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## A Study on Garden Facility Management of Seoul Garden Show 2015 and 2016

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### Abstract

This study focuses(selected) on garden facilities of designer gardens created at the 1st and 2nd Seoul Garden Shows and examined installed facilities at each designer garden by categorization according to type, material and functions. The study observed problems occurring from maintenance of garden facilities as time passes by and collected basic data to develop maintenance guideline aiming to make contribution to further spreading and promotion of high quality garden culture.

This study examined all gardens created at 1st and 2nd Seoul Garden shows in 2015 and 2016. There were 18 gardens built in 2015 and 16 in 2015. The study looked at responsible entities for maintenance of facilities and examined maintenance system for managing these gardens. Garden facilities of the study were categorized into paving, facility for rest, playground, water facility, environmental sculpture and planting media facility according to categorization by landscape design standards and construction guidelines.

Target gardens of this study are maintained mostly by citizen gardeners who are passionately carrying out maintenance work while communicating with designers. However, these citizen gardeners lack technical knowledge to manage various facilities. Also, maintenance manuals submitted by garden designers do not offer sufficient details on facility maintenance which calls for professional maintenance and clear instructions on facilities from early phase of design.

**Keywords:** Seoul Garden Show, Garden Facilities, Maintenance, Retention, Management Authority

### 1. Introduction

As witnessed by more interest and emphasis on the quality of life and various ways of spending one's free time, the era we are living in is changing from the past where economic development was the priority. With such change, garden culture is spreading fast with a revision of laws on "promotion and design of arboretum and garden" by Korea Forest Service along with the Suncheonman National garden exhibition as a start of garden shows in Korea. Korea Forest Service started a project for building local/regional gardens in 2016 with currently 11 regional gardens: 3 regional gardens built in 2015, 2 in 2017 and 6 more in 2018. The budget for building regional gardens in 2018 was 6 B KRW (3 b KRW from the central gov't and 3 B KRW from local govt's.) which is expected to gradually increase in the future[1].

Same trend can be observed in domestic garden exhibitions. 10 years ago in 2010, there had been only one garden show in Korea. However, with more interests on gardens from the public, the number of annual garden shows is currently more than 7 with some in planning stage. So, such growing trend of garden show is likely to continue[2].

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The first garden show held in Korea was “World Flower Exhibition Goyang” in 1997 and “Korea Floritopia Ahnmyeondo” in 2002 was recognized by AIPH (International Association of Horticultural producers). However, the current format of garden show in Korea had started with “Gyeonggi Green Festival” in 2010 followed by “Korea Garden Show”, ‘Seoul Garden Show”, “Suncheonman Garden”, “Suncheon Hanpyeong Gardening Festival”, “Ulsan Taewhagang Garden show 2018”, “ Chungjoo Gardening Festival”, “Busan Garden Show” which were held in various sizes.

As an overseas example, designer gardens submitted at Garden Show BUGA of Germany are sustained and maintained after the show. The purpose of Garden Show BUGA is urban restoration and local development and takes place in various regions throughout Germany. However, garden shows which focus more on garden designs such as “Chelsea Flower Show” takes place in the same place every year and all of designer gardens created for the show are demolished after the show ends.

For Korea, “Seoul Garden exhibition” along with “ Gyeonggi Green Festival”, “Ulsan Taewhagang Garden show 2018”, and “ Suncheon Hanpyeong Garden Festival” maintain gardens created at the shows for purpose of urban restoration. Especially, “Seoul Garden Show” took place 4 times since its first show in 2015. The purpose of “Seoul Garden Show” is urban restoration by gardens and to revive aged parks through garden creation. Such purpose was well achieved as parks where Seoul gardens shows were held, the 1st and 2nd garden shows in the “World Cup Park” and the 3rd and 4th shows in “Yeouido Park” were restored and revived with gardens[2].

At garden shows, there are gardens built by the public, local organizations or students. However, the most important gardens built at garden shows are probably those built by designers. Designer gardens are designed and built by experienced or professional designers who apply various planting materials and methods. For the Seoul Garden show, 18 designer gardens were created at the 1st show and 16 at the 2nd show which were intended to be preserved and maintained. But, 1 designer garden was completely demolished and for other gardens, some facilities were modified and even torn down. Thus the purpose of Seoul Garden show of preservation was not fully realized.

This study focused on garden facilities of designer gardens created at the 1st and 2nd Seoul Garden Shows and examined installed facilities at each designer garden by categorization according to type, material and functions. The study observed problems occurring from maintenance of garden facilities as time passes by and collected basic data to develop maintenance guideline aiming to make contribution to further spreading and promotion of high quality garden culture.

## **2. Relevant Research**

Amid growing interest on domestic garden shows and more Korean designers entering overseas garden shows which led to increasing demand for garden shows, academic research into garden shows are taking place more actively than before. Academic research on garden shows up to date can be categorized into 4 groups.

The first category is the economic and social impact of garden shows. Young Kim[3] published a research paper “A study of impact which influenced region economy by world flower exhibition koyang” in 2002 and Jeong-Taek Kim[4] published “A Study on the Influence of Korea Floritopia 2002(Anmyeondo) on the Development of Anmyeondo Tourism” in 2003. In 2015, there had been a study by Jeong-ro Lee[5], “The Impacts on the Change of Urban Image of Suncheon City Hosting of the International Garden Exposition Suncheon Bay Korea 2013”.

The second category of research is aimed at analyzing satisfaction of garden shows for establishing post-management strategy. Kyoung-Mo Ahn[6] published “Analysis on Expectation Level, Satisfaction Evaluation on 2006 World Flower Exposition Goyang” in 2007 and Tae-Kap Song[7] published in 2014 “A Study on the Visitor's Consciousness Survey and Future Utilization of Suncheon International Garden Expo 2013”.

The third category is trends of garden design at garden shows. Sang-Jun Yoon[8] wrote “A Study on the Trend of Garden Design in Chelsea Flower Show in England” in 2009 and Jin-Doo Park[9] did “A

Comparative Analysis of Recent Flower Shows in Korea and Germany" in 2016. There are also "A Study on Classification of Garden Styles by Analyzing Garden Expo Entries" by Hae-Lee Yum[10] and "A Study on the Trends of Flower Design of Garden at the 2015 Garden Show" by So-young Jung[11] in 2015.

The last category is study on garden show planning and there are "Site Planning of international Garden Show for urban Regeneration" by Se-young Lee[12], "A Strategic Plan of Urban Farming.Garden Expo for the Vacant space in Janghang, Seochun-gun, Chungcheongnam-do" by Youn-Ju Lee[13] and "Garden Festival Park Design of Landfill in Shihwa, Ansan" by Ha-Ryeon Kim[14].

However, as there is a growing number of garden shows, designer intention or concept of a garden created at garden shows are not well preserved or sometimes left in negligence due to a lack of maintenance, changes in vegetation, and damages to facilities.

It's been only 10 years since the embarking of garden shows in Korea and related studies are still in an early phase. At such timing with an increasing number of garden shows taking place, more academic study into how to properly examine and review status/maintenance on gardens created at garden shows would be mandatory.

### 3. Method

#### 3.1 Subject of this study

This study examined all gardens created at 1st and 2nd Seoul Garden shows in 2015 and 2016. There were 18 gardens built in 2015 and 16 in 2015(Table1). Designer gardens that are subjects of this study are gardens by Ji-Hae Hwang who submitted garden design through public contest, Hay-Joung Hwang who is an invited designer and Chun-Hwa Im who designed star garden from 1st Seoul garden show in 2015. From 2nd Seoul garden show, subject gardens are built by an invited designer, Yano Tea and invited arboreta in Korea which are Hantaek Botanical garden and Chollipo Arboretum, and Korea national Arboretum.

**Table 1. Subject of this Study**

Garden type	Gardens (Seoul Garden show 2015)	Gardens (Seoul Garden show 2016)
Designer gardens	15	12
Invited Designer	3	4
Total	18	16

#### 3.2 Field Study

Research on facilities installed at designer gardens at 1st and 2nd Seoul Garden shows focused on early status of facilities with reference to floor plan and aerial view drawing that were submitted when creating a garden. Then, field study was executed for 2 years from Mar. 2017 to Feb. 2019. The reason for 2 years of field study on facilities built at gardens is to understand what kind of changes these facilities go through as time passes by.

First of all, This study looked at responsible entities for maintenance of facilities and examine maintenance system for managing these gardens. Garden facilities of the study were categorized into paving, resting facility, playground, water facility, environmental sculpture and planting media facility according to categorization by landscape design standards and construction guidelines. Then, the study developed detailed evaluation criteria for maintenance status of each facility on a scale of 5. The following explains the scale from 1 to 5.

Score 1 is the highest score with no flaws, problems, or repair needed. Periodical check-up is needed. 2 means minor damage which requires simple repair. Score of 3 means there is damage or flaw which would

require repair work or replacement of parts. 4 means structural flaw and large scale repair or reinforcement is needed. Lastly, score of 5 means banned access to facility or removed facility. Furthermore, the study analyzed current status of facilities installed at target gardens to understand what problems have occurred and causes of such problems.

## **4. Results**

### **4.1. Responsible entities for maintenance and maintenance system**

Gardens created at Seoul Garden shows are maintained by an organization called “Building beautiful gardens”. This organization has 42 members and they have routine maintenance check-up of 1-2 visits per week from Mar. until Nov. However, participation rate for routine check-up is less than 50%. Also, there has not been much active communication between designers and citizen gardeners. Only from 2018, designers have started training on maintenance to citizen gardeners. Currently, citizen gardeners of this organization work in a team of 4-5 people twice a week for 4 hours per visit to take care of 3-4 gardens per team. However, with a growing trend of garden shows, there is more number of gardens for maintenance and current effort may not be sufficient.

### **4.2. Facilities**

#### **4.2.1 Paving Materials**

Only one garden left soil without paving material and the rest use various paving material and methods. One garden was observed to use more than 3 different paving materials and there was a case with one paving material used, but different paving patterns were applied for diversity.

The result of field study on paving materials from 2018 to 2019 showed that target gardens was divided into 2 groups where original form was maintained and those not maintained. Concrete or natural stones have highly endurable and are not much changed or damaged. But, some natural materials such as volcanic stones or grass were somewhat damaged and woodchip or barks were completely destroyed due to their nature(Picture 1). So, one can conclude that durability of materials determines a degree of damage. Evaluation criteria for damage/change are existence of paving material, flatness, stable, corrosion and withering(Table 2).



**Picture 1. Change of Paving Materials**

**Table 2. Results of Paving Materials**

Type	Quantity	Evaluation Score	Damage %	Main Cause
Flagstone	7	7	20%	
Decomposed granite soil	11	19	35%	Wash away
Concrete	4	4	20%	
Pebbles	2	2	20%	
Tile	1	1	20%	
Wood chip	1	5	100%	Corrosion
Volcanic stone	3	7	47%	Wash away
Granite stone	1	1	20%	
Basalt	1	1	20%	
Log	2	2	20%	
Grass Brock	2	2	20%	
Plastic	1	1	20%	
Interlocking	9	11	24%	
Brick	1	1	20%	
Grass	7	19	54%	Withering
Broken Stone	2	2	20%	
Wood	4	6	30%	
Wood deck	7	12	34%	Form change
Bark	2	10	100%	Corrosion
Soil	5	5	20%	

#### 4.2.2 Rest facilities

Mostly commonly used resting facility was a chair. All of invited designers and selected designers at 2015 Seoul Garden Show installed chairs and 7 of garden designers had chairs in their gardens. Material for chairs was mostly wood with some made with brick and ironware. At 2016 Seoul Garden show, chair was mostly commonly used again with installation at 8 gardens.

Both ready-made and customized chairs were installed at gardens with more customized chairs than ready-made. More designers seem to prefer customized chairs are tailored to suit design and mood of the garden. Enjoying scenery is probably the main purpose of a garden and chairs as a tool to sit down, rest and enjoy the surrounding explains why chairs are the mostly popular facility used at a garden. Regarding the material of resting facility, wood or ironware were mostly used and original forms were relatively maintained without destruction or form change. However for some resting facility, original ones were kept at maintenance office

and replacement with similar design was installed at the site(Table 3).

Also for resting facility, an observation was made that there had not been significant damage or destruction, but were sanitary issues and most were not available for sitting or resting. Evaluation criteria for damage are corrosion of material, safety, flatness and cleanliness.

**Table 3. Results of Rest Facilities**

Type	Quantity	Evaluation Score	Damage %	Main Cause
Wooden Long Chair (Customized)	2	4	40%	Cleanliness
Wooden Lattan Chair (Customized)	2	4	40%	Cleanliness
Wooden Lattan Chair(Manufacture)	2	6	60%	Replacement
Wooden Chair (Customized)	8	16	40%	Cleanliness
Table and Chair Set	4	8	40%	Cleanliness
Chair+Flower Bed	1	2	40%	Cleanliness
Brick Chair	1	2	40%	Cleanliness
Pergola+Wooden Chair(Customized)	1	2	40%	Cleanliness
Stone Chair (Original Design)	1	2	40%	Cleanliness
Wall type Chair	1	2	40%	Cleanliness
Iron Angle Chair (Customized)	2	4	40%	Cleanliness
Log Chair	4	8	40%	Cleanliness
Low wooden bench	1	2	40%	Cleanliness

#### 4.2.3 Playground facilities

For gardens with playground facility, there is only 1 garden with playground facility at 2015 Seoul Garden show. There are 2 at 2016 Seoul garden show where one is made up of wood and another one with ironware. The one made with wood is more like a play table which was removed in early 2019 and is no longer available(Picture 2). Another one built with ironware is playground with 2 floors, but access was banned due to safety reasons. So 3 gardens with playground facility were studied, but none of these playgrounds is available for use. One observation to make that regardless of durability of the material, playgrounds will not be available for long-term use unless safety issues are cleared. Evaluation criteria for damage are corrosion, safety, damage and removal(Table 4).



Picture 2 Removal and Prohibition of use

Table 4. Playground

Type	Quantity	Evaluation Score	Damage %	Main Cause
Iron Playground	1	5	100	Prohibition of use (Safety)
Wooden Playground	1	5	100	Removal (Safety)
Iron Sculpture(with Play ground)	1	5	100	Prohibition of use (Safety)

#### 4.2.4 Water facilities

Water facility is an important element of a garden. However, not much water facility was installed at 2015 and 2016 Seoul Garden Shows. There was only one pond built at a garden for 2015 show and 2 at 2016 show which are mirror pond and biotope. This study found out that a pond was dry and no longer served a purpose of water facility. Mirror pond was also dry and no longer serving its purpose and biotope was too dry. No water facility maintained its original form. Evaluation criteria for damage are water quality, operation status, and leakage(Picture 3, Table 5).



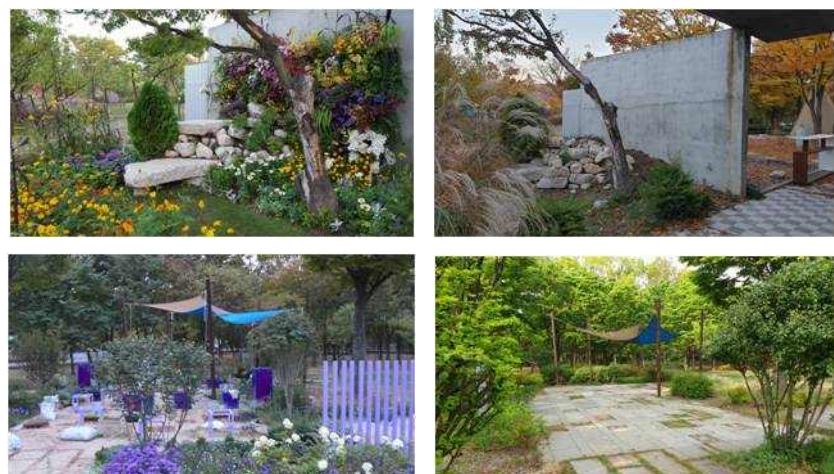
Picture 3. Out of operation

**Table 5. Results of Water facility**

Type	Quantity	Evaluation Score	Damage %	Main Cause
Mirror Pond	2	10	100%	Operation status
Natural Pond	1	5	100%	Operation status
Biotope	1	5	100%	Operation status

#### 4.2.5 Environmental facilities

Garden designers tend to utilize environmental sculptures to capture attention and different kinds of environmental sculptures were installed at gardens created at Seoul Garden shows as well. However, the result of this study revealed that many of environmental sculptures were not maintained well to keep original forms. A garden with various environmental sculptures was completely removed and one hanging garden was removed as well(Picture 4). Picture frame type sculpture and wood sculpture were damaged and walls installed at garden were tilted which was risky enough to fall. So many of environmental sculptures lost original form and were changed much. Evaluation criteria for damage are corrosion, esthetical visual quality, damage, safety, stable and tilting(Table 6).

**Picture 4. Removal of Environmental facilities****Table 6. Results of Environment Facilities**

Type	Quantity	Evaluation Score	Damage %	Main Cause
Wall	3	3	20	
Vertical Garden	2	10	100	Removal
PVC Sculpture	1	5	100	Removal
Tent	2	2	20	
Colonnade	5	10	40	
Iron Sculpture	5	15	60	Removal
Pot	2	2	20	
Wooden Sculpture	6	18	60	Form change
Door	7	7	20	
Jangdokdae	2	2	20	
Art Wall	4	8	40	Form change

Well	1	1	20	
Brick Gallery	1	1	20	
Mobile Sculpture	1	5	100	Removal

#### 4.2.6 Landscape Structure

Landscape structures introduced at garden shows are raised spot, stonewalls, and walls. Raised spots range from simple format which is made up of soil and covered with stone, concrete or volcanic stones or with grass to more complex ones where one side is finished with stone wall and the other side constructed with Plant Stairs. For stonewalls, some were made up of gabion or bricks and some built with stacking stones or bamboo Quickset door On the other hand, walls are categorized as landscape structures with a purpose of serving as barrier for space. In this respect, walls are defined differently from sculptures and mostly made up of cement blocks or by stacking red bricks(Picture 5). For brick wall, these changed much from original form due to damage. Evaluation criteria for damage are crack, structural safety, tilting, change and damage(Table 7).



Picture 5. Damaged landscape structure

Table 7. Results of Landscape Structure

Type	Quantity	Evaluation Score	Damage %	Main Cause
Brick wall	7	11	31%	Tilting
Wooden structure	3	3	20%	
Bamboo Quickset door	2	3	30%	Form change
Stonewall	2	2	20%	
Raised spot	7	13	37%	Form change
Wooden fence	1	3	60%	Damaged
Gabion wall	1	2	40%	

#### 4.2.7 Planting Media

Planting media facility is an important element of a garden since it allows sustainability base for plant and highlights scenic beauty.

Most of gardens created at Seoul Garden shows did not install planting media facility, but made direct planting on soil. Or some gardens made special planting base. For those gardens with direct planting on soil, designers created edges with various material to separate walking routes. For edge materials, steel, rope, block, old wood block, cobble stone, etc. were used(Table 8).

The study showed that planting media for a hanging garden was not used which led to much damage and original form was almost unrecognizable. Wood type planting base did not serve its purpose due to alteration of wood(Picture 6). Evaluation criteria for damage are corrosion of material, damage, safety, removal and form change.



**Picture 6. Destroyed Planting Media**

**Table 8. Results of Planting Media**

Type	Quantity	Evaluation Score	Damage %	Main Cause
Vertical Garden	1	5	100%	
Hume Pipe	1	1	20%	
Train Sculpture	1	1	20%	
Wood Pot	4	10	50%	Destroyed
Flower Bed Edge	6	12	40%	Corrosion of Material
Brick Pot	1	4	80%	Destroyed
Plant Stairs	1	1	20%	
Gabion Pot	1	1	20%	

### 5. Conclusion and Discussion

This study examined 34 gardens including designers' gardens created at 1st and 2nd Seoul Garden shows for how facilities at these gardens change as time passes by. Facilities were categorized into 5 types and examined for damages or removal. The result is as follows.

For resting facilities, most were built by designers from scratch except few tables or chairs which were ready-made goods. Resting facilities did not require much repair, but there seemed to be sanitary issues and were not in much use. Certain ready-made facilities were not built to respond to changing weather from outdoor space and were kept in a separate place. This calls for garden design guidelines to specify that endurable material for all weather conditions should be used.

Playground were installed at 3 gardens, but due to safety issues, playground was completed removed at 1 garden and access was banned at another. For playground in general, there are safety rules to comply with, but most of the times, there is no required verification of safety rules for garden space. This calls for manuals/guidelines for safety check-up for installment and maintenance of playground at a garden.

On the other hand, water facilities is the most difficult facility in terms of maintenance and installation cost is relatively high. Also, a need for circulation system makes water facility undesirable. There are various forms of planting media facility used at garden shows. Vertical garden by Yano- Tea was not maintained well and largely damaged making it almost impossible to recognize its original form.

The result of research into 2 years after garden was built shows that certain traits can be observed from the gardens built at garden shows in Korea as below.

First of all, it was observed that more spending on environmental sculptures was made than on planting media for design elements to match a theme of a garden. However, maintenance and repair was not properly followed and sculptures cease to serve their original purpose. Also for environmental sculptures, customized products are more frequently used than ready-made goods. But lower cost material is often used and there is a lack of construction experts due to cost constraints. This adds to more repair/flawed facility issues. In the future, appropriate material with construction by experts would be needed and guidelines need to be further developed for different type of environmental sculptures.

Another observation was that designers are hesitant towards installing water facilities which is one of the important elements constructing a garden. The reasons are water facilities are costly to make and difficult to maintain. However, water is one important element required for building high quality garden. So this calls for hosting institutions of a garden show to make clear guidelines for utilization of water facilities.

Target gardens of this study were maintained mostly by citizen gardeners who are passionately carrying out maintenance work while communicating with designers[15]. However, these citizen gardeners lack technical knowledge to manage various facilities. Also, maintenance manuals submitted by garden designers do not offer sufficient details on facility maintenance which calls for professional maintenance and clear instructions on facilities from design phase.

Lastly, domestic gardens shows tend to keep designer gardens after garden shows end. Thus, one implication is that designers gardens of such garden shows should be built by designers known for creating sustainable gardens. And garden facilities are mostly built for temporary use which would call for setting a period for keeping.

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