in the legal decision making order and frankness of all involved pursuing the common goal) the process of search could be managed. We have to emphasise that opposition wasn"t only emotionally motivated (fear from radiation), but also motivated by rational economic contemplation, that presumed loss of property value. Here the initiator of the search should have responded. Common ground were also the individuals that entertained some respect for science and technology, i.e. that it is possible to organize a nuclear waste dump by using available technology. The analysis also showed that people aren"t opposed to development in general. Development which could bring personal gain to them (i.e. building a highway), meets much less opposition. A probable hypothesis is also that there wouldn"t be so much opposition if the proposed waste dump would have been perceived as a development possibility. In the past, search for possible sites brought about excessive confrontation, in the affected areas the possibility for new research or a new procedure was thus almost impossible. Analysis showed that the level of anxiety and readiness to „defend" a territory with „all means" were still very high, because of previous unprofessional and unethical enforcement of the waste dump. In fact, conditions during the last few years, when the project was at a standstill, haven"t changed. Therefore the logical conclusion is that the common ground and starting points of a possible new procedure will have to be changed dramatically. The rather selectively collected and presented data, allows added analysis and interpretation. The presented analysis could of course be more in-depth and detailed, but it confirmed the predicted interpretation possibilities for „sociology of garbage". Among other it strongly confirms the known thesis on faltering credibility of expert judgment (Offe, 1987), in fact a major challenge for professional work, one which many are not willing or even able to accept.

Drago Kos, Ph.D., sociologist, Faculty of Social Sciences, University in Ljubljana

Notes

1 The title of the research is Analysis of experience in the preliminary procedure of selecting a site for storing low and medium radioactive nuclear waste: attitudes of local communities (Kos et al., 1999).

2 We relied on the analysis of media coverage, commissioned by the Agency for radioactive waste and carried out by others and on our own media analysis, mainly newspapers. Based on these documents it was possible to reconstruct the events at the five proposed sites rather accurately.

3 The basic research method were non-standard interviews with formal and informal representatives of affected local communities, opinion leaders, landowners where geological research was carried out and also with less active individuals, that didn"t perform significant roles in the events. All together 21 interviews were performed, while the number of involved individuals was much greater, e.g. the whole family took part or the occasional visitor, neighbours, friends etc. Among the interviewed were 17 men and 4 women, on average members of the intermediate age group. Two of the men and one woman were younger than 30 years. 21 men and 1 woman were in the age group 30-55, while the elderly group was represented by 3 men and 1 woman. The education was above average, 8 individuals had high school or college diplomas. The dominant characteristic of the employment structure was that 13 individuals were involved with agriculture (or had the status of half-farmer).

Captions

On information *We that live here know nothing*
On decision making *They drew and wrote everything, but they never asked us*
On dangers from radioactive waste *It is poisonous, surely*
On the best site *Because you"re there, where something stinks*
On economic opportunities *They said that it would be an atomic gold-mine*
On violent protest *There was a scuffle, but the people were agitated*
On correct choice of site *An individual needs a permit for sewage, garbage disposal, the state needs nothing*

For literature and sources see page 24

Aleš BIZJAK

Climatic Changes, Flood Prevention and Water Supply in Slovenia

1. The Climate and Changes in the Water Cycle

The forecasts following research on climatic changes and consequences of global warming on the environment that were carried out by research institutes (e.g. Max Planck Institute in Hamburg, with the hypothesis of increase in concentration of CO_2 in the atmosphere by 1% per year in Hadley Centre in Bracknellu, England, with the hypothesis of increase in concentration of CO_2 in the atmosphere by 1,3% per year) predict qualitative and quantitative changes in certain elements of the water cycle, such as: precipitation, soil humidity, storms and intensive weather and the sea level (Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, 1997).

Global climatic changes will probably affect the distribution and availability of water quantities. Generally the weather will be more humid in the northern, and drier in the southern hemisphere. We can expect longer periods of drought and shorter periods of intensive regional precipitation. Similarly, the volume of winter precipitation will increase, while the quantity of Summer precipitation will decrease. The Alps and the Mediterranean, thus also the territory of Slovenia, northern Scandinava and central and eastern Europe are in this sense defined as vulnerable areas. Consequently periodic, geographic and flood quantity patterns will change, the medium low flows of water courses will diminish and we can also expect problems with water supply because of the drop in the level of the water table and exploatation of subterrenean water below the existing minimal level (Watson et al., 1998).

Effects of climatic changes on the global level are hard to predict, because of inadequate precision of models and scenarios. Forecasts of climatic changes for a territory the size of Slovenia are therefore even more difficult and inaccurate. From the viewpoint of flood prevention and water supply in Slovenia, the areas most vulnerable to change are the same as under present environmental conditions, i.e.:

- problem areas for water supply;
- areas exposed to droughts;
- areas exposed to wind and water erosion;
- areas exposed to the sea – tidal plains and coastal areas;
- areas exposed to common and catastrophic floods;
- areas within the torrential regime of water courses and activity of water and water quantities;
- areas exposed to regression of forest sub-growth.

2. Flooding

Under present climatic conditions the areas most vulnerable to flooding in Slovenia are the areas along the Mura river, lower Sava river and the Savinja river, especially around Celje (WMI, 1995). Table 1 shows the sizes of flooded areas caused by catastrophic floods of Slovenian water courses and the present quantities and local distribution of water masses

According to data supplied by the National Statistics Office the estimated damage caused by flooding in Slovenia in 1995 was 2.8 billion SIT (14 million EUR) meaning 18 % of all economic damage caused by elementary disasters and 1.044 billion SIT (5 million EUR) or 9,19 % in 1996 (National Statistics Office 1997, 1998). Table 2 shows the total estimated damage caused by elementary in the gross domestic product of Slovenia between 1991 and 1995.

The results of model estimates of effects of climatic changes to hydrological conditions in Slovenian water courses for the selected time horisons 2025 and 2050 show a tendency of diminishing low and medium flows and increase in high flows (Rogelj, 1999). Autumn peaks are moving slightly towards the Summer, the Spring and Autumn wet periods are more pronounced while Summer flows will not change significantly. Simultaneously the most significant response to predicted intensive precipitation is expected in the alpine and sub-alpine region (increase in Q_{vk} by 30%), a consequence of topography, river gradients and branched water course networks. Slight increase is predicted in central and eastern Slovenia (increase in Q_{vk} by 20%), while the smallest changes to high flows are expected in the Karst region (increase in Q_{vk} by 10 %), where the geological structure allows greater retention of outflows (Rogelj, 1999).

In view of the present flooding vulnerability of urban and other areas in Slovenia and following results from the model estimates of effects of climatic changes to hydrological conditions of Slovenian water courses, urban regions lying next to river courses (in brackets) are the most vulnerable areas to flooding, namely: Ljubljana and the Ljubljana marsh (Gradaščica and Ljubljanica), Celje, Laško (Savinja), villages along the Dravinja river, Slovenj Gradec (Mislinja), Železniki, Škofja Loka (Sora), Dob, Vir (Kamniška Bistrica, Rača), Litija, Sevnica, Krško (Sava), Kostanjevica (Krka), Bača pri Modreju (Bača), and Vipava and Miren (Vipava) (Burja, WMI).

3. Water Supply

Municipal services performing water supply activities are: supply of drinking water, drainage of refuse and atmospheric water and treatment of refuse water. Differences between shares of supply of water supply services among the population are evident between different parts of Slovenia and the activities performed. Areas which lag behind the national average in service performance are mainly concentrated in the north-eastern part of the country, namely: Ptuj, Ormož, Lenart, Gornja Radgona and Ljutomer. Sewage drainage is below average even in certain municipalities of the Dolenjska and Celje regions. Generally communal infrastructure in the countryside is deficient and too expensive. Most new houses and households are not connected to the sewage network, but use cess-pools, while often refuse water is led directly into water courses or illegally into water bearing reserves.

Table 3 shows the level of communal provision of the population according to activity in Slovenia. The conditions of sewage infrastructure and water treatment doesn"t correspond (they are much worse) to the provision of drinking water. The table also shows, that out of 100 litres of used water, only 18 are treated and that 48 litres (of the 100) are lost in the system (WMI, 1998).

The quality of existing communal provision can also be defined by losses within the system, number of failures in the water supply system, the quality of drinking water in the pipelines and the adequacy of water treatment plants. Losses in the water supply system were noted in all the particular systems, however there are differences between them. Table 4 shows the supply systems that have losses greater than the national average. Areas with greatest losses of water under conditions of realised forecasts concerning climatic changes are also the most vulnerable seen from the viewpoint of provision of water quantities. The larger number of failures in the larger water supply system were in Novo mesto, Koper, Domžale, Velenje, Žalec and Ptuj. These areas are under conditions of realised climatic changes the most vulnerable areas (WMI, 1998).

The quality of drinking water in public water supply networks is also a problem. Only two-thirds of all public networks supply hygienically clean water. The worst noted conditions are in the areas around Celje, Koper, Nova Gorica and Novo mesto. They are also extremely vulnerable if climatic conditions change. Areas where refuse water could potentially endanger water reserves are shown in table 5 (WMI, 1998)

According to data on capacities of refuse water treatment plants, areas with severe deficiencies are: Kozjansko, Posavje, Štajerska (Slovenjska Bistrica, Slovenske Konjice), Zasavje, Kras, Maribor and Koroška. Under conditions of realised forecasts concerning climatic changes are also the most vulnerable seen from the viewpoint of provision of water quantities because of inadequate treatment facilities. Table 6 shows the shares of treated refuse water in Slovenia in 1993 (WMI, 1998).

4. Adaptation Measures

Ensuring stable conditions and efficient management of water systems, that will be nature friendly and serve the needs of humanity, as well as enable the preservation of water resour-

ces for the future generations is the starting point of all adaptation measures following changes in the hydrological cycle.

Flood Prevention

Amongst the primary measures for ensuring better flood prevention and broader water retention are:
- reservation of existing flood plains;
- reservation of new flood plains, planned because of changed climatic conditions;
- reservation of spaces for water reservoirs;
- sustainable arrangements for water courses prone to flooding and adaptation measures for the new protection standards
- raising of bridges to new heights above water courses.

Timely evacuation of inhabitants and mobile material goods and the execution of temporary protection measures depend on the success of forecasting extreme events such as floods. Successful forecasting of floods is tied to forecasts of high water, which are possible on longer water courses, well equipped with automatic measuring stations and ombrographs and the data led directly to data management centres. In Slovenia there are no such water courses nor equipment. Therefore in our early warning system we should involve the meteorological office and use their data on precipitation forecasts – with improved periodic and geographic resolution, monitor the intensity of precipitation by radar, include a forecast hydrological model for predicting the height of the flood wave, etc.

Water Supply

Because of rise in temperature and possible higher frequency of drought periods we can expect increased use of water by end users, as well as worsening conditions in water provision. The primary adaptation measures are:
- preservation of the quality of subterenean water in water protection areas, which are still not in use;
- draining of water from higher lying water bearing structures, that are not under settlement or development pressure as lower lying water bearing areas in alluvial plains;
- diminishing losses in the water supply network by renewal of existing systems;
- rational use of water in households and industry;
- adaptation of outlets from refuse water treatment plants to changing levels in medium low flows;
- adaptation to communal systems for drainage of atmospheric water by increasing the volume of retention pools according to higher precipitation intensity;
- reservation of spaces for constructing new accumulation basins for enriching low flows.

Execution of international, national and regional adaptation strategies based on possible climatic changes are necessary measures. Water is an integral commodity, necessary for the preservation of ecological and economic systems. Flooding and water supply are only a part of an extremely varied topic. An integral approach to surmounting possible obstacles concerning changes to the water cycle is therefore compulsory also in adaptation fields of medium low flows of water courses and the adaptation of structures and functioning of hydroelectric infrastructure.

Aleš Bizjak, M.Sc., Landscape architect, Water Management Institute, Ljubljana

Note

The article is part of a report prepared by the author for the Ministry of environment and physical planning for the 1st National Report on Slovenia to the UN convention on climatic changes

Tables

For literature and sources see page 29

Ivan STANIČ

Design for Security, the British Experience

1. Introduction

Secured by design [1] is a promotion campaign in Great Britain, begun in 1989 and organised on initiative by the Chief Police Officers Union and Crime prevention unit at the Home Office. The goal of the campaign is to promote secure building construction, from planning and design to construction of housing estates and individual buildings, i.e. promoting design that can effectively and in a passive sense diminish possibilities for crime. Buildings which would achieve qualities of security promoted by the Police would be granted a certificate and right to use the logotype. Granting of the certificate wold indirectly mean a higher value of the real estate and lower insurance premiums.

Secured by design *against criminal acts* in the design phase s a mode of preventive activity, whereby security measures are integrated in a cost efficient way, thus creating benefits for developers and future inhabitants.

Basically efficient planning of housing estates from the point of view of security means using certain security features that can be easily built into a layout. In this context implying defensive space, surveillance, design of open space and acts on particular buildings, wherby the most important idea is to reduce fear from crime. Some of the proposed measures from the elaborately presented ideas are shown in continuation.