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# The Current Status of School Gardens in City of Isparta, Turkey

Candan KUS SAHIN

Assistant Professor, Suleyman Demirel University, Forestry Faculty, Department of Landscape Architecture, 32260 Isparta-Turkey

*Abstract— School gardens are important places for children's, educational as well as intellectual situations. They are also support the social and physical development of students. This is especially a common condition for Turkish cities and schools plans that there is a large school building but with small school gardens. The school-age children usually more active life style than others. Therefore, the needs of students in schools should have quality gardens. Because the students allow applying touch, feel, see and understand living nature. This is as important in the school gardens as planning the work done and should be in accordance with certain principles. These principles are taken into consideration in this study, the current status of school gardens in the city center of Isparta examined the case of public elementary schools. The findings of the study, in accordance with the existing primary schools gardens, and at the same time to provide the child experiencing learning what to do to be a part of education are discussed and recommendations are given in this regard.*

**Keywords:** Isparta city, Landscape architecture, Plants, School garden.

## I. INTRODUCTION

The school gardens can be defined as; incorporating various school buildings and facilities with the necessary things. However, ceremonies have held with some of the training activities and the students use to relax between lessons. Moreover, cultivation of trees and plants with suitable rest area open to regulated places, sports organization can be carried out as well [1,2]. With this definition, school gardens are one of the most important places for children and young people, learning to play and physical development as well as being healthy and happy environment [3]. Hence, the school gardens have many functions for not only students and educators but also community and neighborhoods as well. Therefore, gardens in schools provide important venues to share resources and enhance education quality. These areas are continuity of the education provided student's social, physical, psychological, emotional, and cognitive development by supporting key development [4].

The school gardens have also the potential to serve the people of the city as public outdoor spaces and provide significant contribution to the city tissue. Hence, those areas are also usable for the purpose of public education with learning activities. However, facilities at schools, besides the students' learning activities, can also be used for different purposes to serve as; adult education, community meetings, recreation, attractions voting in elections, etc.. This multifunction of schools and its structures' established the effective use of open spaces especially in densely built urban areas.

It is proposed that appearance of the interior and exterior open spaces (gardens, animals, mountains, fountains, people, etc.) Effects positively the design values of the schools. Converting the trees and plants that planted to create a landscape in the field made distinctive values in designed area. In this scene, living units should be considered. However, elements located in that area should not blocked by other objects [4]. Moreover, school gardens must be associated with the number of students studying there. Hence, standards such as; per capita (student/m<sup>2</sup>) and type of school facilities should be carefully established.

Tanrıverdi [6], Eymirli [7] and Yılmaz [8] were conducted on school gardens for Erzurum city at different times. It proposed that public schools that were located in Erzurum city had various garden areas for per student [6]. However, it was identified as 7.3 m<sup>2</sup> open space for per student for primary schools [7]. But, it was reported approximately average of 5.0 m<sup>2</sup> for schools including buildings and gardens for per student in Erzurum city [8]. A similar research conducted by Algan (2008) for Adana city. He found that the school garden area for per student varies and between 1.84 to 18.29 m<sup>2</sup> for Adana City [9]. Özdemir and Yılmaz (2009) investigated the



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socio-economic characteristics of primary schools that located different districts of Ankara. They found that the available space area in these schools varies between 0.9 m<sup>2</sup> and 4.3 m<sup>2</sup> for per student [10].

However, students can benefit from opportunities to learn about the plants in school gardens during their studentship. Recently, a research project name is 'Garden Mosaics' is a U.S.-based community program that conducted in USA and some other countries [11]. In similar, *Garden Africa projects* were incorporated 12 schools in the Cape Flats area, South Africa, helping them to develop gardens that provide an example for students and the community. Teachers are trained to integrate garden activities into formal learning, bringing life into the classroom and essential tools for generations.

A research conducted by Laurie and her group (2012) for surveying school food garden functions in South Africa. Majority of students were involved in school garden activities and perceived garden work to be fun. However, the teachers reported that school food gardens as a means to improve children's health. Moreover, parents were detected behavioural change in their children (e.g., taking part in home gardens and passion for gardening) since involvement in school food gardens. It was concluded that students, teachers and parents were positive about school food gardening [12]. However, Kamper proposed that the school premises were clean but with no grass, flowers or vegetable garden. The school was affectionately known as the "shack school" [13].

In this study, the environmental aspects of designing a school garden in city of Isparta, Turkey was analyzed in terms of per student garden areas and design approaches in the view of landscape architecture major. The detailed observations, interviews with educators and administrative staff, some suggestions and opinions are discussed. The detailed analysis of the data collected through interviews and observations, the findings are presented below.

## II. MATERIALS AND METHODS

The current status of 42 public elementary school's garden that located in the City Centre of Isparta was studied in detail. In addition, the literature on the school gardens and landscape design criteria's were supported material. For this purpose, school's officials were interviewed and detailed observations on school gardens' and their neighborhoods were determined.

To identify the current status of research material, the detailed information on these schools has been obtained from the Isparta Province National Education Directorate. Each school was also visited at different hours of the day and on different days of the week. During that visits, the school officials interviewed and asked permission to take the image as well as information requested about the school's garden. Table 1 presents the schools and garden specifications that this information received from the Isparta Province National Education Directorate. With having these information and site surveys, the open space per student is calculated in accordance with the received data. The calculated data were compared with the standards and qualification conditions were investigated.

The detailed data collection form was prepared in advance. The examination with the observation had the following headings:

- The location and size of school (number of students and staff)
- The number and duration of inhalation
- The school's physical structure (surface characteristics of yards, gardens and open spaces)
- Sportive and living-recreational facilities
- Car parking facilities
- Resting areas for teachers
- Plant assets
- The user status and purposes of school garden at different times (education and training purposes, on weekends)



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Table 1. The specification of public primary schools in Isparta City Centre

The name of primary school	Building coverage (m <sup>2</sup> )	Garden coverage (m <sup>2</sup> )	Number of total students	Garden area per student (m <sup>2</sup> )
Atatürk primary school	1988	4600	313	14,696
Gülcü primary school	413	4395	273	16,098
Yedişehitler primary school	1652	5965	1121	5,321
Ali Haydar Albayrak primary school	701	6478	795	8,148
Mehmet Köse primary school	421	4356	230	18,939
Şehit Koray Akoğuz primary school	960	8956	272	32,926
Bağlar primary school	340	4235	376	11,263
Nazmi Toker primary school	1579	3693	476	7,758
Üçkardeş primary school	3623	3206	316	10,145
Halıkent primary school	850	1650	1437	1,148
Gürkan primary school	3860	4918	261	18,842
Fatih primary school	1112	3404	360	9,455
Nazmiye Demirel primary school	1011	9340	786	11,882
Selahattin Seçkin ve Öğretmenler primary school	392	3280	420	7,809
Çünür Toplu Konut İdaresi primary school	1200	5182	308	16,824
Alaybeyoğlu primary school	415	1584	180	8,800
Mustafa Şener primary school	1890	8876	1049	8,461
Gülistan primary school	600	5499	678	8,110
Fevzipaşa primary school	700	2330	732	3,183
Hediye Un Fabrikası primary school	925	7938	203	39,103
Mehmet Akif Ersoy primary school	1092	5050	551	9,165
Kamile Gürkan primary school	963	5210	444	11,734
Cengiz Topel primary school	668	4783	122	39,204
Bahçelievler primary school	848	3569	749	4,765
Ülkü primary school	884	1818	870	2,089
Yahya Kemal Beyatlı primary school	1011	4161	612	6,799
Iyaş Selçuklu primary school	4300	4158	905	4,594
Zübeyde Hanım primary school	675	4400	404	10,891
Yenice primary school	5180	3300	62	53,225
Yaşar Ulucan primary school	2065	18740	329	56,960
Gülbirlik primary school	324	2467	211	11,691
Hilmi Dilmen primary school	1337	2626	677	3,800
Naşide Halil Gelendost primary school	595	5000	550	9,090
Cumhuriyet primary school	2868	8934	217	41,170
İMKB primary school	3860	12924	597	21,648
Zehra Ulusoy primary school	632	3450	642	5,373
Sidre 2000 primary school	1105	10225	482	21,213
Öğretmenler primary school	810	3574	790	4,524
Öğrenciler primary school	814	5497	325	16,913
Mavikent primary school	3760	4100	642	6,386
Hafız İbrahim Demiralay primary school	809	4604	782	5,887
Toki Akkent primary school	5233	5756	239	24,083

With having this information given in above, structural and vegetative landscape planning and design of applications, a long-term study should be evaluated. Students, teachers, school council, parents, and landscape



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architect with the collection of information related to the improvement of school grounds, put forward the problems, exchange ideas implemented.

### III. RESULTS AND DISCUSSIONS

According to Turkish Government regulations that published in Official Newspaper No. 23804, in the September 2, 1999, the total area of elementary schools should be between 8000-15000 m<sup>2</sup>. However, based on Turkish Standards Institute, the total land cover size of the schools should be calculated according to student number. With this approach, it should be 20-25 m<sup>2</sup> per capita area for first 40 students following 15 m<sup>2</sup> per capita for the next 40 students, 10 m<sup>2</sup> per capita for the third 40 students, respectively. After third 40 students, the necessary area for school gardens should be calculated as 5 m<sup>2</sup> per capita for each group of 40 students.

It was calculated that 42 public primary schools in Isparta city centre have the total area occupied by buildings and the garden areas is estimated to be the total of 219.631 m<sup>2</sup>. The open spaces and gardens approximately total of 62.477 m<sup>2</sup>. So the garden area per student, including building area was found to be 12.947 m<sup>2</sup> per student.

The evaluation is made with having this information in public school total land areas as well as per capita open spaces that located in Isparta city centre. As seen in Table 1, Yaşar Ulucan Public Primary School have the largest per capita school garden with the 56.960 m<sup>2</sup> area, following by Yenice Primary School with the 53.225 m<sup>2</sup>, while the minimum school garden area were found to be for Halikent and Ülkü Public Primary Schools with having 1.148 m<sup>2</sup> and 2.089 m<sup>2</sup>, respectively. However, although the Yenice Public Primary Schools have approximately 53.225 m<sup>2</sup> total area with only 63 students. The open space for per students at this school has been found to very high compare to others.

It was also realized that Yaşar Ulucan Public Elementary School have the largest total open space/school garden area (approx. 18.740 m<sup>2</sup>) while Alaybeyoğlu Public Elementary School have the smallest school garden (approx. 1584 m<sup>2</sup>). It was also realized that although some schools had a large school garden areas but due to very high number of students studying in that schools, resulting less per capita open space/garden area. In this respect, for example, Mustafa Şener Public Elementary School has approximately 8876 m<sup>2</sup> garden area with total of 1049 student and per capita open space/garden area was only 8.46 m<sup>2</sup>. With having this information, it is reasonable to suggest that public schools in Isparta city centre have various open space and garden areas. However, it is clear that primary schools that are located in Isparta city centre have higher open space values than Ankara and Erzurum city as research conducted by others [8-10].

In another approach, the standard per capita open space area for people that living in different size of cities has suggested as follows; for cities that population up to 45.000, per capita space area should be 4 m<sup>2</sup> per person, for cities that population higher than 45.000, the per capita area should be 4,5 m<sup>2</sup> per person, respectively [9]. However, the Isparta city centre population was approximately 244 085 (in year 2010) so that it should be 4,5 m<sup>2</sup> open space per capita is expected. Moreover, public schools gardens in the city centre of Isparta were observed to be higher open space area than regulations suggested as mention in above. On the other hand, continuous expanding of school buildings with increase in number of students in existing garden area, effects on continuous downward trend against open spaces or garden areas of schools. The similar trend has been observed for the city centre of Isparta elementary school gardens.

However, the primary goal of the school gardens should be taking into account of the desires and needs of students during school time with a wide range of possibilities. For that reason, students should have well-designed gardens in order to re-entering the course with relaxed and motivated.

Turkish Ministry of National Education defined the compulsory education age is between 6-14 years age group. According to this regulation, it appears to be a wide range ages of the children in primary school age. Accordingly, school gardens and its arrangements/designs should be made because of the different age groups, different desires and tendencies. However, as a results of direct observation and surveyed study of public primary school gardens located in Isparta city centre, have not meet the needs of landscape design criteria, have not sufficient spaces and inadequate garden organization in allowing the students to relaxation and motivation activities during the off times. It was realized that the in the same school open spaces and gardens, variety of different ages of students in the same

area occupied and plays at the same time. This leads to a high risk of accidents. In addition, this is not appropriate for students to relax rest and motivate to re-enter to classes.

The study conducted in 42 primary schools were found to be have partially sufficient garden elements and the surfaces usually covered by concrete, asphalt, muddy or dusty paths and often used as a parking lot during out of school time. The similar observation in other countries was reported [14].

It was realized that many of the schools have two distinct gardens that the front gardens are usually open for student use. These gardens have also often used as a ceremonial purposes as well as the some sporting organization such as; football, basketball or volleyball practices. However, the front gardens usually have very hard surface and usually prefer for male students to active games played and female students usually use these places as conversation and sitting on yard. Moreover, students usually not allowed entering schools' green backyards. These open spaces usually have somehow borders and limited planting or lawns. In Figure 1, some pictures from front garden/open space areas of public elementary school that is located in the city centre of Isparta.



Fig 1. The typical front gardens of public primary schools in Isparta city

In Figure 2, some pictures from backyard of public elementary school in the city centre of Isparta.



**Fig 2. The typical backyard gardens of public primary schools**

In accordance with the Ministry of Education regulations, for program of public primary school students, total of 6 courses in daily and each course have 40 minutes education and 10 minute inhalation time between courses. However, a 90 minute break established for lunch at noon. Based on this program, public primary school students' approximately spend total of 390 minutes at schools in the regular day.



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In school garden planning, it should be made taking into consideration various age groups. For small age groups, more green spaces is suitable while less green space with more game places areas for higher age groups would be appropriate to be included in school open spaces [15]. However, students should use the open spaces and gardens for the variety of games as well as for the implementation of many courses.

In many countries, regulations on this subject have some standard approaches. The general tendency is to leave large areas around school as much as possible. To do this, approximately 5 m<sup>2</sup> open space per student is calculate to be for inhalation and total of approximately 25 m<sup>2</sup> per student to serve optimum open space in schools [9]. However, in our study, the size of the public primary schools gardens various and not similar.

It has been realized that most of the school gardens have no function established rather than vacant land areas. However, the majority of school administrators have no any interest on the adequacy of these places for children. They have been usually opinion on school gardens that these areas considered as sports facilities.

It suggested that the shortest path is usually followed by children, arrangements should be made taking into consideration [16]. However, harmful elements should not be included on the roads or paths in gardens due to fast-moving students.

In general landscape design practices for school gardens, the fast-growing, high-impact-resistant plants could be suggested to use. However, evergreen trees and shrubs remain green all year is also very suitable for the school gardens. Moreover, plants those have easily broken branches and leaves, fruit trees, poisonous plants, flowers that attract bees, have created problems and cannot be considered to be used in gardens, particularly in primary school gardens. In order to meet these criteria, general aesthetic and technical characteristics as well as genus species and Dendrological forms of plants must be well known during landscape practices [17].

It is well established that climatic conditions and soil structure dictated the selection of trees and flowers. However, poisonous or high pollen-producing plants should be avoided. Plants that do not want special treatment, would be more useful for quick and easy selection for design preference [14]. For the qualify utilization of school gardens in all year, some seasonal changes taken into consideration. Accordingly, one of the most important functions take into consideration is of gardens should be protect of students from the sun. In addition, gardens should also protect somehow from winter climate and the cold winds to create a more appropriate time to be used by students [9].

Based on the information given briefly in above and the literature findings on school gardens, the list of plants presented in Table 2 and 3 are suggested to use in Isparta public primary school gardens. In Table 2, botanical and common name with current situation in school gardens are given. In Table 3, the list of some plants that not recomend to use in school gardens with reasons are given [17, 18].

#### IV. CONCLUSION

The public elementary school gardens that surveyed in the city centre of Isparta appear to be insufficient in terms of landscape practices. According to the results of the study, in primary schools, per student m<sup>2</sup> outdoor space is insufficient. However, many school gardens have the insufficient sports fields, outdoor training areas and most of the hard flooring surfaces.

The insufficient budgets for basic needs for maintenance and renewal of garden arrangement necessitate. For this purpose, necessary financial resources should be emphasized. During garden renovation, landscape architects should support the editing process. Many primary schools gardens insufficient activities to meet the needs of playing, moving and resting places. Considering the current situation, even if not expand the garden areas, the landscaping in these areas during the conversion process should be started.

As mention above, school gardens have many important functions. For that reason, narrow and insufficient school gardens must be converted into rich environmental fields, in order to develop the skills to succeed and create a variety of sporting, artistic and garden work for students.



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Table 2. Some plants that can be suitable to use in school gardens

Botanical name	Common name	Current status in School gardens in Isparta city
<i>Acer negundo</i> L.	Amur Maple	+
<i>Acer campestre</i> L.	Field Maple, Common maple	+
<i>Acer pseudoplatanus</i> L.	Sycamore	+
<i>Albizia julibrissin</i> Durazz.	Hardy silk tree	-
<i>Ampelopsisquinquefolia</i> Mich. Fl.	Virginia creeper	+
<i>Betula alba</i> L.	European white birch	-
<i>Buddleia davidii</i> Franch.	Orange-eye butterflybush	+
<i>Catalpa bignonioides</i> Walter	Southern catalpa	+
<i>Cedrus libani</i> A. Rich	Lebanon -Taurus- cedar	+
<i>Cercis siliquastrum</i> L.	Judas Tree	-
<i>Chaenomeles japonica</i> Lindl.	Japanese quince	-
<i>Cornus alba</i> L.	TartarianDogwood	-
<i>Cotinus coggygria</i> Scop.	Smokebush	-
<i>Cupressus arizonica</i> Greene	Arizona cypress	+
<i>Cupressus arizonica</i> ‘Glauca’	Arizona blue cypress	+
<i>Eleagnus angustifolia</i> L.	Russian olive	-
<i>Forsythia intermedia</i> Zab.	BorderForsythia	+
<i>Fraxinus excelsior</i> L.	Europeanash	-
<i>Hedera helix</i> L.	English ivy	+
<i>Koelreuteria paniculata</i> Lam.	Golden-rain tree	-
<i>Liriodendron tulipifera</i> L.	Tulip tree	-
<i>Philadelphus coronarius</i> L.	Sweet mock orange	+
<i>Picea pungens</i> var. <i>glauca</i>	Colorado blue spruce	-
<i>Picea orientalis</i> L.	Oriental spruce	-
<i>Pinus nigra</i> L.	Austrian pine	+
<i>Rhus typhina</i> L.	Buck’s Horn	-
<i>Salix babylonica</i> L.	Babylon weeping willow	+
<i>Sorbus aucuparia</i> L.	European mountain ash	-
<i>Spiraea xvanhouttei</i> (Briot)Zabel	Bridal wreath spirea	-
<i>Spiraea bumalda</i> Burv.	Anthony waterer spirea	-
<i>Syringa chinensis</i> L.	Chinese lilac	-
<i>Syring vulgaris</i> L.	Common lilac	+
<i>Thuja orientalis</i> L.	Chinese arborvitae	+
<i>Thuja occidentalis</i> L.	American Arborvitae	+
<i>Tilia tomentosa</i> Moench.	Silverlinden	+
<i>Ulmus</i> sp.	Elm	-
<i>Weigela florida</i> (Bunge) A. DC.	Weigela	-
<i>Vinca majör</i> L.	Blue periwinkle	-
<i>Vinca minor</i> L.	Common periwinkle	-
(+) to be school gardens, (-) not to be in school gardens		



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Table 3. The plants that not appropriate to use in school gardens

Botanical name	Common name	The reason to not use in school gardens	Current status in School gardens in Isparta city
<i>Anemone blanda</i> L.	Windflower	Poisonous flowers	-
<i>Anemone caucasica</i> Willd	Manisatulips	Poisonous flowers	-
<i>Anemone narcissiflora</i> L.	Narcissus Anemone	Poisonous flowers	-
<i>Caltha palustris</i> L.	Marsh Marigold	Poisonous flowers	-
<i>Colchium autumnale</i> L.	Autumn crocus	Poisonous flowers	-
<i>Delphinium ajacis</i> L.	Larkspur	Poisonous flowers	-
<i>Iris lutea</i> Lam.	Yellowflag iris	Poisonous flowers	-
<i>Ranunculus arvensis</i> L.	Yellow Cups	Poisonous flowers	-
<i>Berberis thunbergii</i> DC.	Japanese barberry	Thorn	-
<i>Cotoneaster horizontalis</i> Decne.	Rock spray	Thorn	-
<i>Gleditsia triacanthos</i> L.	Thornless honey locust	Thorn	-
<i>Mahonia aquifolium</i> Nutt.	Oregon holly grape	Thorn	+
<i>Pyracantha coccinea</i> Roem.	firethorn	Thorn	+
<i>Robinia pseudoacacia</i> L.	Black Locust	Thorn	+
<i>Rosa</i> sp.	rose	Thorn	+
<i>Aesculus hippocastanum</i> L.	Buckeyes	Toxic and allergic effects	-
<i>Buxus sempervirens</i> L.	Common boxwood	Toxic and allergic effects	+
<i>Cytisus</i> sp.	Broom	Toxic and allergic effects	-
<i>Daphne mezereum</i> L.	February daphne	Toxic and allergic effects	-
<i>Euonymus europaeus</i> L.	European euonymus	Toxic and allergic effects	+
<i>Fagus sylvatica</i> L.	European beech	Toxic and allergic effects	-
<i>Genista anglica</i> L.	Petty whin	Toxic and allergic effects	-
<i>Ilex aquifolium</i> l.	English holly	Toxic and allergic effects	-
<i>Juniperus sabina</i> L.	Savinjuniper	Toxic and allergic effects	+
<i>Laburnum alpinum</i> L.	Scotch laburnum	Toxic and allergic effects	-
<i>Ligustrum vulgare</i> L.	European privet	Toxic and allergic effects	+
<i>Lonicera</i> sp.	honeysuckle	Toxic and allergic effects	+
<i>Prunus amygdalus</i> var. <i>amara</i>	Sweet Almond	Toxic and allergic effects	-
<i>Prunus laurocerasus</i> L.	Cherry laurel	Toxic and allergic effects	-
<i>Rhododendron ponticum</i> L.	Rhododendron	Toxic and allergic effects	-
<i>Sambucus ebulus</i> L.	Dwarf Elder	Toxic and allergic effects	-
<i>Sambucus racemosa</i> L.	Red Elderberry	Toxic and allergic effects	-
<i>Symphoricarpos albus</i> Blake.	snowberry	Toxic and allergic effects	+
<i>Taxus baccata</i> L.	English yew	Toxic and allergic effects	-
<i>Viburnum lantana</i> L.	Wayfaring tree	Toxic and allergic effects	-
<i>Viburnum opulus</i> L.	American cranberry viburnum	Toxic and allergic effects	-
<i>Wisteria sinensis</i> (Sims.) DC.	Chinese wisteria	Toxic and allergic effects	-
(+) <i>to be school gardens, (-) not to be in school gardens</i>			

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