

ENVIRONMENTAL SUBSTRUCTURE IN MEGA CITIES AND SUSTAINABLE DEVELOPMENT

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1. INTRODUCTION

The environmental substructure in mega cities is an element closely connected with the aimed sustainable development. This consists of all these factors formatting a frame for the contemporary citizen, which may be aesthetically upgraded, functioning well and above all atmospherically “ healthy “. What is of prior importance is the level of atmospheric clarity. Photochemical smog, the aggravation of the greenhouse phenomenon and the hole in the ozone layer, are problems demanding immediate and radical action. The “green environment” in the 21st century mega – cities, is “ asked “ to “filter” the inevitable polluting emissions while at the same time create an image of peace and relaxation. The rapid expansion of urban centres minimizes the greenery in a time when its expansion and upgrading has become an issue of top priority. The fast growing construction within the urban web, in combination with the transport and communication net needed, form the basic parts of the urban environment and thus significantly influence its quality level. The above factors in combination with the cultural resources of the city, as well as their incorporation in the functional web of the city, mainly form its physiognomy. In the light of these data, the interventions in international, national and local level of all the organizations involved, become greatly important, transforming the issue of the protection and upgrading of the environment, into an aspect of radical and courageous political decisions.

2. TRANSPORT: The main problem

Contemporary European cities suffer from traffic congestion, which has gradually affected the economical image of regional areas and the wider social and financial cohesion. The European city is said to be threatened by suffocating in the center and paralysing at the edges. [1]

At the threshold of the 21st century the traffic problem has been proved to play perhaps the most serious part in the shaping of the urban environment. It is obvious that sections like the following are seriously affected:

- Pollution of the atmosphere with consequences:
 - To health.
 - To the change of climate in our planet.
 - To the destruction of the ozon layer.
 - To the acidification of environmental problems.
 - To the creation of local photochemical smog.

- The physiognomy and aesthetics of the modern city.
- The function of the city.
- The maintenance and elevation of the politistic heritage.

Transport of today is the main cause of emission of gases which badly affect the atmosphere. More particularly, the fifteen country members of the European Union during the year 1994 appeared to have the following percentages in the emission of gases polluting the atmosphere: CO 69%, CO₂ 24%, NO_x 63%, NMYOC 47% and other emissions 10 ~ 25%.

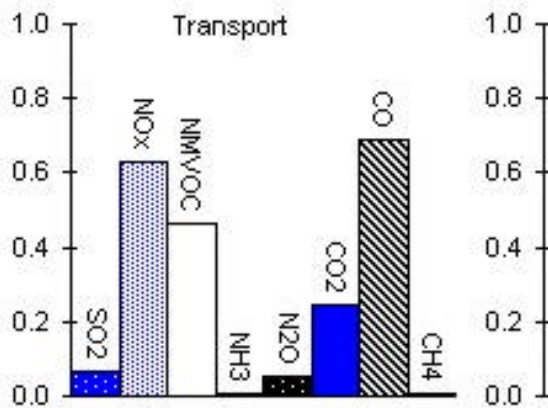


FIGURE 1 Contribution of the transport sector

[Figure 1] [2]. In 1998 CO₂ reached the percentage of 28% [3]. In the period 1980 ~ 1990 the emissions of gases at transport appeared to have greatly increased, while after 1990, with the appearance of catalytic converters and unleaded petrol, a significant decrease was observed. In the predicted course of gases causing the greenhouse phenomenon for the period 1990-2010, transport is in the fact the only section with an estimated raise of 45,8% when the total of sections is estimated to reach a 2,1%.

However, a lot of problems remain unsolved like starting catalytic converters and various emissions of gases from diesel machines. At the same time, a big part of the reduction of NO_x and NMYOC emissions is eliminated by the increase of traffic and the large number of vehicles. Unfortunately, predictions are rather pessimistic for the future. It has been estimated that in the period 1990-2010, the 90% of the increase in CO₂ emissions will be due to transport. The wider pressure and the successive effects of pollution caused by traffic – industries, are illustrated in [Figure. 2]

Particularly hopeful is the recent announcement of the U.S.A. Ministry of Energy for the immediate support of technology of elements with a Hydrogen base (Freedom Car Program) contained in the air, the oxidation of which produces electric energy with only residues water vapour. Lets not forget that the U.S.A. with a population of 5% of the global population, consumes the 25% of the petrol of Earth mainly in the form of gasoline. The first mass production of hybrid machines (gasoline and electric machines) is expected by 2004. Nevertheless, it is widely known that Toyota and Honda have already developed hybrid cars with a 40 miles per gallon of gasoline autonomy.

It is obvious that the particular situation can be only dealt with a series of structural and functional interventions, while at the same time the target should be limiting the wide use of private cars.

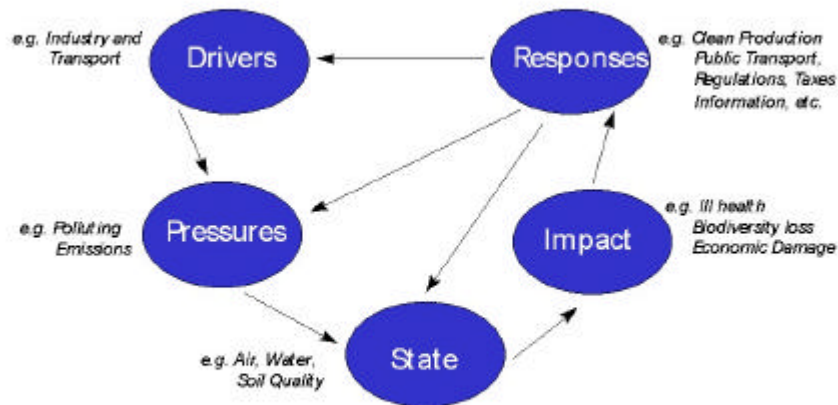


FIGURE 2 The Multi –pollutant/multi-effect approach

The measures taken should be:

- An integrated rail transport system [Underground – Tram – Train], which would cover the wider urban areas.
- A transport net with a web of peripheral roads diverting traffic away from the city center.
- Production and use of ecological means of transport (technological evolution – taxing motives).
- Reduction of vehicle emissions by using ecological fuels.
- Functional land use to avoid traffic pollution.

At this point, we should emphasize on the fact that the serious problem which is soon bound to appear, is strongly related with the aimed financial development which will inevitably increase the need of transport of “man” and “goods”. The above should be tackled with care, combining both development and the protection of the environment.

3. ENVIRONMENT AND THE ATMOSPHERE

From the very beginning of the century, social, economical and most of all environmental problems appear in cities. The observed downgrading of the environment has led to the downgrading of the quality life of citizens of big urban centers, reaching the number of 280 million people in European level. The last thirty years are characterized by a constant downgrading of the atmospheric environment. It is worth mentioning that,

- ❑ 2 billion tones of waste are produced by the E.U. state-members every year, with a 10% annual increase.
- ❑ CO2 emissions caused by transport and households are predicted to increase at least until the year 2010.
- ❑ The quality of life in urban areas is continuously downgraded (pollution – sound pollution).

The environmental issue has become an issue of top priority in international and European level. Taking as a starting point the United Nations Convention-Frame for climate changes in the Rio Di Janeiro Conference in 1992 and the Kyoto Protocol in 1997 for the reduction of emission of

gases causing the greenhouse phenomenon, the international community is directed towards the protection and upgrading of the environment. In a European level, the dramatic deterioration of the environment has activated the whole community. Initiatives and action has been taken since 1982 for the curbing of the observed environmental downgrading. The Amsterdam Convention has elevated environmental protection and sustainable development to an issue deserving the attention of the whole community. The “5th Action Scheme for the Environment” aiming at the realization of the decisions taken at the Rio Di Janeiro international convention of 1992, has covered the period of 1992-1999 and initiated a series of actions in five sections with high rates of pollution (Industry – energy – transport – agriculture – tourism).

The partial success of the “ 5th Action Scheme for the Environment” made us realize that even if progress in reducing pollution levels was made, problems in certain areas remain. The basic conclusion is that the approach towards the whole environmental issue should change. It has been estimated that top priorities should be: [4]

4. THE PROSPECTS OF SUSTAINABLE DEVELOPMENT IN THE FORTHCOMING YEARS

In accordance with the Brundland report, sustainable development is defined as “the development that meets present needs without jeopardizing the ability of future generations to meet their needs”. [5]

It is known that “development” as a concept has three dimensions:

- economic development;
- social balance and development;
- protection and improvement of the natural environment.

Hence, when we are talking about sustainable development, it is considered self-evident that this must serve all three objectives. The President of the European Union, Mr Jacques Santer, during a speech delivered in the European Parliament on January 17th, 1997 pointed out the three objectives for sustainable development that should be pursued by Europe. [6] More specifically:

- to develop an environment friendly economy;
- to prove that economic progress operates in function with the best possible use of natural resources;
- to prove that the protection of the environment shall create new jobs.

The experience and limited results of the 1992-2000 period led to the design of the EU strategic priorities for sustainable development within the following decade. In this period a significant enlargement of the European Union has occurred with the inclusion of new European States.

Such priorities are: [7]

- climate change – clean energy;
- natural resources management;
- land use – regional planning development – traffic issue;
- public health;
- social exclusion – poverty;
- demographic problem – ageing of the population.

The framework for the protection of the environment “aiming at sustainable development” is set out in more detail in the 6th Action Program entitled “Environment 2010, our future, our choice” the main axis of which are:

- strict application and improvement of the existing environmental legislation;
- inclusion of the environmental dimension in the economic policies putting pressure on the environment;

- private initiatives [businesses – citizens] shall play an important part in the efforts for the protection of the environment;
- stimulation of measures aiming at the confrontation of serious and persistent environmental problems such as:
 - climate change;
 - protection of the biodiversity;
 - ground corrosion and pollution;
 - health protection;
 - sustainable use of natural resources;
 - waste management.
- Change of policy regarding land planning and use.

It is evident that the next decade shall be most probably the most critical one with regard to the taking of measures for the protection of the environment and in particular the urban environment. It is certain that the European Court of Justice shall assume all legal responsibility for the implementation of the aforementioned actions, after a policy aiming at informing European citizens with the motto “name – fame – shame” has been completed. [8]

5. CONCLUSION

“We have failed as far as securing longterm sustainable development of the natural environment is concerned” [9]. Having accepted this fact, the European Union illustrates the limited results of both Universal and European attempt for the protection and upgrading of the environment, in most of the sectors. Particularly in the level of the urban environment, the aggravation is rather intense, while on the other hand the protection and upgrading of urban space demands long-term action. The final results of such an attempt creates, as it is known, the “physiognomy of the space” which according to Prof. J.Stefanou is not always easily defined, in relation to factors aiding and elevating it. [10]

In any case, the function of the city in combination with its traffic and transport web, compose the basic substructure in order to be able to materialize the protection of the urban environment. On the other hand, the observed over pollution and the limitation of open areas and green spaces can only deteriorate the already problematic urban reality, the management of which has been a top priority in European level since 1990. [11] It goes beyond doubt that the aimed “sustainability of the urban environment”, demands radical measures to be taken in the next decade. Thus, action should be taken in all levels concerning the urban web focused on the following: **Better management of land uses, rational use of energy sources, effective traffic policy, strict legislation for the protection of the atmosphere, preservation – expansion of greenery and finally elevation – promotion of cultural sources.**

Following such an environmental policy throughout the years to come, can only allow us to be optimistic for the diversion of the today’s situation.

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