

**Research Note :****SENSORY GARDENS FOR DISABLED: A REVIEW****Y.C. Raveendra****K R C College of Horticulture, Arabhavi- 591 218 (University of Horticultural Sciences, Bagalkot) Karnataka***E-mail: ravihortic@ gmail.com*

ABSTRACT : The sensory garden is one of the theme garden that stimulates the five senses viz. touch, smell, hear, taste and sight which provides benefit from young children to senior citizens as well as those physically and mentally challenged. This garden is also called by several names like sound garden, touch and smell garden therapeutic garden, disabled garden. These gardens concentrates on a wide range of sensory experiences, if designed well, will provide a valuable resource for a wide range of users, ranging from education to recreation. Historically, sensory gardens have evolved gradually from the traditional concept of 'Garden for Blinds' to sensory landscapes. Here all components, (hard and soft landscaping, colours, textures and forms), must be carefully chosen and designed to appeal to the senses in such a way that they provide maximum sensory stimulation. This idea is to integrate green areas that will encourage sensory stimulation, physical mobility and social skills along with environmental education, emotional growth and mental development, rather than making special provision for disabled.

Keywords : *Sensory garden, landscaping, mental health, disabled.***Planning of sensory garden**

Basically close senses (touch and taste), distance sense (smell, hear and sight) are most important parameter for planning for user specific sensory garden. For example, When the distance sense of vision is impaired, persons may be able to compensate to some extent by making greater use of their other distance sense of hearing.

Three phase work is best approach for planning of a sensory garden those includes, one is preliminary site study which includes visiting places that claim to have sensory gardens. Secondly, walk through interview with Landscape architecture, designers, key experts, therapist, and teachers followed thirdly, observation and behavior mapping of student or people with special needs. This can make a basic frame work for designing future sensory garden.

Features of sensory gardens

Braille labels : The labels fixed on a stand, which includes braille texts and symbols. This helps for blinds to read the names and description of plants and features in the sensory garden.

Tactile maps : Tactile map includes raised features which helps for easy way finding and navigating in the sensory garden. There are two types of tactile maps, Orientation tactile maps use for Long term installation in the garden, made out of strong and durable materials like magnesium or bronze, metal foil,

portable tactile maps Short term use by blinds for manual use, prepared by disposable material, Paper with plastic fibers expands when heat is applied to specific image drawn.

Flowering, aromatic, fruits and vegetable plants : Different types of flowering and foliage plants gives a pleasant look, aromatic herbs in raised beds will enhances the sense of smell in blinds, small fruits plants and salad vegetables in the in the sensory garden will enhances the sense of taste.

Wind chimes: Wind chimes in different types and design available to produce pleasant sound in which stimulate the sense of hearing.

Water features : Includes fountains, small water falls, ponds and other special features which will enhance the sense of hearing and sight.

Bird bath and other features : Bird bath and features that well comes the birds can act as center of attraction in the sensory garden.

Raised beds : This is an important feature in the sensory gardens for the wheel chair users. They can't able to reach up to ground level, So well designed accessible raised bed with convenient height and width.

Strong and wide pathway : Planed strong and wide pathway will helps to persons with visual impairment and wheelchair users.

Plants used for sensory gardens

Touch	Smell	Taste	Site	Hear
Lamb's Ear	Lavender	Chives	Marigolds	Sage
Woolly Thyme	Lemon balm	Basil	<i>Salvia elegance</i>	Nasturtiums
Coneflower	Roses	Dill	Roses	Bee balm
Silver Sage	Geraniums	Parsley	<i>Nigella damascene</i>	Briza maxima grass
Cape sundew	Mint	Fennel	Chameleon plant	Bamboo (<i>Dietesmiscanthus</i>)
<i>Acacia paradoxa</i>	Rosemary	Straw berry	Attractive flowering plants	
Casuarina	Valerian	Marjoram	Attractive foliage plants	
Bottlebrush	Sweet pea	Atriplex	Salvia	
Clematis	Gardenia	SaladVegetables	Daisy	

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Well established lawn : Lawn is referred as the heart of the garden and one of the basic feature. It will give an opportunity to sit and enjoy which influence the sense of touch.

Less efforts and research has been conducted to know the demand, necessity and needs of users with special needs along with accessibility, functionality and the engaging of attributes in the sensory garden. Several researchers conducted the research and experienced several problems associated with designing, planning and come out with some issues and noted the modifications yet to do in sensory garden.

Ungar *et al.* (8) compared the effectiveness of the instructional methods to provide visually impaired persons with spatial knowledge necessary to navigate the route. The participants were 301 visually impaired adults who were blind from birth or before six years of age. None of the participants had any residual vision which could be effectively used during the experiment. none of the participants had received any formal training in the use of tactile maps for navigation. Participants were required to walk and learn a complete route of 2,050 meters in the unknown environment by three different methods of instruction. In the subsequent three sessions, the participant was asked to walk the route unguided. When the participant got lost, the experimenter allowed him to walk to the next intersection between streets. Then, asked him or her right way to reach the next landmark. If the participant knew the correct direction, he/she was allowed to continue along the route; otherwise he/she was guided by the instructor to the next point of the route. Experimenter observed that the tactile map user travelled the route maximum compare to other instruction methods with minimum lost and stops. Concluded that, visually impaired person had a better

chance of navigating by using tactile interactive methods than verbal direction from other persons.

Larson *et al.* (4) pre-tested the 4 exhibits which were of podium style before the final exhibits were installed within the Clotilde Irvine sensory garden to determine full strength and weakness. 91 Participants were used from nine agencies having different physical and mental disabilities and allowed them to engage with the each exhibits questionnaire which asked to the participants in this study of impressions of exhibits. The each exhibits were on podium style Exhibit 1 consist of Tactile map, to provide orientation of the sensory garden with audio introduction. Exhibit 2 Describes the how brain processes sensory information through touch, taste, sight, sound and smell (Cross cut diagram of brain sensory information within it) Exhibit 3 includes Concept of thearaupatic horticulture and benefits of plants regarding people. (Mirrored tiles with a caricature of green man) Exhibit 4 includes Concept of pollination and how interdependent plants and insect are upon one another for their survival.

Researcher recorded the experience, strength and weakness of each exhibit. Participants and evaluators felt that all exhibits were situated in accessible distance and height, the labels were accurate and legible, the audio was comprehensive and graphics was logical.

In exhibit 1, participant with sight said they would prefer a map printed on a handout or broacher. Participant without side indicated the raised tactile map was of no help if one didn't have any prior orientation to the area. In exhibit 2, people without sight said that the graphics and audio must be able to comprehensive but this exhibit lacked the contextual information for those without sight. In exhibit 3, the artistic graphic was confused the people with sight and caused the cognitive dissonance. So the participants could not appreciate the goal of exhibits was once explained

verbally. In exhibit 4, it met the goal of teaching information about pollination but didn't provide close enough proximity to pollination insect and flowers. Finally the concluded that exhibits in Clotilde Irvine sensory garden they were physically accessible but certain areas need to be changed to enhance inclusiveness. This may help to incorporate needs of people with disabilities in future.

Thompson (7) studied the average sustained focus level, self-injurious behavior, relaxation, happiness and engagement of student before, within and after experiencing multisensory environment. For behavior mapping study they used the Behavioral Descriptors and Likert Scale. They observed and revealed the 14 % positive influence on average sustained focus level, 17% Relaxation ratings, 16 % Happiness, 16% increase, 13% Engagement with attributes with 93 % decrease in self-injurious behavior of students with different disabilities in different ethnic group after entering the multisensory environment.

Hussein (1 and 2) and did exploratory study in two sensory school garden, before studying the actual scenario, they conducted preliminary site study of some sensory gardens. Finally they did research in two special schools; 1) Royal School for the Deaf and Communication Disorders (RSDCD) 2) Lyndale School, Wirral (LS), for childrens with special needs Design objectives to provide verity of different forms, textures, colours, shade, touch and sound to users to achieve maximum potential by providing a series of linked mini gardens. The main challenge was to design for and accommodate an extensive range of user capabilities and needs and revealed that, there is lack of research in particular subject. So, Preliminary site study, Walkthrough interview with practitioners, therapist, teachers, and landscape architects and observation and behaviour mapping with students with special needs (disabled) is best approach.

The interview with designers said that well designed and planed paths are highly significant and would lead to high usage provide clear links between school building and garden. the key principles are to transform the sloping grounds into a stimulating environment through natural features. Maximize the potential of the site and highlight the principles that govern the indoors to the outdoor environment. The main challenges were to accommodate the ambition to have a sensory garden on a limited fund as well as the technical use of a water feature and maintenance in general they revealed that,practitioners should visit existing sensory environments to observe the usage

before starting a project, to help them understand the engagement that occurs between users and their surrounding environment. Even the teachers and therapists, who see their pupils on a daily basis, sometimes make incorrect assumptions so comments and opinions of users are valuable. Only once we have well-researched reliable design guidance could able to standardize (interview and observation).Some of interviewees thought that shrubs may act as barrier between the user and features. Planted shrub around water feature doesn't affect the level of usage and user's still able to enjoy this feature and spent a lot of time (observation and interview). Practitioner predicted that zone with musical instrument would be the most popular but Teachers and therapist said they thought the musical instruments were not that much accessible, because the feature doesn't make that much accessible sound. Teachers and therapists said that, raised planters were inaccessible to students who were wheelchair users (width of the planters made it difficult to reach the plants. students on specially-adapted bicycles were passing by the garden, they were also touching the moss on this feature. Later the observation and behavior mapping study were conducted for seated activity. (Lambe, 3; and Maller and Townsend, 5) The number of attributes and the total area did not relate to the length of the median time spent in a zone per user but, rather, it was the attractiveness and richness of the attributes on offer that did so. wherever there is access, the students will undertake a variety of activities and engage more with the individual behaviour settings compared to the staff. This contributed to the finding that the number of individual behaviour settings, the number of activities undertaken and the time spent engaged in that activity by the users was not dependent on the total area of the zone, nor did it relate to the median time spent there per user, but rather what did enable the usage was the functioning of the individual behaviour settings and access to them. Good pathway design and planning that connect school buildings to the sensory garden, as well as having the ability to move around the garden, promote educational development and social skills. This is one of the significant factors in encouraging the use of zone in special schools. This finding illustrates that users, especially students, enjoyed having functional and a variety of individual behaviour settings positioned, bordering an accessible and continuous pathway. Thus a higher number of users and a longer time spent were recorded in relation to these design qualities.

Concern the design aspect : It seems very clear that sensory gardens which are designed as such, tend not to be entirely satisfactory from the users' perspective, as designers, apparently, may not interview the users before designing the sensory gardens. At present, designers think they are designing sensory gardens well but their biggest mistake is in presuming that they know what the needs of users are. For example,

- ✓ Water is an important feature in that it provides users with the opportunity to respond to it in terms of hearing and touch it but in some sensory gardens, this feature is not fully accessible, therefore, the feature is not of true benefit to the users.
- ✓ Loose materials on the surface of paths, such as gravel separated by wood edging, are inaccessible to wheelchair users, therefore, such users are unable to appreciate significant features that can only be assessed in this way.
- ✓ Ramps, even with an accessible gradient, were not appreciated by the staff of the schools, as they were concerned about the slippery surface. Steps were also not favoured; especially by wheelchair users.

Maintenance : Regardless of who designs a sensory garden, a designer or via community or school effort, challenges in terms of longterm maintenance should also be addressed in the design plan. If they are not, a poorly maintained sensory garden will not benefit its users and it will lack aesthetic value.

Design guidelines : lack of rigorous knowledge and research about the sensory garden.

CONCLUSION

- ✓ Total area didn't correlate total time spent by users, Zones with variety, sensory rich and accessible attributes and good circulation network to pathway, which offers users to easily engage with it.

- ✓ Persons with disabilities will engage easily by making use of other senses apart from the impaired sense.
- ✓ Sensory garden will helps to improve the education value to recreation for all wide range of users, ranging from education to recreation.
- ✓ Further research and standard guidelines to develop sensory garden for peoples with special needs is should be standardize.

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