilitation gardens slowly disappeared from the medical institutions. It can be explained with the rapid development of medical and other technologies. The gardens located near the medical institutions were made smaller, to give space to the car parks in their territory. Balconies and terraces were replaced with modernized ventilation equipment. Due to the rapid industrial development the medical institutions lost the beautiful sceneries that could be seen out of their window. The urban landscape was booming and the nature, its healing power was left forgotten. After the Second World War the hospitals were designed as multi-story buildings, not as Pavilion-type buildings. More emphasis was put on the comfort of hospital’s staff, not patients (Gerlach –Spriggs et al., 1998). In the 21st century the medical institution gardens were made based on technologically advanced equipment, ignoring the emotional needs of patients, their families and staff to mentally recover in an outdoor site (Cooper and Barnes, 1999).

In the recent years there has been an increasing tendency to develop the sensory or therapeutic gardens near the medical facilities. Discussions with the patients reveal their longings for the nature’s beauty, countryside’s peacefulness – bird songs, smell of soil and flowers. Many of them are locked in the medical facilities or their homes without a chance to enjoy the things that for healthy people are self-evident. It is also important for people with various disabilities as they get to explore the world through touch, hearing, taste and smell. Only in silence when enjoying the
God’s given richness and mightiness of the nature, and feeling the seasonal changes, a person can relax from the urban environment, find peace and spiritual balance. The aesthetic and sensory enjoyment of the rehabilitation and therapeutic gardens helps these people to return to social life. These kinds of projects are already known to other countries. The most common types of therapeutic gardens are: Alzheimer’s, healing, rehabilitation, cancer patients’ and meditation gardens etc. The rehabilitation gardens are specially designed to intensify the particular senses that patients need. Many of these gardens have separated zones – for different age groups, treatment specifics or sensory stimulus. Those separated zones have different design techniques, flowers, aromatic herbs, trees and bushes. In the ancient Rome it was popular to plant different medical plants near the soldier medical facilities. Every plant had its own function and therapeutic effect. The fennel (*Foeniculum vulgare* L.) was used as a sedative, the garlic (*Allium sativum* L.) improved the functions of the heart, the willows were used as an antiseptic, but the sage (*Salvia officinalis* L.) who was less therapeutic had a religious meaning. In the Roman military hospitals the key role to recovery was given to the courtyard, fresh air and physical activity (Umbani, 2011). The sensory gardens should have benches, lighting and for physically disabled people – heightened plant beds. The recommended height for the heightened plant beds is 0.75 m, with a place for the legs – 0.5 m. The plant beds should be accessible from all sides. The heightened plant beds, vertical plant walls, pots and containers will also help people in wheelchairs to participate in the gardening – to sow, to weed and take care of plants. For blind or visually impaired people it’s important to have the information on objects in Braille. The sensory gardens have trails with different types of pavement. The recommended width for trails is for 1 person – 1.40 m, and for two people – 1.90 m. If it’s not possible to have the recommended width, then after every 100-200 metres there should be a square of 1.80×2.0 m. The pavement should be non-slip, safe and with a normal slope. For the safety reasons there should be handrails with size of 0.70 and 0.90 m. The New Zealand transport strategy (NZTS) has defined the provisions for improving the standards and design of the pedestrian sites. The strategy includes world’s best practices in planning, designing and maintaining the pedestrian infrastructure networks. The trail infrastructure strategies have been developed also in Australia, the United States and in many other countries (Land Transport NZ, 2009).

Besides the high quality trails the other four most important elements in the garden are – the shed (especially for Alzheimer’s patients), separating walls, relief and water. The water plays a key role in the healing gardens. In the summer it keeps the air nicely cool and moist, creating sounds and senses. A fountain can be in the garden as a landmark. It is recommended to have a separating wall or fences in the healing garden or park. The walls secure the patients’ physical and mental safety, reducing also the risk of getting lost in the garden (Beckwith and Gilster, 1997). In Persia the walls in the gardens were used to keep the fragrances of roses (*Rosa* L.), jasmine (*Jasminum* L.) and fruit trees (Hobhouse, 2003). In the sensory gardens you need to be careful with plants that have strong fragrances, as well as flowers that have a lot of pollen or flying seeds. To evade the hay fever or asthma, it is recommended to choose plants that are pollinated by birds or insects and aren’t self-pollinating plants. The blind people can touch everything in the garden, and with the help of Braille to learn about the sites or the plants. The garden offers to smell and hear freely – it’s a possibility to relax. Many international research papers have analysed the positive effects of these gardens. The United States have many good examples of rehabilitation gardens that are overseen by the American Society of Landscape Architects (ASLA). Since 1999 there is also an online database of therapeutic landscapes (Therapeutic Landscapes Network, 2013). American studies have proven that gardens improve the relations between nurses and patients (Lappe, 1987). Similar studies in Japan show that even in a relatively short time period (two months) the patients’ self-esteem and cognitive functions increase (Endo, 2003; Nomura and Hashimoto, 2006).

**Rehabilitation and sensory gardens in Latvia**

The sensory gardens that are located near the rehabilitation facilities are called the healing or therapeutic gardens. The landscaped environment of the therapeutic gardens is specially designed for people with physical or mental disabilities, for small children to develop their feelings and senses, and for elderly, hospital patients, as well as for the visitors and staff. The goal of the rehabilitation and healing gardens is to improve person’s health and well-being, to advance the recovery with the help of interaction with the nature. In the fast-paced and exhausting day-to-day life, it is important to find time for the relaxation and recuperation. Relaxation and treatment in a site rich with natural healing resources shortens the time necessary for medical rehabilitation and recuperation of the human body. The research and written evidence dating back to the 15th century show that sulphur springs in Baldone health resort had many healing qualities that gathered patients from all over the country. Baldone sulphur spring health resort was located relatively high above the sea level, where the

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air is dry and rich with ozone. The area had many hillocks that heart disease patients could use for the exercises. Since 1992 Baldone resort is closed and the use of mineral waters has stopped (Kūrorts, 2010). The Kemeri resort has also been closed since 1994. The Kemeri resort was opened in 1838. In 1801, in St. Petersburg for the first time a chemical test was made for the Kemeri sanatorium sulphur springs. Soon after that the test results of Latvian-born chemist, pharmacist and nature scientist David Hieronim Grindels were published. The health resort offered mainly the hydrogen sulphide and mud baths, but also the regimen and silence helped the patients to recover faster. In the territories of Latvian health resorts there also were landscaped parks for walking and relaxation that helped to recover faster (Sarma, 2008).

The Bruknas manor is located in Dāvini parish, Bauska region, by the shores of Iecava river. Since 2001 the historical building is a home for ‘Mount blessing community’ and the cultural centre ‘Bruknas manor’. ‘Mount blessing community’ is a mental and physical rehabilitation site for people suffering from addictions. In 2006 the community introduced a drama therapy method that relaxes the body and mind from the tension. Using different exercises and creative tasks, drawing and writing, it is possible to analyse the persons’ feelings and determine what is depressing them. The community is based on the drug addiction community ‘Senacolo’ model – this community is located in Medjugorje, Bosnia and Herzegovina, and its spiritual patronage is Mother Teresa from Calcutta. The main problem for the addicts is not the drugs, alcohol, gambling and other addictions, but rather the lack of will to live. In 2007 the ‘Mount blessing community’ in a project tender received the financing and in manor’s park developed a Renaissance-style garden. The garden’s symmetrical squares are made from decorative vegetable and herbal plants. The crops are changed every year, thus symbolizing the changeability of the world. The idea of this kind of layout for the garden came from the Italian monastery gardens from 15th and 16th century. In the 6.7 ha manor territory is located not only the landscaped park with Renaissance-style geometrical garden, but also ponds, 6.9 ha of pastures, fruit and berry garden. The nature, seasonal changes, liturgical rhythm of time, prayers, work in the garden, maintaining and renovating the Bruknas manor help people to purify and return back to normal life. Through spiritual guidance and work therapy people can find again the meaning in life and get rid of various addictions (Ušča, 2008).

Rehabilitation gardens help to bring back the joy of life not only for the people suffering from various addictions, but also to severely and terminally ill patients. Liepaja Society of the Blind unites more than 480 visually impaired and blind people, as well as the people with different kind of disabilities from Liepaja and 11 Kurzeme regions. The organization focuses on the rehabilitation, employment, education, accessibility and other issues related to the persons with disabilities and their social inclusion. In 2011, in Ziemupe, Pavilosta region the construction works began to develop the “Garden of Soul Relief”. In the farm ‘Laivenieki’ and its 6 ha territory, from which 1.3 ha is forest. It is planned to develop a site where people with special needs can relieve their soul, relax, meet and communicate with other people in a peaceful and harmonious countryside environment. The ‘Garden of Soul Relief’ will be developed based on patients’ senses (vision, hearing, smell, taste, touch, proprioceptive senses). The specially developed landscape design and innovative ideas based on patients’ previous experiences and memories will help to fasten the recovery. It is planned to create a pond with sandy waterfront and a sauna, with places for swimming and fishing. A few kilometres from the farm there is the Baltic sea, giving an additional value. The garden will be a unique environment for people whom their disabilities have deprived of the possibility to enjoy the nature’s beauty (Dvēseles Veldzes Dārzs, 2012).

On May 27, 2012 the sensory trail ‘Juši’ was opened in Ligatne national park, Sigulda. In the planning of this trail participated both experienced landscape artists and children, and youngsters from Sigulda region Creativity Centre in which a young researchers team called ‘Juši’ has been created. Experts from the Nature Conservation Agency and Gauja National Park Foundation, as well as Sigulda region Creativity Centre worked on the development of the sensory trail. The project was supported by the culture, environment and tourism agencies. The main idea of ‘Juši’ project is to encourage children’s interest and give them a possibility to explore this world through their feelings. The goal is to give the children and youngsters a chance to spend their free time innovatively and creatively, and acquire knowledge that later might be useful in the study process. In the modern technological world all that children and adults need is accessible by computer or mobile phone. Our cognition process ends there. But a person has also his senses that allow him to see, explore, understand and feel the world. To maintain those senses they need to be trained. At the beginning of the trail, behind the Sigulda New Castle pond, you can see the ‘Juši’ trail map created by the artist Iveta Ile. Through the entire route there is guidance near the sensory objects and what kind of senses can be experienced near them. In the near future it is planned to develop the trail further.
and introduce many new ideas and designs (Zālīte, 2012).

In May 2013, in Valmiera the development works will begin in the territory of Gauja steep coasts, where the Olympic centre plans to create the ‘Gauja Steep Coast Sensory Park’. Valmiera Olympic centre has the management rights over 349 314 m² territory until December 31, 2017 – it includes 159 314 m² of ‘Steep coasts’ and 190 000 m² of ‘Recreation park’. Two trails are planned to develop in the park with the total length of 3.3 km. The park will be for people of all ages, starting from small children up to seniors. The ‘Gauja Steep Coast Sensory Park’ will offer a possibility to experience nature with all of the five senses: hearing, vision, touch, smell and taste. In the ‘Senses trail’ it will be possible to feel with bare feet different kind of natural material coverings (pine (Pinus sylvestris L.) cones, needles, moss (Bryophyta L.), pebble stones, sand, chestnuts (Castanea L.) etc.). It is planned to have in the park constructions that help to train the balance, as well as the ‘Educational trail’, in which the visitors will be able to explore the local flora and fauna. In cooperation with ornithologist Andris Klepers there will be developed an observation site for the martlets (Apodiformes L.) – birds of the swallow (Hirundo rustica L.) family. The sensory park will also have the ‘Nature school’ – it will be a green classroom both for nature teachers and students to learn in an open air. The park is located next to the Sport Rehabilitation centre, where people can do sports, swim in the pool, relax in the sauna and enjoy the healthy herbal teas (Gaujas Stāvo krastu Sajūtu parks, 2013). Latvia has many natural countryside landscapes, forgotten traditional farms, manor parks, social care homes, kindergartens and Soviet period green territories near the schools that are outdated, non-functional, but may serve as a foundation for the development of new sensory and rehabilitation gardens (Fig. 2.)

Psychological support is formed not only in the social attitudes, but also in the environment in which the person lives. The visit to this garden develops not only feelings and senses of small children and teenagers, but also enables residents of any age with various disabilities to spend their free time interactively. The old school neighborhoods have become mentally and physically outdated landscape. Old manor parks are the cultural heritage of this country and an important tourist sites, but without innovative ideas they are stagnating. To continue the development of this kind of projects in Latvia, it is necessary to do a more detailed research on the planning, designing and maintaining of the rehabilitation and sensory gardens.

Conclusions

In the world and also in Latvia there is a growing interest in the studies of people and environment that show how the relations between these two factors improve the human health. The selection of the location plays an important role when creating the rehabilitation garden. How can we start developing sensory gardens and what is needed for their creation in the future? To achieve the goal, it is necessary to absorb the global experience and exchange the best practices, to find innovative solutions, and adapt the advanced rehabilitation center area landscapes to individual needs. The garden will be more effective and beneficial if it is located near the sea, a river, or a healing source. Furthermore, the proximity of the forest and fresh air is an integral part of rehabilitation garden ingredients. Latvia has natural landscapes,

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**Figure 2.** Health gardens development opportunities for Latvia.
many healing springs and mud deposits, countless well-preserved traditional Latvian farms, historical manors and parks that could be used for the development of sustainable rehabilitation and therapeutic gardens. While doing the research on sensory gardens we have to take into account this important factor – the climate of Latvia. Most of the existing gardens are located in the countries with warm climate. We have to search for appropriate plants, trails, square structures and other elements that can be used in the local climate. In the Baltic Sea region a good example can be found in Alnarp, Sweden, where in the territory of the Swedish University of Agriculture Sciences there has been developed a rehabilitation garden with different garden areas to treat people in distress. Before building rehabilitation or sensory gardens in Latvia, it is important to define the target audience. After finding the appropriate location we have to identify the needs of potential visitors. Whether they are small children, hospital patients or seniors from care homes – every group has its landscape vision and viewing angle. For Latvia to have the development of rehabilitation gardens we must have an overseeing organization that would gather and coordinate the newest tendencies and search for the funding.

References