

# INTERNATIONAL CASE STUDY

## WATER COOPERATION BETWEEN OMAN AND THE NETHERLANDS

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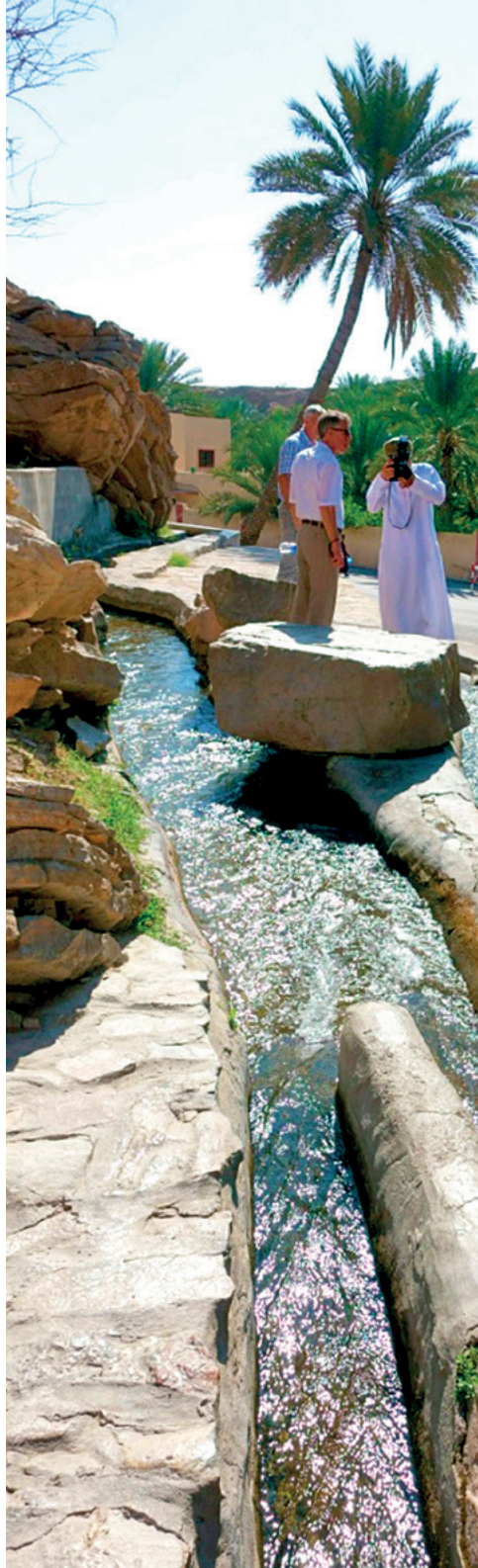
■ Like the Netherlands, Oman faces huge challenges in the field of water management. Therefore an intensified relationship and cooperation with the Netherlands has been started a year ago. A mutual Taskforce was established to solve the water problems by learning from each other. This article describes the water challenges of Oman and highlights the recent developments in the cooperation between Oman and the Netherlands. Oman, just as the Netherlands, has an old tradition on water management. The centuries old falaj system to this day provides for example date palm cultivation and villages with water. With a sundial the gates of a sophisticated irrigation system are opened or closed. It is possible to buy or sell water rights if necessary. But also Oman has an extensive modern drinking water system based on desalination, a system of recharge and retention dams and reuses most of its waste water. In Oman living with water is, like in the Netherlands, of the utmost importance. Due to Climate Change, economic growth and a growing population maintaining an adequate supply of water for agricultural and domestic use is one of Oman's most pressing issues. The article shows that, although the water situation in both countries differs, there are many possibilities to exchange knowledge and ideas in the field of water governance and water management. At the same time the article shows how such a cooperation process can be set up.

### Oman, some facts and figures

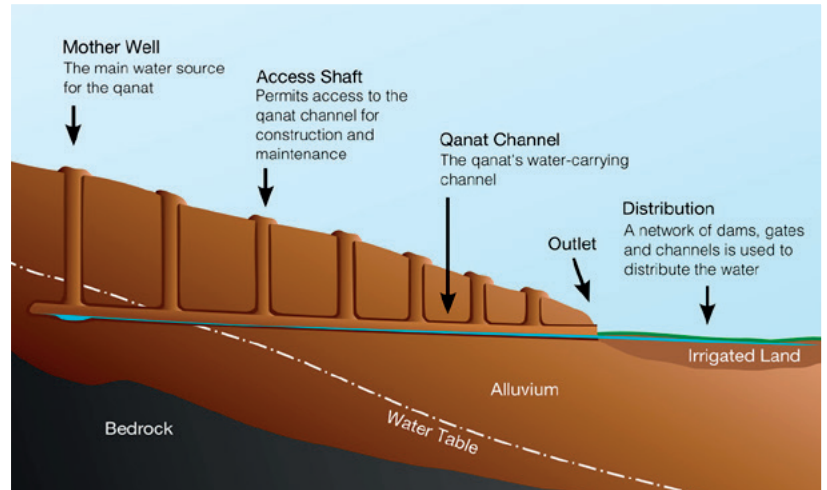
Oman is a country in the Middle-East that is approximately eight times as big as the Netherlands. Oman was a British protectorate from 1891 till 1971. The country is now a sultanate, Sultan Qaboos bin Said Al Said is head of State. The Sultan is advised by the Majlis of Oman, that consists of two chambers. The lower, advisory Council and the higher Council of State. The 84 members of the advisory Council are chosen by the people every four years and the 58 members of the higher Council are appointed by the Sultan. There are no political parties in Oman and the candidates are chosen on their personal title. Women do have passive and active voting rights. Under Sultan Qaboos's leadership Oman

modernized and built schools, hospitals, infrastructure and irrigation projects. The population is almost 3,500,000 people. With 9 habitants per km<sup>2</sup> Oman is one of the lowest populated countries in the world. The population is rapidly growing and will probably double the next twenty years. About 30% of the population are migratory workers and almost 80% of the Omani people work for the government (in the Netherlands: 11%). Actually Oman's economy is strongly dependent of the oil and gas production. More than 45% of GDP comes from this sector and for the Government income this is even 80%. By fluctuations of the oil price on the international markets this can bring substantial risks so Oman tries to diversify its economy.

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Division of irrigation systems



Falaj system



Sundial Rustaq





**Recharge dam, also for mitigating floods.  
Black pillars protect shafts of falaj system of flooding**

Water is a scarce good in Oman, as it consists of arid and semi-arid regions with average rainfall annual of 125 mm. Due to Climate change at the same time tropical cyclones with destructive effects will become more common in Oman. In June 2007 super Cyclone Storm Gonu claimed the lives of 49 people and caused US\$4 billion damage. In June 2010 Cyclone Phet hit the country, killing 21 people and causing US\$780 million in damage.

For the water facts the following figures are important.<sup>1</sup> The urban Omani population in 2015 was 77.6% of total population, with an urbanization rate of 8.54% annually. 0.26% of the country is cultivated (arable land as well as permanent crops). 590 km<sup>2</sup> is irrigated, using available ground- and surface water through – centuries-old – falaj systems and wells. 83% of the country is plain desert, sand, and gravel plains, 14% mountains and 3% coastal area. Day time temperatures are high, generally above 30 degrees and seasonally above 40 degrees, temperatures above 50 degrees, which are already normal in the deserts, are expected all over the country. Desalinated water provides for the largest share of potable water. The country's total renewable water resources are 1.4km<sup>3</sup>/year. These are only from internal renewable water resources, meaning that it does not receive any fresh water from other countries through rivers or other flows, and come from

precipitation and groundwater flows, as the peninsula is surrounded by seas/oceans.

Water demand exceeds renewable resources by 31%. This water deficit results in declining water levels in lower catchments, saline intrusion on coastal aquifers, declining falaj flow and abandonment of wells, falaj and farms in many areas. Freshwater use is 1.32 km<sup>3</sup>/yr of which 7% is used domestically, 2% industrially, and 91% in agriculture. Oman has 43 aquifer recharge dams, with 93.5 million m<sup>3</sup> of total storage capacity. 14 of those dams were only built after 2006. While Oman is a dry country, it does get a small share of South Asia's Summer monsoons in the South. More than 95% of the population has access to safe drinking water and 97.3% of urban and 94.7% of rural population have access to improved sanitation facilities. In 2006, 37 million m<sup>3</sup> of wastewater was treated and reused. Treated wastewater is only used for irrigation.

Oman wants to diversify its economy with the aim of reducing the oil sector's contribution to GDP from 46% at present to 9% by 2020. Tourism and gas-based industries are key components of the government's diversification strategy. Agriculture currently makes up 1.4% of total GDP (and consumes 91% of (ground) water resources), while industry and services make up 52% and 46.6% respectively.



## Overview of the key Omani water sector institutions

This overview, that is important because of the intention of an improved interconnection and cooperation and data-sharing between the institutions, is as follows.

**MINISTRY OF REGIONAL MUNICIPALITIES AND WATER RESOURCES:** Is the main government institution responsible for the management of water resources. This includes the enhancement of infrastructure and public services, as well as a sound management of water resources and services. It is the main legislator regarding water issues. They thereby take into account environmental and health concerns as well.

**PUBLIC AUTHORITY FOR ELECTRICITY AND WATER (PAEW):** This institute is the public organisation that assures the supply of potable water and electricity to all of Oman. Its tasks comprise of distributing water

across the state, expanding the supply of water to provide access to all its inhabitants, developing water plants and networks, setting rules, etc. It encourages the private sector to invest in construction, ownership, operation maintenance and development of water and electricity projects.

**OMAN POWER AND WATER PROCUREMENT (OPWP):** The OPWP is responsible for the procurement and supply of sufficient power and desalinated (potable) water in Oman. It delivers to the Public Authority for Electricity and Water, and is owned for a small percentage by the government, while for the most part it is privately owned. OPWP plans according to projected demand, presented in their 7-year plans. The latest one is for 2016-2022. These 7-year plans are also the basis for tenders to contract parties to meet demand. The OPWP could be seen as the (mostly) private counterpart of the PAEW, where the OPWP secures water supply to the PAEW.

**MAJIS INDUSTRIAL SERVICES (MISC):** MISC is mainly responsible for industrial water procurement from desalinated water. Sometimes, it is supplied by OPWP.

**OMAN WATER SOCIETY (OWS):** The OWS is an NGO consisting of professionals working in both the Omani public and private sector and is involved in management and supply of water, as well as projects supporting those. It is mainly a platform to exchange ideas and research and brainstorm about challenges.

**MINISTRY OF ENVIRONMENT AND CLIMATE AFFAIRS:** Protection of the environment and conservation of natural resources

**MINISTRY OF AGRICULTURE AND FISHERIES (IRRIGATION):** It's three main tasks are:

- 1 Setting and implementing the policies for the development and exploitation of agricultural, livestock, and living water resources.
- 2 Preparing the draft laws and regulations related to the management and exploitation of agricultural, livestock, and fisheries.
- 3 Developing investment in the fields of agriculture, livestock and fisheries.

**HAYA WATER:** Haya Water is a registered trademark of Oman Wastewater Services Company (SAOC) and was established in December 2002 as a closed stock owned by the Government of the Sultanate of Oman, and has been awarded the concession to develop, design, implement, operate and maintain the wastewater facilities in Muscat Governorate in accordance with the Royal Decree No. 69/2005.

**LOCAL FALAJ AUTHORITIES:** Falaj protection and maintenance, water distribution and allocation

### Challenges of Omani water sector

The challenges the Oman water sector is facing are:

- balancing water uses to water availability
- adopting improved irrigation techniques and selecting appropriate crops to reduce agricultural water use further.
- managing water resources effectively and efficiently (IWRM)
- increasing the use of treated waste water and desalinated water
- minimizing water pollution, flood damages and drought consequences

- provision of sufficient water to spur and sustain economic
- provision of access to safe, adequate and affordable water supply and sanitation
- protecting the groundwater resources in qualitative and quantitative terms
- creating and cultivating conservation awareness
- establishing an integrated program for the conservation and management of the resources at basin level
- controlling urban water losses
- using rainwater harvesting techniques for remote areas whenever possible.

These huge challenges make that Oman's water strategy is based on the pillar that water will remain the most valuable and vital resource of the nation. Therefore new techniques like fog collection and cloud seeding are already applied in some parts of the country.

### Water Cooperation between Oman and the Netherlands

Facing the many challenges in Oman in the field of water governance and water management culminated in an official request from the Omani government to the Netherlands, well-known for its water knowledge, for intensifying the cooperation on water management between the two nations. As a response to this, the Netherlands Ambassador in Oman took the initiative to bring together some high level representatives from the Dutch water sector and prepared for a reconnaissance mission to Oman begin March 2017. In the Netherlands this was co-ordinated by the Netherlands Water Partnership. The main objective for this mission can be described as follows: *'To reinforce the water related contacts between the two countries and explore concrete opportunities for water cooperation'*. The composition of the Dutch mission team was as follows: Sybe Schaap (Chairman of the Netherlands Water Partnership (NWP) and Senator, Albert Vermuë (General Director Dutch Water Authorities, and Secretary General of the European Union of Water Management Associations), Pieter van der Zaag (Professor of integrated water resources management at the UNESCO-IHE Institute for Water Education in Delft), Bas Pulles (Director International Programs at the Netherlands Enterprise Agency), Erik Bouwmeester (Ministry of Infrastructure and the Environment) and Koen Overkamp (Senior Project Manager Netherlands Water Partnership).

During this meeting a lot of issues have been discussed: water governance (limited cooperation among the various water sectors, low enforcement of rules), water





### Facilitated discussion three layer model

resource management (rapidly growing demand for water, need for better spatial planning and zoning), water and agriculture (increasing water efficiency, greenhouse cooling), drinking water (leakage control, lack of applied research), waste water and sanitation (backlog in infrastructure development), research and development (lack of funding) and capacity building (need for capacity building and more training). The high level team observed real enthusiasm in Oman to cooperate with the Netherlands on specific topics like cooperation, technical knowledge, stakeholder involvement, data sharing and so on. Oman has well organized water institutions with a clear mandate and due to the population growth there is high pressure on water resources and service delivery (drinking water and waste water). The outcome of the visit was to intensify the cooperation by creating a joint Taskforce composed of key persons from the Omani and the Dutch water sector. It was amongst others also agreed to start a joint dialogue on water governance, to create twinning arrangements with Dutch Utilities, to update water resource data and to increase water efficiency in date palm farming.

### Visit Dutch expert team in November 2017 to Oman

In November 2017 a Dutch team that was composed of Joke Goedhart (Secretary-Director of Regional Water Authority De Stichtse Rijnlanden), Maarten Hofstra (former employee of RWS) Herman Havekes

and Paul Langeveld (both Dutch Water Authorities) visited Oman for a short water governance survey. The team visited several water projects in Oman, met with key persons of Oman's water sector and organized a water governance workshop with all key stakeholders. The final result of this workshop was a recommendation to Omani government, that was discussed and commented upon by all the partners. The base for this recommendation is found in the well-known three layer model<sup>2</sup> and the content is as follows.

#### OVERARCHING RECOMMENDATIONS

Due to the location of the country, the fact that there is no life without water, and facing the rapid population growth and rapid developments in all sectors, climate change and the already existing water deficit:

- Make water a top priority in Oman, similar to the way the Netherlands work with the Delta programme.
- Establish a high water council. In the Netherlands we have a steering group chaired by our highest level, the minister. Maybe in Oman it could be established within Supreme Council for Planning (SCFP).
- The council will need a clear mandate on planning, regulating, monitoring the implementation and finance on all the issues related to the water sector.

## Recommendations Three Layer Model

### 1 CONTENT LAYER

- Oman has lots of good sector plans, but they are not always interconnected. Working together horizontal by making plans and implementing plans is of great importance.
- Monitoring is part of the agenda of the water sector. There are lots of data, but exchange of information can be improved, for instance by a central database.
- Capacity building and vocational education on water should be strengthened, technicians as well as the other levels of the organizations.

### 2 INSTITUTIONAL LAYER

- The existing legislation is scattered and needs integration and an update to keep pace with the developments.
- Match the finance priorities with the water priorities. If water is essential for Oman, as you showed to us, there should be sufficient finances.
- Also make it rewarding to become more efficient. Every organization needs incentives, so let them keep their cost savings for future investments.
- Full cost recovery in Oman is not realistic. But consideration about improvements is desirable. Overuse of water in for instance the agricultural sector should be discouraged and innovations could be rewarded. The use of financial incentives could be considered.

### 3 RELATIONAL LAYER

- Support for a sustainable water policy needs awareness of all the important stakeholders in and outside the water sector. The water sector needs to reach out. Make a ministry leading on this item.
- The Aflaj system is a could example of stakeholder involvement. And there are more associations of stakeholders. They can be used by stimulating the awareness. Participation of other stakeholders as tourism, industry, households, etc. could be strengthened by the establishment of more water user associations.

This outcome illustrated once again that the three layer model is a very suitable approach to discuss water management and water governance issues with one another.

## Taskforce meeting April 2018

From 3 to 5 April 2018 a Taskforce meeting was organized in The Hague. The composition of the Omani delegation was as follows: H.E. Mohammed Al Mahrouqi (Chairman – Public Authority of Electricity and Water), Dr. Said Al Habsi (Director General Water Resources Assessment – Ministry of Regional Municipalities and Water Resources), Dr. Hamood Al Hasni (Director General for Agriculture & Fisheries Research – Ministry of Agriculture and Fisheries), Eng. Hussain Abdulhussain (CEO Haya Water – Waste Water Treatment Company), Mrs. Zainab Al Balushi (Minister Plenipotentiary International Cooperation Department – Ministry of Foreign Affairs), Eng. Salim Al Mamary (Planning and Project Manager – Oman Water Society & Majis Industrial Water Company) and Dr. Ali Al Maktoomi (Soils, Water and Agricultural Engineering – Sultan Qaboos University).

The composition of the Dutch delegation was almost the same as in March 2017. Mrs. Joke Goedhart, Mrs. Marrieke Oversteeg of the Dutch Embassy in Oman and Herman Havekes, Dutch Water Authorities, joined the meeting. In connection with the official Taskforce meeting a varied program for the Omani delegation was organized. Presentations were given by the NWB Bank, the Association of Regional Water Authorities and the Water Information and Data Centre. Visits were brought to UNESCO-IHE, Amsterdam Waternet, Water Authority De Stichtse Rijnlanden and KWR. At the end of the meeting NWP organized a networking reception where Dutch companies could meet the members of the Omani delegation. About 15 firms were present.

The meeting of the Taskforce started with an inspirational pitch of Henk Ovink, the Dutch water envoy, on the global water problems and challenges. Mr. Ovink stressed three main messages to the delegations : increase water awareness, mitigate risks to prevent disasters and innovate in the water sector. The formal agenda for the Taskforce consisted of four elements: water governance, research and development, human resources and projects/technology. During the meeting concrete next steps have been drawn up, a lot of them have a technological character (waste water treatment sludge, recovering of valuable raw materials from waste water, water efficiency in agriculture, etc.) In connection with water governance Oman is interested in finding a better way to involve important stakeholders in water management, both in law as in practice, like in the Netherlands. Besides that Oman wants to establish a comprehensive system for the exchange of essential water data. Concrete appointments have been made on all these issues and it was agreed that a next Taskforce meeting will be arranged in Oman within a year to evaluate progress and to exchange new ideas and experiences. The Netherlands is interested in the way Oman faces the challenge of climate change and severe droughts.





## Closing remark

The recent water cooperation between Oman and the Netherlands shows that although the circumstances are totally different – In Oman dams are built to prevent raindrops flooding in the Ocean and in the Netherlands most of the raindrops are transported immediately to the Northsea – there is a lot of room for learning from each other. The challenges may differ, the solutions can be quite familiar. That counts especially for the field of water governance (invalid cooperation between institutions, lack of funding, low stakeholder involvement and law enforcement), the field of data collection and exchange and human resources/capacity building. In the technological field as well sharing knowledge and experience can be valuable for both countries. Although it's too early for a thorough analysis now, the cooperation learns that water governance and water management challenges can connect countries.

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## SAMENVATTING

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Oman staat voor enorme uitdagingen op het terrein van het waterbeheer. Om die reden is een goed jaar geleden een nauwe samenwerking met Nederland gestart, die onder meer tot de oprichting van een gezamenlijke Taskforce heeft geleid. Door gebruik te maken van de Nederlandse kennis en ervaring en door van elkaar te leren kunnen water problemen worden opgelost. Dit artikel geeft een overzicht van de uitdagingen waar Oman voor staat en van de samenwerking tussen beide landen. Op zich is het nog te vroeg om deze samenwerking te analyseren, maar het artikel laat zien dat, alhoewel de watersituatie in beide landen totaal verschillend is, op het terrein van water governance en waterbeheer toch veel van elkaar geleerd kan worden.

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- 1 Partly borrowed from E.J. Saaf, *Brief on cooperation between the Sultanate of Oman and the Netherlands in the water sector*, October 2016, Leiden.
- 2 See for this model Maarten Hofstra, *Water Governance, a Framework for better communication*, Water Governance 01/2013, p. 9-13, and the booklet *Building Blocks for Good Water Governance*, Water Governance Centre, The Hague 2016, p. 9-21.