



Kingdom of the Netherlands

The Water Sector in Thailand

Credit: Thailand Convention and Exhibition Bureau

Flood, drought, water pollution and increasing demand for water clearly show the need for an integrated development of water resources and management in Thailand. While the Thai government has taken important steps, many institutional, regulatory and budgetary issues remain. Despite this challenging environment, the sector provides interesting opportunities to Dutch companies and organizations specialized in climate change mitigation and adaptation and water technology.

Thailand is the second largest economy of Southeast Asia with an open export-oriented economy and a GDP of 501.8 billion USD in 2020. The country is a global producer of agricultural products, has a long coastline and has several rivers flowing through the country. There are many urban and industrial areas located in Thailand's river deltas.

The country has experienced both drought and floods in recent years, showing the need for a comprehensive and integrated water management plan. The Thai government had formulated a 20-year National Water Resources Management Plan (2018 -2037) which includes an increased investments in the water sector. The development and improvement of new industrial clusters in the Eastern region, the Eastern Economic Corridor (EEC), will also increase water demand both in terms of volume and in terms of specialized water properties.

Climate change impact

Thailand is among the most vulnerable countries to the adverse impact of climate change, and is constantly facing climate variability and extreme weather events such as flood and drought, causing severe impacts on its economy and ecosystems. In 2021, the Global Climate Risk Index ranked Thailand as the ninth country most affected by extreme weather events (2000 – 2019). The Asian Disaster Preparedness Centre (ADPC) has identified flood, drought and tropical storms as being particularly serious. According to the latest International Panel for Climate Change (IPCC) report, the

projected sea level rise will very likely result in significant losses of coastal ecosystems. Thailand's coastal zone is at great risk of intensive flooding resulting from sea-level rise and coastal erosion. Thailand has an average annual rainfall of over 1,300 mm; however, some parts of the country continue to suffer drought problems due to the uneven distribution of rainfall. In urban areas, inundation damage occurs due to outdated drainage systems and insufficient maintenance work.

Flooding usually occurs during the monsoon season (September - October) when there is intense precipitation. Drought occurs in summer or when rainfall is delayed in the early part of the rainy season. According to the Hydro Informatics Institute (HII), particular areas experience both flooding and drought conditions in a single year. Therefore, managing flood and drought risks are becoming more important because of climate change. Water stress caused by rapid urbanization, industrialization, and economic development compounds these challenges.

Priority areas

Flood

Annual rainfall affects urban areas, particularly in Bangkok and industrial zones. Man-made interventions such as reservoirs, control structures, drainage canals, and deforestation negatively affected the original response of the ecosystem to rain events. According to HII, an analysis of rainfall of the past decade showed that Thailand had annual rainfall of 711,146 million cubic meters.



However, only 59% of rainfall flowed into reservoirs. In this regard, it is necessary to develop and restore other water retention areas to retain rainwater properly.



Traditional methods of risk assessment such as rainfall analysis and flood risk mapping are often conducted on an annual basis.

Potential business opportunities for Dutch companies are flood management infrastructure planning, (i.e. dike inspection, dike stability issues, dike design), flood forecasting and early warning systems, dredging and micro-retention options in urban areas.

Drought

In 2020, drought severely affected many manufacturers in Industrial Estates. The Industrial Estate Authority of Thailand (IEAT) sought measures to invest in technologies to produce fresh water as part of the effort to tackle future water shortages. Industrial Estates and factories are encouraged to use water supply efficiently, targeting to decrease at least 10% of their usual consumption and exploring innovations such as desalination and closed loop systems as alternative water sources.

In early 2021, the drought situation continued and accelerated the encroachment of salt water into the Chao Phraya River. People living on the east side of the river experienced shortages of water for consumption and agricultural purposes.



The Metropolitan Waterworks Authority (MWA) revealed that unusual early intrusion of seawater into its pumping stations has threatened the production of tap water in urban areas. Saline water intrusion occurs occasionally; however, it seems the problem is becoming persistent. As fresh water shortage affects agricultural production, the Thai government's 4.0 policy intends to transform traditional farming into smart farming by using technologies and innovations such as water-stress tolerant crops and precision agriculture.

Opportunities for Dutch companies are household water filtration systems, reverse osmosis and membrane technology, de-salination technology, alternative water supply solutions, including water for precision agriculture and IoT-powered irrigation monitoring solutions.

Industrial Water Supply and Wastewater

Informa Markets estimates Thailand's water management and wastewater treatment sector will grow by 10% annually, driven by new investment flows from both the public and private sector. For example, the government has budgeted 2.6 billion Baht toward wastewater treatment plants for 93 communities in the next few years. The Ministry of Industry's laws requiring factories to comply with the installation of pre-treatment water systems before discharging wastewater into their main sewage systems will also stipulate demand for new water recycling systems.



To assure sufficient water supply, several large water-user companies have established their water management teams, aiming to autonomously monitor, assess and report water issues and prepare themselves for any water stress risks.

The Eastern Region's Water War Room, a regional control centre, has been jointly established by the public and private sector to set up measures to address potential risks from water stress. Their projects include research on water supply forecast, utilize meteorological modelling to forecast climate in the long period, and promote Water Footprint Assessments.



Furthermore, several Public Private Partnership initiatives are studied on how to treat sewage water to tackle the shortage of industrial water for factories in industrial parks. The demand for sewage water treatment for industrial water use is high.

According to the Office of National Water Resources (ONWR), the industrial development in the EEC will rapidly increase demands for water in Thailand's eastern region in line with the expansion of production capacity. Both the public and private sector are planning to invest in various projects to add over 350 million cubic meters of watershed capacity in the next 10 years. This can be achieved by increasing the capacity or build new water reservoirs, improving pumping systems that feed water back into the reservoir, and diverting water from other river basins.

The IEAT is planning to build desalination plants through joint-venture investments to solve water shortage for the industrial sector. As additional storage dam construction is unlikely, this will require a shift towards re-using wastewater and desalination.



Opportunities for Dutch companies are reverse osmosis and/or forward osmosis, nano filtration, advanced data analysis to optimize the control system management, water purification and water re-use techniques, recovery of nutrients from wastewater, heat recovery from water distribution and energy recovery from wastewater treatment.

Non-revenue Water (NRW)

In Bangkok, the potable water supply is mainly provided by the Metropolitan Waterworks Authority (MWA). The MWA is responsible for the production and distribution of potable water in the Bangkok metropolitan area. The Provincial Waterworks Agency is responsible for water source development and rural communities in the provinces. There are some private companies that produce and distribute industrial water for manufacturing facilities located in the industrial estates. Those industrial water supply companies are interested in investing in advance technology to increase their capacity and efficiency of potable water supply.



As the MWA is currently focuses on reducing NRW to below 20%, the business opportunity for Dutch companies are such as sensors and monitoring technology, district metering, pressure management and leak monitoring tools.

Institutional framework

The establishment of the Office of the National Water Resources (ONWR) in 2017 and the enforcement of 'Water Resources Law' in 2018 created momentum for institutional development in Thailand's water affairs. The ONWR is in the process of becoming the responsible agency to monitor and evaluate water resources management in Thailand. Their mandate includes the formulation of policies, master plans in water resources management and coordinate the implementation.

The Ministry of Infrastructure and Water of the Netherlands and the ONWR have signed an MoU on the cooperation in the field of integrated water resources management and climate change adaptation on 15 March 2021. Purpose of this MoU was to create a government-to-government framework to share experiences and explore cooperation in the field of digitalization in urban flood management and industrial water technology. Dutch companies and organizations are encouraged to explore opportunities for knowledge sharing and cooperation under this MoU.

The Netherlands Enterprise Agency (RVO) recently commissioned a full market analysis on the opportunities for Dutch companies in the industrial water sector in Thailand, Vietnam, Indonesia, Singapore and Malaysia. A copy is available for interested Dutch companies. If you would like to receive a copy, please send email to ban-ea@minbuza.nl

Funds and Tenders

As the demand for water in Thailand's main economic sectors is increasing, the public and private sectors have announced new projects and funds to address the persisting risk of flood and drought and mitigation of water stress.



Thai commercial banks are keen to provide debt financing for number of projects given the liquidity in the Thai lending market. The World Bank, Asian Development Bank (ADB) and Atradius support private sector developments by providing technical assistance and funding through their partnership strategy. These funds might serve as incentives for foreign companies that are willing to pool resources with Thai counterparts in joint ventures to lower possible risks.

In 2020, the State Enterprise Policy Office (SEPO) announced the Public Private Partnership Plan 2020-2027, covering 11 sub-sectors with total projected investment worth 1.09 trillion Baht.

Both foreign and domestic companies are encouraged by the Thai authorities to participate in bidding processes or get involved in projects in other ways. However, getting access to the competitive Thai water market can be challenging and complex. This can be due to decentral government procurement, information to be only available only in Thai language or it is required to partner with a local entity. The mentioned developments might still provide business opportunities for Dutch companies. It is crucial to find an experienced local partner who has local expertise and a strong network with the government and private sector.

Key Stakeholders

Public Sector

- Office of the National Water Resources (ONWR) www.onwr.go.th
- Royal Irrigation Department (RID) www.rid.go.th
- Department of Water Resources (DWR) www.dwr.go.th
- Department of Groundwater Resources (DGR) www.dgr.go.th
- Department of Industrial Works (DIW) www.diw.go.th
- Electricity Generating Authority of Thailand (EGAT) www.egat.co.th
- Metropolitan Waterworks Authority www.mwa.co.th
- Provincial Waterworks Authority <https://en.pwa.co.th>
- Department of Disaster Prevention and Mitigation (DDPM) www.disaster.go.th
- Marine Department (MD) www.md.go.th
- Hydro Informatics Institute (HII) www.hii.or.th
- Geo-Informatics and Space Technology Agency (GISTDA) www.gistda.or.th

- Industrial Estate Authority of Thailand (IEAT) www.ieat.go.th
- Wastewater Management Authority of Thailand (WMA) www.wma.or.th

Private Sector

- East Water Group (www.eastwater.com)
- Amata Water (www.amatawater.com)
- WHA-UP (www.wha-up.com)
- Global Utilities Services (www.gusco.co.th)
- TTW (www.ttwplc.com)
- TEAM Group (www.teamgroup.co.th)
- Panya Consultants (www.panyaconsult.co.th)

Relevant Associations and Institutions

- The Water and Environmental Institute for Sustainability (WEIS) <https://weis.fti.or.th>
- Thai National Committee on Irrigation and Drainage (THAICID) <https://thaicid.rid.go.th>

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- Providing information on sectors and rules and regulations
- Supporting trade missions and visits to Thailand
- Organizing meetings with relevant authorities at local, provincial, and/or governmental level
- Monitoring business opportunities
- Troubleshooting and advising on resolving disputes
- Advising on available instruments and services
- Promoting Dutch businesses in Thailand

Relevant Contacts

- Netherlands Enterprise Agency (RVO): www.rvo.nl
- The Netherlands – Thai Chamber of Commerce (NTCC): www.ntccthailand.org
- STZ Thailand Zakelijk: www.thailandzakelijk.com

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