

Reports by UNESCO's Water-related Centres (category 1 and 2) on activities related to the IHP in the period July 2006 – May 2008

1. Basic information on the centre

Name of the Centre		International Centre on Qanats and Historic Hydraulic Structures (ICQHS)
Name of Director		Dr. Ali A. Semsar Yazdi
Name and title of contact person (for cooperation)		Mr. Majid Labbaf Khaneiki, Programme Specialist
E-mail		icqhs@yahoo.com
Address		Danesjoo Blvd., Yazd, Iran, POBox: 89165-1553
Website		www.qanat.info
Location of centre		city/townYazdcountryIRAN_____
Geographic orientation *		<input checked="" type="checkbox"/> global <input type="checkbox"/> region
Year of establishment		2006
Themes	Focal Areas ♦	<input checked="" type="checkbox"/> groundwater <input type="checkbox"/> urban water <input checked="" type="checkbox"/> arid / semi-arid zones <input type="checkbox"/> humid tropics <input type="checkbox"/> droughts and floods <input type="checkbox"/> sediment transport and management <input checked="" type="checkbox"/> water and environment <input type="checkbox"/> ecohydrology <input type="checkbox"/> water law and policy <input type="checkbox"/> transboundary river basins/ aquifers <input type="checkbox"/> IWRM <input type="checkbox"/> global and climate change <input type="checkbox"/> mathematical modelling <input checked="" type="checkbox"/> social and cultural dimensions of water <input checked="" type="checkbox"/> water education <input type="checkbox"/> other: (please specify) _____
	Scope of Activities ♦	<input checked="" type="checkbox"/> vocational training <input type="checkbox"/> postgraduate education <input type="checkbox"/> continuing education <input checked="" type="checkbox"/> research <input checked="" type="checkbox"/> institutional capacity-building <input checked="" type="checkbox"/> advising/ consulting <input type="checkbox"/> software development <input type="checkbox"/> other: (please specify) _____
Support bodies ¹		Ministry of Energy of the Islamic Republic of Iran (IRI)
Hosting organization ²		
Sources of financial support ³		IRI Ministry of Energy, IRI Ministry of Agriculture, IRI Budget & Planning Organization, UNESCO Tehran Cluster Office
Existing networks and cooperation ⁴		G-wadi network, International Water History Association
Governance		<input checked="" type="checkbox"/> director and governing board <input type="checkbox"/> other: (please specify) _____ Link to election of board members to the IHP IGC and hosting country IHP National Committee _____ Frequency of meetings: once every 1year(s)

* check on appropriate box

♦ check all that apply

¹ please specify bodies that cover the operational costs of the centre, and other essential costs such as salaries and utility bills, and that provide institutional support to ensure centre's sustainability

² if different from support bodies

³ please specify sources of main budgetary and extrabudgetary funds to implement projects

⁴ please write international networks, consortiums or projects that the centre is part of, or any other close links that the centre has with international organizations or programmes, which are not already mentioned above

	<input checked="" type="checkbox"/> Existence of UNESCO presence at meetings
Institutional affiliation of director	Ministry of Energy
Number of staff and types of staff	total number of staff (full-time, or equivalent) : ____10____ number of staff who are water experts: ____5____ number of visiting scientists and postgraduate students: ____10____
Annual turnover budget in USD	200,000 USD

2. Activities undertaken in the framework of IHP in the period July 2006 – May 2008

2.1 Educational activities (i.e., those with accreditation) that directly contributed to the IHP-VI and WWAP

One of the Educational activities of ICQHS which can be categorized under the topic of educational activities was the establishment of the Qanat training center. This training center which educates the technicians is situated in Taft a town near Yazd, Iran. The students of this collage can gain the skill of construction and rehabilitation of Qanat during a two year period. Actually there are 100 students busy studying there. This center is utilizing the experiences and knowledge of the traditional practitioners too. So this center bridges the gap between the modern sciences and indigenou know how. One of the problems that the Qanats are suffering from is the scarcity of skillful manpower to engage in Qanat-related activities. Thus, the main objective of this training center is to mitigate the present situation of Qanats by training some young experts who are equipped with both traditional knowledge and modern sciences.

2.2 Research activities that directly contributed to the IHP-VI and activities by WWAP

ICQHS has conducted some research projects in line with IHP-VI, whose results have been published as books or papers.

- a. The book Qanat from Practitioners' Point of View was compiled and published by ICQHS. This book contains some interviews with 16 traditional masters out of whom 4 masters unfortunately passed away just during this short time. The interviews are focused on the indigenou knowledge of Qanat construction and rehabilitation. This book is an attempt to preserve the human legacy of the ancient system of Qanat, which reflects the harmony the local people used to live in with nature. This book has been translated into English and the publishing of its English version is under way.*
- b. With UNESCO Tehran Cluster Office's support and advice, the book A Survey on the Qanats of Bam from Engineering Point of View which is a part of the project conducted by the above mentioned office was published. This book examines the impact of the 2003 earth quake on the Qanats in the region of Bam.*
- c. In cooperation with UNESCO Tehran Cluster Office, ICQHS succeeded in preparing the country report of qanats of Afghanistan, Iran and Pakistan. To preserve the ancient heritage of Qanat systems, UNESCO Tehran Cluster Office and ICQHS took the initiative to compile and produce a state-of-the-art report on Qanats of Afghanistan, Iran and Pakistan, within the framework of UNESCO's International Hydrological Programme (IHP) and UNESCO Tehran Cluster Office activities, focusing on IHP's main line of action "Mitigating water-related risks and facing social challenges". ICQHS took the lead to review, compile, make coherent and finalize the three reports into this report*

which gives a good insight into the status of Qanat systems in these three countries.

d. The book "Qanat of Zarch" is a monographic study which has been done by ICQHS. This comprehensive study encompasses a large variety of subjects revolving around a particular Qanat from technical to cultural issues.

e. ICQHS has also presented some papers at international conferences as follows:

- *Assessment of the Contribution of Traditional Qanats in Sustainable Water Resources Management, International Journal of Water Resources Development, Volume 22, Number 4, December 2006*

- *A survey on the Historical Evolution of Qanats in Iran, UNESCO, ICARDA G-wadi meeting on water harvesting, Aleppo, Syria, November 20-22, 2006*

- *The Drought of 2001; And the Measures Taken by Yazd Regional Water Authority, International Workshop on Groundwater for Emergency Situations, RCUWM, October 29-30, 2006, Tehran, Iran*

- *Effect of Water Pricing on Water Consumption, International Conference on Economic Incentives & Water Demand Management, Sultan Qaboos University, Collage of Agriculture and Marine Sciences, Oman, March 2006*

- *Ownership, Operation & Management Systems of the Qanat of Zarch, Fourth International Conference on Ains (Qanats), King Abdul Aziz University, Saudi Arabia, Jeddah, 2006*

- *A Comprehensive Survey on the Conferences on Qanats Held from 1980 to 2005, Fourth International Conference on Ains (Qanats), King Abdul Aziz University, Saudi Arabia, Jeddah, 2006*

- *Special Methods to Economize on Water; Some Lessons from Traditional Irrigation in Central Iran, International Workshop on Innovations in Water Conservation, RCUWM, Tehran, February 2006*

- *Experiences of the Yazd Regional Water Authority on Promoting the Public Awareness Concerning Groundwater Management and its Preservation, International Workshop on Public Participation, Awareness and Information Exchange for Water Resources Development and Management, Muscat, Sultanate of Oman, September 2005*

- *Optimizing the quality of water in qanat, international conference on qanat, Kerman, Iran, 2005*

- *Water distribution system, exploitation and management of the qanat of Zarch, international conference on qanat, Kerman, Iran, 2005*

- *Moving toward a sustainable management system to run water resources with the aid of the traditional management of qanats, international conference on qanat, Kerman, Iran, 2005*

- *Necessity of storm water drainages due to rapid extension of cities, case study: storm water drainage of Tehran, 5th international conference in sustainable techniques and strategies in urban water management (NOVATEC), June. 2004, LYON, FRANCE*

- *An introduction to Qanat as a traditional and sustainable system for underground water resources exploitation in central part of Iran, International scientific conference: The rational use and conservation of water resources in a changing environment, 10-15 July. 2003, Armenia, YEREVAN*

- *The impact of geological formations on the water quality in the Qanats of Enayat Abad and Fazeliyeh, national conference on qanat, Gonabad, Iran, 2003*
- *The methodology of compiling the qanat practitioners' indigenous knowledge, national conference on qanat, Gonabad, Iran, 2003*
- *Depletion of aquifer and struggle for extending qanats; an unfair competition, case study: the qanat of Zarch, national conference on qanat, Gonabad, Iran, 2003*
- *Interactions between city and qanat; a review on the qanats of Yazd, national conference on qanat, Gonabad, Iran, 2003*
- *Technical & historical aspects of "Vaqf abad" Qanat, Oman international conference on the development and management of water conveyance systems, 18-20 May. 2002, Muscat*
- *A survey on the structural and architectural aspects of the water reservoir of Amir Chakhmagh, international conference of water and human being, Ramsar, Iran, 2002*
- *Etude d'une partie de Qanat de Zarch qui passe sous la ville de Yazd, Conference scientifique sur les galeries de captage, 5-7 June. 2001 MADRID*
- *A survey on the reasons of the deterioration of the qanats in the plains of Yazd, and some suggestions to stop that, International Conference on Qanat, Yazd, Iran, 2000*
- *The analysis of the functions of the qanats in Ebrahim Abad plain – Mehriz, International Conference on Qanat, Yazd, Iran, 2000*
- *The analysis of the present situation of the qanats in Yazd, International Conference on Qanat, Yazd, Iran, 2000*
- *The necessity of legislation and frameworks of the water exploitation to protect the water resources, Conference on Water Resources, Exploitation, and Optimum Consumption, Tabriz, Iran, 1997*
- *"Operation and Water Distribution of Qanats", International training course on Qanat; A Multidisciplinary Approach to Integrating Traditional Knowledge with Modern Development, 1-4 July 2007, Yazd, Iran, International Center on Qanats and Historic Hydraulic Structures, UNESCO*
- *"Exploitation of Groundwater in Iran from the Last Century to the Present", Pasts and Futures of Water, 5th IWHA Conference, 14-17 June 2007, Tampere, Finland, IWHA (International Water History Association)*
- *"Traditional Water Management; an Inspiration for Sustainable Irrigated Agriculture in Central Iran", International History Seminar on Irrigation and Drainage, 2 – 5 May 2007, Tehran, Iran, Iranian National Committee on Irrigation and Drainage (IRNCID), International Commission on Irrigation and Drainage (ICID)*
- *"The Effects of Land Reform on Qanats in Iran", Fourth International Conference on Ains (Qanats), April 2-4, 2006, King Abdul aziz University, Jeddah, Saudi Arabia*
- *"Full Exploitation of Groundwater and its Economical-Social Backlashes", International Conference on Hydrogeological Transboundary Problems, November 22-26, 2004, Polish Geological Institute, Warsaw, Poland*

- *“The Techniques of Digging and Repairing of Qanats and the Common Barriers”, National Conference on Qanat, 2004, Gonabad, Iran*
- *“The Role of Qanat in the Formation of a Civilization”, International Conference on the Cultural Approach in Geography, May 15-17, 2000, Ferdowsi University, Mashhad, Iran*
- *“Qanat-related Civilization”, International Symposium on Qanat, 2000, UNESCO & Regional Water Authority of Yazd, Yazd, Iran*

2.3 Training activities that directly contributed to the IHP-VI and WWAP objectives

- *In line with Theme 5 - Water Education and Training of IHP-VI, ICQHS has so far held two international workshops on the subject of qanat, groundwater and sustainability. One of these events was the workshop on Groundwater Artificial Recharge and Rainwater Harvesting in Arid and Semi – Arid Regions of Asia which was held in Yazd in cooperation with UNESCO Tehran Cluster Office, G-wadi and ISESCO. This workshop could bring together many scholars from the neighboring countries and provided them with an opportunity to exchange their ideas which led to some fruitful results. The final statement of this workshop is known as Yazd declaration and the experts usually make reference to it. A complete report has been submitted to UNESCO and the other relevant authorities. The proceedings of this training workshop was published under the title “Proceedings of Regional Workshop on Management of Aquifer Recharge and Water Harvesting in Arid and Semi-arid Regions of Asia”, and sent out to the different scientific centers.*
- *Next event was the first international training course on Qanat; A Multidisciplinary Approach to Integrating Traditional Knowledge with Modern Development. This course which was supported by UTCO was aimed at developing the knowledge and technology of qanat. This event was scheduled to be hold during 4 days with about 30 hours course. The lecturers of this training course were ranked among the most outstanding researchers in the field of qanat. The main objectives of this training course were to:*
 - a. *Disseminate world experiences on various aspects of Qanats;*
 - b. *Incorporate the indigenous knowledge into the new methods of construction, preservation, rehabilitation and operation of Qanat systems;*
 - c. *Turn Qanats into an interdisciplinary tool where the traditional know - how and the modern techniques work together;*
 - d. *Familiarize experts with the importance of cultural and technical aspects of Qanat systems as well as the community life linked to these systems.*

This training course brought together the resource persons and trainees from ten countries of the world. The participants came almost from the cluster countries, Iraq, Japan and Oman.

3. Collaboration and linkages

3.1 Participation in major international networks, programmes, partnerships with other UN or other International Agencies, media and professional bodies

ICQHS is an official member of the International Water History Association, and has a close cooperation with them. An agreement between ICQHS and IWHA is under way and will be exchanged soon.

3.2 Participation in meetings related to the IHP and UNESCO (e.g., the UNESCO General Conference, the UNESCO Executive Board, the IHP Intergovernmental Council and/or other meetings organized by IHP)

To date ICQHS has participated in two meetings of this kind:

- a. *Meeting of the Directors of Water Related Centers (Category I and Category II Centers) in Delft, the Netherlands, IHE-UNESCO Venue, 11-12 June 2007*
- b. *Meeting of Asia-Pacific Category II Water-Related Centers, Bangkok, Thailand, UNESCO, 26-27 September 2007*

- 3.3 Collaboration and networking with other UNESCO category 1 or 2 institutes/ centres
- 3.3.1 cross-appointment of directors of the category 1 or 2 institutes or centres on the governing board
The Director of the Regional Center on Urban water Management (RCUWM) is a member of the Governing Board of ICQHS.
- 3.3.2 exchange of information on activities such as training/educational materials, and funding opportunities
- 3.3.3 exchange of staff, most notably professionals and students
The Director of ICQHS is going to give some lectures at a course entitled Traditional Water Supplying Systems which is to take place at IHE-UNESCO in September 2008.
- 3.3.4 implementation of joint activities, such as workshops, conferences, training programmes, joint projects, field visits, software and data sharing, knowledge exchange and publications
- 3.4 Relationships with the UNESCO field office whose jurisdiction covers the country of location

ICQHS is in close relationship with UNESCO Tehran Cluster Office (UTCO). Most of our research and training activities are done under the supervision of this office such as:

- a. Publishing the book A Survey on the Qanats of Bam from Engineering Point of View*
- b. Preparing the country report of Qanats of Afghanistan, Iran and Pakistan*
- c. Holding the workshop on Groundwater Artificial Recharge and Rainwater Harvesting in Arid and Semi – Arid Regions of Asia*
- d. Holding the first international training course on Qanat; A Multidisciplinary Approach to Integrating Traditional Knowledge with Modern Development*

- 3.5 Relationship with the UNESCO National Commission and the IHP National Committee in the country of location

Director of ICQHS is member of IHP National Committee and regularly attends its meetings which are held every month in Tehran.

- 3.6 Relationship with other UNESCO-related networks, such as UNESCO Clubs, ASPnet, and UNESCO chairs

Some cooperation between ICQHS and UNESCO Iraq Office has just started in the field of training. Also, upon their recommendation we are in the process of translating some books for Iraqi experts.

4. Communication

- 4.1 Communication and knowledge dissemination activities undertaken in the framework of IHP

Herein ICQHS has taken some measures as follows:

- a. Putting forward a proposal on adding some information on Qanat to the primary schools textbooks*
- b. Getting on Iranian TV programs to describe the importance of Qanats and historic hydraulic structures in order to enhance the public awareness about the role of traditional water harvesting systems in sustainable development.*
- c. Teaming up with some directors in making some documentary movies about Qanats and historic hydraulic structures*

- 4.2 Policy documents and advice

5. Update on Centre Operations

- 5.1 Membership of the Board of Governors during designated period

The International center is administered by a Governing Board composed of:

- a. A representative of the Iranian Government.
- b. A representative of each of the other Member States that have sent the Director General of UNESCO notification, and make a substantial contribution to the operating budget or running of the international center, and are thus accorded a seat by a decision of the Governing Board.
- c. A representative of the Director- General of UNESCO.
- d. The Director of the Regional center on Urban water Management (RCUWM) Tehran.
- e. A representative of any other intergovernmental organization or international non governmental organization making a substantial contribution to the operating budget or running of the international center and accorded a seat by a decision of the Governing Board.
- f. The Minister of Energy (Minister in charge of water affairs) of the Islamic Republic of Iran or the person he designates.

The I.R. of Iran's minister of energy has designated deputy minister in water and wastewater affairs as the chairman of the governing board and has also invited the water-related ministers of the countries Pakistan, Afghanistan, Egypt, Oman, Italy, Spain, China, Iraq, and Germany to join the governing board. Fortunately, the minister's proposal was hailed by the countries Pakistan, Afghanistan, China, Italy and Iraq. Thus the first governing board meeting is going to take place in July 2008, with the presence of Dr. Nagy UNESCO's representative and the representatives of the countries China, Afghanistan, Pakistan,



* The governments of these countries have hailed having delegate in the governing board, but they have not nominated their representatives yet.

5.2 Key decisions made (attach minutes of meetings)

Given that the governing board meeting of ICQHS has not still been held, there is no minutes of meeting available.

6. Assessment of the Centre's Impacts

6.1 Science Impacts (Major contributions to the science, technology, education, and regional and/or international cooperation in the field of water)

Taking into account that ICQHS has not long been established, it seems early to judge its impacts on sciences.

6.2 Knowledge Transfer Impacts (Major achievements in the dissemination of knowledge and technology transfer)

Although ICQHS has been established recently, to date it could have made some progresses in disseminating knowledge and transferring technology through the following activities:

- *Training students: ICQHS set up the training center of Qanat where the traditional methods are handed down to tens of students learning how to protect and develop the system of Qanat.*
- *Documenting indigenous know how: ICQHS has sent out expeditions to gather traditional knowledge on Qanat through interviewing the elderly Qanat masters*

the last generation who are vanishing. The book *Qanat from Practitioners' Point of View* contains some of that information.

- *Holding technical workshops: ICQHS periodically holds technical workshops for those who are involved in groundwater or Qanat-related issues. These events are aimed at incorporating the indigenous knowledge into the new methods of construction, preservation, rehabilitation and operation of Qanat systems. Through such workshops the participants can get familiar with the significant role the Qanats can play in sustainable groundwater exploitation, and also with the cultural and technical values the system of Qanat carries.*

6.3 Policy Impacts (advice sought by government and other bodies and evidence of inputs into policy arena)

ICQHS started some negotiations at governmental level which eventually led to an official agreement between the Iranian Ministry of Energy and Ministry of Agriculture. This agreement emphasizes the necessity of training on Qanat technology that the experts of both ministries should receive from ICQHS. Also this agreement stipulates that both ministries should allocate a fund to research projects on different aspects of Qanats, which would be done by ICQHS.

7. future activities that will contribute directly to IHP and/or to WWAP

7.1 Operational Plan (2008-2009) (attach operational plan for 2008-09 if available)

ICQHS's future activities mostly pertain to research and training as follows:

a. future training activities: ICQHS is in the process of organizing a technical training course on Qanat for Iraqi experts, which will be held from 28 June to 11 July 2008. UNESCO Office for Iraq has recommended us to foresee such a training course to update the Iraqi experts on the methods of rehabilitating and repairing Qanat systems, in order to better preserve this technique in Iraq. The main objectives of the course are to:

- *incorporate the indigenous knowledge into the new methods of construction, preservation, rehabilitation and operation of Qanat systems.*
- *get familiar the Iraqi experts with the significant role the Qanats in Iraq can play in sustainable groundwater exploitation.*
- *get familiar the Iraqi experts with the cultural and technical values the system of Qanat carries.*

Another training activity which is under way is an annual international workshop on Qanat. This program is now on the agenda of the upcoming governing board meeting.

b. future research activities:

- *Preparation of the Methodology of the Atlas of: in case this project would be successfully finished, we can make use of this methodology in extending the work to other areas in order to prepare the world atlas of Qanats.*
- *A survey on the negative impacts of the developmental projects on Qanats and the ways to prevent the further destructions: This project is being done with the support of the Iranian ministry of energy (WRMO).*
- *Introduction of modern technology to operation and maintenance of Qanats: this project examines how to apply the modern technologies in the construction and maintenance of the Qanats.*
- *Groundwater Management in the Arid Regions; Some Lessons from Indigenous Knowledge: This project examines the situation of groundwater management in the arid regions of Iran as well as the ways through which we can incorporate some traditional methods into our modern groundwater management.*
- *A Survey on the Possibility of Generating Electricity out of the System of Qanat: this project takes up the interface of the renewable energy and sustainable exploitation of groundwater.*
- *A Survey on the Historical Effect of Qanat on the Scio-Political structures in Central Plateau of Iran*
- *A Survey on the Utilization of Qanat Water in Domestic Sector in Urban Societies (Case Study: Qanat of Dowlat Abad, Yazd and Qanats of Emamiye and Qasem Abad, Mashhad)*

- *The Role of Qanat in Settling the Human Communities and Creating the Agricultural Civilizations in Northern Khorasan*
- *History of Water and Irrigation in Northern Khorasan*
- *Traditional Water Management Systems in Northern Khorasan*

7.2 Strategic Plan linked with IHP-VII (attach strategic plan for 2008-11 if available)

Taking into account that the governing board meeting will take place next month, we are in the process of preparing the ICQHS's strategic plan in line with IHP-VII to put it on the agenda of the governing board. A copy of the strategic plan would be submitted to you, as soon as it would be finalized.

8. Annexes

8.1 List of publications released by the centre (there can be overlap with those listed in 2.2 above)

- *The book Qanat from Practitioners' Point of View*
- *The book A Survey on the Qanats of Bam from Engineering Point of View*
- *English version of the book A Survey on the Qanats of Bam from Engineering Point of View*
- *Country report of Qanats of Afghanistan, Iran and Pakistan*
- *The book Qanat of Zarch*
- *Proceedings of the workshop on Groundwater Artificial Recharge and Rainwater Harvesting in Arid and Semi – Arid Regions of Asia*
- *Proceedings of the first international training course on Qanat; A Multidisciplinary Approach to Integrating Traditional Knowledge with Modern Development*

8.2 List of training courses conducted (there can be overlap with those listed in 2.3 above)

- *Workshop on Groundwater Artificial Recharge and Rainwater Harvesting in Arid and Semi – Arid Regions of Asia*
- *First international training course on Qanat; A Multidisciplinary Approach to Integrating Traditional Knowledge with Modern Development*