

Format for Biennial Reports by UNESCO's Water-related Centres on activities related to the IHP in the period (June 2014 – May 2016)

1. Basic information on the centre

Name of the Centre		International Centre on Qanats and Historic Hydraulic Structures (ICQHS)
Name of Director		Mr. Hossein Ghafori
Name and title of contact person (for cooperation)		Mr. Majid Labbaf Khaneiki, Senior Expert
E-mail		info@icqhs.org / labbaf@icqhs.org
Address		Danesjoo Blvd., Yazd, Iran, Postal Code:891-618-8117
Website		www.icqhs.org
Location of centre		city/town <u>Yazd</u> country <u>Iran</u>
Geographic orientation *		<input checked="" type="checkbox"/> global <input type="checkbox"/> regional
Region(s) (for regional centres)		
Year of establishment		2006
Year of renewal assessment		2012
Signature date of most recent Agreement		10 October 2014
Themes of activities during reporting period	Focal Areas ·	<input checked="" type="checkbox"/> groundwater <input type="checkbox"/> urban water management <input type="checkbox"/> rural water management <input checked="" type="checkbox"/> arid / semi-arid zones <input type="checkbox"/> humid tropics <input type="checkbox"/> cryosphere (snow, ice, glaciers) <input type="checkbox"/> water related disasters (drought/floods) <input type="checkbox"/> Erosion/sedimentation, and landslides <input type="checkbox"/> ecohydrology/ecosystems <input type="checkbox"/> water law and policy <input checked="" type="checkbox"/> social/cultural/gender dimension of water <input type="checkbox"/> transboundary river basins/ aquifers <input type="checkbox"/> mathematical modelling <input type="checkbox"/> hydroinformatics <input type="checkbox"/> remote sensing/GIS <input type="checkbox"/> IWRM <input type="checkbox"/> Watershed processes/management <input type="checkbox"/> global and change and impact assessment <input type="checkbox"/> mathematical modelling <input checked="" type="checkbox"/> water education <input type="checkbox"/> water quality <input type="checkbox"/> nano-technology <input type="checkbox"/> waste water management/re-use <input type="checkbox"/> water/energy/food nexus <input type="checkbox"/> water systems and infrastructure <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"/> public outreach <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"/> data-sets/data-bases development

* check on appropriate box
 · check all that apply

	<input type="checkbox"/> other: (please specify) _____
Support bodies ¹	Ministry of Energy, Islamic Republic of Iran
Hosting organization ²	Ministry of Energy, Islamic Republic of Iran
Sources of financial support ³	Ministry of Energy, Islamic Republic of Iran
Existing networks and cooperation ⁴	
Governance	<input checked="" type="checkbox"/> director and governing board <input type="checkbox"/> other: (please specify) _____ Link to election of board members to the IHP Intergovernmental Council (IGC) and hosting country IHP National Committee _____ Frequency of meetings: once every 1__year(s) <input checked="" type="checkbox"/> Existence of UNESCO presence at meetings
Institutional affiliation of director	Ministry of Energy, Iran Water Resources Management Company
Number of staff and types of staff	total number of staff (full-time, or equivalent) : ____8_____ number of staff who are water experts: ____5_____ number of visiting scientists and postgraduate students: ____9_____
Annual turnover budget in USD	250,000 USD

2. Activities undertaken in the framework of IHP in the period June 2014 – May 2016

2.1 Educational activities (i.e., those with accreditation) that directly contributed to the IHP-VIII (Appendix 1) and WWAP

• *ICQHS organized a 2 week workshop on qanats and architecture in November 2014 in cooperation with Ecole Spéciale d'Architecture (ESA), National School of Higher Studies in Nature and Landscape Architecture (ENSNP) from France and School of Art and Architecture of the University of Yazd. This workshop tried to bring innovative solutions to local city officials and the public for the preservation of the active qanats and the revival of the abandoned ones. The objective was to bring awareness and policy change to an ancient water infrastructure that was at the origin of the city. The ten-day workshop brought together forty people, structured around four multidisciplinary research teams that each studied a specific territory based on the hydrology and hydrogeology of the region.*

2.2 Research activities that directly contributed to the IHP-VIII activities

• *ICQHS conducted a comprehensive study on 11 prominent qanats across Iran. In 2014, ICQHS submitted the study reports on these qanats to the representative of the Iranian Cultural Heritage Organization in order to complete the dossier of Persian qanat for its nomination for the UNESCO world heritage list.*

• *The book "Qanat of Zarch" was published in 2014 by ICQHS. This book embodies the result of ten years of research on the qanat of Zarch which has been nominated for UNESCO world heritage list as well.*

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

- ICOMOS book on Cultural Heritages of Water was published in 2015 in 301 pages, to which ICQHS contributed by writing a chapter entitled "Overview on Technical and Cultural Heritage of Qanats in Bam Region (Iran)".
- ICQHS has embarked on Comprehensive Studies on the Qanat of Arooneh Ardestan. This Study is planned to be conducted in order to prepare a file for nomination of this qanat for UNESCO world heritage list.
- ICQHS has launched the Comprehensive Studies on the Qanat of Cheshmeh Soleymaniyeh in Kashan. This study is also supposed to come up with required information for nomination of this qanat for UNESCO world heritage list.
- India City Heritage Network through UNESCO Delhi Office asked the International Center on Qanats and Historic Hydraulic Structures to take part in a study project on preservation and restoration of qanats in Bidar and Bijapour in Karnataka state in India. For the first phase of this project, the center's senior expert carried out a thorough investigation on those qanats between 11 and 20 February 2015, and then submitted the final report.
- ICQHS has started a study project on reinforcing qanats in urban areas. This project is aimed at finding feasible technical solutions to the problem of qanats being damaged by urban sprawl.
- ICQHS contributed to the journal of "Culture of People" and teamed up with them to publish a volume specific to qanat.
- ICQHS accomplished a study on possible connections between qanat and tourism and the result of this study came out in the shape of a book entitled "Qanat Tourism" in 2015.
- The other books that ICQHS published between June 2014 and May 2016 are as follows:
 "Verbal History of Nahreyn Tabas"
 "Rain Claiming Legends"
 "Amazing Hydraulic Structures in Qayen"

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

- On 30 April and 1st May 2014, graduate students of Tehran University paid a visit to the center and attended a short course to get familiar with qanats and other historic hydraulic structures.
- A one day training course was held on 26 April 2014 for the students of French high school in Iran in order to acquaint them with qanat system.
- A one day training course was organized at this center on 13 July 2014 to acquaint the tour leaders with qanat and other historic hydraulic structures.
- ICQHS held a short training course on 29 September 2014 for the students of architecture at the university of Yazd to acquaint them with qanat and other historic hydraulic structures. This workshop was part of ICQHS training program for universities.
- ICQHS also held a training workshop at this center between 8 and 9 October 2014 on "the necessity of preservation and maintenance of historic hydraulic structures" for 100 experts from Yazd province.
- Training course on UNESCO world heritage was held at ICQHS in 2014 for the consulting engineers companies. This course was aimed at promoting the knowledge of some consulting engineers companies who are working on the nomination projects of Iranian qanat in order to facilitate their studies.
- Workshop on "Climate Change, Qanat and Society" was held on 24 November 2015 at the University of Tehran, Faculty of Geography. This workshop examined the relationship between climate change and qanat its origin and evolution. This workshop was part of the ICQHS training program for universities.
- A roundtable on "Qanat for Future" was held by ICQHS in Mehriz, Yazd on 27 May 2015 in cooperation with Iran Water Wisdom Institute in line

with the serial sessions on water, culture and society. Population growth, urbanization and disproportional economic and social development increasingly make water management and governance face new problems, or perpetuate the former challenges. Therefore our complicated water problems need a vast cooperation from different sectors to be settled, and this roundtable was organized for this purpose.

- *ICQHS hold a special panel on indigenous water technologies during the International Conference on society, natural resources, water and environment at the University of Tehran, 27-28 October 2015.*

- *IWA Workshop on Evolution of Qanat and Relevant Hydraulic Technologies took place between 8 and 10 November 2015 in Yazd, Iran. The main objective of this workshop was to pool the researches recently done on the historical origin of qanat and its technical and social evolution. The workshop delved further into the secret of qanat sustainability throughout human history, and tried to provide answers to the following questions: How could qanat enhance humans' adaptability to their changing environment? How can qanat still help to retain balance between human and nature? This workshop was attended by 22 international and 12 Iranian scholars. International participants came from the countries Germany, USA, Algeria, Tunisia, France, Italy, Canada, Netherlands, Morocco, Greece, China and Iraq.*

- *ICQHS hold a special panel on qanat during the International Conference on Tourism Branding, 3-4 January, 2016, Isfahan, Iran. This panel examined the two elements of qanat and tourism as well as the relationship between them. The panel delved into the urban values revolving around qanat, including traditional architecture, which can be brought to the fore in tourism sector especially in the Iranian desert cities. According to the panel, qanat is a genius technology which has made it possible for humans to exist and flourish in such a dry environment. This panel suggested adding new functions to the existing qanats in order to better justify their existence and guarantee their preservation. One of these functions is tourism in qanat. In other words, tourism and its revenues can give rise to more motivation for maintaining qanats. On the other hand, qanat as a new tourism attraction can help develop the tourism sector.*

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. Also ICQHS is in close contact and cooperation with IWA (International Water Association), and their collaboration is manifest in such program as the Workshop on Evolution of Qanat and Relevant Hydraulic Technologies.

ICQHS is in close contact with UNESCO Regional Centre on Urban Water Management (RCUWM – Tehran). Also, ICQHS has close cooperation with UNESCO-IHE, so that it teamed up with UNESCO-IHE to organize a short course on world history of water management. Moreover ICQHS has participated in several international events such as:

- *Participation in the 7th World Water Forum in South Korea. Our center actively participated in this event by giving two scientific presentations and organizing a technical exhibition at the UNESCO pavilion.*

- *Participation in the international conference on water history, Delft*

- *Participation in a round table on qanat and natural tourism in Paris. At this round table, ICQHS tried to bring up its recent findings regarding qanat and tourism*

- *Contribution to the national congress on irrigation and drainage in Mashhad, Iran, 13 May 2015*

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)

- *Participation in the 21th session of the UNESCO-IHP intergovernmental council in Paris between 18 and 20 June 2014*
- *Participation in Regional workshop on "Promoting Interaction and Knowledge Exchange between UNESCO Natural Sciences related Centres and Chairs in Asia and the Pacific". This workshop took place on 26-27 May 2015 in Kuala Lumpur, Malaysia, and the center's representative gave a lecture on the center's capacities and potentials. Following this workshop, International Knowledge Centre for Engineering Sciences and Technology (IKCEST) under the Auspices of UNESCO invited ICQHS to participate in the Big Data Technology Application and Knowledge Service.*
- *Participation in "Water, People and Cooperation: Perspectives from the UNESCO Water Family in the context of climate change, 2 December 2015, UNESCO Pavilion, Le Bourget, Paris*
- *Participation in the meeting of UNESCO Water Centres and Chairs: a vision to the 2030 Agenda, 3 December 2015, UNESCO, Paris*

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

3.3.2 exchange of information on activities such as training/educational materials, and funding opportunities

ICQHS is in close contact with UNESCO-IHE and we have jointly organized some training workshops so far. At the last governing board meeting of ICQHS, Dr. Laszlo Hayde, as the UNESCO-IHE representative elaborated the possible ways to tighten the tie between UNESCO-IHE and ICQHS. Cooperation between IHE and ICQHS is not unprecedented, for example the short course on water management history held in Yazd proved that our cooperation can yield fruitful results.

3.3.3 exchange of staff, most notably professionals and students

As a lecturer ICQHS senior advisor participates in the training course on world history of water management which takes place at UNESCO-IHE every year.

Also ICQHS dispatched one of its experts to the International Knowledge Centre for Engineering Sciences and Technology (IKCEST) which is a UNESCO category 2 center in China in order to participate in the International Training Workshop 2015 on Big Data Technology Application and Knowledge Service. The training workshop aimed at helping developing countries cultivate talent and build capacity in the field of information technology and improving the data aggregating, processing, mining, analyzing capabilities of professionals to better support sustainable development.

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 and regional 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.

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

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

There are some cooperation and links between ICQHS and UNESCO Delhi Office in India in terms of a research project on the qanats of Karnataka.

4. Communication

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

Herein ICQHS has taken some measures as follows:

- a. Conducting a research project on some materials on qanat which have been added to the primary schools textbooks*
- b. Getting on Iranian media 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 documentary movies and animations about Qanats and historic hydraulic structures*
- d. Holding short training courses for school and university students in order to acquaint them with the values of historic hydraulic structures*

- 4.2 Policy documents and advice

5. Update on Centre Operations

- 5.1 Membership of the Board of Governors between designated period

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

- a. A representative of the Iranian Government, who is the Minister of Energy of the Islamic Republic of Iran or the person he designates.*
- b. A representative of each member state whose membership has been approved by the governing board.*
- c. A representative of the Director- General of UNESCO.*
- d. A representative of any other intergovernmental organization or international non-governmental organization making a substantial contribution to running of the international center and accorded a seat by a decision of the Governing Board.*

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 some qanat holding countries. The first governing board meeting took place in July 2008, with the presence of Dr. Nagy UNESCO's representative and the representatives of the countries Iraq, China, Afghanistan and Pakistan. The Second Governing Board meeting of ICQHS was held in Yazd-Iran, 23 November 2009. The meeting was attended by the representatives of Azerbaijan, Iraq, UNESCO, Regional Centre on Urban Water Management (RCUWM – Tehran), Director of ICQHS, the chairperson of the governing board and UNESCO's representative.

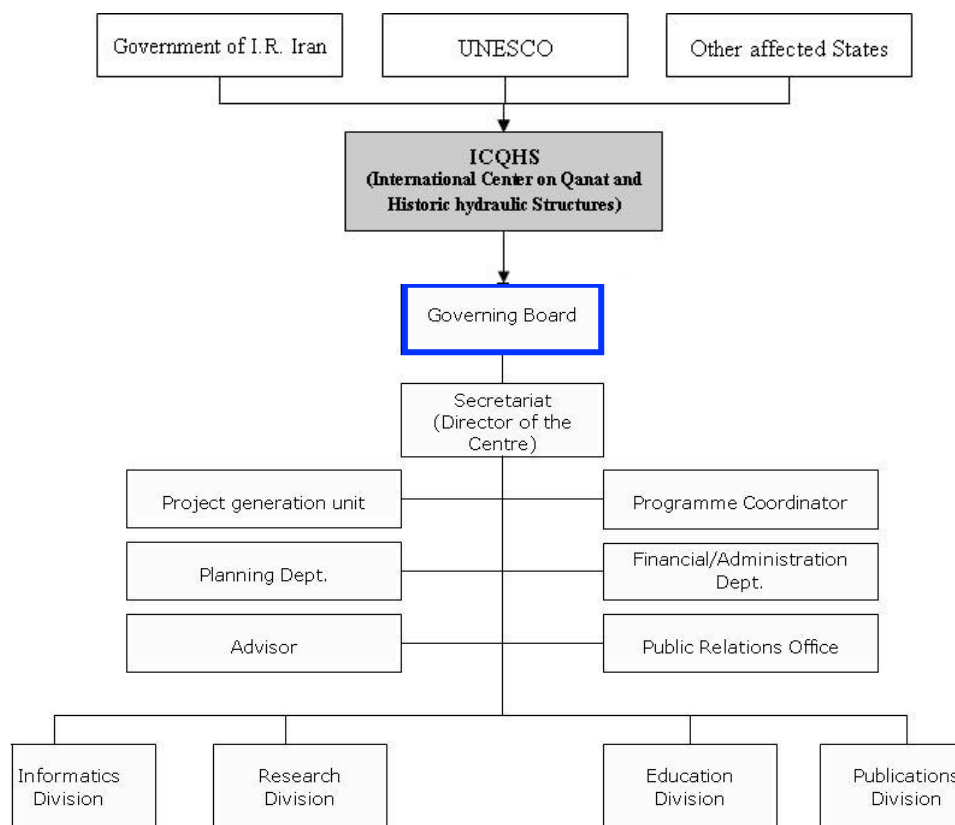
Third Governing Board meeting of ICQHS was attended by UNESCO representatives of member countries such as Japan, China, Iraq, Syria and Algeria. The 4th Governing Board Meeting (4GB) of ICQHS was attended by country members & Director of UNESCO-IHP at Tehran- Energy Ministry Building on 18 December 2011.

Afterward the 5th governing board meeting of the International Centre on Qanats and Historic Hydraulic Structures (ICQHS) was held on 24 October 2013 in Morocco. Morocco is among the countries which place a high value on historic hydraulic structures and they are striving to revive qanat as sustainable groundwater exploitation system. This meeting was attended by representative of UNESCO, representative of Iranian ministry of energy as the chairperson of the governing board, and the representatives of member states including China, Iraq, Algeria, Azerbaijan and Morocco and also observers from Germany, Italy, Oman and Switzerland and representative of Iranian ministry of agriculture. The main topics on the meeting agenda revolved around the evaluating and developing of activities of ICQHS during 2012-2013 and discussing ICQHS plans for 2014. Also at this meeting common grounds for further cooperation was on the agenda in terms of qanats and historic hydraulic structures, and the members and observers delivered their reports on the present situation of historic hydraulic structures in their esteemed countries.

The 6th governing board meeting of ICQHS was held in Iran, Yazd, at the building of the International Center on Qanats and Historic Hydraulic Structures on 8 November 2014. This meeting was attended by the Chairperson of ICQHS governing board, Deputy Minister of Energy for water and wastewater affairs Islamic Republic of Iran, Representative of Iranian Ministry of Agriculture, UNESCO representative from UNESCO Tehran Cluster Office, and representatives of the countries Iraq, China, Azerbaijan and Algeria. Also observers from Iran, Oman, Tunisia and France participated in this meeting.

Eventually According to the article 7 of the agreement signed between UNESCO and the government of the Islamic Republic of Iran, the 7th governing board meeting of ICQHS was held in the International Center on Qanats and Historic Hydraulic Structures, Iran, Yazd on 8 November, 2015. The meeting was attended by Chairperson of ICQHS' GB, representative of UNESCO, and representatives of the countries Algeria, Iraq and China, and also attended by observers from Iran, Greece, Tunisia, the Netherlands, Canada, and Algeria.

The organizational chart of ICQHS is as follows:



5.2 Key decisions made (attach minutes of meetings)

The last (7th) governing board meeting of ICQHS was held in the International Center on Qanats and Historic Hydraulic Structures, Iran, Yazd on 8 November, 2015. The final resolution of the last GB meeting was as follows:

1- ICQHS Acting Director's proposal on the current budget was approved by the GB members. A budget of 2 billion Iranian Rial was agreed for the year 2016 which should be allotted to personnel salary, remuneration, meeting fee, publications, holding workshops and GB meeting, national or international missions and other expenditures. This budget was agreed to be provided through research and study contracts and receiving financial aids and gifts. The GB also called on the Iranian ministry of energy to envision a permanent current budget for ICQHS.

2- It was agreed that a measure would be taken to promote the activities of ICQHS in virtual space and on internet in order to raise public awareness. ICQHS was asked to look into the possibility of setting up an international network on qanat.

3- It was agreed that ICQHS would strengthen its relationship and cooperation with other UNESCO water family members such as UNESCO-IHE.

4- It was stressed that the project of "Qanats of India" as an important international program would be continued and accomplished through dispatching the experts of ICQHS and effectively teaming up with its partners: Indian Heritage City Network Foundation (IHCNF) and Deccan Heritage Foundation (DHF).

5- It was agreed that memorandums of understanding would be signed with University of Yazd, Ministry of Energy Transboundary Rivers and Shared Water Resources Bureau, and Khozestan Water and Power Organization, on mutual interested subjects.

6. Evidence 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)

Publications of ICQHS are playing an important role in enhancing public awareness about qanat system and rational exploitation of groundwater, not only in the host country, Iran but also in the other qanat holding countries.

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

ICQHS could to date 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. Also pupils and university students are periodically trained by ICQHS.*

- 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.*

- 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. Also ICQHS took the lead to organize a qanat committee including representatives of the ministries of agriculture and energy and the cultural heritage organization in order to achieve a convergence between those involved in qanats. Also, ICQHS has put forward a proposal to the Iranian ministry of energy on modifying the existing water fair distribution law in favor of qanats and having it ratified in the parliament in terms of qanat and protection of this ancient legacy against groundwater over-exploitation and structural damages.

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

7.1 Operational Plan (attach if available)

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

- Disseminate world experiences on various aspects of Qanats and historic hydraulic structures;*
- Incorporate the indigenous knowledge into the new methods of construction, preservation, rehabilitation and operation of Qanat systems as well as historic hydraulic structures;*
- Turn Qanats into an interdisciplinary tool where the traditional know-how and the modern techniques work together;*
- Acquaint experts with the importance of cultural and technical aspects of historic hydraulic systems as well as the community life linked to these systems.*
- Study the cooperative capacity of qanat system in arid lands and its role in sustainable development.*

7.2 Strategic Plan linked with IHP-VIII (Appendix 1). Focal areas within IHP-VIII the centre plans to contribute to and specific actions the centre will undertake to align its activities with the strategic plan for IHP-VIII

Due to global changes, a considerable number of aquifers over the world are subjected to over exploitation. Qanat is one of the rational groundwater exploitation methods. In this regard ICQHS participated in the construction of new qanats in Azerbaijan and rehabilitation of qanats in Iraq and India in cooperation with these countries, which is in line with focal area 2.1, theme 2, the Eighth Phase of IHP.

Global warming could have given rise to climate changes in many parts of the world to a large extent over the past decades. Some regions are struck by destructive floods and unprecedented torrential downpour, whereas some other regions are in the grip of severe droughts. In some areas, the snow coverage is shrinking, resulting in a dramatic decrease in snow melt and the amount of surface streams. Permanent streams are turning into seasonal runoffs, and seasonal runoffs are drying out over time. In such areas the demand for water is still on the rise, though their surface streams are diminishing. Therefore the residents of these areas resort to extracting groundwater which is more reliable to supply water to domestic and agricultural sectors. What may immediately flash through our mind is that pumped well is the best way to abstract groundwater, but our past experiences in arid and semi arid regions tell that such regions are subject to over-exploitation of groundwater and depletion of aquifer accordingly.

In some arid zones, groundwater used to be extracted by the system of qanat over the past centuries without causing any drawdown in water table. Therefore ICQHS is trying to introduce the traditional know how of qanat to the regions which turning arid and becoming short of surface streams. Qanat never threatens groundwater resources and ensures sustainable utilization of groundwater, so it deserves to be introduced to the areas in need of groundwater. This goal is being achieved by holding scientific gatherings, publishing books and articles, etc, which lie within Focal area 2.3 - Adapting to the impacts of climate change on aquifer systems. Most of the ICQHS plans and activities lie within THEME 2: GROUNDWATER IN A CHANGING ENVIRONMENT with a focus on the focal areas 2.1, 2.3 and 2.4. ICQHS plans and activities would meet these focal areas through the following measures:

- *Research*
- *Training*
- *Technology Transfer*
- *Scientific Gathering*
- *Publication*
- *Cooperation with other countries and organizations*

8. Annexes

8.1 List of publications released by the centre (there can be overlap with those listed in 2.3 above)

- A- The book Qanat from Practitioners' Point of View*
- B- The book A Survey on the Qanats of Bam from Engineering Point of View*
- C- English version of the book A Survey on the Qanats of Bam from Engineering Point of View*
- D- Country report of Qanats of Afghanistan, Iran and Pakistan*
- E- The book Qanat of Zarch*
- F- Proceedings of the workshop on Groundwater Artificial Recharge and Rainwater Harvesting in Arid and Semi – Arid Regions of Asia*
- G- Proceedings of the first international training course on Qanat; A Multidisciplinary Approach to Integrating Traditional Knowledge with Modern Development*
- H- Veins of Desert*
- I- Qanat in its Cradle*
- J- Qanat Practitioners of Kerman Province*
- K- Proceedings of TKWRM Conference*
- L- The book Qanat Tourism*
- M- The book Verbal History of Nahreyn Tabas*
- N- The book Rain Claiming Legends*
- O- The book Amazing Hydraulic Structures in Qayen*

8.2 List of training courses conducted (there can be overlap with those listed in 2.1 above)

- A- A 2 week international workshop on qanats and architecture, November 2014*
- B- Short course on qanats and historic hydraulic structures for graduate students of Tehran University, 30 April and 1st May 2014*
- C- A one day training course on qanat system for the students of French high school in Iran, 26 April 2014*
- D- Training course on qanat and tourism for tour leaders, 13 July 2014*
- E- Short course on qanats and historic hydraulic structures for the students of architecture at the university of Yazd, 29 September 2014*

- F- Training workshop on "the necessity of preservation and maintenance of historic hydraulic structures" for 100 experts from Yazd province, 8 - 9 October 2014*
- G- Training course on UNESCO world heritage for the consulting engineers companies, 2014.*
- H- Workshop on "Climate Change, Qanat and Society", University of Tehran, Faculty of Geography, 24 November 2015*
- I- Roundtable on "Qanat for Future", Mehriz, Yazd, 27 May 2015*
- J- Special panel on indigenous water technologies during the International Conference on society, natural resources, water and environment, University of Tehran, 27-28 October 2015*
- K- IWA Workshop on Evolution of Qanat and Relevant Hydraulic Technologies, Yazd, Iran, 8 - 10 November 2015*
- L- Special panel on qanat tourism during the International Conference on Tourism Branding, Isfahan, Iran, 3-4 January 2016*

Appendix 1

Agreed Minutes Of the 7th Governing Board Meeting International Center on Qanats and Historic Hydraulic Structures (ICQHS) 8 November 2015 Yazd, Iran

According to the article 7 of the agreement signed between UNESCO and the government of the Islamic Republic of Iran, The 7th governing board meeting of ICQHS was held in the International Center on Qanats and Historic Hydraulic Structures, Yazd on 8 November, 2015. The meeting was attended by the following honorable members:

Members:

● Algeria

Mr. Taha Ansari, National Agency of Hydraulic Resources (NAHR), Adrar, Algeria

● I.R. Iran

Mr. Rahim Meydani, Deputy Minister of Energy for Water and Wastewater, Chairperson of ICQHS' GB

Mr. Hossein Ghafari, Acting Director, ICQHS

● Iraq

Mr. Herish Karim, Ministry of Water Resources (KRG)

● China

Gofur Nurettin Tolmbok, the Bureau of Hydrology and Water Resources of Xinjiang, Xinjiang Karez Study Society Urumqi, China

● UNESCO Tehran Cluster Office

Ms. Tala Vahabzadeh on behalf of Ms. Niloofar Sadeghi, UNESCO Representative

Observers:

- a. Mr. Parastar, Ministry of Jihad-e Agriculture, Iran
- b. Mr. Andreas Angelakis, International Water Association (IWA), Greece
- c. Ms. Feirouz Megdiche, University of Sousse, Tunisia
- d. Mr. Laszlo Hayde, UNESCO-IHE, the Netherlands
- e. Ms. Ingrid Hehmeyer, Ryerson University, Canada
- f. Mr. Talebian, Iranian Cultural Heritage, Handicraft and Tourism Organization, Iran
- g. Mr. Papoli Yazdi, Amirkabir Research Institute, Iran
- h. Mr. Henk van Schaik, ICOMOS, the Netherlands
- i. Mr. Abdolkarim Dahmen, Algeria

Opening

Mr. Ghafari, Acting Director, ICQHS-Yazd

Mr. Ghafari as the acting director of ICQHS warmly welcomed the participants to the 7th governing board of ICQHS and thanked the board for responding positively to the invitation of ICQHS. He stressed the importance of governing board meetings which can pave the way for ICQHS to take more effective steps.

Mr. Ali Asghar Semsar Yazdi, ICQHS Senior Advisor

Mr. Ali Asghar Semsar Yazdi, ICQHS Senior Advisor and former director of ICQHS introduced the participants.

Ms. Vahabzadeh, UNESCO Representative

Ms. Vahabzadeh represented UNESCO Tehran Cluster Office, on behalf of Ms. Niloofar Sadeghi. She started her talk with appreciating the lively participation of the GB

members, and called for continuation of their support to ICQHS and its activities. According to her, ICQHS is one of the exemplary UNESCO water centers and its mandate falls well under the six themes of IHP IHP-VIII, 2014-2021, and this center has grown to take a pioneering role in enhancing our knowledge about traditional water systems which can still play a role in solving our today's problems. She added that ICQHS's role will be rising even more. Growing population, climate change issues and the groundwater resources that are pressurized more than ever are driving us to turn to the legacy of water knowledge left from our ancient civilizations. She mentioned the Sustainable Development Agenda recently signed by 193 members of the United Nations, which bears witness to the fact that the whole world aspires to a better, safer and greener future for all, and water traditional knowledge still has an outstanding place in this global movement. She expressed hope for ICQHS to continue its endeavor to come up with a remedy especially for groundwater shortage which is lurking the future of some poor countries, and then she assured that UNESCO and its International Hydrological Programme stands ready to support ICQHS in this respect.

Mr. Talebian, Iranian Cultural Heritage, Handicraft and Tourism Organization

Mr. Talebian started his speech with expressing his gratitude to Mr. Meydani, Mr. Ghafori and all the GB members for their concern about qanats and other historic hydraulic structures. He pointed out the efforts ever made by the Iranian Cultural Heritage, Handicraft and Tourism Organization in cooperation with ICQHS to nominate eleven prominent qanats of Iran for UNESCO World Heritage List. He appreciated the assistance of ICQHS in gathering and compiling the required information in order to prepare a comprehensive dossier to be submitted to UNESCO. He spelled out the procedure of the selection of those qanats and their significance among the other Iranian qanats. He added that the nomination of Persian qanat for UNESCO world heritage list was a good opportunity to publicize the importance of taking care of water resources just as our ancestors used to do, in such a critical situation we live. That was why the issue of qanat became a common ground for the ministry of energy and Cultural Heritage, Handicraft and Tourism Organization to establish their cooperation in the qanat nomination project. The nomination project opened up a new opportunity for us to turn to the selected 11 qanats by taking a drastic rehabilitation measure. Now these qanat are in perfect condition. He considered this project as a great success for the Islamic Republic of Iran and also for ICQHS.

H.E. Mr. Rahim Meydani, Chairperson of GB and Deputy Minister of Energy, I.R. Iran

H.E. Mr. Meydani thanked the GB members for kindly accepting the invitation of the International Centre on Qanats and Historic Hydraulic Structures to attend its 7th Governing Board Meeting. He contended that the GB participants' concern about qanat bodes well for the future of this ancient technique, a future in which humans would rethink their relationship with nature and decide to use the rest of the groundwater resources more rationally. He said that the establishment of ICQHS could draw more attention to water traditional knowledge and technology in the country, which is in the first place indebted to the support of UNESCO-IHP from the very beginning of ICQHS's establishment. He also appreciated UNESCO Tehran Cluster Office for their generous continuous support to ICQHS and its activities, and then alluded to some activities whose implementation was impossible without the support and cooperation of UTCO, Iranian Ministry of Energy and Cultural Heritage, Handicraft and Tourism Organization. Mr. Meydani continued his speech with saying that "water management based on structural engineering" has been phased out in the world, and now the idea of "water management based on society and history" is catching on instead. This is called "social engineering" for sustainable water resources management. He also pointed out the importance of qanat in sustainable water supply systems in the arid and semi-arid regions of Iran throughout the history. According to him, qanat encompasses a variety of traditional knowledge from engineering to architecture to management, which can still provide us with valuable lessons if we really wish to regain our harmony with nature. He expressed hope that ICQHS could successfully exhibit the innermost value of these lessons and figure out how to cope with our new challenges with the help of these traditional lessons in systematic combination with our modern sciences and technologies. He assured that the ministry of energy places a high value on such activities and never withholds its support from ICQHS. Now the ministry is trying to step up its financial support to ICQHS in order to pave the way for its research and educational programs.

Country reports and remarks by GB members

Representatives of Algeria, Iraq and China gave informative presentations on the situation of qanats in their esteemed countries, and representative of Ministry of Jihad-e Agriculture touched on the measures ever taken by this ministry to maintain qanats in Iran:

Mr. Taha Ansari, Algeria:

Mr. Taha Ansari informed the meeting of an inventory that has recently been prepared on Algerian fogarra (qanats). This inventory contains all the basic information of the qanats still running in Algeria. This inventory has listed 1942 qanats throughout the country and these qanats are running only in three regions. He added that all the shaft wells of these 1942 qanats have been pinpointed and marked on GIS maps by GPS technology, which can make it much easier for the authorities to preserve and maintain the qanats. He said that these qanats are being used mostly to irrigate the palm trees, and still have economic importance in those regions. He also suggested cooperation between Algerian and Iranian ministries to share their information and knowledge on this issue.

Mr. Herish Karim, Iraq:

The representative of Iraq briefed the meeting on the present situation of water resources in Iraq, and he stressed the urgent need to take effective steps to save the future of groundwater resources in this country. He pointed out the booming developmental projects in the neighboring countries especially in Turkey as the culprit. According to him, these projects are mushrooming just across the border and their demand for water is on the rise. Therefore the transboundary rivers are being intensively dammed in order to quench the insatiable thirst of such projects, and accordingly less and less water is entering the country. As a result, the surface water scarcity has driven our people to resort to the groundwater resources in order to supply the same water they once used to obtain from the surface sources. Overpumping of groundwater is bringing about a dramatic depletion in our aquifers which means a fearful blow to the existing qanats in Iraq.

Mr. Gofur Nurettin Tolmbok, China:

He explained the measures ever done or under way on qanat system in China. He introduced a book recently published in China, which has resulted from a five year study and elaborates the qanats of Xinjiang. According to the latest census, there are 470 qanats still in active use in China. Nevertheless the qanats are suffering from the undue pressure put by the tireless industrialization and modernization. He reported on a detailed study recently done on 4 qanats in order to provide the information required for their preservation. According to him, a proposal was put forward to the Chinese government to preserve and refurbish these qanats, and fortunately the proposal met the approval of government and since 2010 a rehabilitation project has been launched.

Mr. Parastar, Ministry of Jihad-e Agriculture, Iran

Mr. Parastar talked about the "Joint Professional Committee of Qanat" the initiative taken by ICQHS to make a stronger convergence and synergy between all the Iranian entities which are somehow responsible for qanat: ministry of energy, ministry of agriculture and Cultural Heritage, Handicraft and Tourism Organization. He said this committee has played an effective role in avoiding any possible overlapping, duplication or disagreement between the aforesaid entities in terms of qanats. He continued with a short report on the measures taken by the ministry of agriculture on qanat. According to him, now 14 percent of our agricultural products is tied to qanats, and 18 percent of the total water supplied to agricultural sector comes from qanats. Since 1998, the Iranian government has allocated a special budget to the maintenance of qanats, and this year some 6.3 million dollars has been allotted for this purpose. From 1998 on, this budget made it possible for us to rehabilitate 22000 qanat across the country. We have also prepared the comprehensive qanat program for five years, and a syndicate for qanat workers (muqqani) is now on our agenda.

Director's report on implemented activities in 2014-2015

Mr. Ghafari the acting director of ICQHS briefed the board on the activities done during the year 2014-2015 by classifying them into six categories as: research, training,

technology transfer, scientific gatherings, publication and cooperation with other countries and organizations. In each category, he spelled out numerous activities carried out by ICQHS from 2014 to 2015. For example he started his speech with introducing the book "Qanat of Zarch" and "Qanat Tourism" recently published by ICQHS. He then talked about the Training workshop on qanats and architecture which was held in November 2014 in cooperation with Ecole Spéciale d'Architecture (ESA), National School of Higher Studies in Nature and Landscape Architecture (ENSNP) and School of Art and Architecture of the University of Yazd. This workshop tried to bring innovative solutions to local city officials and the public for the preservation of the active qanats and the revival of the abandoned ones. The objective was to bring awareness and policy change to an ancient water infrastructure that was at the origin of the city. Beside some projects conducted by ICQHS, he talked about a project on "Qanats in India". He said that India City Heritage Network through UNESCO Delhi Office asked ICQHS to take part in a project on preservation and restoration of qanats in Bidar and Bijapur in Karnataka state in India. For the first phase of this project, the center carried out a thorough investigation on those qanats between 11 and 20 February 2015. He then mentioned the comprehensive studies conducted by ICQHS on the nominated Iranian qanats for UNESCO World Heritage List, and this study made up the final dossier that was later submitted to UNESCO by Iranian Cultural Heritage, Handicraft and Tourism Organization. Mr. Ghafari also listed some scientific events, gatherings and meetings either attended or organized by ICQHS in the framework of its activities and missions.

UNESCO-IHE representative

Mr. Laszlo Hayde, UNESCO-IHE representative started his speech with a brief history of IHE. According to him the main vision of IHP is to help people to manage their water resources in a sustainable manner. Afterwards he elaborated the activities of IHP which fall into three categories of education, capacity building, and research and innovation. He added that cooperation between IHE and ICQHS is not unprecedented, for example the short course on water management history held in 2012 in Yazd proved that our cooperation can yield fruitful results. He said that water management without history does not make sense, and ICQHS can play a crucial role in this context. He welcomed any suggestion from ICQHS for further cooperation on the common grounds between IHE and ICQHS.

Remarks by GB Participants

Mr. Andreas Angelakis, International Water Association (IWA), Greece

He suggested publishing some books on the connection between qanat and other issues such as security, etc, the same as ICQHS has done for the book "Qanat Tourism".

Ms. Feirouz Megdiche, University of Sousse, Tunisia

She contended that qanat system exists in many countries and it is very difficult to deal with them locally. She suggested establishing an international qanat network through which qanat related information can be exchanged quickly and effectively. According to her, there are many helpful experiences in the qanat holding countries which can inspire other countries or enhance the efficiency of their ongoing projects.

Mr. Abdolkarim Dahmen, Algeria

Dr. Dahmen recommended more visibility on internet for ICQHS. He said at the moment the presence of ICQHS on web space is not very strong and it needs to be promoted. Internet professionals can help ICQHS to become more visible on web, which favors one of the center's goal to enhance public awareness about qanat and its values.

Mr. Papoli Yazdi, Amirkabir Research Institute, Iran

Dr. Papoli made distinction between qanat and other world wonders by saying that qanat has underlain a civilization and without qanat there would be nothing in these regions but nomadism. He then added that we should also approach "qanat" from the angle of security in Iran. Qanat can play a vital role in civil defense, so we should maintain at least some qanats for this purpose. For example if the pipe line that is conveying water from Isfahan to Yazd would be broken down for any reason, the whole city would come to a standstill. Most of the Iranian desert towns are fully dependent on the external water resources, and this vulnerable situation can be alleviated by qanats.

Mr. Henk van Schaik, ICOMOS, the Netherlands

He said that this meeting has stressed the importance of heritage for water managers, but from our standpoint water is also important for heritage managers.

Final resolutions

- 6- ICQHS Acting Director's proposal on the current budget was approved by the GB members. A budget of 2 billion Iranian Rial was agreed for the year 2016 which should be allotted to personnel salary, remuneration, meeting fee, publications, holding workshops and GB meeting, national or international missions and other expenditures. This budget was agreed to be provided through research and study contracts and receiving financial aids and gifts. The GB also called on the Iranian ministry of energy to envision a permanent current budget for ICQHS.
- 7- It was agreed that a measure would be taken to promote the activities of ICQHS in virtual space and on internet in order to raise public awareness. ICQHS was asked to look into the possibility of setting up an international network on qanat.
- 8- It was agreed that ICQHS would strengthen its relationship and cooperation with other UNESCO water family members such as UNESCO-IHE.
- 9- It was stressed that the project of "Qanats of India" as an important international program would be continued and accomplished through dispatching the experts of ICQHS and effectively teaming up with its partners: Indian Heritage City Network Foundation (IHCNF) and Deccan Heritage Foundation (DHF).
- 10- It was agreed that memorandums of understanding would be signed with University of Yazd, Ministry of Energy Transboundary Rivers and Shared Water Resources Bureau, and Khoozestan Water and Power Organization, on mutual interested subjects.

Date and venue of the 8th GBM

Dr. Andreas Angelakis suggested holding the 8th GB meeting of ICQHS concurrently with the next IWA workshop in 2017. This workshop is supposed to take place either in China, Algeria or Azerbaijan. His suggestion was approved by the meeting.

Signatories:

Mr. Taha Ansari, National Agency of Hydraulic Resources (NAHR), Adrar, Algeria

Mr. Meydani, Chairman, ICQHS and Deputy Minister of Energy for Water and Wastewater Affairs, Iran

Mr. Herish Karim, Ministry of Water Resources (KRG), Iraq

Gofur Nurettin Tolmbok, the Bureau of Hydrology and Water Resources of Xinjiang, Xinjiang Karez Study Society Urumqi, China

Ms. Niloofar Sadeghi, UNESCO Representative