

# ID 1678 | AN EVALUATION OF THE ACCESS TO NEIGHBOURHOOD PARKS BASED ON THE “NEED-BASED EQUITY”: A CASE STUDY IN IZMIR (TURKEY)

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**ABSTRACT:** This study aims at contributing to the studies about how spatial distribution of neighbourhood parks in existing cities shape the opportunities for equitable access to “healthy environments” of the “need-groups”—here, low income groups, women, children, and elderly. Based on the “need-based equity,” it evaluates such need-groups’ “access” to neighbourhood parks in the central districts of Izmir, the third biggest metropolitan city in Turkey. It deploys “equity mapping” with the help of geographic information system to analyse and interrelate the basic data about the characteristics of neighbourhood parks and the population that is available in Turkey’s context but relatively limited compared to European context. It comparatively identifies and evaluates the objective characteristics of the built and social environment at the city scale and relates the findings to the discussions of the relations between built environment, health and urban justice.

## 1 INTRODUCTION

Neighbourhood parks are ideally green open spaces in residential areas that can provide various opportunities to its users for socializing, improving physical and mental health and expressing own identities. Getting access to such opportunities is especially important for those whose life conditions may lead them to live close to their home and neighbourhood space—such as low income people, women with children, children and elderly. This study calls these significant and potential users of parks as “need-groups.” Yet in reality, these need-groups do and may not have “perfect” access to neighbourhood parks, due to characteristics of the built environment that can be shaped by urban planning decisions or/ and social characteristics of these groups that can be easily ignored again by planning decisions.

This study argues that we need to examine the existing cities to analyse whether green public spaces (such as neighbourhood parks) are within walking distance especially to and in those neighbourhoods with high percentages of low income groups, women with children, children and elderly, which has been an ideal in urban planning and design traditions. Relying on an understanding of “need-based equity,” we underline that examining the allocation of neighbourhood parks through the existing cities in relation to the questions of who gets what and why is necessary both to improve the purposes for healthy environments and also our ethical standing as urban planners (Talen 2010). Also, such analysis can improve our decisions about re-allocation of public resources through cities and about “efficient” urban planning and design of open and green public space (Boone et al., 2009).

Briefly, the idea of “need-based equity” suggests that in the redistribution of public resources, the groups that are traditionally disadvantaged due to their class, gender, race/ethnicity, age and so on should have the priority (Lucy, 1981). These are the need-groups for these public services, such as open and green public spaces. Based on this idea, we deploy “equity mapping” (Talen 2010) with the help of geographic information system to analyse and interrelate the basic data about the characteristics of neighbourhood parks and of population. We evaluate such need-groups’ “access” to neighbourhood parks in the central districts of Izmir, the third biggest metropolitan city in Turkey. We use basic data that is available in Turkey’s context but relatively limited compared to those in European context. It comparatively identifies and evaluates the objective characteristics of the built and social environment at the city scale and relates the findings to the discussions of the relations between built environment, health and urban justice.

## 2 LITERATURE REVIEW

This study considers neighbourhood parks as important for two major reasons. They are public open spaces and public service areas. Related to that, access to neighbourhood parks is necessary especially for those whose daily lives are bounded to neighbourhood and home space, such as housewives, children, seniors, and low income people. At its discussion about the importance of neighbourhood parks, this paper relates to both the researches examining social groups' access to public service areas as an issue of urban and environmental and also those investigating built environment's impact on individuals' physical and mental health (for a review, see Kent & Thompson 2014).

When interrelating these researches, this study situates the issues of built environment and health at the centre of the debates about urban justice, similar to an argument in urban geography, urban planning and politics (e.g., Boone et al. 2009; Byrne & Wolch 2009; Heynen et al. 2006; Pulido 2000). At this argument, urban parks appear as part of "environmental amenities" due to their characteristics providing various benefits and opportunities for improving health, environment, economy, and public life (Boone et al., 2009; Sister et al., 2011). Similar to a distant proximity to environmental disamenities, closeness or a short proximity to environmental amenities (such as public parks) is necessary to improve individuals' and communities' health and quality of daily life. Moreover, created by using public resources, the allocation of public service areas (such as parks) in the city must be taken as the spatial distribution of public resources. So individuals' access to these parks affect their and also public welfare (Byrne & Wolch, 2009; Talen & Anselin, 2001; Talen, 2001; Wolch et al., 2005).

Yet in reality, the opportunities of benefiting from such amenities and public service areas are not equitable distributed among each urban area, community and dweller. This body of work overall criticizes that the existing conditions for people's access to public services, healthy living conditions, local democratic representation and similar public resources are unjust and getting worse especially for disadvantaged groups, such as the poor and low income population, elderly and children. Moreover, it argues for the necessity of an "equitable" spatial distribution (e.g., Harvey, 1973; Boone et al., 2009; Heynen et al., 2006; Marsh & Schilling, 1994; Talen 2010; Wolch et al., 2005) and planning and design (e.g., Loukaitou-Sideris 1995; Low et al., 2005) of public (service) areas built by public resources. Given that human health and also spatial distribution of public resources are criteria at issues of environmental and urban justice, so does the accessibility to urban public parks (Boone et al., 2009; Sister et al., 2010; Heynen, 2006; Heynen et al., 2006; Swyngedouw & Heynen, 2003).

### 2.1 HOW TO ALLOCATE (NEIGHBORHOOD) PARKS

When examining the accessibility to urban parks, studies emphasize to investigate either individual or structural factors or sometimes both. The former investigates majorly the users' socio-economic and park use characteristics, but rarely relate these to structural factors (e.g. Day 2008; Koskela & Pain 2000; Low et al. 2005; Loukatiou-Sideris 1995). The latter considers basically political, administrative, planning and design decisions affecting the allocation of parks, various characteristics of social and built environment and also interactions among these factors. Works in this group develop studies at city and neighbourhood scale, while only some is based on a perspective for equitable accessibility to parks (e.g., Heynen, 2006; Heynen et al., 2006; Sister et al., 2010; Wolch et al., 2005; Talen & Anselin, 1998; Talen, 2001).

Within the perspective underlining equitable accessibility to parks, some of these few studies underline the "procedural" (i.e., historical, political, administrative and socio-cultural) processes of park provision and allocation and perceptions about open green spaces and their use. Others or "outcome" oriented studies (Nichols, 2001) consider the current characteristics of built and social environment and investigates these usually at a spatial scale (namely, neighbourhood, park and park surrounding) yet with varying kind of collectible data and perceptions of "equitability."

Focusing on the distribution of parks as green public spaces at the city scale, the literature uses quantitative data about the geographical distribution of green public spaces and also of socio-economic characteristics of the city population as potential users. Accessibility is considered as individuals' easy reaching to and benefiting from these green public spaces for various purposes. Also, the ways of how to measure accessibility is considered significant in the consideration of equitable allocation of these spaces (e.g., Nicholls 2001; Talen 2010).

Moreover, these measurements can vary depending on four perspectives about “equitable accessibility” (see Crompton & Wicks, 1988; Lucy, 1981; Nichols, 2001). The works within “equality-based equity” can consider “accessibility” by counting number of public service areas in a specific region and equitable distribution as the equal distribution of costs and benefits among individuals or groups. In the case of urban parks, accessibility and equity is measured as the square meter of green space per capita or the budget spent for open green spaces in that region. This approach is criticized for considering city space as a simple geometry and also ignoring socio-economic differences among social groups and districts in the city and even discriminating against those whose needs, characteristics and choices are different from the dominant groups. Alternatively, considering potential users’ socio-economic and demographic characteristics, the “demand-based equity” can argue for the distribution of green spaces in the city according to dwellers’ demand for their neighbourhood. Yet this usually is determined by these groups’ capacity to get access to political power and mechanisms, which is not distributed equally and favours political “perspectives” (Talen, 1998; 2010). Similarly, “market-based equity” (or “those with money can get services”) favours a portion of the society.

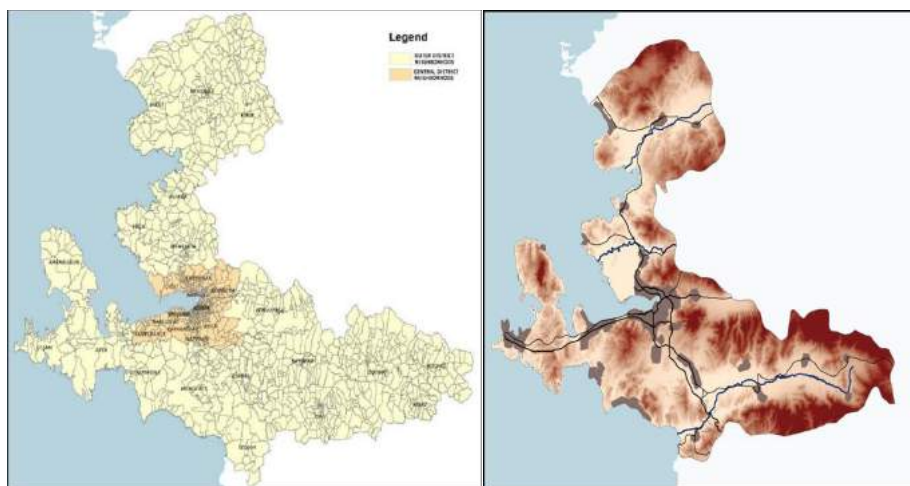
Another perspective argues for “compensation” (Crompton & Wicks, 1988) or “need-based equity” (Lucy, 1981). This considers some groups have been already disadvantaged in getting access to urban resources. However, the main problem is not these groups’ inequitable access to public service areas but their continuous experiences of socio-economic and spatial inequities because of their socio-economic characteristics based on class, race/ethnicity, age, gender and others (Byrne & Wolch 2009; Sister et al. 2010; Heynen 2006; Talen 2010). Thus, this perspective argues for the allocation of public resources and service areas to fulfil the needs of these disadvantaged groups. These groups are basically the poor and low income groups, racially/ethnically marginalized groups, children, seniors and those without cars and so on.

### 3 STUDY METHODOLOGY AND SITE

Based on the perspective of “need-based equity,” the studies that measure and investigate accessibility to (neighbourhood) parks deploy majorly with quantitative data about the spatial distribution of primarily population characteristics of the disadvantaged groups and also of characteristics (e.g., size and amenities) of green public spaces. Through the tools of geographic information systems (GIS) and using other multiple variables, they compare the relationships majorly between these two spatial distributions at the city scale and ultimately, aim at measuring the disadvantaged groups’ accessibility to green public spaces. Relating their findings to issues of urban justice, these analysis are called as “spatial equity” (Talen & Anselin, 1998) or “equity mapping” (Talen 2010).

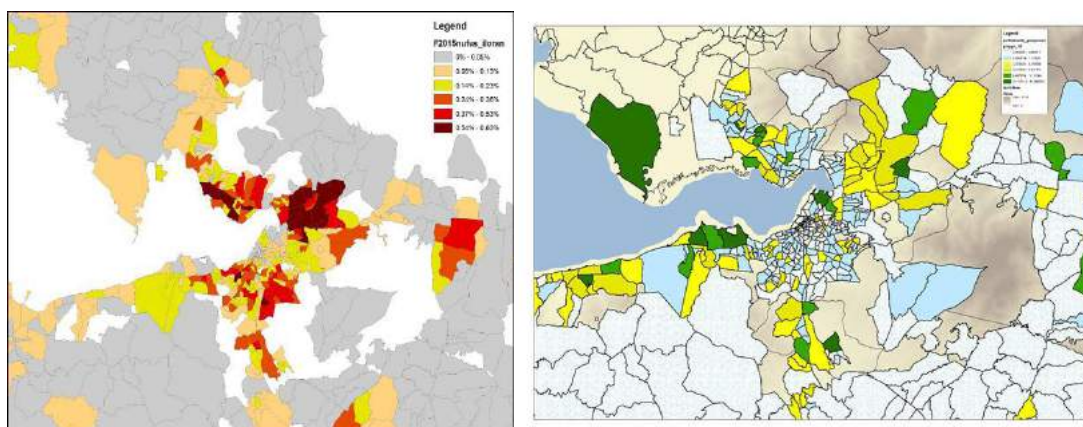
Deploying various kind of equity mapping, the literature focuses majorly on the cases at the city scale in the United States. These works deal majorly with quantitative data driven from “census tracts.” However, given the different forms and availability of data at city scale across the countries, there is a need to re-deploy this approach and method in different contexts with own available data. We aim at fulfilling this need through our case study with the data about Izmir Metropolitan Area and also central city of Izmir. In Turkey, the data about socio-economic characteristics is limited about sex, age, education level and so on at neighbourhood level, but lacks any information about income, wealth, race/ethnicity or political choices or so on. Also, if it exists and assuming that it is reliable, the data about green spaces is available by the municipalities but only about location and size. Also, when working as a unit of analysis, we must consider that boundaries of neighbourhoods are non-homogeneous.

Izmir is the third biggest metropolitan area of Turkey with a population near 5 million at its central and rural districts (Map 1 & 2). The central city with its 11 districts (out of total 30 of metropolitan area) extends along its bay area to the west and immediately on the hills to the east.



Map 1 and 2: Izmir districts and settlements.

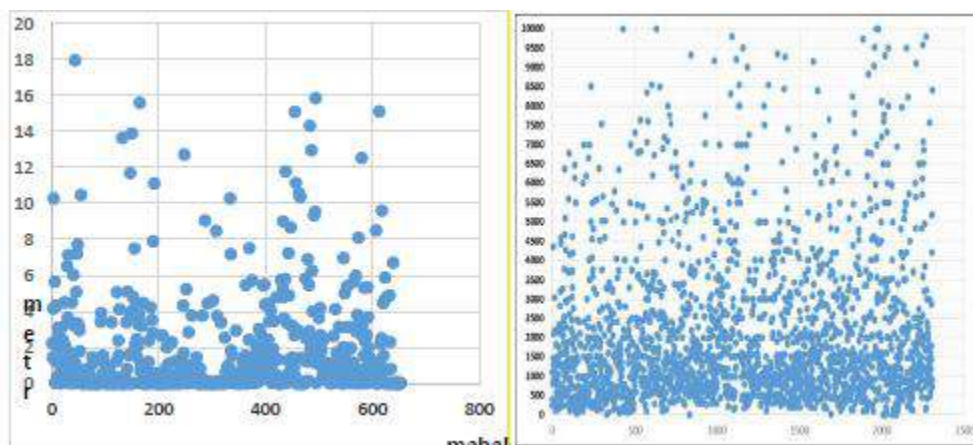
With one of Turkey's densest urban population at its central districts, the city of Izmir has its major commercial areas at coastal neighbourhoods. With an education level higher than Turkey's average, the city gets high level migration especially from its hinterland cities with agriculture base and also south-eastern cities with high concentration of Kurdish people.



Map 3: Distribution of neighbourhood populations

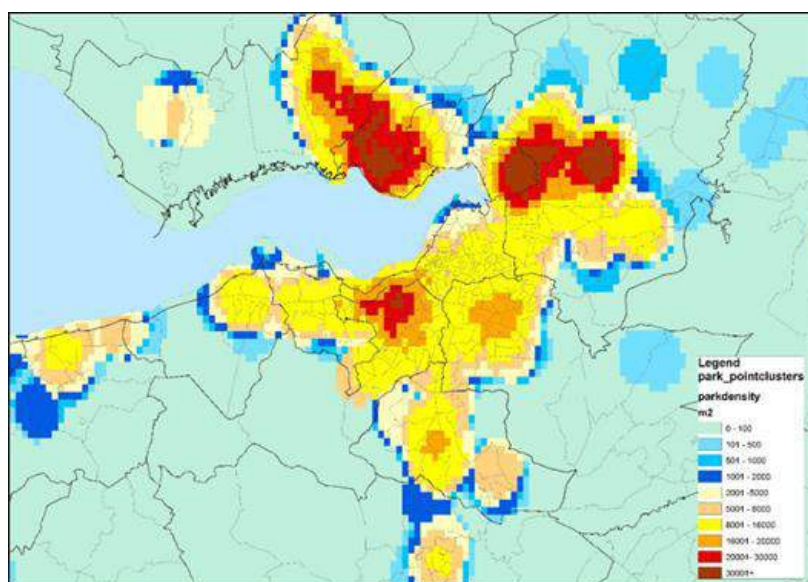
Map 4: Distribution of size of neighbourhood park areas per capita across neighbourhoods

While the central districts are the most populated areas of the metropolitan area of Izmir, the shares of neighbourhoods in these districts from provincial population (Map 3) and also the size of neighbourhood park areas per capita (Map 4) vary and tend to increase to the north and then to southeast. Yet still across total 657 neighbourhoods, the average neighbourhood park area per capita is around 2 square meter (Graph 1).



Graph 1: Size of park area per capita Graph 2: Distribution of neighbourhood park size

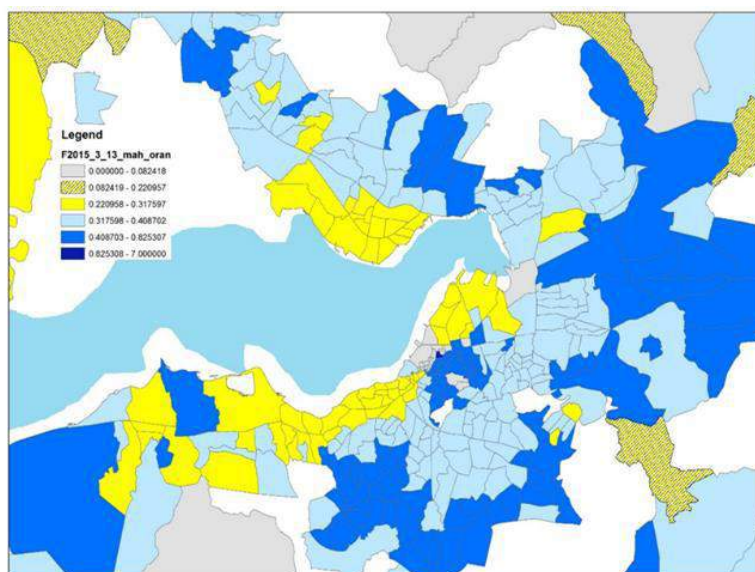
In central districts, the sizes of neighbourhood parks vary tremendously yet with a high concentration under 2.000 m2 and then under 500 m2 (Graph 2). Again the northern districts (Bornova and Karşıyaka) are richer with their major urban parks. When we examine the “impact area” or “clusters of the neighbourhood park areas through “point-density” analysis at GIS, the results again show certain districts with higher level than the others (map 5).



Map 5: “Clusters”/ “impact areas” of neighbourhood park areas according to “point density” analysis.

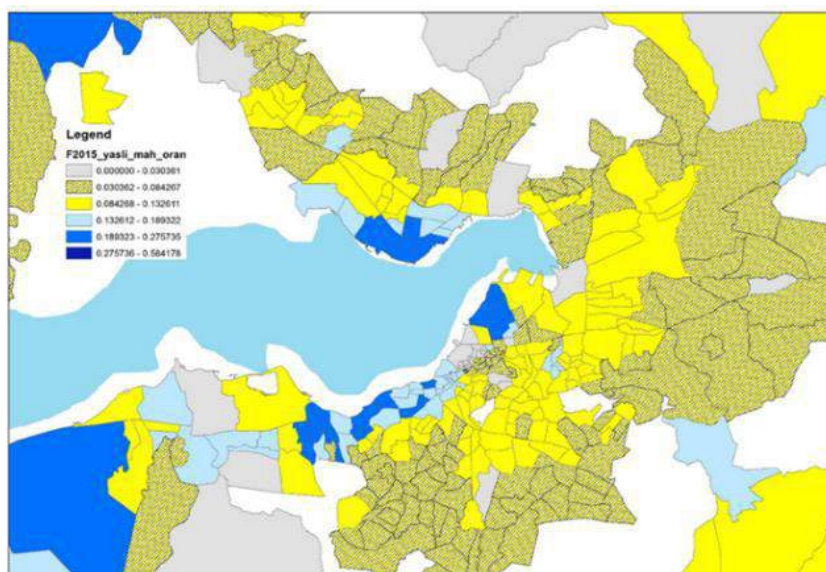
### 3. 1. DISTRIBUTION OF “NEED-BASED” GROUPS IN CENTRAL IZMIR

We can that the neighbourhood shares of total number of children (age 3—13) (map 6) and seniors (age 65+ ) at provincial level vary across the neighbourhoods but in opposite direction and between those along coastal line and on the hills. The former has higher shares of seniors (map 7).



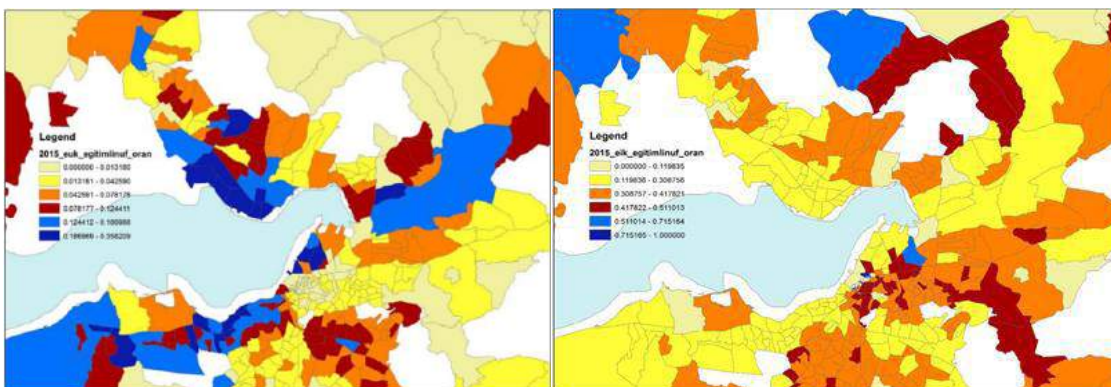
Map 6: Neighbourhood shares of total number of children at province

Also, determined by the number of students, big schools with children (preschools, elementary and secondary schools) and with teenagers (high schools) are located usually at the northern central districts of Izmir (maps to add).



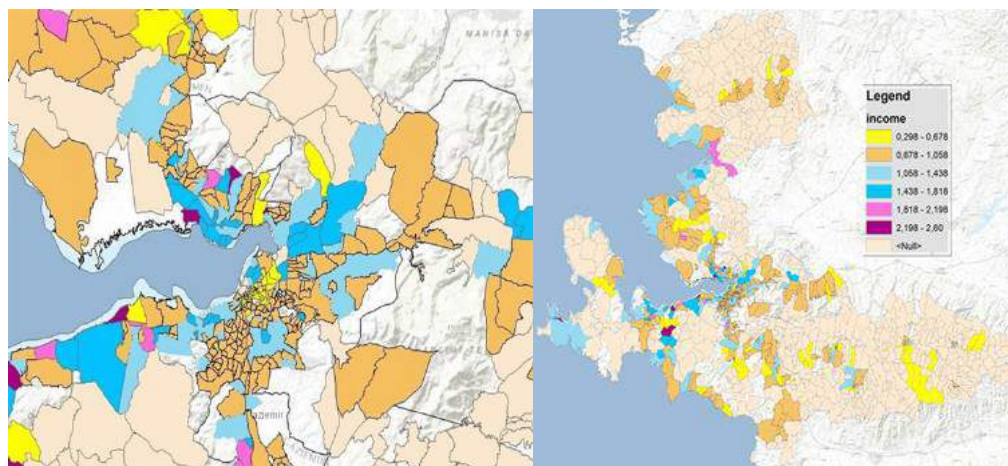
Map 7: Neighbourhood shares of total number of seniors at province

Another group of spatial distribution of population characteristics we examined as part of “need-based” groups is the education level. Similarly, the differences are apparent between the coastal and hilly neighbourhoods but also to the north with a high share of “women with high education level.”



Maps 8 & 9: Neighbourhood shares of total number of respectively “women with high education level” and of “women with low education level” of province

Finally, based on a sample data improved for another project, we have the distribution of income level per household. Those areas below the average income level of the sample (in brown and yellow colour) are those neighbourhoods outside the coastal and northern neighbourhoods.



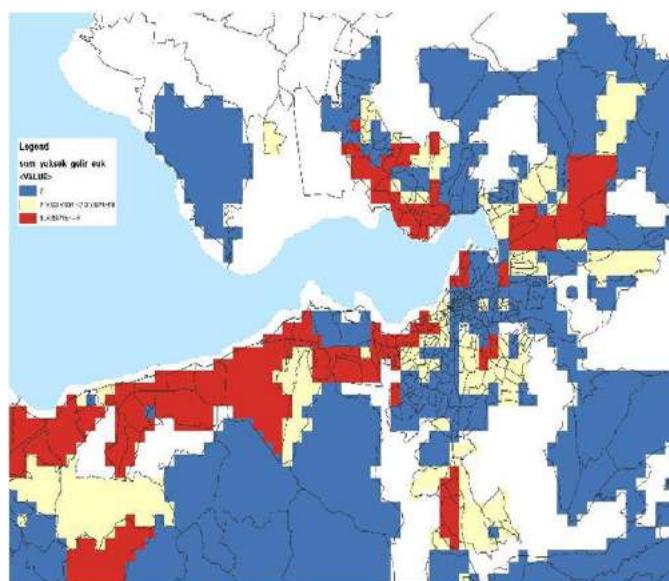
Map 10 & 11: Spatial distribution of household income level at central city and provincial level.

### 3.2. HOW TO RELATE CHARACTERISTICS OF NEIGHBORHOOD PARKS AND NEED-BASED GROUPS

In order to relate the neighbourhood parks’ and need-based groups’ characteristics, we developed both Pearson correlation and also regression analysis. Accordingly, we see that there is no correlation between education level and age groups, while there is linear correlation between income level and education level but none with age groups. Moreover, our regression analysis underline two major findings: i) Those neighbourhoods with higher household income level, low population density and higher education level by women tend to have more size of neighbourhood park area per capita. ii) at provincial level, at rural level the higher the income level and the size of age groups of 6-13 and 30-55 the higher is the size of neighbourhood park area per capita.

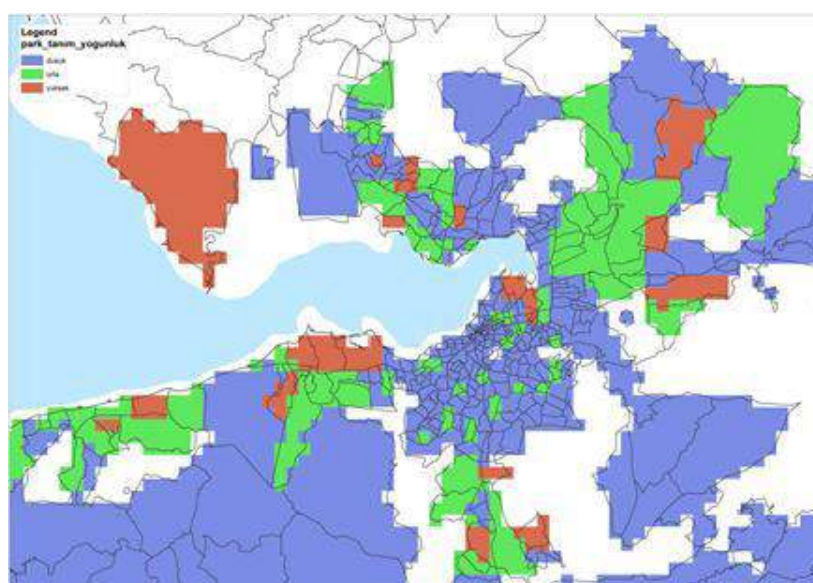
Relating to these findings (especially the first one) pointing to “significant” variables (education level by women, average income level, population density at neighbourhood level, and size of neighbourhood park size per neighbourhood), we deployed “overlay analysis” at GIS in order to “map” the “park rich” and “park poor” areas with need-groups. The results are:

Map 11 shows areas resulted by the juxtaposing of the average income level and education level of women. Accordingly, the areas with “high” values (red) extend along the coastal line especially to the south and again to the north including the hilly areas (Bornova). The areas with “medium” values (yellow) are those next to “red” areas. And the rest is with “low” values (blue).



Map 11: Juxtaposing income and education level

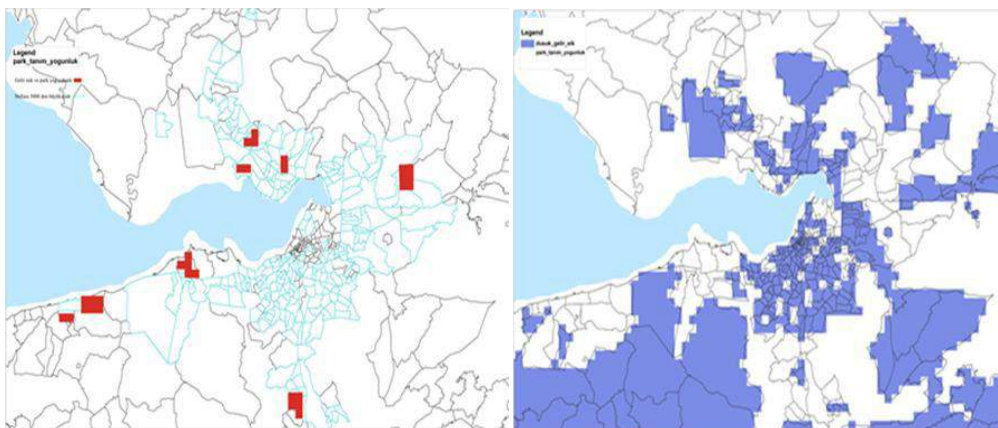
Another map developed by “overlay analysis” is the spatial distribution of size of neighbourhood park areas per capita. “Red” shows again the “highest” values, “blue” shows the “lowest” values.



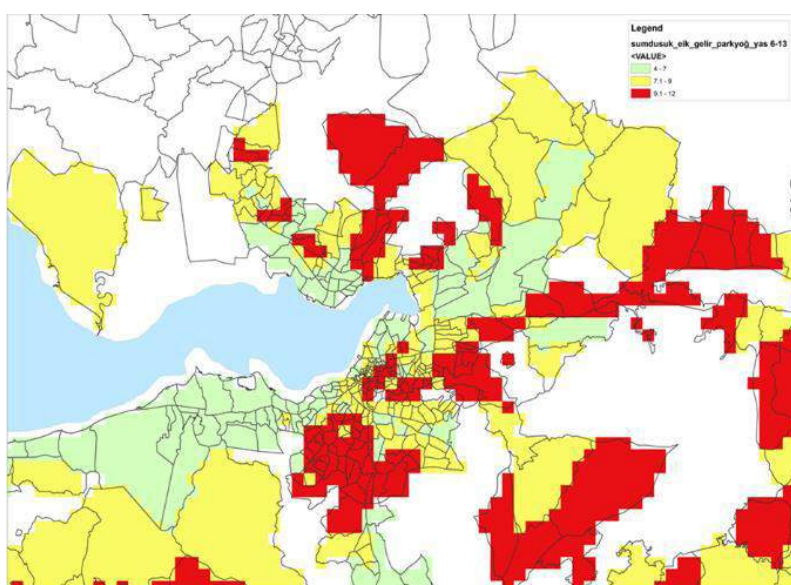
Map 12: Size of neighbourhood park area per capita (by “overlay analysis”)

Then we interrelated respectively “high” values and then “low” values at both of these two maps in order to find out both “park rich” areas and “park poor” areas according to population characteristics.





Map 13 & 14: Respectively “park rich” and “park poor” areas according to population characteristics



Map 15: Juxtaposing “park poor” areas with high level of shares of the age group of 6-13

Finally, we also took the age group of 6-13 (which appeared as significant at regression analysis earlier) into consideration especially for the “park poor” areas. The final map tells that “park poverty” in the hilly areas away from central coastal areas (in “red”) (Map 15) gets more dramatic especially for the children between 6-13 and their families.

#### 4 CONCLUSION

Arguing that neighbourhood parks are important for improving body and mental health especially of those need-groups, this study attempted to map “park rich” and “park poor” areas in the central districts of Izmir especially related to characteristics of the population. Relating to the results of the regression analysis, we underlined the linear relation between income level, education level by women and size of neighbourhood park areas per capita across the neighbourhoods. These results have lead our priorities at the analysis (especially overlay analysis) at GIS. Our final maps point that “park poor areas” are those low income neighbourhoods with low education level by women and away from the coastline. Also, some of these “park poor areas” get worse, given that they have higher level of the share of age group of 6-13, that is children at elementary and secondary school level.

#### 4.1 ACKNOWLEDGEMENT

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