AIR QUALITY IN THE CITY OF TG JIU

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Abstract: One of the most important problems of the modern age is the air pollution. Within this work I realized a description of Tgjiu City: geographic location, climate, hydrographical network, variations in temperature, terrain, sources of pollution.

On the basis of registered values for the air quality indicator, sedimentable powders, and interpretation of results on the basis of the provisions of the standards in force, the comments were made in relation to particulate air pollution in the city area of sedimentable Tg Jiu, identifying the polluters in the area, the proposed solutions for the reduction of pollution.

Key words: pollution, sedimentable powders, air, quality indicator

1. INTRODUCTION

Tg Jiu City is located at the intersection of the parallel of latitude 45°02 with 23° Meridian Eastern longitude, midway between the Equator and the North Pole.

It is located in the central part of the County of Gorj, have following neighbors:
North village, the town of Bumbești Jiu, Turcinești, Stânești commune; East Village, Stânești, Bălănești Drăguțești commune-commune of Dănești,; Bălești commune, West Village Lelești.

Tg-jiu is located about 18 miles south of the Carpathian Mountains, in the Getic plateau, in Giza-depression or depression Olteană Câmpu.

The administrative area of the city of Tehran is 10255,7171 hectares, of which 6377,3571 ha in area and 3878,36 in the town, in the ha which includes the 488,42 ha localităților related components: Iezureni, Preajba Mare, Drăgoieni, Romanesti, Slobozia, Bărsești, Ursăți, Polata.

Of the total area of the municipality of Tehran, farmland 66,32% deal.

Hydrographic network of Ventnor City area consists of the middle course of the JIU, with its tributaries the Amaradia Pietroasă River on the left and Susița on the right side.

Climatic factors in General and particular local ones, are favourable due to movement of air masses in the depression area.

Characteristic is topoclimatul depression sheltered. Temperature variations between summer and winter are not too high, the average temperature of January is from -2.5°C, July +21.6 °C and annual average of + 10.2 °C.

The transition from summer to winter is done gradually. The area is bounded to the West, depression and North of skirt hills.

Through its geographical configuration, the municipal area is insert in Cork area of meadow vegetation.

Tg Jiu City industry underwent significant changes after 1990.
The most important companies in the municipality of Tg Jiu are:

2. SOURCES OF AIR POLLUTION

One of the most important problems of the modern age is a complex phenomenon: air pollution, became the object of interest of several international organisations since the effects of pollution are felt over the borders of the country.

The atmosphere is the vector with the widest coverage in which pollutants are spread into the environment, affecting all the biotic and abiotic components.

It can be said that the pollution has occurred with industrialisation, but amplified and diversified parallel to the development of the society.

The pollution are various factors, among which the most important are: industrialisation, cityscape, chemical, demographic density.

Pollution occurs as a by-product, "of civilization that is not limited just to the inside of an enterprise of a small body, and includes cities, areas within a country and even areas that refer to large geographic areas, becoming an international issue.

Atmospheric environment related indicators are organized on three levels:
- pressure indicators (pollutant emissions);
- status indicators (air quality);
- response indicators (measures taken and their effectiveness).

Substances emitted in atmospheric environment creates more environmental problems: climate change, destruction of the ozone layer, acidification, photochemical smog, greenhouse effect, tropospheric ozone production, microscopic pollutants, particles in suspension.

The main sources of pollutants are issuing:
- fixed industrial sources, focused on large industrial platforms and interspersed with residential areas heavily populated (developed mainly vertically);
- movement, especially along the major arteries including the heavy traffic;
- construction sites and concrete mixers;
- thermal power stations;
- diffuse sources of combustion.

From the point of view of the nature of atmospheric pollutants, they can be categorized into two groups:
- gas and toxic fumes of pollutants present in the atmosphere from industrial emissions from plants and auto traffic;
- suspensions or aerosols form from liquid or solid particles of size less than 100 μm.

Toxic gases and vapours are different in terms of chemical nature, have high stability in the atmosphere and high power broadcasting.

Temperature, humidity, pressure, air movement and rainfall substantiate causes changes on the levels of air pollution.
The stability of the suspension in the atmosphere and their mailing ability depends on the particle size.

Particulate matter shall be classified according to their size and behaviour in the atmosphere, thus:
- suspension with diameter > 10 mm, with stability and low power broadcasting in the air;
- suspension with diameter (10 μm – 0.1 μm), with stability and diffusing power higher in the air;
- suspension with diameter of < 0.1 μm, with stability and diffusing capacity in the very high atmosphere.

Rainfall favours deposition on the soil of a part of pollutants in the atmosphere, playing a role important Purifier.

Water from precipitation can alter the natural properties due to the dissolution of some pollutants, particularly sulphur and nitrogen oxides, a phenomenon that can occur at high altitude and/or appreciable distances from the place of discharge.

Along with gaseous compounds in the atmosphere there is water vapour and natural aerosols (pollens, spores, microorganisms, cosmic dust, dust, volcanic ash, sea salt, ice crystals) and anthropogenic (organic and inorganic powders, liquid aerosols).

In the regions with high density of population, the sulfates contained in rainfall are largely a result of human activity, and in particular the burning of fossil fuels which releases sulfurous gas into the atmosphere (SOx) and being converted into sulphate by oxidation.

Fossil-containing nitrogen, will liberate as a result of the combustion of NH₃ and NOx.

During high temperature combustion takes place in a chemical process between the oxygen from the atmosphere and nitrogen oxides escapes, which appear in the process azotații.

Both azotații and sulphates in precipitation in the form of the corresponding acids, which leads to a drop in pH.

These phenomena are leading to the emergence of acid rains which have strong effects on the spontaneous vegetation and damaging of agricultural crops.

The entire legislation of the environment is dominated by the idea of the need for economic development based on the exploitation of the human and material resources of the country and the use of the technical-scientific conquests, but in compliance with the requirements of environmental protection.

The composition of the air is never constant, depends on the following factors: geographic range, height, time of sampling, the region.

The main source of pollution is the industry because in time for production processes shall be issued for a number of specific pollutants.

Another important source of pollution is transport.
Air pollution by motor vehicles has two main features: the emission of pollutants is very close to the ground, resulted very high concentrations close to the ground, to the very small height, emissions are produced on the entire surface of the locality, the differences in concentrations of traffic intensity and depends on the possibility of ventilation.

An equally important source is household activities.

In Tg Jiu the main domestic fuel is natural gas.

Air quality in the city is monitored with the help of automatic station, located in the northwest part of the town (industrial type station that undertake measurements of SO₂, NOₓ, O₃, PM₁₀, CO, wind, direction wind speed, atmospheric pressure, air temperature, humidity, solar radiation, precipitation).

Throughout the year the sum of 365 calendar days, measurements were performed in 329 days, which corresponds to a monitoring period of over 90%, and for those 6 general indices of air quality portion of the index 2 (very good), and the least represented was the index 6 (very bad).

Under MESD Order no. 1095/2007 for the approval of the Norms regarding the establishment of air quality indices for public information, air quality is represent the general and specific quality indicators, derived from the main air pollutants concentration values measure by.

General and specific indices are represented by integers between 1 and 6 and found appropriate adjectives: excellent-1 very good, 2 good, 3 medium - 4-5 damage him very damage him-6 also marks a code associated color.

Daily general index is established as the highest of the monitored pollutants found appropriate specific indications bet on that day.

Sedimentable dust particles with diameters are greater than 10 µm, which have reduced stability in air, sedimentation with uniformly accelerated speed and diffusing power.

After they are issued by emission sources, they shall be deposited on the soil, vegetation, buildings, causing damage.

3. CONCLUSIONS

Air quality can affect people and the environment as whole health.

Short or long term exposure to high levels of concentration of pollutants can lead to a number of negative effects on health from minor irritation of respiratory system to increased incidence of cardiovascular disease and even prematurely death.

Pollution is an additional risk factor for heart patients with respiratory or other chronic diseases.

It can, also, unintended negative effects on ecosystems, corrosion of materials including cultural heritage objects.

Environmental protection is the area that requires an approach specific subject in all branches of the national economy.
Industry economic sector represents the largest contribution to environmental pollution, the large amount of gaseous, solid and liquid released in the environment air, water and soil.

The purpose of the integrated system is the implementation of the measure by preventing or reducing emissions, and liquid and soil, including the measure by Waste Management to achieve a high level of environmental protection as a whole.

In this regard, the regulation is realized and integrated control of this activity, and ensure compliance with legislation on environmental protection and the sustainable development principles (IPPC Directive 2008/1/EC).

For monitoring the sedimentable particle in the municipality of Tg Jiu, were sampled from five distinct areas (points), located as follows:
- \( P_1 \)– located in the northern part of the city;
- \( P_2 \)– set in the Meteor;
- \( P_3 \)– set limit of S.C. SIMCOR VAR functional area, Colchester, point to the North-East from the factory;
- \( P_4 \)– located north of S.C. LAFARGE SA, at a distance of about 200 m of it;
- \( P_5 \)– all located north of S.C. LAFARGE SA, at the distance of about 1000 m.

Results regarding the values registered in the year 2011 are presented in the following chart.

![Graph of variation of the concentration of dust in the city of Targu Jiu sedimentable](image-url)
Interpretation of the results for this indicator of air quality was done in accordance with the provisions of the standard 12574/87, according to which the maximum permissible quantity of dust in the air of sedimentable protected areas is of 17 g/m²/month.

The location of sampling points in these areas have been taken into account the existence of possible sources of particle generators.

In the North there are units like S.C. ARTEGO and S. C. ROSTRAMO; in the Băresești there are three establishments producing construction material: S.C.LAFARGE SA, MACOFIL SA and S.C. SIMCOR VAR; in the Meteor was taken into account in the practice of melting of the cables in order to obtain from non-ferrous metals.

Analyzing results that weren't registered overrun of the maximum permitted concentration.

The largest quantities of powders were registered in the sedimentable point located at the boundary of the functional SIMCORVAR SA (P₃).

The largest amount of dust in the sedimentable accounted for approximately 96% of the maximum permitted concentration was measured in the month of February, and the lowest in December and represent 35% of the maximum permitted concentration.

Some of these powders is due to traffic and sedimentable.

The lowest amounts of dust were registered in the sedimentable punctual P₄ in the North area of S.C. LAFARGE SA.

At this point the largest amount of sedimentable powders represented 60% of the maximum permitted concentration, and was register in November, and the smallest represented 17% of the maximum permitted concentration, measured in April.

REFERENCES
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