CORPORATE SOCIAL RESPONSIBILITY REPORT **2016**

COMMUNICATION OF PROGRESS
- OUR ACTIVITIES IN 2016
- OUR FOCUS IN 2017

The expert in **WATER ENVIRONMENTS**

DHI

CHIEF OPERATING OFFICER STATEMENT

The 17 global Sustainable Development Goals (SDGs) are broken down into 169 targets and more than 200 indicators. It is an ambitious agenda with clear targets to reach and monitoring mechanisms to follow up. At DHI, we are ambitious in our contribution towards fulfilling the objectives of the 17 SDGs of the 2030 Agenda for Sustainable Development, with particular focus on SDG 6: 'Ensure availability and sustainable management of water and sanitation for all'.

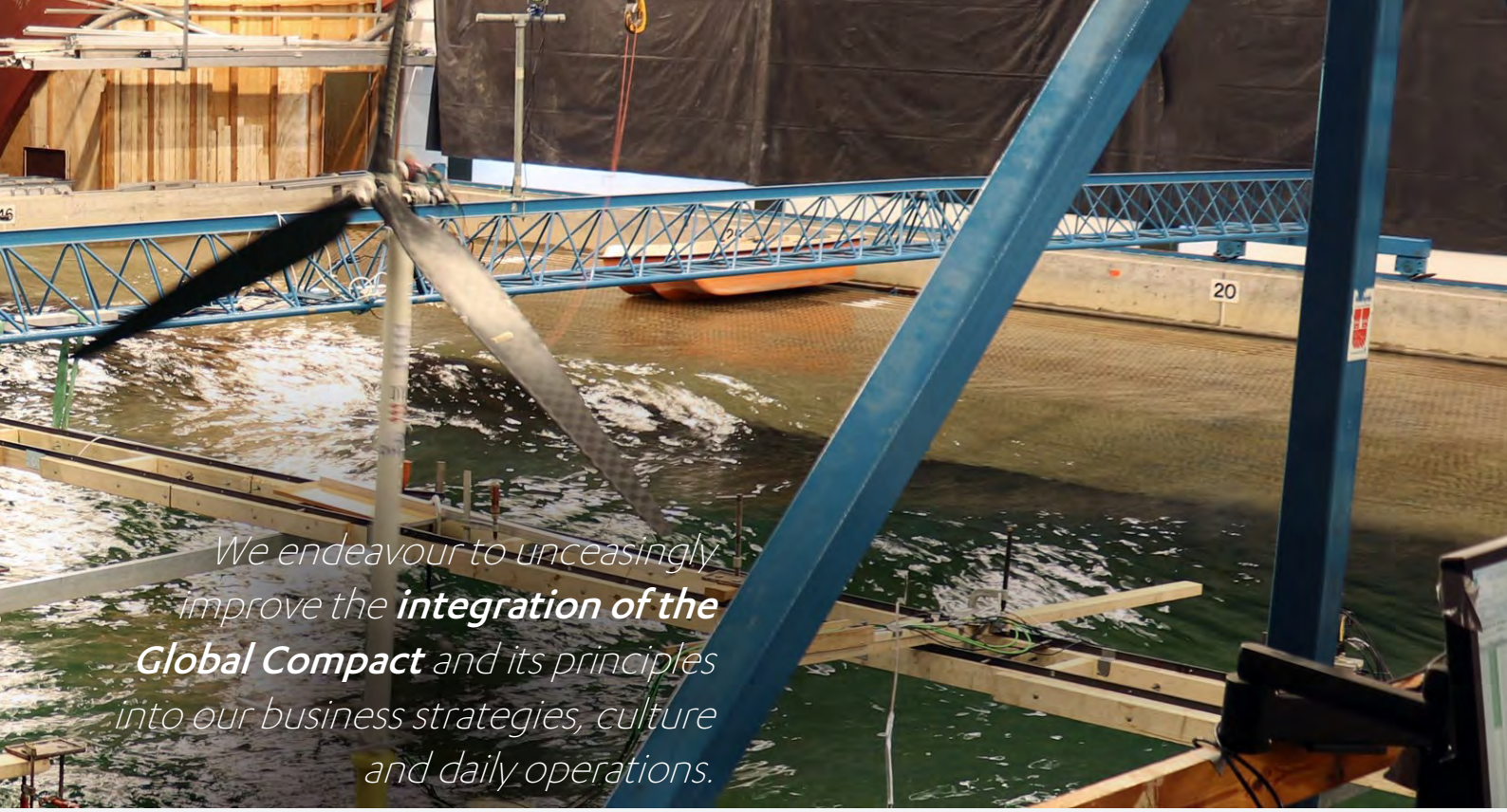
Water, however, is an important cross-cutting element connecting many of the SDGs—even when it is not explicitly mentioned in a specific one. In this year's Communication of Progress (COP), we have therefore chosen to showcase specific examples of how DHI technology and solutions support the development towards selected individual targets under the SDGs.

We are not alone in our quest to solve the world's toughest challenges in water environments. We team up with clients, partners, universities, as well as public and private organisations to develop innovative solutions that can support sustainability and avoid water from being the limiting factor for development. We believe that knowledge holds the key to unlocking the right solutions, but knowledge can only be worth something if it's shared. This is why sharing knowledge and technology is one of our CSR focus areas.

We will continue our strong support for the United Nations (UN) Global Compact's efforts in the areas of human rights, labour, environment and anti-corruption. We are pleased to reaffirm this commitment from DHI. We endeavour to unceasingly improve the integration of the Global Compact and its principles into our business strategies, culture and daily operations.

Yours sincerely,

Jacob Høst-Madsen
Chief Operating Officer



INTRODUCTION

Corporate sustainability stems from a company's value system, beliefs and principled approach in conducting businesses. Since joining the UN Global Compact in 2013, we have been aligning our strategies and activities to its ten principles, meeting fundamental responsibilities in the areas of human rights, labour, environment and anti-corruption.

As a responsible business with more than 30 offices around the world, we believe that establishing a culture of integrity – and being responsible to the world we live in – is core to achieving long-term success. This Communication of Progress is our third annual report since joining the UN Global Compact. We are pleased to share our results and achievements.

The UN Global Compact is a guiding framework for us to:

- carry out Corporate Social Responsibility (CSR) initiatives within DHI Group and ensure that our business partners support and are in line with the Compact's principles
- communicate effectively with the world around us – because upholding social responsibility and conveying its importance in the work that we do, matters
- maintain a meaningful dialogue with our staff, clients and external business partners

This report is produced for the purpose of:

- explaining our progress to the UN
- communicating our messages, challenges and achievements to various stakeholders
- describing the actions we have taken to implement the UN Global Compact principles to our staff, as well as to others who have an interest in CSR and social responsibility efforts

CORPORATE SOCIAL RESPONSIBILITY (CSR)

At DHI, we contribute to our CSR through three focus areas:

- Improving the environment
- Responsible business practices
- Sharing knowledge and technology

Our global activities support the 17 UN Sustainable SDGs. In the coming period, we will increase our focus on supporting the SDGs through our global operations.

IMPROVING THE ENVIRONMENT

*Our **Projects** have ushered in considerable environmental, social and economic benefits.*

OUR ACTIVITIES IN 2016

Our projects described below provide concrete examples of how we have helped solve the world's toughest challenges in water environments. Each of these projects has ushered in considerable environmental, social and economic benefits in their respective areas.

African wetlands are among the most productive and biologically diverse ecosystems in the world, but they are also experiencing immense pressure from human activities. A consortium led by DHI GRAS was selected by the European Space Agency to lead a major initiative to provide Earth Observation methods and tools for the implementation of the Ramsar Convention on Wetlands in Africa. The GlobWetland Africa Project will help African authorities make the best use of satellite-based information to understand and monitor wetland conditions over time. Ultimately, GlobWetland Africa aims to enhance the capacity of African stakeholders to develop their own national and regional wetland observatories.
Elblag city, in north-eastern Poland along the Elblag river basin near the river mouth to the Vistula Lagoon, is located in an area with unfavourable hydrological regime. It is threatened by floods caused by heavy rainfall and blackflow from the Lagoon. To reduce potential losses caused by massive flood events, Elblag city authorities needed to implement a flood forecasting system to enable early warning for the citizens of Elblag. Our team developed a local monitoring and flood response support system to help Elblag authorities protect lives and better manage flood risks within the city.

Heavy rains cause sewers to overflow and may result in urban flooding. In Denmark, we were in involved in a 'Water Smart Cities' project to provide water utilities and municipalities with better tools for climate change adaptation. The project was a collaboration between DHI, the Technical University of Denmark (DTU), Krüger, Ramboll, the Danish Meteorological Institute (DMI) and the four largest water companies in Denmark: HOFOR, Aarhus Water, VCS Denmark and BIOFOS. The aim of 'Water Smart Cities': To develop and test intelligent software technologies for more efficient planning when cities are challenged by heavy rains and flooding in the future.

In recent years, the Hungarian cities of Tát and Tokod have been under threat of urban flooding. The European Environmental Agency together with Norway Grants, had previously approved a programme that will help solve the cities' water concerns. The goal was to increase knowledge about the effects of climate change, take the first steps at climate adaptation in the region and mitigate the damages caused by extreme rainfalls. Our team's expertise in surface water, groundwater and urban water systems came into play when we provided a storm water conceptual plan, which has helped improved flood protection measures and overall management of storm water in the cities.

The Communauté d'Agglomération de Pointe à Pitre (CAP) territory in France is in constant threat of flooding, particularly in the urban areas. As a result of climate change, localised storms and high quantity of rainfall, water rises rapidly – resulting in extreme floods. To mitigate this, we developed a flood early warning system to help with timely decision-making. The system automatically collects rainfall information and launches a simulation process, enabling risk predictions within a 24-hour period. The system also allows easy identification of flood sectors. With the prediction and identification of impending flood locations, operators could now take necessary measures to mitigate flood impacts.

In Turkey, we helped to develop the first-ever integrated real-time flood early warning system for the country. Over the past 20 years, more than 600 flood events in Turkey have led to disastrous consequences: 500 lives lost and irreparable damage to properties. With a flood forecasting system, authorities could now predict the severity of a flood event due to extreme weather conditions or seasonal precipitation and the snow melting process. Our flood alert system can help estimate flood inundation and map risk areas, and enables authorities to implement disaster prevention measures faster and more efficiently.

In Slovakia, we collaborated with Stengl a.s. to spearhead the first nation-wide project of flood hazard and flood risk mapping in line with the European Union Floods Directive. Slovakia, as a European Union member state, is required to establish flood risk management plans. These plans indicate that the country has put in place measures to manage flood risks and mitigate effects should flood events occur. The nation-wide project spanned 559 geographical areas across Slovakia. With our technology and data, we were able to help Slovakia implement cost-efficient flood protection measures and increase overall safety for its citizens.

Also in Slovakia, we provided flood risk assessments of a construction site in accordance with BREEAM's assessment indicators. BREEAM, short for Building Research Establishment Environmental Assessment Method, is a leading sustainability assessment method for the planning of projects, infrastructure and buildings. To carry out the modelling of flood risk, DHI utilised available historical, geological, topographical data as well as design documentation of the proposed construction. All possible sources of flood risks to the building were accurately identified and accessed, and this helped the developer determine possible scenarios and ways to mitigate potential flood impacts.

Jakarta has been increasingly threatened by flooding from a combination of land subsidence, rising sea levels and higher river levels due to increasing rainfall intensity and land-use changes within the catchment areas. UNEP-DHI, together with Climate Technology Centre and Network (CTCN) and Jakarta Research Council (JRC), collaborated on a project to provide technical assistance to mitigate the impacts of flood in densely populated Jakarta. Among the objectives of the technical assistance is to better assess flood risks and hazards, and design climate-resilient pathways to reduce the magnitude and scale of the impacts from flooding.

The Hongshui river basin in China, located in the Northeast of Shandong province has faced threats to its continuous development over the years. Due to increasing demands from a rapidly growing population, industry and agriculture, as well as insufficient water management measures, the river basin is increasingly running out of water. DHI created an integrated water resources management (IWRM) system to help authorities reverse these effects and rejuvenate the ailing basin. The model-based decision support system developed for the IWRM is a highly efficient tool to simulate various management scenarios. This enables authorities to assess and identify economically efficient and socially responsible combinations of resource management measures.

ClassNK, a ship classification society dedicated to ensuring the safety of life and property at sea, was seeking to develop small-scale marine sites in Singapore. This was for testing tidal power generation (TPG) devices through the Renewable Energy Integration Demonstrator Singapore project (REIDS). Due to the small-scale development and limited project footprint, the project required an Environmental Impact Study (EIS), as opposed to a full-scale Environmental Impact Asssessment (EIA). The series of technical and environmental studies we provided supported the development and eventual approval of the tidal energy test sites.

In Malaysia, we developed a Decision-Making and Support System (DMSS) to help authorities operate a range of structures along the Muda River, the longest river in the state of Kedah. The system was developed for the Drainage and Irrigation Department of Malaysia. The DMSS applies real-time meteorological and hydrological data from the catchment area, combined with an existing flood forecasting system, to provide a basis for deciding on the most appropriate management of the infrastructure in flood and drought situations. This project directly contributed to more efficient flood and drought management in the area.

We enhanced Zimbabwe's existing Zambezi Water Resources Information System (ZAMWIS) to create an interactive, web-based spatial database and information portal for the Zambezi Watercourse Commission. The project is part of a larger effort to strengthen ZAMWIS, and will later include a Decision Support System (DSS) component. The DSS will improve water resources management and development planning, scenario analysis and decision-making, as well as real-time flow forecasting and monitoring, along with basin optimisation. Overall, the aim of enhancing ZAMWIS is to support the decision-making and planning processes in the Zambezi River Basin for the benefit of human and economic development.

In Kenya, UNEP-DHI led the Transboundary Water Assessment Programme (TWAP) to assess 286 river basins, and made the results available on an interactive online portal. TWAP was initiated by the Global Environment Facility to create a baseline assessment of the world's transboundary water resources. This is to support: science-based benchmarking and knowledge exchange, identification and classification of water bodies at risk, and increased awareness of the importance and state of transboundary waters. TWAP is by far the most comprehensive assessment of the world's transboundary river basins, identifying basins at risk from a variety of issues, covering water quantity, water quality, ecosystems, governance and socio-economics and risk to deltas.

OUR FOCUS IN 2017

In 2017, we will continue our focus on improving the environment by continuing to develop and deliver services and products that help solve water challenges related to global urbanisation. This includes using water more efficiently, reducing energy consumption, helping cities adapt to climate change and increasing wastewater treatment efficiency.

We will also offer more services and technologies to help solve challenges in the industrial water sector. This includes using water more efficiently, re-using water and developing water-free production methods. In addition, we will continue to develop advanced decision support technology for water management.

In 2017, we resolve to implement an environmental policy which sets out the framework for environmental management – with objectives and measurable targets to be achieved by all DHI offices worldwide.

RESPONSIBLE BUSINESS PRACTICES

We have reaffirmed our commitment to ***ensuring responsible business practices*** *throughout our organisation.*

OUR ACTIVITIES IN 2016

In 2016, we have integrated a requirement to recognise and follow a Code of Conduct as part of the qualification process when subcontracting. This process will help improve the process of assessing CSR impacts during the subcontractor qualification phase and convey our CSR policies to our subcontractors. The Code of Conduct can be found at our corporate website (link).

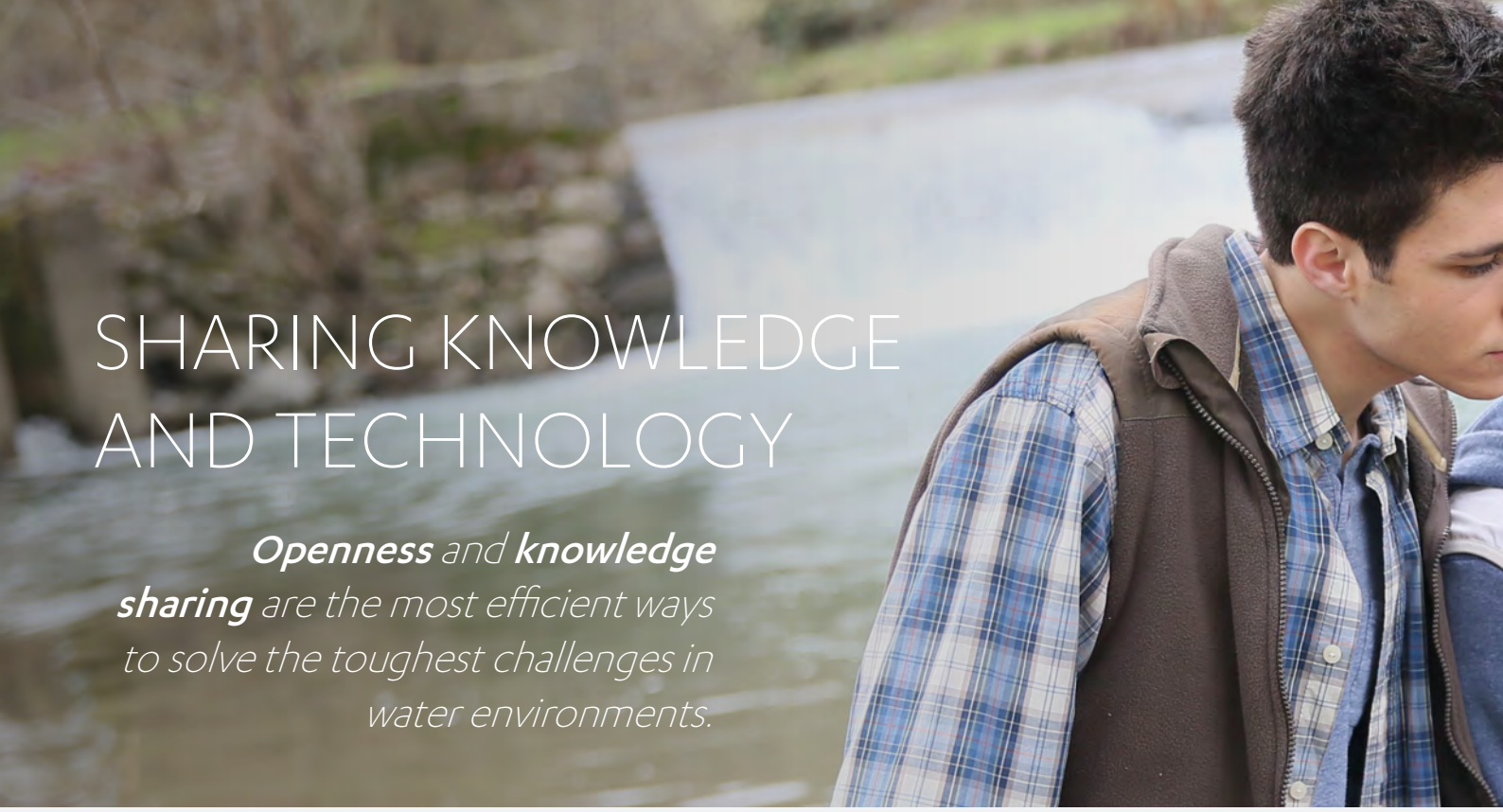
In addition, we have made it easier for all to find our existing corporate whistle blower portal at our corporate website, enabling easier access to the policy and report form.

In 2016, we have launched a process to screen our operations and to implement workplace risk assessments. Part of the process is to evaluate the risks and implement actions to ensure the health and safety of all our employees.

OUR FOCUS IN 2017

To further strengthen our commitment to engaging in responsible business practices, we will screen projects for violation of human rights and labour principles, damage done to the environment and governmental corruption as part of the risk analysis during the bidding decision process prior to entering into contracts and agreements. This will enhance our internal focus on CSR issues and notify our clients of our CSR principles, helping to prevent and mitigate the risks of violating human rights and labour principles, as well as damage to the environment and state corruption that occurs.

We will continue the work to implement workplace risk assessments to increase the health and safety of all our employees.



SHARING KNOWLEDGE AND TECHNOLOGY

***Openness** and **knowledge sharing** are the most efficient ways to solve the toughest challenges in water environments.*

OUR ACTIVITIES IN 2016

'Learn as if you were to die tomorrow. Learn as if you were to live forever.' – Mahatma Gandhi

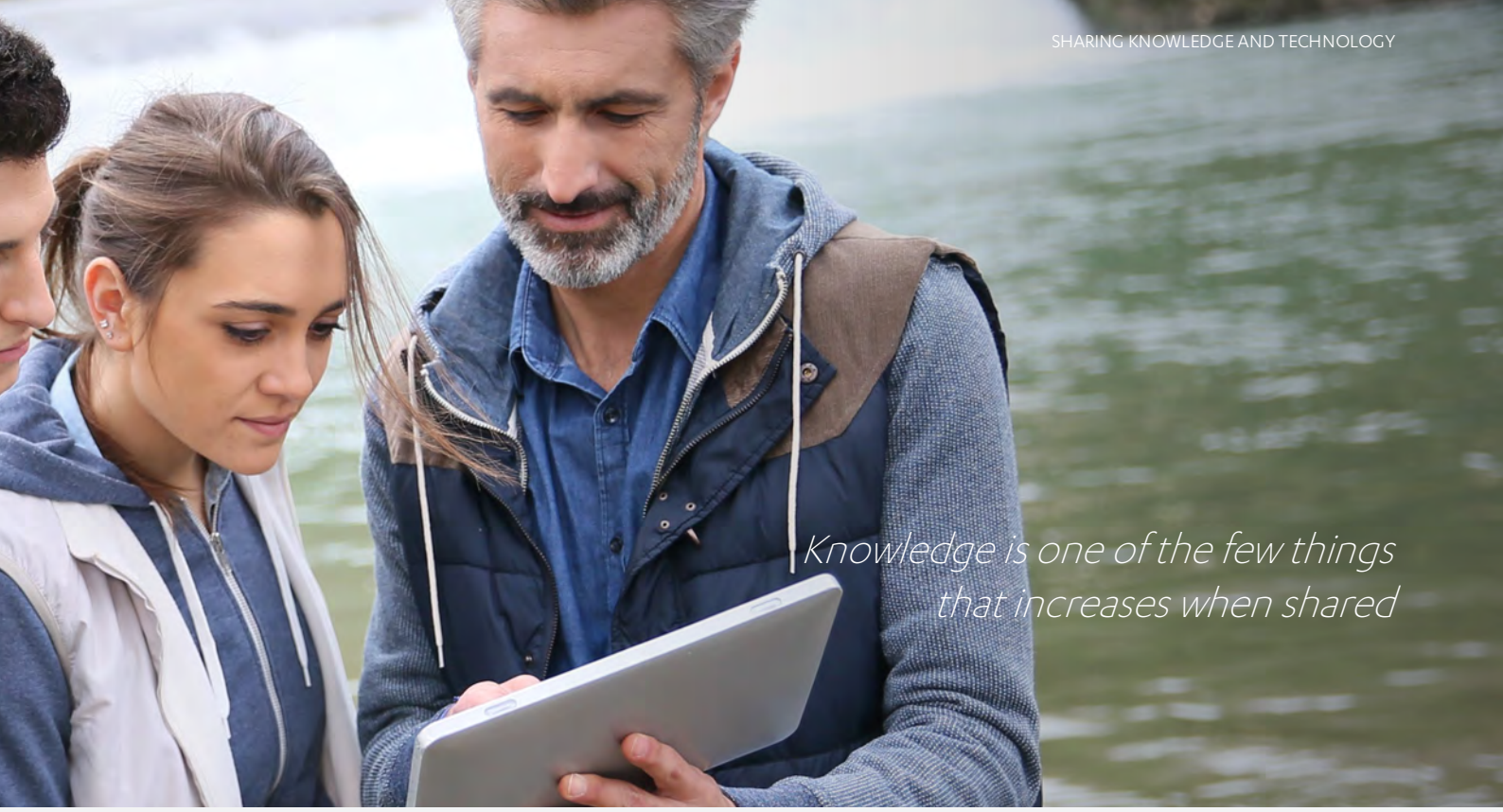
Coping in a changing world requires knowledge and skills. In the fast-paced field of engineering where constant scientific and technological advances play an important role, continuing education and lifelong learning become a must. As an engineer coping in today's world, you can cannot rely on knowledge and skills dating back from the university years. Instead, you need to continuously keep up-to-date through classes and seminars that focus on job-related skills and knowledge.

We contribute to continuing education by offering a wide variety of courses including tailored courses through THE ACADEMY by DHI. The one thing that all our courses have in common is that they rely on a foundation of our newest research, knowledge and practical experience gathered through years of projects around the globe.

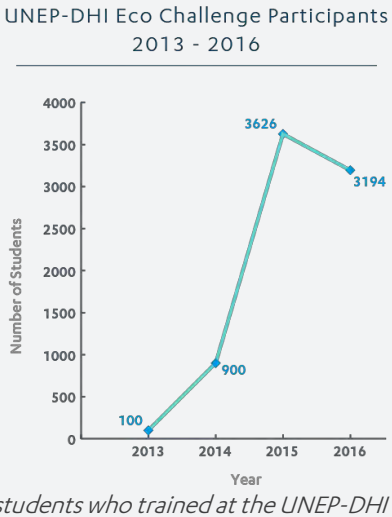
The world is increasingly moving online. For many of us, the internet is the first thing we turn to when looking for resources and information. Completely in line with this digital development, THE ACADEMY by DHI offered an increasing number of online courses in 2016 , both instructor-led and self-paced. The former allow you to participate from all over the world without travelling, but still allow for real-time interaction with the instructor. The latter allow you to learn at your time and pace.

In 2016, THE ACADEMY by DHI trained more than 6,100 people – 11% of whom participated in online courses. In addition to this, we also released five new Tech Talks. Our Tech Talks are presented by DHI's research engineers and allow others to learn more about our current research activities. The five new ones included e.g. one on coastal erosion and protection and on urban flooding and health—topics that are highly relevant in many places of the world.

The future generation of water professionals is vital in working towards fulfilling the objectives of the 17 Sustainable Development Goals (SDGs). DHI hence prioritises to contribute in shaping the future generation. We co-operate with more than 60 renowned universities and research institutions worldwide. The collaboration takes place in many different forms: Supervision of students, development of joint training programs, using our serious game Aqua Republica as a part of Integrated Water Resources Management courses, accepting interns, and so on.



We also continue to co-organise UNEP-DHI Eco Challenges—online serious gaming competitions for high-school students in Asia. The challenges educate youth about the importance and interconnectivity of water, as well as how it can be better managed sustainably. The outreach has grown steadily: more than 7500 students have participated since 2013.



Number of students who trained at the UNEP-DHI Eco Challenge

DHI New Zealand set out to partner with organisations across New Zealand in a bid to build a public understanding of water and integrated catchment management through serious gaming. In 2016, we collaborated with financial partners and built the Awapikopiko catchment game, the first application of Aqua Republica in New Zealand. Armed with the new tool, we then set out to run a national competition, the New Zealand Aqua Republica Eco Challenge 2016. The intention was to build awareness of and stimulate youth interest in environmental issues, and foster the aptitude of Science, Technology, Engineering and Mathematical skills (STEM), in a fun and engaging way.

Attracting over 420 pupils from all across New Zealand, the challenge enabled the young participants to simulate catchment management decision-making in an interactive and engaging way, based on real-life New Zealand scenarios. After almost 50 hours of playing Aqua Republica, the winning team was found. We supported the Eco Challenge by volunteering much of our time on promotion and coordination, and ensured that the event was a success.

We consider the Eco Challenge to have been a great success in introducing Aqua Republica to New Zealand and raising awareness of water-related issues in school children.

To achieve the SDGs by 2030, we will require new and innovative solutions that challenge traditional business models and approaches.

UNEP-DHI, in collaboration with a broad team of global partners, have developed a series of targeted webinars on innovative approaches to support the achievement of SDGs in a variety of ways. They include observation technology for improved water data, serious online games for stimulating mass education, and as advanced modelling tools for better flood and drought management.

In 2016, a series of four webinars on Water Innovation were implemented with more than 340 participants from 73 countries, as well as additional users of online recordings.

Feedback confirmed the need for supported capacity development in terms of innovation, as well as the value of these types of webinars as a delivery mechanism.

OUR FOCUS IN 2017

In 2017, we aim to continue sharing our knowledge of water environments through capacity development programs, training courses and seminars around the world— and also in ways where we utilise new online platforms.

Digitalisation and increased online awareness create new playgrounds when it comes to sharing knowledge. Platforms that were not a possibility 10 years ago now allow us to connect with people across the world, learning and sharing without the boundaries of physical limitations like time and distance. New ways of working emerge from this and we will continue to explore even better ways in an effort to reach out to more people and engage with you. Our online courses and webcasts are just two examples where trainees from around the globe can meet and connect. True knowledge sharing is a two-way street!

Data is the new element. Today's sensor technology allow us (as normal citizens) to measure elements such as water quality. It is no longer something that is only done by trained professionals. Digitalisation makes it possible to turn the data into information for the public. We can upload our measured data into data portals that are accessible to others and analyse and extract information hidden in these vast amounts of data. In return, this information enables us to make better decisions faster. In the coming years, it will be exciting to see how advances in technology will support citizen science and knowledge sharing.

At DHI, we will focus on developing technologies that support this—whether it is in the form of our many online learning options, our sensor technology or online data platforms.

COMMUNITY ENGAGEMENT

*We aim to make a **positive impact** in the communities where we work by contributing our knowledge and resources to initiatives and charities.*

Passionate DHI employees from our global offices dedicate their free time to engage in community-based activities or help people in need around the world through pro bono work, fundraising or by volunteering their knowledge and experience. For example:

DHI Spain, together with the Basque Ports Authority (EKP), sponsored the Basque Country Youth Sailing Championship that was held in San Sebastián, on the Northern Coast of Spain. The annual championship was organised by San Sebastián's Royal Sailing Club. A total of 91 participants from the sailing clubs of Navarra, Asturias, Abra, Oza, Vitoria, Hondarribi and San Sebastian took part in the event, split into four categories and age groups: Optimist-1 (born 2001-2005), Optimist-2 (born 2006-2007), Laser 4.7 and Laser Radial.

Dinghies during the competition. © DHI

In Singapore, 20 employees took part in the J.P. Morgan Corporate Challenge, in their third year running. This year, the run aims to raise funds to benefit Smile Asia, a global alliance of independent charities in 19 countries that work together to treat children with facial deformities. Smile Asia's mission is to deliver safe surgeries to affected children who do not have ready access to them.

The employees at DHI Malaysia Kota Kinabalu (KK) office contributed financially towards a community project which aims to resolve a water supply crisis faced by Kg. Tudan, a remote village in Sabah. In addition, a few of the employees also acted as volunteers at a public fundraising campaign dedicated to the community project.

The raised fund will be used to construct a new water supply system for the village. The supply system will consist of a water catchment (drawing water from a water fall), a 2 km pipeline and water storage tanks. The construction will be carried out in July this year by volunteers— a number of DHI Malaysia KK have signed up for it.

In 2016, DHI Brunei offered an internship program to two interns from the Faculty of Environmental Studies, University of Brunei Darussalam for a 3-month period. This was carried out in line with the University's 'Discovery Year' program.

As in previous years, our employees in Czech Republic helped to collect waste from the River Sazava, a traditional environmental activity organised in April by local and environmental communities. The main project partner is the Vltava Water Authority. We have supported this initiative by a donation as well.

The Czech Republic office is also a regular donor to Koniklec (Pasque flower - Environmental education and awareness): creation and implementation of organic tutorials for pupils and students in Prague, realisation of a long-term environmental educational project 'City in your Pocket' and organisation of public environment-related events.

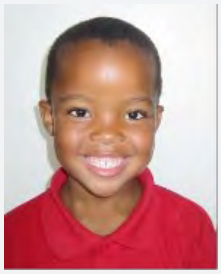
Yearly donations are also given to Voda základ života (Water - basis of life) - the ambition of this non-profit foundation is to become the largest information portal about water in Czech Republic.

DHI India is an awardee in the '50 Most Impactful Leaders in Water & Water Management (Global Listing)' by World CSR Day. The award is given to the 50 Most Impactful Leaders in Water & Water Management from different parts of the world, and recognises leaders who are passionate about water management and those who believe that water management must contribute to social change.

Kavita Patil, Senior Engineer from DHI India received the award at Taj Lands End, Mumbai, on behalf of Managing Director Dr Flemming Jakobsen.

Kavita Patil, Senior Engineer from DHI India received the award at Taj Lands End, Mumbai. © DHI

DHI South Africa has continued to support the IThemba Academy. Aphiwe has graduated from the academy and moved onto senior primary school where we hope he will continue to thrive. Aphiwe is a creative boy who won the art prize in his final year at the academy. We are now happy to sponsor a 6-year-old student Aphile, who has started in Grade R. We hope she will thrive in the same way that Aphiwe did.



Aphile Ayabongwa Shozi, whom DHI is sponsoring through the IThemba Academy. © DHI

The IThemba Academy supports foundational level learning in the Valley of 1000 Hills Community in Kwa-Zulu Natal. Many of the students come from families where one or more members have been lost due to the ravages of Aids. The foundational level is considered the most important learning phase in the development of students and it is hoped that by concentrating on this area, these youngsters will develop into the leaders of tomorrow.

DHI South Africa also sponsors the mathematics prize at the academy as we hope to encourage early engagement in the science and engineering fields.

In addition, DHI South Africa supports 15 universities across Southern Africa Development Community (SADC) with Memorandum of Understanding (MOU) providing free software and support to both graduate and post graduate researchers. Each year, a number of candidates graduate at Masters or higher levels using the software to support their research projects. Many of the DHI South Africa staff dedicate time to answer queries and mentor students in need of assistance.

UNITED NATIONS SUSTAINABLE DEVELOPMENT GOALS

*Our activities **support** the goals to end poverty, protect the planet and ensure prosperity for all*

1 END POVERTY IN ALL FORMS EVERYWHERE

Target 1.5: **Reduce exposure to climate-related events**

The Ministry of Agriculture and Rural Development in Vietnam has the task of promoting flood forecasting in Vietnam. DHI worked with the ministry on the design and operation of a real-time flood forecasting and decision support system of the lower Dong Nai and Saigon Rivers. Available historical and real-time information relevant for real-time flood management was synthesised, layout of a system was made, the necessary software and hardware was installed, and the designated staff of the client were trained in its use. The technology transfer, a major part of the project, was largely based on on-the-job training, where the client established the pilot model under guidance and supervision of DHI.

2 PROMOTE SUSTAINABLE AGRICULTURE

Target 2.4: **Strengthening agricultural sector adaptation to climate change**

The Global Environment Facility supports international projects for floods and drought management, assisting decision-makers at transboundary, national and local levels by including floods and drought issues into water resource and climate change-related planning. The specific project aims to assist the agricultural sector through locally-adjusted seasonal weather forecast, early warnings for upcoming drought hazards and risk assessments towards vulnerable sectors and areas. Food security and sustainable agriculture are key areas supported by the project through technical tools and information, strengthening the planning prior to upcoming crop seasons. The project is a global project and the outputs are tested and validated within the Volta, Lake Victoria and Chao Phraya basins.

The Shire River Basin in Malawi is increasingly experiencing changes in rainfall and in river flow, resulting in droughts and floods. DHI developed short- and long-term forecasts of rainfall, forecast of river flow and floods, satellite-based indicators of agricultural conditions including drought, and a crop calendar to support agricultural decisions for the Shire River Basin in Malawi. The system was developed during 2014-2016 in cooperation with the Department of Water Resources, Malawi Meteorological Services, and the Department of Disaster Management along with a range of other stakeholders. It was prepared to utilise the increasing amount of real-time data being made available during these years. The system runs automatically, keeping the Operational Decision Support System web portal updated and disseminating alerts whenever unusual or dangerous conditions are foreseen.

3 ENSURE HEALTHY LIVES

Target 3.9: **Reduce the number of illnesses from polluted and contaminated water**

Hospital wastewater contains hazardous pharmaceuticals and can cause serious infectious diseases. Hence, it is of paramount importance that hospital wastewater be treated before being released to sewers and the aquatic environment. Together with a partner, DHI tested, developed and evaluated a new type of method to treat hospital wastewater. With the full-scale treatment, it is now possible to clean wastewater efficiently, so that the treated water produced can be used for recreational purposes in the local stream and be re-used as cooling water in the hospital.

Since May 2014, all wastewater from Herlev Hospital in Denmark has been treated by this new treatment technology. After two years of operation, the treatment and economic efficiency of the technology is now evaluated. The evaluation reveals that the technology is able to treat the wastewater of pharmaceuticals efficiently that it is no longer toxic to aquatic organisms, thus not harming the ecosystem when released to the aquatic environment. Furthermore, the technology is also effective in removing all traces of bacteria, including antibiotic resistant bacteria, which cause hard-to-treat diseases.

The local environmental agency of the northern Italian Region (Liguria) needed to develop new and innovative platforms to support the following initiatives: monitoring activities and litter modelling, bathing water quality forecast, forecast of river sediment plume and oil slicks, forecast of algal bloom, as well as monitoring and forecast of aquaculture pollution. These activities will support the region in implementing the Marine Strategy Framework Directive and ensure compliance to the Water Bathing Directive – both Directives underline the need for the adoption of specific modelling-based tools. The new platform integrates a Mediterranean basin model and DHI products at a coastal scale.

5 GENDER EQUALITY AND WOMEN AND GIRLS EMPOWERMENT

Target 5.5: **Ensure women's participation and equal opportunities for leadership**

It is important for us to attract the best-qualified employees within their field regardless of gender, religion, sexual orientation or ethnicity. DHI aims to create a challenging international working environment and has a high proportion of international employees. Currently the number of women in DHI Denmark is 33%. DHI's aim is to ensure that the number of women in top management positions and on the board of directors is proportional to the number of female employees. As of 31 December 2016, 42% of the company's top management and board are women.

6 SUSTAINABLE MANAGEMENT OF WATER

Target 6.3: **Improve water quality by reducing pollution**

The Ipojuca River in the north eastern Brazilian state of Pernambuco has intermittent flows which influences the water quality of the stream and thus the economic growth in the Ipojuca Hydrographic Basin. DHI established a decision support system for wastewater discharge permits, enabling quick and accurate evaluations of the river's water quality for new possible wastewater loads scenarios. The study and established system provided the local river basin authority with a tool for transparent decision-making when issuing effluent discharges permits. It enables better planning with the aim of reducing the number of illness caused by polluted water and ensures availability of good quality water, for example. Local authorities were also trained to operate and maintain the system, as well as to replicate the methodology to other river basins in the State of Pernambuco.

Target 6.4: **Increase water use efficiency across all sectors**

Initial assessments of water use efficiency showed that Danish dairies have a potential to reduce their water use through reuse and reduction. DHI managed a three-year public-private partnership project in Denmark with participation from food and environment authorities, branch organisations, technology providers, universities and applied research organisations. The project mapped water use in four cheese producing dairy plants and a milk processing plant with mixed products. Selected technologies were tested in full-scale in a number of dairy processes including reuse and increased efficiency in utilities and cleaning operations, optimisation and renewal of milk processing operations, reuse of permeate from reversed osmosis filtration for concentration of whey and reuse of dairy waste water in utility functions. The savings were substantial (from 10-40%) and could reimburse the investment costs, often in less than a year – with the longest payback time being five years.

Target 6.5: **Implement integrated water resources management**

The cooperation in the Zambezi River Basin is dependent on access to reliable and updated data for management of the river basin. DHI enhanced the existing Zambezi Water Resources Information System (ZAMWIS) to create an interactive, web-based spatial database and information portal to support the river basin commission. The project is part of a larger effort to strengthen ZAMWIS, which later will include a decision support system component for the benefit of: a) water resources management and development planning, scenario analysis and decision-making and b) real-time flow forecasting and monitoring, and optimisation in basin. Although the focus of the project is on the spatial data, the developed system is an integrated database and information system, which handles both spatial data, time series data and knowledge products – all elements essential for the future planning and management of the basin.

With the aim to strengthen local ground water management, DHI assisted the Hydrology and Water Resources Survey Bureau of Hebei Province (HWRSB) in Northern China to establish a system based on local groundwater modelling. In the province, surface water resource allocation is not optimally distributed, and it is heavily polluted by industry development, resulting in an over exploitation of groundwater. DHI's modelling work gave a clear picture for the government, supporting them in making decisions for sustainable water resources management.

Target 6.6: **Restore water-related ecosystems**

Land-use changes has affected rainfall-runoff processes at small drained agricultural catchments in Bohemo-Moravian highland in Czech Republic. A hydrological model was used for long-term simulation aiming to understand water balance changes, as well as the impact of drainage and land use management to runoff from different types of rainfall events.

Target 6.a: **Expand international cooperation and capacity building**

Denmark and South Africa established a strategic sector cooperation between them to promote industrial water efficiency in South Africa. In cooperation with the Danish Environmental Protection Agency, DHI helped to build capacity in the regulation and promotion of industrial water efficiency in the food sector, and assisted the National Cleaner Production Center in South Africa to implement their industrial water efficiency programme.

Target 6.b: **Strengthen the participation of local communities in management**

Deforestation is increasingly affecting the livelihoods of indigenous people in Bolivia. Together with the environmental organisation Forests of the World, DHI GRAS has introduced satellite-based tools for the monitoring of forest areas in the indigenous people's territory of Monte Verde, Bolivia. Based upon the access to open source tools and data, as well as a tailor-made workshop on site in Bolivia, DHI GRAS facilitated an effective, systematic and routinely monitoring of deforestation in the territory.

Access to data on water and wastewater systems is relevant for water utility customers and citizens. DHI developed a web portal where customers and citizens can access data on the water and wastewater utility in Luckau, Germany. Users of the web portal can access data, for example on the piping system, for use in activities such as construction work, and also upload information about the water systems at a household level, seek information about geographic locations and land register, as well as obtain approximate information on distances and surface areas.

7 ACCESS TO **SUSTAINABLE ENERGY** FOR ALL

Target 7.a: **Enhance international cooperation on renewable energy**

Sweco and Pamir Energy in Tajikistan conducted a feasibility study for a small hydropower plant (HPP) on the Shokdara River in Tajikistan. Historical flow data are available until 1987 from a gauging station in the river, but this station is no longer operational. The lack of recent data causes uncertainty in the hydrologic assessment for the HPP. Sweco therefore requested DHI to collect additional data and provide equipment and training to local hydrologists in order to build hydrological measurement capacity within Pamir Energy.

8 SUSTAINED **ECONOMIC GROWTH**

Target 8.4: **Improve sustainable production and consumption**

Denmark is moving towards energy-neutral wastewater treatment systems. DHI is leading a full-scale test and documentation of a new treatment technology at Esbjerg East Waste Water Treatment Plant in Denmark, where sufficient energy is produced from the wastewater through biogas generation to balance the energy needed to clean the wastewater in order to meet stringent effluent standards. The capacity of the full-scale test will be approximately 6,000 m3 /day. The technology makes it easy to upgrade existing treatment facilities – thereby decreasing the carbon footprint of the facilities and at the same time increasing the capacity of the facilities to treat more wastewater.

Industries are increasingly optimising the use of resources in all stages of the life cycle – from the manufacturing stage to the end use – within industry or by consumers. DHI assisted the Copenhagen Metro Team in the hazard and risk assessment of chemicals before their usage in drilling processes and in constructions. The Copenhagen Municipality requires full insight into the risk of possible chemicals releases to the underground. In collaboration with raw material suppliers, DHI obtained information on the chemicals and evaluated potential releases in order to protect the environment.

Chemicals can be a barrier to the recycling of products and materials if they possess lasting hazardous properties. Together with a number of industries, DHI developed tools to substitute unwanted chemicals in a range of services where substances of concern and alternative solutions will be identified. DHI also participated in 'Circular Chemistry', a Danish partnership. In 2016, 'Circular Chemistry' developed and released a database on alternatives in specific industrial processes. In order to accumulate all relevant expertise, the partnership makes use of crowdsourcing to get ideas and possible solutions related to the substitution of substances of concern. A panel of renowned researchers in the fields of science, engineering, health, environment and economics experts is affiliated to the partnership.

9 PROMOTE **INCLUSIVE AND SUSTAINABLE** INDUSTRIALIZATION

Target 9.4: **Retrofit industries with increased resource efficiency**

DRIP (Danish Partnership for Resource and Water Efficient Industrial Food Production), a public-private partnership with DHI, focuses on water efficiency in the food industry. The ambition is to produce more with less water – once again decoupling water footprint from economic growth. By developing new, sustainable water and production technology solutions, DRIP aims to reduce the water consumption of top Danish food businesses by 15-30%.

By 2025, the most competitive water-using industries will be those that use a 'fit-for-purpose' thinking, that is matching the quality of water with an appropriate usage scenario, which is fit for that type of water quality. It means working towards very efficient use of water, such as through closed circuit, supported by leading technology providers with the required level of food quality and security, and in accordance with environmental legislation.

11

MAKE CITIES **SAFE AND RESILIENT**

Target 11.5: **Reduce losses caused by water-related disasters**

Flood forecasting and water management for Chao Phraya and Easan River Basins are essential for the protection of people and infrastructure in the area. DHI assisted to establish and operationalise a water management model and a flood forecasting model, as well as collaborated with local staff to maximise capacity building and knowledge transfer.

In the context of the development of flood risk prevention plans on the Bruche basin, DHI has been mandated by the Direction Départementale des Territoires du Bas-Rhin to lead a flood hazard study on municipalities on the Bruche catchment. The aim of this study is to map the flood plains for different rain situations – with and without protection structures – against floods with partial or complete erasure of dikes

Target 11.6: **Reduce environmental impacts of cities**

In taking a responsible approach to energy management, the city of Pisek realised the necessity of implementing practical steps in the field of energy savings and emission reduction, as well as the importance of this topic for sustainable urban development included in the wider context of the European Commission's Smart Cities initiative. DHI contributed to a technological part of the project in the water supply sector, implementing online models and data access to support network operation and planning.

12

ENSURE **SUSTAINABLE CONSUMPTION** AND **CONSUMPTION PATTERNS**

Target 12.2: **Achieve sustainable management and efficient use of natural resources**

The increasing world population of mid-income consumers will require a more sustainable production and consumption of industrial products.

The concept of circular economy is high on the political agenda and in the coming years, will set the frame for the development and promotion of sustainable solutions by authorities and within the industry. It has become a key issue to develop technologies in the direction of re-use of resources, whether these are water, energy, chemicals or other resources.

DHI contributes to the agenda of circular economy through development of solutions that enable the industry to reduce net consumption of water and to phase out chemical substances that could be a barrier to the re-use and recycling of materials. Together with Danish industries, DHI furthermore aims to develop methods for reusing chemicals by establishing value chains for secondary chemical resources, thereby introducing a practically- and commercially-suitable concept of circular economy

13

TAKE ACTION TO **COMBAT CLIMATE CHANGE** AND ITS IMPACTS

Target 13.1: **Strengthening resilience and adaptive capacity to climate-related hazards and natural disasters**

Following the publication of Guideline no. 30: 'Updated climate change factors and design rainfall intensities' by the Danish Wastewater Committee (2014) and the availability of the new, high-precision terrain model of Denmark, Aarhus Vand wanted to update the previously generated storm water inundation maps for the city of Aarhus and the surrounding area. The results are to be used as input for the updated Aarhus' Municipal development plan. This work was seen as an opportunity to refresh the setup of the urban hydrological model, by improving the handling of the runoff contribution from the green urban areas and to apply the newest developments in urban flood modelling.

A decision support system was developed for the Muda River in Malaysia to provide a basis for deciding the most appropriate management of the available infrastructure in flood and drought situations. In cooperation with the Drainage and Irrigation Department of Malaysia and other partners, DHI developed a system applying real-time meteorological and hydrological data from the catchment area combined with an existing flood forecasting system. The flood forecasting system, earlier developed by DHI, was being expanded and a river model has further been applied to derive operation rules and recommendations under various flood and drought conditions for the dams and barrage.

14 CONSERVE AND SUSTAINABLE USE OF **MARINE RESOURCES**

Target 14.1: **Prevent and reduce marine pollution**

The discharge from an industry in the Khalifa port area was assessed to determine whether it would be compliant with discharge and marine standards.

The industry, situated near Khalifa Port and with discharge to the port, needed to be assessed to evaluate whether the various components in the discharge stream would be compliant to national discharge standards and marine standards. DHI carried out a study of the fate of the discharge in the marine area and made a range of modelling studies to assess dilution and spreading of the discharge.

Target 14.4: **Regulate and end illegal, unreported, unregulated and destructive fishing**

The Sabah government, local NGOs and the Hong Kong-based NGO 'Stop Fish Bombing' have established a voluntary commitment to be lodged with the UN Conference on SDG 14 in June 2017. DHI is a signatore of the voluntary commitment and has also contributed with the modelling of fish bomb blast to improve sensor placement and future placement of detection equipment in the coral triangle and elsewhere where fish bombing is practiced.

Target 14.7: **Increase the economic benefits through sustainable management of aquaculture**

Darden Group, Yayasan Sabah and Nexus Aquasciences Joint Venture are planning to establish the first ever large-scale lobster aquaculture grow-out in the world (approximately 18,000 tonnes). DHI assisted in the site selection, risk assessment and carrying capacity studies as well as in the preparation and submission of governmental report requirements. The reports prepared included the Special Environmental Impact Assessment and Marine Aquaculture Spatial Plan – part of a government planning tool for sustainable aquaculture.

DHI also assisted in determining the optimal lobster site selection for the client's land application and prepared a risk assessment report to supplement the lobster grow-out operations, which includes catchment-related risks from the mainland.

15 HALT **BIODIVERSITY LOSS**

Target 15.8: **Prevent the introduction and impact of invasive alien species on water ecosystems**

To achieve a Ballast Water Management System certification, an efficacy test must be performed in accordance with the U.S. Coast Guard Standards for Living Organisms in Ships' Ballast Water Discharged in U.S. Waters and the International Maritime Organization (IMO) Guidelines for Approval of Ballast Water Management Systems (G8).

DHI is a world leader in testing Ballast Water Management Systems and has conducted tests for more than 20 international system manufacturers. DHI plays a pivotal role for BWMS manufacturers in ensuring that living organisms in the form of algae and zooplankton do not interfere with the ecosystem into which the ballast water is discharged.

17 STRENGTHEN THE IMPLEMENTATION OF **GLOBAL PARTNERSHIPS** FOR SUSTAINABLE DEVELOPMENT

Target 17.6: **Enhance international cooperation**

United Nations Environment Programme-DHI Collaborating Centre was the lead coordinator of the Transboundary Water Assessment Programme (TWAP) River Basin Assessment. UNEP-DHI also was responsible for calculating results for two out of 20 assessment indicators, and leading the integrated analysis of the assessment.

The TWAP River Basin component is a global indicator-based assessment of all 286 transboundary river basins in the world, aimed at enabling the prioritisation of funds for basins at risk from a variety of issues, covering water quantity, water quality, ecosystems, governance and socio-economics. The TWAP River Basin Assessment also covers risks to deltas from threats of a transboundary nature, and considers the relative influence of lakes on these river basins.

ASPIRATIONS

We have developed a company strategy, the DHI Compass, which clearly supports our CSR initiatives. We will continue our efforts to advance our progress within our three CSR focus areas: Improving the environment, responsible business practices, and sharing of knowledge and technology. Being a global company, we see a significant potential in contributing to the sustainable development and social responsibility.

We will fully support the 17 UN Sustainable Development Goals. The majority of the goals and targets involve water-related issues which are at the core of DHI's quest and activities.

DHI THE EXPERT IN WATER ENVIRONMENTS

DHI are the first people you should call when you have a **tough challenge to solve in a water environment** – be it a river, a reservoir, an ocean, a coastline, within a city or a factory.

Our knowledge of water environments is second-to-none. It represents more than **50 years** of dedicated research and real-life experience from more than **140 countries**. We strive to **make this knowledge globally accessible to clients** and partners by channelling it through our local teams and unique software.

Our world is water. So whether you need to save water, share it fairly, improve its quality, quantify its impact or manage its flow, we can help. Our knowledge, combined with our team's expertise and the power of our technology, holds the key to unlocking the right solution.

DHI OFFICES WORLDWIDE

Australia
Austria
Brazil
Brunei
Bulgaria
Canada
China
Czech Republic
Denmark (head office)
France
Germany
Hungary
India
Indonesia
Italy
Malaysia
New Zealand
Norway
Peru
Poland
Romania
Singapore
Slovak Republic
South Africa
Spain
Sweden
Turkey
United Kingdom
USA
Vietnam

For more information visit: www.dhigroup.com

The expert in **WATER ENVIRONMENTS**

DHI