Project
“RIVERTWIN-Central Asia”

THE BASIC RESULTS
of the work package 7
(WP-7)

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“RIVERTWIN”: general information

- **EUROPEAN RESEARCH PROGRAMS (relation):**
- **- EU FP6: Priority 1.1.6.3:**
- **- «Sustainable development, global change and ecosystems»**
- **- aimed at implementation of EWD in part of water resources management (WRM) at a level of river basin (management unit)**
- **MAIN OBJECTIVE:**
- **- development, adaptation and use of integrated regional model (RM) for SP WRM in 3 twinned river basins (Germany; Benin; Central Asia: Kazakhstan = RK, Kyrgyzstan = Kr , Uzbekistan = RU)**
- **Strategies (scenarios) for SD in river basins are developed with involvement of main water users and other stakeholders**
- **PARTNERS:**
- **Researchers from Europe (Germany +), Africa (Benin), Central Asia (Kazakhstan, Kyrgyzstan, Uzbekistan)**
- **GENERAL GOVERNANCE AND COORDINATION:**
- **- Hohenheim University (Germany)**

“RIVERTWIN” – Central Asia: general information

- **RESPONSIBLE: SIC ICWC of Central Asia**
- **REGIONAL POLICY OF WRM (relation):**
- **- in general – promote policy of transition to IWRM in the region at different hierarchical levels (transboundary, national, local)**
- **PARTNERS:**
- **- SIC ICWC branches (Kazakhstan, Kyrgyzstan), BWO «Syrdarya», MAWR Uzbekistan (ChABAIS, SANIIRI) + … other stakeholders**
- **OBJECTIVES: … for the project zone. PROJECT ZONE:**
- **ZONE of Western Tien-Shan (WTS):**
- **- KR (more than 60%), RK (about 20%), RU (more than 15%) and RT (about 4%).**
- **CHIRCHIK-AKHANGARAN BASIN (ChAB): - 21.900 square km:**
- **- Kyrgyzstan (Djalalabad province – Chatkal upper reaches) – 13.7%**
- **- Kazakhstan (Keles mountain range, Shymkent province) – 15.1%**
- **- Uzbekistan (Tashkent province - whole) – 71.2%**

“RIVERTWIN” – Central Asia: work packages (WP): WP-6 +WP-7

- **WP-6: «Development of database (DB), testing and adaptation of sub-model to Chirchik-Akhangaran basin»**
- **OBJECTIVE: … for establishment of DB and development and validation of models. Main stages, tasks; implementation … (A.Sorokin’s report)**
- **Within WP-7 … assistance to WP-6 (until February 2006):**
- **- STAGES: 3. DB: Land resources (18); 4. DB: Agrarian resources (24); 5. Water demand (20); 6. Forecasting water availability (24); 8. Effect of WU (water use) on economic and environmental indicators (26) 9. Prospective socio-economic development (SED) and impact of water demand on WU (27) +**
- **TASKS: 1. Zoning criteria and zoning of irrigated and non-irrigated areas; 3. Establishment of DB on WR (location, structure water: surface, ground); 4. Assessment and forecasting of water availability in ChAB; 8. Assessment of sustainability of prospective SED; 9. Establishment of DB on land resources (climate, soil, +); 11. Establishment of DB (Agriculture): main indicators, pricing +; 14. Establishment of general project DB for ChAB**

“RIVERTWIN” – Central Asia: WP-7

- **WP-7: «Participative scenario analysis, development of regional model (RM) and integrated evaluation of sustainable WM in the Chirchik basin»**
- **OBJECTIVE: … for cooperation with WM institutions and other stakeholders**
- **MAIN STAGES (by February 2006):**
- **1. Analysis of water management institutions (6)**
- **2. Long-term objectives of WRM and sustainability indicators (9) …**
- **4. Workshops with participation of WM agencies’ and key users (15-35) + MAIN TASKS (by February 2006):**
- **1. Analysis of WRM, long-term objectives, criteria of WR SD (+)**
- **2. Supply of climate data and scenarios**
- **3. Modifications of modeling framework with water users**
- **4. Development of IRM, including DB components**
- **5. Workshops on decision support for WRM agencies**
- **6. WRM scenarios for preparation of management plans for ChAB**

WP-7 (basic results):
MAIN BLOCKS and SECTORS

- **- THE SOCIO ECONOMIC BLOCK …… (V.Prikhodko)**
- **- AGRARIAN SECTOR ……. (Dr. S.Nerosin)**
- **- THE ECOLOGICAL BLOCK …… (Dr. I.Ruziyev)**
- **- THE CLIMATIC BLOCK …… (Dr.G.Stulina)**
- **- THE SUBBLOCK "HYDROGEOLOGY"…… (…)**
- **- WATER-POWER ENGINEERING (L.Averina) ..... (…)**
- **1. WATER MANAGEMENT: POLITICS and LAW ……... (08.04)**
- **2. WATER MANAGEMENT INSTITUTES ……. (08.04)**
- **3. WATER RESOURCES……. (08.04)**
- **4. WATER USE in AGRARIAN SECTOR …… (08.04)**
- **5. DEVELOPMENT SCENARIOS …… (10.04.2006)**
- **6. DISSEMINATION of KNOWLEDGE…… (08.04)**
- **7. PUBLIC PARTICIPATION……. (08.04)**
- **+ SOIL, FISHERY … + …**

WP-7 (basic results):
Note: problems are not considered

- **Problems, trends and others aspects are revealed in all blocks of the WP-7 of the project "Rivertwin – Central Asia"**
- **However, in the given report the revealed problems are not considered**

- **The problems on separate blocks of the WP-7 will be considered at presentation of the development scenarios for the concrete blocks of the project (socioeconomic, climatic, ecological etc.)**

WP-7 (tbasic results):

WATER MANAGEMENT: POLITICS and WATER LAW

- **1. WATER MANAGEMENT: POLITICS**
- **Political basis for implementation of IWRM at all water management levels (transboundary, national, local) is available …**

- **2. WATER MANAGEMENT: WATER LAW (in light of IWRM):**
- **- Water Code of the Republic of Kazakhstan (2003)**
- **- Water Code of the Kyrgyz Republic (2005)**
- **- Law of the RUzbekistan «On Water and Water Use» (1993)**
- **- basin principle of WRM (+)**
- **- public participation (+): WUA (KR); ACC of WU (RK); *WUA (RU: Law)***
- **- water pricing: RK (+), KR (+), RU (-)**
- **- water demand management (-), still … water requirements**
- **- other aspects (incentives +). … Implementation of regulations (-)**

WP-7 (basic results):

WATER MANAGEMENT INSTITUTES (WMI)

- **1. TRANSBOUNDARY LEVEL:**
- **- ICWC of Central Asia**
- **- BWO «Syrdarya» of ICWC of Central Asia**
- **2. NATIONAL LEVEL (project zone:** modeling units**):**
- **- KAZAKHSTAN** (**Keles massif of Shymkent province:** 1 modeling unit)**: Ministry of Agriculture - CWR - (Aral-Syrdarya BWMA:** as a whole under its jurisdiction**) Committee for WR (CWR) - NPE "Yugvodkhoz" (**direct jurisdiction - DJ: **its Sary-Agash branch) CWR + SPUC «Ontustyk su sharuashylygy» (**direct jurisdiction: **its Kazygurt branch) of CWR**
- **- KYRGYZSTAN** (**Chatkal river upstream:** 1 modeling unit)**: MAWR&PI - WR-Department - Djalalabad BWMA** (DJ)
- **- UZBEKISTAN (Tashkent province:** 16 modeling units**): Ministry of AWR - Main WMA of MAWR – ChABAIS** (direct jurisdiction)

WP-7 (basic results):
WMI: TRANSBOUNDARY LEVEL

- **1. ICWC of Central Asia (established 1992, IS-Agreement, Almaty)**
- **ICWC is structure of IFAS (established 1993, by the Heads of CA-countries)**
- **ICWC of Central Asia (CA) is responsible for general governance of the regional water system**
- **2. BWO «Syrdarya» (estab. 1992, but…) of ICWC of CA operates:**
- **- 5 big head intake structures located at interstate canals:**
- **(1. LB Karasu; 2. Main Big Keless; 3. Zah; 4. Khanym; 5. Parkent)**
- **- (+ gauging stations in these canals, head canal reaches up to gauging stations)**

- **At the same time, BWO "Syrdarya" is not a full-right "master" of the basin. Thus, recommendations of BWO on operating regime of one of the largest in Uzbekistan Charvak reservoir are of voluntary nature. Charvak reservoirs and other waterworks with power generation functions are under control of the Ministry of Power Engineering in Uzbekistan**

WP-7 (basic results):
WMI: Tashkent province (71,2%)

- **Tashkent province (**16 modeling units): **15 Districts + Tashkent city**
- **ChABAIS (general management). CABAIS serves (2004):**
- **- more than 386 thousand ha of irrigated lands:**
- **- more than 300 thousand ha (from Chirchik river)**
- **- about 41 thousand ha (from Akhangaran river)**
- **- about 36 thousand ha (from Syrdarya river)**
- **- about 8 thousand ha (springs, sais and collectors)**
- **ChABAIS is comprised of:**
- **1. Tashkent canal management organization (Tashkent CMO)**
- **2. Administration of Bozsu irrigation system (Bozsu AIS)**
- **3. Administration of Parkent-Karasu IS (Parkent-Karasu AIS)**
- **4. Administration of Akhangaran-Dalverzin IS (Akhangaran-Dalverzin AIS)**
- **5. Tashkent municipal water organization (Tashkent MWO)**

WP-7 (basic results):
WMI: Tashkent province

- **1. Tashkent CMO:**
- **- serves Parkent-Karasu and Akhangaran-Dalverzin IS's**
- **- the command area: about 63 thousand ha of irrigated lands**
- **- command zones** (of Parkent-Karasu and Akhangaran-Dalverzin IS's)**:**
- **- Akkurgan, Akhangaran, Bekabad, Byka, Pskent and Urta-Chirchik districts (**6 modeling/planning units**)**
- **- the length of canal: 60.4 km**

- **The canal has 25 hydrostructures, including 14 barrages, 8 duckers, and 3 aqueducts. Besides, there are 116 gauging stations (GS), 10 outlets and 9 pumping stations**

- **Tashkent canal also transports water to Tajikistan (up to 1 m3/s)**

WP-7 (basic results):
WMI: Tashkent province

- **2. Bozsu AIS:**
- **- serves Kibrai, Tashkent, Zangiata, Yangiyul and Chinaz districts (**5 modeling/planning units**)**
- **- command irrigated area of the system: about 94 thousand ha.**
- **Bozsu IS includes: 12 inter-district (the total length – 313 km) and 141 inter-farm canals (676 km). There are 402 hydrostructures in those canals (including: barrages - 366, duckers - 15, aqueducts – 21). There are also 856 gauging stations, 801 outlets, 54 pumping stations. There are 171 primary water users in total in IS, of which: agriculture - 75, fishery - 2, communal services - 12, industry - 53, power engineering -1, other water users – 28**
- **- transports also water to Kazakhstan via Verhniy Tashkent canal (VTC) and Severniy Tashkent canal (STC). In turn, Kazakhstan supplies water to 16.9 thousand ha of irrigated lands in Tashkent and Kibray districts, Tashkent province via Zakh and Khanym canals and Big Keles main canal (BKMC)**

WP-7 (basic results):
WMI: Tashkent province

- **3. Parkent-Karasu AIS:**
- **- serves Akkurgan, Akhangaran, Bostanlyk, Kuyi-Chirchik, Parkent, Urta-Chirchik and Yukori-Chirchik districts (**7 modeling/planning units)
- **- command area: about 15 thousand ha of irrigated lands.**
- **Parkent-Karasu IS has: 7 inter- districts (252,2 km) and 146 inter-farm (1096 km) canals.**
- **The canals are provided with 385 hydrostructures, including:**
- **- barrages - 294, duckers - 49, aqueducts - 42. There are also 878 gauging stations, 852 outlets, 30 pumping stations**
- **There are 149 primary water users, of which: agriculture - 88, fishery – 5, communal services - 2, industry - 20, power engineering – 3, and other water users - 31**

WP-7 (basic results):
WMI: Tashkent province

- **4. Akhangaran-Dalverzin AIS:**
- **- serves about 84 thousand ha of lands in Akkurgan, Akhangaran, Bekabad, Buka and Pskent districts (**5 modeling/planning units)
- **- consists of 15 inter-district (161 km) and 104 inter-farm (723 km) canals. The canals are provided with 321 hydrostructures, including: barrages – 256, duckers - 43, aqueducts - 22.**
- **- there are also 952 gauging stations, 927 outlets, 41 pumping stations.**
- **Amount of primary water users is 71, including: agriculture - 59, fishery - 1, communal services - 2, industry - 4, power engineering – 2, other - 3.**
- **Akhangaran-Dalverzin IS also transports water to Tajikistan**

- **5. Tashkent MWO:**
- **- serves more than 7 thousand ha of irrigated lands in city Tashkent.**
- **MWO operates 3 inter-district (15 km) and 34 inter-farm (111 km) canals. Those canals have 107 hydrostructures, of which: barrages - 32, duckers - 75. There are also 35 gauging stations and 22 outlets**

WP-7 (basic results): WATER RESOURCES

- **Water resources (WRs) by river basins of Central Asia:**
- **- are defined in the mid 1980-ties**
- **- their distribution between CAR republics is established in basin Schemes (BS) of integrated water use and conservation (IWUC) of Amudarya and Syrdarya rivers. These documents are recognized by appropriate Interstate Agreements, Agreement of 1992, International Conference on Sustainable development of the Aral sea basin (Nukus, 18-20.09.1995) and remain valid**
- **In accordance with «Scheme … of Syr-Darya basin» upstream Chardara reservoir's average annual flow is distributed between the republics in the following proportion: Uzbekistan – 73.3%, Kazakhstan – 7.2%, Kyrgyzstan – 9.8%, Tajikistan – 9.7%**
- **Water resources distribution between ChAB: RU – near 88%, RK – near 12%, KR – less than 1% of total long-term runoff.**
- **ChAB average long-term WRs are estimated as 9.32 km3/yr, of which surface flow constitutes 8.67 km3 (93%) of total volume**

WP-7 (basic results): WATER SOURCES

- **Basic CAB water sources are:**
- **1. Chirchik River** (is formed by conjunction of rivers Pskem and Chatkal):
- **- length (L)- 161 km, water catchment area (WCA) - 14240 km2, inflow regime (IR): snow-glacier (SG). Average multiyear flow – (MF) 7.2 km3. Chirchik river takes water from two relatively big tributaries – Ugam river (L – 68 km, WCA – 866 km2, IR: SG) and Aksakatasay (L - 48 km; WCA -453 km2, IR: snow-rain (SR)**
- **2. Pskem river: L – 70 km, WCA – 2540 km2, IR: SG**
- **3. Chatkal river: L – 223 km, WCA – 6580 km2, IR: SG**
- **4. Koksu river: L - 57 km, WCA – 372 km2, IR: SG**
- **5. Akhangaran river: L-236 km, WCA-5220 km2, IR: SR; MF – 0.72 km3**
- **6. Keles river: L- 241 km, WCA - 3310 km2, IR: SR, receives additional water from Chirchik. Average MF in mouth – 6.5 m3/s**
- **7. ChAB water resources form also tributaries of specified rivers**
- **Water supply source of Tashkent province is Syrdarya river water too**
- **Groundwater is source of water for drinking and irrigation also**

WP-7 (basic results): Water reservoirs: Tashkent province

- **In order to regulate flow in ChAB water reservoirs are constructed:**
- **- Charvak (Useful Volume - 1580mln.m3, Regulation – seasonal);**
- **- Tyuyabuguz (Useful Volume - 220mln.m3, Regulation – seasonal);**
- **- Akhangaran (Useful Volume - 183mln.m3, Regulation – seasonal);**
- **- Gazalkent (Useful Volume - 7mln.m3, Regulation – daily);**
- **- Khojikent (Useful Volume - 9mln.m3, Regulation – daily).**
- **Charvak reservoir is oriented on irrigation and hydropower**
- **- Tyuyabuguz – irrigation**
- **- Akhangaran – irrigation and drinking water supply**
- **- Gazalkent and Khojikent reservoirs – hydropower**
- **From these reservoirs only Charvak reservoir can render transboundary influence on interstate distribution of a river flow between RK and RU**
- **The most developed and sophisticated irrigation infrastructure in ChAB belongs to Uzbekistan (Tashkent province), less sophisticated to Kazakhstan (Keless massif), relatively weakly developed because of mountainous area – Kyrgyzstan (upstream of Chatkal river).**

WP-7 (basic results):
WATER USE in AGRARIAN SECTOR

- **0. (In national economies of ChAB countries, production of irrigated agriculture is very important part of GNP. For instance, in 2000 irrigated agriculture product amounted for: in South Kazakhstan – 29%, KR – 27%, RU – more than 30% of GNP.**
- **In agricultural sector employment percentage is as follow: RK - 22%, KR - 53%, RU – 36%. Rural population amounts for 60-70% (in Tashkent province – 30%).**

- **1. In the ChAB-countries, near 90% of available water resources are used for agricultural sector.**
- **For example, for 1998-2003 Keles massif used:**
- **- on irrigation needs: 90-97 %,**
- **- on needs of other economic sectors – 3-10% of water resources**
- **The similar trends are observed in Uzbekistan and Kyrgyzstan**

WP-7 (basic results): PUBLIC PARTICIPATION

- **On January 6-7, 2005 - the international workshop:**
- **- Managers, experts and key specialists of public authorities, water sector, environmental and other agencies, research and design institutes, NGOs, Kazakh and Kyrgyz branches of SIC ICWC took part in the workshop**
- **The key results are the following:**
- **1. The first three important ones are: a) nature water demand priority, b) legal framework and c) inter-sectoral coordination;**
- **2. The top three acute conflicting water interests in CAB are: a) those between the economic sectors and the environment, b) between economic sectors, and c) between upstream and downstream water users**
- **3. Problems are ranked as follows: a) top – environmental problems; b) second place – socio-economic; and, c) third place – social problems**
- **4. Degree of public participation in nature use management in CAB is considered as "unsatisfactory" by 67% of the participants**
- **5. «Who is responsible for adverse environmental impact in ChAB?», 67% of the respondents answered «all», 60% - «local authorities», 47% - «people» and «economic sectors»**

WP-7 (the basic results): “Stakeholders”

- **Key stakeholders:**
- **- Tashkent provincial Committee for nature conservation (CNC)**
- **- Tashkent province khokimiyat or municipality (branches)**
- **- ChABAIS and its branches (hydrogeological survey, AIS +)**
- **- Tashkent province agricultural and water management organization**
- **- State stock company “Uzbekenergo”**
- **- Research Institute “Gidroingeo”**
- **- “Tashvilsuvokova”**
- **- Research Hydrometeorological Institute (NIGMI) at Uzgidromet**
- **- BWO «Syrdarya»**
- **- SPA «SANIIRI»**
- **- «UZRYBA»**
- **- NGOs + other stakeholders**
- **During reporting period: …with key stakeholders on issues of ChAB development («closely»: ChABAIS, CNC, UZRYBA, UZBEKENERGO +**

WP-7 (the basic results):
DISSEMINATION of KNOWLEDGE (DoKN)

- **Opened web-site: www.cawater-info.net/rivertwin/:**
- **- about 30 documents of project "Rivertwin-central Asia" executors in English and Russian placed on web-site**
- **Presentations at international conferences (IC) and publications in IC proceedings and international journals (IJ):**
- **- "INBO-Newsletter"-2 (2005, 20060, IC materials «Clean water in Russia - 2005» (Russia, Ekaterinburg) - 4, IC «Applied ecology and development» (Karshi, Uzbekistan) - 1, IJ «Water sector in Russia» (Russia) - 1, IC (Cotonou, Benin) + …**
- **Materials submitted:**
- **- IC «ECWATEC-2006» - 3 (Russia, June-May 2006)**
- **- IC "III TWM" (Spain, June-May 2006) + …**
- **Contribution of WP-7: …more than 80% …**
- **Prospect …**

(DoKN): By the executors of WP-7…: some publications (hard copy +)

- **1. Web-site** (on English + Russian): www.cawater-info.net/rivertwin/
- **(Beglov I.F., Turdybayev B.K., Akbarov O.R., 2005)**
- **2. Dukhovny V.A., Rysbekov Yu.Kh.:** Chirchik-Akhangaran basin (Central Asia) water sector management problems and ways of their solution in sustainable development context. // IC-materials «Clean water in Russia - 2005», Russia, Ekaterinburg, 2005 (on English + Russian) + web-site
- **3. Dukhovny V.A., Shapiro A.M., Ruziev I.B., Rysbekov Yu.Kh.:** Groundwater resources of Chirchik-Akhangaran basin (Central Asia): issues of quantity and quality management. // IC-materials «Clean water in Russia - 2005» (Russia, Ekaterinburg) (on English + Russian) + web-site
- **4. Dukhovny V.A., Rysbekov Yu.Kh.:** «Проблемы управления водохозяйственным комплексом Чирчик-Ахангаранского бассейна (Центральная Азия) и пути их решения» //«Водное хозяйство России», 2005, № 2 + web-site
- **5. Ruziev I.B.:** «Complex estimation of quality of ChAB-surface waters and their protection» // IC-proceedings «Applied ecology and development», 2005 (on Russian)
- **6. Rysbekov Yu.Khai.:** "Rivertwin: public participation" // "INBO-Newsletter", # 13, Dec. 2004-Jan. 2005 (on English, French, Spanish, Portuguese)
- **7. Rysbekov Yu.Khai.:** "The Rivertwin project" // "INBO-Newsletter", # 13, Dec. 2005-Jan. 2006 (on English, French, Spanish, Portuguese) **+ etc.**

DoKN by the executors of WP-7:
some publications (on web-site +)

- **1.AVERINA L.A.** Гидроэнергетический комплекс и перспективы его развития в ЧАБ и БД по энергетике, как составная часть моделирования, 2005 (on Russian)
- **2. Dukhovny V.A., Rysbekov Yu.Kh.:** Long-term objectives of water resources management in Chirchik-Akhangaran basin (Central Asia), 2005 (on English + Russian)
- **3. Stulina G.V.:** Soils of Chirchik-Akhangaran Basin, 2005 (on English + Russian)
- **4. Stulina G.V.:** Climatic changes and their impact on water resources of Chirchik-Akhangaran hydrological area, 2005 (on English + Russian)
- **5. Kovalev Yu.S.** Восполняемые «сложившиеся» ресурсы подземных вод Чирчикского месторождения, 2005 (on Russian)
- **6. Prihodko V.G., Nerozin S.A.** Социально-экономическое и агроэкономическое обследование бассейнов рек Чирчик и Ахангаран, 2005 (on Russian)
- **7. Rysbekov Yu.Khai.:** Concept of WP-7 fulfillment within RIVERTWIN project, 2005 (on English + Russian)
- **8. Rysbekov Yu.Khai.:** Concept of block “Public participation and awareness” realization, 2005 (on English + Russian)
- **9. Rysbekov Yu.Khai.:** Analysis of water management organizations in Chirchik-Akhangaran river basin (Central Asia), 2005 (on English + Russian)
- **10. Rysbekov Yu.Khai.:** Transboundary Problems in the ChABasin, 2006 (on Eng + Russian)
- **11. Rysbekov Yu.Khai.:** European Water Directive and Water Development Planning in Central Asian Project Site under Project “Rivertwin”, 2006 (on English)

DoKN by the executors of WP-7:
(are accepted to the publication)

- **1. Dukhovny V.A., Rysbekov Yu.Kh.:** ABOUT PROSPECTS OF DEVELOPMENT AGRICULTURE IN CHIRCHIK-AKHANGARAN BASIN (CENTRAL ASIA) (on English + Russian) // IC ECWATEC 2006 (Russia, Moscow, May-June 2006)
- **2. Ruziev I.B. (“**Quality of ChAB-waters) **……** // IC ECWATEC 2006 (Russia, Moscow, May-June 2006)
- **3. Rysbekov Yu.Khai.:** TRANSBOUNDARY PROBLEMS IN THE CHIRCHIK-AKHANGARAN BASIN (CENTRAL ASIA) (on English + Russian) // IC ECWATEC 2006 (Moscow, May-June 2006).
- **4. Rysbekov Yu.Khai.:** European Water Directive and Water Development Planning in Central Asian Project Site under Project Rivertwin // III International Symposium on Transboundary Water Management (Spain, 30.05 – 01.06.2006).

…

- **… “MONEY SPENT ON EDUCATION, NEVER VANISHES” …**

Instead of the conclusion …