

Feasibility Study for the Establishment of a UNEP/GRID-compatible Environmental Information Network in Hungary

Csaba Nemes



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FEASIBILITY STUDY REPORT

Csaba Nemes

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Foreword

In 1994, UNEP initiated a program to support environment assessment, reporting and data management capacities in countries with economies in transition in Central and Eastern Europe. This includes identification of needs and the formulation of project proposals to meet these needs. With partner agencies and other donors, UNEP seeks to leverage finances to correct any imbalances.

This activity is a part of UNEP's global ENRIN (Environment and Natural Resources Networking) programme, which is a direct follow-up of Agenda 21, chapter 40 on information for decision-making. This chapter underlines that there is a need for easily accessible environmental information at all levels, from that of senior environmental decision-makers to the grass roots. An agreement has been made with the GRID-Arendal centre in Norway for implementation of the ENRIN program in Central and Eastern Europe.

This feasibility report assesses the environmental information systems capacities and needs in Hungary, and proposes actions necessary for strengthening the existing capacities to improve access to environmental information for decision-making and awareness.

Included in the recommendations is an implementation proposal leading to an operational UNEP/GRID-compatible environmental information network in Hungary.

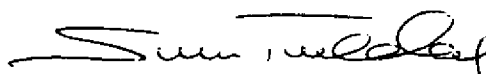
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Nairobi, 4. October 1995



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Arendal, 9.9.1995



Otto Simonett, Programme Manager
Eastern European and Developing Countries

Hungary Report

FEASIBILITY STUDY REPORT

1. INTRODUCTION

The recognition of the inherited environmental problems and the need to remedy them and to take strong measures to avoid further environmental degradation and, even more - to follow the principles of sustainable development in the future - are important lessons and issues which have at last been adopted in general terms. Unfortunately, this learning and modernisation process is very slow. The position of environmental protection and nature conservation, or, in more general terms, that of integrated resource management and sustainability, are relatively weak, because of the seemingly more evident short-term priority of essential, but particular economic and social problems.

The fundamental task of the monitoring systems used in environmental protection is to provide structured information on the effects of the deterioration of the environment. This information has to be suitable to satisfy the information demand of the scientific and professional fields (system analysis, planning) of authorities and politicians as well as of the general public.

Increasing the efficiency of the process of taking environmental decisions saves time. Implementation of emission-reducing programmes and of other tasks as well as increase of the efficiency of the control activity require standardized, exact, well-organised, up-to-date data systems. These should be as complete as possible, and there should be the possibility of

displaying the data in the desired form and specification.

The recent monitoring system is divided according to professional branches and contains relatively few measured data except quality data related to air and soil. Auto-evaluation and control measurements show that the demonstration of the data in one system is not solved yet in a satisfactory manner.

The first steps in developing a comprehensive information system containing the diverse data related to the environment have been made under the co-ordination of the Ministry for Environment and Regional Policy.

For the co-ordination of IT-activities, an Inter-Ministerial Committee for Information Technology (ICIT) has been established. This Inter-Ministerial Committee was formed following the Government resolution of 1993 (No. 1039/1993). The main tasks of this organisation, which consists of several working groups, are the creation and enforcement of government level recommendations, standards and regulations, as well as controlling the optimal utilisation of resources.

A new department was established within the Directorate for Environmental Strategy of the Ministry for Environment and Regional Policy: the Department of Environmental Analysis and Informatics which has to co-ordinate all related IT-activities within the Ministry. In addition, an Information Programme Council has been

established within the Ministry, which is formed by the Heads of the Departments and 11 representatives of the regional environmental inspectorates and the nature conservation directorates. This council has to define the tasks and to prepare policy decisions for the development of the IT. The council is chaired by the State Secretary, whereas the head of the Department of Environmental Analysis and Informatics acts as its secretary.

As a result of their authorized tasks in areas dealing with the protection of the natural environment, regional organisations collect and process data (environmental protection inspectorates, nature protection directorates and Board of Directors of national parks). The basis of the information system will be the data collection related to the national monitoring system. The establishment of the information system and the planning of its operation began within the framework of the concept of the Environmental Information Centre. Similar tasks have been formulated to tackle the more specific problems of nature conservation. In this area however, definitions of natural areas and values worth of protection should also been given (with a proper classification system), thereby putting them under protection. Regarding the technical integration of data related to the environment, the development of a National Environmental Information Network has been launched.

The recently published Medium Term Government at Programme and the elaborated National Concept of Environmental Protection and Nature Conservation as well as the new Environmental Act (accepted in May 1995) all emphasize the importance of environmental data management and of access to environmental data. The governmental programme states:

- *Recognising the necessity of the public as the base of environmental protection, and the importance of making acceptable compromises in the decision-making process, the Government is to extend the legal opportunities for citizens concerned, for environmental organisations and for local governments, to enable them to participate in the environmental decision-making process in a regulated form.*
- *The mentioned Concept says in this context: "an essential element of public participation is the legal guarantee of free access to environmental data; every person, group and organisation has the right to access information which is or can be made available referring to their environment, that is: measures affecting or aiming at the protection of their environment and data on the status of their environment. Information must be given in a form which is clear and understandable for the public, together with the data necessary for control. All this have to be provided at a reasonable amount of money. Mass media and adequate dissemination of information play a very important role in the strengthening of public awareness and propagation of different types of environmentally friendly behaviour. The Government is obliged to regularly publish a report on the status of the environment to keep the public informed."*

In accordance with the documents, the development of the comprehensive National Environmental Information Network is in progress. The realisation of this development programme should support current policy planning and authoritative activities of the relevant national organisations (the ministries, their regional organisations, etc.) and of researchers, and it should strengthen the public awareness, by keeping it informed about environmental facts, including data on different environmental elements, various environmental impacts as well as data requests by international partners.

Agenda 21, Chapter 40, "On information for decision-making" outlines the need for improved capacities for information management, to make environmental information more easily accessible. The UNEP Environmental Assessment Programme's (EAP) mandate is "to provide the world community with improved access to meaningful data and information, and to help increase the capacity of governments to use environmental information for decision-making and action-planning for sustainable human development". To meet these needs, UNEP/EAP is providing preparatory assistance to developing countries and countries in transition to strengthen their environmental data and information management capacities. Programme outputs will include an operational global network.

The UNEP/EAP approach - combined with UNEP/IEO (Industry & Environment Office) APELL (Awareness and Preparedness on Emergencies at Local Level) implementation tasks - consists of four stages of activities: Assessment - Feasibility - Implementation - Operation. For these, guidelines have been developed. Among these stages, the feasibility study is the most critical, as it outlines future developments, plants the seeds of the network to be, starts pilot operations and secures funds for the implementation.

Several activities are undertaken with respect to the implementation of IT within the Ministry. One of these activities aims at participation at the Global Resource Information Database (GRID), an UNEP network. This is based on bilateral Norwegian/Hungarian cooperation.

The main objective of this bilateral activity will be to:

- Strengthen the capacities of the national environmental information network in Hungary, to provide the aggregated information needed for improved national environmental management, for decision-making and for raising public awareness.

This will be achieved by the following measures:

- Strengthen the information section of the Hungarian Ministry for Environment and Regional Policy, to establish a fully operational, internationally compatible environmental information system core unit, based on modern GIS-and communication-technology.
- Facilitate networking between the Hungarian Ministry for Environment and Regional Policy and other key institutions with environment information mandates.
- Ensure compatibility between the environmental information network and the Hungarian Environment Monitoring System both at national and sub-national level. Establish an interface of the environmental information network and early warning emergency information systems related to natural and industrial accidents and risks.
- Establish international links and ensure compatibility with UNEP (EAP, GRID, GEMS, APELL), the EU (EEA, PHARE, EUROGIS/CORINE), OECD (OECD TDS [Territorial Development Service], OLIS), US EPA EMAP/IRIS and other assessment programmes to provide the necessary environmental information to support action plans dealing with environmental issues of transboundary and global concern; in particular, the Central European initiative (CEI) Environmental Programme and also the CEI 2010 project, as well as the Danube River Initiative.
- Enable the involved institutions to get access to environmental data bases held by UNEP and other UN or regional agencies.
- Encourage and enable the Hungarian Government to diffuse environmental information as freely as possible.

2. BACKGROUND

2.1 Country Profile

2.2.1 Geographical data of the Republic of Hungary

Hungary is located in the Carpathian Basin in the heart of Europe. The area of the country represents less than 1 % of Europe: its maximum length in north-south direction is 268 km; and in west-east direction 528 km; the total length of the border is around 2,300 km. Hungary is a typical low-lying country: 73 % of its territory is flatland which is less than 200 meters above sea level.

Six major terrains can be identified: the Great Plain and the Little Plain are filled-up lowlands, while the Transdanubian Hills, the Transdanubian Mountains, the Sub-alpine Region and the Northern Mountains are denuded formations.

Some basic facts:

- Area (km²) 93,033.
- Arable land (km²) 47,128.
- 93 % of Hungary's surface is covered with loose sedimentary rock as the country's territory represents the lowest part of the Carpathian Basin (which covers an overall area of about 300,000 km²).
- 58 % of the surface is covered with loose rocks and another 4.4 % of it is covered with karstic rocks (limestone).
- as a result of its geological structure, the country is relatively poor in mineral resources.
- 94 % of surface water originates outside the country.
- in the Carpathian Basin which is surrounded by high mountain ranges, the prevailing winds are western and northern.
- Population (1,000) 10,277 (01. 01. 1994).
- Urban population (in %) 64 (01. 01. 1994).
- Rural population (in %) 34 (01. 01. 1994).

Population of the main cities (1,000):

- Budapest -1,996.
- Debrecen -218.
- Miskolc -190.
- Szeged -179.
- Pécs -172.

The country belongs to the catchment area of Danube and Tisza and their tributaries. The Lake Balaton with its area of 600 km² is one of the largest lakes in Europe. Bauxite, brown coal, lignite and hydrocarbons are the most significant mineral resources found in Hungary. As a result of past volcanic activity, the country is also rich in thermal springs.

2.1.2 Economy

Hungary is in the process of a substantial socio-economic transition, and it has become evident that the symptoms of the lasting crisis of the Hungarian economy are basically structural in nature. The structural changes substantially affect the contemporary and future emission of greenhouse gases. This situation offers the rare opportunity to take the environmental considerations more seriously into account during and after the transition, than this has been the case before. The mass production capabilities which have been built up to satisfy the protected domestic and COMECON markets during the preceding decades have become obsolete.

The efficiency of economic activities based on cheap East European raw materials and energy imports considerably lags behind advanced international market competitors in most cases. For a number of products, the East European market has disappeared. In the case of some important product groups, the previous Hungarian market share has been taken over by multinational companies, who often are able to produce products with higher technical standards at lower prices.

The considerable fall in the production has not left the industrial structure untouched: between half and two thirds of the previous industrial capacity has become superfluous and has been written off during the recent years. In a sectoral analysis, the changes are even more obvious. A considerable proportion of the metallurgy, mining and agriculture co-operatives, of the electronic and telecommunication industry, and of the artificial fertilizer industry has disappeared. Undoubtedly, also new activities have emerged (e.g. passenger car production).

Nevertheless, in terms of the overall economic outcome, they are unable to compensate for the deterioration in other areas. The extremely strong centralisation related to state ownership in the Hungarian economy decreased considerably in recent years. This process should be continued and strengthened by direct methods of transformation and privatisation of state companies; by indirect methods of strengthening and supporting the sector of small and medium-size enterprises; and through consistent actions against monopolies.

- GDP/per capita: 6,100 USD (in purchasing power parity, 1993).
- Unemployment rate: 13 %.

The distribution of GDP in various sectors (1993):

- Agriculture and forestry 6 %.
- Industry (including building and construction) 32 %.
- Services 62 %.

Starting at the end of the 1980's, the Hungarian economy (main economic sectors) has transformed considerably. Agriculture rated at 20% of the total GDP in the 1970's and 1980's; after that, this value dropped below 10%. Industry also decreased by 10 to 15 %. All these trends resulted in a rapid and significant growth of the service sector in recent years. The present portion of this sector is nearly the same as in the average developed OECD countries.

The employment structure of the active population generally follows these transformation trends. Due to the economic recession - which is caused mainly by the transformations - the unemployment rate greatly exceeds the present average rate of OECD countries. Moreover, this rate shows significant differences in various regions of Hungary.

During the last 10 years, the number of companies and enterprises grew about tenfold, and a number of state-owned companies were privatised. This resulted in an increasing number of small and medium-size enterprises.

One of the most important methods of ownership-restructuring is the privatisation of state companies. The basic goal of ownership reform is the improvement of economic productivity and the establishment of a company ownership that is directly interested in the successful utilisation of assets. At the same time, the privatisation process aims to serve the following:

- the elimination of market-, organisation- and ownership-monopolies;
- the structural decentralisation of companies which consist of a number of individual units;
- the strengthening of co-operative supply-relationships between economic organisations and the establishment of new types of integration;
- the promotion of property acquisition by domestic entrepreneurs and employees, efficiently turning these parties into co-operating company owners.

The new environmental standards, adjusted both to national and international requirements, are also being introduced during this restructuring process. According to current government strategy, domestic privatisation fundamentally means the sale of property. Experiences so far indicate however that demand and supply conditions are inadequate for the quick privatisation process that had initially been envisaged by the government.

The supply side has been weakened by worsening economic conditions and by the increasing number of bankruptcy and liquidation experienced by companies. On the demand side, limited domestic purchasing power, moderate foreign investor interest, and the high nominal interest rate caused by high inflation are among the many influences that have made an impact on the pace of privatisation.

At the end of 1994, the number of the economic organisations having legal status reached 100,000. The number of small enterprises was about 800,000. A similar trend characterises proprietary changes. In the middle of the 1980's, more than 90% of the GDP was generated by the state sector. In 1994, the share of the private sector exceeded 50% of the GDP. About one-quarter originated from companies partly or completely owned by foreigners. In 1995, the presently state-owned servicing enterprises will be privatised; for example, the natural gas distribution and the electricity supply.

In 1985, investment for environmental protection was about 0.5% of GDP. This increased to 1.5% in 1986 and 1987, decreased to 0.6% in 1991, and increased in 1992 to 0.9%. In 1993, this value reached about 1% .

2.2 Main Environmental Issues

When priorities are to be determined, the starting point has to be that the quality of the environment must provide suitable conditions for a healthy human life, biological diversity and economical development. This must be considered to be the fundamental goal of environmental protection. Within this, essential requirements are:

- *Reducing and eliminating factors which damage the human health;*
- *Protecting environmental elements which positively influence the quality of life;*

- *Implementation of a harmonic connection system between the economic development and the environment, by managing natural resources rationally and economically.*

2.2.1 Short-term priorities (up to the year 2000)

Short-term priorities include tasks which can not be postponed further because significant environmental and health damages must be reduced or eliminated. Results of the programmes to be started promptly will be seen after 1 to 6 years only. For this reason, one should not consider financial (budgetary) years for these short-term programmes. However, financing the environmental programmes which extend to several years must be in accordance with the principles of the annual financial plans. Environmental projects with short-term priority are the following ones:

- *Elaborate and launch a detailed assessment programme on the state of the environment in Hungary.*
- *Survey the activities of industrial and other hazardous technologies which seriously and extensively damage the human health and the natural heritage; either stop their activity or modernise and transform their production profile or technology.*
- *Eliminate and/or mitigate environmental pollution and deterioration accumulated during the last decades (military objects, liquidated plants, abandoned mines, serious soil contamination, etc.). Provide regular financial sources for eliminating this pollution.*
- *Interrupt deterioration of the environment in areas increasingly exposed to and burdened by cumulative pollution effects and improve the environmental quality in accordance with economic restructuring, regional development and social programmes. The elaborated regional environmental protection programmes focused on the industrial agglomerations located along the river Danube; on the industrial area of the Central-Transdanubia (Ajka, Varpalota, Tatabanya, Dorog); on the industrial agglomeration located in the Sajo-valley, on the capital and its*

surroundings (region of Szazhalombatta) and around the Hungarian Great Plain (practically on the Tisza River's watershed). Attention must be paid to the special problems in areas located along the state borders; like the transboundary impacts of external emission sources, and the regionally specific effects on the social environment (migration, disease, drug transport, civil war impacts, transitional ethnic conflicts, etc.).

- Elaborate qualifying and labeling auditing systems, meeting recommendations and stipulations of the International Standardisation Organisation (ISO) and of the European Union. Assist the development of environmental management systems for companies.
- Declare the most important nature conservation areas to be state properties; put the proprietary relations fully in order. To create conformity between nature conservation and ownership interests are urgent conditions for preserving the biological diversity.

As far as protection of the air quality is concerned, the fundamental strategic goal is to improve the air quality in the most polluted regions. Within this goal, reduction of the urban air pollution is assigned the first priority and should be aimed at by assisting the regional policy and planning.

In addition to the reduction of the industrial and communal pollution, moderation of the air pollution caused by road traffic and by other means of transportation must be stressed. To achieve this goal, the Air Quality Protection Inter-Sectoral Action Programme elaborated for the period of 1994-1998 and accepted by the government defines specific tasks. Among these, the following issues must be addressed as they are of utmost importance:

- Elaboration of action plans for the assigned areas;
- Adoption of regulations of the European Union related to the exhaust emission of public road vehicles as stipulation of the traffic license for new vehicles;
- Reduction of the exhaust emissions of the existing vehicle fleet by subsequent technical interventions and by increased control of the operating conditions;

- Moderation of the air pollution originating from public traffic in big cities, by improving the technical level of the environment-friendly public transport and by means of traffic-organising devices;
- Continuation of the establishment of a modern air quality monitoring system within the settlements for measuring the background pollution levels as well as starting the establishment of such systems outside the settlements in areas with sensitive ecosystems;
- Performing of the obligations stated in international agreements.

In order to reduce effects of traffic noise and of other vibrations damaging the human health, implementation of active and passive acoustic and other physical protection systems must be established in the areas which are affected most seriously.

The Governmental Programme related to the protection of drinking water aquifers must be carried out according to the following considerations:

- The equilibrium of the water balance must be improved in areas endangered as a consequence of the dropping of the permanent water level (e.g. Duna-Tisza koze, Transdanubian mountains of medium altitude, etc.).
- By significantly developing the drainage system and the waste water purification, pollution load (originating from the recently very low prices of the public works services) must be reduced. Those who dispose their waste water with drainage substituting means on a middle-or long-term basis must be assisted by proposing environment-friendly solutions to them and by motivating by through economic regulations.
- Spreading water-saving solutions must be motivated by technical development and information. This must be taken into consideration when awarding central financial assistance (e.g. assistance in the development of irrigation schemes). The spreading of water-saving solutions must be gradually enforced in the regions of the country with scarcity of water (e.g. Duna-Tisza koze).
- Reduction of high specific water demand must also

be achieved by other methods than mentioned above. For example, the following information should be given as an input to land use planning and agriculture: water usage should be in accordance with water availability (e.g. in areas which are getting drier due to the sinking ground water level, drought-resistant plants must be cultivated).

Fertile soil is a partly renewable, limited natural resource. For this reason, preservation of its diverse functionality and saving of its substance must be ensured in order to maintain quality and quantity of soil resources:

- When regulating land use, conservation of the diverse functionality of the soil must be considered as the primary goal;
- For preventing or reducing soil losses caused by water and wind erosion, soil utilisation and various soil protecting measures should take the characteristics of the cultivated area more strictly into consideration (type of cultivation, sowing structure, crop-rotation, agrotechnology);
- Acidification of soils must be prevented by integrating the liming process into the agrotechnical system (this can be stimulated economically) and by taking the soil character into consideration when selecting the type of fertilisers which are to be applied;
- Efficiency of water utilisation must be increased, fluctuation in the water utilisation -due to extreme climatic conditions -as well as the danger of flooding by inland waters and drought-sensitivity must be reduced in the plant cultivation by preserving the soil structure;
- Biological degradation of the soil and reduction of its humus content must be prevented. Thus, decrease of its ability for storing, compensating, filtering and neutralising toxic materials can be prevented by recycling plant residues and waste which had accumulated during the cultivation;
- Pollution load of the soil must be reduced through rational and environment-friendly nutrient utilisation and plant-protection, and the utilisation of natural and artificial materials must be balanced at a level not exceeding filtration capacity of the soil;
- In areas withdrawn from agricultural cultivation, utilisation methods which regenerate the soil-and the environment-must be applied and propagated;

- Changes in the soil quality must be continuously followed by operating measuring -and monitoring systems.

Waste management belongs to one of the most-stressed areas of the Hungarian environmental policy. In view of the recent strikingly bad waste management situation, enforcement and implementation of the following three priorities must be stressed:

- Prevention of waste generation.
- Recycling of generated waste.
- Disposal of the waste which can not be utilised.

In the field of prevention, both technology and product development is necessary for moving towards material-and energy-saving low-waste technologies as well as moving towards environmentally sound, longlasting, re-usable products, and those which are "easy to treat"-products. This should be approached by applying market-conform economic tools.

In order to reduce damaging effect of waste (especially hazardous and toxic waste), finding, opening and rehabilitation of illegal disposal sites must be increased.

In the field of recycling, the principle that already exploited natural resources should be maintained in the production and consumption circulation as long as possible and that raw materials or energy sources should be utilised as much as possible. For this reason, introduction of modern methods already applied in the international practice must be promoted.

In the field of disposal, a combined and wide application of the physical-chemical-biological methods must be forced. Non-disposable waste should be processed through thermal decomposition bound to heat recovery. Engineered land-fill carried out naturally and with suitable technical protection must be limited to the remaining waste determined by necessity.

A basic requirement for these waste treatment principles is the application of waste collection-systems. Selective collection and pre-treatment-methods matching the main treatment methods must be developed parallel with the development of processing capacities.

For the sake of the practical implementation of modern waste treatment and waste management principles, realisation of the following actual steps are indispensable:

- *On the basis of joining the Basel Convention and the consistent implementation of its stipulations, it is necessary to treat waste, if possible, on the site where generated; and the waste treatment should be an organic part of the production. The international circulation of the really re-circulated waste -of which Hungary is also part -should not be banned, only kept under strict control.*
- *A waste management law determining general standards, rights and obligations must be elaborated.*
- *The regulation system relating to the treatment of hazardous and non-hazardous waste production and municipal waste must be revised and modernised.*
- *The implementation of "the polluter pays"-and the "responsible care"-principles must be enforced by legal and economic regulations (responsibility and compensation, introduction of environmental taxes and product fees).*
- *Polluted areas and illegal waste disposal sites must be discovered and their liquidation and rehabilitation must be continued gradually by means of foreign expertise supported by separate financial sources (e.g. Central Environment Protection Fund).*
- *Development of environment-friendly technologies and products as well as spreading of recycling must be supported.*
- *Waste disposal capacities corresponding to the Hungarian waste generation structure must be gradually developed on entrepreneur basis.*
- *Treatment of solid waste must be improved through development of regional systems applying modern separated collection possibilities as well as rational rates of recycling, composting, incineration and land filling.*
- *Collection processes supported by economic methods must be introduced and possibilities of deposit fees, product fees, replace and repurchase obligation must be applied.*
- *Establishment of regional and global international agreements assisting environment-friendly waste treatment must be supported.*

2.2.2 Mid-term priorities (up to the year 2005)

The goal is that the tendency of deteriorating environmental elements must be reversed in areas determined by the government programmes, and a perceptible improvement in environmental quality must be reached in some areas. Envisaged goals are:

- *The environmental protection institutional system (state administration, executive, legal, information, economical and technical) must create the capability necessary for Hungary to reach its goal, that is to join the requirement system of the European Union. Full membership should be possible by the year 2000.*
- *Improving the water quality and decreasing the bacterial contamination of the Danube and Tisza rivers.*
- *The pollution rate must be reduced, and the endangered state of the ground water aquifers must be improved.*
- *The water quality of big lakes with significant recreation and attractivity potential (Lake Balaton, Lake Velence and Lake Tisza) must be considerably improved by means of further complex programmes.*
- *The air quality meeting the public health limit values must be provided in settlements of the country. For these, modern measuring and information networks must be fully developed, and the conditions for operating smog alarms must be created.*

In regions with non-polluted air, the good air quality must be preserved.

- *Industrial emissions exceeding the limiting values must be stopped; In order to prevent air pollution, technologies corresponding to an advanced technical level must be applied.*
- *For the sake of replacing the out-of-date vehicle fleet, legal, economic and technical provisions must be*

introduced (through modification of the vehicle purchasing policy as well as through taxation and custom regulations).

- In the field of division of labour among vehicle production branches, a more favourable structure must be developed from the environmental point of view. Increase in the use of alternative vehicle types must be reached through improving conditions for bicycle riding and walking as well as increasing the role which railway, water traffic and combined transportation methods play.
- The transport of goods must be influenced by taking environmental aspects into consideration through economical motivation and through legal and administrative measures.
- The rate of public transport must not be allowed to decrease, and a balanced service covering all areas should be maintained.
- Main roads which bypass settlements must be constructed and simultaneously, traffic reducing solutions must be applied within the settlements involved.
- Enforcement of requirements put down in international agreements.
- In the field of waste management, the rate of recycling must be considerably increased, by a growing proportion of selective waste collection, done by the population and by the commerce.
- Simultaneously with the considerable industrial restructuring, the spreading of low-waste, environment-friendly (so-called "cleaner") technologies must be promoted.
- Recultivation, revitalisation and re-use of polluted or damaged areas must be commenced in an environment-friendly way.

2.2.3 Long-term priorities (up to the year 2020)

- Developing, introducing and spreading of environment-friendly techniques and "cleaner" technologies relating to the entire production and consumption processes must be provided. Contrary to passive support only, priority must be given to the application of low-waste and "cleaner" technologies as well as to the production of environment-friendly products.

- Eliminating environmental damage ensued from the past and developing a system which prevents occurrence of repeated contamination and which guides the effects of market disturbances into the right direction.
- Developing a consolidated market economy system in accordance with environmental aspects so that environment pollution should not provide "comparative" advantages for the actors of the economy.
- Establishing the philosophy of sustainable development which provides a permanent basis for the state, local governments, companies, economical organisations, institutions and individuals.

2.3 Environmental Decision-Making and Role of Environmental Information in Improving Policy and Management Decisions

2.3.1 New requirements for decision-making

Decision-making, especially in socio-economic areas, is a fairly comprehensive process and has been further influenced to a large extent by the substantial changes which have occurred in our country for the recent period. The democratisation process brought with it a profound change in the political, legislative and decision making structures with the rapidly expanding involvement of the general public in the preparation and monitoring of decision-making. The decentralisation of policy planning and policy making is also a characteristic element of these changes, with the increasing role of regional and local governments and the enhancement of the influence of the non-governmental (civil) organisations and groups. The primary tasks in terms of sustainable development are highlighted by the Agenda 21 (chapter 8):

"8.4 The primary need is to integrate environmental and developmental decision-making processes. To do this, Governments should conduct a national review and, where appropriate, improve the processes of decision-making

so as to achieve the progressive integration of economic, social and environmental issues in the pursuit of development that is economically efficient, socially equitable and responsible and environmentally sound."

In accordance with the provisions of the international programme and our present national priorities, the cross-sectoral theme on integration and decision-making outlined in the Agenda 21, is a crucial one in Hungary today. Integration itself is a troublesome task, not only in Hungary, but world-wide due to the fact that the majority of the active population everywhere has been trained to think analytically and to solve problems in a piecemeal way. This procedure stems from the educational systems and research establishments which are traditionally organised, namely discipline-oriented. Even the policy making bodies reflect this rather fragmented approach in handling complex issues. Integration means an interdisciplinary and holistic approach which produces more expensive solutions in the short run rather than solving problems in a partial way.

This is the major paradox of the subject matter. Decision-making procedures under the new, market-oriented conditions are yet in their emerging stage in Hungary. Methods considering multiple perspectives originating from socio-economic and environmental issues and a broader range of public participation have not yet been widely used; and developing appropriate frameworks for this kind of arrangements is still ahead of us.

Although Hungarians and their governments are committed to democracy, the ways it may be exercised should mature and be mastered. It means that the integration of different views in decision-making is a relatively new concept in the context of our subject. It also denotes that a system of integrated environmental and economic accounting, and in general a view synthesizing analytical concepts and methods,

should be seen as a complement to, rather than a substitute for, traditional national accounting practices and conventional environmental indicators for the foreseeable future. It must be born in mind that environmental standards may pose severe economic and social costs if they are uniformly applied in the transitional countries in Eastern Europe.

During the current transitional period to a market economy, the process outlined above is accompanied by another one: that of catching-up to European socio-economic as well as environmental norm patterns. These tasks are mostly beyond our capacities, thus we are forced to rely on the multilateral support of the developed countries.

As it was reported last year in this series, the country not only faces an inherited economic crisis, but suffers from long-lasting world-wide recession, too. This happens while Hungary continuously attempts to introduce new and Europe-compatible legal, regulatory and economic policy instruments. Part of the process of economic restructuring and privatisation was that a number of companies using old, outdated technologies went bankrupt and that economic output declined severely. As a side-effect of this decline, many environmental indicators have shown improvement, especially in industrial areas characterised by regional pollution. But these tendencies are misleading in the long run; consequently, definite policy measures have to be taken to avoid similar environmental mistakes we made earlier, even if we have to pay their social costs.

2.3.2 Environmental policy at the highest policy-making level

In Hungary, the relationship between short-term advantages and long-term environmental and social costs has been realised, and the national programme is formulated accordingly. It balances socio-economic and environmental (and of course other) problems and their fac-

tors. It has been declared that, whilst the task of overcoming the present economic and social crisis is of basic priority, environmental issues should be integrated into policy making in relation to privatisation, tourism, land use, etc.

The process of emerging governmental and public awareness of environmental problems, and as a result of this perception, the improvement of policy making, started slowly in the early 1970's following the Stockholm Conference in 1972. The book "The Limits to Growth" published in the same year also received positive feedback. In the following years, both the administration and the legislation sought better organisational frameworks and legal measures which would reflect the perceived deepening environmental problems. During this period, ministries were reorganised by establishing their own environmental departments, and the structure of ministries changed accordingly as well. In 1976, the Act on Protection of Human Environment was issued as the first one in this field, and research on this domain of economic activity gained priority.

This progress on behalf of the public was accompanied by the evolution of the different non-governmental movements which at the same time turned to be umbrella organisations of those alternative thinkers. Various groups became powerful enough to have an influence on governmental decision making (c.f. Danube Circle and the Act on rejecting the plans for a hydro-power station to be built on the Danube).

At present, in spite of the fact that the socio-economic problems dominate the governmental programme, it is clearly declared that due attention should be devoted to environmental issues: "the only viable road to the future is genuinely sustainable development, without detriment to public health and protective of the environment. In view of the severity

of our environmental problems, the Government will enforce the criteria of environmental protection in legislation and in its economic policy. It will submit the law on the protection of the environment to Parliament as soon as possible, on the basis of which it will develop legal regulations pertaining to individual sectors and the economic regulatory instruments of environmental protection. The fundamental principle of the government's environmental policy is 'the polluter pays', as accepted internationally."

It is also emphasized that priority should be given to consideration of the protection of the environment in the economic policy decisions and in the development of regulations. In the course of the elaboration of development programmes and the regulation of economic sectors, the preparation of environmental impact analysis will be required which will be used in comprehensive decision-making concerning energy policy, transport, water management, agriculture and forestry management, mining, etc.

The recently elaborated concept on National Environment and Natural Policy is based on the general principles of sustainable development, environmental protection and nature conservation. It was prepared following a Parliament decision passed in 1993. By March of 1994, the concept was ready and submitted to the Government. The concept will serve as the basis for the development of a medium-term National Environmental Protection Programme and the new framework Act on Environment. The first principle of this concept is devoted to sustainable development as the central idea of environmental policy. Within this principle, the society-economy-environment triangle plans to bring the associated factors and conditions into equilibrium. Another principle of the concept is dealing with the integration of the so-called internal and external factors, namely that the environ-

mental policy must be integrated into the economic policy. To achieve this goal, the gradual enforcement of the sustainable development principle requires both compensation of the realistic social value of the natural endowments and integration of the environmental considerations into the economical processes (which states yet another principle).

All these declarations show that the planned activities will improve decision making by integrating the required aspects of development at least at the national and ministerial level, but it is important to recognise that government institutions alone cannot guarantee the success towards sustainability. A broad collaborating relationship must be formed with the enhanced non-governmental sector.

Entrepreneurs have not usually been involved and interested in the environmental actions, but they should be engaged in the ecological reconstruction to such a degree that serves their direct economic interests.

2.3.3 Facts and bottlenecks

As to the economic instruments and market incentives operating at the company level known in the developed countries, some have already been introduced. At the same time, serious problems have been encountered with enforcement. These problems are due partly to insufficient resources available for enforcement. Some of the instituted principles; e.g. the "polluter-pays"-and "natural-resources-user-pays"-concepts, are proceeding well. The product fee has also been initiated in the case of gasoline usage whereas other products (tires, special packing materials) are to be charged as well. Nevertheless, there is no system of integrated environmental and economic accounting (IEEA); hence, this instrument as such does not play any role in the national decision-making process yet, although some elements of a system like that do exist. (As a matter of fact, there are no widely accepted approaches or methods of IEEA as is stated in an interim UN

report on the subject.) IEEA needs environmental data and information to be integrated with economic data. Although the recent outputs of the environmental information system in Hungary are far from complete and perfect, they do cover some of the elements required by an integrated information system, but these are not yet perfect enough for a full scale accounting system.

The ideas on integrated decision-making presently appear at various forums. For instance, a detailed plan for transition entitled Environment and Development in Hungary was one of the outcomes of a recent international workshop held in Hungary by the University of Minnesota and the Budapest University of Economics. The plan defines two purposes:

- 1. To increase social awareness of the necessity for moving on the path of sustainable development*
- 2. To provide a starting point for the Hungarian public and those responsible for deciding and implementing public policy in beginning a dialogue as to how to move the country towards a sustainable future. The dialogue has started and its recommendations are followed by NGOs, researchers, and to a certain extent, by those involved in public administration as well.*

Some technical details of this document and some actions outlined in the Agenda 21 are also seriously considered or even designed to be used; like the improvement of methods of data assessment and analysis within which the application of the highest level of integration through geographical information systems is being implemented. The necessary training programmes are also being prepared with some organisational development. The importance of these activities is underlined by the relevant chapter of the Agenda 21 (paragraph 8.10). In Hungary, there are series of general and specific trainings devoted to environmental activities. These are provided in co-operation with Western experts and universities by the appropriate authorities like the Ministry for

Environment and Regional Policy but are also offered by postgraduate centres like (among others) the Budapest University of Economics and the Technical University of Budapest.

Several relevant books were also published in Hungarian ("Only One Earth", "Groping in the Dark", "Our Common Future - the Brundtland Report" and others) to make the information available to the general public and to raise public awareness and concern about environmental hazards, principles and instruments of sustainable development, etc. The Agenda 21 itself is also available in Hungarian. Various periodicals, newsletters and journals have appeared in the recent years which address problems of environmental monitoring, management or technologies. The developments related to the UNCED follow-up activities are covered by a series of publications which were compiled under the aegis of the recently established Hungarian Commission on Sustainable Development.

The progress characterised above should not hide the fact that there are severe "bottlenecks" in dissemination of information and provision of extensive opportunities for public participation in the decision-making process related to sustainable development.

3. STATUS IN ENVIRONMENTAL INFORMATION SYSTEMS

3.1 Preliminaries

The question of the quality of the environment is an old problem, but humankind became conscious of its real importance only in the last three or four decades. Also in Hungary, people perceived the problems related to environment, but the political and economic situation did not allow interventions that cost more than not-environment-friendly actions.

Now, Hungary wants to approach the European community, so the Hungarian regulation and economy, the applied methods and solutions should follow the example of the developed countries. Life conditions and also the environmental status ought to be revised.

To create better conditions and to rehabilitate the deteriorated environment, data are needed concerning the actual situation.

On some fields of the registered data, Hungary was always up-to-date (i.e. hydrography), but on other problems, initiatives have only started now.

Another problem is, that the data collected and stored by different institutions are not co-ordinated. Each organisation defined his own sampling and data collecting methods, data processing, treatment and storage manner, so the different data of various services are not always comparable.

Therefore, environmental data needs co-ordinated, standardized regulations. A system has to be devised that links different databases, so that data could be taken from any existing source, for many different purposes and types of usage.

Actually, there are environmental data available in some governmental organisations which are part of the Hungarian Ministry for Environment and Regional Policy and of other Ministries, as well as in some non-governmental organisations.

Data in governmental organisations are available for common interests. Data in other services must be revised: how and of which funds the databases have been created, and how they arrived at the NGO. Because the owner is not necessarily the NGO, but it may be data which was once collected with the help of public

funds. In this case, the NGO is actually only the manager of the database, but not the owner. It must be clarified, who owns the rights and under what circumstances one has access to the different databases. Also, it should be made clear which databases are obliged to provide information for common interest.

3.2 Management, Monitoring and Networks

3.2.1 The organisation of Hungarian environmental management

The environmental management is directed by the Ministry for Environment and Regional Policy.

Under the minister, there are a political state secretary, an administrative state secretary and three state vice-secretaries responsible of specific fields of:

- *environmental protection;*
- *regional & physical planning and housing;*
- *nature conservation.*

These state secretaries and state vice-secretaries direct the different departments of the Ministry. There are seventeen departments, and nine independent sections, secretariat, funds and bureau assuring the central administration.

The operative work in the country is assured by the twelve environmental inspectorates whose competence covers territories with limits approximately corresponding to watersheds; four directorates for nature conservation and five National Parks, whose competence corresponds to geographical units; furthermore, eight regional offices of Chief Architects whose areas of competence are identical with administrative units, i.e. counties.

In-between the Ministry and the regional inspectorates is the Environmental National Inspectorate, which co-ordinates the activities of the regional organs, and takes decisions on national level.

3.2.2 Environmental monitoring in Hungary

Before the 1980's, all environmental data in Hungary were collected by non-co-ordinated methods. In the early 1980's, an interministerial information system was developed, in order to try to improve the situation. As a result, four distinct methods of data collection are currently used in Hungary:

1. *observation networks;*
2. *statistical collection;*
3. *calculation based on modeling;*
4. *remote sensing and aerial photography.*

Environmental data is for a big part still collected by the Hungarian government and national institutes sponsored by the Government. The input from the private sector remains small, but with more rigorous implementation of the "polluter pays" principle, it is expected that this situation will start to change in the near future. However, before the private sector generates significant volumes of environmental data, it is important that they are:

1. *assured of the confidentiality of the data they produce;*
2. *aware of the necessity for objective monitoring programmes and the use of standardized techniques.*

Hungary has signed a number of international conventions and agreements on transboundary air pollution and river basin management. This involvement obliges the Hungarians to produce environmental data which is accurate and obtained using internationally recognised techniques.

It should be appreciated that the Hungarian environmental monitoring systems are relatively advanced when compared to other central European countries.

3.2.2.1 The state of the air

Within Hungary, a considerable volume of financial and technical resources are directed towards air quality monitoring. This investment is not a recent phenomenon; air quality

monitoring has been practiced for several decades. Initially, it was developed because of the potential damage to human health that would be caused as a result of sustained atmospheric pollution. Retrieval of collected data does not seem to be simple, and only data gathered since the late 1980's are readily accessible.

Nowadays, there are several organisations involved with the operation of air quality stations and the review of air quality data. Each organisation has a tendency to work for a specific reason, either related to public or environmental well-being or to comply with national or international requirements. The abundance of air monitoring stations indicates the investments made in the monitoring of air quality throughout Hungary.

The organisations which are currently involved with air quality monitoring include the following (they are all government organisations):

1. *Ministry for Environment and Regional Policy;*
2. *Regional Environmental Authorities;*
3. *National Meteorological Service;*
4. *Ministry for Health and Social Welfare;*
5. *National Hygiene Institute (Air Hygiene Department);*
6. *National Institute for Public Health;*
7. *Ministry of Trade and Industry;*
8. *Traffic Science Institute.*

The current tasks of each of these organisations are given below. In the event of lack of detailed information, the discussion cannot be comprehensive but instead is written to highlight the salient points abstracted from the information which was available. Some of the details quoted may now be superseded by more recent information. Several texts which were used were published in the late 1980's. Occasional references are made to the "Hungarian Standard" which is produced by the Institute of Environmental Protection.

Ministry for Environment and Regional Policy

This Ministry fulfils an important co-ordinating and management role within Hungary and also internationally (in association with the Foreign Office). It is responsible for overseeing the activities of the regional environmental authorities who undertake the actual atmospheric monitoring at some air quality monitoring stations throughout the country.

The twelve Environmental Authorities maintain a register of 40,000 to 50,000 sources, including industrial plants, power plants and heating facilities of a capacity greater than 120 kW. The details of each registered facility are:

1. *the process and equipment used;*
2. *the plant location;*
3. *an emission inventory.*

From this information, an emission limiting value is calculated, including approximately 200 different substances with sulphur dioxide, nitrous oxides, soot and heavy metals among them. Every year, each source of gaseous emissions must provide an actual average emission rate for each substance (and emission duration). The Inspectorates perform some measurements to check upon these declarations, but these checks are understood to be sporadic in their frequency and distribution, although it was reported that check measurements are normally undertaken once per year.

The Inspectorates publish emission figures based upon these estimates, using certain emission factors. Regulatory information is compiled at the national level although this does not seem to be systematically compared to the calculated estimates.

Hungarian Meteorological Service (HMS)

This organisation is responsible for operating the database which continuously monitors the aerial environment with either ground or high atmosphere observation. The Service currently provides measurements of background pollu-

tion and long distance transport of pollutants and participates in the monitoring networks of international organisations. The Service operates ten precipitation and chemical monitoring stations. A laboratory for measuring complex background pollution is located near the geometric centre of Hungary, using measuring methods employed by the World Meteorological Organisation.

Ministry for Health and Social Welfare

In 1974, the National Ground Level Monitoring Network was established to provide pollution data on a continuous basis. This network comprises regular air pollution monitoring in major towns, cities and protected regions utilising uniform sampling and analytical procedures called the "Hungarian Standard". It is assumed that this monitoring network has been established under the auspices of the Ministry for Environment and Regional Policy and is still functioning.

This Ministry has the responsibility for measuring ambient air quality throughout Hungary. In order to accomplish this task, nitrous oxides, sulphur oxides and particle sedimentation are regularly monitored at 100 stations. These stations are operated by 20 local offices of the Ministry, according to the 19 administrative districts and Budapest.

National Hygiene Institute/ Air Hygiene Department (MW)

Both of these organisations are involved with the operation of the settlement emission database, which operates primarily for public health purposes. The institutes manage and coordinate the settlement emission database, while the Service is the owner of the database. This particular database is concerned with the collection of air quality information for 180 settlements, at more than 800 locations.

National Institute for Public Health (MW)

The responsibilities of this particular organisa-

tion include the performing of the analyses of data collected for the Ministry for Health and Social Welfare, with publication of regular data summaries.

Ministry of Trade and Industry (MTI)

It is understood that the Ministry of Trade and Industry is responsible for cooperation with environmental ministries as well as with the industry, to research into air pollution control equipment. The Ministry does not seem to have any air quality monitoring responsibilities.

Traffic Science Institute (MTI)

This Institute owns and partly manages the traffic emission database. The model, which is divided into three individual models, utilises data gathered by the traffic authorities on traffic volume and by the environmental authorities on air quality. The three separate models cover the following specific situations:

1. *main roads and motorways;*
2. *large settlements;*
3. *small settlements.*

The purpose of the model is to allow comparisons to be made between traffic volumes and the resulting air quality; the study is usually made at individual nodes and junctions where problems are expected to be most severe.

Another traffic model exists within Transram Ltd which comprises two functions:

1. *to establish noise and air pollution status of Budapest relevant to traffic;*
2. *to predict the air quality trends around public roads in the next 5 to 20 years.*

No further information on the status or scope of this model was available.

As can be seen from previous sections, there are a number of organisations currently operating quite extensive air quality monitoring programmes. It is expected that, in some cases,

separate monitoring stations are being operated within the same city, but with information gathered by different means and destined for different organisations, each one is now running its own archive. This situation hinders efficient retrieval.

3.2.2.2 The state of the water

The whole issue of integrated water management is particularly important in Hungary. This is primarily the case, because 94% of the surface water in the country originates from an international water basin; upstream control on the volume and on the quality of the water entering the country can therefore not be influenced by the Hungarians. The quality of many surface water bodies is poor upon entry into Hungary and reduced further within the country. The associated issues of groundwater availability and quality appear to receive less attention, although the interdependence between surface and groundwater resources is being increasingly recognised.

As with air, surface water quality has been monitored by Hungarian authorities for a considerable period of time; it is understood that co-ordination of the monitoring systems including data storage has been undertaken since 1967. Water sampling is the responsibility of the regional environmental authorities, with overall management and co-ordination undertaken by the Ministry for Environment and Regional Policy.

3.2.3 The databases

3.2.3.1 Water resource data

The VITUKI Research Institute for Water Resources Share Company and the Institute for Hydrology operate the database for surface and subsurface waters. In this database, the results of regular observations since 1835 are archived. The observation network and the method of measurement, as well as the units have changed. (At first, data were measured in

feet, inches and lines, whereas now the metric system is used.) All data are stored using the conventional method, that means: registered in form of notes on paper; but data newer than 1970 are available on magnetic tape, too.

The collected data in VITUKI are the results of measurements which were taken, since 1980, almost exclusively on regular observation stations.

The registered data concerning surface waters are: water level, rate of flow, water temperature, the place of the measurement on the map, the cross section of the measurement site and the protocol of the survey. There are also some water quality data from the period of 1970 to 1975. Before, there were also data on sediment transport, but now this lost importance, so it is not measured any more. Occasionally, there are also data on evaporation on free water surfaces.

The registered data of subsurface waters are: the ground water level, geologic and hydrogeologic characteristics, groundwater temperature, level of karst water. The regular ground water observation well network consists of 2,500 to 3,000 wells in the country. Of each well, the data of the location of the drilling, the altitude of the well above sea level, the registry sheet of the well and the bore-diary are stored. Water quality data are only available from the water producing wells. Water chemical data are retrievable from the karst-pits, but only during the drilling period. Other data are characteristics of evapotranspiration and characteristics of snow cover (thickness, water content).

The data series of the regular observation stations on water courses, channels and lakes (being part of the hydrological monitoring network of the country) is continuous and complete. (The Regional Water District Directorates also have their own data storage systems and databases. They store observa-

tions from other sites, too, namely observations effectuated in local stations and of industrial or agricultural plants and of the water industry.) The most important data of the regular observation stations are evaluated; statistically processed information is also in the register. The total range of stored data may be 250 - 300 million.

One part of the data of hydrologic pilot plants are deteriorated by an inundation caused by damaged water conduct in the storage area. The principal data collection method is the gauge reading made by the official persons, but recently more and more limnigrams of permanently functioning automatic stations are also available. The main data stored are published in the hydrographic annuals. Every 10 -12 years, a catalogue of the stored data is also published. There are also hydrographic annuals of foreign countries stored in the database.

The data are available to the public. For receiving data from the VITUKI database, the users pay as follows: the Ministry for Transport, Telecommunication and Water Affairs receives the data free of charge. The Regional Water District Directorates pay the data reproduction costs. Each other user pays a sum ranging from one thousand to three thousand Ft, depending on the amount of data.

3.2.3.2 Forest data

Before the political changes in Hungary, the major part of forests was state property, directed and managed by the state forest societies. A smaller part of the forests was managed by agricultural communities, state farms, water district directorates, cities and small communities for forest management. Nowadays, a big part of the forests is destined to be distributed by way of compensation to individuals who suffered political and economic injuries.

The forest management was and is actually a long-range planned state duty, and the owner

of the forests is obliged to respect the prescriptions of the plans of forest management (logging is allowed only if permission is granted, and must be made reforestation in conformity with the plans). Now, the privatisation of forests is on-going, but the land registration follows the redistribution very slowly.

The administration of forestry is performed by eleven forest police offices and ten forest inspectorates. The offices make the surveys for forest-related data acquisition, and they are elaborating the forest management plans while the inspectorates control the management.

In Hungary, there are 22 state silviculture management companies, functioning as stockholder companies that are composed of 220 forestry districts. Recently, they made an evaluation of the assets. The result is that the forested area of the country is 1,7 million hectares. Approximately 1 million hectares are managed by these companies.

The Service for Forest Management of the Ministry of Agriculture operates the forest register. This register contains - arranged by communities - data on all territories under forest management, therefore: forests, storage spaces, cuttings, as well as some arable lands, meadows, pastures and reeds. There is also information concerning the status of the habitat: state and tasks (information for planning), and others, like transport facilities and hunting.

Data is available since 1981. The forest register is theoretically updated every year up to the situation on 1 January. Reforestation, exploitation, the recently admitted areas and other changes are entered into the frame of the yearly maintenance of the register.

The main objective of this register is to prepare every ten years a forest plan for the silviculturists. Maps are made by plots of communities and given to the silviculturist, the forest

inspectorate, the bureau of forest planning and the ministry.

The basic unit of the register is the forest part. Registered are data on the management, characteristics of the culture, site characteristics and other information. The information concerning one forest part consists of 80 to 1,200 characters, depending on the case. The management information covers the activities of the year (wood felling, reforestation), the tree species, the method of use, the surface, the volume of wood in cubic meter, the identification of the silviculturist, and the part of the community where the forest lies. There is a possibility to describe nine tree species in each forest part. If the vegetation type is not forest, but arable land or pasture, then the tree species range is not filled in. The correctness concerning the growing stock is also different. Where cutting is planned, a representative survey is made; in other parts, the timber is defined according to tables.

In the database, there are 153 possible tree species. Defined are: the rate and kind of composition, the age, height, diameter of the trunk, the class of wood productivity, closeness of the crowns, the volume of wood in cubic meter pro hectare, and the total volume of the forest part. Description is given on the methods used to define the wood-stock, and on what kind of duties shall be made within the next ten years. How many cubic meters will be felled of which species and with what urgency: inevitably, possible to fell, cut out or cleaning (at the age of 20-25 years), clear-felling, gradual renewal cutting, selecting.

Registered site characteristics are: location of the site, climatic and hydrologic data, genetic soil type, physical soil type, thickness of the productive layer, direction of the slope, inclination and altitude above sea level.

Other data concern transport facilities and the category of the nature protection area applicable to the forest part. Collection of hunting data does not exist any more.

The complete database is on magnetic tapes at the Forest Management Office, which operates the register. The system is working on a computer MICROVAX 3. Background capacity is 3,2 Gbyte. One or two years data are loaded at once in the computer. The different years are not linked, because they represent 420 hundred thousand records. One query represents about 1 Mbyte. In the central database, the privately owned forests are not individually entered. In each county, they are cumulated under one code number. Detailed registration is available at the forest inspectorates. A special code number is assigned to the unregulated forest (dissolved agricultural communities, where the question of ownership is not solved yet).

The forest inspectorates store the data of wood felling and reforestation on magnetic data bearers, and PC system calculates the actual stock.

The most important utilisation of the data is the making of forestry plans. For this purpose, routine statistics are performed, showing after how many years the forest part would become ready for felling. Forest prognoses are made for 50, 60 or even for 100 years, based on the actual state and development, and the eventual cutting and reforestation periods.

Since 1986, there exists a survey of forest damage. Each year, one tenth of the forests of the country is checked for damage (in regions with high priority, the survey is made more frequently). Measured is the type of damage, and its extent. The survey covers damage of the roots, the trunk, injuries of the bark, deterioration of foliage, soil damage, damage by fire and damage caused by game.

For 5 years, a forest protection network has been existing. This is a grid of 4 km x 4 km of forested areas where a yearly survey is made at 1000 sites, in the framework of an international forest protection monitoring system.

3.2.3.3 Public health data

The State Public Health and Medical Officer Service controls the human environment affecting the health of the population.

They have a register of non-contagious diseases, which are related to environmental pollution. Now, they are building up a database including also field-observations and measurements of environmental elements.

Atmospheric pollution: medical service executes emission measurements at some polluted sites. Some respiratory diseases are related to pollutants in the air, but a central database does not exist yet. It would be of common interest with the environmental branch to create a database of atmospheric pollution available to both partners.

Another focal point is the qualification of drinking water. Health authorities have been controlling the water producers for a long time, to prevent bacterial contamination of the water. But in Hungary the nitrate pollution of subsurface water resources became more significant. Therefore, the importance of chemical analyses is growing. In summer times, the sanitary control of beaches along rivers and lakes is also the regular duty of the medical service. Data are now exchanged with the environmental branch and compared with the interpretation of bacterial characteristic figures in the surface water quality of the Institute of Environmental Management.

The medical services make soil analyses, too, but these are not regular measurements and samplings; so, this is not a database. The

National Institute for Radio-Biology holds a database of radioactivity in the country. This database is available because it is linked on X25. The registered communal waste deposits are regularly controlled, and the results are on electronic data storage. A list of hazardous material and components is under preparation, this will contain about 2,000 components and products.

These are not public databases because actually, they are still in the stage of elaboration. The users of the existing data are the sanitary and the administrative division. The conditions of receiving data of these databases are actually not fixed yet.

3.3 International Assistance Activities and Projects

3.3.1 PHARE funded projects 303&802/91

Development of Hungarian Ministry for Environment and Regional Policy (KTM) Information System. Project implementation yet to start. Project beneficiary: KTM and Environment Sector of Hungary and international community, through GRID connection. (see details in ch. 3.3.2);

G124/90

RIM (Regional Integrated Monitoring) System (study to analyse and design a feasible GIS-based, decision support system, a decentralized "ring-topology" communication network, a frame project for the sectorial pilot applications);

802/91

Establishment of a computerized GIS at the National Authority for Nature Conservation (tender, with detailed technical specification, has been cancelled. Project has been integrated into the first project for optimal harmonization);

W1/7/92

Developing the framework of a Biodiversity monitoring programme for Hungary (this project contains: data format/ record elements, relation to the info system, data input. Project implementation yet to start);

704/91

Development of a database on municipal waste (on-going).

3.3.2 Development of KTM Information System (PHARE Project, No 303&802/91)

The project includes the following areas:

1. Establishment of two pilot thematic centres: a thematic centre on environmental data at Székesfehérvár, responsible for the region of Lake Balaton, and a thematic centre on nature conservation at Debrecen, responsible for the Hortobágy area. In the frame of the project, a workstation (DEC Alphastation) based client-server facilities are established, with the Oracle database management system and the Arc/Info geographic information system.

2. At the pilot thematic centres, the methodologies and the human and technical (software) requirements of data collection and management are elaborated and tested, in the field of environmental and nature protection. This activity is based on the current (mostly inefficient and unreliable) data collection on:

- *surface water quality, hazardous waste generation and handling, air pollution emission sources and fresh water sources (environmental protection);*
- *endangered animals, protected plants and animals, areas under protection, or designated as future protected areas.*

The developed system should be able to handle data, coming from the future data collection systems/campaigns. The experience gained and the tools acquired at these centres are to be made available to the other Environmental Protection Inspectorates and to Nature Conservation Directorates and Natural Parks.

3. Installation of hardware and basic software systems of the local agencies of KTM (Environmental Protection Inspectorates, Nature Conservation Directorates, Natural Park Directorates) at a common level, including Novell Netware local area network, Oracle Relational Database Management System and GIS query facilities.

4. Establishment of X25 data transmission facilities between the above-mentioned institutions.

3.3.3 Finnish Feasibility Study of the Hungarian Environmental Information Systems

The feasibility study shows a lack of data administration and environmental data responsibilities in Hungary. The data flows have developed in a way not favourable to the needs of the Government. The development of an operational Hungarian Environment Information System requires a number of decisions to be made by the Ministry: the data strategy, the data administration and the Hungarian Environmental Data Center (EDC). These tasks have already been included in the mentioned Act on the Environment. The highest priority is suggested to be the IS/DSS system which directly serves the needs of the Ministry and steers the infrastructure of the systems at the regional and thematic level. The regional system should preferably be developed on the basis of Hungarian experience and know-how.

The databases of the thematic centres could well be developed on an international bilateral basis (i.e. with GRID-Arendal).

3.4 International networking

Originating from Hungary's geographical, political and economic situation, the outside determination plays a significant role in the treatment and solution of the environmental problems. The problem of transboundary environment pollution can be solved only by well-

harmonized international efforts. It is a national interest that controlled and regular co-operation should be maintained with the neighbouring countries in environmental issues and that such multilateral agreements which control environmental effects on regional or global level should be supported. Hungary can take an initiating role in the elaboration of projects aiming at the improvement of the state of environment of the Central and East European region; but also in the institutional information service relating to environmental affairs, research and development results and new technologies.

The international environmental co-operation should be better utilised in order to reveal possibilities in the economical co-operation. Initiating the investment of foreign capital, funding projects and establishment of joint ventures can also promote the spreading of environment-friendly technologies and know-how as well as of developing tools of the appropriate information management of the environmental industry.

The access to international environmental databanks may provide better communication and co-operation in bilateral and multilateral aspects as well.

The "every day" connection to the international networks and databases is very important. Governments must be informed. The most important aspect of this need - in terms of national-level information systems - is the necessity to make clear that the policy of economics affects the environment. At the international level, it is important to also take the necessary precautions concerning the influence of the policy of economics on the environment. At the regional level, transboundary environmental issues and the development of real-time decision support systems are urgent.

Those modest achievements and further requirements which appear to us in an international context should also be mentioned: the fulfilment of the commitments within the international environmental conventions or those which are closely related to our determination to join the integration institutions of the developed countries (notably, the OECD and the EU) which imply stringent environmental criteria, as well.

We have obtained significant representation in several international bodies, meetings and projects. To mention the most important examples, Hungary has become member in the:

- *UN Commission on Sustainable Development;*
- *UNEP Governing Council;*
- *OECD Panel dealing with "Good Laboratory Practices" (GLP).*

Prominent functions were filled in the following important international organisations: ECE Convention on Long-range Transboundary Air Pollution Working Group on Technology; ECE Council of Senior Advisers on Environmental and Water Problems; Standing Committee of the Ramsar Convention; Bern Convention Working Group on Legislation; and INC/IPCC Working Group No. II.

The above-mentioned tasks and the other related activities need a well-based environmental information system, which has good relation to the international environmental information network, as well. There is an increasing demand being placed upon it to introduce environmental information in the international arena, which meets quality control standards and is capable of fulfilling a number of tasks.

The Ministry has good relations to the OECD Environmental Performance Review Programme. This review takes into account each country's absolute levels of environmental quality and its physical, human and eco-

conomic context. However, our contribution to this review could be more efficient. So far, the contribution is based on the present environment information system; however, this contribution to the international programme is poor, because the recent monitoring system is divided according to professional branches and contains relatively few measured data. The environmental information system must be developed to be complex and fast, in order to provide data to decision-makers. Connection of the information systems which have up to now been separated according to professional branches, as well as data-protection and the solving of problems in data-circulation in national and international context are of utmost importance.

For Hungary, the opportunity of active participation in the specific harmonization programmes of OECD is important. This programme is managed by the OECD Territorial Development Service (Regional Policy, Urban Affairs, Rural Development, and LEED (Local Initiative & SME's) in particular within the specific coordination by the OECD PIT (Partners In Transition) Programme. Also, the existing data exchange across the OECD OLIS (On Line Information System) Center should be strengthened.

3.5 Legal and Administrative Framework

3.5.1 Background

Formulation and implementation of the environment protection obligations require development of specific legal and administrative regulation systems. However, an efficient environment policy can not be realised relying exclusively on them. The really efficient solution is if - during elaboration of every regulation - the environmental aspects are built into the regulations from the beginning.

It is especially important that in the continuously changing regulations relating to account-

tancy and statistics, the environmental protection, the environmental developments, investments and products should be treated separately allowing to treat priorities which are also important for other regulations as well. Legal and administrative tools of the environmental protection must be modernised constantly.

The Act II/1976 on the protection of the human environment was at the time of enacting considered progressive. It satisfied the requirement arisen in the 1970's that the environmental protection as a social aspect must gain stipulation through a law.

At the same time, this law bore features of that period, therefore it did actually not give a real standard for the implementation and the environmental protection, and it was not built into the social-economic processes. Due to the limits of the political system, this law did not guarantee public participation and control.

After several years of preparatory work, a new environmental protection law corresponding to the changed social-economic requirements was accepted by the Parliament in May, 1995.

The most important elements of the new legislation are as follows:

- *Putting an end to the former way of thinking and contrary to passive environmental protection, the main goal is to make efforts to prevent environmental damage. This principle is emphasized in the new law.*
- *Environmental protection requires significant economical effort for the sake of eliminating big damage. As decisive part of the environmental damage occurring in the production and consumption processes; enforcement of environmental aspects in the economic processes is a key issue. In the environment protection law, it is stipulated to share the burden among environment users, the state and the local governments, according to the European Union principles.*
- *Due to the diversity of environmental problems, their treatment requires multifarious means. In addition to*

establishing conditions of the market economy reflecting environmental aspects, special economical institutions and suitable solutions representing environmental protection are also necessary. Among others, the central and self-governmental environment protection funds and the system of fees to be paid for using the environment are determined in the law of such institutions.

- The environmental act also stipulates regulations regarding public participation, the principles of publicity and creation of special possibilities for accessing environmental information. It stipulates regulations preferring education and aesthetic view-formation focusing on the environment.
- The fundamental and long-term prevention is regulated by the Environmental Impact Assessment, the introduction of which already includes the necessary corrections based on the experience of the application of the recently effective governmental regulation. Regulation of the environment control system allows complex administrative measures.
- With regard to future planning, the National Environment Protection Programme stipulated by the Law determines how the state formulates tasks and means related to the preservation of the environmental balance and to the prevention and restoration of the environment on a long-term basis.

In accordance with the basic law, a full regulation of the professional fields must be elaborated. In every professional field, a requirement system harmonized with the leading European regulations must be introduced. For the existing establishments, stipulations must be made stricter, while for new ones, prompt enforcement of the strict stipulations must be applied. By means of regulations, it must be ensured that the available and most effective solutions corresponding to the updated technical level should be introduced for preventing or eliminating contamination of environmental elements by taking the economic realities and the protection of the domestic industry into consideration. Lasting legislation efforts must be made to establish calculable and executable regulations.

3.5.2 Accessibility and freedom of information

Constitutional Provisions

Article 61 (1) of the Constitution states who has the right of access to information of public interest.

Under Article 27, members of Parliament may demand information from the Government and from other authorities.

Laws

Act LXIII of 1992 deals with the protection of personal data and the access to data of public interest. The act protects business secrets, allowing the concerned company to decide what data is qualified as secret. The Act stipulates that data concerning the activities of state and local governments should be open to the public, with exception of data concerning national security, criminal procedures and related issues. Moreover, Section 20 of the Act requires the government agency to deliver requested data within fifteen days, or to notify the person making the request within eight days if the data is secret.

The public often lacks information concerning environmental violators. There is no legal requirement that a company's violation of an environmental regulation has to be announced to the public, and the media rarely reports on such violations. Potentially, the newly established Data Protection Ombudsperson could increase public awareness regarding violators.

Data on pollution and health matters are now public and are required to be disclosed under the 1991 act on the Public Health Service. This has been interpreted not to apply, however, to data on individual facilities.

Rather, the National Public Health Service is required to periodically publish a report on the general conditions relating to health and the environment, with overall levels of pollution

for areas within Hungary. The environmental law still contains an EIA component, including right-to-know provisions.

Another problem however, is whether good data will exist. Apart from resource limitations, which are to be expected, the REI's do, under current law, not have inspection rights that would allow them to enter privatised premises. They may only monitor water discharge, for example, at the boundary of the property. Also, there is no requirement that industrial accidents are reported, although such a case normally leads to fines.

3.5.3. Public participation in environmental protection laws

The environmental protection law currently in force (adopted in 1976) is typical of such laws under the former regimes, giving lip-service to strict environmental standards, while providing no mechanism for administration or enforcement. There are no provisions in this law for public participation in decisions relating to environmental impacts, environmental protection or other decisions that might be made during the development process. Enforcement of the current law is undertaken by the Regional Environmental Inspectorates, twelve in number, which also handle permitting of facilities, in co-ordination with the regional Public Hygiene authorities and the regional Water Management authorities. There has been talk about co-ordinating permitting activities (including the EIA component) under the single authority of the REI's, although this will still be debated.

The recently established National Environmental Protection Fund is another instrument of national environmental policy. Act LXXXIII of 1992, as executed by the Ministry Decree No.20/1993(IV/23), established the fund to support projects and investments related to environmental protection. The fund's revenues come primarily from fines paid by polluters, a tax on fuel and support from the

state budget. There is very limited opportunity for public participation in the administration of the fund. Although one representative of environmental NGOs sits on the committee that decides how to use the fund, the vast majority of committee members are representatives of interested ministries. The Ministry for Environment and Regional Policy recently organised a meeting for NGO representatives, to discuss the principles of sharing the proceeds of the fund.

As a matter of practice, the Government Decree No. 43/1990, described above as "Public Participation in Governmental Practice," should be mentioned. This decree mandates public consultation in the formation of environmental policy on the ministry level.

3.5.4 Anticipated developments in the law

The following laws are currently in draft or on the agenda for future consideration:

- *Nature Protection Law.*
- *Animal Protection Law.*
- *Law for Housing & Construction.*
- *Physical Planning and Zoning Law.*
- *Preservation of Historical Monuments Law.*

3.6 Economic Aspects of Environmental Information

Considering the trilateral relation of environment-economy-society, a significant change in the paradigms has been ensued in the last decade in the developed countries of the world. Government policies relating to the environment moved from the earlier environment protection in a narrow sense towards the formulation of goals of sustainable development in a wider sense which became a guiding principle of the modern environment policy programmes. The essence of sustainable development is that, within the conditions of general development, it should consistently be striven towards an equilibrium among social, economic, technical and environmental conditions.

Information is a major input to sustainable development. At the micro level, individual households need to be informed of the consequences of particular decisions about inputs and outputs, and the potential adverse and beneficial impacts, as well. Governments also must be informed. The most important aspects of this need for information is the necessity to make clear that the economic policy affects the environment, which in turn affects the economic welfare.

Geographic information systems can combine e.g. satellite imagery with information gained on the ground. This can then be used not only for traditional purposes of mapping and assessing land capability, but also as a database for interpreting environmental change and the degradation processes. The systematic interaction of socio-economic data bases and environmental information systems may provide the basics of decision support systems.

3.7 Environmental Information, Awareness, Education, Media

3.7.1 Access to and use of environmental information for decision-making

One of the particularly important questions at present is the access to data on the status of the ambient environment or on the environmental characteristics of various activities, technologies and products. This is a key criteria for further development of decision-making mechanisms, with the requirement to properly integrate environment and development in decision-making for all parts of the society and all sectors of the economy. The requirements of public access to these data is also an essential criterion. Both these requirements are reflected in the principles of the Rio Declaration (1992) and serve as the basic guideline for our present projections and measures:

Principle 4.

In order to achieve sustainable development, environmental protection shall constitute an integral part of the development process and cannot be considered in isolation.

Principle 10.

Environmental issues are best handled with the participation of all concerned citizens, at the relevant level. At the national level, each individual shall have appropriate access to information concerning the environment that is held by public authorities, including information on hazardous materials and activities in their communities, and the opportunity to participate in decision-making processes. States shall facilitate and encourage public awareness and participation by making information widely available. Effective access to judicial and administrative proceedings, including compensation and remedy, shall be provided.

The availability and regular provision of information related to the environment is a pre-requisite for the efficiency of the integrated decision-making systems and the public awareness. The latter determines to a large extent the level of public interest and involvement in the decision-making processes. The recent tendencies prove undoubtedly the increasing concern and the improving awareness on environmental problems. According to a contemporary public poll by Gallup, an increasing number of Hungarian citizens think that they or their groups (NGOs) can influence the solution of environmental problems (Gallup, 1994):

	Jan 1992	Aug 1994
to a large extent	8 %	12 %
to a fair extent	20 %	25 %
not too much	40 %	37 %
almost none	26 %	22 %
no answer	6 %	4 %

Table 1

From the point of view of the integrated decision-making systems, the proper understanding of the relation between the environmental and the socio-economic problems will become even more important in the future. Despite the severe economic problems of the present transition period, many rank the environmental tasks as being of a high priority. Concerning the dilemma between: (i) the environmental protection is of first priority even if, as a consequence, the economic development slows down, and: (ii) the economic development is of principal importance even if the environment degrades, the outcome of the poll was as follows:

	Jan 1992	Aug 1994
higher priority for environment	28 %	49 %
higher priority for economic development	7 %	17 %
equally important	62 %	28 %
no answer	3 %	6 %

Table 2

A similar analysis on the environmental attitudes of the population in a particular region of the country (Tiszantul) resulted in a much more modest preference of the reparation of the environmental problems compared to solution of the tasks of economic development; however, the strong demand for information on the environment was also clear from this study.

3.7.2 Raising environmental awareness through education, teaching and training

For the sake of the economical development of the country and the welfare of its citizens, propagation of general and professional knowledge relating to environmental protection as well as development of a deep awareness directed to the necessity of correctly approaching environmental problems, are of utmost importance.

Attaining the ecological attitude must become an important part of the general education, and citizens must be assisted to acquire this attitude.

In education, professional knowledge must be increased, and the principle of sustainable environment must be made known and its importance emphasized.

It is important that the environment-oriented education should be started already in the nursery or in the primary school and should be maintained to the university level and beyond.

Education of all professional fields must include environmental and environmental protection knowledge corresponding to the field. It is especially important that the environmental knowledge should be organically built into the subjects, leading to basic and specific professional knowledge. In addition to this, such professional education is also necessary at medium and at high level, this will provide professional qualification in environmental protection.

The environment-oriented education, teaching and training should not stop at educational forms outside school, but it should serve all citizens, by accompanying the whole life of people. In order to reach long-term development in the state of the environment, establishment of a proper environment-oriented attitude is necessary. The environment-oriented education must include practical knowledge which is necessary for everyday life. The appropriate knowledge about the environment is based on real information. The fundament of the source of real information is a well-based environmental information system.

4. USER NEEDS ASSESSMENT

The range of topics to be covered by a system supporting information needs of decision-making at national level and that of the general public is notably wide in scope. The information content selected for such a system represents a statement of the current conception of critical topics of first-priority environmental data, which also implies priorities in underlying data collection efforts delegated to regional and thematic levels by the Ministry. On the other hand, the cross-sectoral information content requires design of an extensive conceptual data model for general aspects of environmental data. This model should aim at components of information for which a generally applicable characterisation can be made, as independently of the data producing sector as possible.

One of the main factors of environmental management and of improvement of related sectors is the appropriate environmental information system. The objectives are :

- *Harmonizing the environmental and economic interests in the spirit of sustainable development.*
- *Improvement of regulatory means and methods for the environment, according to international practice and in compliance with international conventions.*
- *Strengthening the environmental management capacity; promotion of professional skills and efficiency of experts at the central and local authorities and at NGOs.*

Development and research strongly depend on the development and usage of information systems, which is a very sectoral, interministerial and interdisciplinary co-operation process. This field of co-operation could be characterized as follows:

- *Definition of the main components of a complex environmental information system.*
- *Co-operation to harmonize the efforts.*
- *Information systems of: environmental protection, such as air-, water-and soil-pollution control, waste, hazardous substances, noise and vibrations,*

radioactive materials and pollution accidents; furthermore technologies aimed at eliminating or moderating the detrimental impacts on the environment; adverse processes in the health-and in the social context; nature conservation and landscape protection; regional development; decision support systems.

Agreements already exist between the Hungarian Ministry for Environment and Regional Policy (MERP) and the Ministry of Welfare (MW) on common data exchange, namely to facilitate information on Health and the Environment. Also, there exist agreements between the Hungarian Ministry for Environment and Regional Policy (MERP) and the Ministry of Transport, Communication and Water-Management on common data exchange. The preparation of the other agreement between the Ministry of Agriculture (MA) and the Hungarian Ministry for Environment and Regional Policy is in progress. The National Institute of Hygiene (MW) is participating in the WHO/ECEH (World Health Organisation/European Centre for Environment and Health) HEGIS Programme.

- *Co-operation to harmonize data processing standards for environmental protection use (i.e. waste codes, soil-and air-quality, emission-and water standards).*
- *Co-operation to use CASE (Computer Aided Software Engineering) tools for planning and harmonizing environmental information systems (analysis, design, automatic documentation, code generation and maintenance, etc.).*
- *Definition of the interfaces to access environmental protection databases, and exchange environmental data towards the harmonization of these processes and databases.*
- *Co-operation in the development and usage of "Open Systems" in the administration and in related sectors.*
- *Governmental policy, laws, bills, rights, experience, reality and plans of collecting, processing and using environmental data.*
- *Development and usage of environmental meta-databases.*

Development and usage of connections between other relevant databases, i.e.:

- *GGGIS database: registers of geophysical surveys in Hungary;*
- *GEFGIS : archives of national and regional mineral reserves;*
- *KGGIS: archives of geophysical data of concession areas.*

Development of the potential of access to the international and UN-wide (UNEP, WHO, UNESCO, FAO, IDNDR, etc.) environmental and related databases.

- *Integrated training programme focusing on networks, usage of the appropriate databases.*

In general, data related to environmental protection are necessary for the following user groups:

1. *Medium- and high-level decision-makers at KTM and its local institutions.*
2. *Officers at KTM and at its local institutions working in operative administration (permitting, fining, data collection).*
3. *Other ministries (KTM already signed agreements on data exchange with the Ministry of Welfare (MW), and with the Ministry of Transport, Communication and Water- Management; an agreement with the Ministry of Agriculture is under preparation.*
4. *Local government offices.*
5. *Research institutes.*
6. *General public (through media), NGOs.*
7. *The international community, through international programmes.*

Resulting from the nature of environmental protection, the range of environmentally related data is extremely wide. Consequently, and also due to historical and political reasons, most of the ministries and a large number of other institutions host some sort of database, that can be of value in environmental protection (for details, see: EDC, 1993: Feasibility study of the Hungarian Environmental Information System. Environment Data Centre, Finland.) However, as to the present situation in Hungary, the usage of this information is usually limited to their host institutions.

The reasons for this are: the lack of knowledge about the existence of these databases and the difficulties in accessing them. This situation could be greatly improved by establishing a meta-database, containing information on the institutions collecting environmentally related data and on the data themselves. The meta-database would be of importance to all of the above-mentioned user groups, most important it would be to groups 1 and 4, least important to group 2.

As it is described in section 3 (Status in Environmental Information Systems) of this study, KTM with its local institutions collects and processes data on several topics. These topics include the following: surface water quality, hazardous waste production, air pollution emission sources, water sources, endangered animals, protected plants and animals, areas under protection or designated for protection. In a currently running project (PHARE 303&802/91, described in 3.3.2), the data collection on the above-mentioned topics at the institutions of KTM will be brought up to the current technological level. This does not include, however, a country-wide collection and analysis of the data, which would be vital for user group 1, and also necessary to groups 3, 5, 6 and 7.

A priority task of the environmental information centre to be established is the collection, analysis and dissemination of data from the institutions under the KTM.

Data collected by other institutions, but highly relevant to the work at KTM (mainly user group 1), should also be made available within KTM.

As a next phase, more efforts have to be made to harmonize the data-collection activities, namely in standardising data-referencing and data-structures.

The data collection network of KTM, currently limited to its institutions, is to be extended to include "local governments and central government agencies performing environmental protection tasks" (cited from Article 50 of the new Environmental Law). A more detailed definition of the data and the institutions involved is yet to be determined by the government within a short time. Obviously, the data collected from these new sources will also be included in the database of the environmental data centre.

The activities described above should serve as a basis for the regular creation of state of the environment reports. Such reports should be prepared to inform the general public (group 6), and the management of the ministry (group 1). The biannual preparation of the report to inform the Parliament is also enforced by Article 41 of the Environmental Protection Law.

5. IMPLEMENTATION AND PROPOSED ACTION

5.1 Project Implementation

The project implementation will take place under UNEP/GRID supervision, in close co-operation with the Hungarian Government, with UNITAR (responsible training body), with the donor and with the responsible institutions for the managerial and technical assistance, and also with other international initiatives, namely under the umbrella of the EU (EEA, PHARE).

Project Co-ordination and cooperation with UNEP/GRID

This component of the project will include:

- Administration of the foreign grant and supervision of the establishment of the Centre.
- Advice on the organisational and institutional framework and inter-sectoral co-operation in connection with the establishment of a national

environmental information network.

- Co-ordinate the training and the managerial and technical assistance; responsible for periodical reporting to the donor.
- Ensure compatibility of the Hungarian network, the database and the meta-database with UNEP (EAP, GRID, GEMS), the EU (EEA, PHARE) and others.
- Strengthen international communication and co-operation.

Managerial and Technical Assistance

- Assistance to the core institution in establishing routines for project management and control, budgeting, accounting etc.
- Design of an environmental information system which is suitable for the main task: to provide environmental information to decision-makers in Hungary.
- Establishment of a GIS-based report on the state of the environment in Hungary. Guidance on output production and reporting.
- Sectoral competence to assist in case studies; especially in the fields of digital base maps, of thematic maps and of environment and health.
- Specification of hardware and software for the core institution with special emphasis on communication and compatibility with the GRID network.

Training

- Design and implement a training programme with regular interventions to ensure the successful and sustainable implementation of the project.
- Assist the core unit at the Ministry of Environment in organising an initial workshop, yearly workshops and a specific workshop on environmental health.
- Practical organisation of the training. Both in-country training in form of on-the-job-training and visits to and from Hungary.

5.2 Action

Preparation

This phase involves steps necessary to ascertain that the project activities are carried out in a solid institutional framework. The following documents will have to be drafted:

- Memorandum of Understanding between UNEP and the Ministry for Environment and Regional Planning in Hungary for the establishment of an UNEP/GRID compatible environmental information network.
- Project Agreement between the Ministry of Environment, the donor and the project implementing agencies. The agreement should specify the responsibilities of the different institutions and the funding obligations.
- Documents stating the legal regulations regarding the collection and dissemination of public data and information in accordance with Hungarian legislation, EU norms and UNEP data release policy.

Project preparation should also include a bidding process on the managerial and technical advice components.

Project initialisation

This phase should be started with a meeting/workshop. Its participants will come from: the core unit (KIK) of the Ministry of Environment, other parts of the Ministry, other leading institutions in the environmental network, the donor, UNEP/GRID, UNITAR and from the agencies implementing the managerial and technical assistance.

The main outputs of this workshop will be:

- Common agreement upon a workplan for the three year project period.
- Detailed Terms of Reference for the managerial, technical and training advice components.
- Official opening of the UNEP/GRID-compatible network in Hungary.

Networking within Hungary

This concept of a national environmental information network should ensure the regular communication and the exchange of data and information across sectors between the various participating institutions.

- Actively present and promote the network in inter-ministerial bodies such as the Co-ordination offices of the Prime minister.
- Create mechanisms to provide easy access to the

facilities, data and information to groups within the Ministry of Environment, other sectors, sub-national bodies and universities in accordance with data release policy.

- Conduct specific case studies - as outlined below - to facilitate inter-sectorial networking.

International co-operation and networking

- Act as a switchboard for data and information, facilitate relations with international initiatives such as UNEP, the EU, OECD, WHO and others.
- Active participation in international meetings and seminars on environmental information systems and related fields.
- Assist national users with help and guidance in using international datasets and conventions.

Data and meta-database development

- Data on priority environmental issues should be integrated into a small-scale national environmental database in GIS format. Since it can not be expected that all relevant datasets can be held centrally, priority should be assigned to the development of a meta-database (with information on availability of data).

Main activities in this stage of the project are:

- Provide data producing agencies and users with standards on data collection, data documentation, data storage and digital base maps.
- Establish a meta-database on relevant spatial environmental data in the different bodies of the Hungarian Government. This product is expected to be updated regularly and made accessible to users.
- Establishment of a central spatial database with the most relevant (and accessible) aggregated environmental data.

Environmental information products for decision-makers

One of the core tasks of the network will be to make aggregated information on environmental issues in Hungary available in an easily understandable form, in particular:

- Produce a GIS-based State of the Environment for Hungary and make it accessible to a wide audience,

including schools and the general public. Closely co-ordinate this activity with the other State of Environment initiatives in Hungary, including the PHARE activity in the Department for Environmental Policy in the Ministry.

- Preparation of small-scale digital base and thematic maps (input scale approximately 1:50,000) for the general presentation of environmental data.
- Present scientific reports and statistical data as easily understandable maps, ensuring that issues regarding the environment and environmental problems are brought to the attention of the public and the decision-makers.

- Three annual workshops which are relevant to the general development of the network, focusing on data-and meta-database development and on production of information for decision-makers.
- Two workshops related to the case studies: CORINE Land Cover and Health and Environment.
- Technical Training on GIS-tools, databases etc. should be arranged locally (by software suppliers and universities), according to the needs.
- Exchange visits abroad for two to three representatives at a time, to expose the core staff to other operating nodes in the GRID network, like GRID-Arendal, GRID-Geneva or GRID-Warsaw.

Networking Case Studies

As a continuation of existing co-operation between the Ministry of Environment, the Ministry of Welfare and the Ministry of Agriculture in Hungary, two joint case studies facilitating inter-sectorial co-operation should be developed:

Corine Land Cover

The Institute of Geodesy and Cartography is in the process of compiling and presenting the data of the CORINE Land Cover project for Hungary (under the EU PHARE programme). The case study should focus on the presentation and dissemination of these data to a wide user group. This need has also been explicitly mentioned by EU (PHARE, EEA).

Environment and Health

The National Institute of Hygiene is participating in the WHO HEGIS programme; also the Ministry of Environment has participated in HEGIS activities. The case study should focus on continuation of this work on combining environmental and health information to show potential impacts.

Training

An important component of the project will be an integrated training programme focusing on the network's needs with regular interventions, namely:

Appendix

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