Environment Telematics - Perspectives of Users and European Decision Makers

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Abstract

Telematics applications play an essential role in the dissemination of environmental information and environmental measures. This contribution gives an overview of the applications of environment telematics in Europe as a result of two projects which were performed on an international level.

The analysis covers the situation in EC countries as well as in CEE countries, with an emphasis on regionally different expectations of users and decision makers on a local level. They are based on the one hand on already existing experience with telematics applications, on the other hand they are a consequence of different economic, political and environmental framework conditions. The individual environmental situation and environmental awareness in the examined regions are the main factors leading to different expectations from the use of telematics.

An overview of environment telematics applications structured according to the relevant subject areas highlights to what extent single projects have been able to fulfil the expectations that had been placed in them.

1. Introduction

The International Society for Environmental Protection (ISEP) organised, in cooperation with partner organisations, several conferences and workshops on Web-based applications. The conferences were entitled Internet for Environmental Communication (Vienna, 1996), DETERMINE (Dissemination of Environment and Transport Telematics Results and Needs Analysis in Central and Eastern Europe, Szentendre Hungary, 1998) and Telematics Solutions for Sustainable Development (CAPE, Munich, 1999). The latter events focused on the presentation of results

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which had been developed in the Telematics Application Programme (TAP) of the 4th Framework Programme of the European Union. Moreover, DETERMINE and CAPE (Co-ordinated Action for Pan-European Transport and Environment Telematics Implementation Support) consider the special requirements and needs of future users in the countries of Central and Eastern Europe (CEEC).

2. Methodology

During the CAPE project (1998/99), an evaluation of the environmental background and traffic situation was performed, including an outlook on future developments in ten CEE countries (Bulgaria, Estonia, Latvia, Lithuania, Poland, Romania, Slovakia, Slovenia, Czech Republic, Hungary).

In the environmental area, the following themes were included in the survey: existing telematics applications, preparedness to intensify these applications, availability of data, legal and financial framework conditions, etc. The methodology employed in the area of traffic and environment was to put experts who were familiar with the local and national situation in charge of a study. Moreover, in the area of environment, questionnaires were sent out to more than 500 public authorities.

The objective of the studies and of the survey was to find up-to-date information on the evaluation of the environmental situation, the environmental problems to be expected, personal opinions on the current environmental situation, the importance of telematics applications and the expectations placed in them in the co-operation of CEEC. While the studies permitted a representative overview of the supra-regional and national situation, the questionnaires also reflected the standpoint of the locally affected representatives.

A return rate of 26% in CEEC countries can be considered relatively high. In the environment sector, the survey was also sent to approximately 800 public authorities in 15 countries of the EC. The return rate was of 15 % which is – we had almost expected that – lower than in the CEEC. An overall number of 250 questionnaires was analysed during the whole survey.

3. Evaluation of the Environmental Situation

If we want to find out to what extent environment telematics may improve the state of the environment – even if that is difficult to evaluate – we must first define the key environmental problems. This definition has been performed on the basis of the survey. During the analysis some parallel developments but also important differences emerged between the EC and CEE countries due to the diverse economic and environmental backgrounds but also due to the different level of environmental awareness in the countries included in the survey.

Moreover, the evaluation performed by the independent experts differs partly from the environmental status resulting from the survey. However, in the current analysis we can certainly make our comments on the basis of the decision makers and users.

If we consider the result more closely, we can perfectly understand the sewage situation in the CEE countries, especially if the country reports say that e.g. only 20% of households in Budapest are connected to a sewage plant (CAPE Country Reports, Hungary 1999). These problems seem to have been solved in the EC countries, except for some regions in southern countries of the Community. The situation is much more varied with respect to traffic-induced environmental problems. While they seem to be predominant in EC countries, decision makers in CEEC rarely consider traffic as a major problem. At the same time, the country reports indicate that the rapid increase in private motor vehicles has led, especially in

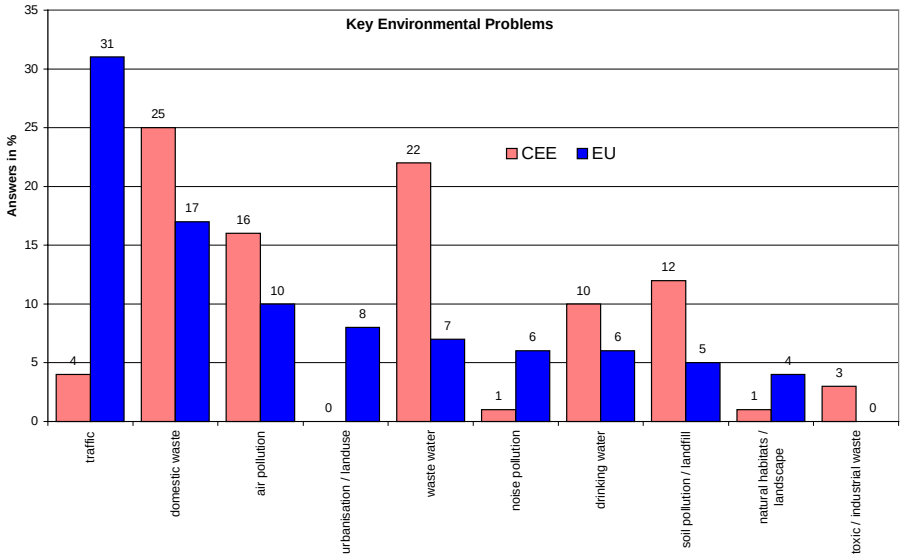

Figure 1: Key Environmental Problems. Percentages are related to the answer 'highest priority' out of four possible answers.

congested areas, to a major degradation of the environment. This fact is reflected by the evaluation of air pollution in CEEC, although considerable progress in domestic heating and industrial emissions was detected recently. If the European Community considers the increasing level of urbanisation, noise and the endangering of habitats as major problems, CEECs are facing, on the other hand, environmental problems

like toxic waste and contaminated soils as classical burdens of the past. These issues are considered to have been resolved in the EC countries.

4. Availability of Environmental Data

Reliable data materials are the basis for successful environment telematics applications. To define key priorities, the availability of basic data had to be evaluated. We have to emphasise that the survey does not reflect public access to the data, but only the level of accessibility of data for users and decision makers on a local and regional scale and, respectively, which data are retrieved automatically and may be accessed.

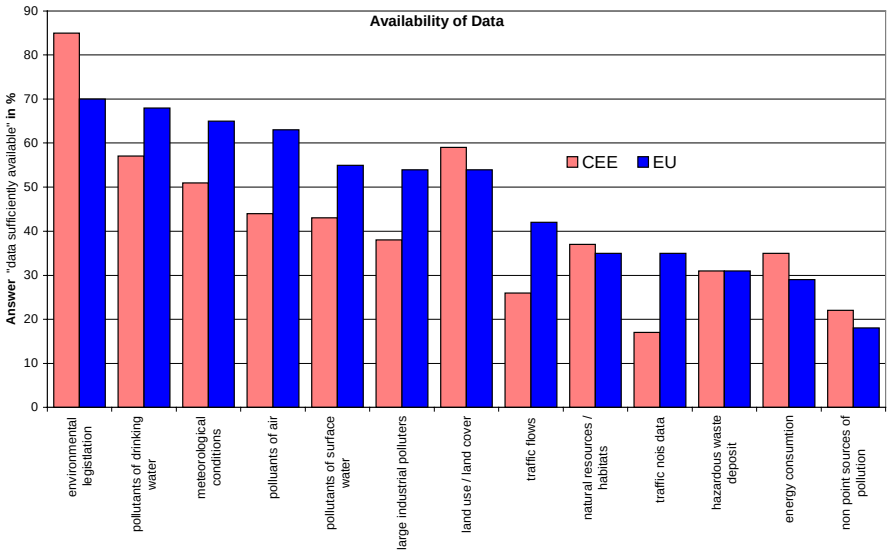

Figure 2: How do decision makers on a local level evaluate the availability and completeness of data?

EC representatives are convinced they have sufficient data material at their disposal, and, on the whole, decision makers from CEE countries share this opinion. However, according to the experts, the data material available in CEECs is very often insufficient. Measurements are sometimes available with reference to time and space, but a lack of data in time series and the incompatibility of databases are problematic, making it difficult to exchange data (CAPE Country Reports). The question of insufficient data was raised in this context. There was general agreement that there was

insufficient information on diffuse emissions, hazardous waste deposits and energy consumption in most cases.

5. Expected Impacts of Telematics Applications

The question: „*What do you personally believe the impact of information and communication technologies might be in the next 2 - 3 years?*“ offering the following possible answers: “ – low (no or very little actual change) – moderate (some benefits are expected) – significant (major improvements will be achieved)” can be considered as a key question of the survey.

Significant progress is expected first of all in the area of support for environmentally relevant decisions, in education and training and in awareness raising. Support in the implementation of environmental legislation, in emergency management and in industrial environmental protection are essentially expected in the CEE countries. The expected support in waste management highlights the problems in these countries. However, the following proves that telematics-based solutions are difficult to find.

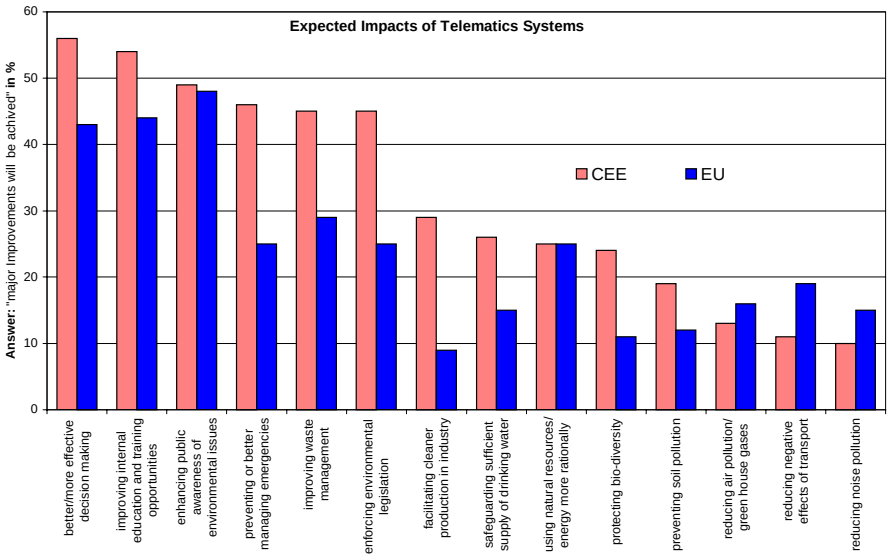

Figure 3: High expectations and some regional disparities characterise the opinions expressed on expected impacts of environmental telematics

6. Existing Applications of Environmental Telematics in CE and CEEC

Existing applications are basically structured according to the contents, e.g. in areas like Environmental Monitoring, Air, Water, Environmental Information, Systems for Management of Resources, Emergency Management Systems, Waste Management Systems, Tools for Environmental Assessment and Planning. Further structuring is possible according to the application area (trans-national, national, region, local) and to the user group (public, administration, decision makers, experts). In the CAPE project, a number of telematics applications have been selected, starting with a requirement assessment, which were representative in terms of their application area and user group. Many telematics applications have been funded in the 4th framework programme (TAP), others had been tested in the CEEC. The case studies have been selected as "Good Practice Cases" according to their potential for development, transfer or adaptation. Particular emphasis was placed on transferability of the applications. New solutions are required bearing in mind different framework conditions (priorities in environmental problems, technical infrastructure, funding, data availability) in the CEECs and EE countries.

The following projects have been documented as "**Good Practice Cases"**:

Project	Theme	Scale	Users	Location
Construction and Demolition Recycling Database	Waste Management	Regional, local,	public	Austria
Telematics for Waste Management in the Rhone-Alpes Region SINDRA	Waste Management	regional	decision makers, experts	France
Contaminated Sites Management COSIMA	Assessment and Planning	regional, local	administration, decision makers, experts	Germany, Ireland
Urban Air Quality Management in Vilnius	Air Monitoring	local	administration, decision makers, experts	Lithuania
Joint Air Monitoring System in the Black Triangle Region JAMS	Air Monitoring	transnational, national, regional	decision makers, experts	Czech Rep., Germany, Poland
Telematics Assisted Handling of Flood Emergencies in Urban Areas TELEFLEUR	Disaster Prediction, Emergency Management	regional, local	decision makers, experts	Greece, Italy
Danube Accident Emergency Prevention and Warning System Danube AEWPS	Disaster Prediction, Emergency Management	transnational, national, regional	decision makers, experts	Danube Catchment Area
Forest Fire Support Management DEDICS	Emergency Management	regional, local	decision makers, experts	France
Health and Environmental Information System of Munich HEISMUC	Environmental Information	regional, local	public, administration, decision makers, experts	Germany
Environmental Information System of Prague IOZIP	Environmental Information	regional, local	public, administration, decision makers, experts	Czech Rep.,
Black Sea Marine Environmental Management Support System	Environmental Information	transnational, national, regional	public, administration, decision makers, experts	Black Sea Region

7. Conclusion

Based on the results of the survey and the Internet Applications for Environmental Protection, DETERMINE, and CAPE conferences we can enumerate the following essential environmental problems which have been evaluated differently on a regional level:

- Traffic in the area of the EC
- Waste in EC and CEEC and
- Waste Water mostly in the CEEC

However, the key environmental problems in the long term, which have been recognised by renowned experts, like global warming management, conservation of biodiversity and sustainable development, have only been mentioned sporadically.

Related to telematics

- Traffic has to be considered as a special problem. The effect of many telematics applications is to increase individual traffic and, as a consequence, to aggravate environmental problems.
- There are few telematics solutions in the field of waste, like a recycling forum or public information.
- In waste water management, telematics may be employed as a planning and decision making tool during the implementation of technical solutions (e.g. construction of sewage systems and sewage plants). In addition, web applications offer new possibilities in international communication. For example, the exchange of environmental data and information is required for pollution mitigation in transboundary river basins. Moreover, bi- and multilateral decision making processes can be supported through distributed information systems (Ruzic, Pillmann 1998).

The expected impact of telematics is basically considered higher in CEE countries. This can be mainly explained by a lack of experience, since telematics applications are often considered to be a ‘panacea’. In fact, they do not solve all problems but act as decision support systems. In the area of public information, telematics applications facilitate the dissemination of environmentally relevant facts and support at the same time environmental pressure on decision makers. However, we should not overestimate this effect. As a further step in the area of public information, plans can be made for ‘personal environmental information’ providing citizens and organisations with data which are individually adapted to personal interests and needs or according to limiting values.

Another difficulty is the transfer of approved systems to other expert fields or other regions. The problem is not only the compatibility or the capacity to integrate existing systems. In many cases, a slight shifting of framework conditions (e.g. in administrative structures) requires development of a completely new system. There-

fore, it would be important to encourage an intense exchange of experience in telematics applications in relation to contents, administrative and technical items, and to promote the dissemination of the results of "Good Practice Cases" on an international level.

8. References

Determine: Environment and Related Transport Telematics Results. Innovative Services and Solutions for the Citizens (1998). Proceedings of the EC DG XIII/ ISEP/KFK/REC Conference June 4-5, 1998, Pillmann W., Simpson J. (eds.), Szentendre, Hungary. International Society for Environmental Protection, Vienna 1998 (see also: www.isep.at/publications/determine.htm, and http://www.rec.org/REC/Programs/Telematics/DETERMINE)

Environment Telematics – Project Summaries. Telematics Applications Programme 1994-1998. DG XIII Telecommunication Market and Exploitation of Research, Brussels 1998

ENWAP User Forum – Environmental Telematics for Water and Air Pollution Management. Good Practice Case Studies. DG XIII Telecommunication Market and Exploitation of Research, Brussels 1999

Internet for Environmental Communication. Workshop ISEP & Umweltbundesamt Wien, Mai 1996. Tagungsberichte Bd. 17, Umweltbundesamt, Wien 1996

Needs and Options for Environment Telematics Research at the Turn of the Millennium. Recommendations for the preparation of the 5th Framework programme. EC DG XIII Telecommunication Market and Exploitation of Research, Brussels 1997

Ruzic I., Pillmann W.: Towards an Integrated Danube River Basin Information System. In: Determine 1998

Telematics Solutions for Sustainable Development. Preprints of the International User Forum June 1999, Mudri M., Pillmann W. (eds.), Munich 1999; Proceedings 2000