What are the design principles of Healing Gardens

For people who are suffering from stress-related diseases?

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Abstract

According to European Agency for Health at Work (2011), Stress is one of the biggest health and safety challenges in Europe and "[it] is the second most reported work-related health problem, affecting 22% of workers from EU 27 (in 2005)." Nature by having special futures has positive effects on human's health and can be a place for restoration from stress. Healing gardens for people who are suffering from stress-related disease is a concept which tries to take advantage of being passive and active in natural space.

The aim of this thesis is to look at the design principles of this kind of healing garden with the case study of Torup Healing. The result which is mainly extracted from interviews of designers, shows that there are two main parts, first before starting the design process "what is important to know" and "important factors" while planning it. The study got two significant elements; "society" and "establishment" as new findings through the research which might not be called principles but they are as important as principles and should be taken into account during the process of design.

Content:

1-Introduction

Through rapid growth of cities as a offspring of modernization and urbanization, populations have tended to choose urban areas as their environment over rural areas resulting in denser urban areas. This has happened without considering psychological and social aspects of design of public space and buildings properly (Gehl 2010). Moreover, this led conurbations to have further infrastructure and less nature, while on the other hand modern lifestyle has provided various choices such as computers, internet, TV, mobile and all other modern electronic gadgets which renders us to experience pressure to fulfill all the demands of a so-called-social life. Accordingly, the rate of stress and stress-related diseases are significantly increased.

According to European Agency for Health at Work (2011), Stress is one of the biggest health and safety challenges in Europe and "[it] is the second most reported work-related health problem, affecting 22% of workers from EU 27 (in 2005)."

Many studies focusing on stress and human health suggest that in order to release the negative affects of stress on human health, it should be restored and recovered. Researches in environmental psychology has indicated that there is a direct connection between human health and access to nature.They also recommend that a natural environment can be one of the answers which may be considerably helpful to restoration and recovery from mentioned issues (Kaplan and Kaplan, 1989; Kaplan, 1995; Ulrich et al. 1991; Van den Berg et al., 2007). Largely many have indirectly experienced this feeling of restoration.

Nevertheless, the objective of this thesis is to systematically examine the design principles of healing gardens for individuals who experience stress from a lack of nature. Specifically, there are certain motives that inspired me to devote my final project to this subject matter. At the outset, this topic is related to environmental psychology and it is one of my favorite subjects through my studies in architecture and urban landscape dynamics. Firstly, I am appealed to the relationship between humans and their surrounding environment, dwelling, mental and physical health and what the essential factors contained by gardens subsists which facilitates the assuaging of stress-related illnesses.

Secondly, by going through previous studies and literature it has encouraged me to continue researching this topic for the reason that there is a lack of research on how to design this kind of places. Specifically, finding fundamental aspects of design which can be implemented in different societies was my last intention, especially, by considering the growth of mental diseases caused by stress in global context which of course affects my home land, Iran as well.

1-1 Stress

Baum et al. (1982) define stress as "stress refers to a process that is not only specific, but also central to the relationship between people and their surroundings". Stress is procedure that environment forces as stressors, threaten an organism's existence and well-being and by which that organism responds to that threat. The reaction to the stress is commonly known symptoms as fear, anxiety and anger which are just part of this process (Baum et al. 1982 p.15)

"The concept of stress is referred to a set of biological reactions" (Dahlgren 2006 p.11). Stress is a result of reactions of body to any kind of demand. It is physiological reactions of the body to a dangerous situation or a threat, which cause physiological changes. These kinds of changes in body prepare us to fight or flight. The first reaction of the body to a "stressor", which can be any demanding and stressful situation in the environment (Adevi 2011 p.39) is to activate the sympathetic nervous system which is done by stress hormones (adrenaline, norepinephrine and cortisol) that are released in bloodstream. The consequences of this release are that blood pressure and heart rate rises, raises sensitivity to pain and increases our attention and muscle tension (Dahlgren 2006 p.11).

There are plenty of individual differences in how people respond to stressful situations as these rely on two principles factors. Initially, one is how the individual perceives and interprets the situation as a threat or not. Then the behaviors and physiological responses follow further consequences. If the situation is not perceived as a threat, then no respond occurs.

The second factor of individual differences relates to the condition of the body itself. For instance, people who are in a good condition physically can cope in difficult or energy-consuming exercises better than those who are not in good shape (McEwen 1998 p.36). Stress reactions are fundamental biological powers and social faculties which are inherited evolutionarily and gained through culture (Stigsdotter & Grahn 2003). It helped our ancestors to flight or fight in dangerous situations. Today it assists us to be cautious and awake during serious situation and it is considered as a positive reaction as long as it could be recovered and rested after the situation is solved. But if the body cannot be restored from stress, it can trigger serious illnesses (Stigsdotter & Grahn 2004).

1-2 Stress and positive effects from nature

Often, response to acute stress doesn't affect their health, since the stress hormones return to their baseline levels automatically when the stressful situation is over. So stress itself is not only harmful but also necessary (Dahlgren 2009 p.12).
What leads to the development of stress-related diseases includes long-term increase of circulation cortisol and elevated blood pressure. Cardiovascular, metabolic, immunological and neuronal pathology are result of those physiological changes (Dahlgern 2009 p.12).

Theories in environmental psychology (Kaplan & Kaplan, 1989; Kaplan, 1995) explains that by using direct attention intensively without getting restored, mental fatigue is its consequence (Herzog et al. 2002). The consequence of intentional fatigue can be losing concentration, heightened sensitivity or irritation and higher possibility for errors (Herzog et al. 1997). These theories affirm that, nature by having special features makes it possible for recovery and restoration. On the other hand researches in the environmental psychology field have indicated that, there is a direct connection between human health and access to nature. As de Vries claims, there is a positive relationship between health and easy access to green space (Ward Thompson, C., et al 2010). Healing gardens by having natural setting might be one of the answers to deal with stress.

1-3 Introductions to the healing garden and its history

"The idea of healing garden is both ancient and modern"(Cooper Marcus & Barnes 1999 p.1). Persian garden, the Japanese Zen garden and the Monastic Cloister gardens are some of examples of a healing environment which appeared throughout history in different parts of the world. However, by increasing technical approach in healing process, the connection between health and nature was missed. During 1980s the concept of a healing quality of nature became in vogue once more.

 "The restorative garden is one among the many varieties of gardens that human planted since taking up agriculture ten thousand years ago (Gerlach-Spriggs et al. 1998 p.7, Messer Diehl 2009). The restorative garden as a place to reflect on emotional feelings, practicing social support, originated in Persia, Egypt and the Far-East. During Middle Ages such gardens appeared in Europe as well.

They were surrounded by walls to provide a feeling of security, form of enclosure. It accommodates shelter, sun and shade. Gardens have been part of human life since they started agriculture. They display the culture of people who design or use it (Messer Diehl 2009).

Labyrinth is one of the oldest types which has roots in Greek mythology and also Egypt as a part of ritual celebration. "It was a symbolic journey to the center and rebirth, then back out again"(Cooper Marcus & Barnes 1999 p.93). There are still representations of Labyrinth in modern life, for instance the pavement of the main plaza California pacific Medical Center (Cooper Marcus & Barnes 1999).

The Persian garden is one of the best models of landscaping with an enormous history as a result of the interaction of the Iranian human with nature is from the sixth century BC (Brooks 1987 p.31). The Persians who have a long history in gardening and designing oasis's throughout dry lands were almost the first ones looked at their nature and put their effort to find a definition for place according to their beliefs so it is the result of the interaction of Iranian with nature (Brooks 1987). Persian Gardens are designed upon a geometric and structural definitions and harmony. Influenced by the Persian historical restorative garden, Islamic Paradise gardens were formed and developed. They are surrounded by a wall which

is one of their characteristics. Water, canopy and hill are other important elements in the garden. Symmetrical design with fountain in the intersection of the axes in the middle of the garden is another obvious character of the garden.

Figure 1. Bagh-e Eram, the Eram palace and garden at Shiraz, Fars province, Iran.

Figure 2. Zen Japanese garden, Ryoanji temple garden in Kyoto Japan.

Japanese Zen garden is another example which is going back to 12th century through the 14th century. The idea was to bring all of the elements of nature together in one place, represent the simple essence of nature. The Tea garden is a kind of Zen garden, with a function of preparation for tea ceremony, which is mostly used for observation rather than participation.

Historical gardens mentioned above might be difficult to import to our modern life directly, however it may be useful to acquire approaches to integrate these historical concepts in order to incorporate them into our modern lifestyles.

1-4 Healing gardens and Today's life

In general healing is a process that promotes overall well-being (Cooper Marcus & Barnes 1999). In particular, it is a process that the body restores or recovers both physically or/and mentally. Moreover, it is a multidimensional process which includes physical, mental, spiritual, emotional and social aspects. "The word heal derives from an old English word *haelon* which means wholeness" (Gesler 2003 p.3). The idea of wholeness, connectedness or integration means, healing is a process that all the aspects of physical, mental, emotional and social components of a patient are involved in and they affect each other. Gesler believes that there are four types of environments, natural, built, symbolic and social environment that are substantial in healing process (Gesler 2003).

The garden is a multicultural history term and an essential component of human life. They have been used for cultivation, providing shelter, demonstrating symbolism, showing beauty and offering refuge (Messer Diehl 2009). The garden should be seen as an enclosed ground, to feel safe. It has different rooms with walls and floor with different materials (Stigsdotter & Grahn 2002).

The combination of these two terms, healing and garden is a healing garden. But the question is ''what is a healing garden?'' What Ulrich (1999) proposes the term healing garden is referred to different garden features that have the ability to foster restoration from stress and also have other positive effects on patients, staffs and visitors .The features should contain salient amount of real nature components such as green vegetation, water and flowers. In order to call a garden a healing garden it is important it should have therapeutic health effects on its users. Designers who are successful in creating healing gardens are those who implement the need of patients and staffs into their design approach (Cooper Marcus & Barnes 1999).

Commonly, people take advantage of viewing landscapes or being in nature. There are positive advantages for various reasons depending on the person such as participating in therapy programs, patients aspiring to better themselves or merely children playing as well as healthy people. It is important to know the user groups, who are going to use the place (Tenngart 2011). The preferences of different user groups are important to know in order to fulfill their needs. For instance children are looking for functional aspects of the environment while adults may consider more how the place looks like (Whitehouse et al. 2001). Tveit et al. (2006) describe that, there are two kinds of approaches about preference of landscape.

One is related to human beings evolutionary background that responding to natural landscape is biological. On the contrary, some scientists believe that preference of landscape relates to culture and background or personal attributes of the observer, so differences in culture and ethnic background can have influence on preferences for various types of natural setting (Tveit et al. 2006).

Cooper Marcus and Barnes (1999) in their book "Healing Grandees" categorized user groups of therapeutic places into two types. Group one, "a space to look at and a space for passive and quasi-passive activities such as observing, listening, strolling, exploring." This type of garden can be part of a hospital or healthcare center which helps patient's to gain back their health progress beside medication. The other type of user groups are those participating in horticultural therapy programs, who are engaged with active gardening and plant propagation. Depending on horticultural programs, the users may differ (Haller et al. 2006). Ulrich (1999) also explains that a garden in a health center setting plays the role of stress mitigating by fostering sense of control and access to privacy, social support, physical movement and exercise, access to nature and positive distractions.

1-5 What theories explain the healing garden?

Healing gardens have been set up upon supported theories and according to their purpose, target users and settings may vary from type to type. Stigdottir and Grahn (2002) in the article "What makes a garden a healing garden?" categorized and sorted the theories on healing effects in gardens from different research areas into three different schools including; The healing garden School, The Horticultural Therapy School and The Cognitive School.

Healing garden school

As stated by Stigdottir and Grahn (2002) three theories explain "the Healing Garden School". In accordance with The Healing Garden School, the garden's health effects are the experiences of the person in different parts of the garden which can be related to the design of the garden or its contents. Three theories which explain this school will be mentioned below:

The first theory that relates to the Healing Garden School describes that human beings react to natural areas biologically. They can trust their surroundings in natural environments unconsciously while in a city with an unnatural setting the mind should be cautious and not relaxed. "…open, light, savannah-like nature areas have been found to give the quickest restoration reaction after stress, since they resemble man" (Stigsdotter & Grahn 2002 p.62).

The second theory of the Healing Garden School is explained by the Attention Restoration Theory (Kaplan & Kaplan, 1989; Kaplan, 1995), is based on that human has two different types of attentions, directed and spontaneous attention. Directed attention is using part of the brain with higher cognitive functions. It has limited capacity and may become tired in a

short time. We use directed attention in daily life while we focus on something, for instance driving or studying (Stigsdotter & Grahn 2002). It is voluntary, needs concentration and control of distraction through inhibitory mechanisms. It may lead to mental fatigue and increase performance errors (Felsten 2009). The other type of attention is called spontaneous attention or fascination, which has unlimited capacity. It is involuntary and effortless and can be evoked by natural settings.

According to the Attention Restoration Theory, intentional fatigue is one of the results of stress. There are several studies which have examined the relationship between the natural environment and restoration. "Any prolonged mental effort leads to directed attention fatigue" (Kaplan 1995 p.170). Soft fascination which is one of characteristics of natural settings gives opportunity for recovery from directed attention fatigue. Restorative environments are those that provide opportunities for restoring fatigue of directed attention.

Fascination is necessary for recovery but it is not sufficient. The setting should have other characters to complete the process of restoration. Being away, the idea of being away is to be in a new environment, not just physically but also it can be conceptual transformation. The environment should be extent. "It must provide enough to see, experience and think"(Kaplan 1995 p.173). The last character is, it should be compatible. The setting must afford what one needs from it.
The third theory of the Healing Garden School claims that the health effects are related also to how much the garden or nature makes demands according to the human's ability. Research on people's function in green areas shows that experiences of nature influence human differently and this depends on their life situation. This is explained by the pyramid that was modified by Grahn (1991). It shows that, people can be affected by experiencing nature differently and it depends on mental power of each individual (Stigsdotter & Grahn 2002).

The pyramid is a model to present the relationship between physical and social environment and human's functions. "People have different preferences with regards to the environment, depending on the status of their executive function at that time" at the bottom of pyramid, is "directed inward involvement" where one needs to be alone by himself. The mental power is low and the activities tend to be private, like taking a walk. By increasing the level of mental energy the person may prefer to be more active. The second level is "emotional participation" by having visual contact with other people. The next stage upward is the "active participation" level where one tends to be active in a group and do different things with the other people of the group. They would like to share and be creative. On the top of the pyramid is "outgoing involvement" level, where is the mental energy is very strong. In this level one can be leader of the group. They are strong enough to do things even without the support from outside (Ottosson, 2001). If the mental power is low, the person might need more privacy with less demanding environment. The level of involvement gets much when the mental power capacity becomes larger (Stigsdotter & Grahn 2002).
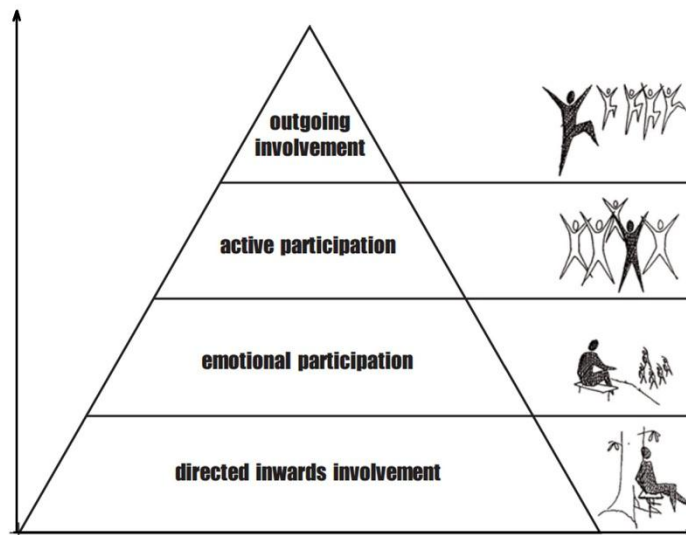
Figure 3. *Different stages of involvement according to individual's mental power (Stigsdotter & Grahn 2002).*

The Horticultural Therapy School

The second school is ''The Horticultural Therapy School'' that is based on the idea of the activities in the garden which are meaningful and enjoyable. They have positive effects on human's health as gardening provokes both physical and mental exercises. (Stigsdotter & Grahn 2002)

Horticultural therapy is a combination of two disciplines merging complementarily, horticulture which is supported by therapy and rehabilitation (Simon & Strause 1998). Haller et al. (2006) define it as "…horticultural therapy is a professionally conducted client-centered treatment modality that utilizes horticulture activities or rehabilitative goals of its participants. The focus is to maximize social, cognitive physical and/or psychological functioning and /or to enhance general health and wellness"(Haller et al. 2006 p.5). Clients, goal, plants and therapist are four important factors in such therapy which makes it distinguishable from other types of garden interactions. Goals are objectives which are defined for client and therapeutic team. The therapist is the professional who leads clients in order to achieve defined goals. Plants and plant-related engagements are the tools which provide activities and treatment opportunities to the clients. Depending on horticultural programs, the users may differ. According to Haller et al. (2006) horticultural programs can be categorized into three kinds including vocational, therapy and social program. Vocational program seeks how to improve job skills and employment. Therapeutic program deals with recovery from mental or physical illnesses. Social programs focus on improvement of general health and quality of participant's life (Haller et al. 2006).

"The Cognitive school" is the unification of the other two schools; the Horticultural Therapy School and the Healing Garden School. It is combined the effects of experiences from garden and the activities in the garden. It has both role of being passive and active in garden. (Stigsdotter & Grahn 2002).

It is a delicate interaction between real environment, the observed and perceived one that is undoubtedly important in the design of therapeutic places. The understandings of these interplays as well as the symbolic meaning of objects are necessary for designers in order to obtain healing benefits from the designed environment.

To create a therapeutic place a combination of two objects are required; creating the place and facilitating healing process. According to Marcus Cooper and Barens "understanding how people see their environment and how they react to it is the most critical component of therapeutic design"(Cooper Marcus & Barnes 1999 p.88). First level is what the individual observes and second is how it is interpreted.

Lewis (1996) in his book "Green Nature/Human Nature" explains that in human-plant relationship, plants in three dimensional environments can affect humans when they are transformed to a mental record of experience while encountering them. The experience subconsciously is associated with the objects. By seeing them again, images of the objects will poke on human's mind mentally to stored samples of thoughts and feelings which determine how we interpret the object (Lewis 1996 p.6).

1-6 What are design principles of a healing garden?

Before starting the design process it is important to know the user groups. In designing a healing garden the focus should be on the people who are going to use the garden, on the other hand the theories should be considered as a guide. Depending on user groups there should be a balance between the physical activities and just being and experiencing the garden passively (Stigsdotter & Grahn 2002). It is important to know who are the group of people is going to use the garden. Who are they? What do they do? (Stigsdotter & Grahn 2003)

Feeling of security

Since, not all gardens have healing effects (Stigsdotter & Grahn 2002), they should have special characteristics in order to be called a healing garden. Healing gardens should provide a feeling of security and safety. By being fenced off and safe, they could offer psychological peace and space for relaxation (Tenngart 2011). Garden, by showing life with lively components such as trees, flowers, bushes may give the feeling of security and hope to the visitors (Stigsdotter & Grahn 2002). The architecture of the building should give a feeling of security, since user groups are in a more vulnerable situation, they tend to perceive depressive or threatening message from their surroundings. In order to promote the healing

process in healing environments the surroundings must be unambiguously positive, this means that process of healing should be supported by the place (Cooper Marcus & Barnes 1999). Using art as sculpture or shape of garden or façade of the buildings should be considered as risk of making ambiguous or abstract design might increase (Cooper Marcus & Barnes 1999). Environmental qualities that help for recovery and mitigating stress can be included as predominance of hard-scape or built material, may increase or decrease insecurity and unsafely, crowding, ambiguous design feature and urban noise (Cooper Marcus & Barnes 1999).

Attachment to the garden is another important aspect in terms of healing gardens. "A garden is a pre-selected habitat pure refuge, laden with biological symbolic of safety. They provide a sense of rootedness and connectedness to the surroundings"(Tenngart 2011 p.65).

Understanding user groups and their needs

Healing gardens should be restorative and helpful to participants for improving their well-being. In designing healing gardens it is extremely decisive to understand the user groups and intention of the garden. The next step is what the garden can offer to that specific user group (Stigsdotter & Grahn 2003). According to Cooper Marcus and Barnes understanding how people see their surroundings and how they react to it, is one of the most crucial factors of therapeutic design, in another word what individuals observe and how they interpret it (Cooper Marcus & Barnes 1999 p.88)."Sound, sight and smell in the environment are external stimuli that are directly identified by the conscious mind"(Cooper Marcus & Barnes 1999 p.88).

Offering different types of activities

In healing gardens, paying attention to the need of different types of communication is crucial. One type can relates to demanding environment. For instance ponds or water can be the least demanding part or cultivation in garden can be considered as the most demanding. And between these, there are different parts according to the mental capacity of the visitor; one of them suits her/him (Stigsdotter & Grahn 2002). According to Ottsson the experiences from the nature depends on ones' life situation. So the garden should offer different degrees of demand for the participants (Ottosson, 2001).

Different rooms

It is important that the garden has different rooms with different characters. Research shows that gardens or parks should have some specific characters in order to be visited by the users. "Healing garden must be able to communicate with the visitors on many levels through sight, smell, hearing etc." (Stigsdotter & Grahn 2003). Senses stimulation is one of the important factors in both the healing Garden School and the Instorative or Cognitive School. Designers should offer different thing to awaken participant's senses. They can be varied as listening to running water, touching stones, tasting berries or smelling flowers (Stigsdotter & Grahn 2003).

Basic characteristics for rest and activity

It is believed that there are some basic features in our environment which give quality to it and this quality affects the environment which makes it more attractive or unattractive.

These are eight characteristics, which have been claimed by Patrik Grahn in 1991, that are connected to the idea of how environment can have a restorative effect on visitors (Stigsdotter 2005 p.17).

1) Serene: The place is characterized by peace and silence. There is no rubbish, weeds or disturbing people. Sounds derived from wind, water, birds or insects.
2) Wild: The place is fascinated by wild nature. Plants seems to be self-sown, rocks are lichened and mossed.
3) Rich in species: In this environment, you can experience a variety of different species, both plants and animals.
4) Space: There is a feeling of entering to another world, which is associated with a whole, like a beech forest.
5) The common: It is an open green field that invites you to stay and provides vistas and views.
6) The pleasure garden: The place is a refuge, which is enclosed, safe and secluded. There are opportunities to be with yourself and experience or play as well.
7) Festive: It is a meeting place for social activities and festivity.
8) Culture: A historical place which offers fascination with course of time.

Privacy and social interaction

Exercise reduces stress plus physical exercise improves psychological well-being. It also reduces depression (Cooper Marcus & Barnes 1999). There should be a balance between the gardening activities and just being passive by experiencing the garden (Stigsdotter & Grahn 2003). Research shows that people who are supported socially are usually less stressed and they have better health status than people who are more socially isolated. Researches also show that patients and staffs prefers natural, spatially enclosed settings for active socializing but on the contrary they prefer natural, spatially open settings for more passive activities such as sitting and viewing scenery or watching the other people. Settings with vegetation are more preferred over built environment for different types of activities (Cooper Marcus & Barnes 1999). Designers should be aware of the balance between the social aspect and privacy.

Surrounding and views

The geographical context of the garden has influence on the garden and the experience of the garden. It is important to know what surrounds the garden. The history of the place is also important to know, because it shows how the place transformed to the present appurtenance (Stigsdotter & Grahn 2003).

1-7 Alnarp Rehabilitation Garden

The First healing garden in Scandinavia specially designed for stress-related-diseases

Alnarp Rehabilitation Garden has been laid out at the Swedish University of Agricultural Sciences in 2002. The garden was purposed to be a healing garden. The concept of the garden is supported by different theories related to the Healing Garden School, the Horticultural Therapy School and Cognitive School. The healing garden at Alnarp was meant to serve several purposes. It will offer horticultural therapy programs for people who are diagnosed as burnout diseases. An interdisciplinary research program and studies on how the garden functions for these people will be provided. Scientists are allowed to test design hypothesis as well as different types of horticultural therapeutic programs. At the end it can be study object for students.

The treatment team consists of two horticultural therapists, one landscape architect, one occupational therapist and one physiotherapist and one anthroposophic medical pedagogue. Two days a week one physiotherapist and one psychotherapist are also available there. Every patient has a doctor responsible for them. The participants must suffer from a type of disease which has been diagnosed as fatigue-depression-related, STFR (stress-triggered fatigue reaction), burnout syndrome and/or pain in the back or in the head (Stigsdotter & Grahn 2003, Grahn 2010, Tenngart 2011).

In Alnarp, there are three objectives have led to the design different rooms. These objectives are based on research and demands of the participants. First objective is more demanding and the focus is on cultivation and horticultural therapy. The second one is less demanding and concentrates on nature and restorative functions. The last is the rooms introduced by Instorative/Cognitive School. There are some parts that work as transitory between demanding and non-demanding rooms (Stigsdotter & Grahn 2003, Grahn 2010, Tenngart 2011).

2-Objective:

My objective is to investigate what design principles are important for designing a healing garden for patients with stress-related mental diseases with the case of Torup healing garden. What I mean from "design principles" of a healing garden is to find out a fundamental scientific theorem or law when a plan of a healing garden is being drawn and built according to its function and looks.

3-Methods:

To get the answer to my objective I needed to go through literature to understand how previous studies have defined design principles of healing gardens. I searched for literature related to the subject in different ways. I used internet and search engines with key words such as healing gardens, stress-related diseases, nature-based therapy and etc. I also looked

for some authors who I knew about and asked my supervisor to get more information about previous studies as much as it was possible.

In order to examine the objective a case study was chosen. In case study Torup health garden, in consideration of understanding the designers' ideas of principles, qualitative techniques were suitable which allows the researcher to share the understanding and perception of others. They are useful to explore people's ideas (Berg 2004). Qualitative research refers to the meaning, definition, explanation, description, ideas of thing." It refers to what, how, when and where of a thing"(Berg 2004 p.2).

In research methodology I tried to use triangulation method to assume a richer and complete result. Case study, reviewing literature, interviews, maps and photos were my tools throughout the process. The first step was to start with studying previous researches in order to strengthen conceptual linkage between what has been found before and what I will find.

3-1 Case study: Torup "The Healing Garden"

The reason this case was selected for further study is, that Torup healing garden has a unique characteristic. First it is not research based as Alnarp rehabilitation garden, but its design principles are coming from research that has been done and approved in Alnarp garden. Second, since it was created after Alnarp rehabilitation garden, from all research and experiences gained in Alnarp, I assume that it should be a better version and more complete than Alnarp. The third reason was, the designers were available so the opportunity to have in-depth discussion was applicable.

The City of Malmö [Malmö stad], with funding from the EU Social Fund, is building a health garden in Malmö. This proposal is a basis for how the garden can be designed. A health garden is fully in line with the promotion of environmental, social and economic sustainability that the city of Malmö is undertaking for the future, and the venture is built upon a well-documented and existing strong interest in nature and gardening, among employees and the general public. The Health garden also demonstrates a new, more sustainable way to take care of your employees and, by extension, other residents of the city (halsotradgarden-torup,2012).

The purpose of the health garden is to work in a preventive way with employees in City of Malmö who are at risk of becoming ill from stress. The aim is an improved quality of life and increased work capacity. The health garden will be continually developed with long term partners in the region, so that it can gradually be adapted to the needs of other societal groups.

Work in the health garden is based on theories derived from garden therapy, occupational therapy, physical therapy and psychotherapy. In addition to direct stress reduction it also provides increased knowledge and techniques for the individual to manage her or his life situation and stress in the future, and it is adapted to the needs of each individual (ibid).

Figure 4: Sketch for Torup garden, drawn by Frederik Tauchnitz

The Malmö health garden is located on the outskirts of the Torup recreational area, about 10 kilometers east of Malmö. Torup, or The beech wood [Bokskogen], as the area is popularly known, is part of the largest contiguous forest area in the vicinity of Malmö's and has long been one of the favorite recreational areas for Malmö residents. The area has an estimated 500,000 visitors a year, half of them from Malmö. The health garden will be close to Malmö, but still physically and especially mentally, in a completely different world (ibid).

Health Garden vision is that no employees in Malmö should suffer from stress. Its aim is to prevent stress-related illness among employees in the city of Malmö. Courses and Seminars Operations in The Torup Health garden is based on finding methods to detect prevent and manage stress-related illness and staying in a green healthy environment. Managers and leaders in the city of Malmö have the opportunity to strengthen health leadership through training in stress management. Employees have the opportunity to increase their understanding of stress effects on body and soul. Courses are restricted to individuals who work but at the same time they are at risk of being sick. The team of treatment includes one landscape architect, occupational therapist, therapist, gardener and wellness coach (Friskvårdscoach) (ibid).

Examples of course content, lectures, garden activities, creative exercises, crafts, light physical activity, relaxation techniques, etc. In the garden vegetables, fruits, herbs and flowers are being grown and opportunities to get acquainted with animals such as dogs and

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occasionally hired Ardennes Horse are available. In addition, there are other visitors, which can be field trips or student at evening classes and the like that may be arranged on site. Today the easiest way to get to Torup is by car. At the main road to the west there is a bus stop where the Torup bus [Torupsbussen] and the Nature bus. [Naturbussen] stops during parts of the year. The closest regular bus stop is located at Bara, a few kilometers away. There is also a bicycle path from Malmö out to Torup (ibid).

3-2 Data collection

Data collection has been done through interviews from the experts who are involved in the design process, since interviewing can be used as an intentional conversation to gather specific information (Berg 2004). In consideration of covering all necessary topics semi-structured interview was selected which is scheduled activity with open ended discussion (Bernard 2006 p.212). The interview was chosen to gain direct answers from the respondents and follow up my questions. It was semi-structural interview with open question and answer to give them the maximum opportunity to tell their own ideas (Smith 2007). Before the interviews observation of the site was done to get to know the place and get the picture of the garden for a better discussion during interviews. I asked for the sketch of the garden from one of designers to compare it with actual garden to understand if there is some changes or not, then I could ask from the staffs for the reasons.

The invitation for four interviews was done through e-mails and phone calls. The two of the informants were designers of the garden Frederik Tauchnitz who was involved in designing of Alnarp rehabilitation garden and Carina Tenngart. She finished her doctoral thesis on exploring the design of Alnarp rehabilitation Garden. The manager of the garden Sara Lundström who is landscape architect and she had close cooperation in Alnarp Rehabilitation garden was the third interviewee. The last one was the gardener of Turop garden Lina von Friesen. It was intentional to choose them for interviews, since as experts they were the only people who can answer the question regards to design principles and their concepts regards to design of Torup healing garden. I also interviewed the manager who is landscape architect and the gardener to know their opinion about design of the garden not just as an expert but also as a user. The interviews had been done at informants' offices and all of them were done in March 2012.

The questions were divided into different themes which are about design principles in general; Alnarp experiences what were the concepts of design and relationship between landscape and architecture to cover all necessary information to get a clear answer. Interviews lasted approximately one hour. Only the first one was around one and half hours, which was not really constructive after the first hour. All the four interviews were recorded by voice recorder not to miss important nuances (Smith 2007); also during the interviews some important notes were taken. After finishing them, the transcriptions were prepared.

I used maps and plan of the garden while visiting the garden and during interviews as well to have an image for both myself and interviewees and second to avoid misunderstanding while talking about different parts of garden.

3-3 Analysis of the Transcriptions

For analyzing the transcriptions, since the answers of the questions were not really clear, I had to use special strategy to interpret it. Interpretive phenomenological analysis method (IPA) was a useful one to give me a broader view as its intention is to investigate how participants create their own personal and social life. It tries to explore individual personal perception of an object or event, which in my case was a bout the interviewees' ideas of design principles (Smith 2008).

Smith (2008) assets that the means of IPA is that the analyst in interested in understanding about the respondent's beliefs. The transcriptions were read several times, with left-margin for annotating what is interesting or important, summarizing or paraphrasing. The second step was to transform the phrases to different themes. I went through the transcriptions again to not to miss any important information.

The next step was to make a cluster with emerged themes. At the same time it had to be checked with original text to compile directions of interviewees' phrases. After that a table of the themes was prepared which shows each of participant's significant ideas with different themes. I got second opinion from my supervisor. At the end a flow chart was made to connect the themes and conclude the whole interviews together into a cluster with a more general view.

4-Results

In this section, the result of the project will be presented which are first the result from literature reviews and then the outcome from what I found through interviews. These are what I could get and it might not be everything regards to design principles.

Reviewing literature indicates that design principles of healing garden include:

1- Understanding user groups and their needs
2- It should provide feeling of security and safety
3- Offering different types of activities according to individual's mental power which also explains the necessity of preparing different spaces or rooms for privacy and social interactions
4- Offering diversity of rooms to fulfill eight characteristics
5- History and geographical context can affect the experience from the garden

The main result which I gained through interviews from experts is shown in a chart. To make it more understandable I clustered all found themes regards to design principles in a chart (figure 1) which is a summary of what I found through my interviews. The main result is divided into two parts. "What to know" before starting the design process of healing garden (see figure 1, on the left side) and "the important factors" which should be taken into account during the time (see figure1 on the right side). The finding contains principles which I was searching for at the beginning. It also presents important factors regards to the design of healing gardens for stress-related-diseases.
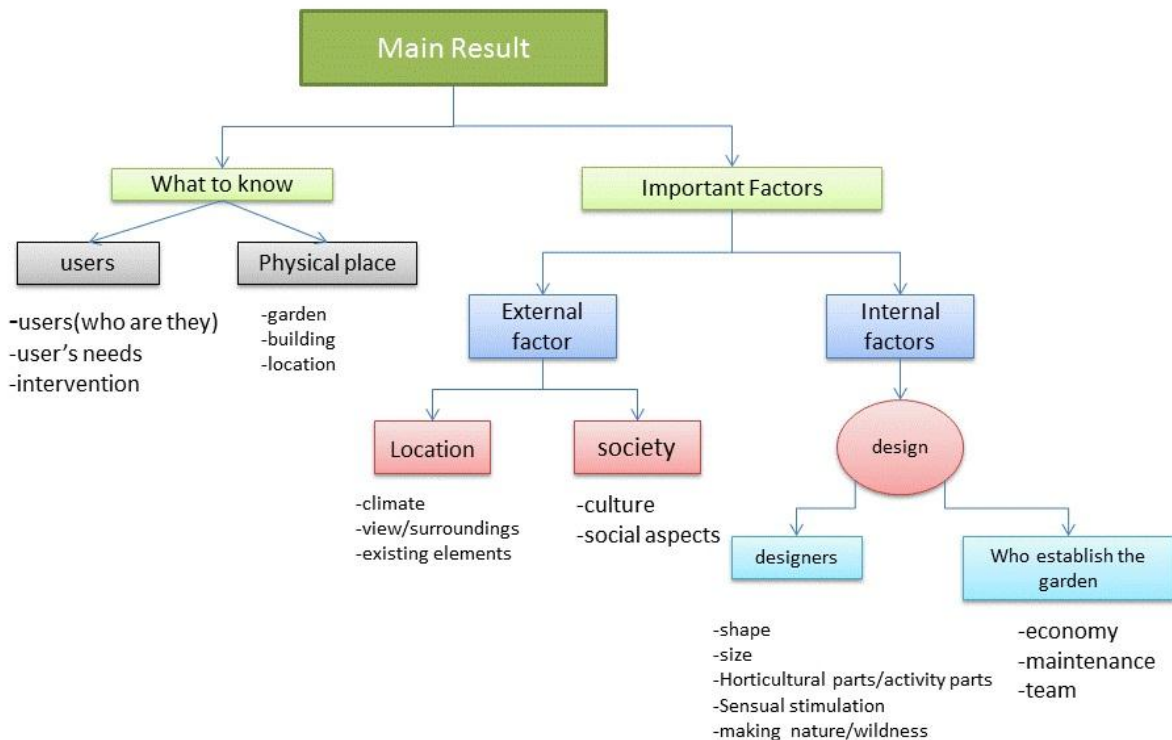
Figure 4: it depicts and summarizes the result, which is mainly divided into two parts. First what to know before starting project of design a healing garden and second important aspects during the process.

4-1 What to know (see figure 1, on the left side)

There are two main necessary aspects which should be considered before starting the process. First, is to know the users and second the physical place.

Users

Like all kinds of designed products it is necessary to know about the user groups, who are going to use it. Who are they? In order to know what their needs are we should know what are their problems and according to the needs, what kind of intervention is needed. Intervention may lead the design to fulfill the needs of participants. Intervention and design should support each other. Intervention should be design after types of clients has become clear. Carina Tenngart (March 2012) describes it as there is a pendulum between users and design. As designers, the balance between functions which relate to users and aesthetics of the garden that comes from design should be considered as one of main factor during design process.

Physical place

There is some fundamental information relates to physical place of garden should be known at the starting point. It is important to analyze the site. Where is it located? How is the climate? Where are sunny spots for both growing and user's activities? What are the components of the site? Are existing components valuable or not? Direction of the local wind and its power should be examined, if wind shields are needed, and what are the best ways to reduce wind's power.

Is there already a garden constructed there? Is there any building in it? How is the connection between building(s) and its surroundings? In other words, to get all basic information about the site is needed.

4-2 Important aspects (see figure 1, on the right side)

There are two kinds of factors, external which are those forces coming from outside and internal which are related to each individual design.

External factors

Location is one of the aspects in site analysis; it is also influenced by climate, surroundings and existing elements. Climate plays an important role in creating comfortable outdoor place in the garden. Knowing about the climate of the area makes it easier to create shelters which are safe from strong winds, sun or humidity.

Views and surroundings are important because they may give more or less value to the garden. There is a huge difference between natural surroundings with various types of landscape and urban area surrounded by walls with city noise.

Existing elements have the same value as surroundings. For example the values may be different, a beautiful garden with old trees and bushes and an empty plot. Also it is important how to use these elements according to garden's intervention.

Society, by introducing culture and social aspects is the second part of external factor. It is significant to know in what society the garden is being designed, what the values within gardening in the culture are. What are the expectations of users from a garden and to be simplified, what are the definitions of a garden in the culture of the society. How much do they know about relationship between health and nature or being healed by being in natural place and gardening?

Internal factors

Design of a garden is not just affected by desire its designers but also by establishers who organize it. No matter who is the designer, it is important to consider some fundamental issues which are going to be mentioned below (see also figure 1 internal factor part).

The garden should be shaped functionally and aesthetically in order to attract and fulfill participants' needs. Designers should think about the size of garden, to create enough space according to intervention and amount of participants. They should also consider that it shouldn't be too big to be difficult to be maintained. There should be a balance between activity parts and just being passive to get the most advantage from it. Another aspect is using sensual stimulation which is one of the most crucial parameters in a natural setting to awaken one's senses and connect him/her to his/her environment, to practice mindfulness. Because of this it is significant to bring nature and wildness to the garden.

Establishers (who establish the garden) should be considered as one of essential factors, who are taking care of the garden, and also how construction of the garden is being financed. The maintenance is another decisive aspect for the garden; it can affect the size of it or types of plants which need more or less maintenance. Last but not least is the professional team who works in the garden. There should be an interaction between designers and the treatment group in order to understand how to imply the need and proper intervention into actual place in the garden.

5-Discussion

The relationship between human and his environment was always my favorite topic and that was one of the reasons I started my study at SLU, Alnarp. Searching in environmental psychology has led me to the topic; interaction between man and nature and why we need to be connected to nature. On the other hand depending on in what kind of environment we are, we might be affected positively or negatively. This field of environmental psychology which deals with nature and mental/physical health guided me to start reading more about healing gardens and its functions to its participants. After visiting Alnarp rehabilitation garden the idea of what are the design principles of this type of garden came to my mind.

I wanted to get a more general understanding about how the design of a garden can improve one's health status. What are the main principles that we shouldn't ignore. How much our responsibility as designers is serious and important in order to improve health status of people who especially suffer from mental disorders. I also was curious to know what the relationship between architecture (built environments) and landscape (garden) is. How much cooperation between architect and landscape architect could be significant? All these questions have led me to choose this topic as my thesis.

Comparison between two results from literature review and interviews shows that I found that the points from literature were not only approved but also some new aspects have been found.

The main result from interviews shows that there are two main themes which should be considered as design principles of a healing garden. First is "what is important to know" before starting the process of design, second is some significant aspects which should be taken into account during the process.

What is important to know?

First we need to know about the user groups. They are the first intention of designing a healing garden. Stigsdotter and Grahn (2003) emphasize users and count it as one of the first important aspects of a healing garden. Also Cooper Marcus and Barne(1999) believe that understanding how people observe the environment and how it is interpreted is fundamental for design a healing garden. Through understanding who they are and study what problems they have their needs will be clear. What they need in the garden in order to feel better and finally after finishing their rehabilitation treatment get well. User groups' needs can be fulfilled by appropriate intervention designed by professional team of rehabilitation. The intervention should be implied in garden through landscape designer. Here I would like to emphasize that; there should be a constructive communication between designers and rehabilitation team in order to get the most advantage from the garden. If this stage is ignored or not paid attention to, it may cause more trouble for users. For instance, if participants are sensitive to strong colors and designers don't have enough information about it and bring colors to the garden, it may be disturbing for those sensitive participants. On the contrary, if the users need some kind of colors to lift up their energy; designers should know about it so they can provide some spots in the garden with colorful flowers. Lina von Friesen mentioned during interview that garden should provide different tools to how to deal with their problems (March 2012). I believe the user may not know about their problems and even they know that they might not be clear with the specific needs. Needs of users groups might direct designers to a clear layout for design. It is important to plan diversity of activities and also different places with similar characters, so it would be easy for participants to do the same activity as the same time without disturbing other's privacy.

Second, is related to physical place of the garden and analysis of the site. Physical place has some different aspects. Analysis of the communication is one of them. It is important to provide easy transportation for everybody who commutes there and not just people who have cars but also it should be convenient with public transportation.

Healing gardens are combination of gardens with some structures where some of the activities may take place. If there is existing building(s) in the site, during analysis of the site the relationship between architecture and landscape should be examined. I believe that architecture and garden should complete each other; they should have the same language. I mean with the same language is that, there should be a harmony between garden and building. Cooper Marcus and Barne (1999) confirm this idea that healing process should be supported by the place such as, shape of garden, façade of the buildings and so on. They concern that even hard-scape or built material has influence on feelings of security and safety.

It is necessary to have some information about the geographical location of the garden; where the garden is located or being constructed. Geographical location of the garden is important in many ways. Firstly, it is affected by climate which is really significant for both natural and built environment. Climate plays important role in outdoor and indoor activities. The effects of climate on types of vegetation make it necessary to get information about climate and different kinds of plants in order to use them in the right place.

Wind, sunshine and soil also depend on the climate and location of the garden which are important in order to make a comfortable and cozy place in the garden. We should consider

the amount and direction of wind and temperature especially in windy areas wind protection helps to reduce the strength of the wind. On the other hand it is important not just to prolong the season winter but also show seasonal changing. Carina Tenngart and Frederik Tauchnitz (March 2012) agree on this aspect especially in areas with harsh and long winter. As she mentioned that "seasonal effects are part of the nature"(March 2012). For instance, in Torup the winter garden (the glass house) is a wonderful place to sit and watch changes in landscape but still be inside.

It is so much different if the garden is located in the city or in a rural area outside a city. By taking gardens to natural environments with natural sounds, the idea of being away is fulfilled (Kaplan 1980). A garden can be a simple place as a contrast to the complexity of society.

Views and surroundings are significant elements in the garden as it is so much different if the garden is located inside the city or natural environment in the rural area. Views and surroundings are important because they offer things to look at through different seasons. They bring sounds of nature to the garden which is one of the factors a healing garden is looking for rather than disturbing urban noise. Since we want to have diversity of place and activities, surroundings may play a great role to encourage participants to do different things from sitting, resting and looking at landscape to taking a walk or listening to the sound of nature. For instance what Frederik Tauchnitz (March 2012) mentioned about Torup garden that diversity of activities may apply through greenhouse which connects indoors and outdoors and provide the views to watch the surroundings during cold days. He continues that pergola is semitransparent place for warm days in summer and pavilion on the top of the hill in the garden afford beautiful vistas for all days since it is assumed as a golden spot. The duty of the designer is to choose the best spots for different activities such as sitting, walking, strolling to encourage participants to be outside in nature more. Surroundings can be used both physically and visually.

It is also stated by Stigsdotter and Grahn (2003) that the importance of geographical context of the history of the place is considerably significant to know since it shows how the place transformed to the present appurtenance. They believe history explains why the place has its present appearance. Also Lina von Friesen (March 2012) comments that history of Torup shows that the area was for relaxing traditionally. This shows that knowing about the history of the place may help to increase sense of relaxing and security.

There are some noteworthy aspects related to society which might be parts of the design principles of a healing garden. First it is necessary to know the society in accordance with interaction between individual and nature. By understanding this interaction it would be easier for designers to create appropriate spaces for interplay in order to get a better result. Second, is society's expectation from a garden, which makes it different from one culture to another. What participants expect to see and do in the garden make it clear to how to form the garden. They display the culture of the society (Messer Diehl 2009). For instance Persian gardens show interaction between nature and human and his effort to make a garden in the middle of desert (Brooks 1987). I think this explains that meaning of garden might be different among different culture and identity of a culture can be seen in their design of gardens.

There is another factor which should be considered as design principles during design process are the design itself. What I mean as design is the functional and practical parts which is drawn by landscape architect. I called it internal factor which depends on designers and establishers as well. How to shape the garden is up to designers' decision, but still there are some aspects that they should think about. It is important how to arrange the setting of a garden, how to divide the garden between horticultural activities and being inactive or passive. Since the basic idea of healing gardens is to have a combination of both activity and passivity there should be balance between these two aspects depending on type of participants, how much they are eager to be active or vice versa. For instance if they are more energetic to do gardening the kitchen garden can be bigger than for the garden with less active participants. Again we can see how much it is important to know the user groups and their needs.

Arranging different functions is another thing that should be thought of, where to put the entrance and how to introduce the first image of the garden to participants. It is important because the first image is crucial to attract the patient to feel secure and safe or not. The importance of this image again depends on user groups and their strength of mind which is explained by Ottsson and Grahn (1998). For instance if participants' mental power is weak, their physical activities limit to be more private, so showing cultivation area as first picture of garden might be too demanding for them. The place of growing which can be counted as demanding activity, is not just affected by user groups, it needs to be close to water, sheds and buildings. Also it should be in a spot where the soil is good and there is enough sun light. I think this shows the importance of analysis of the site, visiting the site before starting the process. Eight characteristics (Stigsdotter 2005 p.17) which were also emphasized by Frederik Tauchnitz and Carina Tenngart (March 2012) as one of the main concepts of the design in Torup garden, provide different rooms for different activities. They can fulfill the feeling for both privacy and social interactions which are supported by the shape of the room and types of plants and vegetation.

One of the roles of the garden is to awaken all senses and help to practice mindfulness, which is as important as horticultural activities to feel better. This might be gained through variety of materials in the garden. The sense of sight among other senses has great benefits, since providing views and sceneries is one of main concepts of creating a healing garden. Sense of taste and touch can be tricky to be awakened, while sense of hearing is easy to be provided, as having natural environment in the garden leads to bring nature sounds such as birds tweeting or insects sound. Touching stones which get warm in sun light, walking on different paths with soft or hard surface, touching hairy leaves or the hard surface of a trunk of an old tree, all can make ones aware of their surroundings and connect him to his environment.

Size of the garden which relates to the number of people is one of the difficult issues in terms of design of a healing garden. On one hand there should be enough space for different parts with different functions, since we need plenty of the same kind of place if some participants want to use the place at the same time. On the other hand it should be in manageable size with enough personnel for maintenance-related issues. It is complicated to determine the dimensions which would be called suitable in different cases.

The last part of Internal Factors relates to "who establishes the garden". I found it very important that it can affect the garden and its functions even more that other factors.

Economy is one of the most crucial aspects, which should be taken into account, since its role can be counted as fuel for the engine to start. It doesn't matter how beautiful or functional the design is, without enough functional support the garden cannot be successful as it is expected.

Economy also could influence the maintenance. If the money that the garden and its expenses live on is not enough, it may cause lack of maintenance for some parts of the garden. In this situation the design itself cannot help to work properly. Here I would like to declare that designers, by choosing types of plants and vegetation which needs less maintenance can be effective in case of saving money. Again having information about local climate and plants seem to be efficient.

Last but not least is the team of rehabilitation. Depends on who are the users, specific specialists are needed. If they are chosen before the process of design starts, it would be prefect to have constructive discussions between designers and rehabilitation team in order to fully understand the needs of participants which I claimed many times as one of the most important factors.

6-Conclusion

I consider what I got as result in this thesis is mostly a reflection of Swedish model to design a healing garden, since Torup healing gardens is located in Sweden and its designers' concepts come from Swedish society. But if I want to think globally as an international student who is from a place which is different in culture and geographical location, in my opinion the category of design principles of healing garden can be divided into four major cores which are **geographical context, society, economy and design.** Before I start I would like to emphasis that design principles can be applied for any garden or natural settings, but what is important here regarding healing gardens is that the users or participants are kind of patients who are suffering from some type of temporary mental and/or physical disabilities which the former may cause the latter. That's the reason I chose them as design principles of a healing garden as what we expect from a healing garden is to feel healthy after a specific time. As I mentioned before Marcus Cooper and Barnes (1999) believe that the environment should be helpful for the process of healing.

Geographical context is the main core, and subdivisions as society, economy and design are related to geographical context directly it should come first. When we talk about the location the other aspects will come after. Depending on location of the garden, they can be prioritized, since in different contexts they don't have the same value. What I mean is that if the garden is located in Iran, Egypt or Sweden the priority would be absolutely different. For instance, in Iran the priority might be maintenance, therefore economy will be the first and society and design are coming next. Priority of design principles of a garden in Egypt might be first economy, second design and then society which can be totally different from a garden located in Sweden. I think in Sweden, society plays stronger role since Sweden is known as culturally heterogeneous.

Society, as it was stated before is one of the major cores of design principles of a healing garden as gardens are parts of the culture of the society. There are some important questions about society and its relation to garden which I think should be answered through the process of design. I divide these questions into three main parts.

-Part one

-what is the definition of a garden in the society?

-how should a garden be shaped?

-what are the landscape preferences in the society?

-how does gardens have influence on society's identity and attachment to place?

All these questions are related to this idea that how culture have influence on gardens. For instance by looking at Persian gardens, it would be understood that geometry and symmetry are dominant concept. This caused the garden to be shaped geometrically and symmetrically for Persians. Culture also affected landscape preferences since as it was mentioned before some scientists believe that preferences for landscape have been influenced culturally (Tveit et al. 2006).

In order to make Persians feel at home and attached to the place concerning to the shape and mental definition of garden seems necessary. This will be even more significant if the person experience the garden in multicultural society such as Malmö which its residents are diversity of different nationalities with different languages and cultural aspects. I think as much as we consider the affection of garden on identity of the society, the design would be more productive and proper.

-Part tow

-What are social aspects and social relationship between participants and participants with nature?

What I mean about social aspects regards to be in garden and gardening is, how the culture supports the idea of being passive and active in the garden. What other activities may take place beside horticultural activities? There is an example in the case study of Latino community gardens in New York (Saldivar-Tanaka and Krasny 2004) that gardens are being seen as cultural and social centers. Although it is talked about community gardens but I suppose the concepts of garden in both healing garden and community gardens are the same. Latino gardens also provide not just daily socializing but also a place for special events and celebrations. For instance one of the main elements in those gardens from Puerto Rico was a small house called *Casita* which reflect part of culture of Puerto Rico. I brought up this example to show that practicing social aspects can be part of the program and help to have a richer intervention and design. If we know what activities are being done in the garden traditionally, it would provide better opportunities for participants to exercise their costumes. In addition, there is a great chance for users to learn from each other through social activities.

-Part three

-What causes the stress which leads to stress-related diseases?

I presume that the reasons which cause the stress and afterwards stress-related diseases are different from one country to another or in other words from one culture to another. For example the situation in a country which is unstable economically and politically is absolutely different from a developed and industrialized one where reasons to be stressed might be being over-loaded from information, technology or difficult tasks in their jobs. If I want to compare a person from Iran and another one from Sweden in the context of Torup healing garden, generally being in nature could help both of them, but I assume to dig out the problems throughout rehabilitation program by consideration of their reasons to feel stressed, they might need divers tools.

Design is the last major core of design principles, although it might be different from one project to another, there are some common aspects that should be considered. I believe there should be two kinds of communications through the process of design. First, between designers and team of rehabilitation and second, between landscape architecture and architecture or in other words, landscape architects and architects.

Communication between designers of the garden and team of rehabilitation seems significantly important to me since both teams are responsible for the garden and its users. The idea of the healing garden is to have an intervention, a program which is planned for specific user groups. This intervention should be applied through design. So garden and intervention should work together, as a healing garden is not an ordinary garden and there is an intention of being healed through programmed time in it. Different rooms in the garden should fulfill user's need. As the team of rehabilitation knows the user's needs better than anyone else, discussion between these two teams seems obvious in order to have a successful plan for the garden.

Here a question would be raised up as if we agree on that garden is being developed through the time, do we need to have a finished design for the garden? Can it be developable, but how much is sufficient? Is it enough to just have a structure as design and not strict ones? I am not sure about the answers but I think there is a possibility if we continue this communication between designers and rehabilitation team even after construction of the garden, the questions will be solved.

Second communication as I said before is between landscape architects who are responsible for designing the garden and architects who are in charge of buildings and architecture. Here there can be two kinds of scenarios. First one is, having empty plot, so we need to design the garden and its buildings at the same time and second, when there is already a garden with buildings.

In the first scenario, it is obvious that there should be an effective conversation between the two teams of design; otherwise it may lead to an unsuccessful project in which each part of garden talks differently. Although I believe this communication should work in any kind of built and natural environment, the sensitivity of healing garden which deals with people's mental and physical health makes it more essential.

Second scenario is rearranging the garden through what already exists in the garden and adopt the plan with existing components which I consider it more difficult to manage since the limitation makes it more inflexible, so corresponding between two teams seems undeniable.

Connection between indoor and outdoor is another aspect in terms of design, which provides different views through openings such as windows, doors, roofs or glass house. During cold weather or in some areas with harsh climate, some spots should be accommodated for this connection. Even types of vegetation which is planned to plant should be in a way to not to block the view. Entrance to the building as another type of connection should be clear and not confusing to support feeling of safety and security.

7-Methodological discussion

The methods I have chosen which include literature review, interviews, maps and photos, could be a great combination to get to know the answer of my objective "what are design principles of a healing garden?". But there were some lacks during the process of writing this thesis, therefore I think it can be improved.

First of all, literature which focus on the topic "design principles" is limited. There is not so much information in previous studies. Like a guide for designers. Since the idea of a healing garden for people who are suffering from stress-related diseases is new, the concept that has come after Alnarp rehabilitation garden, the need for more research is felt. I think since there is direct relationship between designs of garden and how much it can help participants to feel better, this topic should be more investigated.

Second, the result has been the outcome from interviews with people who are experts in designing healing gardens. Users as the main intention of the garden, are another part of this issue, which I believe what they think and feel about the garden is as significant as the designers. The project would have been more complete if I could interview participants and ask them what their opinions are about the garden and its settings. For sure the questions might be different from professionals and participants, as users might not be aware of their needs and technical vocabulary of design. I couldn't go through user's idea, first I didn't get permission to do it and because of time limitation. I think this could be good reason to continue this topic for further development.

And finally, the result from the four interviews to get a general idea about the design principles of healing gardens may seem insufficient but a question might be raised if I could ask any landscape or garden designers about healing garden and its design principles. The reason I chose an actual garden with known designers was to give more credibility to my findings. It would be interesting to analyze different parts of Torup garden or other project as well to see how they work according to the main idea of designs.

8-Further studies

In the beginning of result section I brought those aspects which I found important in previous studies regards to design a healing garden. I believe that two factors of society and establishment can be added to the prior studies. Although researches on environmental psychology indicate that landscape preferences can be influenced by culture and ethnic background (Tveit et al. 2006), I assume that the notion of migration as a new phenomenon which multicultural society is one of its consequences should be considered beside other aspects. Economy and establishment are other factors which I think are forgotten. I believe in order to take the most advantage of design they should be thought carefully about it.

The aim of this thesis was to investigate design principles of healing gardens which are planned for people who are affected by stress-related diseases. What I have been searching for was to find out those principles, which may not cover all the aspects. I believe that this research could be improved since the user groups as one of the most important parts of the garden are missed. It would be interesting to continue the investigation through participants and also staffs in order to gain more knowledge about this issue. This may need to go through participation observation study. And also dig down more about the aspect of society and culture to see how much and in what ways it can affect the design to see how the garden should be planned in multicultural society. Finally it would be interesting to use the idea of healing gardens in the city not only for people who suffer from stress-related illnesses but also more public garden for citizens.

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Transcription of interview:

Frederik Tauchnitz, gardener, Work Science, Business Economics and Environmental Psychology SLU-Alnarp, March 2012

Carina Tenngart, Landscape architect, Malmö Stadsbyggnadskontor, March 2012.

Sara Lundström, Director in Torup Health garden, March 2012.

Lina von Friesen, gardener in Torup Health garden, March 2012.

Acknowledgment

Appendix

Questions for designers:

1- What is the first step to design a healing garden?
2- What is the basic information you need to know to start?
3- Is the location important for the design and how?
4- Did you have a model before starting the design process?
5- What were your experiences from Alnarp Rehab garden, if is the model?
6- Wish consideration that each design is unique; are there similarities between different designed gardens?
7- How much the users have influence on design? What kind of users or participants with various problems?
8- Have you had a guide line for the process of design?
9- What was your approach?
10- Do you know if the garden in terms of its design is working properly?
11- What are the design principles of healing gardens?
12- Is it important to look back at design after a while to see how it works?
13- Have you had any thoughts of relationships between architecture and landscape? indoors and outdoors
14- Have you used the existing elements or material in the site? How
15- Are there any differences between the design on paper and actual garden? If yes why?

Questions for staffs (the manager and the gardener of Torup garden)

1- Who are the users? What problem they have? How much they have influence on the design?
2- Is the garden different from the sketches from designers? Where is different? And why?
3- What do you think of the design of the garden? What are the negative and positive points of the design?
4- Do you think that the design was successful or not? How? Where is not successful?
5- How do you use the garden? How different parts of the garden work for the user groups?
6- What do you think of design principles of healing garden? What you consider is important when   designing for this kind of user group?
7- How is the connection between architecture and landscape? Building and garden? Indoors and outdoors?
8- How much the location is important? How did you find the location?