PRIORITIZING PROPER GRASS FOR GREEN SPACES (CASE STUDY: GHIR-O-KARZIN CITY)

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ABSTRACT
There are many fundamental problems related to the green spaces of Ghir-o-Karzin city. Many efforts are being made each year to improve the quality of such spaces. Apparently such activities are intended to increase the environmental quality of the cities; but here most of them do not reach the optimum results expected by their designers. It may be because of the unilateral view about different parts of urban habitat-consistency and absence of a relationship between ecologic, aesthetical guidelines and design functions. In this study, using the so-called hierarchical model AHP, proper grass kinds for being used in green spaces of Ghir-o-Karzin were prioritized and the best plants were introduced. The results showed that types of Chayer, Zvyshya and Behya were the most suitable ones to be used due to their optimal tolerance in the climatic condition of Ghir-o-Karzin.

KEY WORDS: *Green spaces, Ghir-o-karzin, AHP, Grass*

Introduction

With the increase of urban population, changes in life styles and new job patterns in modern life, far from natural open landscapes whence people used to find mental or spiritual peace, need for recreation and leisure is increased among citizens as one of the most important needs of them. The leisure includes all activities which people willingly want to do in their free times-free from occupational or social responsibilities, mostly with their family-whether for getting some rest, recreation, to expand their knowledge, self-educating, free social participation or to inspire their creativity. In other words, leisure is a kind of activity which is done in relative freedom due to its satisfying qualities (Lese Yoved et al, 2001). The leisure time activities have a wide range of variety such as artistic, cultural, sport, sacred pilgrimages, audiovisual, comfort & recreation, social relationships, inspiring from the nature, reading and computer activities; each one of them require their own specific circumstances (Amestoy, 2008). Urban green spaces are parts of each city which are covered by natural plants and protected against pavement areas or buildings (Balram and Dragicevic, 2005). As essential parts of urban areas, green spaces are very important for improving the life-quality of residents and environmental sustainability of cities (Gupta et al, 2012). They have many advantages & benefits for people which deal with their health; for example, reduction of stress and mental tensions, cooling & balancing the temperature of urban environments, to absorb the polluted air and producing oxygen, providing chances for people to perform physical exercises

(Villeneuve et al, 2012). According to the various climatic conditions of Iranian cities, such as Isfahan and Charmahal Bakhtiari, a wide range of potential local plants grow here which can be used to develop such gardens. The implant and growth of plants depend on the genetic structure, environmental conditions and the soil. Whence the climatic conditions in large scale is not controllable, choosing plants to be used in green spaces or agriculture must be in a way that its climatic conditions are the same as plant's natural ecological requirements, so that the plant could grow, reproduce and adapt well with the environment. A green space designer should consider plant's natural birthplace and their destination environments for using local plants. This will result in purposeful selection (Jani Ghorban, 2011).

Review of Literature

Motamedi et al (2012) in their paper "Evaluating the urban green spaces in comparison with Standard per capita" studied the status of green spaces within the 10th region of Mashhad's Municipality, comparing them to the standard per capita, and also the accessibility for the citizens due to their dispersal. Their results showed that for locating parks within the area of study, criteria like distance from available parks, distance from main streets, concentration of people and the centrality were considered. Jani Ghorban (2011) in her article "Using native species in developing green spaces" emphasizes on their applicability. She states that choosing suitable type of plants for green spaces in large scales particularly within the urban environments and the parks shall be made according to the ecologic elements of the determined place and adjustment regarding the original habitat of the plants. She collected 6 types of tree, shrub, herb and grass plants from different regions and made herbarium samples of each type; then they were precisely given scientific names using flours and various resources. Salehi Fard (2009) in his research "An analysis on social dimensions of urban green spaces" stresses the view of citizens. His results show that the socio-cultural effects of green spaces are both ideal (building social interactions, spread of urban culture, awareness of citizens, etc.) and undesirable (birthplace of many urban crimes, development of vandalism, etc.). Nadja Kabisch (2014) in her paper "Ecosystem service implementation and governance challenges in urban green space planning—the case of Berlin", concluded that providing ecological services might be a good background for discussing the promotion of protecting available urban green spaces and also for building relationships between citizens in all levels. Wei Li (et al.) in their research "A comparison of the economic benefits of urban green spaces estimated with NDVI" discuss the economic benefits of such plans. They state that pricing is applicable only when enough data related to the land cover is available. Their results show that the benefits of using high resolution data NDVI is more than using medium resolution data (CLC) in urban green spaces plans.

Materials and Methods

The AHP method was used in this study. AHP is a simple calculative method based on major functions in the matrixes. Providing proper hierarchy and step-by-step processing along with building comparative matrixes in different levels of the hierarchy, the special vector & special amount of them are calculated and combining the weight coefficients, different options can be measured. In vector of weight coefficient, relative importance of each option will be determined according to top target of each hierarchy. Using Expert Choice software, each plant type considered

for being used in green spaces were given proper weights and the priority graph of trees being used was resulted.

Area of the study

Ghir-o-Karzin is one of the counties in Fars province, with 184 km distance from Shiraz. It covers an area of 3402.98 km^2. Based on climatic conditions, it is classified as a dry area; in winter, there is much downfall. Summer, on the other hand, is hot and dry. The annual rainfall amount is 270mm. During the summer, the maximum temperature is 46 degrees while minimum temperature is 1.25 degrees in winter.

Results and discussion

To evaluate the proper grass for urban green spaces, firstly a target and secondly other criteria for planting were determined; then all options considered in relation with the green space were classified as following:
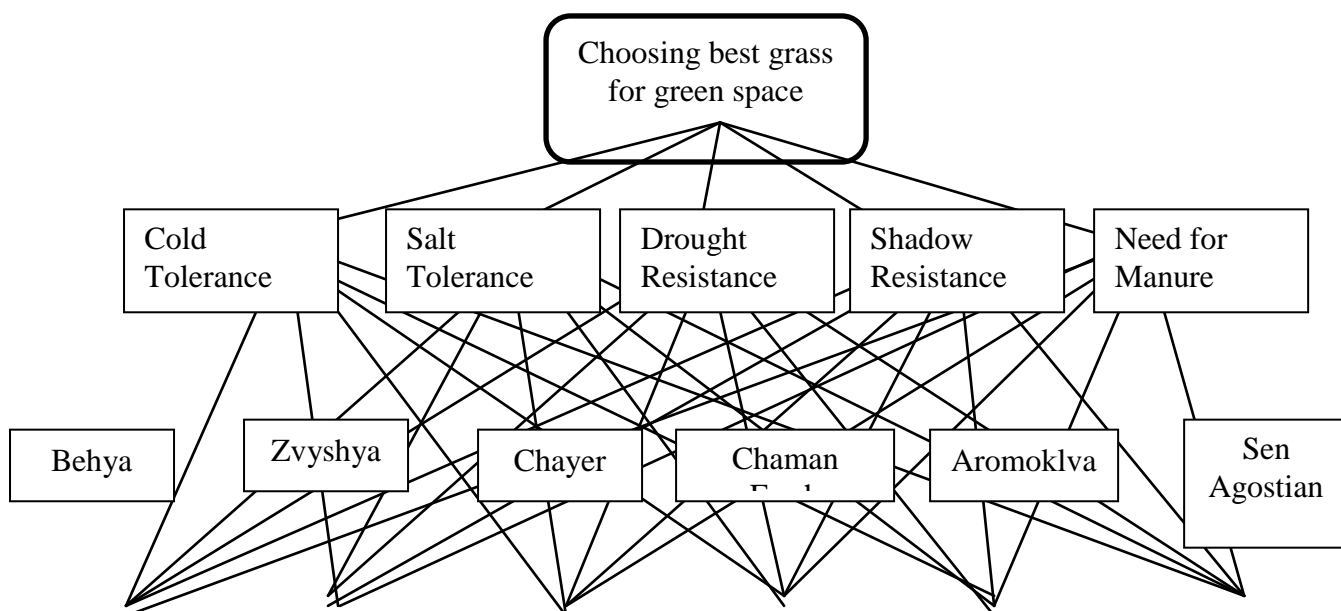

Figure 1: The tree chart of prioritizing grass type for green spaces (authors, 2014)

After giving the data to the Expert Choice software, according to the weight-giving criteria defined earlier, the following diagram was resulted:
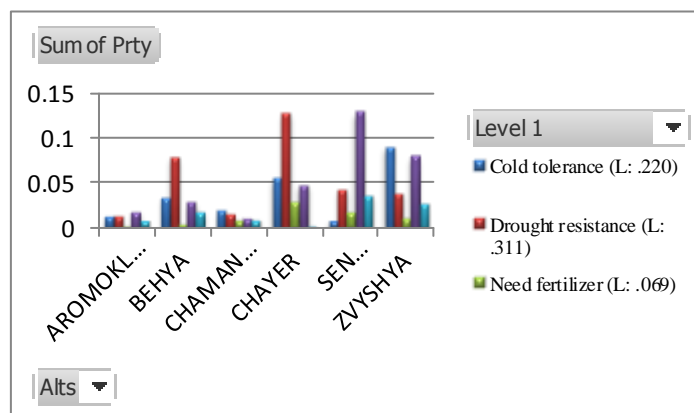

Figure 2: Chart of prioritizing the grass (authors, 2014)

According to the charts, Zvyshya has the most cold-tolerance; unlikely, Aromoklva has the least cold-tolerance. Chayer has the maximum drought-tolerance while Chaman Farsh has the minimum drought-tolerance. This proves that the Chayer type is very strong. Regarding the need for manure, Chayer is at the first place while Aromoklva has the least need; this shows that the Chayer type requires attention and care. Sen Agostian has a high value in salt-tolerance while according to the charts Chaman Farsh has the least salt-tolerance ability. In shadow resistance criterion, Sen Agostian has the highest value but Chayer is the last option.
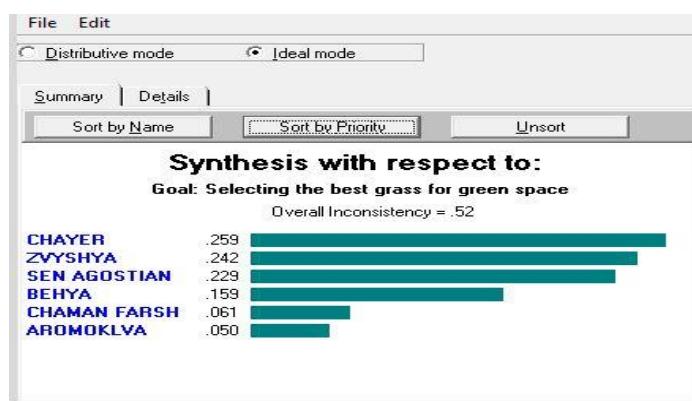

Figure 3: The Diagram of Choosing the best tropical grass for green spaces (authors, 2014)

Since Ghir-o-Karzin is located in a tropical region it's important to choose suitable types of grass regarding the climatic conditions of the area. The prioritizing process carried out by the AHP model and the Expert Choice software show that types of Chayer, Zvyshya and Behya due to their suitable features are fit to be used in green spaces of Ghir-o-Karzin.

Suggestions

1- Removal & replacement of trees or plants which are not fit to the climatic conditions.
2- Paying attention to the beauty of images which trees build in green spaces.
3- Noticing the water consumption rates and costs of plants used in green spaces.
4- Using proper, fitted, beautiful and aromatic types.
5- Planting plants which are less calamity-stricken by the vermin.

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