



This is a book chapter originally published by Routledge.

Citation for published version:

Grahn, P., Stoltz, J., Bengtsson, A. (2022). The Alnarp Method : An Interdisciplinary-Based Design of Holistic Healing Gardens Derived From Research and Development in Alnarp Rehabilitation Garden. In: Bishop, K. & Corkery, L. (eds) *Routledge Handbook of Urban Landscape Research*. London: Routledge. 299-319.

<https://doi.org/10.4324/9781003109563-25>

This is an Accepted Manuscript of a book chapter published by Routledge in *Routledge Handbook of Urban Landscape Research* on 2022-12-27, available online:

<http://www.routledge.com/9781003109563>

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# **The Alnarp Method: An Interdisciplinary Based Design of Holistic Healing Gardens Derived from Research and Development in Alnarp Rehabilitation Garden**

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Chapter 20 in Routledge Handbook of Urban Landscape Research, edited By Kate Bishop and Linda Corkery. Routledge 2022. <https://doi.org/10.4324/9781003109563-25>

## **Introduction**

In 2001, construction began on the Alnarp Rehabilitation Garden on the Swedish University of Agricultural Sciences' campus in southern Sweden. The garden belongs to the university's research infrastructure and the purpose is to increase knowledge regarding evidence-based design processes in landscape architecture and nature-based rehabilitation.

Research in the garden is about *restorative* processes as well as *instorative* processes. Restoration is defined as the recuperation of diminished daily functions and capabilities, a return to a normal state of health or strength, largely during people's free time (Han 2018). Restorative environments permit and promote restoration (von Lindern et al. 2016). However, certain activities in natural areas contribute to something more than just restoration, and this is described as instorative effects and environments (Hartig et al. 1996). The word instorative relates to instauration – meaning an act of instituting and establishing something new. Instorative effects are about how natural environments appear to act as catalysts; speeding up the processing of mental health processes or crises so that reorientation is achieved faster. Instorative environments convey perceptions and awareness that lead to instorative effects (Grahn et al. 2021).

Alnarp Rehabilitation Garden has been used to investigate how the design can support interventions regarding different user groups, such as rehabilitation from stress-related mental illness (e.g. depression and burnout syndrome) (Grahn et al. 2017); stroke (Palsdottir et al. 2020); Parkinson's disease (Ottosson et al. 2015); dementia and memory disorders (Bengtsson

et al. 2020); and to facilitate integration and workplace introduction for refugees from war-torn areas (Ekstam et al. 2021). It is important to point out that the design of Alnarp Rehabilitation Garden has taken place in collaboration with medical expertise. This chapter describes the process of developing the design of the garden, related to stress-related mental illness. In many articles and book chapters, the function of the garden, where the design of the garden is a crucial part, has been described in general and in smaller sections. The intention here is to – for the first time – provide a comprehensive description from theoretical framework to implementation. The introduction is followed by a section that describes the theoretical framework. The Alnarp method is based on this framework and is described in the third section. Finally, a description is presented of how the method has been applied in our laboratory, Alnarp Rehabilitation Garden.

### **Some Early Swedish Pioneers in Nature Based Therapy**

The theories behind the design of Alnarp Rehabilitation Garden began to be formulated in the 1980s (Grahn 1991). Before we go into these theories, we will present some Swedish pioneers. Although they and their therapies were very well known both in Sweden and internationally during the 19th century and until the middle of the 20th century, they were almost forgotten thereafter. At the height of their popularity, they were considered miracle doctors, and they had patients from all over Europe, some even from South Africa. When the first participants were referred to Alnarp Rehabilitation Garden in 2002, it led to renewed interest in garden history and medical history, which brought the pioneers in Sweden to light again. There are clear parallels behind the design of Alnarp Rehabilitation Garden and how these pioneers created their therapies, both in terms of the content of the gardens and the roles of the therapists. Since the 2010's, the theories of these pioneers have come to affect theories related to the Alnarp Method.

To understand the approach to the design of a health garden, we therefore begin by presenting the three Swedish pioneers in this field and the therapeutic landscape settings associated with each of them. The first example is Ronneby Brunnsparck, which was built next to a medicinal spring and hospital in south-eastern Sweden. The medicinal spring was discovered in 1705, and in 1726 the construction of a hospital and a health park began. The design of Ronneby Brunnsparck took off when Doctor Adolf Magnus Sjöborg became chief physician in 1790. Together with garden architects and gardeners, he and other doctors developed a program that

was intimately connected with taking the waters, such as gymnastic exercises, walking, resting, and contemplation in specially designed environments (Jakobsson 2004). The treatment at the spa's hospital required a large and flexible health park. The function of the spa area implied that it was necessary to create a garden, park and nature area with many qualities (Jakobsson 2004). Sjöborg laid a good foundation, which other doctors and gardeners took over.

The second example is Doctor Ernst Westerlund, who in the 1870s began prescribing regimens, which included diets, rest and activities. Westerlundska gården consisted of a doctor's medical service and a garden of about 2000 square meters. Most of Westerlund's patients suffered from mental illness. The activities were largely located outdoors. He signed a contract with the city of Enköping to allow his patients to work in the city's parks, as his own garden was not enough. During the high summer, he placed his medical service at Storlien in the Swedish mountains, where patients had the opportunity to wander in the mountains (Jonsson 1998). Westerlundska gården, with garden and plantations, is today cared for by the park administration in Enköping municipality.

The third example is Vårstavi, Poul Bjerre's therapeutic garden in the southern part of Stockholm. The physician Poul Bjerre (1876-1964), a pioneer in psychotherapy, sought his main inspiration from Taoism, especially from its concept of 'wu-wei'. The concept is concerned with impact, not through what a person does but through what the person is. Bjerre also used the concept related to the physical environment, its 'väsensverkan' which can be translated to the impact of a physical environments essence and being. Some environments, especially natural environments, can have an impact on people that results in a cognitive re-evaluation and 'omstämning' (emotional change), which can result in a new orientation in life (Bjerre 1944; Sahlin 2021). Bjerre claimed that people's mental illnesses are often in a natural process of healing. The therapist's role is to remove obstacles to this healing. Often, the key is that patients need to leave a goal or a role in life in order for something else to take over. In this process of reorientation, it is the patient who sets the direction, never the therapist, whose role is to empathetically follow along as a supportive and encouraging part in the patient's reorientation. It is about a trusting collaboration between therapist and patient, on equal terms. Only in such a collaboration the patient can overcome an experience of being alone with the problem (Bjerre 1944; Sahlin 2021). To facilitate this, a cognitive re-evaluation and emotional

change is needed, which according to Bjerre is facilitated during outdoor stays, if the environments have the right content.

### **Theoretical Framework**

The theoretical framework deals with how the physical environment, not least nature, parks and gardens, affect people. The framework consists of several parts, of which the overall theory is called the *Supportive Environment Theory* (SET). SET and its associated theories seek to explain how certain environments, more than others, can help support people who are feeling unwell.

### **The Supportive Environment Theory: A Basis for the Development and Design of the Alnarp Rehabilitation Garden and Program**

The historical examples above show that working with the design of gardens and parks that will work in nature-based therapy is different from designing health-promoting gardens and parks. When the landscape architect works with designing health-promoting gardens and parks, he/she works mainly from a restorative perspective. This means that the environments should restore visitors from stress and mental fatigue. When the landscape architect, on the other hand, is to design environments that should work in nature-based therapy, the area must be able to function both restoratively and instoratively. The latter means that the area should be able to cover the full range of support and challenges, needed and preferred by the users. In addition, the area should be able to function with a group of people who are extra sensitive to impressions and disturbances. Finally, the area must serve as a tool for therapists. Sjöborg, Westerlund and Bjerre all advocated the use of different landscaped and natural environments as tools in the therapeutic process, where the tools included the physical environment as well as the doctors and other therapists. Sjöborg wrote out rest, contemplation, gymnastic exercises and walking as activities. Thus, including a type of physiotherapy. Westerlund wrote out regimens, which included diet and everyday activities, preferably outdoors such as managing parks, including occupational therapy. Bjerre claimed the benefits of psychotherapy and described in more detail the healing power of the natural environment.

The purpose of Alnarp Rehabilitation Garden is to offer a holistic treatment and rehabilitation method - the Alnarp method. The design of the outdoor environment aims to meet the needs

of both care recipients and therapists, with the goal that the care recipients will recover. The design of the environment and the therapy program is based on the Supportive Environment Theory. The theory claims that people are dependent on social, physical, and cultural components that support their health and well-being (Grahn et al. 2010; van den Bosch et al. 2018):

1. The *social component* can be about support from a spouse, children, family, friends and / or colleagues. In a therapeutic environment, it consists in part of fellow patients, who are often in the same situation. Patients can identify with their fellow patients' problems and progress. The social component is strengthened by a therapeutic team. The Alnarp method includes a physiotherapist who works to strengthen the body's functions and the musculoskeletal system as well as with physical activity; a psychotherapist who works with the participants' mental ability and an occupational therapist who works to strengthen the participants' activity spectrum and executive functions.
2. The support from the *physical component* is about how the environment can facilitate and support opportunities for rest and various forms of meaningful activities.
3. The *cultural component* is about how activities in, and interpretations of, the environment can provide support. The cultural component is thus about the care recipients' own choice of activities and environments, social and physical, and how these activities and environments meet and satisfy the care recipients' needs.

Usually, the cultural component is governed by the human *Internal Working Model*, i.e. how humans routinely relate to the demands of the environment and their own needs. Sometimes people may need calm, serene impressions from natural environments, while other times they may want to seek stimulating surroundings, with lots of people, music and entertainment. What you want to apply for can vary from day to day, or from morning to evening. As an example, we can take a person who is interested in relaxing after work, and that he/she usually seeks out the inner city's lively parks and outdoor cafes. There, this person knows that it is pleasant, with good food, beautiful surroundings and high spirits. In the case of more severe physical and mental illnesses and other life crises, the Internal Working Model does not work well. What has previously been experienced as pleasant, beautiful and enjoyable can be experienced as strange and even frightening. Communication between the surrounding world and the person becomes difficult. The gap between one's own perception of who I am,

how I function and behave, and the signals from the environment becomes large (Grahn 1991; Grahn et al. 2021).

The *Scope of Meaning* is a function that is related to and supports the human Internal Working Model. Originally the Internal Working Model was created by this function. The Scope of Meaning may be seen as being made up of experiences and values, and how the person communicates with the surrounding world in order to function and survive in it. It becomes an important part of how a person identifies him/herself and his/her functions in different contexts and determines how the person perceives the environment and his/her own scope of action. The person's Scope of Meaning forms the framework for and guides the person's Internal Working Model, which facilitates how the person thinks and acts in everyday life and how the person socializes with others. When the Internal Working Model does not work well, the Scope of Meaning becomes an important and prominent function (Grahn et al. 2021).

### ***The Importance of Calm and Connection***

It is important to emphasize that the Scope of Meaning function does not provide quick and routine type of instructions to care recipients on how they should work. To end up in a state when you cannot manage everyday life, not be able to cope with what you could previously cope with easily, means a difficult loss. In such crises, people are fragile, and thus have a great need to be able to be in more manageable environments that are not demanding. The environments must instead offer support. Burnt out, sick, crisis-stricken and depressed people have a hard time thinking and being able to get a structure in everyday life. Because their internal working model does not work as it should, their executive function (EF) does not work either. EF is used to sort information, prioritize, plan and finally implement what is planned. As a result, the sick or crisis-stricken cannot motivate, plan and organize their actions in order to gain structure in everyday life. A healing environment therefore needs to contain simple, clear components that people feel they can control. They should feel free and not bound by requirements in the environment that they have difficulty understanding or being able to handle. Built environments can be difficult to manage. People are often difficult to interpret and understand, and it is easy to feel misunderstood or offended (Grahn et al. 2021).

How can nature-based therapy start and drive health-promoting processes? Bjerre claimed that his patients had a *pursuit of competence*, but had got stuck which led to life crises, mental exhaustion and depression. In Vårstavi, he strived for patients to undergo a cognitive re-evaluation and emotional change, in order to find a new orientation in life. People's pursuit of competence deals with two major aspects (Ekvall 1988):

1. The pursuit of autonomy – an expansion and independence activity whereby we wish to understand and master the surrounding world to avoid falling victim to unpredictable or unknown forces. This entails, e.g., our thirst for knowledge, desire to create and ambition to attain a position of control and mastery of everyday situations.
2. The pursuit of homonomy – affiliation with a group, clan, family, work community, association, church or some other form of fellowship with God, Nature or the cosmos.

Bjerre did not explicitly state that he worked to facilitate these two pursuits of competence for his patients, but the activities ranged from walking and resting, over simpler chores to creative activities. Bjerre also initiated deeper psychotherapeutic conversations with patients. His most interesting contribution, however, is that he urged patients to let nature have an essential effect, and he said that this can be achieved if they could find a connection with nature; a kind of pursuit of homonomy. He called this process attunement.

We have developed this part of SET into a theory we call the Calm and Connection Theory (Grahn et al. 2021). The first and most important part of the process in Alnarp Rehabilitation Garden is that patients can begin to attune to the physical environment, because it starts the healing process. *Attunement* is defined as a kind of attachment; a condition where a person can feel complete trust and security in the environment, which means that the calm and connection system can be activated. This system releases, among other things, the hormone oxytocin, which opens up systems that have to do with attachment. The calm and connection system is an archaic system involved in protective and health-promoting mechanisms in many situations, not least when the system is connected to pleasant sensory stimuli. For example, looking out over a mirror-shiny water surface, detect a scent of flowers, listening to birdsong or soothing sounds from wind in treetops or waves towards the beach; or getting tactile stimuli, such as feeling warm sand under the soles of your feet or the sun warming your face. All of these stimuli are likely to activate different types of sensory nerves, thereby activating the calm and connection system. Once the system has been activated, people can form



relationships with garden and natural environments. Certain qualities in garden rooms can attract a desire to approach and interact. These qualities can convey an experience of security and kindness, as well as access to resources vital to survival, such as water, berries or fruits. Such qualities that are perceived as calm, friendly and safe can attract and form a basis for attunement, and the process can be further benefited by qualified healthcare professionals.

### **The Alnarp Method**

The Alnarp method is about the theories above being translated into visual models that can help the landscape architect to design health-promoting environments. The overall model, which summarizes much of the Supportive Environment Theory, consists of a pyramid. This in turn is associated with *Perceived Sensory Dimensions* (Table 20.1 and Figure 20.1). The models can be seen as compasses that the landscape architect can practice. The overall model emanates from the existence of a gradient of challenges: from garden and nature environments that are dominated by more tranquil natural environments, of importance for attunement, to environments that are dominated by social activities.

### **Perceived Sensory Dimensions and the Sensory Opportunity Spectrum**

A comprehensive study over more than 30 years, including research conducted in the Alnarp Rehabilitation Garden, has been carried out on which perceived qualities in outdoor environments that are the most important to support people's needs. This research has suggested affordances (Gibson 1979) for eight basic qualities, or *Perceived Sensory Dimensions* (PSDs), as crucial (Stoltz and Grahn 2021). These qualities encompass and are shaped by all our senses and bodies in motion, as well as our higher cognition. However, they are not defined in terms of specific physical attributes. Rather, they are seen as perceived qualities that emerge in the meeting between an individual and an environment. These PSDs are understood as having a Natural, a Cultural, a Cohesive, a Diverse, a Sheltered, an Open, a Serene, or a Social quality, respectively. Table 20.1 gives a brief description of each PSD.

Table 20.1. Brief descriptions of the eight PSDs. (Source: Stoltz and Grahn 2021)

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PSD	The environment affords...
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Natural	- fascination with the natural world, its distinctive shapes and colors, its inherent force and power. A sense of the wild and untouched, of the passage of time.
Cultural	- a sense of fascination with human culture, creativity, labor, and history. The cultivated, crafted and man-made, as opposed to the “self-made” or natural.
Cohesive	- a sense of spatial cohesion and spaciousness, an experience of a “world in itself”, an extended, uninterrupted whole, possible to explore.
Diverse	- a sense of diversity and variation in the environment. A large variety of different species of plants and animals. A multi-layered and diverse vegetation, often in combination with water features.
Sheltered	- a sense of shelter, safety and protection. An enclosed space, a refuge, a hideaway. The possibility to “be seen without being seen”.
Open	- a sense of openness and freedom. Overviews, prospects, vistas and stays. Open space for physical activities, room to roam freely, to see far into the distance.
Serene	- a sense of serenity, peace, quiet, and stillness. Freedom from noise and disturbances. Peaceful sounds of nature. Absence of other people, signs, signals, threatening or intrusive stimuli.
Social	- a sense of bustling activity, people, and movement. A dense and lively place, with social activities and interactions. Often especially strong in dense urban settings; around e.g., cafés, shopping streets, squares, etc.

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More than 60 studies using the PSDs have been conducted by different researchers in different parts of the world, and the collected results indicate that they are experienced as of similar general importance regardless of cultural context. This suggests that they might point towards universal human needs. It also seems that people assess them in a similar way in a given environment. As such, the PSDs can be understood to point towards eight complementary, but equally important human needs. A summary interpretation of the collected evidence regarding the PSDs suggests that their mutual relations can be schematically illustrated as in Figure 20.1 (Stoltz and Grahn 2021a, b). Here, the eight PSDs

are understood along four axes of opposing qualities: A *Natural – Cultural* axis, a *Cohesive – Diverse* axis, a *Sheltered – Open* axis, and a *Serene – Social* axis. These axes are placed in relation to each other to also reflect a certain kinship between adjacent qualities. Research suggests that the Serene, Sheltered, Natural, and Cohesive PSDs are the most important to support restorative processes (e.g., Pálsdóttir et al. 2018). The Social quality on the other hand is usually perceived as the least desirable by people with a low sense of wellbeing and high levels of stress and/or attention fatigue. In general, between two and four adjacent qualities in the PSD model (Figure 20.1 left) might be combined to create high synergy and low conflict between different sensory dimensions at a given site. It is possible also for opposite PSDs to be simultaneously supported, however this might require some extra effort since attributes reinforcing one PSD tend to decrease the opposite quality in the model.

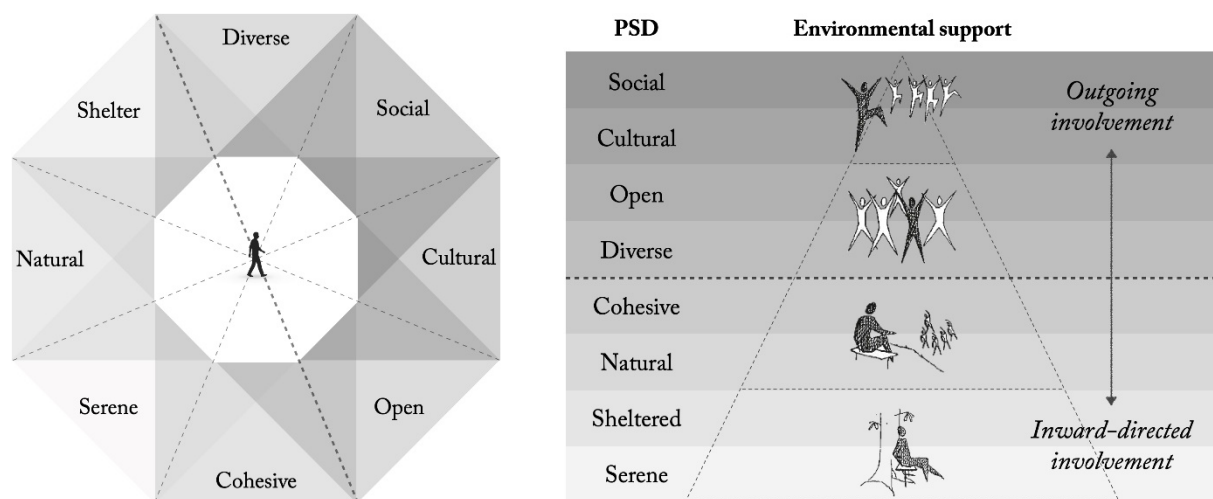


Figure 20.1. Schematic illustrations of the general relations between the eight PSDs: Understood along four axes of opposing qualities (left), and in relation to the Pyramid of Environmental Support (right).

Together, affordances for the eight PSDs could be understood to define what we call the Sensory Opportunity Spectrum (SOS) of an environment. Ideally, the SOS of a supportive garden environment should provide affordances for all eight PSDs. However, it is usually not possible, nor desirable, to support all PSDs simultaneously at a given spot in the garden. Instead, our findings suggest that different PSDs and combinations of PSDs might be used to create garden rooms with support for different stages of the restorative process. Such sites can

then be laid out spatially to provide smooth transitions between different stages of the rehabilitation process, supporting both restorative and instorative pathways. Different areas of a healing garden can be designed to emphasize different PSDs or combinations of PSDs, corresponding to different levels of the Pyramid of Environmental Support. These areas are placed in relation to each other with consideration for their relative restorative/stimulating potential, as illustrated in Figure 20.2. The illustration is schematic, and thus only shows the general principles of the garden layout. Each site provides unique possibilities and restrictions that also will be crucial for how a rehabilitation garden is laid out and designed.

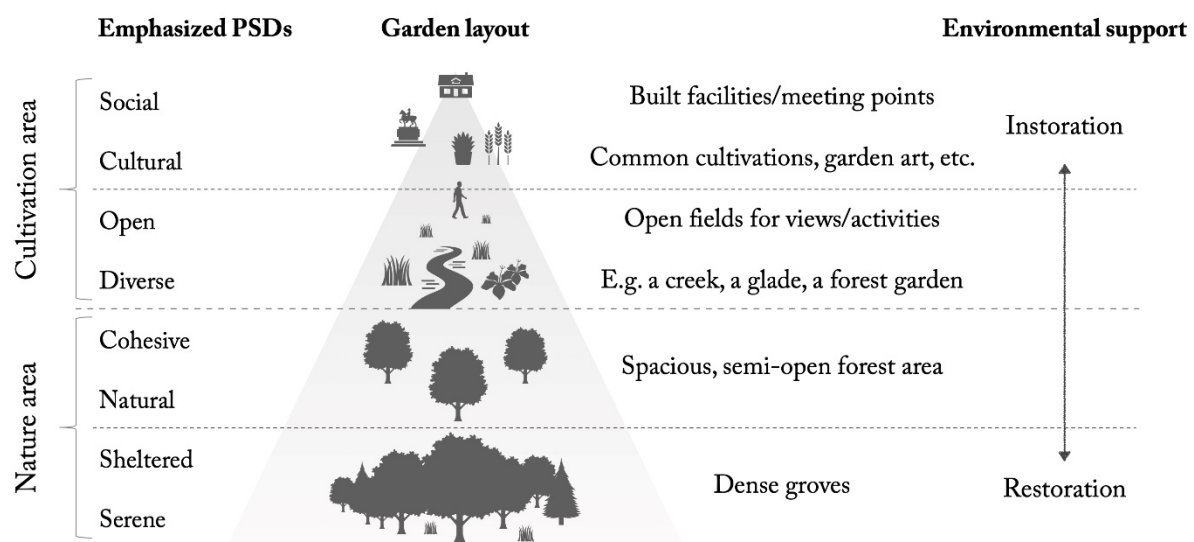


Figure 20.2. Schematic layout for the Sensory Opportunity Spectrum (SOS) of a supportive garden environment.

#### Four Zones of Contact with the Outdoors

The principal model of Four Zones of Contact with the outdoors was developed to promote design that takes advantage of the potential resource of the outdoors for human health and wellbeing in a holistic way (Bengtsson 2015). The idea is to make the most of the outdoors by considering all relevant zones in a design process. Zone one concerns the view from inside the building, through windows, as well as the daylight coming into the building. Zone two, the transition zone between indoors and outdoors corresponds to e.g., terraces and greenhouses. Zone three concerns the immediate surrounding, e.g., a garden or park associated to a building. Zone four corresponds to the wider neighborhood and whatever opportunities for outdoor experience and use it might encompass. Since all four zones have the potential to promote health and wellbeing of the users, a design process that considers all relevant zones

could lead to a design with a greater positive impact. In such a process it is important to understand the user group the design is intended for, since different user groups could have quite different needs. For instance, at a nursing home, some user groups are very sensitive to over stimulation whereas other user groups are very sensitive to under stimulation.

The PSD model and the Pyramid of Environmental Support (Figure 20.1) together indicate the importance of a range and variation in the environment, so that there is a possibility to recover from stress in secluded, tranquil parts with a natural character, and that there are parts of the environment that provides opportunities for physical, social, and cultural stimulation. The Four Zones could be a helpful structure to guide the overarching design and placing of different environmental features in line with the users' preferences and needs, e.g. by placing more challenging features in zones further away from the building so that users can choose whether or not they wish to confront them, or by placing particularly important features so that they are visible already from inside the building (i.e. in zone one). As will be presented, the layout of Alnarp Rehabilitation Garden largely follows these design- and planning principles, considering the SET model in general, the Calm and Connection theory, the PSD model, the Pyramid of Environmental Support (Figure 20.1), and the Four Zones of Contact. All adapted to the unique features of the available property at the Alnarp campus.

### **Alnarp Rehabilitation Garden**

A description of the design of Alnarp Rehabilitation Garden illustrates how the above models are realized in practice.

#### **Design and Layout of the Garden**

Alnarp Rehabilitation Garden is located in the eastern part of the campus area in SLU Alnarp. It is located about 500 meters from the campus center with Alnarp Campus Park, Alnarp Castle and premises for teaching and research. Just north, east and south of the garden are experimental areas for plants to use in horticulture and landscape architecture. The garden is hence surrounded by cultivation areas on three sides and on the fourth side, to the west, the garden faces the public campus area. The whole garden is surrounded by a fence and the gate is locked. This allows participants to feel safe. In addition, the boundaries of the garden have been planted with more shrubs and trees over the years to strengthen the feeling of entering a

safe and enclosed space. The main road between Malmö and Lomma, with public transport, runs between the eastern and central parts of the campus. A bus stop is located near the main entrance to the garden as well as parking spaces for visitors. The garden is thus hidden from the public but still close to premises for teaching and research (see Figure 20.3).

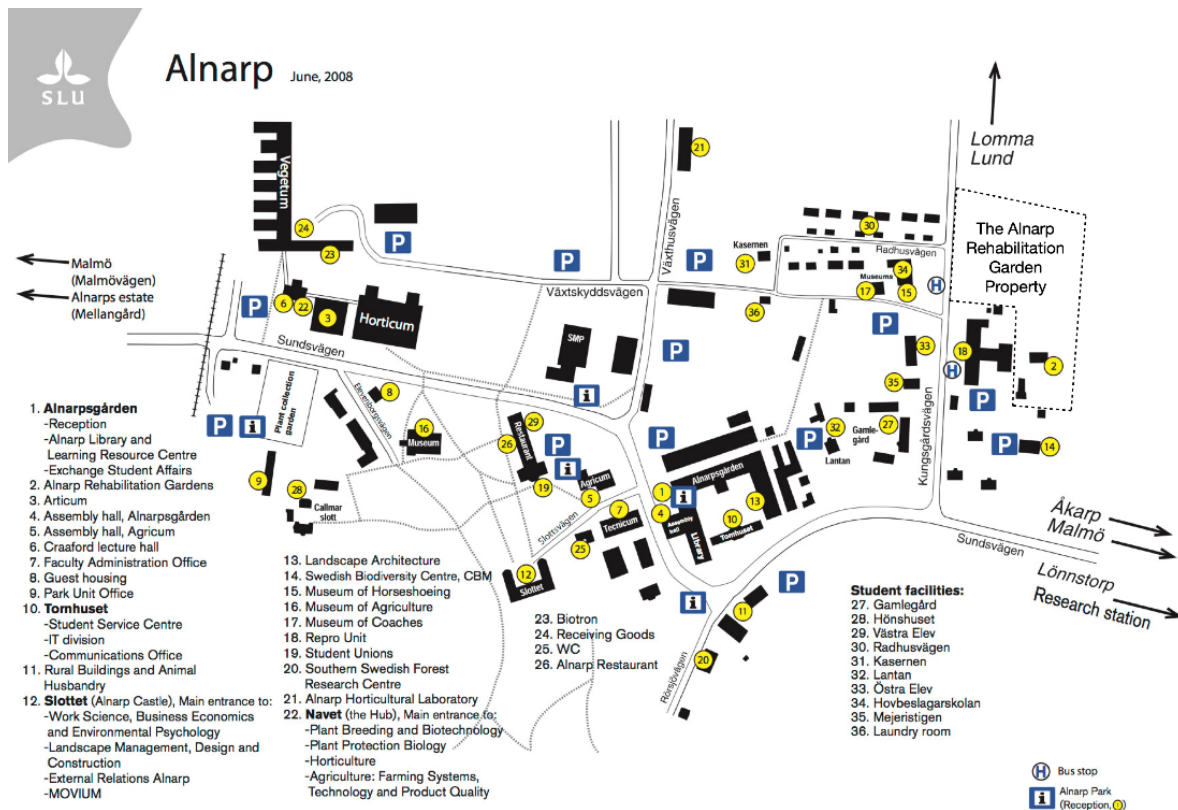


Figure 20.3. Map of Alnarp Campus and the location of Alnarp Rehabilitation Garden.

Central in the design and planning of the Alnarp Rehabilitation Garden and its facilities has been to offer users a wide Sensory Opportunity Spectrum, with all eight PSDs present, thus supporting various levels of wellbeing and different phases of the rehabilitation process. In line with this, all Four Zones of Contact are represented in the garden and have been used in different ways by the participants. The garden is divided into two main areas: a Cultivation and Gardening Area in the southern part, and a Nature Area in the northern part. These areas in turn consist of different parts, with different functions for the rehabilitation process, supporting restorative as well as instorative pathways (Figures 20.4 and 20.5).

The garden is designed with contrasting principles. In the Nature Area, two restorative areas have been created: the more closed the Grove next to the more open, ‘savannah-inspired’

Meadow. In the Cultivation and Gardening Area, the open, well-organized Kitchen Garden contrasts with the more closed, informal, natural Forest Garden. South of the Forest Garden is the Urban Garden with many built elements and less of nature: instead, there are two greenhouses, several raised beds and some hard surfaces. All this to investigate various hypotheses by e.g. Roger Ulrich, the Kaplans, Diane Relf and us (Grahn et al. 2010).

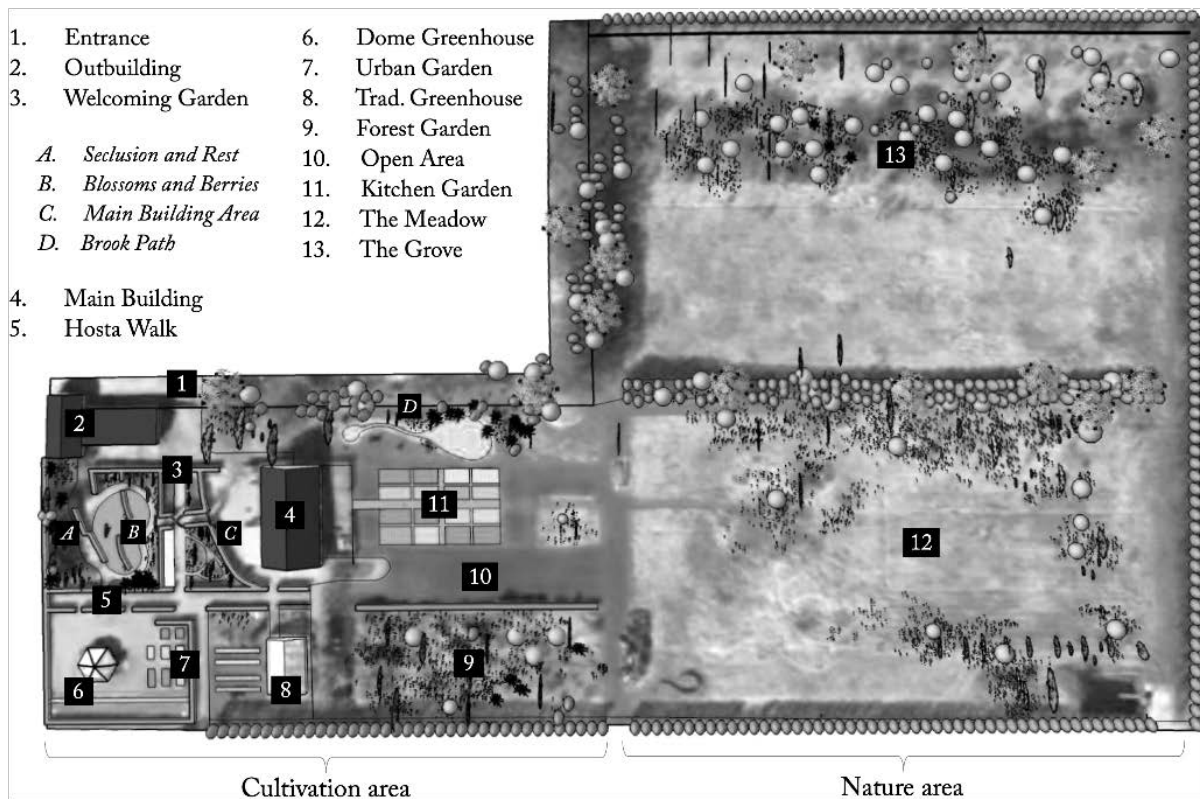


Figure 20.4. Digital model of Alnarp Rehabilitation Garden showing the main entry point, buildings and the names of the different parts of the garden. (Source: Created by Gunnar Cerwén)

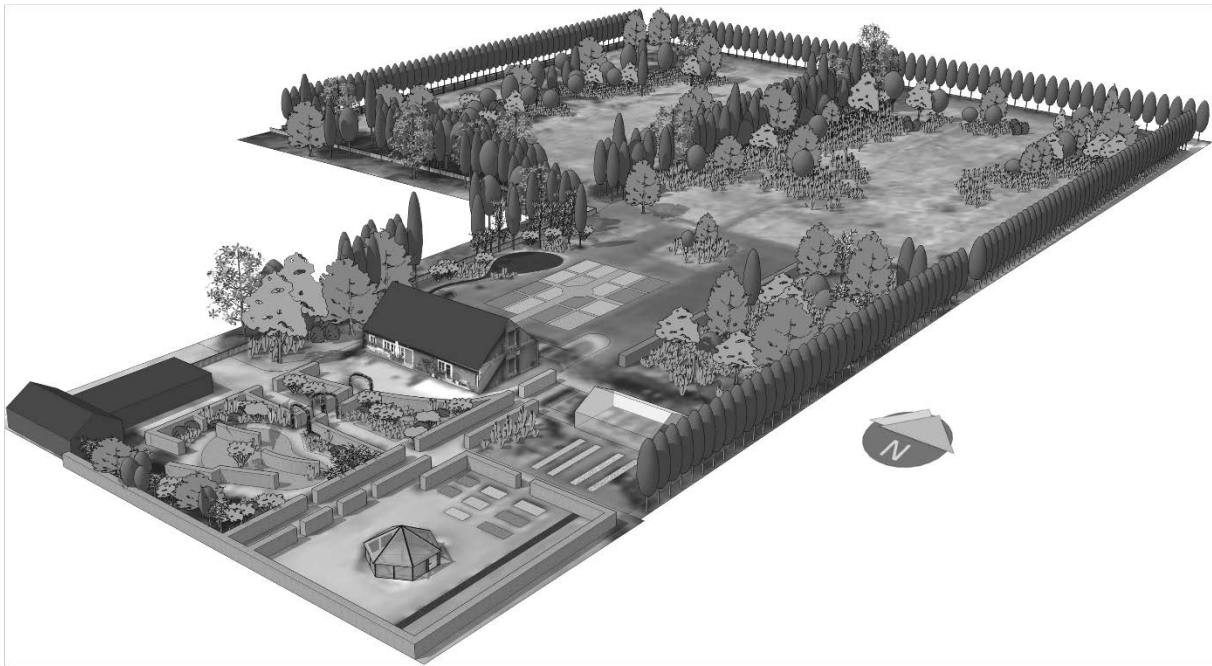


Figure 20.5. A 3D-Digital model of the Alnarp Rehabilitation Garden. (Source: Created by Gunnar Cerwén).

### ***The Nature Area***

The Nature Area was planned and designed to be a restorative, serene place, as in the base of the Pyramid of Environmental Support. The area consists of two parts, the *Grove* and the *Meadow*, divided by a row of Swedish whitebeam trees (*Sorbus intermedia*).

What is now called The Grove was originally an orchard of fruit trees. The western part was dominated by trees while the eastern part had a more open character. The older fruit trees stood together with younger ash trees, maples, rowans and shrubs of European elder, blackberry and raspberry, and moreover tall grass and herbs, such as red clover, thistle, northern dock and chamomile. Overall, the impression here was one of quite wild and untamed nature. This area was planned to offer the most powerful support to the severely stressed and exhausted. The dominant PSDs are at the bottom of the Pyramid of Environmental Support: Sheltered, Serene and Natural. The orchard should continue to grow wild, where ashes, maples and rowan trees would grow. There are no activities led by therapists in this part of the garden. Either participants come here themselves because they need it, or therapists can suggest that they visit this part of the garden.



The Meadow consists of a large open area dominated by grass mixed with meadow flowers. In some places there are shrubs of willow and hawthorn and some fruit trees. The Meadow slopes slightly upwards to the north, where the lowest point in the garden is in the southern part. In the upper part of the area, by bushes with fruit trees, a couple of seats are landscaped overlooking the more active part of the garden. The aim was that this area would be slightly more demanding than the Grove. The dominant PSDs here are Cohesive, Serene, Open and Natural. Usually, the participants come here themselves because they need it, and then it is mostly about walking, or sitting down and looking at the view. Sometimes therapists - especially the psychotherapist - can walk here with a participant to talk about serious things. Both participants and therapists think that the natural environment with its openness, space and light in this part of the garden make it easier to talk about such things.

### ***The Cultivation and Gardening Area***

The Cultivation and Gardening area is divided into three types of gardens, each with distinctive character. These include a permaculture-inspired *Forest Garden* and a *Kitchen Garden* located north of the Main Building, and a more *Urban Garden* located south of the Main Building. These areas shall train participants to become more physically active and social. They form a gradient, from the more low-intensity, restorative Forest Garden over the more production-oriented Kitchen Garden to the both production- and socially-oriented Urban Garden. Activities led by therapists - especially the occupational therapist and the landscape engineer - follow the same gradient. In the Forest Garden, not much gardening takes place because the plants are perennials and resist weeds well. However, it can be about harvesting fruit, nuts and berries. Here, the therapists can sometimes also arrange a fire to BBQ or just hang out with the participants around the fire. Significantly more intensive gardening takes place in the kitchen garden. In the urban garden, gardening takes place all year round. All of these gardens aim to grow organically produced food, which the participants are offered to eat and take home. Between the Forest Garden and the Kitchen Garden there is an *Open Area* with grass and sparse with fruit trees. This area serves partly as part of a line of sight from the Welcoming Area to the Meadow, partly as a break or half-halt between the Kitchen Garden and the Forest Garden. This Open Area offers the PSDs Open and Cultural.

The Forest Garden was designed with the intention to offer opportunities for permanent cultivation with an organic, informal, and nature-like design. The cultivation is multi-layered, where fruit trees, hazel and berry bushes form an irregular forest, where herbs and root vegetables can grow in the rooms of clearings that arise between bushes and trees. Here, participants can work in an environment that offers small private garden rooms and can consider what individual plants need in terms of light, heat, water, etc. Thus, participants can also think about their own needs and opportunities. A permanent fireplace has also been laid out here, and there is seating around it. The PSDs offered here are first and foremost Diverse and Sheltered, followed by Natural. The affordances that this area contains can be interpreted to correspond to those found in the lower part of the Pyramid of Environmental Support. Consequently, the Forest Garden acts as a bridge between the Nature Area and the Cultivation and Gardening Area.

The traditional Kitchen Garden, reminiscent of Swedish country homes, is designed with a focus on cultivation of many different herbs and vegetables. The rectangular space features abundant planting, all in-ground plantings, carefully laid out in rows. Thus, it differs markedly from the Forest Garden. This area places significantly higher demands on the participants; when it comes to physical work and to endure and abide with being exposed to others. The dominant PSDs here are Cultural, Cohesive and Open.

To the east and south of the Main Building is the Urban Garden, which is dominated by built elements such as greenhouses, raised plant beds, gravel surfaces and strictly pruned hedges. These greenhouses were partly needed to plant seeds and to subsequently cultivate and retrain plants to be planted in the gardens; partly as conservatories and orangeries. They have proven to be particularly good representatives of zone two. Two greenhouses were built: a *Traditional Greenhouse* with a wooden frame and a *Dome Greenhouse*. The larger, Traditional Greenhouse was built east of the Main Building and is mainly used for sowing, planting or replanting plants and other garden activities. A number of straw bales were also laid out in the greenhouse. The participants were allowed to lie there, look at the sky and sometimes received treatment from the physiotherapist while lying on the straw bales. The contact with the outdoor environment, with the trees, the sky and the seasons proved in interviews to be of great value.

## ***The Welcoming Garden***

In addition to these main garden rooms, there is a larger entrance area called the *Welcoming Garden*. Here is the main and only entrance to the garden. It is important that the Welcoming Garden does not place too many demands on the visitor, so that also those with low mental strength can handle it. At the same time, it should be perceived as interesting and attractive. Visitors should feel welcome, safe, and secure here, so that they can relax and be themselves.

Participants who suffer from stress-related mental illness often state that they cannot handle people at all. They cannot even look at something they know is planted by humans. They want to be removed from all this and be in natural environments where the vegetation seems to be self-sown and left undisturbed by human influence. They want 'social quietness' and peace (Palsdottir et al. 2014). During the first weeks, these participants cannot walk longer distances but stay in the Welcoming Garden. The design of this part of the garden therefore needed to be modified to provide more support for PSD's Serene, Sheltered and Natural than we originally thought. The planted boundaries of the garden are important for the participants to feel that they are coming to a safe place separate from the outside world.

At the entrance to the Main Building, there is a lot of social contact that many of our participants have a hard time with. To solve this problem, the Welcoming Garden needed to include a Miniature Pyramid of Environmental Support. There is thus a gradient in demand and challenge. These are highest closest to the entrance to the Main Building and lowest in the part farthest away from the entrance to the Main Building. Activities led by therapists take place in the area at the entrance to the Main Building, sometimes in the middle but never in the far part.

## **How Different Garden Spaces Support Different Phases of Rehabilitation**

The original participants who came to Alnarp Rehabilitation Garden were in much worse condition than we had prepared for. The agreement with the healthcare system enabled doctors to refer participants with stress-related mental illness, such as exhaustion disorder, burnout and / or depression to Alnarp Rehabilitation Garden. It turned out that the referral was often for participants that no previous treatment or rehabilitation could help. On average, they had been on sick leave for almost four years. Our design was based on the participants staying for a maximum of a couple of days in the Welcoming Garden. Then they would spread

throughout the garden, where the garden itself (especially the Nature Area) could offer qualities that support the need for recovery and homonymy with nature. However, due to the poor health of the participants, they stayed in the Welcoming Garden for much longer, and we therefore needed to strengthen the design regarding the PSD qualities Sheltered, Serene and Natural, in the areas of Seclusion and Rest, Brook Path and the Area of Blossoms and Berries. In addition, it turned out that the Dome Greenhouse could serve as a refuge for the stressed. Table 20.2 provides a summary of the garden rooms with respect to supporting therapy.

Table 20.2. The design of garden rooms with respect to PSDs and their support of therapy.

<i>Garden Zone</i>	<i>Features</i>	<i>PSDs experienced</i>	<i>How used for therapy?</i>
<b>The Nature Area</b>			
<i>The Grove</i>	<ul style="list-style-type: none"> <li>• Overgrown fruit tree orchard</li> <li>• Mix of deciduous trees, grasses and herbs</li> <li>• Wild, unmanaged landscape character</li> </ul>	Sheltered, Serene and Natural	Opportunities for participants to find solitude; a place to escape to. The Grove has also been used as a place for participants' grief, despair and to curse one's own situation.
<i>The Meadow</i>	<ul style="list-style-type: none"> <li>• Open grassy area with meadow flowers</li> <li>• Mix of trees and shrubs at the borders</li> <li>• Loose, informal landscape character</li> </ul>	Cohesive, Serene, Open and Natural	The participants have walked back and forth across the meadow, letting their gaze rest in the landscape, giving space for their minds to think, pondering and contemplating.
<b>Cultivation and Gardening area</b>			
<i>Forest Garden</i>	<ul style="list-style-type: none"> <li>• Organic, informal, "nature"-like design</li> <li>• Multi-layered vegetation with food producing plants and herbs</li> <li>• Small private 'garden rooms'.</li> </ul>	Diverse, Sheltered and Natural	Opportunities for participants to find solitude; a place to escape to. Used for low-intensity horticulture, mostly about harvesting. The place can in later stages of rehabilitation be used for activities with self-rewarding and symbolic values. To practice being social, such as hanging out by an open fire.
<i>Open Area</i>	<ul style="list-style-type: none"> <li>• Open grassy area</li> <li>• Sparse with fruit trees</li> </ul>	Open and Cultural	Part of a line of sight and serving as a break between gardens
<i>Kitchen Garden</i>	<ul style="list-style-type: none"> <li>• vegetable and herb plants grown for consumption</li> <li>• tidy and geometric layout in rows</li> </ul>	Cultural, Cohesive and Open	Work with planting, clearing weeds, harvesting Activities with primarily clear and concrete values. Practice being exposed
<i>Urban Garden</i>	<ul style="list-style-type: none"> <li>• Dominated by greenhouses</li> <li>• Raised planting beds</li> <li>• Pruned hedges</li> <li>• Gravel ground surfaces</li> <li>• Water feature with gold carp</li> </ul>	Social and Cultural	Work with all types of gardening, in greenhouses, on ground and in raised beds Practice social activities Practice many types of activities: concrete, creative, self-rewarding and symbolic

			Psychotherapy in the dome greenhouse
<b>The Welcoming Garden</b>			
<i>Seclusion and Rest</i>	<ul style="list-style-type: none"> <li>• Small garden rooms surrounded by trees, bushes, high grass and flowers</li> <li>• A big boulder</li> <li>• A small pond</li> <li>• A hammock and seats</li> </ul>	Shelter, Serene, Diverse and Nature	Opportunities for participants to find solitude; a place to escape to Rest after physiotherapy
<i>Brook Path</i>	<ul style="list-style-type: none"> <li>• Several garden rooms surrounded by small trees and bushes</li> <li>• A brook and a pond with gold carps</li> <li>• Water lillies, flowers and grass</li> <li>• Many seats</li> </ul>	Serene, Shelter, Diverse and Nature	Opportunities for participants to find solitude; a place to escape to Practice being closer to people
<i>Area of Blossoms and Berries</i>	<ul style="list-style-type: none"> <li>• Many small garden rooms surrounding by hedges</li> <li>• Densely planted with flowers and berries</li> <li>• Sensory garden: scents, colors, shapes, textures</li> </ul>	Diverse and Shelter	Harvesting flowers and berries Opportunities for participants to find solitude Physiotherapy Rest after physiotherapy Practice being closer to people
<i>Hosta Walk</i>	<ul style="list-style-type: none"> <li>• Straight gravel path lined with cut hedges and different varieties of Hosta</li> <li>• A long wooden sofa at the bottom of the southern part of the walk</li> </ul>	Cultural and Open	Part of a line of sight and serving as a break between gardens
<i>Main Building Area</i>	<ul style="list-style-type: none"> <li>• A gravel floor in a semicircle</li> <li>• A sculptural tree surrounded by flowers</li> </ul>	Social, Cultural and Open	To gather people, talk to them and give instructions

### ***The Daily Program***

An overall intention of the rehabilitation program has been to focus on what is sound and healthy with our service users. Therefore, we use the term ‘participants’, not ‘patients’. The participants come from cities near the garden, such as Malmö and Lund. They arrive in the morning and return home in the afternoon. They all have a low degree of executive functioning, at the same time as they are in a state of crisis or depression. The therapy normally takes twelve weeks. There are most often seven participants in each group. The program is set to be four days a week, 4.5 hours per day. The structure is strict, so that every day, every week follows the same order: Gathering in the morning with tea from the garden, bread with different toppings from the garden, and where each person is offered to say a few words about his/her mood. The days also end in the same way. Every day, the therapy is led by an occupational therapist and a landscape engineer. In addition, a gardener helps with the management of the garden. Mondays and Thursdays are intended for gardening, while

Tuesdays and Wednesdays also include individual meetings with a psychotherapist or physiotherapist. Tuesdays and Wednesdays also include group exercises with a physiotherapist.

During the rehabilitation, the psychotherapist helps the participants to put their feelings into words and to find suitable action strategies to be able to move on in life. The physiotherapist works with the participants' bodies, and after physiotherapy treatment the participants are asked to bring their feelings to the garden outside her office (especially the garden room Seclusion and Rest) and nurture them there. The occupational therapist helps the participants to get structure in everyday life. Later in the rehabilitation, the participants' function increases even more. They can participate more and more in cultivation activities, in the Forest Garden, the Kitchen Garden and also in the Urban Garden. The participants now use the entire rehabilitation garden. They begin to move back and forth through the Meadow and between the Kitchen Garden and the Forest Garden. Increasingly, participants stay near the Main Building; on the wooden terrace, at the entrance and sometimes the participants even stand at intersections between paths to the Welcoming Garden, the Forest Garden and the Urban Garden, to be able to meet people and get a chance to talk. This indicates that they now not only manage to be more social but look forward to social contact.

When the participants are judged to be sufficiently rehabilitated, they are given a task, for example to design a flower bed in a part of the garden, themselves or together with another participant. Some of the participants also use the environment outside the Alnarp Rehabilitation Garden and went for walks in Alnarp Campus Park. Now the participants are ready to leave the Garden. However, not everyone achieves such a good result, partly because some are only allowed to be in the rehabilitation garden for eight weeks while others could be there for as long as 12, or even 24 weeks. During the years that research has been conducted in Alnarp Rehabilitation Garden, researchers have continuously followed how the participants' health has changed (e.g. Grahn et al. 2017), and the participants have also been studied and interviewed about when, how and why they have used the garden in the way they did, and what they liked / did not like (e.g. Palsdottir et al. 2014; Palsdottir et al. 2018). There is a clear difference in how well the rehabilitation works in relation to the number of weeks in the different programs (Grahn et al. 2017).

## Conclusion

Planning for the Alnarp Rehabilitation Garden began in 2000, and during the more than 20 years that have passed since then, it has functioned as a clinic and laboratory for researchers from many different disciplines. The garden has been continuously used in both teaching and interdisciplinary research. This has made it possible to develop and test theories and methods in landscape architecture and health.

Evidence has been collected regarding the overall effectiveness of the garden environment and the rehabilitation program to support recovery from, e.g. stress-related disorders and attention fatigue. With time, this has crystallized into the Alnarp Method, centered on the combination of a specially designed garden environment and a therapeutic team and treatment program. The facility will continue to be used to develop both theories and methods in health and landscape architecture.

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### **Acknowledgement**

We want to acknowledge those who have contributed to the development of knowledge in Alnarp Rehabilitation Garden. The original design of the garden: landscape architects Sara Lundström, Ulrika Stigsdotter, Frederik Tauchnitz, John Pearson and Patrik Grahn. The original design of the therapeutic program: Patrik Grahn in collaboration with Susanne Iwarsson, professor of occupational therapy and Lil Träskman Bendz, professor of psychiatry. The team in the garden (occupational therapist Lena Welén-Andersson, psychotherapist Inga-Lena Bengtsson, physiotherapist Lillian Lavesson, landscape engineer Liselotte Lindfors and landscape architect Frederik Tauchnitz) have together with the researchers developed both the therapeutic program and the garden. The researchers who have been most involved are the landscape architects Dr. Anna Bengtsson, Dr. Carina Tenngart Ivarsson, Dr. Ulrika Stigsdotter and Dr. Patrik Grahn; horticulturists Dr. Anna Maria Palsdottir and Dr. Johan Ottosson, psychologists Dr. Anna Adevi and Dr. Eva Sahlin; cognitive scientist Dr. Jonathan Stoltz; occupational therapist Dr. Dennis Persson and physician Dr. Peter Währborg. In addition, several researchers from Lund University and Karolinska Institutet have participated. Part of this review has been funded by the FORMAS Research Council; the project ‘Sustainable outdoor living environments—systematic interdisciplinary studies of health effects and impact on social inequalities’ (D-nr 2019-01916)