

Green walls

Evolutionary introduction:

During the evolution of human beings that are known today previous humans were always surrounded and strongly influenced by nature, especially in forms of plants. For the ancestors of nowadays' humans the colour, amount and diversity of plants were crucial indicators for food resources, protection of the sun and predators, and eventually existing predators. Moreover, plants were signals for water that could have been utilized by humans themselves and increased the probability to find other animals that could have been hunted and eaten. So, during evolution the perception of humans towards plants became more sensitive. Nowadays, this precise natural perception is expressed through positive emotional responses towards green and flourishing environments. Furthermore, plants were so important in the history of human evolution that the comprehensive positive effects of plants on humans can still be observed today. Natural environments or plants have an impact on physiology and psyche, but also on general health and stress reduction. Natural landscapes, plants and especially the colour green are stimuli to which the human perception and cognition apparatus is adapted. This increases the positive effect on cognitive processes, for example: Concentration is maintained longer, if the person sees natural elements.

Plants and natural landscapes also have a fundamentally positive effect on human well-being, which manifests itself in a generally increased quality of life.¹

1 Elisabeth Oberzaucher, Biophilie, oder wie Pflanzen Leben retten. *Homo urbanus*, p. 69-74 (2017)

Green walls:

Nowadays, a high percentage of human beings world wide lives in cities where less green or natural spaces can be found. For utilizing the benefits natural landscapes and plants have on human beings architecture found ways to implicate natural landscapes and plants into the design of buildings. By doing so the benefits nature has on increasing the general quality of life, stress reduction and improved cognitive performances of human beings can be maintained while at the same time natural elements offer additional benefits to the building and city itself.

A possibility for implementing natural elements into the building is by utilizing green walls into the building's design.

These additional benefits will be outlined in the following paragraphs.

One of the significant benefits of green walls is their ability to absorb and store water in the leaves, stems and roots of plants and additionally evaporate water directly. This means that green walls have a great positive influence on storm water management by reducing the water run off in urban environments. Furthermore, through incorporated water retentive or drainage layers at the base of the green walls additional water storage capacities are offered.

Compared to conventional walls green walls also make a great difference in temperature and energy savings. Due to the plants the green walls are improving the buildings heating, cooling, ventilation and air conditioning (HVAC) systems by directly shading the building's surface. By providing cooling systems for the building itself the temperature of the whole environment gets reduced as well which prevents heat islands within a city.

Moreover, green walls offer advantages for enhancing and contributing biodiversity because they provide new and specific urban habitats for rare and needed plants and animals. In addition, green walls spread over the city provide a corridor across urban areas with very little biodiversity and assist in migration of insects and birds.

Natural environments and access to green open spaces affect health, stress reduction and increase the quality of life, so green walls are crucial for increasing amenity and provide opportunities for food production, recreation and relaxation.

Depending on the plant species and area of cover green walls have an impact on the removal of gaseous pollutants from the air – of course this impact differs between different plants.

Plants with textured leaf surfaces or high foliage density are able to capture small particles and help removing particulate pollution. On a large scale, green walls are able to reduce the overall environmental heat gain and to improve the air quality.²

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2. GROWING GREEN GUIDE, Benefits
<http://www.growinggreenguide.org/?s=BENEFITS> (2014)

² GROWING GREEN GUIDE, Benefits <http://www.growinggreenguide.org/?s=BENEFITS> (February 28, 2014)