

ENVIRONMENT PROTECTION AND ITS REFLECTION IN THE ENVIRONMENTAL CONSCIOUSNESS OF THE INHABITANTS IN A MIDDLE-SIZED TOWN (VÁC, HUNGARY)

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Received 13 September 2010; accepted in revised form 15 December 2010

Abstract

The paper presents the role of urban environmental protection in sustainable development while analysing the factors influencing the environmental consciousness of the inhabitants of a middle-sized town based on a general model, together with the role of environmental consciousness in solving environmental protection problems at settlement level. My particular research focused on characterising the environmental state of Vác, with a population of 35000 people, and on the knowledge and environmental consciousness of the inhabitants. In the course of the representative questionnaire survey, 439 people gave assessable answers. Questions were related to the most significant environmental problems (air pollution, water contamination, sewage treatment, waste management). Answers were compared to the real situation based on measurements. Results revealed that the knowledge of the inhabitants on local environmental problems is better than the national average. In certain relations (water contamination, sewage treatment), however, it is deficient, thus information transfer was studied separately as well. It can be stated that local governments should make greater efforts in order to inform inhabitants. Environmental attitude of the inhabitants can be regarded as good. Based on the general model, I analysed the tasks of the settlement to improve environmental consciousness in order to increase efficiency of urban environmental protection.

Keywords: urban environmental protection, sustainable development, environmental consciousness, Vác, middle sized town, system model

1. Introduction

The term sustainable development was introduced into the professional literature by the publication of the book of Brown, L.R. entitled “Sustainable Society” back in 1981 (Brown, 1981), however, it became acknowledged internationally during the Environmental Protection World Meeting (Kerényi, 2006b, Láng, 2003). The term became common from the end of the 1980s and the classic definition became widespread in the Bruntland Commission Report (Bruntland, 1987):

Sustainable development “*meets the needs of the present without compromising the ability of future generations to meet their own needs.*” (Our Common Future, 1988. p. 62).

Since then several authors have interpreted and improved variously the term at several levels discussing its complexity, possibilities and difficulties of its

interpretation (Erdösi, 2000, Gyulai, 2002, Kerényi, 2002, 2006a,b, Náray-Szabó, 2003, Bulla-Tamás, 2006, Wackernagel-Rees, 2001). Realizing sustainable development is one of the greatest challenges in the history of man (Náray-Szabó, 1999, 2006, Pálvölgyi-Nemes-Tamás, 2002, Simai, 2001). Most tasks are presented by the still new environmental protection among its three pillars (environment, economy, society). Efficiency of this is helped by the stricter environmental policy of the EU. These induced partly the completion of environmental protection programs, sustainable development strategies, both at European Union and Hungarian levels. For the optimal realization of programs and strategies, determination of tasks of small communities, families and individuals is important. A major role in this is played by local governments as they have the closest relationship with inhabitants, authorities and companies as well. They also have significant political influence. The question is, are the ecological, economic and social conditions of sustainable development realizable simultaneously? The fact that ecological sustainability is a long-term global issue, while economic and social conditions have immediate local effects on man in the present (Wackernagel-Rees, 2001) makes the question more complex.

In my research I was interested in local (settlement) environmental conditions and the attitude of inhabitants towards environmental problems, and its role in the life of the given settlement, and in the development of its environmental culture. The paper studies the general connections of the question and some of the results of a questionnaire survey performed in Vác, a Hungarian town with a population of 30000 people. Geographical position of Vác is given in Fig. 1.

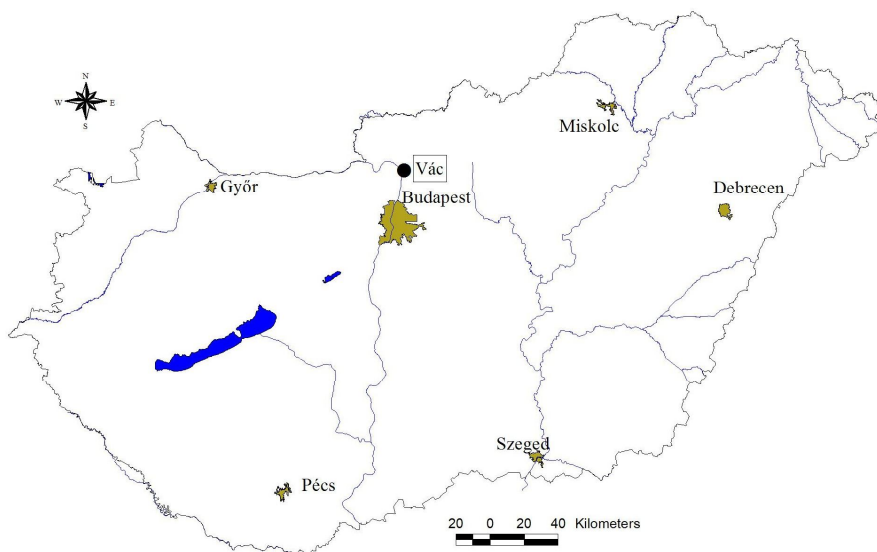


Fig. 1: Location of Vác

2. Methods

Several aspects determine the environmental culture (the environmental consciousness within this) which are determined by several factors that affect each other, and the population as well. The effects can be successfully regarded the development of environmental culture, if they operate as a system, and the effects enhance each other.

Studying the interactions, a system model is presented in the paper first in which the centre is obtained by the population of a middle-sized town, and the effects of the given system elements on the environmental consciousness of the population are studied. Following this, the level of the environmental consciousness of the inhabitants is analysed, based on the questionnaire survey performed in Vác, comparing it to instrumental measurements.

The survey performed in the Spring of 2009 among the inhabitants was deliberately face-to-face. It was completed by the random-walk method and produced 439 assessable questionnaires out of the 450. Those who replied represent the population of Vác older than 18 years regarding sex, age and qualification as well. To control this, the data of the census in 2001 from the Central Statistics Office was applied (KSH, 2002).

The questionnaire involved 33 questions, of which 2 were open, and 31 were closed. In the case of 10 questions of the 31, comments were possible to make. As the detailed assessment of the results would require a longer paper I only analysed those replies that can be compared to the instrumental measurements as well.

In order to make exact conclusions, the environmental load of Vác is characterised based on graphs and tables of measurement data supplied by the Central Hungarian Inspectorate for Environment, Nature and Water and by the Danube Regional Waterworks.

From the Central Hungarian Inspectorate for Environment, Nature and Water, I received data on 3 measurement stations in Vác regarding settling dust, NO₂ and SO₂. The three stations are located along busy roads of the Dr. Csányi L. circuit, Vám Street and Zrínyi Street.

Limits were marked based on the annual data of the joint decree of the Ministry for the Environment, the Ministry for Health and the Ministry for Agriculture (14/2001.V.9.).

In the case of the Danube Regional Waterworks, sewage treatment data of the first half years of 2001 and 2007 were applied for easier comparison for the following

parameters: released KOI, released BOI, released P, released N(NH₄) and total airborne material. For the limits, the values were given in the decree 28/2004 (XII. 25.) of the Ministry for the Environment and Water regarding the release of water contaminants.

Finally, I studied the opinion of inhabitants on the environmental conditions in their settlement by a questionnaire survey. Results are compared and analysed.

3. Model of local factors influencing the environmental consciousness of the inhabitants of a middle-sized town

General relationships gave the basis for the study, thus a model was constructed in order to determine the factors influencing the environmental consciousness of the inhabitants of a middle-sized town. Major effects developing the environmental attitude of a man are presented in the model together with those that may influence the environmental attitude of people living there into a positive direction (Fig. 2).

First factor – and strongest in the early period of life – influencing environmental attitude, is the family. Today it is clearly recognized that family is decisive in the mental, emotional, psychological and thus environmental relationship of the child and later, for the adult (Bogner-Wiseman, 1999, Havas, 1996, 1997, Kerényi, 2008, Leeming-Dwer-Bracken, 1995, Varga, 2003, 2004). Family education develops “brought” customs and first “samples” for the child. Enforcement and forming of these may come from the church as well that may have effects forming strong morality and attitude (naturally this is strongly dependent on the religious life of the family).

In the framework of institutional education, significant modifying – maybe enforcing – factors appear. Today with the help of the ever more effective forms of environmental education, and with the integration of the pedagogy of sustainability into education, they have more-and-more significant roles – especially in lower education – in turning the relationship of children to the environment into a positive direction (Havas, 1996, Havas-Varga, 1998, Varga, 1997, 2003, 2004). As a result, knowledge of the environment increases and new habits and behaviour forms appear.

Institutional education may give stable scientific knowledge and can make the child able to decide correctly alone and to acquire new knowledge from reliable sources.

The role of the media, besides family and educational institutions, is increasing (Control Group, 2002, Török, 2005, Szabó, 2007). Considering the forming of the environmental attitude of children, it seems to have negative effects, rather than

occasional information with advantageous characters. However, this field holds many more possibilities in the case of informing both children and adults, and in influencing behaviour in the right way.

The office also has great effects on the adult population (Schäffer-Dudás, 2008, Nemcsics-Zsóka, 2005). In this case primarily the environmental attitude and social role of the employer can influence significantly the environmental behaviour of the employee. Of course one of the major influences is presented by the environmental attitude of friends.

As people live in a settlement, the opinion of the leaders is also significant. In the case of a middle-sized town, local government has several fields in which it can take measures in developing the environmental conscientiousness of the inhabitants and thus, the whole town.

Civil organizations also have an increasing role in forming the environmental attitude of people. With their educational programs calling attention and colourful events inspiring active participation, they can contribute largely to the development of the environmental conscientiousness of the population. Many people become members of green organizations.

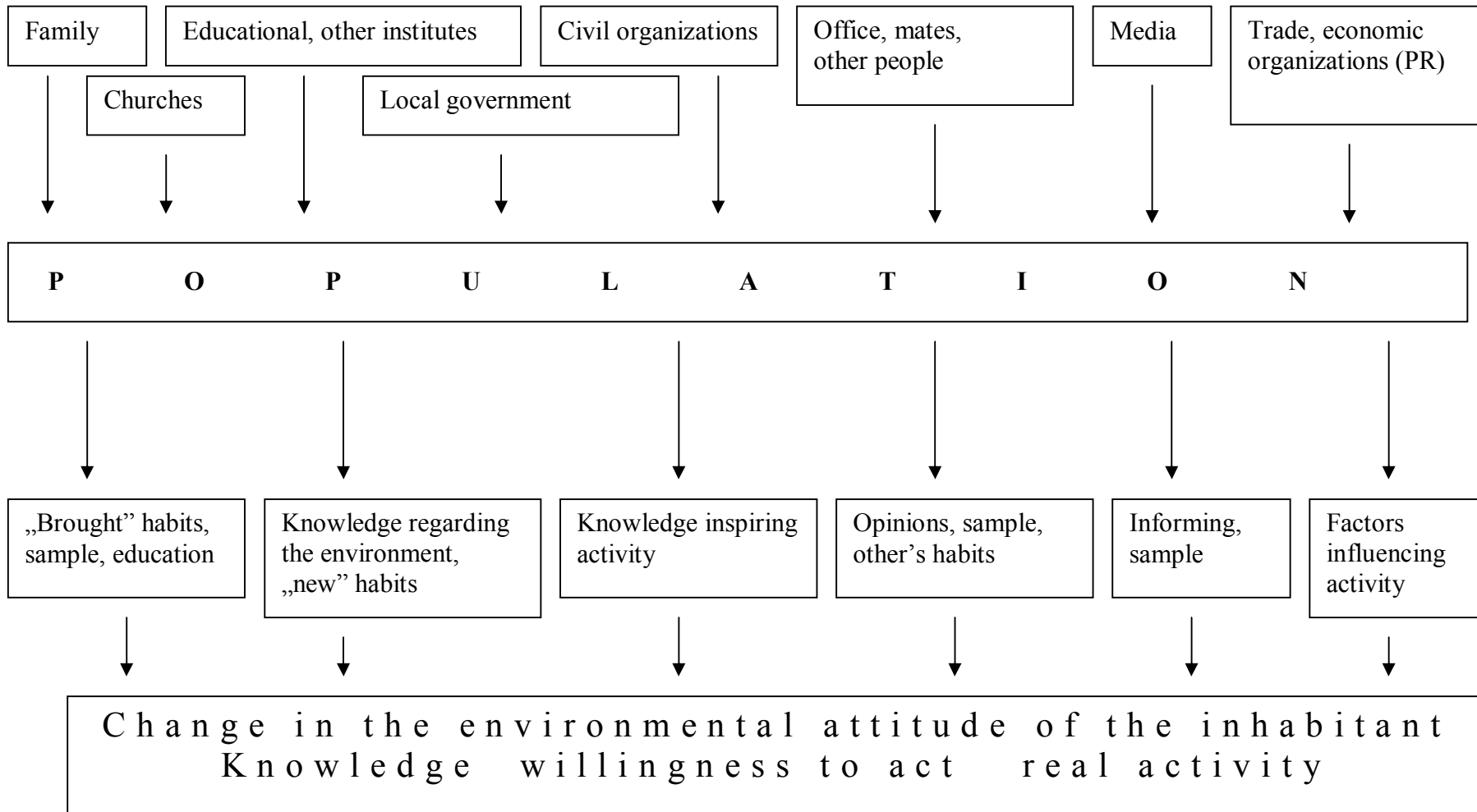
Representatives of trade and the economy in general, can influence environmental attitude in two directions. False, misleading advertisements reduce environmental conscientiousness, while accurate customer guides and leaflets showing the advantages of environmental friendly products and open days presenting the environmental control system of a company, can help the development of environmental conscientiousness.

All these factors affect together – in many cases simultaneously, and in opposite directions – the community forming its environmental attitude, behaviour and activity.

4. Characteristics of air pollution in Vác and their judgement by inhabitants

Vác is one of the towns in Hungary where significant changes occurred in environmental loading in the past two decades. It is beneficial that this change was primarily positive. Vác belonged to the most polluted towns in Hungary at the end of the 1980s and at the beginning of the 1990s. This has changed significantly today.

Fig. 2. Model of the local factors influencing the environmental consciousness and environmental attitude of the population



Following the political change, the infrastructure and utilities provision in Vác developed significantly, while the structure of industry changed completely. This can be explained by one of the most polluting industrial establishments – the factory of Duna-Dráva Cement Ltd. in Vác – significant technological developments and environmental protection investments were completed, reducing significantly the rate of air pollution. This is particularly striking when data prior and after the developments are compared. Today the rate of air pollution is one-twentieth and one-tenth of that of the 1980s and 1990s respectively. It was obligatory for new industrial establishments to apply environment friendly technologies. Currently the most important air pollution values are under the health limits in town average, except for a few hourly data (Megyeri-Runyó A. 2008).

Clear reduction of dust immission can be observed as measured values stay below the annual limits (Fig. 3). On the busiest road (Dr. Csányi L. circuit) of the town, however, air pollution values vary widely in relation to the rate of traffic.

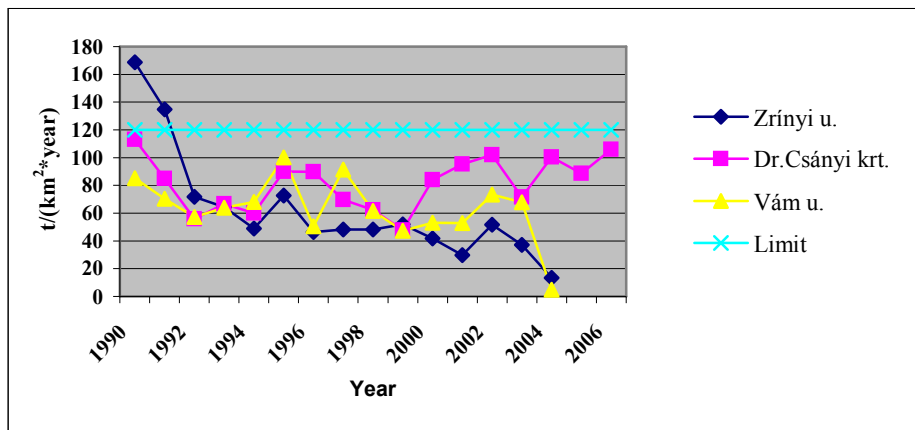


Fig. 3. Annual average amount of settling dust between 1990 and 2006 (prepared by the author based on the data of Central Hungarian Inspectorate for Environment, Nature and Water)

Regarding annual average, values of SO₂ have not exceeded the limit since 1995 at any of the measurement locations. It is clear that NO₂ values show high salient in annual level along the most polluted road – Dr. Csányi circuit – with values way over the limit (Fig. 4).

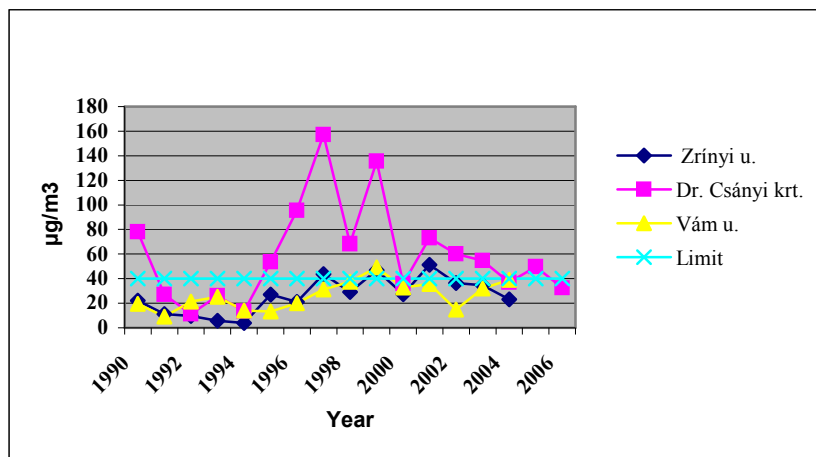


Fig. 4. Annual average concentration of NO₂ between 1990 and 2006 (prepared by the author based on the data of Central Hungarian Inspectorate for Environment, Nature and Water)

From 2000 pollution data of NO₂ remained near the limit, exceeding it occasionally in all three measurement places. This also indicates that the majority of pollutants were emitted by industry and heating of houses earlier, today traffic is the primary source of air pollution.

How much is observed by the inhabitants from this? Based on the questionnaire survey, it can be stated that the majority of inhabitants (63 %) regard air pollution as the most important problem considering the environmental state of their settlement. Similar results were obtained by Kenéz in the course of a national survey in 2006, when air pollution was given first place among environmental problems by those replying (Kenéz, 2007). Traffic is pointed out as the cause behind air pollution by 57% of those asked, as shown in Figure 5. This means that inhabitants feel the problem and see well the cause. The situation is not so advantageous regarding the use of cars: According to the Eurobarometer (Eurobarometer, 2005) only every tenth person would avoid the use of his car in Hungary, however, this would still mean 53% less car use compared to the EU25 (Eurostat, 2007).

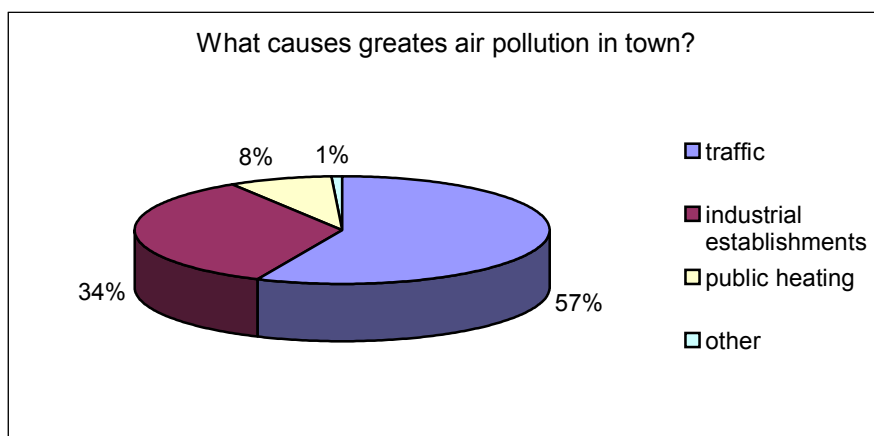


Fig. 5: Origin of air pollution in the town according to those who were asked

It is worth noting that traffic of main road 2 running across the town has not been reduced since the 2A bypass was built. Therefore, no real change has been measured regarding air pollution since the construction of the bypass road. An important result, however, is that the local government of Vác prepared the traffic development concept in November 2006 and its realization is currently underway. In the course of this, one part of Széchenyi Street has been transformed to a pedestrian precinct, together with Március 15 Square, in order to reduce the environmental load. Therefore, significant improvement is expected in this part of the town.

5. Quality of waters, problem of waste management and the opinion of the inhabitants

The state of surface waters was improved significantly as well. This was largely produced by the increase of the rate of utilities – reaching 87 % in 2006 – and channel construction has been continuous since then, joining various parts of the town to the channel network and increasing the rate up to around 90%. This value is extraordinary at national level, as according to the data of the Ministry for the Environment and Water, ratio of the channel network was 70.8% at national level on 31st December 2008 (KvVM, 2010) this can be regarded as a significant improvement, compared to the 56% in 2002. The survey among the inhabitants of Vác coincides well with the data provided by the local government: 91% of those who were asked live in parts of the town that are connected to the channel network indicating that sewage management is a practically solved issue in Vác.

Water contamination, however, was not caused entirely by the population. Industrial establishments were significant contamination sources as well. In the case of the Danube and the Felső Gombás and Gombás streams, pollution originated outside the country.

Regarding these, the town was able to take measurements against industrial and population originated contaminations. The greatest problem was presented by the fact that industrial factories, in numerous cases, released a part of sewage into precipitation channels often releasing dangerous compounds as well. As the result of intervention of the town such industrial contaminations became rare.

Further improvement was reached by the fact that, new larger factories (Zollner, Eichhof Ltd.) have preliminary cleaning units accredited by certain prescriptions, therefore they can be regarded virtually as non-polluting establishments (Megyeri-Runyó, 2008).

Contrary to the facts, 34% of the asked inhabitants regard water pollution as the second major environmental problem of the town. That is similar to the national survey of Kenéz as it also revealed that water contamination is the second largest problem following air pollution (Kenéz, 2007). Studying the age distribution of the answers, it is revealed that older people regard the problem especially severe. (43 % of those aged above 60 marked water pollution as the most important environmental problem of the town.) This can be explained – as I have already mentioned – by the fact that a part of industrial and domestic sewage in Vác was released into surface waters mostly, illegally, without any treatment.

Answers to the question on efficiency of sewage treatment gave interesting results. The aim was to see what inhabitants know about the effective operation of the sewage works. 67% of those asked had no information at all, only 25% replied that he/she considers it appropriate and 6% had negative opinions on the operation of the plant.

Measured data gives no reason behind the distrust of inhabitants regarding the operation of the sewage works: Clear improvement can be observed in the treated sewage quality parameters, compared to data of the 1980s (Table 1). Probable explanation of the distrust can be that the unpleasant smell of treated sewage released into the Danube prior to the renovation of the plant developed negative feelings among inhabitants.

Improvement in sewage treatment is fundamentally the result of developments of the sewage treatment plant completed in 2006 (DMRV c Inc., 2007). Thanks to the investments, no significant pollution is released into the Danube from the sewage treatment plant during normal operation.

Table 1. Most important quality parameters of sewage treatment (source: DMRV c Inc.)

Quality parameters	2000 1st half year (mg/l)	2007 1st half year (mg/l)	Limit (mg/l)
KOI released	80.4	46.3	75
BOI released	35.6	6.6	25
Total suspended material	95.5	41	35
N(NH ₄) released	32	2.54	25
Total P released	6.3	5.3	2

Considering both water contamination and sewage treatment, it has to be stated that the knowledge of the inhabitants differs significantly from the real situation, as the sewage treatment plant of the town operates generally with good efficiency, only the total P content of the released water exceeds the limit significantly.

Considering waste management, the situation is not as good. Although waste transport is solved over the entire area of the town, and 45 sites of selective waste collection are found, illegal waste dumping is a continuous problem. This is especially harmful next to streams and the Danube. Thirty percent of those asked regarded this as a major problem placing the issue as third among major environmental problems.

Local government makes huge efforts in order to eliminate illegal waste dumps, however, forming the attitude of the population seems to be even more important. It is beneficial that environmental education is involved in education – especially in elementary school – and receives an ever increasing role. In the meantime, however, improving the environmental consciousness of adults also needs addressing, as the environment of the present is basically formed by them, and they have the potential to change current negative processes.

A positive feature is that inhabitants use selective waste collection in a high ratio. At the national level the ÖKO-Pannon Public Utility Company charged the TNS Hungary Ltd. to prepare a representative survey involving 1005 people at the end of 2008. This revealed that 52% of those asked collect waste selectively (TNS, 2008). 68% of those asked in Vác are contributing to selective waste collection, and this is a high value, even in the national context. Furthermore, 72% of those not selecting said that the collection point is located far from them, thus further improvement in the ratio is expected in case the location of collection points will be rationalized. (Distance of collection points was the primary reason for those not selecting waste, according to the survey of the TNS Hungary, as well. TNS, 2008)

6. Information transmitting at local level

Finally, information transmitting as a factor influencing significantly environmental consciousness and knowledge as well is discussed. Nowadays media and, especially electronic media becomes the primary source of information (Szabó, 2007). Television influences significantly our lives and our scale of values. This is recognised by both the companies and the civil sphere as well although possibilities have not been utilised completely yet (Török, 2005). Local channels and thematic programs become more-and-more important and local media may contribute largely to presenting the strategy of dematerialization and consumer optimalization (Valkó, 2003, Szabó, 2007). Several authors have studied its positive effects (Control group, 2002, Szabó, 2007).

People, however, today – due to the lack of experiences and inadequate information transmitting – often cannot see the relationship between environmental problems.

Information in Vác, with the help of local media, can be regarded as reasonable. Local people use local media as 41% signed local TV and radio, while 30% the local newspaper as their source of information. These results are comparable to the survey of Szabó (2007) revealing that local television, radio and press are the primary source of information for local people (Debrecen) (Szabó, 2007) My survey, however, also revealed that information from friends and other people – not official – has a major role in orientation (43% of those asked obtain their information through friends and other people). This may explain that, despite official information, the population has no adequate information on the most important issues. This is supported by the replies to the questions on the new regional waste depository and the already in force, partly realized, traffic development concept as well. In both cases the rate of those who have not even heard the issues is above 75%. What causes this? Disinterest? Indolence? Or unclear meaning of the term? In my opinion all three have a role in it, but maybe repliers did not want to admit their own indolence.

7. Conclusions

In conclusion, it can be stated that facts and feelings of the population regarding environmental features are in accordance to each other. Differences are caused by inadequate or missing information - this has to be changed. As environmental changes are always the result of some kind of human activity thus in harmonic operation of urban environment and in the environmental effects of social activities – including environmental pollution and environmental protection as well – thoughts of inhabitants are fundamentally decisive. Environmental problems lead not to automatic generation of environmental attitude. Social demand, forming on the basis of environmental interest, can create the appropriate relationship between society and environment. This is why it is important for the system elements in the system model to unfold their positive effect on the environmental attitude of the inhabitants. If, for example, the elements in the model of Vác (e.g. families, educational institutes, local government, civil organizations) operated together steering each other, inhabitants following the development of firm based knowledge and activity willingness would reach real activities protecting and sparing the environment. This is in the interest of the local government as well, thus it has to make further efforts to inform the inhabitants in order to activate them in larger ratio to solve environmental problems.

Environmental conscious thinking results in the correct usage of the environment with which inhabitants establish their own safety and life standard. Protection of the environment requires active daily attention from every man. It is highly important, therefore, what the relationship between the given person and his/her surrounding environment – in this case the settlement – is like, how he/she decides on the activities that may influence the environment.

Environmental sensitivity of the population of the studied settlement is strong, emotional components of environmental conscientiousness of the inhabitants show positive signs.

Although their knowledge is deficient in certain topics, it is better than the national average. However, the general level of environmental attitude in Hungary is at an intermediate level compared to European levels. The situation is better than the national average in Vác and this is reflected in the overall good image of the settlement as well. Transmission of environmental information, however, needs to be improved and the relationship of the local government, civil organizations, educational institutes and the inhabitants in order to develop more effective environmental protection.

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