



# WRDMAP

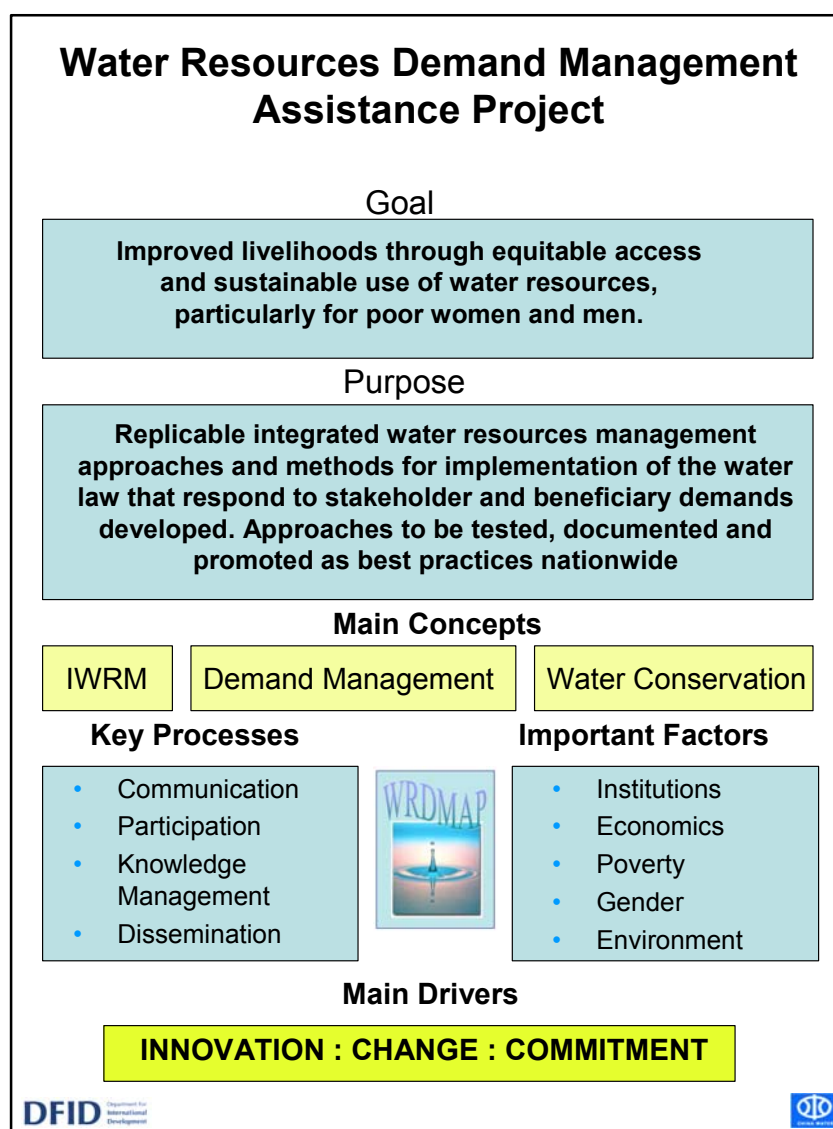
## Water Resources Demand Management Assistance Project

2005 – 2010

### Status Bulletin

November 2008

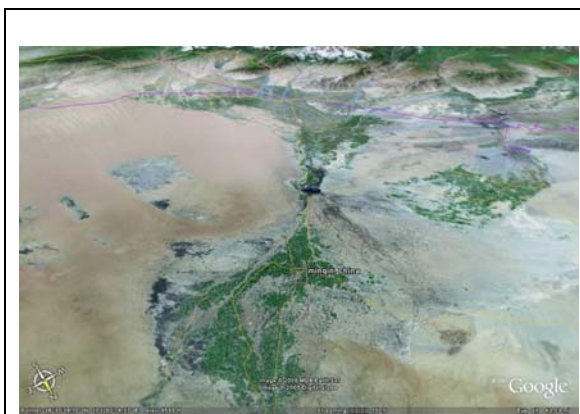
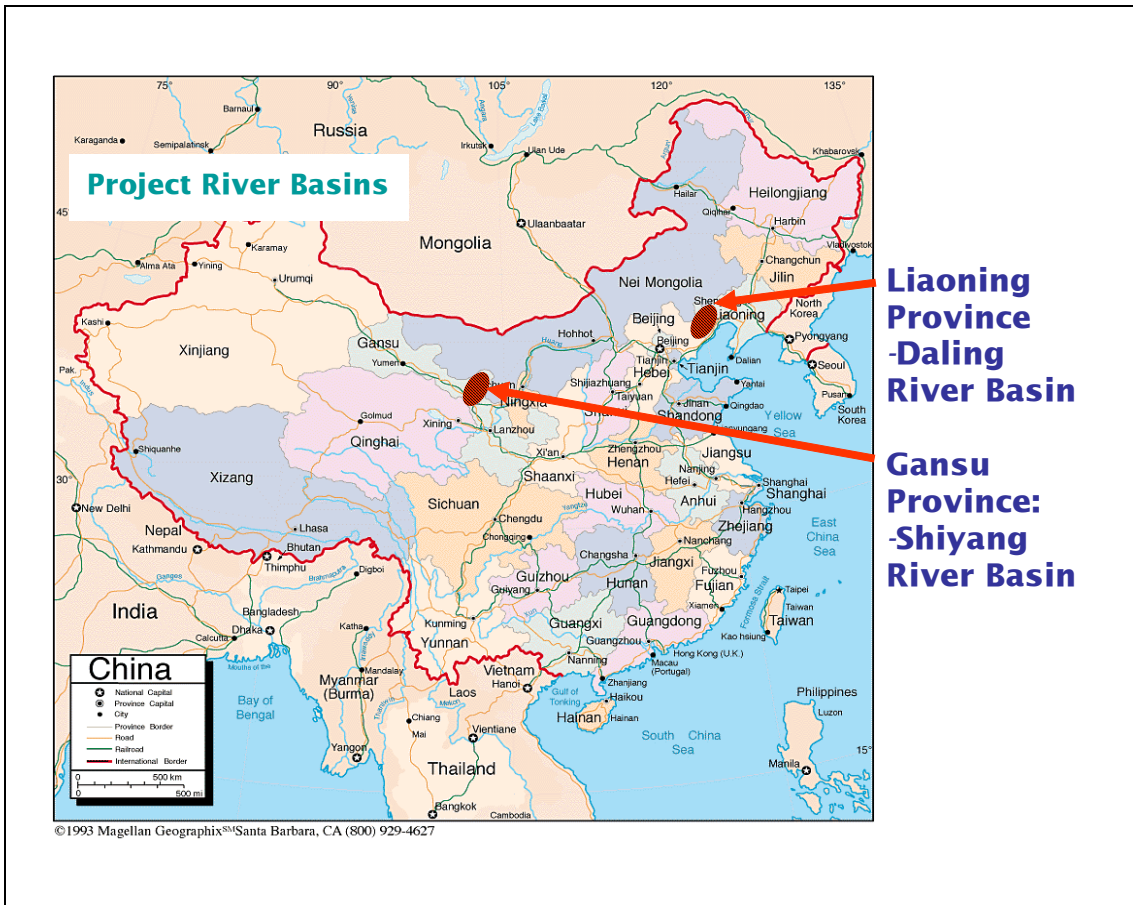




*Content should be read in conjunction with the Status Bulletins of November 2006 and November 2007*

<p><b>Central Case Study CCS: Documentation and nationwide promotion of best practices in IWRM (Integrated Water Resources Management)</b></p>	<p><i>Provision by the Department of Water Resources (DWR) within the Ministry of Water Resources of direction and guidance to Gansu and Liaoning provinces on interpretation of the 2002 Water Law and its application in the case studies in the two provinces. DWR is monitoring implementation and observing good practice. The DWR is assisting the central and provincial case study teams in presenting the information in formats that are suitable for dissemination, promotion and replication nationwide.</i></p>
<p><b>ACHIEVEMENTS IN 2008</b></p>	<p><b>ONGOING-ACTIVITIES</b></p>
<p>Numerous studies undertaken including:</p> <ul style="list-style-type: none"> <li>• Drought planning and management practices in China;</li> <li>• Approaches used for assessing ecological flows or water requirements as used in China.</li> <li>• Water Use Norms in China with a focus on the irrigation sector.</li> <li>• Water Resources Fees – Assessment of practices in different parts of China.</li> </ul> <p>International Study Tours:</p> <ul style="list-style-type: none"> <li>• Study Tour to the UK and Ireland visiting environment agencies and organisations involved in water resources management in England, Scotland and Ireland.</li> </ul>  <p><i>Photo: Study Tour visit to Reservoir in Yorkshire</i></p> <p>Additionally:</p> <ul style="list-style-type: none"> <li>• Further expansion of the Central Case Study counterpart team to include representatives from several MWR technical departments.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Seminar Programme</b> to reinforce awareness within the Ministry of Water Resources of project findings and to plan the future dissemination programme. Seminars including, of 16 planned: <ul style="list-style-type: none"> <li>- <i>Climate change evaluations (Nov08);</i></li> <li>- <i>Water quality modelling (Nov08);</i></li> <li>- <i>Groundwater management (Nov 08);</i></li> <li>- <i>Water Saving and WUAs (Dec 08);</i></li> </ul> </li> <li>• <b>Draft Project documentation</b> for certain topics including, amongst others: <ul style="list-style-type: none"> <li>- <i>Co-operative Working Guidelines for WABs(WRDs) and EPBs in water quality management;</i></li> <li>- <i>Drought Management Manual for municipalities;</i></li> <li>- <i>Urban Water Supply Tariff Design Principles and Practices for small water supply companies;</i></li> <li>- <i>Role WUA in Groundwater management.</i></li> </ul> </li> </ul> <p>Further status studies:</p> <ul style="list-style-type: none"> <li>• <i>Effluent discharge permitting in China – practices and progress.</i></li> </ul>  <p><i>Photo CCTV4 News Programme on SRB-WRDMAP</i></p>
<p><b>TRAINING / WORKSHOPS</b></p>	<p><b>NOTABLE ACHIEVEMENTS</b></p>
<p>International experience/best practice in:-</p> <ul style="list-style-type: none"> <li>• Water resources assessment approaches and water resources modelling.</li> <li>• Approaches to climate change impact evaluation.</li> <li>• Approaches to water quality modelling at the local level using of local expertise.</li> </ul>	<ul style="list-style-type: none"> <li>• Document “<i>Draft guidelines and manuals on IWRM and the use of tools to facilitate IWRM and demand management at the river basin level</i>”</li> <li>• <b>DFID/MWR Annual Review Mission</b> of July 2008 commended the progress of activity in all provincial case studies.</li> </ul>

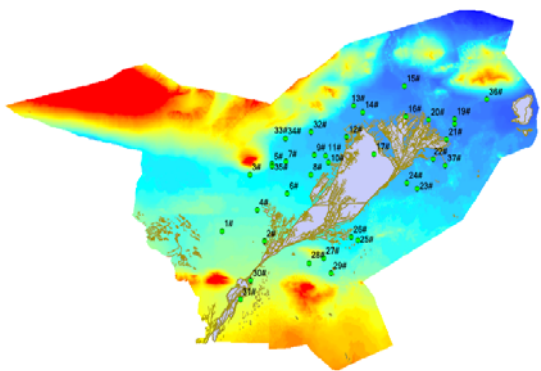
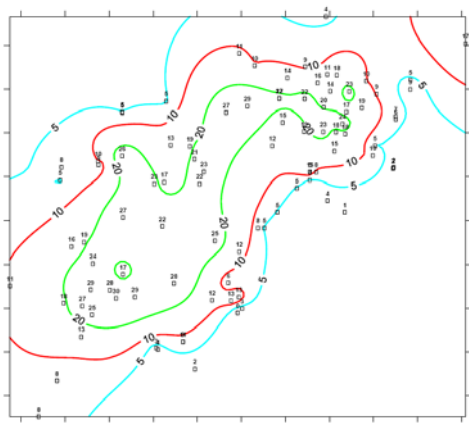
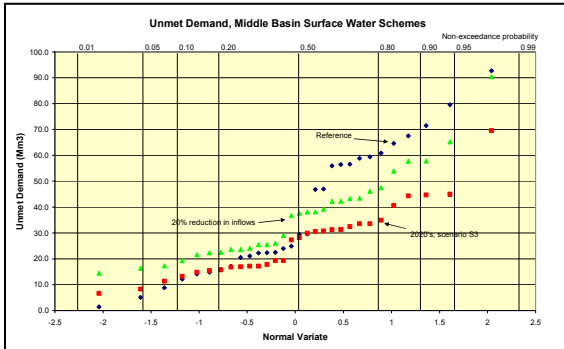
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*View of Shiyang River Basin from north looking south west (downstream to upstream) showing the encroaching desert system.*



*View of Upper Daling River Basin showing more uniform characteristics but still drought prone.*

<p><b>Case Study Gansu 1: Integrated Water Resources (IWRM) planning for Shiyang River Basin (SRB)</b></p>	<p>Application of <b>IWRM</b> principles of water resources management in the context of a small river basin. The planning process is being used to develop the mandate of the newly formed Shiyang River Basin Management Bureau (SRBMB) and strengthen its organisation. The case study is introducing international practices for river basin organisations, building commensurate capacity in water resources planning and management at the river basin level and encouraging communication with municipalities, Wuwei (inc. Minqin County) and Jinchang.</p>
<p><b>ACHIEVEMENTS IN 2008</b></p> <ul style="list-style-type: none"> <li>• Further reports covering the development of the hydrological and water allocation modelling for the Shiyang River Basin;</li> <li>• Further refinement of the WEAP-Tsinghua Model through the introduction of a greater number of groundwater level field information;</li> <li>• Preparation of the <b>Draft Integrated Water Resources Management Plan</b> for the Shiyang River Basin.</li> </ul>  <p>Figure : Location of additional groundwater observation wells.</p>	<p><b>ONGOING-ACTIVITIES</b></p> <ul style="list-style-type: none"> <li>• Development of economic analysis concepts and assessments of the scenarios associated with the IWRM Plan;</li> <li>• IWRM Plan stakeholder/consultation process.</li> <li>• Climate Change studies including Inception Report and data gathering.</li> </ul>  <p>Figure : Groundwater level isolines for the Minqin area of the Shiyang River Basin</p>
<p><b>TRAINING / WORKSHOPS</b></p> <p>Training including:</p> <ul style="list-style-type: none"> <li>• Various training sessions related to water resources assessment and allocation modelling using the WEAP-Tsinghua Model.</li> <li>• Promotion of IWRM Management Models and management of groundwater.</li> <li>• Methodology and practice of the establishment of a water saving society.</li> <li>• Policies and regulations related to irrigation water use and water resources management.</li> <li>• Policies and practices for water resource fees.</li> </ul> <p>Study Tours:</p> <ul style="list-style-type: none"> <li>• Local Study Tour to Hebei, Shandong and Xinjiang undertaken to gain knowledge on water management and WUA financing.</li> <li>• <i>International Study Tour being planned to the Republic of South Africa (RSA).</i></li> </ul>	<p><b>PROJECT RELATED TOPICS</b></p> <ul style="list-style-type: none"> <li>• SRB Strategic (Master) Plan approved;</li> <li>• GIS provided to 4 other counties for abstraction permit management.</li> <li>• SRB &amp; Project Activities on <b>CCTV4</b>.</li> </ul>  <p>Figure : Example of the simulation modelling of the water resources development scenarios in the Shiyang River Basin – probability analysis of unmet water demand in the middle basin.</p>

<p><b>Case Study Gansu 2: Water saving societies in Wuwei and Jinchang</b></p>	<p><i>Assisting Wuwei and Jinchang Municipalities, which are the principal administrative units within SRB, in regulating water use within their administrative boundaries in order to achieve a long term sustainable balance between the available water resources, the current use of water and the projected future demands for water.</i></p>
<p><b>ACHIEVEMENTS IN 2008</b></p>	<p><b>ONGOING-ACTIVITIES</b></p>
<p>Documentation has included:</p> <ul style="list-style-type: none"> <li>• Document : WUA Development – Role in water savings and management in the Shiyang River Basin;</li> <li>• Document : WUA Role in Groundwater Management (for the Central Case Study);</li> </ul> <p>Interventions:</p> <ul style="list-style-type: none"> <li>• Design and construction of improvements to parts of the irrigation systems in the pilot WUA areas in Wuwei and Jinchang (Donghe Irrigation System).</li> </ul>  <p><i>Photo : Irrigation system improvements funded by the project</i></p>	<p>Documentation:</p> <ul style="list-style-type: none"> <li>• Document : WUA Role in the Surface Water Irrigation Management.</li> </ul> <p>Systems:</p> <ul style="list-style-type: none"> <li>• Further development of Management Information System (MIS) linked to a GIS for abstraction permits to SCD 460 but also for use in the Shiyang River Basin – being undertaken through the SRBMB;</li> </ul> <p>Interventions:</p> <ul style="list-style-type: none"> <li>• Training in improved water management and flow measurement – plans for 2009.</li> </ul>  <p><i>Photo : Discussion of the benefits of the improved canal distribution systems</i></p>
<p><b>TRAINING / WORKSHOPS</b></p>	<p><b>PROJECT RELATED TOPICS</b></p>
<ul style="list-style-type: none"> <li>• Water Saving Society practices and approaches (incl Study Tour to Zhangye).</li> <li>• Further WUA related training including: <ul style="list-style-type: none"> <li>- Policies and regulations related to WUAs</li> <li>- Water saving practices and techniques in irrigated agriculture;</li> <li>- Role of WUAs in Groundwater management;</li> <li>- Improving effectiveness of women in irrigation management;</li> <li>- Communication, conflict resolution and leadership capacity;</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• All project equipment-software being well used.</li> </ul>  <p><i>Photo : Project Water Saving/Agronomy trials</i></p>

**Case Study Gansu 3: Shared water management in Minqin County, Shiyang River Basin.**

*Establishment of Water User Associations in selected rural communities to develop a model for increased community and user participation in management of water resources and water delivery as close to users as possible particularly related to irrigation water usage.*

**ACHIEVEMENTS IN 2008**

- Guideline Document for Water User Association (WUA) Mandates through a stakeholder participatory approach;
- Community assistance with regard to ‘household water rights’, IC Card usage, abstraction permit management and overall water management;
- Selection and use of groundwater observation wells in the desert fringes to improve groundwater modelling activities.
- Establishment of improved overall water management practices in counterpart system.



*Figure : Typical wall display now employed in Minqin WAB to demonstrate well distribution and irrigation coverage (Use of Project GIS software, computers and A1 printer provided by the project).*

**ONGOING-ACTIVITIES**

- Further advice on groundwater monitoring, recording and assessments. This being done at the county water resources department level as well as in local communities in the pilot study areas;
- Initial development of a WEAP-Tsinghua water resources simulation linked to GIS to provide information for the future water conjunctive use management in Minqin.
- Advice on the future transfer of surface waters from the upper basin to Minqin and the associated management needs.



*Photo : Recording groundwater usage in pilot area*

**TRAINING / WORKSHOPS**

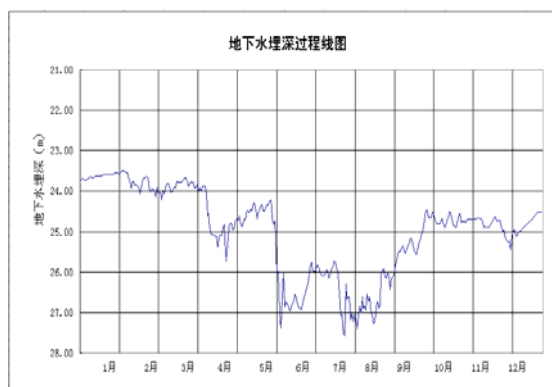
- Further GIS Training
- As per those listed under Case Study Gansu 2;
- Water usage monitoring, flow measurement and management.



*Photo : Typical activity during Annual Progress Review Field Visits (example in Minqin)*

**PROJECT RELATED TOPICS**

- All project equipment-software being well used;
- More groundwater well closures effected;
- Aspects of Strategic Plan being implemented
- (Other items as per Case Study G2).



*Figure : Typical water level hydrograph of the 17 well groundwater monitoring network*

**Case Study Liaoning 1: IWRM planning for the upper Daling river basin**

*Assisting Chaoyang municipal Water Affairs Bureau (WAB) in applying IWRM planning in the upper Daling river basin that mainly lies within the municipality. The case study is focusing on the planning functions of a large municipal WAB in the absence of a river basin organisation. The case study is developing the communication channels upward with the provincial Water Resources Department, horizontally with other municipalities and downwards with counties and communities in the municipality.*

**ACHIEVEMENTS IN 2008**

- Further calibration and enhancement of the Daling River Basin Water Resources Model;
- Development of water demand simulation MSWorkbook model to estimate development scenarios for 2010 and 2020. (This built on the Major Water Use survey undertaken in 2007).



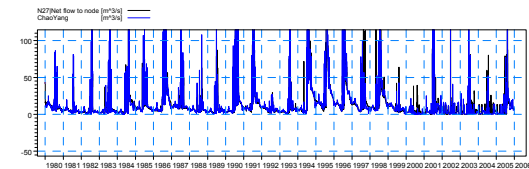
*Figure : Typical output presentation of simulation model output through the GIS established under the project.*

**ONGOING-ACTIVITIES**

- Scenario development related to water resources development and management;
- Development of Scenario Costing Model.
- IWRM Plan development and consultation;
- Climate Change studies including Inception Report and data gathering.



*Photo : Typical reservoir included in the MikeBasin Water Resources Simulation Model*



*Figure : Typical river flow series from the MikeBasin Daling Basin Water Resources Simulation Model for one of the water resources management scenarios being studied.*

**TRAINING / WORKSHOPS**

- Further GIS Training;
- IWRM Awareness Workshop for Stakeholders;
- Extra Mike Basin Daling River Model Training.
- Policies and practices for water resource fees.



*Photo:: Working Group discussing water use information*

**PROJECT RELATED TOPICS**

- All project equipment-software being used;



*Photo : New build 'house' for new groundwater observation wells provided by the project.*

### Case Study Liaoning 2: Integrated water abstraction and wastewater discharge permitting in Chaoyang

Assisting the Chaoyang municipal WAB and Environmental Protection Bureau (EPB) integrating the permitting of water abstractions and wastewater discharges. The process aims to strengthen the sense of shared responsibility for regulation of water use in accordance with the objectives for functional use of water sources and receiving waters as defined in the river basin planning and pollution control.

#### ACHIEVEMENTS IN 2008

- Drought Management Plan for Chaoyang Municipality approved by Government;
- Improvement of the Water Quality Model for pilot reach of the Daling River using Qual2K software – scenarios studied;
- Preparation of various reports on discharge permitting and co-operative/collaborative working between WAB and EPB.



Figure : Chaoyang Municipality Drought Management Plan – approved October 2008

#### ONGOING-ACTIVITIES

- Formulation of working guidelines to enable co-operative working between EPB and WAB on water quality management – elaboration in response to State Council Directive to establish co-operative working arrangements between EPBs and WABs (Nr 75 : July 2008);
- Data collection/acquisition and survey programme to enable improved and extended water quality modelling in the river basin.
- Preparation of a guideline document on effluent discharge permitting.



Figure : Daling River Water Quality Zoning

#### TRAINING / WORKSHOPS

- GIS Advanced Training.
- Water Quality Modelling using Qual2K.
- Abstraction and discharge permitting systems – international best practice.

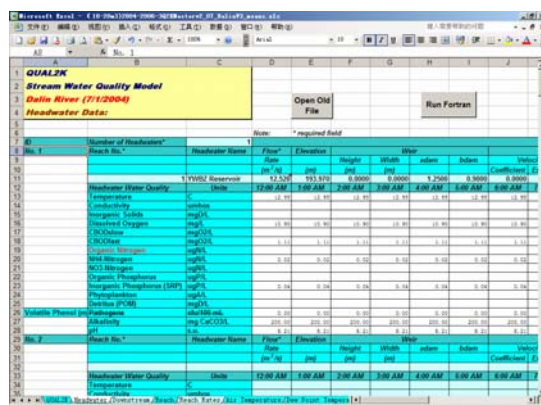


Figure : QUAL2K Water Quality Model Screen during training in Chaoyang.

#### PROJECT RELATED TOPICS

- All project equipment-software being well used in Chaoyang WAB and EPB;



Figure : Driver WAB-EPB Data sharing and GIS

### Case Study Liaoning 3: Water tariff reform and efficiency in Beipiao.

#### PROJECT ACTIVITIES COMPLETED

Assisting Beipiao County WAB, Beipiao Water Supply Company (WSC) and selected urban communities to develop a model for sharing of responsibilities and functions in the future management and delivery of urban water supply services. The model will be developed as part of a program for tariff reform and water savings in the WSC with a strong focus on institutional development.

#### ACHIEVEMENTS IN 2008

- Completion of a Willingness-to-Pay survey and Ability to Pay Assessment in Beipiao for domestic and commercial 'clients' and Associated Report (Leading to Guideline Document on such topics for the CCS);
- Final design of a tariff options and recommendations for the Beipiao WSC;
- Recommendations for the role of WABs as activity/performance regulators for WSCs.
- Leak detection practices fully explained and demonstrated to WSC personnel.

#### FINALISING ACTIVITIES

- Household water loss assessment (*since system losses are often dwarfed by building losses*) – a completed activity and results presented to the WSC Management;
- Development of sample pipe network model using Wallingford 'Infoworks' during training. Software provided by the project;
- Recommendations made for further leak detection activity and planning of future District Metering Area (DMA) establishment.
- Recommendations for improvements in WSC management.

固定资产统计表									
编 号	型 号	流量 (m³/h)	扬程 (m)	转速 (r/min)	效率	运行状态	出厂日期	地 点	
B-2006-0-1	2005-663	288	62.5	2950	79.50%	正常	2003.6	西街泵房	
B-2006-0-2	2005-663	288	62.5	2950	79.50%	正常	2003.6	西街泵房	
B-2006-0-3	63B-6	162	78	2950	74%	正常	1998.08	总公司院内	
B-2006-0-4	63B-6	162	78	2950	74%	正常	1998.08	总公司院内	
B-2006-0-5	100L-90	80	90	2950		正常		总公司院内	
B-2006-0-6	63B-9	288	65.2	2950	79.50%	正常	2000.10	总公司院内	
B-2006-1-1	1500L180-25 (1) × 5	180	125	1480	76%	正常	2000.10	凉水河加压泵站	
B-2006-1-2	300S-90B	720	67	1480	73%	正常	2002.01	一公司院内	
B-2006-1-3	63B-6A	144	62	2950	72%	正常	2000.11	一公司院内	
B-2006-1-4	63B-6A	144	62	2950	72%	正常	2000.11	一公司院内	
B-2006-1-6	63B-9	288	65.2	2950	79.50%	正常	2002.10	凉水河加压泵站	
B-2006-2-1	1500L180-20 (1) × 4	150	80			正常		本村	
B-2006-2-2	1500L × 4	150	80			正常		翔山二工村	
B-2006-2-3	1500L × 4	150	80			正常		翔山二工村	
B-2006-2-4	1000L × 5	100	100			正常		翔山二工村	
B-2006-2-5	1000L × 5	100	100			正常		翔山二工村	
B-2006-2-6	1000L × 4	100	80			正常		翔山二工村	
B-2006-2-7	1000L × 4	100	80			正常		翔山二工村	
B-2006-2-8	1000L × 4	100	80			正常		翔山二工村	
B-2006-3-1	2000L240-30 (1) × 4	280	120	1480	77.90%	正常		台香水源池	
B-2006-3-2	2000L240-30 (1) × 4	280	120	1480	77.90%	正常		台香水源池	
B-2006-3-3	2000L240-30 (1) × 4	280	120	1480	77.90%	正常		台香水源池	
B-2006-4-1	1500L180-30 (1) × 4	180	120	1480	75%	正常		三堂水源池	
B-2006-4-2	1500L180-30 (1) × 4	180	120	1480	75%	正常		三堂水源池	
B-2006-4-3	1500L180-30 (1) × 4	180	120	1480	75%	正常		三堂水源池	

Figure : Asset Register development.

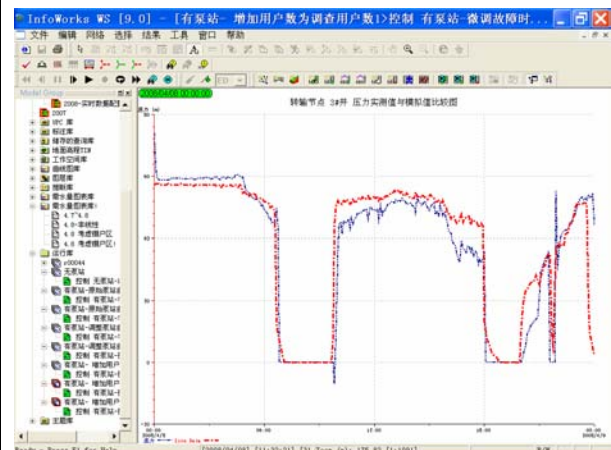


Figure : Infoworks hydraulic modelling software screen (during training).

#### TRAINING / WORKSHOPS

- Workshops on Leak Detection practices.
- Financial management training.
- Tariff design workshops in Beipiao WSc.



Photo : Small Group Training in Financial Management

#### PROJECT RELATED TOPICS

- Project Supplied Equipment now also being used by Chaoyang WSC – recently transferred there .

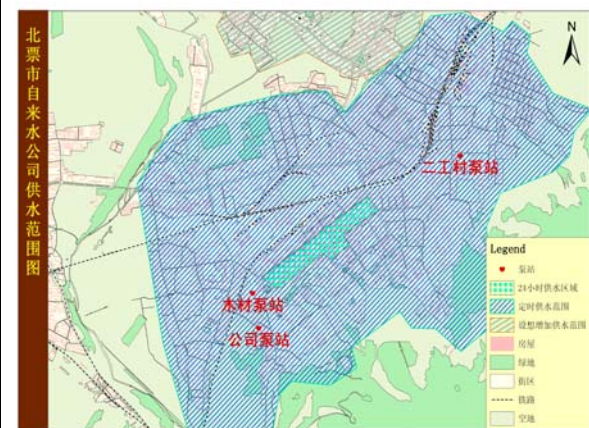
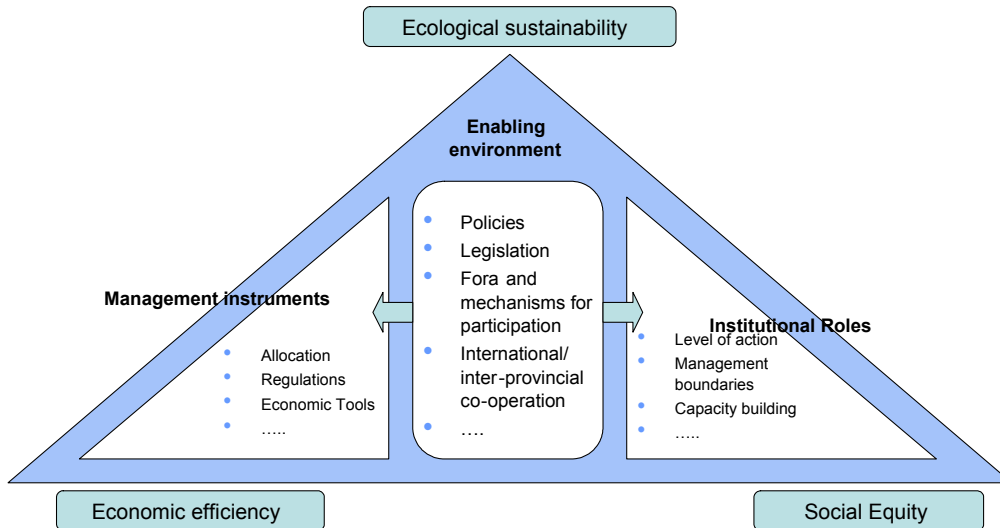


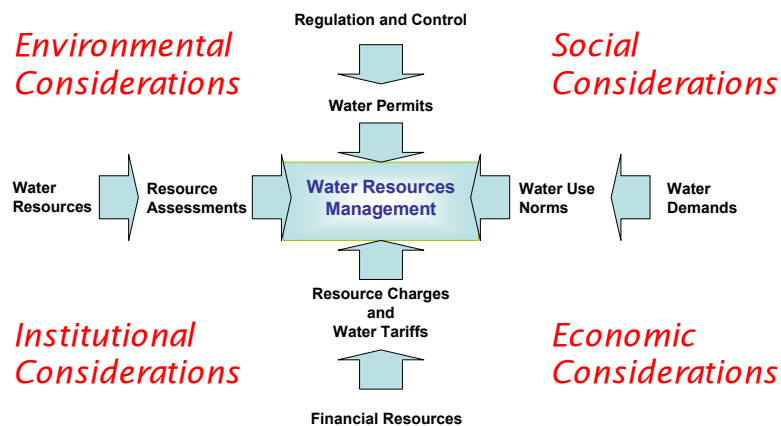
Figure : Sample output from WSC GIS

# Integrated Water Resources Management (IWRM)

*(Basics after Global Water Partnership)*

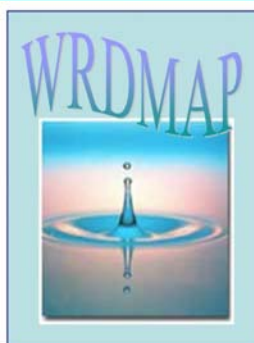


## Driving Elements of Integrated Water Resources Management



*(Second figure after WRDMAP)*

## Water Resources Demand Management Assistance Project WRDMAP



[www.wrdmap.org](http://www.wrdmap.org) (Chinese)

[www.wrdmap.com](http://www.wrdmap.com) (English)

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