

Review Article

Healing Gardens- A Review of Design Guidelines

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Abstract

Through speedy growth of towns as a offspring of modernization and urbanization, populations have tended to pick city areas as their surroundings over rural areas ensuing in denser urban regions. This has come about without considering psychological and social components of design of public area and homes nicely (Gehl 2010). furthermore, this led conurbations to have in addition infrastructure and much less nature, while on the other hand modern life-style has furnished diverse selections which includes computer systems, internet, tv, cellular and all other cutting-edge electronic gadgets which renders us to enjoy stress to satisfy all of the demands of a so-known as-social life. For this reason, the fee of strain and pressure-associated diseases are considerably extended .Through speedy growth of towns as a offspring of modernization and urbanization, populations have tended to pick city areas as their surroundings over rural areas ensuing in denser urban regions. This has come about without considering psychological and social components of design of public area and homes nicely (Gehl 2010). furthermore, this led conurbations to have in addition infrastructure and much less nature, while on the other hand modern life-style has furnished diverse selections which includes computer systems, internet, cellular and all other cutting-edge electronic gadgets which renders us to enjoy stress to satisfy all of the demands of a so-known as-social life. for this reason, the fee of strain and pressure-associated diseases are considerably extended. So the interest in recuperation gardens has expanded around the arena. Several studies disciplines and professions deal nowadays in specific ways with healing gardens. What determines whether or not a lawn is a 'healing garden?' The concept that is particular gardens is useful to human health become the spark that started this investigation to discover if there had been sure traits that distinguish a 'healing lawn' from every other lawn kind. If there are specific features that make up a restoration lawn, then what are they and will a list of hints can be created to aide within the layout of a recovery garden? There are a few important scattered researches approximately restoration garden that had carried out in this problem via famous and expert researchers like Clare Cooper Marcus, Roger Ulrich, Rachel Cooper Marcus ,Barnes, McDowell , Clark-McDowell, Mitrione, Larson, Naderi , Cochrane , Tseng, W.C., Chang, W.C., & Yi, K.J. and Stephen Kaplan. Therefore, the objective is to present the principle of healing garden through the basis of theoretical analysis of the core studies in the field of healing gardens and the extent of user satisfaction and their perceptions about the elements of design that should be available in the gardens.

Keywords: Healing Gardens- Healthcare- design principles- Hard landscape- Elements of design.

1. Introduction

Within the last 20 years there has been renewed interest in the role of designed natural environments and health. However, the importance of natural environments to health is ancient. The use of the garden as a place for healing can be traced back to early Asian, Greek, and Roman cultures.

Presently, hospitals and healthcare institutions often keep up extensive gardens and landscapes as an important part of healing. However, over the last 50 years with the rapid growth of medical technology and economic pressure, this ancient concept has been neglected(Beal, 2004). "Healing gardens" is a term

frequently applied to gardens designed to promote recovery from illness. "Healing," within the context of healthcare, is a broad term, not necessarily referring to the cure from a given illness. Rather, healing is seen as an improvement in overall well-being that incorporates the spiritual as well as the physical.

2. Healing gardens

An emerging area of research and design focus within landscape architecture has sought to address the relationship of designed natural environments to health and healing. As landscape architecture increasingly addresses the interface between designed natural environments and health, confusion has developed regarding various terms applied to this concept.

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2.1. History of Gardens in Healthcare

Historians have traced the use of gardens as restorative places back to the beginnings of recorded history in Persia, Greek, Egypt, and the Orient, and have noted that the existence of these gardens has continued until today in these cultures fig (1) (Gierlack, *et al*, 1998).



Fig. 1 The temples for the god Aesclepius (god of healing)

Gardens as an integral part of healthcare were also found in the Middle Ages among the monastic communities of Europe (Cooper Marcus, *et al*, 1999).

Justification for gardens in monastic communities was based on the idea that the combination of herbs from the garden with religious prayer could aid in the healing of individuals (Cooper Marcus & Barnes, 1999).

Although the exact origin of restorative gardens in Europe is nearly impossible to pinpoint, it is believed that gardens were commonly found in healthcare institutions for the poor, sick, and infirm between the 10th and 14th centuries (Gierlack- Spriggs, *et al*, 1998).

By the end of the 80's and the start of the 90's a decline of the concept was witnessed all around the world. The connection between healing and nature was gradually superseded by advancing treatment technologies and methods. By the late twentieth century the idea of nature and healing was totally lost; nature 'landscaping' came to be merely portrayed as a green sort of decoration. Starting from the 1990's the idea of healing gardens, once again, gained interest and began to appear in the research field of sustainable landscape (Vapaa, 2002).

Today the aspect of Healing Gardens is gaining its popularity due to the harsh living and environmental conditions that people are suffering from all over the world.

2.2. Defining Healing Gardens

The healing garden is the place to ease the tension of the patient, through the use of natural elements available to the garden, and thus help restore psychological as well as physical (Vapaa, 2002).

Stark (2004) has a vision of the healing garden as a microcosm of the larger world, where each feature of the garden is to represent a larger feature in the landscape. He argues that through this modeling healing has to be able to "stimulate the senses, improve immune response, and promote recuperation from physical and emotional illness ... a healing garden is a keeper of a sacred place. Its users can access higher levels of spiritual power by their simple presence in its space" (Stark, 2004).

American Horticultural Therapy Association defines healing garden is the garden which helps patients to speedy recovery, through programs of horticultural treatment.

The concept of healing gardens in the hospitals : As an external vacuum attached to the hospital, surrounded by one or more ,a special environment , far from the atmosphere in the hospital and believes the continue of the patients with the environment (Gokcen, *et al*,2013).

2.3. Types of Healing Gardens

The types of healing gardens can be classified as follows:

The first type of healing gardens is like a sanctuary or a natural reservoir, where natural and wildlife are preserved. This is presented by the city's green infrastructure elements, encompassing the city's open spaces, green ways, nature parks and greenbelts.

The second type is a meditation garden within the premises of a hospital or a health care centre. Finally, the third type is a privately owned garden. The third type is agreed upon by most healing researchers to be the best type of meditation garden with healing effect. This is based on the fact that the more time a human is in contact with nature; the more profound the healing results will be (Hopper, 2007; Vapaa, 2002; and Marcus and Barnes, 1999).

A residential or a private garden is the climax of the healing garden typology.

It allows the user(s) to gain the maximum benefit from the healing qualities of a garden because it is their own personal space where they express their individual identity, needs and level of engagement (Vapaa, 2002).

The research will target the healing gardens of a hospital or a health care Centre for trying to measure and evaluate design elements in healing gardens as a tool to identify the extent of Successful healing gardens during the stages of design process.

3. Healing gardens design criteria for hospitals

Well-designed hospital gardens not only provide calming and pleasant nature views, but can also reduce

stress and improve clinical outcomes through other mechanisms, for instance, fostering access to social support and privacy, and providing opportunities for escape from stressful clinical settings (Ulrich, 1999; Cooper-Marcus, *et al*, 1995).

So 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, *et al*, 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, *et al*, 2003)

3.1 design principles of healing garden

Numerous healthcare institutions all over the world have begun to incorporate therapeutic landscape design, cause of Healing gardens focus on providing stress relief, alleviation of physical symptoms, and improvement in the overall sense of wellness for both patients and healthcare staff. (Sima POUYA, *et al*, 2015).

When creating a garden for a health-care facility, the focus should be on location, accessibility, patients' requirements and preferences, and the design elements to be included (Epstein,2006).

The garden should have opportunities for mobility and exercise, present a choice between social and solitary spaces, and facilitate beneficial distraction and direct or indirect interaction with nature (Marcus, *et al*,1999).

Successful healing gardens make use of certain fundamental design principles (Sherman, *et al*,2005):

Enhance feelings of control: People should be aware that there is a garden and be able to find, enter and use its space. The garden should have private areas which cannot be seen from overlooking windows, and different kinds of spaces so users can feel they are making choices; if users are also consulted in designing the garden, this will also add to their feeling of control. All or some of the five senses can be chosen as focal stimuli in the garden's construction (vapaa,2002)

Have a prevalence of green material and areas: Patients' sense of well-being is enhanced by soft landscapes, so plant material should be dominant and hardscape reduced to a minimum: trees, shrubs and flowers should make up about 70% of the garden, with 30% in walkways and plazas fig(2) (Franklin,2012).



Fig 2 .landscape and hardscape in Dora Efthim Healing Garden

Encourage exercise: Designs should provide easy access and independence, as well as stress reducing structural elements such as walking paths for patients to encourage exercise, and play areas for children fig (3) (Severtsen, *et al*, 2013)



Fig. 3 Rramp over a sand play area becomes a feature in itself in this universally designed children's play area

Social support: refers to the perceived emotional assistance individuals receive through communication with other individuals in the garden (Brannon & Feist, 1997; Ulrich, 1999). Social support may be facilitated by a healing garden design that encourages and reassures conversations and social network among groups of visitors fig.(4)(Ulrich, 1999).

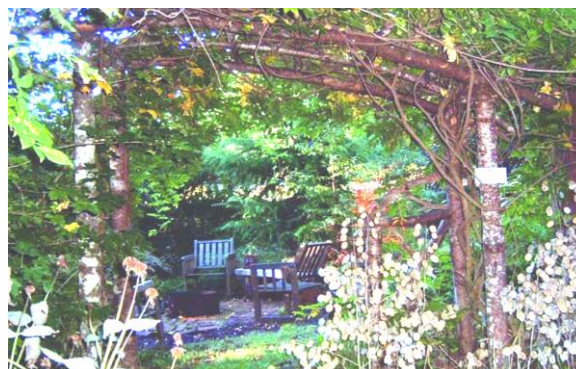


Fig. 4 There are private areas where people can be alone in the garden

Minimize intrusions: Gardens should be designed to minimize negative factors like urban noise, smoke, and artificial lighting, in favor of natural lighting and sounds. Gardens that appeal to the different senses are ideal (although strongly scented flowers and other scents should be avoided for chemotherapy patients) (Franklin,2012), and also *Access to privacy* refers to an individual's ability to find spaces of solitude in the garden.

It is important to provide spaces within the garden where all groups of visitors (i.e. patients, visitors, and staff) may go to have privacy (Sherman, *et al.*, 2005).

Access to Nature refer to environmental features that help alleviate visitors' stress through their restorative influence (Ulrich, 1999).

In a healing garden, natural distractions such as greenery, flowers, water, and sunlight are thought to provide restoration to users of the garden fig.5. (Ulrich, 1999).

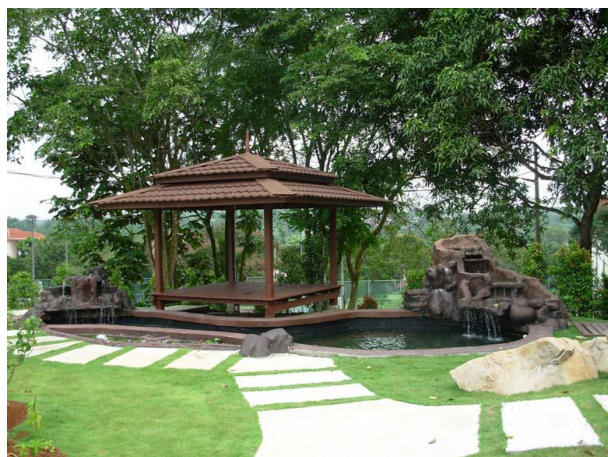


Fig . 5. Natural distractions such as plants, flowers and water features decrease stress levels.

3.2. Hard landscape design

3.2.1. Gateways and entrances

Gateways and entrances welcome individuals on arrival and give signs to them to discover their route around the site; they can play out this capacity if an extensive system of associating ways is arranged, determined, and followed up to guarantee they are legitimately built (Shackell, , *et al.* ,2012) Arranging, work of art and specifying can organize the primary access focuses and make a feeling of place, and seats ought to be accessible for individuals arriving or sitting tight for rides to sit on (Main, , *et al.*,2010).

3.2.2 paths

Entries must be sufficiently wide to oblige people with unprecedented convey ability requirements; for the ostensibly blocked, different sorts of surfacing materials can be helpful, and material parts should indicate edges (Queensland Health,1999).

The principle circulation routes ought to be plainly shown, for instance by giving effortlessly comprehended names to the primary halls or having shaded lines along the dividers or floor to assign fundamental circulation routes; or utilizing lighting along a routes (NHS Estates, 2005), Essential routes ought to be open to everybody.

3.2.3. Children's gardens

Children are generally demoralized from moving around in doctor's facility surroundings for fear that they irritate the medicinal services laborers or patients; there ought to be spaces separate for them where they can move as openly as they need or wish to (Nord, , *et al.* ,2009), as they have to participate in creative play paying little mind to the state of their wellbeing. Children need to feel they can make and roll out improvements by interfacing with their condition and moving items and parts; accordingly, adaptable play territories ought to be intended to empower their creative impulses (Verderber, *et al.* ,2006), and give them the delight and helpful advantage of imaginative movement.

3.2.4. Art

Artworks form part of the healing environment, and works of art in health-care facilities featuring images of nature have been linked with stress relief in diverse groups of people. In hospital spaces which can easily be accessed, artworks which create inviting, habitable spaces should be incorporated into the design.

3.2.5. Water

Hearing water running in a fountain, or seeing fish in a pond or sunlight reflecting on water, can be meaningful for a patient (Verderber, *et al.* , 2006), the sound of running water in particular can mask other noises which negatively affect the therapeutic value of a space. Such sights and sounds create sensory focal points for garden spaces which attract all ages and abilities.

3.2.6. Site furniture

This term refers to free-standing elements such as seating, litter bins, lighting and signs, which should be selected to meet the needs of users.

Seating: Seating ought to be accessible where people would really need to utilize it, ordinarily encased what's more, towards the back, confronting an appealing perspective or point of convergence, and not discouraging individuals on the way. Comfortable, movable and fluctuated seating can build use of the garden, particularly by hospital or healthcare staff ; there ought to be benches and seats for individuals, and more social seating courses of action for gatherings (Main, *et al.* ,2010).

Signage: Having the capacity to pick regardless of whether to take after or dodge a course that may have unpleasant ways is basic; fitting, agreeable and inviting signs are an unquestionable requirement. Site signage ought to show, in addition to other things, directional or one-way activity, confinements, stopping, conveyances, understanding passage focuses, doors to offices, et cetera (Epstein, *et al.*, 2006). Material signs ought to be settled at a stature of 150cm (120cm for children) (Stephen and *et al.*, 2006). Other tangible indicators, for example, capable of being heard water, highlights and wind rings may likewise be utilized to help route finding for the outwardly disabled in the garden.

Lighting: The basic role of lighting is to improve wellbeing and security. lights on stairs, walkways or approach streets both increment wellbeing for patients and help avert coincidental falls. passage and administration streets, and furthermore separated or dim territories should be plainly characterized and lit. Lighting along person on foot courses ought to be mounted at a stature where appearances can be seen and perceived, and any doors, convergences or risks, for example, changes in way level, ought to be demonstrated by guides. An additional remedially advantage of evening time lighting is that it empowers safe utilization of the space during the evening, and survey of the garden from inside (Marcus, *et al.*, 1995)

3.3. Planting design

sunny glades and generous paths are best for the medicinal services condition: they help wild blossoms to develop, and improve the sensory aspects of nature (Shackell *et al.*, 2012). Regularly changing blossoming trees, bushes and perennials bring an encouraging consciousness of life's rhythms and cycles; and utilizing vegetation that gives complexity and agreement through surfaces, structures, hues and courses of action draws individuals' consideration and concentrate far from themselves ((Marcus, Clare, 1999), also Native trees are especially valuable as they pull in nearby natural life: plant species that pull in butterflies bring a climate of delicacy; while extra highlights (wellsprings or water basins, a winged creature feeder, trees proper for perching or settling) might be utilized to pull in fowls and butterflies, which empower the faculties with their colors and sounds and raise individuals' assurance.

4. Need to explore the principles of Healing Garden

Presenting the core objective of healing gardens principles adopted of a number of design guidelines which aims to maximize the ability of healing gardens to meet the psychological and functional goals of the program through three phases:

The first stage is to present specific healing garden design features that potentially facilitate each of the five key outline standards of recuperating garden proposed by the Theory of Healing Gardens.

The second stage is an analytical study on the extent of the effect of gardens on the stress state of patients.

The third stage is to present the principles of healing garden through the basis of theoretical analysis of the core studies in the field of healing gardens and the extent of user satisfaction and their perceptions of the elements of design that should be available in the gardens

4.1 healing garden design features

Tables below presents specific healing garden design features that potentially facilitate each of the above five key design elements suggested by the Theory of Healing Gardens, These design features were compiled based on recommendations found in several influential publications in the area of healing gardens including: Cooper Marcus and Barnes (1995, 1999), McDowell and Clark-McDowell (1998), Mitrione and Larson (2007), Naderi and Smith (2008), Ulrich (1999) Cochrane, T.G. (2010) and Tseng, W.C., Chang, W.C., & Yi, K.J. (2014).

Table 1. Enhance feelings of control

Design Feature Item	Design Published Recommendations						Total
	Cooper, et al.	McDowell et al.	Mitrione et al.	Naderi, et al.	Ulrich	Cochrane, T.G	
easily visible from the entry.							4
provide an inviting entrance.							2
easy to see from hallways in the hospital.							3
Maps are to be had at unique places inside the health facility							1
signage							4
The doors are easy to use.							2
The paving of pathways is smooth.							3
Navigating across the lawn is simple.							5
provide ease in getting around for users in wheelchairs.							6
provide an expansion of seating arrangement choices.							5
comfortable seats							5
sunny and shaded areas.							4
Avoid glare from light concrete							4
entering the garden without having to use stairs or ramps.							1
Variety of walking routes.							3
variety of choices in gardens' spaces.							3
unique perspectives of surroundings to choose from inside the garden.							3
fountain							2
restroom near the garden							1

Based on Table 1, the most common elements suggested by the literature were Variety of walking routes in the garden, easy to see from hallways in the hospital, The paving of pathways is smooth, different

views of scenery to choose from in the garden, variety of choices in spaces within the garden and provide sunny and shaded area. According to the result, designers should Provide ease in getting around for users in wheelchairs, Navigating across the lawn is simple, an expansion of seating arrangement choices and comfortable seats .

Table 2 Access to Nature

Design Feature Item	Design Published Recommendations						Total
	Cooper , et al.	McDowll et al.	Mitrione ,et al.	Naderi ,et al.	Ulrich	Cochrane,T.G	
plants with a variety of colors.							5
spots of bright colors in the plants.							4
plants are pleasant to touch.							2
The vegetation is planted densely.							3
The vegetation is the major portion of the garden.							4
The vegetation are appealing.							1
The plants have a nice fragrance.							1
variety of types of plant life the garden.							2
the choice of flowers fits this location/metropolis properly.							2
Provide a few local plant							1
Some plants attract butterflies.							4

As shown from Table 2, the factors that most mentioned with the aid of the seven guides were The lawn has flora with a spread of colors., vegetation (timber, shrubs, and plants) is the primary portion of the garden., designers ought to choose vivid colorings inside the plant life that trade coloration with the seasons and some plant life inside the lawn entice butterflies. a précis, garden layout need to have plenty of flowers mainly with awesome species, methods which could provide privacy.

Table 3 Social support

Design Feature Item	Design Published Recommendations						Total
	Cooper , et al.	McDowll et al.	Mitrione ,et al.	Naderi ,et al.	Ulrich	Cochrane,T.G	
provide areas for conversations in small groups.							5
Plenty of seating available							3
movable seating.							3
central space for gathering							1
table for coffee or food							2
Comfortable Chairs							3

Referring to Table 3, 4 sub-elements in this category achieved a minimum of 3 number of hits which included areas in the garden for conversations in small groups, Plenty of seating available, movable seating and Comfortable Chairs

Table 4 Minimize intrusions

Design Feature Item	Design Published Recommendations						Total
	Cooper , et al.	McDowll et al.	Mitrione ,et al.	Naderi ,et al.	Ulrich	Cochrane,T.G	
personal areas in which patient can be alone							4
some personal seating regions hidden with the aid of vegetation private places.							2
a sense of enclosure from the outside the world.							1
a sense of enclosure from the hospital environment							3
the scale of the garden is big sufficient to keep away from noise							2
privacy from on-looking patient rooms.							4
							2

As proven from table 4, the elements that maximum noted were personal areas where in humans can be alone, there may be a sense of enclosure from the outside global and the size of the garden is big enough to avoid noise.

Table 5 Encourage exercise

Design Feature Item	Design Published Recommendations						Total
	Cooper , et al.	McDowll et al.	Mitrione ,et al.	Naderi ,et al.	Ulrich	Cochrane,T.G	
provide areas that encourage exercise through walking.							6
diverse sorts of taking walks paths.							1
narrow and curving walking paths							3
Play area for children							3
region for gardening and therapy							1
Places for exercise and workout							1

In table 5. the most common factors counseled through the literature have been provide regions that encourage exercising thru strolling, narrow and curving strolling paths for slowly on foot and meandering and Play place for children.

4.2 Analysis of users' Respones

The strategy for proceeding users' interviews(patient-staff- families of patients) was semi-organized users' interviews occurred between the hours of 10:00 am and 5:00 pm. The researcher asked and interviewed with fifty Each meeting kept going no longer than twenty minutes. the interviews were directed independently to have a firsthand comprehension of requirements and to ensure data integrity.

The participants' responses were analyzed in terms of their perceptions of satisfaction with the indicators for healing gardens Table 6. And their perceptions of the design elements that must be available in the

gardens and their impact on the psychological state of them Table (7).

Table 6 Essential Objectives of a Healing Garden for Different User Groups

Objectives of a healing garden	Patients	Staff	Families of Patients
Stress reducing features			
Sense of control			
Physical movement and exercise			
Opportunities for social support			
Spaces for significant associations with friends and family			

Table 7 Design Elements in Relation to Goals of the Healing Garden

Objectives of a healing garden	Patients	Staff	Families of Patients
Stress reducing features	Waterfall birds pond Variety of plants.	waterfall birds Variety of plants.	Variety of plants.
Sense of control	easily visible from the entry.	N/A	N/A
Physical movement and exercise	paths	paths	N/A
Opportunities for social support	Plenty of seating Resting points	resting points	paths benches/ resting points
Interaction with friends and family	none cited	N/A	paths

4.3 Discussions

The most discussed design recommendations (things which were specified more than 3 times) from the reviewed literature and users' interviews can be abridged as takes after.

A-Seating

While choosing furniture for patients, the physical delicacy of the patients must be considered. healing garden ought to have a lot of seating with various forms, for example, those with arms and backs and furthermore seating which are moveable. Other than that, the patients lean toward zones with overhead shade which enabled them to remain outside with protection from the hot sun.

B-Pavement Material

Patients regularly feel powerless. Along these lines, a garden space should be safe. Material of the asphalt must be non-slide and non-glare with indeed, even and smooth surface which will be simple for wheelchair clients to move around. Handrail ought to be given along some walkway.

C-Activities

Give open air exercises, for example, healing garden has been appeared to have positive advantages to patients . Other than that, horticultural treatment is considered as a therapeutic system which may enhance memory, consideration, feeling of obligation and social association. Moreover, greenery enclosures can give regions for amusement and exercise purposes, places for social exercises and furthermore play area for children which are helpful for physical and emotional wellness of the patients.

D-Location of the Garden

The open air plant needs some feeling of walled in area and the non attendance of feeling that usres are in a "fishbowl" or being gazed at. Along these lines, the area and introduction of the garden are significant, for example, the garden ought to be close to the principle entrance and furthermore unmistakable from fundamental indoor zone.

E-Access to Nature

Many research had discovered the significance of medical advantages for the patients , for example, enhanced mind-set , diminished worry and stress by having contact with nature. In this way, a very much outlined garden ought to give components that could urge the patients access to nature, for example, a differing blend and wildflowers to attract birds and butterflies

Conclusions

Quiet healing garden functions as a quiet environment to minimize and reduce tension and stress, must Focus on integrating all key elements of users' desire Garden that will draw the user in and provide the required activities of users.

It needs special attention in the design and continual emphasis by the hospital.

The following list is an important elements which must be included in the design:

- 1) Climate-controlled areas (i.e., misters to cool and heated floor to produce warmth)
- 2) Strolling ways and exploring trails
- 3) Improve the stream to take into consideration however much connection as could be expected.
- 4) Play area to take into consideration patients' and children' delight.
- 5) Open area to take into consideration different exercises.
- 6) Contemplation region for thought and reflection.
- 7) A few water highlights.
- 8) Different seating choices with the greater part in the one to three seating range.

- 9) Friendly/commonplace components (i.e., winged animal feeders, recognizable plants and scents).

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