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Journal of Global Scientific Research

journal homepage: www.gsjpublications.com/jgsr



Effects of Population Pressure on Forest Resources in Trabzon-Turkey and How to Conserve them

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ARTICLE INFO

Received: 25 Feb 2022,
Revised: 27 Feb 2022,
Accepted: 7 Mar 2022,
Online: 5 Apr 2022

Keywords:

Land use/land covers (LULC),
Urbanization, Urban, Trabzon

ABSTRACT

The high population thickness in urban zones has brought about an enormous scope modification of the environment in the urban fringe. Urbanization is a mind-boggling procedure of changing over urban fringe and rustic land to urban land utilizes and has caused different effects on ecosystem structure, function, and dynamics. On one hand, the high rate of urbanization causes high density in settlement restricted zones of cities, then again, it costs increments to society because of the subsequent unplanned and uncontrolled urbanization and land use with the skirts, particularly in the urban fringe of natural habitat/landscape pieces and the defiled utilization of urban territories without considering natural law or the ecological balance. Suburban, urban fringe, and provincial advancement are the main source of biodiversity misfortune and natural asset degradation in Trabzon region. Forests used to be the main field of enthusiasm for provincial communities, however, now they pull in the consideration of urbanites as well. The forest-the advertising is significant as forests secure water assets, preserve the soil and increment its productivity, give positive impacts on climate and health as a rule, and can be utilized for recreation and tourist purposes. Our review aims at evaluating how the current rapid urbanization process in Trabzon influences forests. Urban necessities, for example, biomass for heating, education facilities, settlements, recreation, tourism, and employment apply different pressures on the forest.

1. Introduction

Turkey has 213,890 km² of forests and 99.9% of these are claimed by the state and other public entities (Erdoğan Atmış, 2013). Some problems happen in sustainably dealing with the backwoods assets, for example, faulty applications, association and management, the structure of ranger service, and especially forest villages and villagers that are legitimately or in a roundabout way identified with forests. Social, economic, geographical, and cultural circumstances of these

villagers constrain them to clarify cutting for agricultural and settlement purposes, starting forest fires, illicit cutting, and grazing. These exercises have brought about noteworthy forest degradation.

Both the quality and quantity of the forests have diminished due to the socio-economic conditions of the forest villagers. Accordingly, Turkish forests have neglected to deliver timber and timber-based items, hydrological, erosion control, climate

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doi: [10.5281/zenodo.6380033](https://doi.org/10.5281/zenodo.6380033)

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alleviation, scientific, nature conservation, and recreation functions (Mustafa F. Türker, 2003).

Urbanization is one of the clearest global changes on the planet. During the last century, rapid urban growth has applied substantial weights on land and resources, in urban just as rural zones (M.A. Hoogstra, 2004). Enormous pieces of the world have become profoundly urbanized and the majority of the world's population presently lives in cities and towns (Konijnendijk, 2003). In 1900, just 9% of the world's human population lived in "urban environments". This figure had expanded to 40% by 1980, half by 2000, and is relied upon to increment to over 60% by 2025 (Cecil C. Konijnendijk, 2003; McIntyre, 2000). In created countries, 80–90% of the individuals live in cities, while in the poorest countries just 20% live in cities (BOTKIN, 1997; Cecil C. Konijnendijk, 2003).

In Turkey, immigration of numerous rustic individuals to big cities, particularly during ongoing years caused the demographic structure to change extensively. As indicated by the year 2000 enumeration, 65% of the populace lives in urban centers. This percentage is assessed to arrive at 89% in 2025. In many countries, most of the population will live in enormous urban communities sooner rather than later. Along these lines, in the event that we are keen on helping individuals to live in better environments in an urbanizing world, there is an urgent need to examine urban environments (BOTKIN, 1997).

Urban forests, green spaces, and herbaceous open spaces assume an indispensable job in the environmental and aesthetic "health" of urban areas. The qualities and advantages are complex, including giving diversion prospects and urban biodiversity. The significance and interest of urban forests are anticipated to increment, because of the proceeding with the urbanization process (Åsa K. Ode, 2002). In numerous pieces of the world, urban woods pressures are expanding.

At present, social orders are significantly keen on woodlands, for wood production as well as for their non-timber values. The backwoods the advertising is significant as woodlands protect water assets, save the soil and increment its productivity, give positive impacts on climate and health as a rule, and can be utilized for amusement

and tourist purposes. In addition, urbanites have changed their ordinary view towards forests, and diversify their desires from forests (Carol Mansfield, 2005; C.Y. Jim, 2006). As the socio-cultural administrations which can be given by forests become better seen, such expectations increment and diversify. These expectations can prompt positive just as negative outcomes. Hence, environmental, educational, and particularly recreational aspects are of expanding significance for planning and management of backwoods in an urbanized society (Erdogan Atmis, 2007).

Turkish forest organizations are organized under the top of the Ministry of Forestry and Water Affairs (known as the ministry of Forestry and Environment somewhere in the range of 2003 and 2011). Organizations, for example, the General Directorate of Forestry bring the Forestry Operation Directorates that produce firewood and other woodland items under a similar rooftop. These are the General Directorate of Combating Desertification and Erosion, and the General Directorate of Nature Conservation and National Parks that oversee secured territories and wildlife.

Turkey is a piece of the Pan-European and Near East economical forest process. This prompted the planning of the "Forestry Sector Research Study" with the help of the World Bank, and the "Turkish National Forestry Program" with the help of the FAO.

In the Turkish National Forestry Program (2004–2023), feasible ranger service was defined as:

overseeing forest territories and sources by safeguarding and improving the integrity, biodiversity, productivity, regeneration limit, and healthiness of them so that giving ecological, economic, social, and cultural benefits for the society in nearby, national, and global levels for today and tomorrow without harming the different ecosystems. (FAO, 2004)

The most significant qualities of the recent century have been technological advancements and elatedly rapid urbanization. This reality has prompted numerous sorts of environmental and socio-economic issues at different degrees in countries, for example, Turkey (Longley, 2002; Leao, Bishop, & Evans, 2004). Understanding the growth and change welcomed on by urbanization

is basic to the individuals who study urban dynamics and the individuals who oversee assets and offer types of assistance in these quickly evolving environments (Chen, 2002; Yang, 2002; Sanchez, 2004). Urbanization is an aftereffect of a rapid population increment brought about by mass immigration from provincial zones to urban regions in Turkey. Along with this, spontaneous and subsequently uncontrolled urbanization (improvement of urban, urban fringe, and rural territory) brings about the obliteration of green areas and water resources.

Urban settlements are the most significant human habitat. Around 60% of the world population lives in urban communities and towns, producing very nearly 80 % of the global economic yield. Notwithstanding, the metabolism of urban activities (that is, land use) has become a treat to the global environment. In creating countries, other than a high pace of urbanization, urban, urban periphery and provincial zones are grown spontaneously, unplanned, as well as uncontrolled, subsequently ecological assets can't be thought about intentionally. On one hand, the high pace of urbanization causes high thickness in settlement limited regions of urban communities, then again, it costs increments to society because of the subsequent spontaneous and uncontrolled urbanization and land use with the skirts, particularly in the urban edge of natural habitat/landscape pieces and the adulterated utilization of urban zones without considering natural law or the ecological balance (Cenap Sancar, 2009). Land-use change can assume a significant job in environmental changes and contribute to global change and biodiversity loss (Chen L, 2001; Zongming Wang, 2006). Changes in urban (fringe) land-use have significant consequences for natural resources, particularly natural habitat ecosystems, through their effects on soil and water quality and climatic frameworks (Chen L, 2001) bringing about genuine environmental issues from macro to micro-scale. Understanding land-use changes is fundamental for sustainable management of regular assets and urban territories as it permits decision-makers to take a more extensive perspective on the urban framework and its components (Alphan, 2006).

The principle problem is the difficulty between the protection of the environment and urbanization.

One of their spatial showcases has been expanded fragmentation and consistency of eco-systems (scenes) and urban communities. The rates, scales, and reasons for the urban change have impacts affected urban areas and have produced solid reverse processes (Mattos, 2002). Urban communities have gotten increasingly vulnerable and globalization has decreased their security and independence (Cenap Sancar, 2009).

Remote sensing (RS) and geographic information systems (GIS), given their cost-effectiveness and technological soundness, are progressively being utilized to create valuable sources of information and to support decision making regarding a wide cluster of urban applications (Lo, 2002). GIS and RS techniques are valuable to urban planners and have been utilized progressively in urban, rural, and territorial examinations. Especially, GIS gives a powerful tool in the geoenvironmental evaluation procedure to help urban land use arranging (F.C Dai, 2001). Satellite pictures are conceivably helpful wellsprings of information on scene structure (Cenap Sancar, 2009).

The fast urbanization procedure can cause different problems. A high population growth rate alongside urban advancement prompts a misuse of nature, bringing about an unhealthy nature, influencing urban woods clients. (Miyan Rukunuddin Ahmed, 2003).

There is a whole other world to the forest-public relationship than simply the rural measurement. Urbanites build up different associations with woods and may have different expectations, for example, socio-cultural and environmental estimations of forests, aside from economic values (Konijnendijk, 2003). Public expectations can likewise apply pressure on woods and in the long run harm them. While the forestry sciences are traditionally applied to the rustic setting, there is growing pressure on woodlands from progressively urbanized societies living in and close by urban territories. In this way, "the forest-the public relations ought to be considered from two perspectives, for example, the relationships between rural communities including woods clients and forests, and the relationships among urbanites and forests" (Erdogan Atmis, 2007).

This investigation targets surveying how forests in Trabzon are influenced by the current rapid urbanization process.

2. Vegetation Analysis

Protection, conservation, and restoration of habitats have picked up global consideration. Along these lines, sufficient data pertaining to such habitats structures the reason for creating compelling strategies for management (Rodrigues RS, 2011).

Plant species are the most significant pointers as a key to human uses and scene change in coastal territories. They are strongly influenced by physical, micro-environmental, and aggravation attributes and they are orchestrated along an ecological slope that develops from the coastline (Lombardi, 2014). Numerous examinations have concentrated on the flora, fundamental vegetation, structure and elements of plant communities on the coastal habitats on the planet (J. C. Costa, 2011; Elena De Luca, 2011)(XIN-SHENG QIN, 2012; Rodnikova, 2012; Vitale, 2013). The factors that control the arrangement of coastal vegetation are regularly ascribed to sets of forces: common and human disturbance factors (Thomas E. Miller, 2010).

Trabzon city is one of the most evolved cities in the northeastern piece of Turkey (fig.1). Because of the unforgiving and steep environmental conditions of the region, settlements can be characterized as "littoral-linear" along the Black Sea coastal zone. The coastal zone of the locale has been for the most part accumulated to finish the global Black Sea highway and stretched out seaward to increase new recreational zones and shield the roadway from the negative impacts of waves (Fevzi Karsli, 2011; Guneroglu N, 2013).

In the quickly creating city of Trabzon in the eastern Black Sea district, the coastline has been in filled to give space to transportation infrastructure (FA, 2006; Acar C, 2007). Past scientific studies have revealed that coastal flora and fauna have been wrecked by infilling along with the vast majority of Trabzon's shoreline. The Black Sea coastal highway, with a length of 542 km, goes through the area of Trabzon, a 113 km length that structures some portion of the present study. Around 75 %of this road in the city furthest reaches of Trabzon was built by infilling the coastline (Cengiz Acar, 2014).

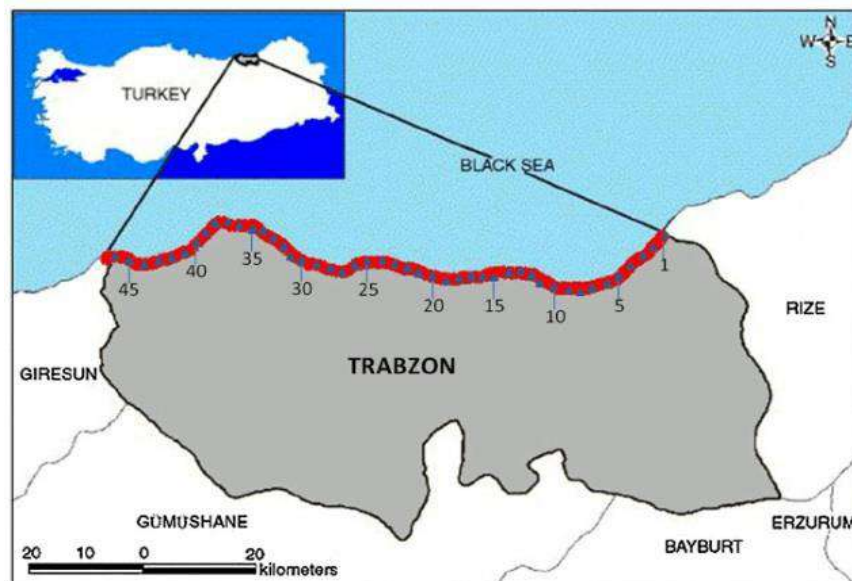


Figure 1: The study area and the location of sample plots (Cengiz Acar, 2014)

3. Urbanization and Forest Cover Change

Land use/land cover (LULC) change can assume a significant job in environmental changes and add to global change and biodiversity loss (Chen L, 2001; Zongming Wang, 2006). Changes in land-use and land cover have significant consequences for natural resources, particularly woods ecosystems, through their effects on soil and water quality, and climatic systems (Chen L, 2001) LULC and woodland cover changes are likewise the most widely recognized reason for the loss of biological productivity and biodiversity in aquatic and terrestrial landscapes (S. Kilic, 2004)

LULC change is especially identified with the expansion in population, urbanization, and escalated agriculture. Land cover change and conversion are driven by the interaction in space and time between biophysical and human dimensions (Zongming Wang, 2006). Urbanization in the world has been quickening because of population increment, immigration from provincial regions to urban regions. This phenomenon around the globe has been a significant segment of LULC change, and its essentialness will continue to increase with most of the world's population swarming into urban areas (Acar C, 2007).

Understanding scene changes is fundamental for the practical administration of natural assets and urban zones as it permits decision-makers to take a more extensive perspective on the urban framework and its components (Alphan, 2006). With the awareness of the importance of LULC change on global change, the significance of breaking down LULC changes has become the focal point of much scientific and international organizations in provincial and global scales (Chen L, 2001). In this way, the LULC change contemplates dependent on the interpretation of multi-date remotely detected information have expanded in recent years just as GIS.

4. Negative Effects of Urbanization

Air pollution is brought about by urbanization in the city of Trabzon and, therefore, harms vegetation and forest resources where (Kavraz, 2011), Human-based aggravations, for example, forest cover change, air pollution, water pollution, soil disintegration, and losses of productive land

covers and biodiversity are progressively compromising ecosystem productivity and health on the nearby and global scales (S. Kilic, 2004).

Air pollution in Trabzon

Air pollution is a significant problem during the winters in Trabzon. The degree of SO₂ and PM increments throughout the winter particularly among November and April in Trabzon as it does in different urban areas in Turkey. There is thick air pollution in the neighborhoods along the coastline in the west of the city. These pieces of the city are portrayed by high buildings. This prevents the removal of the pollution by the prevailing winds in the city. Since the pollution isn't shipped out of the city by the air, a haze of pollutant particles can without much of a stretch be found in winter months (Kavraz, 2011).

As per the information got from the Trabzon Local Directorate of Environment and Forest, Trabzon is among the second-level polluted urban areas in Turkey as far as air pollution. The geographical and topographical structure of the city, unpredictable urbanization and the insufficiency of green territories in the city center are supposed to be the fundamental driver of air pollution. Also, the thick lodging in the natural air corridors (the valleys) of the city, which would remove air pollution, forestalls air circulation, particularly in winter times (Kavraz, 2011).

Temporal Change in Forest Cover

As per what he said (Köse, 2008) the forest cover maps for 1975, 1987, and 2000 are presented in Figs. 2, 3, and 4. The territory of each forest covers class during the three periods. Results demonstrated that the woodland region diminished from 244,543 ha (46.2% of study city) in 1975 to 220,128 ha (41.6%) in 2000. Both productive and degraded woods regions decreased from 1975 to 2000. Total forest and degraded forest territories diminished during the first (1975–1987) period yet expanded during the second (1987–2000) period. Significant changes in forest cover are in the blended woodland that it decreased from 106,821 ha (20.2% of the examination region) in 1975 to 59,580 ha (11.3%) in 2000, a net abatement of 47,241 mixed forests. As a general change in Trabzon, there was a net decrease of 24,416 ha (4.6%) in total forest areas.

Study territory was 529,298, 529,300, and 529,383 ha in 1975, 1987, and 2000 individually. The case study territory expanded from 529,298 to 529,383 (85 ha) during a 25 year period. Planning unit change has developed along the shore through the years 1960–2000 and the zone

is getting greater. The purpose behind that difference is that it has been struggled to gain some land by filling the ocean so as to meet open requirements, for example, green zones, recreation zones, roads (Selçuk REIS, 2003).

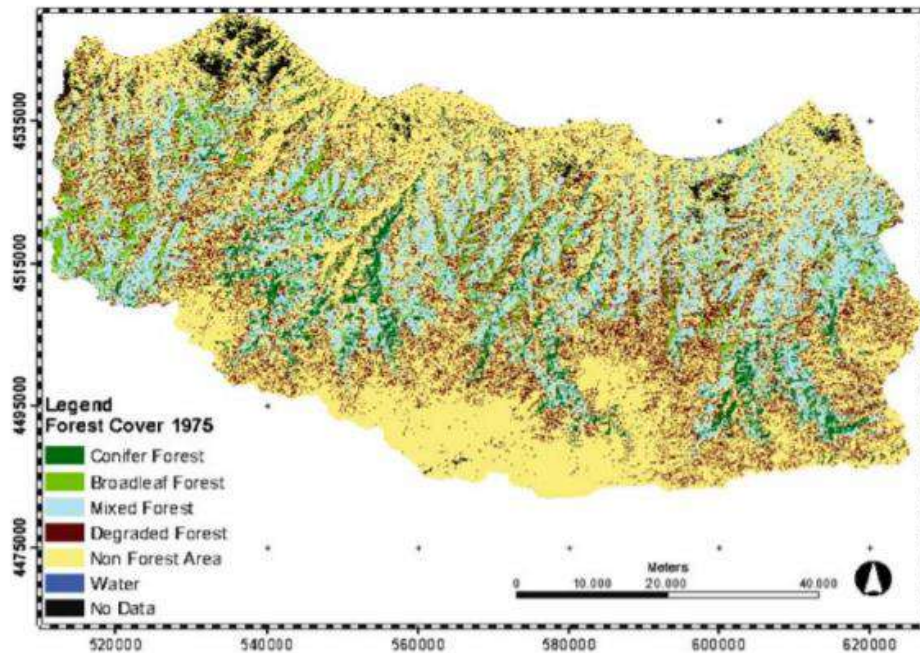


Figure 2: Forest cover type map of Regional Directorate of Trabzon Forestry in 1975 (Sedat Keles, 2008)

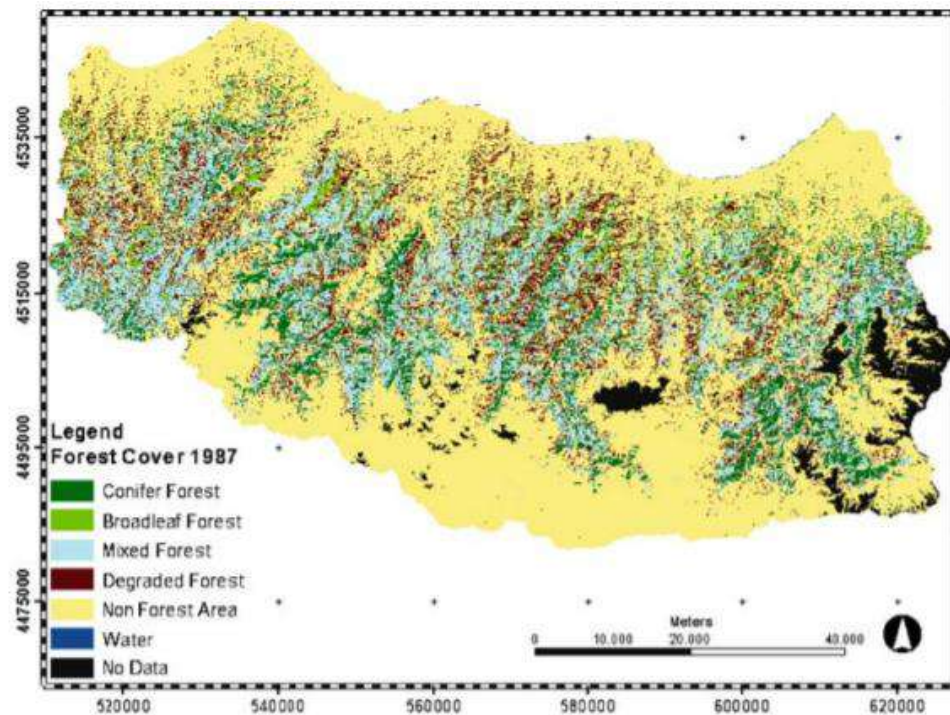


Figure 3: Forest cover type map of Regional Directorate of Trabzon Forestry in 1987 (Sedat Keles, 2008)

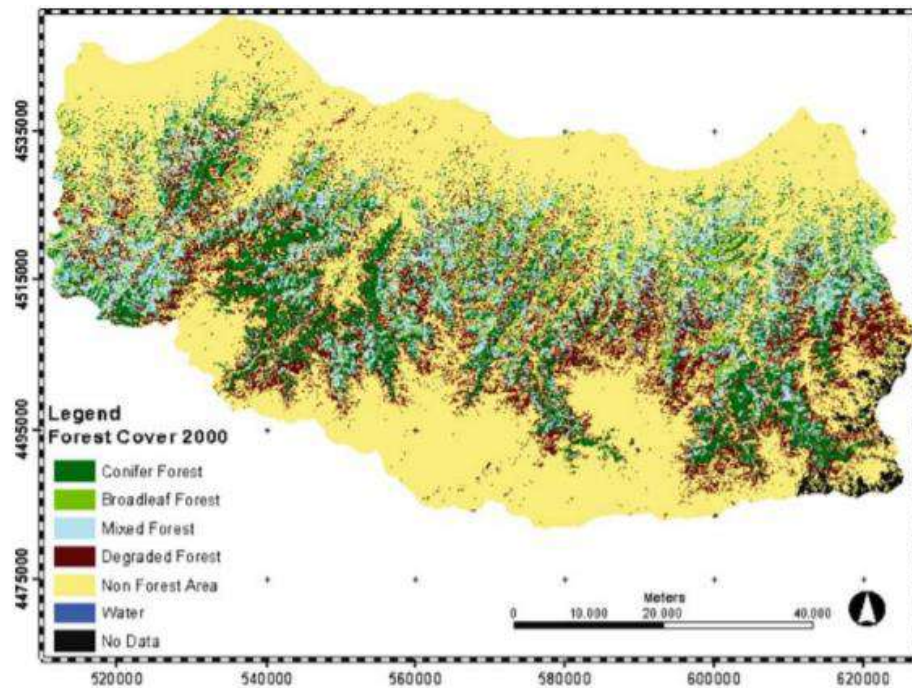


Figure 4: Forest cover type map of Regional Directorate of Trabzon Forestry in 2000 (Sedat Keleş, 2008)

The observed patterns of decreasing backwoods zones and increasing nonforest regions in the Trabzon could be explained by the following fundamental reasons. In the first place, among the general and fundamental drivers of deforestation are human population pressure and expanding interest for land for agriculture and lumber products from forests. In Trabzon, there is a significant change in the population of Trabzon for more than 30 years. The absolute population expanded from 659,120 to 975,137 (almost 48%) occupants in the period 1970–2000. Be that as it may, the rustic population expanded during the first period (1970–1985) and furthermore the forested zone decreased from 244,543 to 209,674 ha. On the other hand, the rustic population diminished from 546,641 to 496,183 during the second period (1985–2000) and the forested zone expanded from 209,674 to 220,128 ha. These results upheld the possibility that the adjustment in the human population was critical in increasing or diminishing forest regions. Second, urbanization causes forest degradation and loss of biodiversity. Significant applications rose after the 1990s considerably affect the growing zones of the city (Selçuk REIS, 2003).

Third, rather than escalated collecting activities conducted for the greatest wood production from 1972 to 2005, light silvicultural prescriptions and harvesting activities were done in the research area.

5. How to Conserve the Forests?

It is essential to understand the job of backwoods for all social groups. Forests give the public various benefits, while simultaneously they endure harms due to social indifference. This is a tragicomic circumstance. To unravel this problem, all social groups including the forestry authority should work together.

- Urbanites' enthusiasm for and information about the forests ought to be expanded. Urbanites ought to add to forest management, the relevant decision-making processes, and the applicable implementation. This likewise fits into certain global conventions, which require urbanites to be educated about the forests and to permit them to contribute to woods management.

- Forest legislation ought to be created to react to expectations of urbanites from forests and to diminish urban pressures on the forests.

- Ensuring that urbanites and other social groups add to forest management is an errand falling inside the field of duty of the forestry authority. To do this, the forestry authority should be reorganized. For instance, the present General Directorate of Forest and Village Relations can be rearranged as a General Directorate of Forest and Society Relations. The advertising division of this authority can be redesigned into an increasingly productive unit. The public relations office should be a flexible and open organization, including a wide range of disciplines and interests, being actively associated with a collaborative dialogue. More extensive and increasingly comprehensive visions and goals should be formulated, where science and scientists can be valuable. As community-level participation and strife management are progressively important, various social science and people skills should be recognized and developed (Cecil C. Konijnendijk, 2003).

- Perception of the forest as only one tree or a gathering of trees ought to be overcome; the public ought to be educated to perceive it as an ecosystem. Besides, the hole among urbanites and timberlands ought to be filled; they ought to perceive forests as significant.

- Messages of the authority to the public should be founded on right information. Particularly the true reasons for deforestation and measures that must be taken to stop it should be communicated.

- Non-governmental organizations ought to be upheld to encourage the urbanites to act in an organized approach to understand forestry problems.

- New recreation zones ought to be created to decrease the urbanites' recreation-oriented pressures on the timberlands. Social and environmental administrations, for example, providing opportunities for open-air entertainment and protection of drinking water for basically urban populations have become organized in national woodland policies (Cecil C. Konijnendijk, 2003). As of late, the Forestry Ministry has set up urban backwoods in all urban

areas in Turkey. These urban woodlands ought to be well-planned and take the clients' profiles and needs into consideration (Erdogan Atmis, 2007).

6. Conclusion

Trabzon city skirts are totally under the pressure of the unconstrained urbanization process. Such advancements stay under pressure and cause for the arranging stage to be lacking, for the rural territories or unplanned urban skirt to be self-developed inside the system of auto-dynamics of development. This reality obstructs or deteriorates the utilization of rustic resources, country feasibility, and rural advancement strategies. Additionally, the unconstrained residential improvements cause unsustainable or rural landscapes as far as the ecosystem and make a holistic approach for the protection of regular resources unimaginable. Settling the problems that showed up around the urban skirts that are not assessed inside plans is of vital significance as the issues trigger global warming, shortages in water resources, corruption of biodiversity, and the sustainability of ecosystems.

(Cenap Sancar, 2009) Said that the level of urbanization in the Trabzon Centrum expanded from 4.72 in 1987 to 6.27 in 2008 dependent on supervised classification of pictures. Cumulative urbanization represented 1.55% of the entire territory of Trabzon (254 ha) and 32.8% of the Settlement region of the Trabzon from 1987 to 2008. This translates to a yearly pace of urbanization of 1.35% somewhere in the range of 1987 and 2008. Another investigation accomplished for Trabzon area by (Köse, 2008) means that a yearly rate of deforestations of 0.41% somewhere in the range of 1987 and 2000 years. Another comparative investigation about the urbanization of Trabzon territory demonstrated a yearly rate of urbanization of 3.13% from 1960 to 2000 years (Selçuk REIS, 2003). Likewise, research directed by (Alkan Günlü, 2009) indicated that an annual rate of urbanization of 1.98% in the Rize area, a neighboring territory of Trabzon.

Trabzon has encountered changes in its urban morphology and its socio-spatial structure because of the expansion in populace and mobility, the development of new urban extension

territories, and population migrations from country to urban. This examination obviously demonstrated that there is still spontaneous urban improvement and extension in the Trabzon region and the conventional development models may not clarify the organization of the urban spaces in urban areas in Turkey. These uncontrolled and unconstrained developments of settlements in the study are covered inside the city development plans in the following or future time frames. Such an idea nearly turns into an automatic or default process and exceptionally obstructs future plans as it proceeds to fragment the land use examples and causes to change the arranged land-use decisions.

Urban pressures on the backwoods increment due to urban population growth. These pressures prompt the woods zones to shrink from one perspective and harm the forest ecosystems then again. Additionally, it is a test to create without deforestation. It is important to find the reasons hidden these pressures.

So Urban pressures make proceeded with population increment and further urbanization establishes major factors that will influence the forest division in the following a very long time in Trabzon. Pressures on forest assets are expanding, especially those identified with land acquisition, while the pressure on provincial forests will probably continue to decrease. Urbanization will be joined by an increased awareness which thus will prompt better management of forest resources.

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