

The Iranian capital of Tehran extends from the southern slopes (1,700 meters above sea level) of the Alborz Mountains into the Dasht-e Kavir desert in the south (1,100 meters above sea level). Compared with Iran's many ancient cities it is a relative newcomer, having served as the capital city for only 200 years.

Ranking among the world's largest metropolises, Tehran is also part of Iran's most densely populated province. The latest census (1996) records a population of 11 million for Tehran province, with 6.7 million in the city itself. While the city's annual population growth dropped to only 0.9 per cent from 1986 to 1996, the province as a whole has grown by 4.7 per cent per year, and is projected to exceed 15 million individuals by 2012.

Tehran's consistent rapid expansion and population growth are significant factors contributing to several environmental problems. Among these problems, the shortage of potable water is of major concern. The province contains only two per cent of the total water resources of semi-arid Iran but already houses 20 per cent of the country's population. Geologically, the Tehran plain can be likened to a bowl, limited to the north by high mountains and to the south by the hills of Kahrizak. Tehran is far from any major river and relies on water supplies located at a distance from the city.

The slow development of reservoirs, water mismanagement and a series of dry years have combined recently to diminish water resources dramatically. Meanwhile, the lack of sufficient sewage facilities results in most human wastes being discharged untreated into domestic sewage wells, a situation leading to deterioration of the groundwater quality. At the same time and as the city has grown, more potable water is being imported into the city. This water in turn is used and adds to the existing polluted groundwater, particularly in lower, southern Tehran, where flooding often occurs.

Figure 1, which has been created by rectifying and vectorizing old maps of Tehran, illustrates the historical growth of the city.

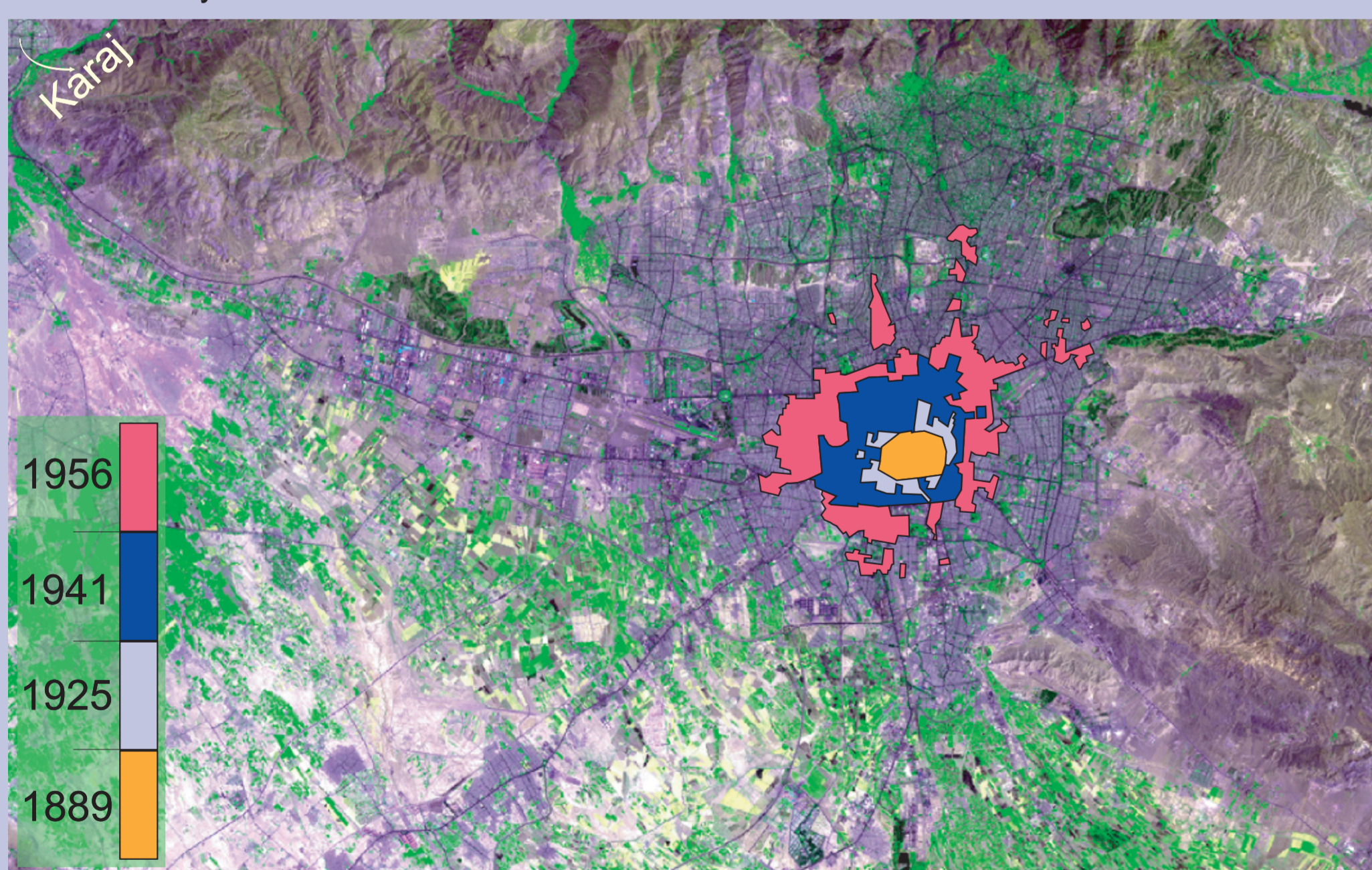
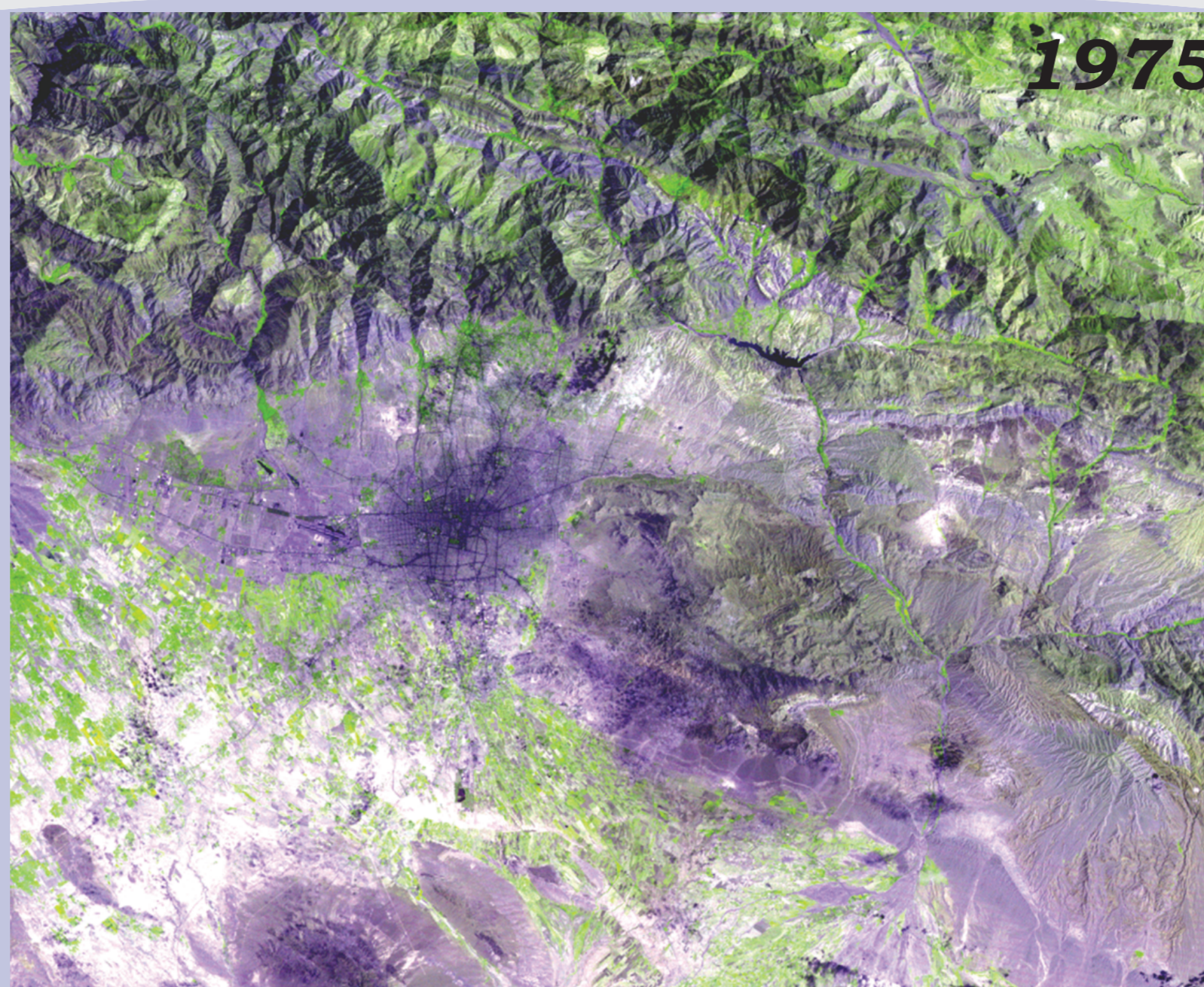


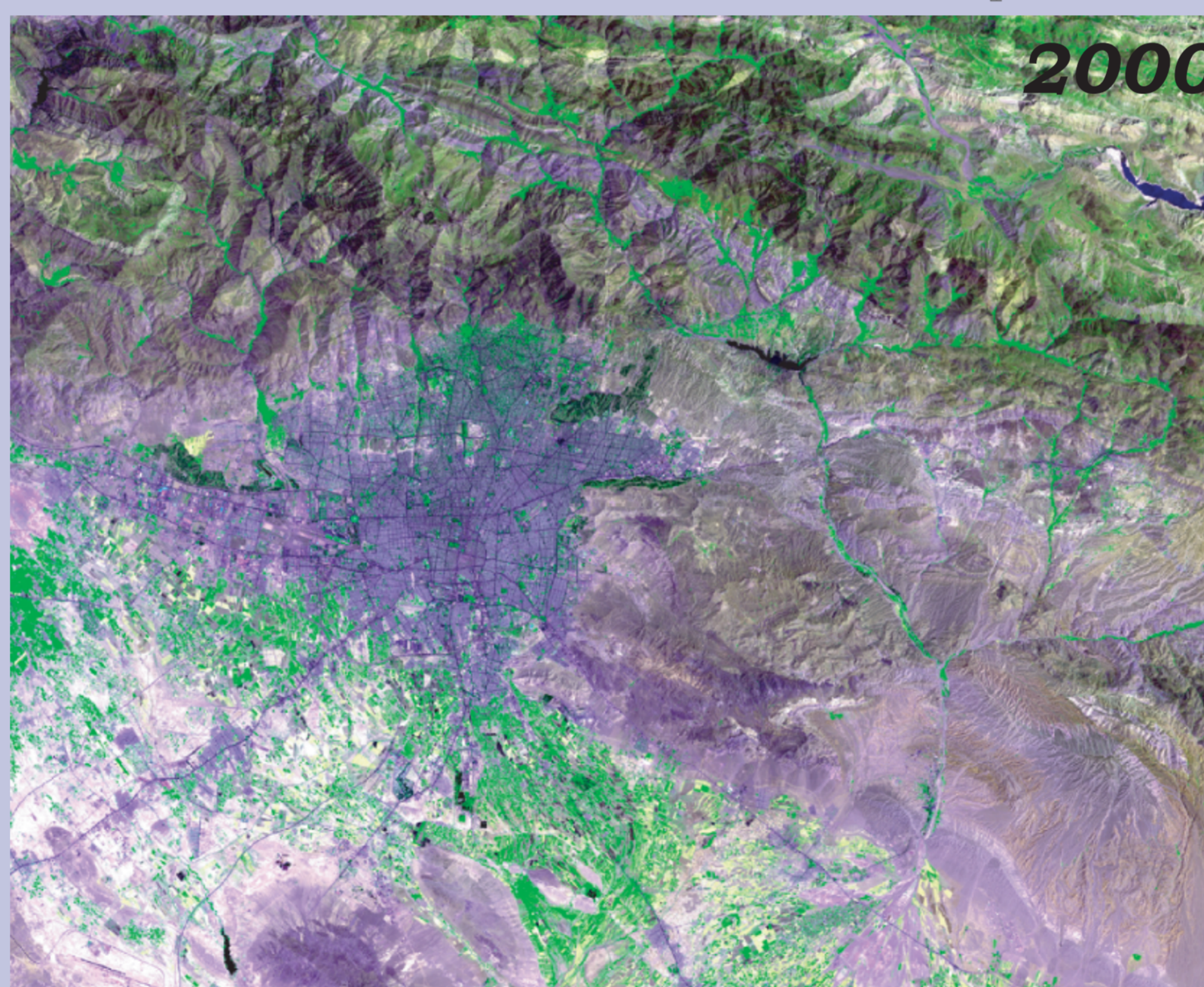
Fig 1. Historical growth of Tehran 1881-1956 on the image of 18.07.2000



25.07.1975 Landsat MSS colour composite RGB, bands (1,4,3)



Photo: Nazouah Nazouah



18.07.2000 Landsat ETM+ colour composite RGB, bands (1,4,3)

Here the city nearly connects with the province's biggest suburban area, Karaj (not included in the available images; Tehran's expansion, however, is so extensive that a part of Karaj is visible in the left side of the image of year 2000 in Figure 1).

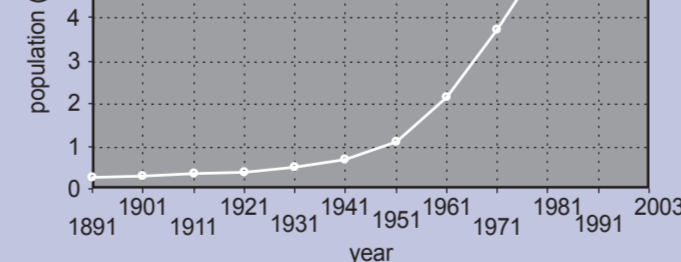
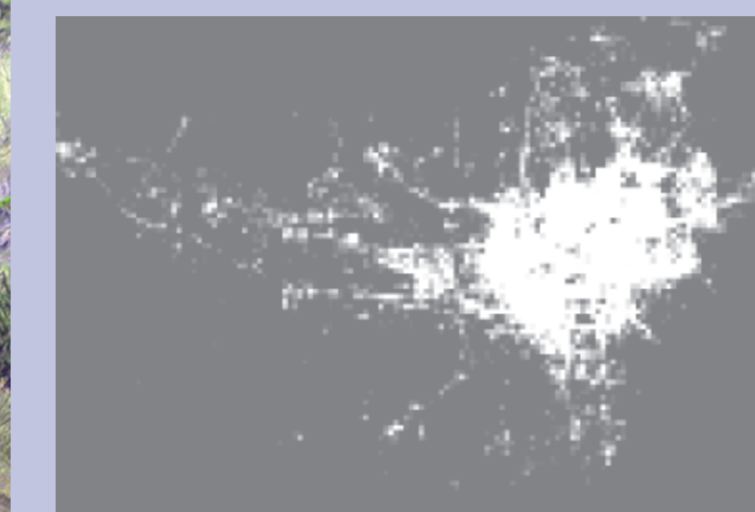


Fig 2. Population in Tehran municipality 1891 - 2001

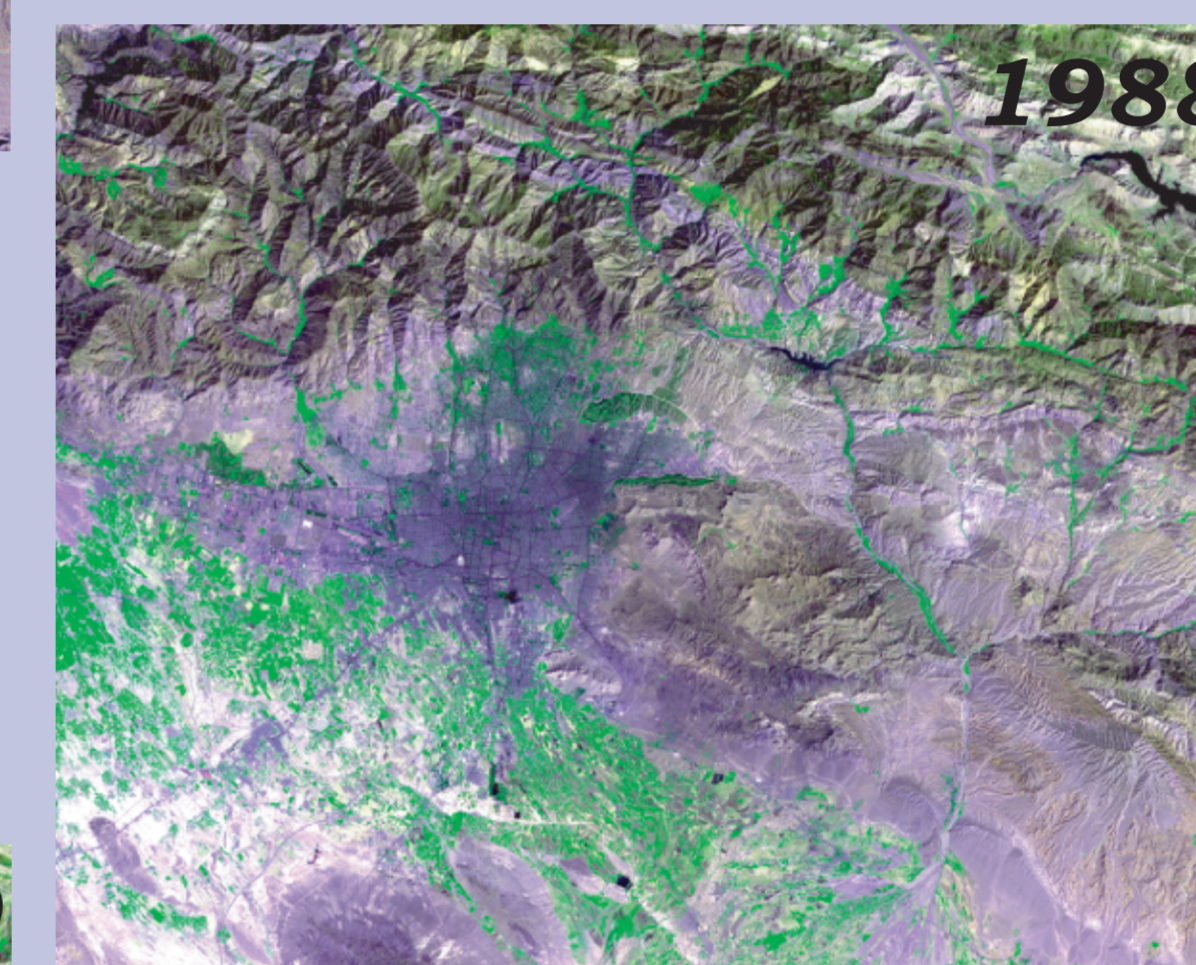
The following images show how "Greater Tehran" has expanded from 1975 to 2000. "Greater Tehran" is a geographic and administrative expression for Tehran and the immediately adjacent built-up area.

Tehran once received adequate water supplies from the Amir Kabir Dam on the Karaj River (in the extreme upper left of the image; the shadows of the surrounding mountains make it appear dark) and the Latian Dam (on the right of the image, above the city) on the Jaj-Rud.



Clouds cover small parts of the image. To the south and west of the urban area lies a belt of fertile land, which appears as green.

The joint cartographic visualization of the built zone of the years 1975, 1988, and 2000 illustrates Tehran's urban growth.



19.09.1988 Landsat TM colour composite RGB, bands (1,4,3)

The Lar Dam was completed in 1980 (see lake in the extreme upper right of the image) to meet Tehran's growing demand for potable water. The dam is built on the River Lar, which discharges northwards into the Caspian Sea.



This image illustrates the city's geographic expansion and increased density, as well as the significant decline in reservoir levels. It also reveals the important loss of green spaces in the north of the city.

The expansion and growing density of the city are quite notable in the west and northwest. The mountains to the north and east and the desert in the south are natural obstacles to Tehran's further sprawl.

The urban texture is increasingly expanding towards the west of the city, where there are no natural limits to development.

