

## Basin Report:

Questionnaire + Addendum

To review case study basins

with regard to their water governance regime, context and  
performance

## Tisza Basin

With focus on the Hungarian part

Case Study Review Workshop for the NeWater project

Berlin, 05. – 07.05.2010

## About this questionnaire

This questionnaire was developed within the scope of the Twin2Go project. It serves to record case study data about a river basin's water governance regime, its context and its performance. An explanation of the indicators, pre-defined scores and potential data sources is provided in the guidance on this questionnaire. (Twin2Go, Guidance on the Questionnaire of the Twin2Go - Case Study Review Workshops. 13/03/10).

Scores to each of the indicators are assigned according the suggested score scheme proposed in the guidance. In the case of numerical indicators like indices, the numerical values are added in brackets after the score, e.g. "B (0.178)" or "C (12,534)". For a better understanding of the recorded issue, additional information is added in the "comments" column.

- ❖ If not specified differently, the indicators refer to the national part of the basin of interest. The report only considers the national part of the basin.
- ❖ In general, you should check the GWP toolbox for papers, reports, etc. as data sources of your region, especially with regard to the water governance regime.

Prefilled questionnaires were discussed and completed in workgroup sessions during the Review Workshop in Berlin (05-07/05/10). Difficulties concerning indicators were discussed in the plenum. The most controversial indicator was no. 8, "*National basin organisation or comparable arrangement*". No formal basin organisation exists that is responsible for the total Hungarian part of the Tisza catchment. Instead, several sub-basin organisations care for water management and are relatively independent on management issues. This issue as well as further remarks and suggestions concerning several indicators are documented in the Tisza questionnaire.

Despite good progress during the workshop, final scores could not be determined for indicators 18, 19, 79 and 80. These indicators were post-processed after the workshop by participating experts who consulted:

- the water management sector of the newly organised Ministry of Rural Development (to which the previous Environmental and Water Ministry had been integrated),
- the Agricultural and Food Sciences Centre of the University of Debrecen, and
- the Trans-Tisza Region Environmental, Nature Protection and Water Inspectorate.

Based on the preliminary synthesis results and discussion during the Twin2Go synthesis workshop (Stockholm, 01-02/09/10) an addendum was made with some additional parameters. This addendum has been filled by the same experts.

***The resulting data will be post-processed and added to the Twin2Go database. Should you feel these scores do not reflect the situation of the basin accurately, or want to contest any of the information included, you may contact the project organisers. Contact information as well as additional information regarding the project and the results can be found on [www.twin2go.eu](http://www.twin2go.eu).***

***Names of participating experts have been removed for confidentiality purposes.***

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**A) Water governance regime**

No.	Indicator	Score	Comments
<b>I) Characteristics of environmental governance regimes</b>			
<b>a) Water policy, institutional &amp; legal framework (formal and informal)</b>			
1.	<b>Domestic water legislation (laws, by-laws, etc.) in place?</b>	A	<p>National water law: Act LVII of 1995 about water management. (Modified by Act LXXI of 2001 and later on 20 Oct 2009.)</p> <p>The scope of the Act extends to</p> <ul style="list-style-type: none"> <li>a) the subsurface and surface waters (hereinafter: waters), the natural aquifers of subsurface waters, and the channels and beds, banks and shores of surface waters;</li> <li>b) the facilities, which influence or change the runoff and flow regimes, the quantity and quality, the channels and beds, banks and shores of waters, or the aquifers of subsurface waters;</li> <li>c) the activities, which influence or can change the runoff and flow regimes, the quantity and quality, the channels and beds, banks and shores of waters, or the aquifers of subsurface waters;</li> <li>d) water utilisation, the preservation of alternatives for water utilisation, and water resources management;</li> <li>e) the monitoring required for obtaining knowledge about waters and exploring their conditions, the collection, processing, supply, and use of data (hereinafter: hydrographical activities), as well as the evaluation and research of water conditions;</li> <li>f) the control of, and emergency defence operations against floodwater damage, furthermore, to private individuals, legal entities, and the unincorporated economic associations thereof, which pursue the activities indicated in paragraphs c) to f).</li> </ul>

No.	Indicator	Score	Comments
2.	<b>Domestic Water Law: Public character of water and legal status of water use rights</b>	A	<p>- Act XX of 1949 The Constitution of the Republic of Hungary: Article 70/D.            (1) Everyone living in the territory of the Republic of Hungary has the right to the highest possible level of physical and mental health.            (2) The Republic of Hungary shall implement this right through institutions of labour safety and health care, through the organization of medical care and the opportunities for regular physical activity, as well as through the protection of the urban and natural environment.</p> <p>- Act LVII of 1995 about water management. (Modified by Act LXXI of 2001 and later on 20 Oct 2009.)</p> <p>- Act LXV of 1990 about the Self-governments. This act determined that self-governments have to provide healthy water supply for the population.            Following the Self-government Law, one year later the Hungarian Parliament adopted the Act XXXIII/1991 on Transfer of Properties, which regulated the way how state properties, such as water utility assets can be transferred to self-governments.            This law determined among others that:</p> <ul style="list-style-type: none"> <li>- self-governments in possession of water utility assets have to provide professional operation of their water utilities in accordance with laws and regulations.</li> <li>- if water utility asset lies on two or more settlements than the asset had to be transferred to joint property of the settlements in concern.</li> </ul> <p>An important condition is mentioned in Article 20. section (2): The water utility assets belong to initial capital of the self-government and these assets are of restrictedly negotiable and can be utilized only for public service purposes.</p> <p><u>Legal frame of establishing and operating water utilities</u></p> <p>1990 LXXXVII Law on determination of prices;</p> <ul style="list-style-type: none"> <li>- in case of water utility works owned by municipal self-government the tariff setting authority is the self-government's body of representatives</li> <li>- in case of state owned water utility works the tariff setting authority is the environmental and water management minister</li> </ul> <p>Civil Code</p> <p>1992 XXXVIII Law about state finance            In par 105 it is stated that the self-government is authorized to hand over its assets for property management in case the body of representatives decides on authorizes.</p> <p>Governmental Decree 38/1995. (IV. 5) on public water supply and sewage disposal. The issue of this law was ahead of the issue of new water management law.</p> <p>Ministerial Decree of 21/2002 (IV. 25) KöViM about the operation of water utilities.</p> <p>2007 CVI Law about the state properties.            In par 36 it is stated that the proprietary right of state properties can be transferred free of charge to the municipal self-governments to promote to carry out their obligations determined by law.</p>
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No.	Indicator	Score	Comments
3.	<b>Domestic Water Law: Explicit recognition of traditional and indigenous water uses</b>	A	See comments at Indicator No. 2. e.g. traditional rights related to fishery, tourism
4.	<b>Domestic Water Law: On flow availability, third party rights and ecological requirements</b>	A	- See comments at the above indicators. - Act LVII, chapter 5, paragraph 15 specifies ranking of water uses to satisfy different water demands , including ecological protection - Governmental Decree No. 90 of 2007 about the Prevention and averting of environmental degradation. - Act LVI of 1995 on Green tax as well as environmental tax of certain products.
5.	<b>Integration of domestic water legislation</b>	A	See comments at Indicator No. 1. - Act LIII of 1995 on the General Rules of Environmental Protection - Act LIII of 1996 on Nature Protection
6.	<b>Multilevel structure of domestic water legislation and subsidiarity</b>	A	- Governmental Decree No. 72 of 1996 about the jurisdictions in water management - Governmental Decree No. 347 of 2006 on Designation of Organisations providing environmental protection, nature conservation and water management official and administrative tasks
7.	<b>Existence of formal domestic administrative structure for water governance</b>	A	- Ministry of Environment and Water (KvVM) - Development Directorate of the Ministry of Environment and Water; (KvVM FI) - Central Directorate for Water and Environment (VKKI) - National Inspectorate for Environment, Nature and Water (OKTVF); - Regional Inspectorates for Environment, Nature and Water (10 KÖTEVIFE) - Environmental and Water Management Directorates (12 KÖVIZIG) - National Park Directorates (10 NPI)

No.	Indicator	Score	Comments
8.	National basin organisation or comparable arrangement	D	<p><b>Sub-basin (Regional) Management Council for the Tisza, below the National Water Management Council, supervises the short-term and long-term plans and makes priority recommendations and is able to reject water management plans</b></p> <p>Multilevel-system, Primary organisations:            - Ministry of Environment and Water (KvVM)            - Central Directorate for Water and Environment (VKKI)  <b>- Environmental and Water Management Directorates (12 KÖVIZIG) – 6 on Tisza Basin (they are relatively independent on management issues)</b></p> <p>Additional responsibilities:            - Regional Inspectorates for Environment, Nature and Water (10 KÖTEVIFE) - 5 on Tisza Basin            - National Park Directorates (10 NPI) – 5 on Tisza Basin</p> <p><i>Comment during the workshop: Definition is too narrow and should consider where responsibilities are integrated and carried out by multilevel hierarchy of organisations , not one single organisation, e.g. the national ministry</i>  <i>Reply: This indicators asks if there is one independent formal authority that is only responsible for the national basin part</i></p>
9.	Formalised transboundary coordination organisation	A	<p>Not one single river basin organisation for the entire Tisza river exists, there are effective bilateral committee organisations (see below) dealing with water management issues for just partial area of the basin.            ICPDR for the total Danube exists.</p> <p>- Ministry of Environment and Water (KvVM)            - Environmental and Water Management Directorates (12 KÖVIZIG) – 6 on Tisza Basin</p> <p>- Governmental Decree No. 130 of 2000 on Enactment of Helsinki Agreement (17 March 1992) on the protection and use of transboundary rivers and international lakes.            - Governmental Decree No. 148 of 1999 on Enactment of Espoo Agreement (26 February 1999) on Environmental Impact Assessment in a Transboundary Context.</p> <p>Transboundary Agreements with neighbouring countries (SK, UA, RO, RS) establishes <b>permanent bilateral commissions</b>, the Hungarian part of which operates under the direction of the KvVM, and gives direction to the directorates, which do the on-the-ground management</p>

No.	Indicator	Score	Comments
10.	<b>Formal institution (legislation) that prescribes the basin management principle</b>	A	<ul style="list-style-type: none"> <li>- Act LVII of 1995 about water management. (Modified by Act LXXI of 2001 and later on 20 Oct 2009.)</li> <li>- Governmental Decree No. 221 of 2004. (VII.21.) on Rules of River Basin Management.</li> <li>- Spirit of WFD was transposed into Hungarian legislation in 2003</li> </ul>
11.	<b>Water (basin) strategies, programmes and plans</b>	A	<ul style="list-style-type: none"> <li>- Spirit of WFD, which mandates that each basin gets a RBMP was transposed into Hungarian legislation in 2003</li> <li>- Governmental Decree No. 221 of 2004. (VII.21.) on Rules of River Basin Management.</li> </ul> <p>River Basin Management Plans for 42 design units; 4 sub-basins and a national plan (<a href="http://www.vizeink.hu">www.vizeink.hu</a>)</p>
12.	<b>Financing mechanisms: Degree of investment from private sector/ public/ other sources (e.g. international)</b>	B	Dominance of public sector (including EU).
13.	<b>Economic instruments Is water for irrigation priced?</b>	A	<p>Irrigation water is priced. User can receive irrigation water through application for licence and the water is charged according to actual use.</p> <ul style="list-style-type: none"> <li>- Ministerial Decree No. 2 of 1997 of KHVM on Operation of agricultural water service works.</li> </ul>
14.	<b>Economic instruments Is water for households priced in urban areas?</b>	A	<p>Yes, it is priced in urban areas (see 13).</p> <ul style="list-style-type: none"> <li>- Act LXXXVII of 1990 on determination of prices</li> <li>- Act LXV of 1990 about the Self-governments</li> </ul>
15.	<b>Economic instruments Is water for industry priced?</b>	A	Yes, it is priced (see 13). According to license and usage.
16.	<b>Tradable permits related to water abstraction/use</b>	C	No tradable permits exist in Hungary.
17.	<b>Polluter pays principle (related to water)</b>	A	Act LXXXIX of 2003 about the environmental exposure charge



No.	Indicator	Score	Comments
18.*	<b>Environmental subsidies (related to water )</b>	A	The agri-environmental measure of the New Hungary Rural Development Programme provides area based payments for farmers, who fulfil on voluntary basis land use management requirements. These payments encourage producers of agricultural lands to adopt farming and production methods, which are compatible with the sustainable use of environment. The main targets of action: to support the sustainable development of rural areas, to preserve and improve environmental conditions, to reduce load on environment from agricultural sources, and to promote agricultural practice based upon the sustainable use of natural resources. Special attention has been paid to the support of land use change (conversion of arable lands into grasslands), and zonal schemes with higher environmental performance. Reference link: <a href="http://www.umvp.eu">www.umvp.eu</a> ; <a href="http://www.fvm.gov.hu/doc/upload/201003/nhrdp_v5_2009.pdf">http://www.fvm.gov.hu/doc/upload/201003/nhrdp_v5_2009.pdf</a>
19.*	<b>Payment for ecosystem services (related to water)</b>	C	There is no payment for ecosystem services.
20.	<b>Tradable permits (related to water quality, maximum, allowable loads etc.)</b>	C	No tradable permits exist in Hungary related to water.
21.	<b>Environmental tax (related to water)</b>	A	Sewerage load and waste water discharge fees are applied. The income is used for an environmental fund, which, finances investments in the water sector as well as other investments to improve the environment Governmental Decree No. 204 of 2001 about the sewerage load fee. Governmental Decree No. 203 of 2001 about Some rules of the protection of surface water quality
22.	<b>Presence of substituting informal institutions for management of water</b>	B	Medium Corruption Perception Index, more evidence needed
23.	<b>Presence of complementary informal institutions for water management</b>	C	
23.a	<b>Case-specific indicator(s)...</b>		
<b>b) Formalisation of IWRM principles &amp; Millennium Development Goals</b>			

\* The scores of the indicators 18, 19, 79 and 80 were post-processed after the workshop. For this, J. Fehér consulted

- the water management sector of the newly organised Ministry of Rural Development (to which the previous Environmental and Water Ministry was integrated),
- the Agricultural and Food Sciences Centre of the University of Debrecen, and
- the Trans-Tisza Region Environmental, Nature Protection and Water Inspectorate.

No.	Indicator	Score	Comments
24.	Formalised IWRM principles	A	<p>- Act LVII of 1995 about water management. (Modified by Act LXXI of 2001 and later on 20 Oct 2009.)</p> <p>The Integrated Water Resources Management (IWRM) as the Johannesburg target is fully in accordance with the goal of the EU Water Framework Directive. Hungary – together with the EU member states and the Danubian countries started the implementation of the Framework Directive. The Danube basin wide implementation of the WFD is the main task of the International Commission of the Danube River Protection Convention. At national level the sub-basins of the Danube, Tisza, Drava and the lake Balaton have been designated for the river basin management plan (due to be completed in 2009).</p> <p>The structure of water management in Hungary was already organized for 50 years ago on the basis of the river basin principle. The regional institutions of the water and environmental sector cover 12 regions of the country. The National Environmental Programme includes substantial provisions and measures for the conservation and management of surface and subsurface water resources. Some of the key targets and approved policy directions are: regulation development to encourage sustainable and economical water use; improvement of water quality for the main watercourses/water bodies (Danube and Tisza Rivers, Lake Balaton); gradual increase (to a level of 65%) of the number of settlements having sewer systems; at least biological treatment of wastewater from sewers; nitrate and phosphorous load reductions for highly protected and sensitive waters.</p> <p>The governmental program, the New Vásárhelyi Plan has started in 2004 on the enhancement of flood safety and the related regional and rural development in the Tisza Valley. The Plan comprises a complex program which covers beyond the creation of a higher level of flood safety, the improvement of the living standards of the rural and urban population of the region, the formulation and introduction of new types of agro-ecological land use in the area of the emergency flood retention reservoirs and the modernisation of the infrastructure in the settlements along the Tisza River.</p>
25.	State of implementation of IWRM principles	A	See WFD and its implementation.
26.	Capacity to implement IWRM	B	<p>Water Directories do not get 100% financing of their budget, but must earn a part of the budget on their own. This causes financial uncertainty to a certain extent.</p> <p><i>Comment during the workshop: This indicator could be split: human + financial capacity</i></p>

No.	Indicator	Score	Comments
27.	Is universal and non-discriminatory access to safe drinking water and sanitation a goal?	A	- Act LVII of 1995 about water management. (Modified by Act LXXI of 2001 and later on 20 Oct 2009.) - New Hungarian Development Programme
28.	Integration of wetlands in IWRM and IRBM*	A	Vásárhelyi Plan (VTT) The principles of the VTT conception plan are as follow: a) Increase the water carrying capacity of the flood river bed; b) Storage of flood water in external reservoirs c) Establishment of flood flow strip and reconnection of wetlands and oxbows wherever it is possible. Also in River Basin Management Plans, consideration of wetlands is mandatory
28.a	<i>Case-specific indicator(s)...</i>		
<b>c) Decision making regarding uncertainties</b>			
29.	General practices for dealing with uncertainties	A	See implementation of WFD.
30.	Dealing with uncertainties: Reversible and flexible options	B	<u>Comment during the workshop:</u> This indicator could be split: policies + physical measures in the field (e.g. dams)
31.	Dealing with uncertainties: Safety margins	B	Alternatives have to be presented in project proposals applying for funding and in the authorization procedure as well. However, alternatives do not necessarily mean handling uncertainties.  <u>Comment during the workshop:</u> Define better what are the kinds of margins: diversity of choices or performance level? <u>Reply:</u> There is no clear scale.
32.	Are scenarios used for decision making?	B	In RBMPs some elements of scenarios are taken into account, but in the current decision-making time horizon, which is up to 2015 long term climate change scenarios have little relevance.
33.	Climate risks: Climate variability and change	A	Hungary is very active in the consideration of climate change issues. - Parliamentary Decision No. 102 of 1993 on Reinforcement of UN Climate Change Framework Agreement signed on 13 June 1992 in Rio de Janeiro. - Act LX of 2007 on Implementation of UN Climate Change Framework Agreement and Kyoto Protocol. This Act prescribes the elaboration of a National Climate Change Strategy for 2008-2025. - On 13 February 2008 the Hungarian Government adopted the National Climate Change Strategy for 2008-2025. - The Hungarian Parliament started the discussion of a proposed act on Protection of Climate in early 2010.

No.	Indicator	Score	Comments
<b>33.a</b>	<b><i>Case-specific indicator(s)...</i></b>		
<b>II) Actor networks with emphasis on the role and interactions of state and non-state actors and power relationships</b>			
<b>a) Cooperation and coordination structures</b>			
<b>34.</b>	<b>Vertical coordination (governmental)</b>	A	See comment for Indicator No. 7.
<b>35.</b>	<b>Horizontal coordination (governmental)</b>	B	
<b>36.</b>	<b>Role of local governments</b>	A	There are 7 major nation wide associations for municipalities, local governments. These associations are actively involved in any decision-making process that would / might affect the local level.
<b>36.a</b>	<b><i>Case-specific indicator(s)...</i></b>		
<b>b) Information sharing via formal rules, dependency relationships etc.</b>			
<b>37.</b>	<b>Kinds of knowledge included =&gt; Role of experts/ science, local/traditional knowledge</b>	A	Wide range of forums were provided for local and scientific experts to explain their views in the preparation of RBMPs.
<b>38.</b>	<b>Access to information =&gt; about expert knowledge and management plans</b>	B	Information theoretically and legally is open. Some effort is needed (any sometime some costs are also involved) to obtain the required information.
<b>38.a</b>	<b><i>Case-specific indicator(s)...</i></b>		
<b>III) Multi-level interactions across administrative boundaries and vertical integration across levels and horizontal integration across sectors</b>			
<b>a) Centralisation</b>			
<b>39.</b>	<b>One level one actor?</b>	B	Power is shared among administrative disciplines (e.g. environment, agriculture). The ministry of environment and water is dominating at the national level.
<b>40.</b>	<b>Degree of centralisation</b>	A	Water related issues and decisions are shared among several governmental bodies and their decentralised institutional networks.  <i>Comment during the workshop: A graphical illustration would be useful.</i>

No.	Indicator	Score	Comments
41.	Technical capacity and economies of scale	A(-)	<i>Comment during the workshop: A clearer definition is needed and a more fine-grained scoring. Reply: Yes, it is needed.</i>
42.	Legal obligations and responsibility	A	Legal obligations and responsibilities of the decentralised system are defined by laws, regulations and clearly established. Some discrepancies might be observed, but more difficulties come from inappropriate budgeting of the responsibilities.
<i>42.a</i>	<i>Case-specific indicator(s)...</i>		

## B) Context

No.	Indicator	Score	Comments
<b>I) Societal dimension</b>			
43.	<b>Proportion of the population living in rural areas</b>	<b>H: 33.7%</b> UA: 32.2% RO: 46.3% SK: 43.8% SRB: 48.5%	Source: United Nations Population Division (2008): World Urbanization Prospects: The 2007 Revision Population Database, <a href="http://esa.un.org/unup/">http://esa.un.org/unup/</a> Values for 2005  Total population of Hungary as of 1 January 2008: 10 045 000. (Central Statistical Office of Hungary - KSH). Population on the Hungarian part of the Tisza River Basin: 4 048 562 (KSH)
44.	<b>State of societal development</b>	<b>H: B (0.879)</b> UA: C (0.796) RO: B (0.837) SK: B (0.880) SRB: B (0.826)	Human Development Index Source: UNDP: Human Development Report, online at <a href="http://hdr.undp.org/en/statistics/">http://hdr.undp.org/en/statistics/</a> Values for 2007
45.	<b>Social sustainability (Gini Index)</b>	<b>H: B (30.0)</b> UA: A (28.2) RO: B (31.5) SK: A (25.8) SRB: n/a	Gini Index Source: UNDP: Human Development Report 2009, <a href="http://hdr.undp.org/en/media/HDR_2009_EN_Complete.pdf">http://hdr.undp.org/en/media/HDR_2009_EN_Complete.pdf</a> - Values were calculated based on data by World Bank (2009d)  In many socio.economic indicators, the Tisza area scores lower than the Hungarian average.
46.	<b>Economic sustainability (e.g. GDP)</b>	<b>H: B (17,014 \$)</b> UA: D (5,583 \$) RO: C (9,374 \$) SK: B (15,881 \$) SRB: C (8,609 \$)	GDP per capita (US-\$, PPP-corrected) Source: World Bank, <a href="http://siteresources.worldbank.org/ICPINT/Resources/icp-final-tables.pdf">http://siteresources.worldbank.org/ICPINT/Resources/icp-final-tables.pdf</a> Values for 2005  In many socio.economic indicators, the Tisza area scores lower than the Hungarian average.

No.	Indicator	Score	Comments
47.	Effectiveness of formal institutions	H: C (5.1) UA: E (2.2) RO: D (3.8) SK: C (4.5) SRB: D (3.5)	Corruption Perception Index Source: Transparency International, <a href="http://www.transparency.org/policy_research/surveys_indices/cpi/2009/cpi_2009_table">http://www.transparency.org/policy_research/surveys_indices/cpi/2009/cpi_2009_table</a> Values for 2009
48.	Trustworthiness of economic institutional setting - degree of risk for foreign direct investment	H: B (A- to AA+) UA: D (CCC+) RO: C (B- to BBB+) SK: A (AAA) SRB: n/a	Rating by the rating agency "Standards & Poor Source: The Guardian (article from 22.05.2009), <a href="http://www.guardian.co.uk/business/2009/may/22/recession-government-borrowing#zoomed-picture">http://www.guardian.co.uk/business/2009/may/22/recession-government-borrowing#zoomed-picture</a>
49.	Presence of avenues of dissent – press freedom, freedom of speech	H: A (5.50) UA: C (22.0) RO: B (12.50) SK: B (11.00) SRB: C (15.50)	Press Freedom Index Source: Reporters without Borders, <a href="http://en.rsf.org/press-freedom-index-2009,1001.html">http://en.rsf.org/press-freedom-index-2009,1001.html</a> Values for 2009
49.a	<i>Case-specific indicator(s)...</i>		
<b>II) Good Governance Principles at the national level – legal basis at the national level</b>			
50.	Participatory regarding decision making in the water sector	A	The Hungarian Constitution and relevant laws ensure freedom of association and speech as well as capacities to participate constructively.
51.	Transparency regarding water allocation	A	See comments for Indicator No. 37, 38, 42 and 50.
52.	Effectiveness and efficiency regarding decision making in the water sector	A	<i>Comment during the workshop: This indicator is redundant to earlier indicators</i>
53.	Equitable and inclusive	A	Hungarian Constitution - Article 7. (1); Article 18.; Article 70/D. (1) and (2).

No.	Indicator	Score	Comments
54.	Predictability – with regard to IWRM and climate change	A	See comments previously.
54.a	<i>Case-specific indicator(s)...</i>		
<b>III) Environmental dimension</b>			
55.	<b>Köppen-Geiger climate classification (river basin)</b>	Cfb (lowlands) Dfb (eastern and northern mountains) Dfc (single mountain peaks)	Source: Kottek, M., J. Grieser, C. Beck, B. Rudolf, and F. Rubel (2006), <a href="http://koeppen-geiger.vu-wien.ac.at/present.htm#maps">http://koeppen-geiger.vu-wien.ac.at/present.htm#maps</a> For period from 1951 to 2000  Note: World Map of the Köppen-Geiger climate classification updated. Markus Kottek <sup>1</sup> , Jürgen Grieser <sup>2</sup> , Christoph Beck <sup>2</sup> , Bruno Rudolf <sup>2</sup> and Franz Rubel <sup>*1</sup> <sup>1</sup> Biometeorology Group, University of Veterinary Medicine Vienna, Vienna, Austria <sup>*1</sup> Corresponding author: Franz Rubel, Biometeorology Group, Department of Natural Sciences, University of Veterinary Medicine Vienna, <sup>2</sup> Global Precipitation Climatology Centre, Deutscher Wetterdienst, Offenbach, Germany In: Hydrol. Earth Syst. Sci. Discuss., 4, 439–473, 2007  Comment: Hungarian meteorologists state that the climate in the Carpathian Basin differs from the European average climate.
56.	<b>Climate Moisture Index</b>	SA, semi-arid (lowlands) H, humid (mountains) SH, sub-humid (between both zones)	Source: GWSP Digital Water Atlas (2008), GWSP Digital Water Atlas (2008), <a href="http://atlas.gwsp.org/index.php?option=com_wrapper&amp;Itemid=53&amp;id_desc=98&amp;itemId_desc=63&amp;id_ds=146&amp;itemId_ds=52&amp;header=Climate%20Moisture%20Index&amp;site=b1_cmi_anWSAG1_0">http://atlas.gwsp.org/index.php?option=com_wrapper&amp;Itemid=53&amp;id_desc=98&amp;itemId_desc=63&amp;id_ds=146&amp;itemId_ds=52&amp;header=Climate%20Moisture%20Index&amp;site=b1_cmi_anWSAG1_0</a> Reported are the dominant values in the Tisza basin
57.	<b>Climate Moisture Index Coefficient of Variation</b>	C, high (lowlands) A-B, low to moderate (mountains)	Source: GWSP atlas (2008), <a href="http://atlas.gwsp.org/index.php?option=com_wrapper&amp;Itemid=53&amp;id_desc=126&amp;itemId_desc=63&amp;id_ds=171&amp;itemId_ds=52&amp;header=Coefficient%20of%20Variation%20for%20Climate%20Moisture%20Index&amp;site=b2_cmi_annual_cv">http://atlas.gwsp.org/index.php?option=com_wrapper&amp;Itemid=53&amp;id_desc=126&amp;itemId_desc=63&amp;id_ds=171&amp;itemId_ds=52&amp;header=Coefficient%20of%20Variation%20for%20Climate%20Moisture%20Index&amp;site=b2_cmi_annual_cv</a> Reported are the dominant values in the Tisza basin.



No.	Indicator	Score	Comments
58.	Per Capita Equivalent of TARWA	H: B (10,580 m <sup>3</sup> /yr) UA: D (2,900 m <sup>3</sup> /yr) RO: C (9,510 m <sup>3</sup> /yr) SK: C (9,270 m <sup>3</sup> /yr) SRB: B (19,820 m <sup>3</sup> /yr)*	Source: UNESCO, UN World Water Development Report, <a href="http://www.greenfacts.org/en/water-resources/figtableboxes/3.htm">http://www.greenfacts.org/en/water-resources/figtableboxes/3.htm</a> Values for 2005 * including Montenegro
59.	Average water availability at the river basin level (1995)	B (200-400 mm/yr)*	Source: University of Kassel, WaterGAP 2.0, <a href="http://www.env-edu.gr/Documents/World%20Water%20in%202025.pdf">http://www.env-edu.gr/Documents/World%20Water%20in%202025.pdf</a> Danube basin  Tisza: Avg.Flow [m <sup>3</sup> /s] at Vásárosnamény: 449 at Záhony: 496 at Tiszapalkonya: 596 at Kisköre: 584 at Szolnok: 557 at Szeged: 919 Source: Vízrajzi Évkönyv, 1995. (Hydrological Year Book, 1995) VITUKI, Budapest, 1995.
60.	Annual renewable water supply per person by river basin (1995)	B (1,700-4,000 m <sup>3</sup> /yr)*	Source: World Resources Institute, EarthTrends 2001, <a href="http://earthtrends.wri.org/pdf_library/maps/2-4_m_WaterSupply1995.pdf">http://earthtrends.wri.org/pdf_library/maps/2-4_m_WaterSupply1995.pdf</a> * Danube basin  Produced water (national, pumped out): 795 936 700 m <sup>3</sup> Supplied water (national): 661 618 800 m <sup>3</sup> Population: 10 246 000 capita 64,573 m <sup>3</sup> /cap/year Source: Most important communal supply data, 2000. KSH, Budapest, 2001.
61.	Projected annual renewable water supply per person by river basin (2025)	B (1,700-4,000 m <sup>3</sup> /yr)*	Source: World Resources Institute, EarthTrends 2001, <a href="http://earthtrends.wri.org/pdf_library/maps/2-4_m_WaterSupply2025.pdf">http://earthtrends.wri.org/pdf_library/maps/2-4_m_WaterSupply2025.pdf</a> * Danube basin Some places are confronted with lower values.

No.	Indicator	Score	Comments
62.	Relative Water Stress Index	A-B (very low to low) with patches of C (high)	Source: UNESCO, World Water Development Report II, <a href="http://wwdrii.sr.unh.edu/download.html">http://wwdrii.sr.unh.edu/download.html</a>  Aridity varies significantly year by year in the Hungarian part of the Tisza Basin. See Annex attached below the Questionnaire table.
63.	Climate Vulnerability Index	<b>H: B (medium low)</b> UA: n/a RO: C (medium) SK: A (low) SRB: n/a	Source: Oxford Centre for Water Research (OCWR), 2008-2010, <a href="http://ocwr.ouce.ox.ac.uk/research/wmpg/cvi/">http://ocwr.ouce.ox.ac.uk/research/wmpg/cvi/</a>
64.	Degree to which water quality status restricts usability of users' types	B	In part of the Tisza Basin arsenic, nitrate are limiting water quality factor of water usability.
65.	Extent of flow and channel modification	B	About half of the Hungarian Tisza River section is considered HMWB, while the other half is still in natural condition from hydromorphological point of view.  <p>Final HMWB designation EU Member States:  <span style="color: purple;">■</span> HMWB  <span style="color: darkgreen;">■</span> Natural</p> <p>Final HMWB designation Non EU Member States:  <span style="color: pink;">■</span> HMWB  <span style="color: lightgreen;">■</span> Natural</p>

No.	Indicator	Score	Comments
66.	<b>Impact of land-use changes on hydrological processes</b>	C	<p>The answer depends on the time horizon of investigation.            If the “original” state of the river (say before the major river regulations started in the Tisza Basin) is the reference level, then the answer is definitely C.            If the reference state is what was in 50 years ago, then the answer is B.</p> <p><i>Comment during the workshop: The definition needs to be clarified with regard to the time horizon – what is the baseline at which we define the original state and from which we measure forward to the present, which is referred to?</i>  <i>Reply: The state without (or low) influence by human civilisation. Here: before the major river regulations.</i></p>
67.	<b>Uncertainty associated to climate change predictions regarding precipitation for the basin</b>	Northern mountains: C (0.4-0.6) Lowlands: D (0.2-0.4) Eastern mountains: E (0.05-0.1)	Source: Illustration from MAGICC-SCENGEN tool at the end of the guidance document
<i>67.a</i>	<i>Case-specific indicator(s)...</i>		

### C) Performance

No.	Indicator	Score	Comments
<b>I) Progress towards stated Goals</b>			
68.	<b>Progress towards sustainable access to safe drinking water (MDG drinking water target)</b>	<b>H: A</b> UA: A RO: A SK: A SRB: A	Source: WHO & UNICEF (2008), Progress on Drinking Water and Sanitation: Special Focus on Sanitation, <a href="http://www.wssinfo.org/en/40_MDG2008.html">http://www.wssinfo.org/en/40_MDG2008.html</a> Values for 2006
69.	<b>Proportion of population with access to improved drinking water</b>	<b>H: A (100%)</b> UA: B (97%) RO: C (88%) SK: A (100%) SRB: B (99%)	Source: UN statistics of MDG progress, <a href="http://mdgs.un.org/unsd/mdg/Data.aspx">http://mdgs.un.org/unsd/mdg/Data.aspx</a> Values for 2006
70.	<b>Proportion of rural population with access to improved drinking water</b>	<b>H: A (100%)</b> UA: B (97%) RO: C (76%) SK: A (100%) SRB: B (98%)	Source: UN statistics of MDG progress, <a href="http://mdgs.un.org/unsd/mdg/Data.aspx">http://mdgs.un.org/unsd/mdg/Data.aspx</a> Values for 2006
71.	<b>Progress towards sustainable access to basic sanitation (MDG sanitation target)</b>	<b>H: A</b> UA: C RO: C SK: A SRB:n/a	Source: WHO & UNICEF (2008), Progress on Drinking Water and Sanitation: Special Focus on Sanitation, <a href="http://www.wssinfo.org/en/40_MDG2008.html">http://www.wssinfo.org/en/40_MDG2008.html</a> Values for 2006

No.	Indicator	Score	Comments
72.	Proportion of population with access to improved sanitation facilities	H: A (100%) UA: B (93%) RO: D (72%) SK: A (100%) SRB: B (92%)	Source: UN statistics of MDG progress, <a href="http://mdgs.un.org/unsd/mdg/Data.aspx">http://mdgs.un.org/unsd/mdg/Data.aspx</a> Values for 2006
73.	Proportion of rural population with access to improved sanitation facilities	H: A (100%) UA: C (83%) RO: D (54%) SK: B (99%) SRB: C (88%)	Source: UN statistics of MDG progress, <a href="http://mdgs.un.org/unsd/mdg/Data.aspx">http://mdgs.un.org/unsd/mdg/Data.aspx</a> Values for 2006
73.a	<i>Case-specific indicator(s)...</i>		
<b>II) Good governance principles as indicators for the process dimension (IMPLEMENTATION)</b>			
74.	Participation regarding decision making in the water sector	A	The Hungarian Constitution and relevant laws ensure freedom of association and speech as well as capacities to participate constructively. See <a href="http://www.vizeink.hu">www.vizeink.hu</a>
75.	Transparency regarding water allocation	A	See comments for Indicator No. 37, 38, 42 and 50. The documentations are available in the Water Directorates
76.	Effectiveness and efficiency regarding decision making in the water sector	B	Goals are reached but we do not definitively know if they are achieved efficiently.
77.	Equitable and inclusive	A	Hungarian Constitution - Article 7. (1); Article 18.; Article 70/D. (1) and (2).
78.	Predictability – with regard to IWRM and climate change	A	See comments previously. Consideration of IWRM (and later climate change) have a long practice in Hungary.
78.a	<i>Case-specific indicator(s)...</i>		
<b>III) Stakeholder participation</b>			

No.	Indicator	Score	Comments
79.*	<b>Deliberative engagement opportunities</b>	A	Three levels (regional, sub-basin, national) of water management councils exist according to a ministerial decree (5/2009 (IV. 14.) KvVM) consisting of (roughly) 40% of governmental and local governmental representatives, 20% NGOs, 20% water users, 20% academia. The councils have the mandate of supervising public participation process of river basin management planning.
80.*	<b>Inclusiveness of stakeholder participation</b>	A	During the river basin management planning (2006-2009) three rounds of consultations have been run according to Art 14 of WFD (on workprogramme, significant water management issues, draft RBMPs). Written and oral consultation has been organized through website and dozens of fora countrywide. Through the participating associations, NGOs, authorities and other organizations thousands of stakeholders were involved from the whole cross section of the society. The process was monitored by the water management councils (see point 79).
80.a	<i>Case-specific indicator(s)...</i>		
<b>IV) Response to climate change</b>			
81.	<b>Strategy for adaptation to climate change in the water sector</b>	A	See comments for Indicator No. 33. Climate change is addressed in the sub-basin plans
82.	<b>Availability of specific knowledge enabling adaptation</b>	C	
83.	<b>Awareness of water managers regarding adaptation to climate change</b>	A	The issue is high on the agenda!
84.	<b>Coordinated implementation process regarding adaptation to climate change: Program / Plan of activities and measures</b>	B	There are some activities related to CC adaptation, but a consistent national coordination programme is still missing.
85.	<b>Operational activities (measures)</b>	C	Operational activities (soft and hard approaches) are existing, but not comprehensive enough.
86.	<b>Ways to deal with climate variability (floods and droughts)</b>	B	Some reactive measures are there.
86.a	<i>Case-specific indicator(s)...</i>		

### Addendum - Context

No.	Indicator	Score	Comments
<b>I) Basin Characteristics</b>			
67a	Sub-Basin Size	46,213 km <sup>2</sup>	
67b	Transboundary	Yes	The Tisza River Basin is located in the Carpathian Basin. The territory of the basin is shared by 5 countries, namely: HU (46,213 km <sup>2</sup> ), UA (12,732 km <sup>2</sup> ), SK (15,247 km <sup>2</sup> ), RO (72,620 km <sup>2</sup> ), and RS (10,374 km <sup>2</sup> )

### Addendum - Performance

No.	Indicator	Score	Comments
<b>I) Environmental sustainability</b>			
<b>a) State of the water resources and the environment</b>			
87	Aquatic biodiversity	B	The known number of fish species is 68. This is outstanding in Europe. Along the longitudinal of the river there are many, so called fish tracts, which are rich in fish.
88	Invasive exotic species	C	Special attention is given for these issues in the KEOP (Environmental and Energy Operational Programme) especially in case of terrestrial plants.
89	Surface and groundwater quality	B	Surface waters are dominantly II. and III. quality. The impact of surface water quality on ecosystems is minor. High salt content of shallow groundwater impacts soil salinity in some locality.
90	Groundwater use	C	There are localities where overexploitation is significant. There are 5 groundwater bodies – identified according to the WFD methodology - where exploitation for drinking water supply and irrigation purposes exceeds the limit. At other 5 groundwater bodies (karts and warm water aquifers) exploitation for thermal bathing and heating purposes also surpasses the limit value.

No.	Indicator	Score	Comments
91	Water Exploitation Index (WEI)	B (14%)	European Environmental Agency produced CSI 018 in January 2009. For the entire territory of Hungary WEI is A, less than 10%), but when WEI is calculated for the Hungarian part of the Tisza basin, than WEI is only B (14%). Source: Data reported by Hungary to the EU Commission for the "Scarcity and Drought, 2. Interim report", 2010.
<b>b) Management practices</b>			
92	Water allocated for aquatic ecosystem	B	Aquatic ecosystems need improved water allocation at some places in the Tisza Basin in Hungary. In the frame of New Hungarian Development Programme (2007-2013) several improvement programmes were called for tender under KEOP (Environmental and Energy Operational Programme ) to improve fish migration, flowing conditions and connectivity to main stream and flowing conditions.
93	Water pollution incidents	A	There is appropriate regulation about water pollution incidents handling. The role of different national, regional and local organisations (VKKI, KÖVIZIGs, KTVFEs and local municipalities) are regulated in detailed way.
94	Water quality monitoring	A	Water quality monitoring is organised according to WFD requirements.
95	Hydrometeorological monitoring – levels	A	Sound hydrometeorological monitoring system is operational in Hungary more than 100 years.
96	Level of understanding of groundwater resources	B	Still important gaps are identified about withdrawals. Significant discrepancies can be observed among the actual and licenced water withdrawals even in case of public water supply provider companies. Significant information gap exists about illegal water withdrawals.



**ANNEX:*****Characterisation of drought in 2003***

The national average value according to the drought index by Pálfai (PAI) was 9.2 °C/100 mm in 2003. The size of the area affected by drought (PAI  $\geq$  6.0) was 88,000 km<sup>2</sup>, which is 94% of the whole country's territory. Comparing these results to the drought index counted from 1980 (see Table 6.) the drought of 2003 can principally be compared to the droughts evolved in the beginning of the 90s (1990, 1992, 1993) and can be called a very serious drought. Regarding the drought's territorial distribution, the most serious situation has been evolved in the South-eastern part of the country, between Rivers Körös and Maros and around that region. (Figure 1.) The value of PAI has approached or even exceeded 12 on this region and even in some localities there have been extreme values of more than 14.

***Characterisation of drought in 2004***

The time period from 15<sup>th</sup> of June until 15<sup>th</sup> of August, which must be taken into account when calculating the drought index of 2004 shows that the longest period of dry weather has usually been 15-25 days and typical mainly between the end of June and the middle of July. The summer heat days taken into account by the drought index were between 16 and 23 thus being a little bit over the yearly average.

In summary, it can be stated that the agricultural year of 2004 were a little bit wetter than the average and on the whole period had a temperature near the average.

The ground water level below the field was usually located below of many years' average in the beginning of spring 2004 (on the region between River Danube and Tisza there have been very low water levels for a long time) but then it has gradually increased, and in the middle of the summer it was above many years' average on the middle and northern part of the Trans-Tisza Region and in some parts of the right bank area of River Tisza.

The territorial distribution of the drought index (PAI) in 2004 is shown in Figure 2. The national average of PAI was 4.3 °C/100 mm in 2004. This was somewhat lower than the index average of many years. The size of the area affected by drought (PAI > 6.0) is about 600 km<sup>2</sup>, which is only 1% of the country's territory. Areas which have PAI values between 5 and 6 can approximately be regarded as droughty. Comparing these results to the droughts counted since 1980, it can be stated that the drought of 2004 resembles mostly the really moderate droughts of 1982 and 1985. (Table 6.)

***Characterisation of drought in 2005***

The time period from 15<sup>th</sup> of June until 15<sup>th</sup> of August shows that the longest period of dry weather was 17 days in contrast to the 22-day-average of several years. The number of summer heat days (maximal daily temperature over 30 °C) was 13 in national average; it was less than the 16 days average of several years.

The ground water level was usually located below of many years' average in the beginning of spring 2005 but then the water level has gradually increased, and in midsummer it was above many years' average on the middle and northern part of the Trans-Tisza region and in some parts of the valley of River Tisza's right bank.

The national territorial average of the drought index in 2005 was 3.0 °C/100 mm according to the data of 68 stations. This is significantly lower than the national index of many years which was between 1931 and 1990 4.7 °C/100 mm. The drought index did not reach on any station the 6.0 threshold thus there was no area in the country (PAI > 6.0) affected by drought (Figure 3). Comparing these results to the droughts counted since 1980, the situation in 2005 resembles mostly the really very rainy, completely drought-free situation of 1980 and 1999 (Table 6).

***Characterisation of drought in 2006***

The average value of PAI was 4.1; so 2006 was not a droughty year.

***Characterisation of drought in 2007***

The average value of PAI was 8.9. On the whole this means a serious national drought.

The drought especially hit the area between Rivers Danube and Tisza where the PAI index sometimes exceeded 12 (extraordinary drought).

***Characterisation of drought in 2008***

Average PAI was 4.8. There was a moderate drought in the Lower-Tisza region (PAI=6-8 C°/100 mm), there was a drought that can be labelled as mild on the whole Great Hungarian Plain (PAI=5-6).

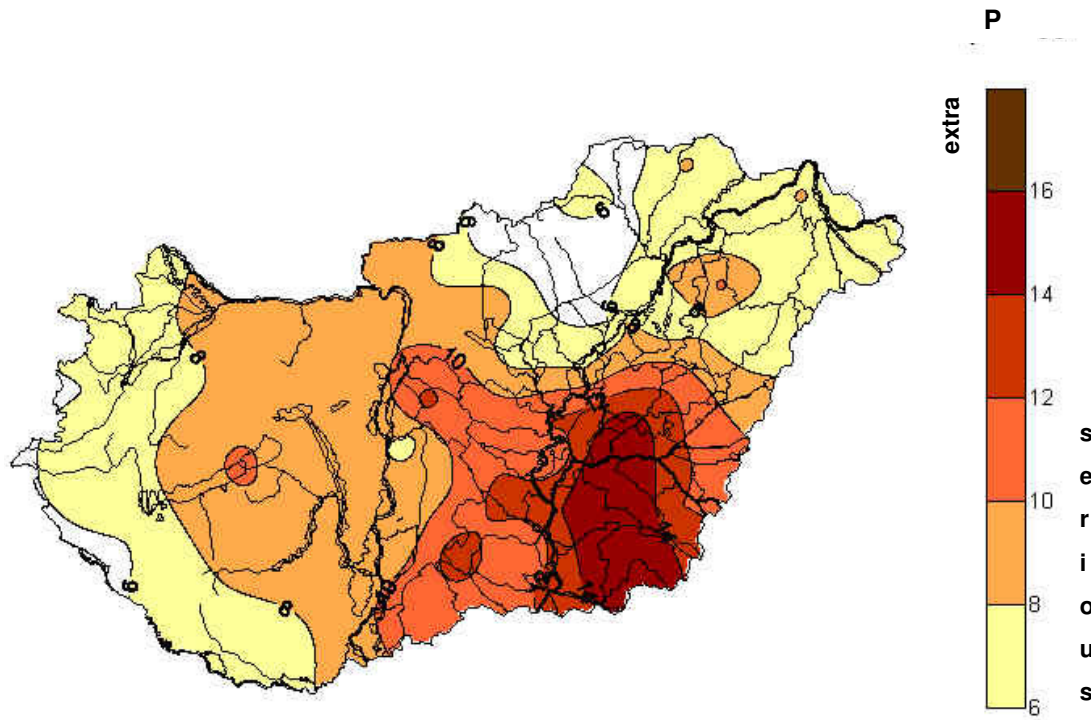


Figure 1. Drought formation in 2003

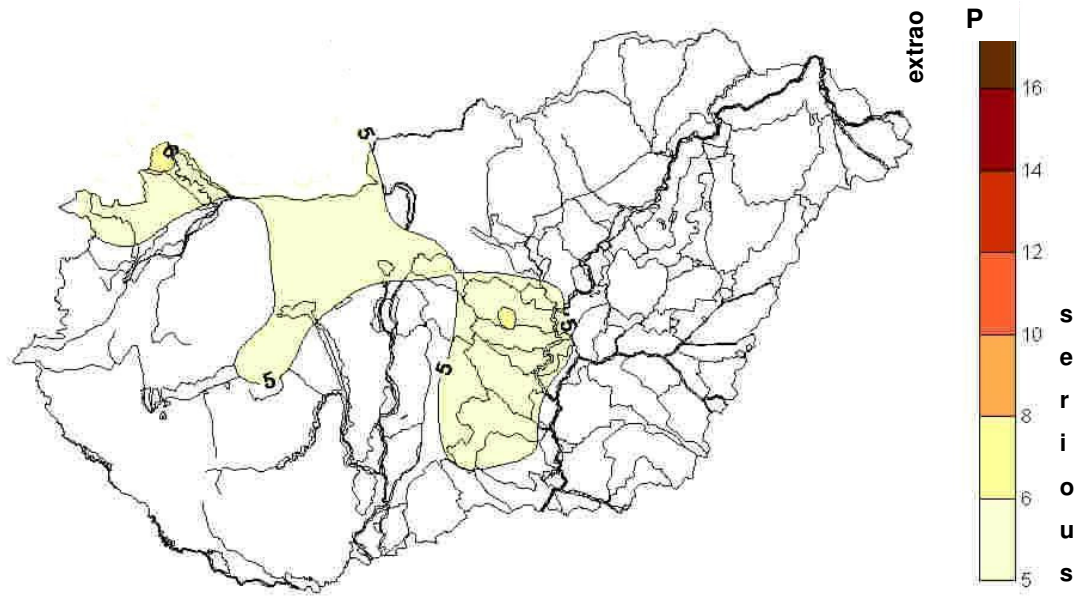


Figure 2. Drought formation in 2004

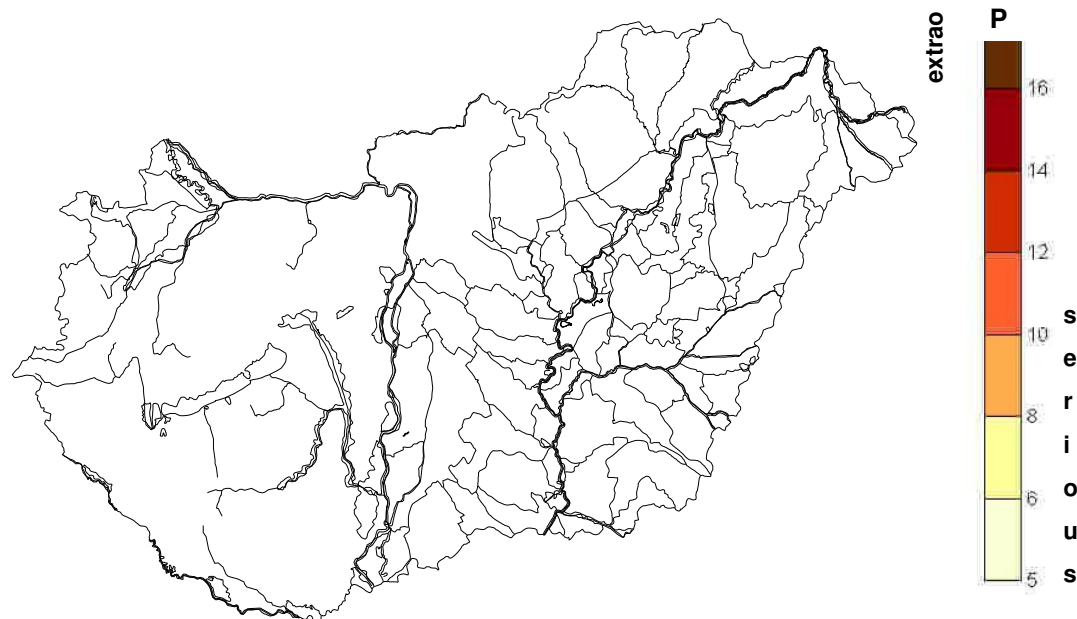


Figure 3. Drought formation in 2005

Table 6. Change of the drought index and size of the areas stricken with drought in Hungary

Year	National average of drought index	Size and % of area affected by drought
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	°C/100 mm	km <sup>2</sup>	%
1980	3,0	0	0
1981	4,2	0	0
1982	4,0	4 500	5
1983	6,5	48 500	52
1984	5,0	33 000	35
1985	4,5	6 000	6
1986	5,4	21 000	23
1987	5,0	19 000	20
1988	5,6	42 000	45
1989	4,0	9 500	10
1990	8,8	85 000	91
1991	4,1	0	0
1992	9,8	92 000	99
1993	9,0	78 000	84
1994	8,0	67 000	72
1995	5,8	40 000	42
1996	4,7	8 000	9
1997	3,6	0	0
1998	4,6	8 500	9
1999	2,8	0	0
2000	8,1	86 000	92
2001	4,5	14 700	16
2002	6,8	66 000	71
2003	9,2	88 000	94
2004	4,3	600	1
2005	3,0	0	0
2006	4,1		
2007	8,9		
2008	4,6		