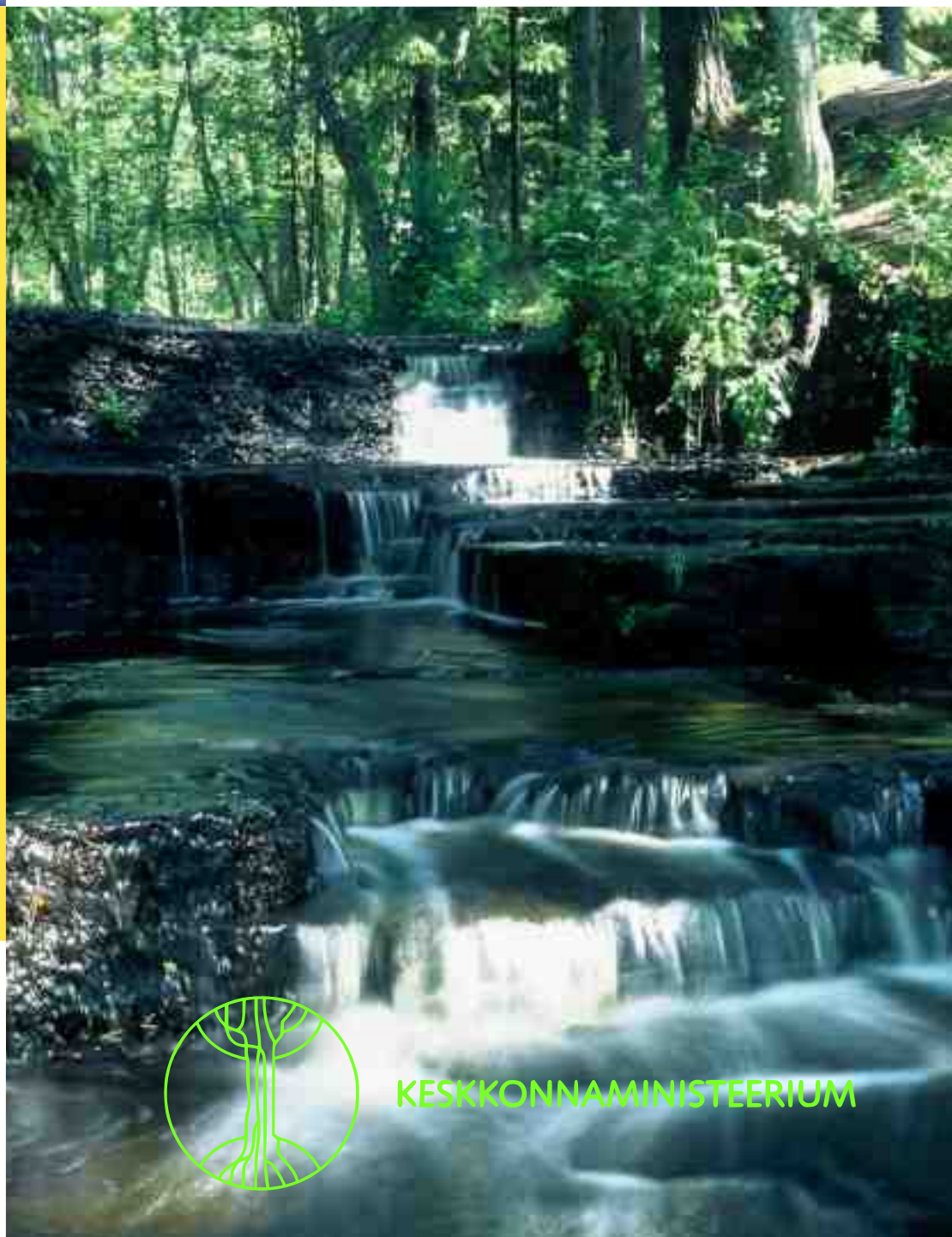
Viru-Peipsi CAMP

Summary Report

The European Commission
Environment Directorate



The project objectives were to support implementation of the Water Framework Directive (WFD) in the context of Lake Peipsi Basin and Viru counties in Estonia, a region facing a large array of problems: heavily industrialised in the north, the project area is mostly agricultural in the south; water resources are shared with Russia, a non EU State Members. Therefore the project approach had to be multidisciplinary and transboundary.

A multi-sectorial inventory and assessment of water resources and their management had to be conducted first. Then, a detailed programme of measures aimed at achieving good status for water resources had to be developed, taking into consideration economic, social, environmental, and transboundary aspects of water management. Specific activities have been conducted throughout project implementation to reinforce Estonian administrative capacities leading to the development of information tools, training of staff, information diffusion, and awareness building among stakeholders.

The Beneficiary, the Estonian Ministry of the Environment, is the highest executive body for environmental protection in Estonia responsible for water policy planning and implementation. Project partners are: Tallinn Technical University, Estonian Agricultural University, AS Maves, Maa ja Vesi, Wildlife Estonia, and Estonian Water Consultancy Ltd.

On November 30th, 2001, the French Fund for Global Environment (FFEM) officially adopted the financing of the project; the agreement granting financial support from Life programme was signed in December 2001 with the European Commission.

With a budget of € 1,728,320 financed by the Ministry of the Environment of the Republic of Estonia (12%), Estonian partners (3%), the Life-Environment Programme (29%) and FFEM (56%), the Viru-Peipsi CAMP project is one of the most ambitious initiative to set up a basin management plan in Estonia.

A complex management system of the project ensured thorough information of Estonian and Russian authorities. In Estonia, a Project Steering Committee supervised the implementation of the project; technical and financial reports further on submitted to an Estonian-Russian Basin Steering Committee for final endorsement.

The Framework Directive

- Protects all waters - rivers, lakes, coastal waters, and groundwaters.
- Sets ambitious objectives to ensure that all waters meet "good status" by 2015.
- Sets up a system of management within river basins that recognises that water systems do not stop at political borders.
- Requires cross border co-operation between countries and all involved parties.
- Ensures active participation of all stakeholders, including NGOs and local communities, in water management activities.
- Ensures reduction and control of pollution from all sources like agriculture, industrial activity, and urban areas, etc.
- Balances the interests of the environment with those who depend on it.

Inventory

Applying the Water Framework Directive (WFD) requires dividing the national territory into river basin districts (RBD), i.e. the fundamental administrative unit of water resources management for the WFD. All inland and coastal waters, as well as aquifer systems, are divided or grouped in their turn into water bod-

ies forming the lower management level of water resources.

The subdivision of Estonia into three RBD takes into account two international districts: the *Southern District*, comprising the river Gauja basin (shared with Latvia), the *Eastern District* including Narva River, Peipsi Lake, and the rivers drained towards the Gulf of Finland; at last, the *Western District* encompasses the rivers flowing to the Gulf of Finland, the Gulf of Livonia, and to the open Baltic Sea. The division into three districts has been officially adopted by the regulation of the Government of the Republic of Estonia n°210 from June 3rd, 2004. The competent authority is the Ministry itself for all the three basins.

Typing water bodies

Surface water bodies within the river basin district have been differentiated into types using indicators such as altitude, geology, and size. Typology of surface water used for their characterization is based on the studies and reviews done by relevant scientific institutions. Altogether twenty-two different types have been defined: eight for rivers, eight for lakes, and six for coastal waters.

The work done by Project's working group on groundwater bodies resulted in identification of eighteen distinct bodies of groundwater. This first proposal was further revised and the Ministry of the Environment, in its Regulation on Groundwater bodies (N. 47 of May 10th, 2004) retained fifteen of them.

Characterization

According to the WFD, type-specific conditions have to be established for each surface water body. The *Reference Conditions* represent the values of quality and quantity elements specified for that surface water body type at high ecological status.

Insufficiently purified wastewater and agricultural runoff, both causing eutrophication, are the main problems affecting surface water quality in Estonia. Therefore, setting reference conditions for rivers the following parameters were taken into account: content of dissolved oxygen, biochemical oxygen demand, content of total nitrogen and total phosphorus.

While the typology of lakes focuses mainly on abiotic parameters, quality assessment is based on biotic indicators. In lakes, such elements include: phytoplankton, macrophytes, and zoobenthos. In addition, certain indicators of zooplankton and concentrations of nutrients are also taken into account.

High, good, and moderate ecological status of coastal waters is defined on the basis of biological, hydromorphological and physico-chemical quality elements. According to this classification, reference conditions are established separately for each individual type.

The Regulation of the Ministry of the Environment on Groundwater bodies (N° 47 from May 10th, 2004), stipulates the list of quality indicators of groundwater classes as conductivity, pH, content of dissolved oxygen or redox potential, content of chlorine, nitrate, ammonium, and substances hazardous to the aquatic environment. This regulation has been used to define the type of bodies of groundwater.

Status of water bodies

The Project determined the status of fifty rivers, i.e. of all water courses having a basin exceeding 100 km². Although investigations were conducted on a relatively small number of rivers over the six hundred watercourses of the basin, they concerned all in all 25% of total length of rivers, i.e. 2,268 km; the catchment area, taken as a whole, covers a surface of more than 14,280 km², i.e. 92% of the Project area. Following expert assessment, 4%

The project area

The project basin is one of the few the European Union shares with a non-Member State, Russia. It comprises six counties: Ida-Viru and Lääne-Viru counties, predominantly industrial and situated in the north-east of the country, Jõgeva, Tartu, Võru, and Põlva counties, which are predominantly agricultural and situated to the west and the south of the lake. They have a combined population of 484,000 and cover an area of 15,760 km², i.e. roughly one third of Estonia.

Serious damage to water resources in the north east have been caused by oil-shale mining and energy production, chemical and other industrial activities. In the south, agriculture and point source pollution from insufficient municipal sewage treatment have contributed to significant pollution particularly to surface water bodies.

of water courses length may be classified as poor, 29% as moderate, and 67% as good.

A total of 103 lakes were assessed, i.e. almost all lakes with a surface exceeding 10 hectares, and few other ones presenting particular ecological or recreational significance. Assessment used mainly existing limnological database, and additional observations were carried out on eight lakes. Among the lakes assessed, 9% belong to high quality class, 48% to good, 39% to moderate and 4% only can be characterized by poor quality. Long-term monitoring data allowed experts of Life, Tacis and UNDP/GEF projects to conclude, during a bilateral Russian Estonian seminar, that the status of the lake Peipsi can be considered as moderate on the whole, while statuses of lakes Lämmijärv and Pihkva vary between moderate and poor.

GPS are widely used to locate objects in nature

As for coastal water, monitoring values obtained in Narva-Jõesuu and Sillamäe classify them as moderate. In Eru Bay however, measurements allow attributing a good or even high status to coastal waters, taking into account their type. All in all, existing data let suggest that the ecological status of coastal waters belonging to the Project area is rather good than moderate.

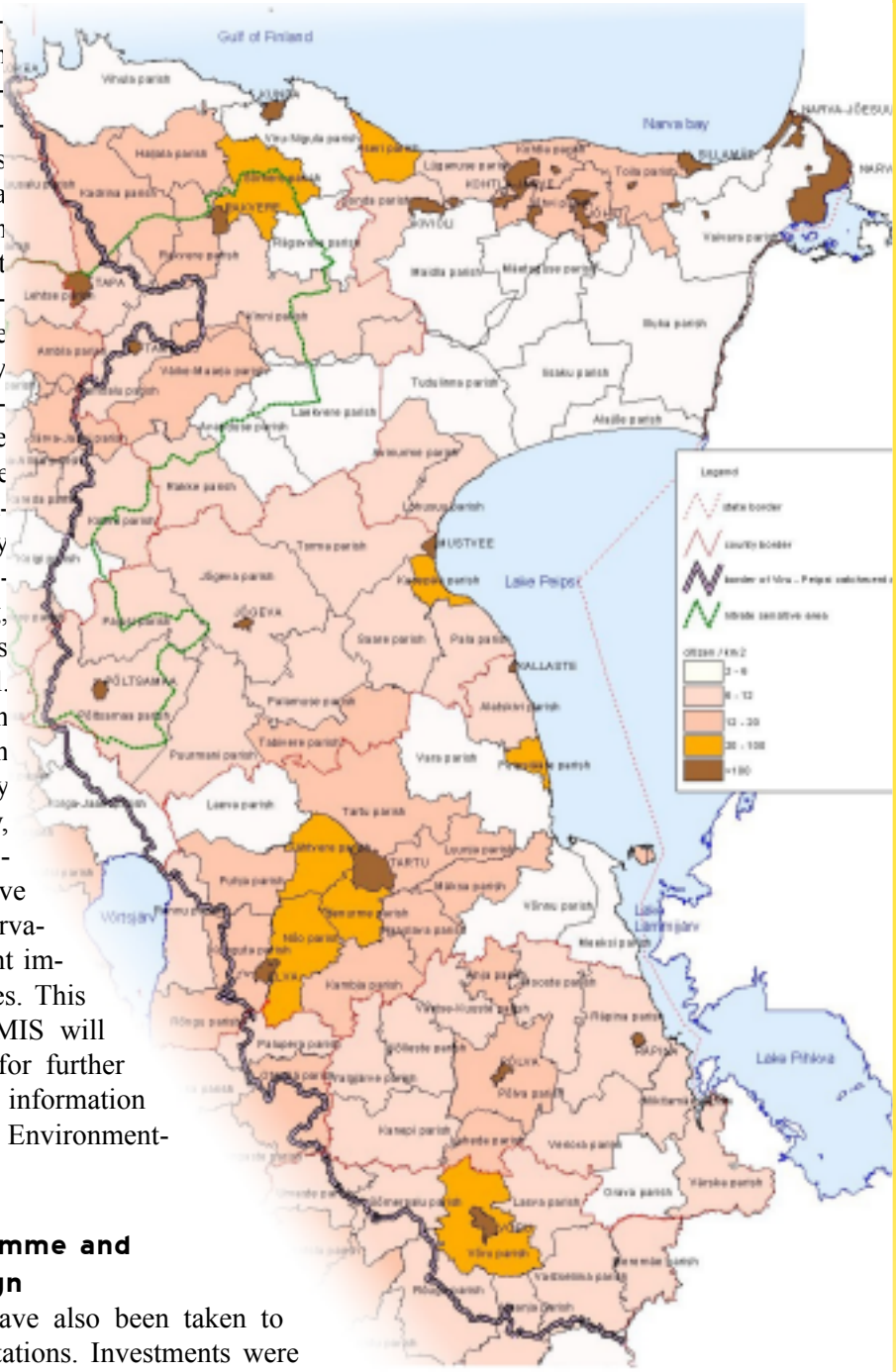
At last, a similar initial characterization has been conducted for all the fifteen groundwater bodies that count the basin; this characterization shall assess their use and the risk failing to meet the objectives of good status by the end of 2015. In the project area, the Ordovician body of groundwater in Ida-Viru oil-shale basin is the only one which status can be assessed as poor. From a technical and economic point of view, it seems impossible to achieve a good water quality by 2015, as a consequence of dewatering and contamination by oil-shale waste products.

Information resources

Inventory of water intakes has been conducted by analyzing and cross checking data issued from various databases (water permits, water abstraction and effluent discharges, sanitary and monitoring analysis). Polluted sites have been inventoried and the resulting database contains comprehensive information on a majority of them, whatever their origin is: former Soviet military bases as in Raadi, or abandoned asphalt factories and oil storages. A lot has been done in the past few years to limit the impact of the energy sector, especially of the oil-shale ash fields in power plants, the sedimentation basins, and the mining waste landfills. The most harmful remain however semi-coke landfills: resulting from sixty years of production, 93 million tons of semi-coke has been stored in Kohtla-Järve and Kiviõli, resulting in a durable pollution of the surroundings.

Pollution hot spots as well as natural and hydrological features have been stored into a

multi-thematic Geographic Information System (GIS) containing more than 20 vector and raster layers together with a metadata information system (MIS). Project database was compiled using a wide variety of primary data sources as described above. The overall purpose of the GIS is to support strategic water quality and river basin modelling, decision-making, and raising awareness at a regional level. GIS layers have been grouped into seven themes: hydrology and hydrogeology, land cover, topography, administrative limits, nature conservation areas, environment impact and infrastructures. This GIS and its related MIS will serve as a reference for further development of the information system at the Estonian Environmental Information Centre.



Monitoring Programme and Sampling Campaign

Particular measures have also been taken to enhance monitoring stations. Investments were made to renovate monitoring wells, closing down wells representing a threat to groundwater quality, restoring the original depth and condition of monitoring wells, as well as installing automatic systems in monitoring stations for registering groundwater level fluctuations. At last, portable monitoring devices were afforded to enhance surface water monitoring capacities, by measuring such parameters as temperature, diluted oxygen, pH, redox potential, conductivity, turbidity, chlorophyll, depth, flow velocity and flow rate.

Particular monitoring programmes were designed for sampling those elements of the WFD directive that were currently not

sampled in the frame of the national monitoring programmes. Results allowed assessing the state of the water bodies and therefore characterizing their current status with respect to the reference conditions.

Programme of measures

Henn Timm collecting living organisms: zoo- and phyto- planktons give precious indications on the state of the water in lakes.

The economic analysis

The objectives of the programme of measures were to realize an economic and cost / impact analysis, and to develop an impact reduction programmes for different sectors of the economy.

The Project conducted a thorough characterization of the economic significance of water uses and services in the area, before forecasting their future evolutions by developing the baseline scenario. The northern part of the basin is heavily industrialized: exploitation of the oil shale has been the pillar of economic development for more than fifty years, and Ida-Viru and Lääne-Viru counties make up twenty percent of the national industrial output; only Tartu may have a comparable level of industrialisation. Elsewhere in the basin agriculture and forestry productions dominate, and the total industrial production of the remaining part of the basin (i.e. Jõgeva, Põlva, and Võru) is less than a third of that of Ida-Viru alone.

Within the last decade, the scale and nature of human impact on the environment has significantly changed in Estonia. The beginning of the nineties has been characterized by a fall in industrial and agricultural productions (e.g. the number of cattle decreased by nearly a half and consumption of fertilizers by three times). Annual output of oil shale mining dropped between 1991 to 1995 by seven million tons. Since then, successful introduction of environmental-friendly technology and modernisation of infrastructure allowed decoupling economic growth and water consumption. As a result, the volume of water pumped out of mines or used as cooling water for power plants decreased significantly. At national level, domestic and industrial water consumption decreased almost twofold.

Parallel to the characterization of water use, the project launched public consultation on water issues. Thirty face-to-face interviews have been conducted with stakeholders of different professional profiles and geographical origins, in order to benefit from their experience and expertise. Problems related to drinking water supply and urban sewage treatment were almost systematically mentioned, but clearly described as improving; impacts of mining activities, mine dewatering, and extensive discharge of mine water in the environment were also reported, and usually considered as unavoidable.

Cost recovery levels of water services have been assessed for three sectors of the economy: households, agriculture, and industry, and were estimated at approximately 70% all

Explaining, convincing, teaching: Ain Lääne, Project Manager, during a training session.

over the area. The most important water users are households and industry with a respective share of 65% and 27% of total costs. No improvement is expected in the level of cost recovery for the population, as tariff for water services may be raised only in densely populated areas.

The last step in the economic analysis, the baseline scenario, is aimed at describing changes that may occur during the coming decade (2005 - 2015) in water uses and in cost recovery level of services. Water service costs are expected to increase on average by 5% annually for all consumers, but will not represent more than 4% of households' disposable incomes. Water abstraction and sewage discharge fees will increase drastically by 10% and 20% respectively in the coming years, before stabilizing at 5% to 7% annual growth.

Impact reduction programme

The main objective of the impact reduction programme is to define the needs of public water supply, sewer and storm water systems, of settlements more than 500 inhabitants. Only administrative divisions whose territory belongs to Project area have been considered; therefore, Järva, Võru, Viljandi and Valga counties have been only partly taken into account. All in all 78 settlements sheltering more than 360 thousand people were studied, that represents 72% of the total population living in the area.

The methodological approach to develop the impact reduction programme includes a thorough description of the existing situation, bringing up problems related to social aspects (provision of services, health protection, general welfare) and to environmental protection (adequacy of water and wastewater treatment level with existing and, whenever possible, future legislation), in respect of deadlines foreseen by Estonian and EU legislative acts for achieving objectives fixed in the legislation, and following general principles of sustainable development. The overall cost of the measures to bring drinking and sewage networks to a satisfactory level of efficiency have been estimated at EEK 4.8 billion (approximately € 300 millions), i.e. making more than a half of all measures cost of the Management Plan (EEK 8 billions).

Modelling of groundwater abstraction

Aquifer modelling leads to a better knowledge of the limiting conditions in the aquifer systems (water-head conditions, flow conditions, and water-abstraction conditions). The actual geological model is sufficient to understand the structure in general, but it should be refined to integrate limiting conditions on the other side of the border. All necessary data have been integrated into the hydrogeological model (piezometric levels, pumping,

Time for the reflexion: building a groundwater model on the border with Russia to better share water resources

hydrological parameters, transmissivity, and permeability). At that stage, the model of the geological structure has been finalized for Estonia as well as the piezometry of all aquifers, the permeability map and withdrawal maps, and different files for visualizing the results.

Dissemination

The official announcement of the project was published by the Ministry of the Environment on November 11th, 2001. Press releases and articles were regularly published to present the project and to keep stakeholders and the public informed. The project homepage has been operational since July 2002; moreover, a collaborative platform has been set up to allow free access to project's documentation.

The project booklet *Assessment of the State of Surface Water Bodies and Groundwater* has been issued at the fall of June 2004; its presentation took place at the Ministry of the Environment on 7th of July 2004. The print run of one thousand two hundred largely allowed distributing it.

The video film *Dialogue with water* is a another key element of Project information policy, as it allows informing a very wide, and not always well informed, public. Water related problems are depicted by experts and well illustrated by the pictures. Preparation of the 40 minutes documentary has been entrusted to *Läänemaa Telestuudio*. Originally produced in Estonian, it has been translated into English.

The implementation of the project was also the opportunity to rise public awareness on water management issues, to inform local stakeholders about the WFD, and to train local civil officers and regional specialists to new approach or instrumentations. Moreover, public confrontations were also used to test for civil acceptability of the measures foreseen in the draft management plan. Numerous information seminars have been organized all along project duration.

Training has been a key element of the project; here in Tartu, the practice follows the theory.

Strengthening institutional capacity

Putting into practice a new and comprehensive legislative approach as the WFD required modifying and enhancing understandings on a broad range of subjects. Environmental authorities, environmental managers, experts, and other stakeholders have been trained in various aspects of water management, from water sampling to economic aspects of water policy and relevant EU and Estonian legislation.

Handbooks

To reinforce institutional capacities, the Project has taken steps in developing information tools, training, and knowledge basis. A series of handbooks have been released about sampling and monitoring, environmental impact and risk assessments and geographic information tools. Dedicated to a public of professionals, they intend to represent an accessible, yet reliable and comprehensive, source of practical knowledge.

Training courses

Parallel to the preparation of theoretical documentation, on the ground training allows direct contact and fruitful exchange between trainees and specialists from different countries. Training sessions on sampling have been organized conjointly by the Project Implementation Unit (PIU), the French Geological Survey (BRGM), and the Finnish Environment Institute (FEI); the training documentation has been published and widely distributed. Training in sampling and monitoring concerned also the use of portable equipment bought in the frame of the project. Seminars on GIS and MIS were carried out in collaboration with Estonian Environmental Information Centre Nature Bureau to train civil officers from County Environmental Departments. In line with GIS development, training course on the use of GPS was organized in the frame of the Water Seminar in 2003. At last, a training session for ArcView users has been provided by BRGM for Estonian and Russian specialists to allow common understandings of GIS. Training documentation has been provided to trainees: it includes a complete set of ESRI Arc-View® software technical guides, all in all more than 2,000 pages of documentation.

Hardware & software deployment

Bringing together theory and practice would not have durable and efficient effect if, besides handbooks and training, the suitable equipment would be available. In that purpose, public procurements for purchasing computers and appropriate software were organized, and the fifteen Counties Environmental Departments of the Ministry received computers equipped with office suites and GIS software, as well as with the Estonian information system on nature (EELIS), which

will be later used as a tool for handling data during the preparation of the basin management plan.

River Basin Management Plan

Organization of public discussions

A first draft version of the CAMP has been completed by the end of March 2005 and published on the project homepage for information. Not less than six public meetings were organized in the basin to focus as much as possible on local priorities. Participants were invited, either personally when it was possible, or through their company or organization; press inserts have been published well in advanced in all local newspaper. All in all 150 persons attended the public discussions.

People showed interest in how the measures contained in the plan will be financed, if state fundings will be made available, and how the planned measures have been chosen. The active attitude of non-governmental organisations (NGOs) showed that people are worried about the maintenance and protection of groundwater resources.

Preparation of the final CAMP

The comments submitted during the discussions showed that local authorities and inhabitants are very well acquainted with local problems, but missed sometime broader view and understandings of their neighbours' problems. The river basin management plan appears to be a good tool to connect neighbourhoods and develop concerted actions for protecting water resources shared at the level of the basin.

Both public comments received during public consultation and experts' comments of officials consulted by the project were used to finalize the River Basin Management Plan. The document will be hosted on the Ministry of the Environment web page to allow public access, and will be used as a reference document by the Water Department and the County Environmental services of the Ministry. At the same time, the Management Plan is a living document that will be modified or supplemented following the development of the implementation of WFD.

A first conclusion...

Experience gained in Estonia

Drafting such a comprehensive river basin management plan brought a lot of experience to Estonian environment specialists, representatives of local authorities, and officials involved in the project.

Training courses, monitoring equipment, computer hardware and software provided by the project to County Environmental Services and to the Estonian Environment Information Centre create a solid base for the future implementation of the WFD.

Close cooperation with French and Finnish specialists raised the motivation of locals and helped understanding the overall philosophy of the Water Framework Directive.

The inventory and data gathering put into the fore the weakness of existing monitoring network, as well as the information missing for assessing the state of surface and groundwater bodies.

The elaboration of the plan of measures showed that several local authorities pay no interest to water management issues. Often, local

development plans for water supply or sewage collect and treatment, which should be taken into account during the elaboration of the plan of measures, are missing.

At last, public discussions concerning the plan of measures in the Counties revealed that there are some hot spots important for local authorities which were not taken into account during the elaboration of the draft river basin management plan. Therefore, the consultations with local authorities and inhabitants have a crucial importance in the final stage of the elaboration of the river basin management plans.

Return of experience for European Union and other Member States

Positive impact of the project goes beyond Estonian border as it represents a test in full size for many innovative aspects of the water framework directive.

One of these aspects concerns collaboration with non European-Union member state. From that point of view, joint seminars with representatives of the Russian Federation greatly helped clarifying EU water policy and strengthened understanding that the future of the Lake Peipsi depends very much on actions taken on both sides of the Lake.

Also inconsistencies and possible misinterpretation of the guidelines appeared during the course of their implementations; such difficulties will be reported and discussed by Estonian representatives in future European workshops.

...And a sight in the future

Following project implementation, several actions have to be taken at Ministry's level to adapt existing legislation and ameliorate its consistency with the Water Framework Directives. The regulation on discharges to the environment is yet in contradiction with European legislation and will block further application of the Directive; also existing regulations concerning the classification of surface water bodies will have to be revised following intercalibration of reference conditions for water body types at European level.

It appears necessary to reform the existing financing scheme (tax collection and financial support granted) of the Environmental Investment Centre, to adapt it to river basin districts, which is one of the requirements of the Directive.

In 2006, criteria for designating heavily modified water bodies should be finalized, and existing monitoring requirements will have to be revised in order to start implementing the monitoring programme required in 2007 for finalizing the assessment of the status of water bodies.

The status of water bodies assessed by the project will have then to be reviewed and modified to integrate both the results of the international intercalibration and the results of the monitoring campaign in 2007. Socio-economic analyses have to be pursued to elaborate baseline scenario up the year 2015. All results have to be compiled and clearly presented to the public for discussions.

The management plan will be supplemented: all measures foreseen will be detailed in the light of the outcome of the monitoring programme, of the reassessment of the status of water bodies, of the economic analysis, but also to take into account results of the public consultation. At all stages, experience gained in the project we be recalled and reapplied, facilitating and speeding up the preparation of the final management plan and implementation of the Water Framework Directive.

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