

Landscape and Health in Sustainable Development

Krajobraz i zdrowie w zrównoważonym rozwoju

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Abstract

The article discusses the correlations between health, landscape, and sustainable development. In the first part, the basic concepts are defined. Attention is drawn to the therapeutic effect of landscape, and the subject of therapeutic parks and gardens is discussed. Based on the conducted analyses, characteristics of landscape with therapeutic properties are proposed, and the practical application of research on the landscape-health relationship is indicated. Perception is identified as the key to understanding the therapeutic properties of landscape. Taking care of the therapeutic values of landscape should be part of sustainable development.

Key words: landscape, health, perception, green therapy

Streszczenie

W artykule przedstawiono rozważania dotyczące zależności jakie zachodzą pomiędzy zdrowiem, krajobrazem i zrównoważonym rozwojem. W pierwszych rozdziałach zdefiniowano podstawowe pojęcia. Kolejno zwrócono uwagę na oddziaływanie terapeutyczne krajobrazu oraz omówiono tematykę parków terapeutycznych. Na podstawie przeprowadzonych analiz zaproponowano cechy krajobrazów o właściwościach terapeutycznych oraz dostrzeżono przydatność badań nad relacjami krajobraz-zdrowie w praktyce. Wykazano, że kluczem do zrozumienia terapeutycznych właściwości krajobrazu jest percepcja. Dbalność o terapeutyczne wartości krajobrazu powinna być elementem zrównoważonego rozwoju.

Słowa kluczowe: krajobraz, zdrowie, percepcja, zielona terapia

1. Introduction

Health is one of the most important values in the life of people around the world (GUS, 2017). Socio-economic development allows greater possibilities with regard to general access to healthcare and pro-health measures, but it also entails greater hazards to human health. These hazards are linked to increased motor traffic, urbanisation, chemicalisation of agriculture and food, and the resulting pollution of air, water, and soil as well as landscape degradation (e.g. Dobrzańska et al., 2008; Francis the Pope, 2015). As Mazur-Wierzbicka observes (2017), social and economic inequalities also pose a threat as they can considerably reduce the possibilities of providing adequate healthcare and prevention of disease. Human health thus depends not only on natural environment

determinants (such as climate change, availability of natural resources) but also on economic and social determinants (e.g. degree of affluence, unemployment). Therefore, public health and the attainment of a high quality of life by society are recognised as key challenges and indicators of sustainable development (e.g. Dobrzańska et al., 2008; *Health in the Framework of Sustainable Development 2014*; Bernat et al., 2017). It should be noted that since the publishing of the *Our Common Future* report (WCED, 1987), sustainable development is defined as development where the needs of the present generation may be satisfied without diminishing the opportunities of the future generations to satisfy their needs. The first principle of sustainable development formulated in the *Rio Declaration on Environment and Development* (1992) indicates that *human be-*

ings are at the centre of concerns for sustainable development. They are entitled to a healthy and productive life in harmony with nature. In accordance with sustainable development, the fulfilment of the material needs should be accompanied by the spiritual development of human beings (e.g. Borowska, 2012). The previous models of values and desires as well as consumption patterns must be changed (Kozłowski, 2005). Sustainable development means the necessity of preserving the equilibrium in the natural and the socio-economic environment, as well as the spiritual balance of human beings. This development is understood comprehensively in the ecological, cultural and economic sense (Kozłowski, 2005). The forms and dynamics of economic activity, institutions, lifestyles (mainly the volume of consumption) and population size should ensure an appropriate quality of life to every person in the present and future generations, and all aspects of this development will be secured by the availability of natural resources, ecosystems and life-supporting systems (Bergh, Nijkamp, 1991).

According to the idea of sustainable development, the progress of civilisation, which seeks to improve the quality of life of the present and future generations, may not occur at the expense of our environment. The preservation of the resources of this environment in such a condition that subsequent generations can use them is a key objective of the idea. From the ecological perspective, there is a call for limiting the pressure on the natural environment and for the fullest possible protection of natural resources. It is also necessary to correlate the objectives of sustainable development with the management of cultural landscape (Myga-Piątek, 2010) that should be treated as a strategic resource, similarly to the environment. According to Myga-Piątek (2011), what contributes to the shaping of diverse landscape and preservation of its identity and familiar character is sustainable tourism focused on reconciling the needs of tourists, the natural environment and local communities.

Nowadays, one can observe an intensification of efforts to identify and preserve landscape assets. There is a growing awareness of their significance for the tangible quality of life, the preservation of the identity of regions and communities inhabiting them. All these aspects are reflected in the *European Landscape Convention* (2000).

Already 40 years ago Daniłowa (1977) observed that the favourable influence of scenic landscapes on human health was indisputable. However, it is difficult to develop scientific methods to assess the psychological impact of different kinds of landscape. Daniłowa also noted that *some question the usefulness of such actions. The reality is that the findings of these studies have a practical application and can be used in choosing tourist regions* (Daniłowa, 1977, p. 239).

Numerous international conferences devoted to health and landscape have been held in recent years. The results of research on the subject have been reported in numerous publications, mainly in English. However, there is still a need for continued research, particularly in the context of sustainable development.

The objective of the analyses whose results are presented herein is to identify the correlations between health, landscape, and sustainable development. A number of questions were posed in the research process, including:

- What characteristics should landscape have to perform a therapeutic function?
- What places and landscapes should have a particularly positive therapeutic effect?
- What is the significance of the therapeutic values of landscape in sustainable development?

2. The basic concepts

According to the World Health Organization, the term *health* encompasses three spheres of life and denotes *a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity* (Constitution of the World Health Organization, 1948). This definition of health, despite varying opinions of it, has played a major role in recognising the importance of *positive health* and its environmental determinants (Kalamucka, 2017).

Based on an analysis of international literature from recent years, Kretowicz (2013) observes that the traditional understanding of health as the absence of disease has been replaced by regarding it as an experience. Woynarowska (2008) found more than 300 definitions of health, which proves the multiple dimensions of health and the difficulty of defining it accurately. For example, Bircher and Kuruvilla (2014: 363) define health as *a state of wellbeing emergent from conducive interactions between individuals' potentials, life's demands, and social and environmental determinants*. Aleksandrowicz and Woszczenko (1990) define health as the felt state of physical, mental and social fitness adequate and proportional to one's age. The condition of human health should be defined by at least two borders: objective physical and social fitness on the one hand, and the subjective border of one's well-being, ambitions, and aspirations. Therefore, classifications by various authors mention at least three dimensions of health – physical, social and psychological – while some indicate as many as six aspects of health (Walentynowicz-Moryl, 2017). Alongside the ones already mentioned, the intellectual, spiritual, emotional, professional and environmental aspects are mentioned. According to Hales (2012), the environmental dimension of human health refers to the interaction with the external, physical environment over which we have only limited control.

In the most general terms, human health is linked with a harmonious physical and mental development, and good adaptation to the surrounding environment, vital energy, physical fitness, ability to live actively and creatively, optimism, happiness; it is an asset, a positive, desired and highly valued state. The main factor determining the health of an individual and society is lifestyle, which accounts for more than 50% of the health potential (Woynarowska, 2008). Physical activity is by far the most important part of a healthy lifestyle.

The concept of health is linked with the concept of quality of life that directs attention to the positive aspects of human life and expands the objective measures such as health or affluence to include the subjective concept of well-being. In many concepts of quality of life, health is among values regarded as the most significant, and the semantic scope of health as broadly understood well-being is close to the quality of life in its subjective sense. Quality of life is determined by, among others, the possibility of leisure and recreation, the condition of the immediate surroundings and environment as well as ecological safety (Campbell et al., 2007). Studies on quality of life serve as a handy technique for acquiring information on changes taking place in healthcare, particularly the well-being of patients, that can prove useful in undertaking further treatment and restoring health. The usefulness of these studies depends on how accurately the state of health of an individual or group can be identified using quality of life measurement (Kalamucka, 2017)¹.

In the concept of health promotion, defined as the actions of the entire population regarding its every life (Karski, 1994), aimed at the achievement of physical, mental, and emotional well-being, the subjective sense of state of health was recognised, which has consequently made health research independent from the exclusively medical interpretation of health and one-sided assessment criteria complying with the norms adopted by physicians. It was emphasised that health is linked with various aspects of societal life and the life of individuals. Thus, the promotion of health denotes actions that influence the relationships between *health and the economy*, *health and the environment*, *health and the society as well as*

health and the individual (Słońska, 2008, p. 83). Therefore, the goal of health promotion is to enable individuals and communities to improve their state of health by controlling all modifiable factors, including the physical environment, that determine health (Słońska, 2008). It should be noted that already the *Constitution of the World Health Organization* (1948) stressed that *healthy development of the child is of basic importance; the ability to live harmoniously in a changing total environment is essential to such development*. Thus, a correlation was indicated between sustainable socio-economic development and the state of health throughout human life, particularly in the youngest age group.

Colloquially speaking, landscape is most often regarded as the view, the scenery that surrounds us. In science, however, the term *landscape* is construed as a multi-layered reality, the information system of the environment, a set of actually existing processes, a system of interrelated processes, a set of stimuli perceived by various human senses (including a set of views), a set of values, and a system providing actual and potential services for various groups of users (e.g. Richling, Solon, 2011). The European Landscape Convention (2000) defines landscape as *an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors*. It is regarded as a key element of the welfare of the entire society and individuals, and its preservation and planning entail certain duties for every person. Landscape is experienced universally; hence it impacts the quality of people's life wherever they might live: in towns, cities and rural areas, in environmentally valuable and degraded areas, in special and ordinary places. As the explanatory reports the European Landscape Convention show, the perception² of landscape has a multisensory character. The sound and smell as well as the touch and taste contribute to a positive or negative overall assessment of landscape by people, and influence the quality of life (*Landscapes and individual and social well-being*, 2003; *Landscape and sustainable development*, 2006). Landscape enhances and develops sensory experiences. Limited experiences and sensations result in reduced quality of life. Contributing to the development of high-quality landscapes in order

¹ It should be stressed that Kalamucka (2017) analysed the concepts for research on quality of life, ecosystem services and securing livelihood; she also systematised knowledge on the subject, taking into account the role of geographical factors. She proposed a new, synthetic approach where quality of life, being the most comprehensive term, widely adopted as a measure of the effects of sustainable development and a desired life goal, remains a key concept. The new research proposal allows combining a static assessment of quality of life, captured in a specific time frame, with a description of ways of securing livelihood, with the concept of ecosystem services included in the structure of quality of life.

² Perception is not the same as seeing: it is an active process where we perceive an object or phenomenon with

our senses (sensory and motor aspect), and we process the information thus obtained in a way that is determined by our pre-existing knowledge and emotions (semantic and emotional aspect) as well as the specific situation, the here and now. This process leads to remembering the perceived image or another sensory experience, but we remember it in our own way (Pawłowska, 2008). According to Wojciechowski (1994), the perception of landscape is an element of the perception of the environment in its broad understanding, as perceiving, sensing and experiencing, then as interpretation through conscious and subconscious association with the models stored in the mind, and finally, as the formation of attitudes to the perceived objects, their mutual relations, and the situation of the perceiver in such systems.

to improve the quality of life of European citizens was recognised as the basic objective of the *European Landscape Convention (Landscape and sustainable development, 2006)*.

3. The therapeutic effect of landscape

There is a close relationship between people and the landscape in which they live. Kozłowski (2005) observes that it is to landscape that we owe not only our living conditions but also many traits of our character. Landscape is a source of numerous values for people: symbolic (the sacred, the *genius loci*), emotional (familiarity, tradition, identity), aesthetic (grandeur, beauty, harmony, natural state, diversity), source of information (content, antiquity, historic nature, authenticity, representative nature, uniqueness, otherness), economic and utilitarian values (Myga-Piątek, 2012) as well as therapeutic values (Kopczyński, Skoczylas 2008) resulting from the positive impact of harmonious landscape on human psyche. The contemplation of a beautiful landscape allows one to forget about everyday worries and can provide relaxation and restoration of energy. Thus, landscape can be an environment where people can recuperate, where their physical and mental state can be improved and their stress levels can be reduced (Chwalibóg, Wolski, 2015).

As early as the 1980s, Wojciechowski (1986) observed that the aesthetic values of landscape constitute a very significant component of quality of life (perceived at all times), and play an important role in the shaping of several significant spiritual qualities of a human individual. The richness of positive experiences coming from landscape enriches the human psyche, strengthens the cognitive and creative passion and, finally, enhances the joy of life. On the other hand, ugliness, chaos, the littering and degradation of the environment frequently result in spiritual poverty, and can even lead to violence, aggression or apathy (Bernat, Kałamucka, 2008). The components and characteristics of landscape thanks to which the basic human needs according to Maslow's hierarchy (1954), i.e. biological and social needs, can be satisfied include: the existence of high-quality green areas and other recreation areas ensuring healthy conditions; the possibility of reducing noise and other kinds of pollution; suitable conditions for enhancing the sensory and emotional apparatus; conditions inspiring creative activity and conducive to emotional experiences; and the potential to build and strengthen the identity of individuals (Wojciechowski, 2004).

The aesthetic values of landscape are significant for the formation of a special emotional bond between a person and a place based on a sense of belonging or

ownership (Pawłowska, 2001). The landscapes of native places shape people's perception habits, the perspective through which they perceive reality. One can talk about the familiarity of landscape, a quality specific to spaces perceived as giving a sense of safety and comfort. A specific image of familiarity accompanies people throughout their lives, as they move with this image inscribed in their memory and *domesticate* new places.

Although experiencing landscape is personal, it is a point of reference for social interactions. Satisfaction with life in a harmonious landscape can be a significant factor shaping positive relations among people. Harmonious landscapes also contribute to an increase in civic engagement and a stronger sense of belonging to a particular place (Chwalibóg, Wolski, 2015). A great number of local associations are established in areas characterised by high-quality landscape, often with the aim of preserving it. The appropriate shaping of landscape protects society against losing its roots and fosters the creation of interpersonal ties (*Landscape and sustainable development, 2006*).

Experimental studies confirm the conclusions mentioned above. As early as the 1980s, Ulrich (1984) indicated that a view from the window should be treated as conducive to the recovery of hospital patients. His research findings clearly show that the possibility to see the natural surroundings out of the window of a hospital room speeds up the recovery of patients after surgery and reduces the amount of painkillers used in comparison with patients whose rooms had windows facing a wall (Ulrich, 1984).

Studies conducted in the Netherlands show that a view of a park from the window of an apartment increases its market value by 8%, and the proximity of the park increases the value by 6% (Luttik, 2000), which is probably linked with the awareness of the influence of landscape values on health and quality of life. According to Wilson (1984, 2008), who introduced the biophilia hypothesis³, people having the option to choose a place to live or work, prefer places that allow them to look at the surroundings from a distance, i.e. some kind of open areas of the savannah type (grassy areas with scattered copses of trees), places characterised by the presence or proximity of water bodies, even if these only have an aesthetic function. As Kaplan and Kaplan (1989) proved, looking at a harmonious landscape with the predominance of plant components is soothing and accelerates recovery from mental fatigue. Osikowska and Przetacznik (2007) observed that a park or garden, water, and wooded hills are the landscape features that raise property prices to the greatest extent. Furthermore, the possibility of looking at an interesting panoramic view is important. Landscape

³ The biophilia hypothesis explains the natural innate mechanism thanks to which connecting with nature alleviates stress and reduces muscle tension (Trojanowska, 2017).

features that generate noise (e.g. industrial and transport facilities, etc.) are undesirable and can reduce property prices. The presence of noise has a significant impact on the value of property, particularly residential property (e.g. Senetra et al., 2014) because, more and more often, it is regarded as a serious threat to health (e.g. Edworthy, 1997; Seidman, Stranding, 2010). In the light of the European Environment Agency Report *Quiet areas in Europe* (2016), only 18% of Europe's area (particularly countries with low population density: Finland, Iceland, Norway and Sweden) can be regarded as tranquil while the potential impact of noise pollution can be observed in 33% of the area. As much as 20% of protected areas are exposed to high noise levels. Therefore, tranquil areas must be protected to ensure the protection of human health and preservation of biodiversity.

In the 1940s, the term *landscape potential* was introduced to denote all resources and assets of landscape (its physical and aesthetic properties) enabling it to satisfy human physical and mental needs, at present and in the future, and to maintain this capacity through self-adjusting and self-protecting mechanisms (Kistowski, 1997). The following basic potentials of landscape are distinguished: self-adjusting and self-protecting, resource-related and functional, perception-related and behavioural⁴, the latter construed as landscape's capacity to influence human senses and stimulate human behaviour (Przeźniak, 1991). The resource-related and functional potential comprises, for example, the recreational-balneological potential, i.e. the landscape's capacity to satisfy human needs with regard to recreation and health.

In the 1980s, standards (definitions) concerning landscapes, their protection and rational use, were developed for Comecon countries. One of them was *comfort of landscape* denoting a measure of the medical-biological and social-psychological benefits of living conditions in a specific landscape. *Comfort of landscape* can be achieved by observing the environmental quality standards (including noise standards) and taking into consideration inhabitants' opinions with regard to the emotional ties with the surroundings, the sense of familiarity and security.

In the 1990s, the term *ecosystem services* was introduced to denote the benefits derived, directly or indirectly, by the human population from the functioning of ecosystems (Constanza et al., 1997). In recent years, this term has been replaced by the term *landscape services* that is deemed more appropriate due to the integration of natural environment and cultural aspects, and the inclusion of spatial models and involvement of stakeholders, particularly in the context of local landscape planning (e.g. Verburg et al.,

2009). Landscape services are divided into four main groups: provisioning, regulatory, auxiliary, and cultural. The last group above includes aesthetic, recreational, spiritual, scholarly, and educational functions (e.g. Constanza et al., 1997; Dłużewska, 2016). Vallés-Planells et al. (2014) noticed that, in the classification of landscape services, cultural services should also refer to intangible resources obtained through people's contact with ecosystems. Therefore, they distinguished four categories within cultural services: mental and physical health, entertainment, social fulfilment and self-fulfilment. In the last category, they distinguished, among others, spiritual and inspiring experiences.

In the 1990s, Gesler (1992) put forward the concept of therapeutic landscape, described by him as varying places, situations, spaces, backgrounds, interiors, encompassing both the tangible and non-tangible (psychological) environment, associated with therapy or treatment, influencing physical, mental and spiritual healing. Therapeutic landscapes are places of everyday health promotion, conducive to the restoration of physical and mental health, e.g. through contact with nature and possibility of experiencing it with various senses. Therapeutic places, a concept linked with therapeutic landscapes, are places with an established reputation as supporting the health recovery process (Gesler, 2003), e.g. health resorts, mountain and seaside areas, pilgrimage centres. These places are usually accompanied by valuable natural assets (mineral springs, forests), attractive landscapes, and, in the case of religious sites, an atmosphere of mysticism (Gesler, 1996; Williams, 2010; Perriam, 2015). The idea of therapeutic landscapes was developed by Williams (1999, 2007), recognising spirituality as the most intangible dimension of these landscapes. Highlighting the relationship of health with the quality of the environment in the place of residence, Kearns and Andrews (2010) observed that the geographic scope of research should be expanded to include therapeutic landscapes, and that geography should participate in research on the individual and collective experience of places. The subject of the impact of landscape on health and quality of life has also been studied by scholars such as Abraham et al. (2010), Thompson (2011), Rose (2012), Doughty (2013), Tsunetsugu et al. (2013), Bell et al. (2015), Houghton and Houghton (2015), Liamputtong and Suwankhong (2015), Meijering et al. (2017). This is related to the wide range of positive changes in brain activity, blood pressure, heart action and muscle tension. As demonstrated by Wolf and Flora (2010), the therapeutic role of landscape is manifested in the improved mental state in persons affected by various mental conditions, including depression from which

⁴ According to Malinowska (2006), the perception-related and behavioural potential is the subjectively perceived pleasure of staying in a particular place, generally evaluated visual attractiveness, stress-relieving properties,

accessibility, presence of extensive views, occurrence of positive or negative non-visual stimuli, including auditory and olfactory ones.

about 350 million people currently suffer, according to WHO. According to Velarde et al. (2007), generally natural and open landscapes have a more positive impact on health as compared to urban, closed landscapes: they improve well-being, alleviate anxiety and pain, and reduce stress, blood pressure, heart rate, muscle tension and electrical conductivity of the skin (Ulrich, Simons, 1986). An important role is played by vegetation (including vegetation seen from the window and within a one-kilometre radius from one's place of residence) and water as they have a regenerating effect on physical and mental fatigue (e.g. Gesler, 1992). It is necessary to search for functional landscape models conducive to human health and sustainable development. Using the research findings in the planning and designing of landscape is a key research challenge for the future. Menatti and de Rocha (2016) observe that perception is the key to understanding the health–landscape relationship.

According to Trojanowska and Sas-Bojarska (2013), the therapeutic properties of landscape should be part of the assessment of investment projects impact on health and landscape. An in-depth study of potential landscape transformations, including the lost therapeutic values, is necessary already at the initial planning stage of an investment project. Landscape must be properly shaped to ensure the strengthening of health.

A particularly important factor supporting the therapeutic effect is the presence of natural landscapes or natural elements in landscape. Green areas, providing a kind of refuge and giving a sense of comfort, safety, peace and attachment, are regarded as a significant form of support in therapy. The focus on health is a source of demand for tourism in natural landscapes (Toczek-Werner, Sołtysik, 2012). Innovative forms of health or wellness tourism are implemented in environmentally valuable areas (Pietrzak-Zawadka, Zawadka, 2016).

Green therapy, i.e. treatment of minor mental and emotional disorders where the administration of drugs is replaced by direct contact with nature and the beneficial effect of natural landscapes, the smells and sounds of nature on human psyche, becomes an integral part of the treatment and rehabilitation process (Poskrobko, 2013). Experiencing nature as a way to improve one's mood and concentration, and to alleviate stress, has led to the development of horticultural therapy, forest therapy and terrain therapy. Horticultural therapy is a form of treatment and rehabilitation that involves gardening and is used to

treat individuals with psychological, mental, physical, sensory, geriatric, addiction or social disorders, in order to improve their physical and mental condition as well as their interactions with other people (Dorn, Relf, 1995). Forest therapy uses the therapeutic effect of forests (e.g. Karjalainen et al., 2010). Experimental studies show that a fifteen-minute walk in the forest causes profound changes in the human nervous and hormonal system (Park et al., 2010). Terrain therapy is based on various forms of dynamic physical exercise in terrain with varying scenery and landforms (Ponikowska, Marciniak, 1988). The therapeutic effect of this method is linked with the influence of meteorological and landscape factors and physical exercise. Its goal is to improve the motor function and motor coordination, enhance physical fitness and increase blood supply to bodily organs through a beneficial effect on the cardiovascular and respiratory system.

Recent years have seen a growing interest in designing therapeutic gardens, whose origins go back to ancient and mediaeval times (Pudelska et al., 2016). Therapeutic parks and gardens, specially designed to support treatment and use the healing properties of nature, should be equipped with attributes conducive to the restoration of health; among other effects, they should stimulate all human senses (Trojanowska, 2017). The following kinds of therapeutic parks can be distinguished: spa parks⁵, established to improve the physical and mental health of residents; open areas with a sports and leisure function, adapted to a specific group of users; hospital, sanatorium and nursing home parks and parks in housing developments for elderly people; parks (or sections of parks) designed for horticultural therapy (e.g. Hazen, 1995; El-Barmelgy, 2013, Jaszczak, 2016). Such parks, both public and of a specialist character, are popular in the United States and western Europe (Trojanowska, 2017). Here are a few examples of special-purpose parks designed for patients with specific kinds of medical conditions: Portland Memory Garden (USA), supporting the treatment of dementia and Alzheimer's disease; Jardin Grain de Vie (*Grain of Life*) of the Pierre and Marie Curie Institute in Paris (France), supporting the treatment of cancer disease; the therapeutic garden at the Swedish University of Agricultural Sciences in Alnarp (Sweden). Biblical gardens⁶ constitute a peculiar variety of therapeutic gardens. They are described as *spaces for spiritual relaxation, an imitation of the image of paradise, and peculiar spa parks* (Włodarczyk, 2013). These are themed gardens where various forms of expression

⁵ At present, there are approximately 1500 various spas and health resorts, most of them being located in Germany (350), Italy (300), Spain (128) and France (107). Europe's largest spa park, with an area of 52 ha, is located in Baden bei Wien (Austria).

⁶The first biblical garden was established in Carmel-by-the-Sea, California (USA) while the first such garden in Europe was founded in Wales (United Kingdom) in 1961.

Since 2005, the number of biblical gardens has been growing rapidly, particularly in Germany where there are 30 gardens (Włodarczyk, 2013). Alongside the countries mentioned above, biblical gardens can be found in Australia, Austria, Croatia, Spain, the Netherlands, Ireland, Israel, Japan, Switzerland, Poland, Ukraine and other countries.

are used to build scenery imitating the Holy Land, its landscapes and famous buildings. The vegetation in biblical gardens is composed of plants mentioned in the Gospel. They are accompanied by quotations and biblical scenes in which these plants appear. Biblical gardens perform a number of complementary functions and, as it turns out, satisfy several human needs. On the one hand, they have an educational purpose in that they teach about the world and life in biblical times; they act as a cultural medium, and can be used both in evangelisation and ecumenical work. By becoming tourist attractions, they can be conducive to the shaping of desirable moral attitudes, also in relation to landscape. On the other hand, they are tranquil places for rest, reflection and prayer, allowing one to discover the meaning of life. Thanks to their visual, auditory and other values, they convey positive aesthetic models, give joy, and enable recreation and relaxation; sometimes they even have a therapeutic function (Włodarczyk, 2013).

4. Conclusions and final remarks

The *European Landscape Convention* is right in stating that landscape requires legal protection because of its unique value to individuals and society. It should be added, however, that the value of landscape also encompasses health. Comprehensive measures to improve the health of individuals and societies should take into account the therapeutic effect of landscape to a greater extent.

Perception is the key to understanding the therapeutic properties of landscape. It is through perception that we establish relationships with landscape which influences our health in its mental (intellectual, emotional), physical, social, and spiritual dimension. It should be noted, however, that the therapeutic effect of landscape depends on many individual factors, e.g. the traits of the individuals perceiving landscape and their expectations, and the context that is influenced, for example, by atmospheric conditions. That is why the attributes of a therapeutic landscape cannot be determined with great precision. The therapeutic properties of landscape are usually associated with its natural character (vegetation, water), beauty, harmony, diversity, familiarity, uniqueness, rich symbolism, open views, and presence of positive multisensory stimuli.

Environmentally valuable areas (especially national parks and nature reserves) have a particularly positive therapeutic effect. Other green areas, including city parks, also play an important therapeutic function. Spas and health resorts (especially spa parks located in the so-called A zone) as well as places of religious cult and their surroundings should also be

regarded as unique therapeutic places. Besides those mentioned above, ordinary local landscapes, particularly those of special emotional value to the individual perceiving them, can also have a therapeutic effect.

The therapeutic values of landscape are of great importance in sustainable development. Therapeutic landscapes are places of health promotion, conducive to the restoration of physical, mental, and spiritual health, e.g. through contact with nature and possibility of experiencing it with various senses. They are also a source of comfort, providing advantageous living conditions for people, which is linked with the compliance with environmental quality standards, among other factors. The protection of therapeutic landscapes should be one of the goals of sustainable development because it involves, *inter alia*, the protection of the natural and cultural environment (especially in environmentally valuable areas), and lots of benefits in the economic and social sphere, including the strengthening of health and spiritual development of the human population on which sustainable development is focussed after all. The therapeutic values of landscapes also offer a possibility for the development of sustainable tourism, which often constitutes an opportunity for the economic development of a given region. It should also be remembered that healthy landscapes influence the quality of life of present and future generations.

In response to social demand, it is necessary to use the possibilities of strengthening health by properly shaping landscape and utilising its therapeutic values, e.g. through the proper maintenance of green areas, water bodies, and tranquil areas, particularly in urbanised areas. Typically, cities are not a source of varied and positive sensory experiences. As Czajczyńska-Podolska and Rzeszotarska-Pałka (2016) observed, spaces with a therapeutic and integrating function should be an inspiration to design human-friendly cities. According to Gehl (2014), urban design must take into account the human dimension, which is manifested in strengthening the role of pedestrians and the role of urban space as a gathering place. Urban design should also recognise the role of the senses, particularly vision, as the basis for behaviours, actions and communication in space. Therefore, Gehl emphasises the need to protect interesting, unobstructed views and the acoustic climate (low noise levels)⁷. The accomplishment of the above goals will result in *human-friendly cities*, cities that are full of life, safe and healthy. The creation of a healthy urban environment (free of pollution, noise, with numerous green areas) is also one of the goals of sustainable development (e.g. Naess, 2001).

⁷ Corburn (2009) also pointed at the acoustic environment as a key factor in the creation of healthy cities. This issue was also the subject of the conference in Stockholm (Eu-

ropean Green Capital, 2010), entitled *Designing Sound-
scape for Sustainable Urban Development*.

References

1. ABRAHAM A., SOMMERHALDER K., ABEL T., 2010, Landscape and well-being: a scoping study on the health-promoting impact of outdoor environments, in: *Int. J. Public Health*, 55(1), p. 59-69.
2. ALEKSANDROWICZ J., WOSZCZENKO P., 1990, Środowisko w perspektywie medycznej: humanizm ekologiczny szansą przetrwania, in: *Człowiek – środowisko – zdrowie*, eds. Kopczyński J., Siciński A., Zakład Narodowy im. Ossolińskich, PAN, Wrocław.
3. BELL S., PHOENIX C., LOVELL R., WHEELER B., 2015, Seeking everyday wellbeing: The coast as a therapeutic landscape, in: *Social Science & Medicine*, 142, p. 56-67.
4. BERGH J.C.J.M., NIJKAMP P., 1991, Operationalizing sustainable development: dynamic ecological-economic model, in: *Ecological Economics*, 4, p. 11-23.
5. BERNAT S., KAŁAMUCKA W., 2008, The 'landscape experienced' in empirical research conducted by Lublin scholars, in: *Methods of landscape research*, eds Plit J., Andreychouk V., Dissertation Commission of Cultural Landscape of Polish Geographical Society no 8, Sosnowiec, p. 21-33.
6. BERNAT S., FLAGA M., KAŁAMUCKA W., 2017, The shaping of sustainable landscape in the context of the European Landscape Convention and the Encyclical *Laudato Si'*, in: *Problemy Ekorozwoju/Problems of Sustainable Development*, 12(2), p. 123-131.
7. BIRCHER J., KURUVILLA S., 2014, Defining Health by Addressing Individual, Social, and Environmental Determinants: New Opportunities for Healthcare and Public Health, in: *Journal of Public Health Policy*, 35, p. 363-386.
8. BOROWSKA A., 2012, Rozwój zrównoważony a rozwój duchowy człowieka, in: *Economy and Management*, 2, p. 20-27.
9. CAMPBELL F., BODLEY A., BERKELEY C., 2007, *Measuring Quality of Life: Does Local Environmental Quality Matter?*, ENCAMS Research Report.
10. CHWALIBÓG K., WOLSKI P., 2015, To co ważne dla przeciwdziałania destrukcji krajobrazu, in: *Krajobraz kulturowo-przyrodniczy z perspektywy społecznej*, eds Ratajski S., Ziółkowski M., Polski Komitet ds. UNESCO, Narodowe Centrum Kultury, Warszawa, p. 71-95.
11. *CONSTITUTION of the World Health Organization*, WHO, New York 1948.
12. CORBURN J., 2009, *Toward the Healthy City: People, Places, and the Politics of Urban Planning*, The MIT Press Cambridge, Massachusetts, London, United Kingdom.
13. COSTANZA R., D'ARGE R., DE GROOT R., FARBER S., GRASSO M., HANNON B., LIMBURG K., NAEEM S., O'NEILL R.V., PARUELO J., RASKIN G.R., SUTTON P., VAN DER BELT M., 1997, The value of the world's ecosystem services and natural capital, in: *Nature*, 387, p. 253-260.
14. CZALCZYŃSKA-PODOLSKA M., RZESZOTARSKA-PAŁKA M., 2016, Spaces that heal and integrate as inspiration for a new look on the modern city, in: *Space & Form*, 28, p. 165-180.
15. DANIŁOWA N., 1988 (1977), *Przyroda i nasze zdrowie*, Wiedza Powszechna, Warszawa.
16. DŁUŻEWSKA A., 2016, Cultural Ecosystem Services – Framework, Theories and Practices, in: *Problemy Ekorozwoju/Problems of Sustainable Development*, 12(1), p. 101-110.
17. DOBRZAŃSKA B., DOBRZAŃSKI G., KIELCZEWSKI D., 2008, *Ochrona środowiska przyrodniczego*, PWN, Warszawa.
18. DORN S., RELF D., 1995, Horticulture: Meeting the needs of special populations, in: *Hort Technology*, 5(2), p. 94-103.
19. DOUGHTY K., 2013, Walking together: The embodied and mobile production of a therapeutic landscape, in: *Health & Place*, 24, p. 140-146.
20. EDWORTHY J., 1997, Noise and its effects on people: an overview, in: *International Journal of Environmental Studies*, 51(4), p. 335-344.
21. EL BARMELGY H., 2013, Healing Gardens' Design, in: *International Journal of Education and Research*, 1(6), p. 4.
22. *EUROPEAN Landscape Convention*, The Council of Europe, Florence 2000.
23. FRANCIS THE POPE, 2015, Encyclical *Laudato Si'*, Vatican.
24. GEHL J., 2014, *Miasta dla ludzi*, RAM, Kraków.
25. GESLER W., 1992, Therapeutic landscapes: medical issues in light of the new cultural geography, in: *Social Science and Medicine*, 34(7), p. 735-746.
26. GESLER W., 1996, Lourdes: healing in a place of pilgrimage, in: *Health and Place*, 2(2), p. 95-105.
27. GESLER W., 2003, *Healing places*, Rowman & Littlefield, Lanham.
28. GUS, 2017, *Jakość życia w Polsce w 2015 r., wyniki badania spójności społecznej*, Studia i Analizy Statystyczne GUS, Warszawa.
29. HALES D., 2012, *An invitation to health: choosing to change*, Wadsworth Cengage Learning, Belmont.
30. HAZEN T., 1995, Therapeutic Garden Characteristics, in: *The American Horticultural Therapy Association*, 41(2), p. 3.
31. HEALTH IN THE FRAMEWORK OF SUSTAINABLE DEVELOPMENT, 2014, *Technical Report for the Post-2015 Development Agenda*, Sustainable Development Solutions Network.
32. HOUGHTON F., HOUGHTON S., 2015, Therapeutic micro-environments in the Edgelands: A thematic analysis of Richard Mabey's *The Unofficial Countryside*, in: *Social Science & Medicine*, 133, p. 280-286.
33. JASZCZAK A., 2016, 'Zielona' i 'niebieska' terapia w niemieckich uzdrowiskach (na przykładzie Kurortu Bad Bevensen), in: *Hortiterapia – terapia wspomagająca rehabilitację dzieci i dorosłych*, ed. Płoszaj-Witkowska B., Wydawnictwo UWM, Olsztyn, p. 35-47.
34. KAŁAMUCKA W., 2017, *Jakość życia i zabezpieczenie egzystencji z perspektywy geograficznej*, Wyd. UMCS, Lublin.
35. KAPLAN R., KAPLAN S., 1989, *The Experience of Nature: a Psychological Perspective*, Cambridge University Press, Cambridge.
36. KARJALAINEN E., SARJALA T., RAITIO H., 2010, Promoting human health through forests: overview and major challenges, in: *Environmental Health and Preventive Medicine*, 15, p. 1-8.
37. KARSKI J.B., 1994, Zdrowie i promocja zdrowia. Aspekt ewolucyjny, in: *Promocja zdrowia. Wprowadzenie do zagadnień krzewienia zdrowia*, eds. Karski

- J.B., Słońska Z., Wasilewski B.W., Sanmedia, Warszawa, p. 15-24.
38. KEARNS R.A., ANDREWS G., 2010, Geographies of well-being, in: *The SAGE Handbook of Social Geographies*, SAGE, eds. Smith S.J., Pain R., Marston S., Jones J. P., London, p. 309-328.
 39. KISTOWSKI M., 1997, Studium związków pomiędzy strukturą i potencjałem krajobrazu młodoglacjalnego (na przykładzie okolic Elku), in: *Prace i Studia Geograficzne, 21, Studia Geoekologiczne*, Uniwersytet Warszawski, Wydział Geografii i Studiów Regionalnych, p. 43-64.
 40. KOPCZYŃSKI K., SKOCZYŁAS J., 2008, *Krajobraz przyrodniczy i kulturowy. Próba ujęcia interdyscyplinarnego*, Badania Interdyscyplinarne UAM w Poznaniu, no 13, UAM, Poznań.
 41. KOZŁOWSKI S., 2015, *Przyszłość ekorożwoju*, Wyd. KUL, Lublin.
 42. KRETOWICZ P., 2013, Nowe podejścia badawcze w geografii zdrowia w literaturze anglosaskiej, in: *Przełąd Geograficzny*, 85(4), p. 549-571.
 43. *LANDSCAPES and Individual and Social Well-being*, 2003, European Landscape Convention Report Theme of the 2003 Workshop, Council of Europe Strasbourg 2003.
 44. *LANDSCAPE and Sustainable Development: Challenges of the European Landscape Convention*, 2006, Council of Europe, Strasbourg.
 45. LIAMPUTTONG P., SUWANKHONG D., 2015, Therapeutic landscapes and living with breast cancer: The lived experiences of Thai women, in: *Social Science & Medicine*, 128, p. 263-271.
 46. LUTTIK J., 2000, The value of trees, water and open spaces as reflected by house prices in the Netherlands, in: *Landscape and Urban Planning*, 48, p. 161-167.
 47. MALINOWSKA E., 2006, Zmiany walorów wizualnych krajobrazu w dolinie Narwi, in: *Problemy Ekologii Krajobrazu*, vol. XVIII, Zakład Ochrony Środowiska UMCS Lublin, p. 305-313.
 48. MASLOW A.H., 1954, Motivation and personality, in: *Journal of Personality*, 22(3), p. 326-347.
 49. MAZUR-WIERZBICKA E., 2017, Zdrowie publiczne jako element zrównoważonego rozwoju – analiza komparatywna. Polska na tle Unii Europejskiej, in: *Studia Ekonomiczne* 310, Zeszyty Naukowe Uniwersytetu Ekonomicznego w Katowicach, p. 53-67.
 50. MEIJERING L., LETTINGA A., NANNINGA CH., MILLIGAN CH., 2017, Interpreting therapeutic landscape experiences through rural stroke survivors' biographies of disruption and flow, in: *Journal of Rural Studies* 51, p. 275-283.
 51. MENATTI L., DA ROCHA A.C., 2016, Landscape and Health: Connecting Psychology, Aesthetics, and Philosophy through the Concept of Affordance, in: *Front Psychol.* 7, p 571.
 52. MYGA-PIĄTEK U., 2010, Przemiany krajobrazów kulturowych w świetle idei zrównoważonego rozwoju, in: *Problemy Ekorożwoju/ Problems of Sustainable Development*, 5(1), p 95-108.
 53. MYGA-PIĄTEK U., 2011, Koncepcja zrównoważonego rozwoju w turystyce, in: *Problemy Ekorożwoju/ Problems of Sustainable Development*, 6(1), p. 145-154.
 54. MYGA-PIĄTEK U., 2012, *Krajobrazy kulturowe. Aspekty ewolucyjne i typologiczne*, Uniwersytet Śląski, Katowice.
 55. NAESS P., 2001, Urban planning and sustainable development, in: *European Planning Studies* 9(4), p. 504-524.
 56. OSIKOWSKA W., PRZETACZNIK J., 2007, Problemy percepcji i oceny estetycznej krajobrazu Krakowa, in: *Roczniki Geomatyki*, 5(8), p. 79-88.
 57. PARK B.J., TSUNETSUGU Y., KASETANI T., KAGAWA T., MIYAZAKI Y., 2010, The physiological effects of Shinrin-yoku (taking in the forest atmosphere or forest bathing): evidence from field experiments in 24 forests across Japan, in: *Environ Health Prev Med.*, 15(1), p. 18-26.
 58. PAWŁOWSKA K., 2001, Idea swojskości krajobrazu kulturowego, in: *Krajobraz kulturowy. Idee, problemy, wyzwania*, ed. Myga-Piątek U., Wydział Nauk o Ziemi Uniwersytetu Śląskiego, Oddział Katowicki Polskiego Towarzystwa Geograficznego, Sosnowiec, p. 95-101.
 59. PAWŁOWSKA K., 2008, *Przeciwdziałanie konfliktom wokół ochrony i kształtowania krajobrazu. Partycypacja społeczna, debata publiczna, negocjacje*, PK, Kraków.
 60. PERRIAM G., 2015, Sacred Spaces, Healing Places: Therapeutic Landscapes of Spiritual Significance, in: *J Med Humanit*, 36, p. 19-33.
 61. PIETRZAK-ZAWADKA J., ZAWADKA J., 2016, Obszary przyrodniczo cenne jako miejsce realizacji innowacyjnych form turystyki zdrowotnej na przykładzie lasoterapii, in: *Studia Ekonomiczne i Regionalne*, 9(3), p. 112-120.
 62. PONIKOWSKA I., MARCINIAK K., 1988, *Ciechocinek – terenoterapia uzdrowskowa*, PWN, Warszawa.
 63. POSKROBKO B., 2013, Zielona terapia i rekreacja jako nowy produkt turystyczny, in: *Problemy Turystyki i Rekreacji*, 3, p. 5-23.
 64. PRZEWOŹNIAK M., 1991, *Krajobrazowy system interakcyjny strefy nadmorskiej w Polsce*, Wyd. Uniwersytetu Gdańskiego, Gdańsk.
 65. *PUBLIC Health and Landscape, Creating Healthy Places*, 2013, Landscape Institute Position Statement, London.
 66. *QUIET Areas in Europe. The Environment Unaffected by Noise Pollution*, 2016, EEA Report No 14.
 67. PUDELSKA K., DUDKIEWICZ M., DURLAK W., PARZYMIES M., 2016, Ranga dawnych i współczesnych ogrodów terapeutycznych, in: *Acta Sci. Pol. Form. Circumiectus*, 15(1), p. 125-137.
 68. RICHLING A., SOLON J., 2011, *Ekologia krajobrazu*, PWN, Warszawa.
 69. ROSE E., 2012, Encountering place: A psychoanalytic approach for understanding how therapeutic landscapes benefit health and wellbeing, in: *Health & Place*, 18, p. 381-1387.
 70. SEIDMAN M. D., STANDRING R.T., 2010, Noise and Quality of Life, in: *Int. J. Environ. Res. Public Health.*, October, 7(10), p. 3730-3738.
 71. SENETRA A., SZCZEPAŃSKA A., WASILEWICZ-PSZCZÓŁKOWSKA M., 2014, Traffic noise as a factor driving apartment prices—a case study of a large European urban agglomeration, in: *Acoustics Australia*, 42 (1): 47-50.

72. SŁOŃSKA Z., 2008, Nowe oblicze medykalizacji: redefinicja i marginalizacja promocji zdrowia, in: *Socjologia i antropologia medycyny w działaniu*, eds. Piątkowski, Płonka-Syroka B., Arboretum, Wrocław.
73. THOMPSON C., 2011, Linking landscape and health. The recurring theme, in: *Landscape and Urban Planning*, 99, 3-4, p. 187-195.
74. TOCZEK-WERNER S., SOLTYSIK M., 2012, Orientacja na dobrostan i zdrowie jako źródło popytu na turystykę w naturze i naturalnych krajobrazach. Zdrowotnej, in: *Zeszyty Naukowe Uniwersytetu Szczecińskiego. Ekonomiczne Problemy Usług*, 83, p. 279-292.
75. TROJANOWSKA M., 2017, *Parki i ogrody terapeutyczne*, PWN, Warszawa.
76. TROJANOWSKA M., SAS-BOJARSKA A., 2013, Ocena wpływu inwestycji na zdrowie w świetle badań nad terapeutycznymi właściwościami krajobrazu, in: *Architektura Krajobrazu*, 40(3), p. 94-107.
77. TSUNETSUGU Y., LEE J., PARK B.-J., TYRVÄINEN L., KAGAWA T., 2013, Physiological and psychological effects of viewing Urban forest landscapes assessed by multiple measurements, in: *Landscape and Urban Planning*, 113, p. 90-93.
78. ULRICH R.S., 1984, View through a window may influence recovery from surgery, in: *Science*, Vol. 224(4647), p. 420-421.
79. UN, *The Rio Declaration on Environment and Development*, 1992, Rio De Janeiro.
80. VALLÉS-PLANELLAS M., GALIANA F., VAN EETVELDE V., 2014, A classification of landscape services to support local landscape planning, in: *Ecology and Society*, 19(1), p. 44.
81. VELARDE M.D., FRY G., TVEIT M., 2007, Health effects of viewing landscapes – Landscape types in environmental psychology, in: *Urban Forestry & Urban Greening*, 6, p. 199-212.
82. VERBURG P. H., VAN DE STEEG J., VELD-KAMP A., WILLEMEN L., 2009, From land cover change to land function dynamics: A major challenge to improve land characterization, in: *Journal of Environmental Management*, 90, p. 1327-1335.
83. WALENTYNOWICZ-MORYL K., 2017, Wielowymiarowe modele zdrowia, in: *Hygeia Public Health*, 52(1), p. 1-5.
84. WCED (WORLD COMMISSION ON ENVIRONMENT AND DEVELOPMENT), 1987, *Our Common Future*, Oxford University Press, New York 1987.
85. WILLIAMS A., 1999, Therapeutic landscapes in holistic medicine, in: *Social Science & Medicine*, 46(9), p. 1193-1203.
86. WILLIAMS, A. (ed.), 2007, *Therapeutic landscapes*, London, Ashgate Publishing.
87. WILLIAMS A., 2010, Spiritual therapeutic landscapes and healing: A case study of St. Anne de Beaupre, Quebec, Canada, in: *Social Science & Medicine*, 70, p. 1633-1640.
88. WILSON E.O., 1984, *Biophilia. The human Bond with other species*, Harvard University Press, Cambridge.
89. WILSON E.O., 2008, The nature of human nature, in: *Biophilic Design*, eds. Kellert S., Heerwagen J, Mador M., New Jersey: John Wiley & Sons, p. 21-25.
90. WŁODARCZYK Z., 2013, Ogród biblijny – nowy typ ogrodu tematycznego, in: *Zeszyty Naukowe Uniwersytetu Rolniczego im. Hugona Kollątaja w Krakowie*, 499, Rozprawy, 376.
91. WOJCIECHOWSKI K.H., 1986, *Problemy percepcji i oceny estetycznej krajobrazu*, UMCS, Lublin.
92. WOJCIECHOWSKI K.H., 1994, O przydatności badań percepcji krajobrazu, in: *O percepcji środowiska Zeszyty Naukowe PAN nr 9*, ed. J. Bogdanowski, Komitet Naukowy przy Prezydium PAN ‘Człowiek i Środowisko’, Warszawa, p. 109-124.
93. WOJCIECHOWSKI K.H., 2004, Miejsce postrzeganego krajobrazu w całościowym ujęciu jakości życia, in: *Annales UMCS. Sectio B*, 59(13), p. 213-229.
94. WOLF K.L., FLORA K., 2010, Mental Health and Function – A Literature Review, in: *Green Cities: Good Health, College of the Environment*, University of Washington, Washington.
95. WOYNAROWSKA B., 2008, *Edukacja zdrowotna*, PWN, Warszawa.