INTRODUCTION

The Upper-Tisza river basin is shared by four nations: Ukraine, Romania, Slovakia and Hungary. The river itself is the frontier along several kilometres between Ukraine and Romania and between Ukraine and Hungary. All blessings and all disasters a river can cause are also shared by the four nations. For people living close to the river it is their source of survival, their friend, their partner, and their enemy. In local language use she is a female. They love her, they fight with her, but they cannot live without her.

The river basin experienced catastrophic floods four times in 28 months between November 1998 and March 2001. Each flood surpassed the previous one in magnitude, reaching heights and causing damages bigger than ever before. At the beginning of March 2001 the highest ever flood occurred in the Transcarpathian region in Ukraine. Flood stages exceeded all previous maximums. In the region of the springs of the river Tisza the 3-day total rainfall was close to 300 mm, about 40% more than the previous maximum. At Tisza-Tivadar (close to the Ukrainian border in Hungary), the water level rose more than 10 m in 48 hours and close to 12 m in three days. Flood protection levees were breached at many sites, including Ukraine and Hungary, causing enormous economic loss and even demanding human lives.

After the 1998 catastrophic events the Ministry of Emergency and Chernobyl Affairs in Ukraine officially asked NATO for help in taking measures to mitigate the effects of the floods in the Carpathian region. NATO responded under the Partnership for Peace Program with setting up an Expert Task Force to prepare an Assessment Report with practical recommendations on various ways of improving efficiency of flood and emergency management systems in the Transcarpathian area. Ten nations participated in the Task Force. The lead was taken by Belgium, the other 9 nations are: Czech Republic, Germany, Hungary, Sweden, Switzerland and the USA as NATO members and Slovakia, Romania, and naturally Ukraine as affected countries. It is anticipated that the Report will serve on the one hand as a practical guideline for four of the five affected countries in harmonizing flood related development and on the other hand it will be the basis of the second, implementation phase.

The practical work of the Expert Task Force started on 3-4 September in Uzhgorod, Ukraine, followed by a study tour in Hungary. On this trip participants could familiarize themselves with the world standard first phase of the online flood monitoring system joining Hungarian and Ukrainian territories in one computerized system. At the same time existing problems and room for improvement were also realized. Based on the first-hand experience activities and focus areas were clearly structured.

The main goal of the assessment is to discover the critical shortages in technical standards, legislation, international co-operation and communication that hinder more efficient control of floods and more efficient disaster management and prepare practical recommendations that can serve as a direct reference for Ukrainian authorities that want to prepare project proposals for international development or financial institutions. The work was carried out in 6 work packages as below

1.) General background

The most important geographical features and the history of the project are shown in a few paragraphs at the beginning of the first chapter. After that the chapter concentrates mostly on institutional aspects. The present legal conditions and the institutional frame developed through several decades of centralized government systems. Being in the process of democratic decentralization many new questions have to be answered. These questions cover both international relationships and internal relations of institutions dealing with flood management issues. Reconsideration of existing systems is
also forced by the rapid change in information technology that has to be reflected in the legal and institutional framework.

2.) Geospatial data

Whatever flood management system is chosen, it has to be based on a sophisticated system of data and information. Digital maps, GIS, satellite imagery are all tools that serve flood managers more efficiently than paper maps. However, even in this latter respect there is room for improvement. In previous times most of the maps were classified, so the very first question is how to make them available for flood experts.

3.) Hydro meteorological data and network

In this work package the non-automatic network of hydrological and meteorological observation stations is analysed from the hydrological perspective of an undivided catchment. Instrumentation, data derived from the observation, primary data processing and information communication are all assessed and recommendations are made, based on accepted international standards.

4.) Flood monitoring and forecasting

This work package is actually sub-divided into
   a.) On-line automatic monitoring
   b.) Flood warning and forecasting

The IT frame of a joint Hungarian-Ukrainian on-line remote sensing system for observing water level, precipitation and air temperature together with two stations were constructed in 1999-2000 from a Hungarian Government grant. Other systems are also being planned in Romania, Slovakia and Ukraine. The assessment covers evaluation of the operation of the existing system, its relation with the planned new systems and recommendations for the extension. Special emphasis is given to the required very close international co-operation. Practical recommendations are given to establish four interrelated Regional Flood Centres with a shared information database and on-line connection. These centres would serve the purposes of the other work packages too. Flood forecasting activities are also analysed and recommendations are given for setting up an international modular flood forecasting system.

5.) Flood management

Flood management measures are divided into structural and non-structural measures. This work package deals mainly with non-structural measures like availability of information on the extension of the floodplain, identification of communities, population and assets prone to flooding, public awareness, existing land use planning policy, allocation of public tasks and organisational structures concerning flood management, tasks related to different levels of flood alert, national standards and guidelines related to structural flood defence.

Assessment of the existing flood alleviation schemes, as well as overview of planned developments and a preliminary assessment on the expected effects of those has also been made. Recommendations are given on the development of integrated flood defence plans and confinement plans (Arc View/AutoCAD), on GIS based flood risk assessment and mapping. The necessity of a feasibility study for structural improvements is emphasised.

6.) Emergency management

Emergency management has its own role during floods. To be efficient in case a disaster occurs, a well-established system of material and personnel resource management, action plans, evacuation plans etc. are required. Institutional and legal backup has to be well established and good communication channels to the people in danger have a very important role in mitigating the adverse
effects. The present Ukrainian situation in relation with the international requirements is assessed in this work package.

PROJECT STRUCTURE

More than 40 flood and emergency experts from the 10 nations worked together in a very constructive teamwork. The common goal was to find the best way of mitigating the effects of the flood related disasters and reduce as much as possible the probability of the recurrence of the catastrophe. The work was grouped in work packages along functional lines, not along territorial division. Therefore each work package had experts from all the four countries affected by the development alongside with other NATO experts. Several workshops have been organized on the one hand to coordinate professional expectations of the four affected nations and on the other hand to have proper feedback from government institutions, NGO-s and other public organizations on the professional views.

CO-ORDINATION WITH OTHER INTERNATIONAL ACTIVITIES

When the practical work started, the Budapest Declaration (Tisza Forum) signed by the responsible ministers of the 5 riparian countries was already in force. TACIS, PHARE-CBC, DANCEE AND UNDP too were active with somewhat similar goals. Therefore the ETF decided to undertake the role of co-ordination between the various international projects and make sure that all recommendations would be in compliance with the Budapest Declaration.

THE STRUCTURE OF THE FINAL REPORT

Each Chapter reflects the results of the work carried out in the above work packages. All can be divided into three main parts. The first one is the actual assessment followed by the conclusions and by the perhaps most important parts, the recommendations. As the chapters contain quite numerous recommendations, the most important ones are named “Key Recommendations” and given a numbering system following the numbering of the chapters, e.g. Key rec. 4.1, Key rec. 4.2, ... Key rec. 4.15. Numbering of tables, figures and key recommendations within one chapter is continuous.

Support material, tables, charts, inventories are attached to the Main Report in the Annexes.

It is important to note that although all chapters refer already to Phase Two, in most of them it can actually be divided into Phase Two and Phase Three, because generally they aim at the ultimate solution that might not be achieved in one phase. These tasks could be performed in the FORUM established to co-ordinate the Flood control co-operation in the TISZA River Basin agreed in the BUDAPEST DECLARATION from May 2001.

THE WAY AHEAD

It is anticipated that phase two and later phases of the project, following the successful implementation of the Task Force recommendations, will lead to the establishment of a powerful flood management system in Ukraine. Planners and developers will be able to use the Assessment Report to put in place a state-of-the-art hydro meteorological network which will be capable of providing real-time satellite imagery of high-risk areas, of highlighting flood-prone areas and of mapping out landslide susceptibility regions. This information will then be available for the relevant national and regional authorities to initiate their new and improved emergency response system in a timely manner that will ultimately save lives and property during future flood events.