Data of Environmental Impact Assessments and Information Systems

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Abstract – The aim of the Environmental Impact Assessment (EIA) is to survey and evaluate the impact the establishment is expected to have on the environmental elements and systems. In order to describe the probable impacts we need data of the environment. The primary aim of the research was to explore the data required to perform the Environmental Impact Assessment with the help of literature, law and impact studies. It was further studied to what extent the data content of the relevant domestic information systems and databases are suitable to satisfy the data-pretension of environmental impact studies.

Keywords: environmental elements /environmental database/ environmental impacts

1. INTRODUCTION

Prior to realising, abandoning or enlarging certain establishments or projects it is compulsory or in some cases advisable even without any legal obligation to carry out Environmental Impact Assessment. In Hungary the Government Decree No. 314/2005 (XII. 25.) on environmental impact assessment and the integrated environmental permit stipulates the necessity of the Environmental Impact Assessment (BÁNDI 2007).

The task of the Environmental Impact Assessment is to decide the execution of the establishment on the basis of the examinations. In general we can say that impact assessment is a process of information acquisition and analysis. In order to get as useful as possible information through representative tests and measurable results in view, we need reliable data. The principles of the Environmental Impact Assessment emphasise the importance and necessity of tha data because these principles can be realized only in the possession of quality and quantity data (PÁJER 2006).

Conducting impact assessment is time-consuming primarily because of the lack of the possibility for directly transferring actual data from information systems for the indication of the condition of the area under study (ELEKNÉ FODOR 2010).

2. METHODS

The aim of the research was to explore the data required to perform the environmental impact assessment as well as to study the possibilities of transferring those data from electronic databases. The basic method applied was the investigation of pertinent literature, law, available impact studies and electronic databases.

The question to answer was what types of environmental data are necessary and satisfactory for carrying out the impact analyses of roads. In the course of the research the

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general requirements on data for impact studies were investigated, we have not attempted to go into specific cases and unique data-pretensions.

It was further studied to what extent the data content of the relevant domestic information systems and databases are suitable to satisfy the data-pretension of environmental impact studies and how readily they can be transferred for concrete studies. Among the potential electronic databases that can be regarded significant from the point of impact studies the ones as below were investigated:

- Nature Conservation Information System
- Soil Protection Information and Monitoring System
- Water Information Systems
- General National Habitat Classification System
- Hungarian Air Quality Network.

3. RESULTS AND DISCUSSION

3.1. Data of Environmental Impact Assessment

In the subsequent sections the results of the research will be demonstrated through a case study relating a road *(Table 1)*.

In the construction phase, in order to determine the load on the area it was necessary to know the nature of the area, the use of the area and the soil quality. For the impact of the felling of trees and the removal of the vegetation we had to have knowledge on the ligneous and non-ligneous plants of the area including the protected species that occurred in the area. In this case study removal of Black locust and poplars had happened and since this was an agricultural area no non-ligneous plants other than crops had been cut out. Because the removal of the vegetation caused the ceasing of habitats the research extended to studying the animal species (first of all birds) that lived in the area, and their movement.

For establishing the impact due to earthwork we had to test the value of soil and the depth of humous bed. The disturbing effects of noise and vibration due to the road construction work can be assessed with the knowledge of animal species. When investigating the impact by the surfacing of the road we took the localisation of superficial and subsoil water, as well as ground water into consideration.

With respect to road construction we had to reckon with the generation of gases and vapour and their spread that is influenced by the prevailing wind direction. The study also used that information on the prevailing wind direction to assess the air pollution that happened with the transport of building materials.

In the case of roads water construction works may extend to both the superficial and the groundwater systems, drain directions, therefore these data were also taken into consideration in the impact studies. Prospective change in the water balance can be determined with the knowledge of site conditions. Our investigations also extended to the water flora and fauna.

In the operational phase, for determining the diffusion of substances into the soil from machinery in the course of their movement we had to know the localisation of soil layers and their slope conditions.

Examination of the probable air pollution (gazes, dust pollution, heavy metals) was carried out with taking into account the data on the prevailing wind directions and wind speed. The assessment of the expectable traffic and the corresponding stress was effected by considering the traffic on the nearby roads, local traffic as well as the extent the area is built up.

For the assessment of the change of state due to harmful influences on the vegetation (noise, vibrations) we needed information on the composition of species and their sensibility.

In order to determine the extent of barrier effect the movement of wild animals and the spread of plant species was examined on the spot.

On the basis of the species in the plant cover of roadside shoulder and drain ditch we could conclude the size of the effect by the salt solution flowing down from the pavement, which can result for example the propagation of halophyte plants.

Since the waters draining from the road can easily get into live waters, we needed to determine the slope situation, precipitation conditions and the composition of water wildlife for the assessment of the stress on the environment.

Table 1. The necessary and satisfactory data for EIA

Environmental elements and systems	Types of data
Topography, soil and parent material	topography, parent material, relife soil type, soil quality, water balance and soil layers location, stability, vulnerability physical, chemical, biological characteristic (for example pore volume, porosity, permeability, humus content, thickness of humus layer, ph, acidification-leaching tendency, naturally occurring heavy metal content) protected geological values
Surface and groundwater	location of surface and groundwater, sensitivity, stability, vulnerability size and location of drainage basin, watercourse and water storage runoff flow direction, quantity, and velocity Significant water flow physical, chemical, biological parameters Number of wells protected hydrological values
Air	prevailing wind direction, wind speed precipitation conditions, spatial and temporal distribution of rainfall dominant atmospheric conditions, air quality average and extreme temperature data atmospheric inversion rate of snow melt
Flora an fauna	species composition of the roadside environment, protected species, biodiversity sensitivity of plant species animal species sensitivity against noise and vibration
Ecosystem	type of ecosystem, extent of ecosystems stability of ecological processes sensitivity of the roadside environment movement and behavior of animals
Urban environment	noise and vibration load condition of roads and buildings built-in area cultural values
Landscape	landscape, land use nature-function areas, protected areas

The effects of abandoning the planned road were not examined in our study. The probability of traffic accidents is low; accidents may be prevented by careful construction as well as by road use according to regulations. Examination of damages would not need special data, since the features of the environmental elements have been demonstrated in the course of the preliminary investigation documentation (KORONIKÁNÉ PÉCSINGER 2008).

3.2. Examination of Information Systems

The data content of the inrormation systems could be useful and available for the environmental impact assessment documents, but there are some difficulties.

It should be noted that since these networks do not cover the whole of the country it is not guaranteed that we can find data for the area under study.

The databases and systems examined in this study are accessible for the public with difficulties. Data can often be queried from the respective authorities only; in the case of special needs users are supposed to pay fees for the supply of data. There exist databases to which access can be obtained after complicated registering processes.

The information and monitoring systems studied are not compatible, data is not possible to be transferred from one database to another; often there is no conformity between the individual modules of the same database.

In the course of examining the databases we met data that were found in several databases, but depending on the supplier of information for the given system or on the authority inspecting the operation of the system these data showed different values.

It was experienced several times that access to data can not be provided in the course of development or updating of the database, resulting in sustained interruption of the supply of data.

It can be established that the databases studied are not open for the needs of unique investigations; these can only be built in the system with difficulties or not at all.

4. CONCLUSION

According to the investigations there are no concrete standards to the requirements on data of Environmental Impact Assessment. Therefore, the main parameters of the environmental elements and systems that are necessary for the environmental impact assessment can be established.

The databases examined in this study roughly contain the necessary data, so ideally they can be useful in the environmental impact assessment process. However in practice transferring actual data from information systems is difficult and time-consuming.

For this problem it could be a solution to establish a database which can be continuously developed and is accessible for the public. It should cover the whole of the country to avoid the lack of data. More emphasis should be also laid on the relationships between the individual inspecting and operational organisations.

This system would not only reduce the time of preparation of impact studies, but also speed up the impact assessment process.

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