VI - SUMMARY

This study was performed aiming to design appropriate garden for kindergarten from the functional, environmental and aesthetic aspects, and to study the role of plants represented by their color in the displaying of kindergarten garden. The study was executed during the period between 1993 - 1998 at the Faculty of Agriculture, Moshtohor, and Faculty of Agriculture, Bologna Univ. - Italy.

- The study comprised the following points:

1 - To determine the educational aspects that children can learn in the garden, a questionnaire was designed and presented to professors of education in the University of Bologna and University of Alexandria.

2 - To determine the garden's components actually present in those kindergarten gardens. Nine gardens for kindergarten in Bologna city were served.

3 - Children's behaviors with materials and play equipment in five kindergarten garden were studied to determine children's requirements of materials and play equipment.

4 - A servay was made on (27) teachers in nine kindergarten gardens to determine the components needed in the garden.

5 - Bolzani kindergarten in Bologna city was chosen for design appropriate garden from the functional, environmental and aesthetic aspects. The suggested design consisted of seven basic areas in natural style namely: Sea garden, Open play area, Vegetables and fruit garden, paved area, Rainbow garden, Nature garden, and Butterfly garden.

6 - The plants utilized were studied for the effect of their colors (leaves - flowers - fruits) on kindergarten garden within the employed the design.
7 - Kindergarten garden under Egyptian conditions were determined for design appropriate kindergarten garden.

The study can be summarized as follow:-

1- The professors in both Alexandria and Bologna University determined the educational aspects that children can learn in the garden. These aspects comprised a group of Concepts, skills and values. The Concepts determined were classified into Scientific, Environmental, Mathematical and Language concepts. The Skills were Physical, Art, and Music Skills. The Values were Social values and Aesthetic values. The Scientific concepts included the color, development, texture, smell, sound, light, shade, temperature and float concepts. The importance degree for children learn the color concept in the garden was (100%) while for the float concept was (66.7%). The Environmental concepts included the plants, animals, air, water, rain, sun, snow, earth, food, life and death concept. The importance degree for learning each of plants, food and life concept were (100%) while that for death concept was (50%). The Mathematical concepts included the formal shapes and volumes concepts and the importance degree was determined for each. The Language concept included the Alphabet and vocabulary, and the importance for learning in the garden was determine for each.

The Physical skills included run, jump, cache, push, throw, balance and skating, and the importance degree for learning in the garden of each was determined. Art skills included drawing, formation and manipulation skill and the importance degree was determined of each also. Music skills included rhythm and sound differentiation and the importance degree for learning in the garden was determined. The Aesthetic values that included balance, harmony, rhythm and contrast, also the importance degree for learning in the garden was determined. The Social values included cooperation, systematic, obedience, independence, care and cleanliness and the importance degree for learning in the garden was determined.

2 - By studying the components of kindergarten gardens, there were appeared (13) types of materials and play equipment. Sand was present in all kindergarten gardens (100%), either boxes or sand holes. Also, Water play equipment, huts, spring play equipment, swings and slides were present in (100%) of the gardens. Bridges were present in (67%), while tunnels in (44%) of the gardens surveyed.
3 - The study of the children's behaviors towards materials and play equipment indicated that (13.2%) of the children play in sand, (6%) with different types of swings, (15.4%) with huts and play houses, (4%) with spring play equipment, (14.2%) with slides, (12.2%) with Water play equipment and (17.6%) of children play with structure play equipment. The study also indicated that (2%) of children always with teachers in the garden, and (20.4%) of children play without use any kind of materials and play equipment.

4 - The study indicated that (92%) of teachers demanded that the garden should comprise plants with colored flowers, (89%) asked for an area devoted for vegetables and fruit plants. The teachers (82%) asked for a safe border for the garden, protecting from the outside animals intruders, (87%) of the teachers asked for appropriate gate for the garden. Concerning the paved area, (71%) of the teachers asked for paved area for outdoor classroom and (67%) of the teachers demanded for safety paths in the garden.

5 - The design used for Bolzani kindergarten fulfilled all the educational aspects (concepts, skills, values). Sea garden for play equipment achieved (41.7%) of the concepts, skills and values, while vegetables and fruit garden achieved (29.2%) of the educational aspects. The Butterfly garden, Suspension bridge, Rainbow garden and Alphabet/music board achieved (20.8%, 18.8%, 12.2%, 10.4%, 10.4%) respectively of the educational aspects.

6 - The study on plant colors indicated that the color of leaves for trees affected the garden during September, October, June with (98.7%, 96.3%, 99.7%) respectively. The effect decreased during December, January, February and March (52.3%, 50%, 50%, 51%) respectively. The study also, indicated that the colors due leaves for shrubs affected the garden during September, October, May and June by (96.5%, 94%, 100%, 100%) respectively. The color due to leaves for herbaceous affected the garden during May and June by (100%) each and the effects decreased in the other months.
Regarding the color due to flowers for trees, the study indicated that trees affected the garden during March, April, May and June by (16%, 38%, 30.7%, 21.3%) respectively. The flowers of *Magnolia soulangeana* gave the highest color values while the flowers of *Malus Robusta* gave the lowest values (4%). The flowers due to shrubs affected the garden during the month of June by (36%), while its effects decreased during September, October and November by (1.33%, 0%, 3.3%) respectively. The flowers of *Jasminium nudiflorum* gave the highest values of color (16.7%) while the flowers of *Viburnum opulus* gave the lowest values (2%). The flowers of the herbaceous affected the garden during the June by (39.6%) and the values decreased during the month of December and January. The flowers of *Callauna vulgaris* gave the highest values (28.7%), while the flowers of *Gerbera jamisonii* gave the lowest values (9.3%) among the months of the study.

The study due to fruits indicated that the colors of fruits affected the garden during September, October and November by (73.3%, 83.3%, 79.3%) respectively and the effect decreased during other months. The fruits of *Citrus sp.* gave the highest values (100%) due to fruits, while *Aucuba japonica* gave the lowest values (10%).

7 - Based on the result of the study, the components of kindergarten gardens under Egyptian conditions were determined and it was shown that 600 sq.m. are the minimum requirements for appropriate kindergarten garden serving 25 children and the garden comprised five main areas:

A - An sandy area of 160 sq. m. comprised five play equipment, (structure plat equipment, Two spring play equipment, slide, swing and water pay equipment).

B - An open play area of 180 sq. from lawn for free play of children.

C- Paved area of 100 sq. as outdoor classroom and for driving moving play equipment.

D- An adventure area for discovery contain a kind of huts, bridge, tunnel, and a place for birds or small pool with color fish.

E- An area planted with vegetables and fruit plant with place as a nursery for children.
VI - LITERATURE


