



The Water Sector in Thailand

Recent floods and drought, water pollution and increasing demand for water clearly show the need for an integrated development of water resources and management in Thailand. While important steps have been taken by the Thai government, 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 adaption and waste water treatment.

Thailand is the second economy of Southeast Asia with an open, export-orientated economy and a Gross Domestic Product (GDP) of 405 billion (2014). Similar to other countries in Southeast Asia, Thailand faces major challenges with regard to climate change and the availability of purified water. Demand for water in the country's main economic sectors, such as tourism, industry and agriculture, continues to increase, having a major impact on the country's fragile water infrastructure and resources. Currently, waste water and sanitation infrastructure in Thailand is underdeveloped. There is an excessive discharge of industrial waste in rivers, causing water pollution and health problems. The country has witnessed both droughts and floods in recent years, showing the need for a comprehensive water management plan.

However, Thailand's legislative and institutional framework need to be strengthened. Although a Master Plan has been drafted, institutional competition and political issues prevent it from being implemented. The institutional framework is highly fragmented, lacking a single-commanded authority and an integrated approach, which leads to inconsistent strategies and budget allocation. The Thai government increased investment in its water sector and has announced new projects and funds to address the persisting risk of floods and drought, providing business opportunities. However, major challenges remain.

Priority sectors

Floods

The major floods of 2011 along the Chao Phraya and Mekong river basins, affecting almost 14 million people, resulted in an estimated damage of around USD 46 billion. The flood protection levels in Thailand are relatively low. Bangkok has a 1% probability of major floods over a period of 100 years (and in the countryside this probability is even around 10%), which is relatively high compared to other large cities in the world.

Besides the heavy monsoon, the main causes for the floods are the decline of flood retention and flood plains areas due to urbanisation and intensification of the agricultural sector in particular. In addition, increased (illegal) deforestation in the river basin areas has increased the number of flash floods, erosion and landslides. Furthermore, water shortages in Bangkok have resulted in the over-pumping of groundwater resulting in land subsidence, which increases the risk of floods even further. Generally, better governance and coordination between local and national authorities on water management are needed to tackle the challenges more effectively.



Figure 1: River Basins and reservoirs in the Chao Phraya area. Source: ONWRC

In 2002 the government introduced 25 River Basin Committees (RBCs) in order to strengthen local governance and achieve a more integrated approach towards river basin planning and development, especially in the Chao Phraya river basin area, which consists of 8 RBCs. These local authorities were established to draw up watershed management and water allocation plans, mediate disputes and manage better coordination between involved organizations. However, the RBCs are poorly authorized and generally ineffective in maintaining consistent standards of river basin planning.

The Thai government invested significantly in water storage reservoirs, but many need to be managed more effectively. In addition, the construction of dams and reservoirs is often delayed, as they are prone to protests and criticism. Environmental impact assessment studies are not always conducted.

The Thai government has planned to invest approximately USD 7.5 billion in urgent water management projects, including new canal systems, dredging operations, pumping stations and retention walls. Non-structural improvements include relevant agency reorganization, streamlining the line of command during disasters and the establishment of a relief and recovery scheme. These developments clearly show the commitment of the Thai government to strengthen its water management infrastructure, although a more coherent and systematic approach would be beneficial. Moreover existing plans have a timespan of at most 20-50 years. This is rela-

tively low compared to other countries. Longer-term projections and planning are needed, for example on sea level rising and land subsidence, which are factors which can influence the probability of future floods.

Drought

Thailand was hit by severe droughts in 2015 and 2016, in particular in the upper-middle part of the country, causing irrigation problems in many areas. Droughts had a major impact on the agricultural sector, accounting for more than 75% of the country's water demand. Thailand is a key player in the global food supply chain and a major exporter of rice.

Although climate change appears to be the main cause of drought, urbanization, industrialization and the expansion of agricultural farmland have a major impact on water demand, especially during the dry season. Other important factors are the insufficient water sources due to the high loss of water, irregular rainfall, unequal distribution of water and a lack of proper management.

Drought results in greater extraction of ground water, often beyond replenishable levels. The extraction can have a negative impact on nearby ground, especially infrastructural, which can lead to road collapses and land subsidence. The extraction also leads to water reservoirs running low and a decline in water resources. This forces rural consumers to rely on nearby groundwater sources, pressurizing the already minor availability of water resources even more. The main problem in rural areas is the lack of a centralized access to water resources. Instead, private and individual extraction takes place, resulting in poorly manageable water distribution.

The Thai water infrastructure is generally outdated and was considerably damaged during the 2011 floods. It is estimated that the water loss amounts to more than a quarter of the total extracted water volume. In light of the rapidly increasing demand for water, this is a significant problem. Major leaks should be repaired and the overall efficiency of water networks must be strengthened to reduce loss of water. This is especially true for rural areas, which have higher distribution levels than urban areas. The recent introduced 'Water Loss Improvement Project' aims to strengthen and renovate



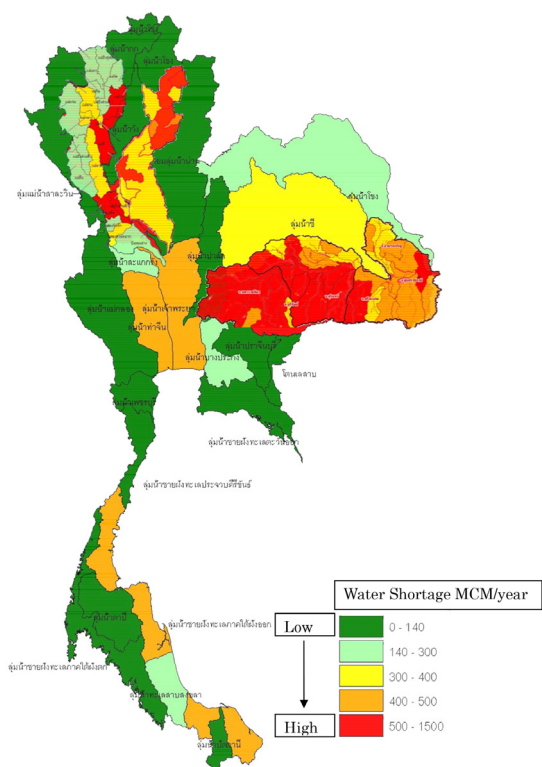


Figure II: risk areas for drought. Source: Department of Water Resources Thailand

the existing infrastructure in order to reduce the loss of water.

The government has stressed the need to reform the system of irrigation and aims to double the irrigable area in order to cover 50-60 million rai (8 million ha.) by 2019. The Ministry of Interior has allocated 40 million USD to dredge canals and to develop local water resources to tackle shortages. The government has also approved the allocation of USD 240 million for installing water pumps, new reservoirs and mobile tanks, and the development of quick alert warning systems. At the same time, farmers are assisted through rice management, which aims to stabilize commodity prices through subsidies and soft loans, and to delay the cultivation of new crops.

This renewed emphasis on efficient irrigation practices is intended to result in better quality infrastructure for the collection, and reuse of water in major agricultural regions of Thailand. However, as will be explained later in the 'Institutional Framework' section, the implementation will be difficult due to institutional weaknesses.

Waste water treatment

Thailand experiences major challenges with regard to water pollution and the treatment of waste water. Rivers in populated areas, like the lower part of the Chao Phraya river, are easily polluted due to discharges of waste water from various factory plants. These discharges include agricultural fertilizers, pesticides, industrial waste, urban sewage and pharmaceutical residues. This pollution

deteriorates the water quality in various water sources, risking possible waterborne diseases and potential health problems. Also sea water intrusion affects the water quality.

The waste water treatment sector has not developed sufficiently over the last years. Currently, only about 15% of the total volume of consumed water consists of treated waste water. Meanwhile the increasing population and economic, agricultural and industrial expansion, combined with poor management and enforcement, are further increasing the pressure on the authorities to come up with solutions. Not without reason have the United Nations has 'urged the Thai government to make water sanitation a key focus for investment'.

The Thai government has acknowledged the problem in its 11th National Economic and Social Development Plan (2012-2016) and is cracking down on industrial polluters. Currently, there are over 1500 sewage and waste management plants and over 100 waste water treatment plants. The Bangkok Metropolitan Region currently has 7 central water treatment plans and is currently preparing the bidding process for the construction of an 8th plant. In order to be able to deal with the increasing need for waste water treatment of this region in the longer term, the authorities foresee to build another 19 treatments plan in the decades ahead in order to reach a total number of 27 plants eventually.

The government has allocated considerable funds to local authorities for constructing, renovating and monitoring treatment plants. However, many of the existing plants are not operated adequately due to a lack of skill or discontinuation of budget allocation. Furthermore, these plants are often not sufficiently technically equipped to counteract on, for instance, pharmaceutical residues in waste water. This will remain a problem as these residues might find their way into the food chain eventually.

According to estimates an increase of 10% in the waste water treatment capacity is to be expected on an annual basis as a result of growing investment, although future political developments might delay investment. This potentially provides opportunities for foreign companies, for example through joint ventures with local companies. However, foreign companies should take several major challenges into account when doing business in this sector, inclu-



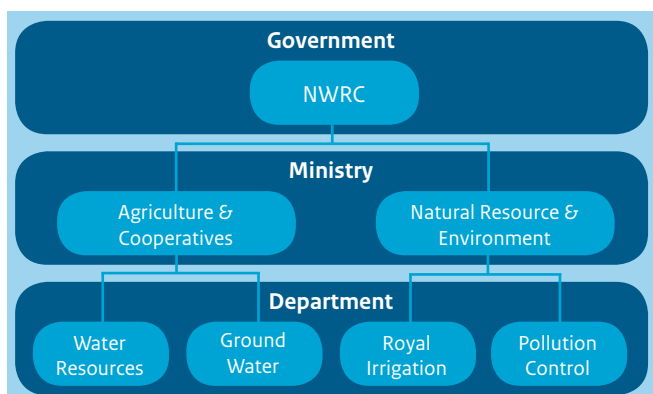


Figure III: Basic representation of involved institutions in Water Management

ding malfunctioning plants and discontinuation of budget allocations.

Institutional framework

The institutional framework is highly fragmented. There are at least 31 ministerial departments under 10 ministries, one agency and six national committees involved in Water Management. Some of them draft policies, other execute or monitor them. There is competition between institutions, as priorities and responsibilities are sometimes conflicting or overlapping. In general, there is a lack of unity and coordination, and no sufficient long-term planning and vision on how to tackle water-related issues in a sustainable and integrated manner. This regularly leads to discontinuation of budget allocations and other obstacles to an efficient water management.

The need for an overarching institution is, however, well-recognized since 1988, when the government established the National Water Resource Committee (NWRC). This committee is responsible for supervising and monitoring projects, and advises the cabinet on (new) policies and regulations. Delegates of involved departments and agencies exchange their views in this committee, although these often contradict each other. The NWRC is formally the most important body in water management, but lacks real power or authority to determine or influence policy. It functions on ad-hoc basis, and has no mechanism on its disposal to monitor the implementation of policies.

Floods

The institutional weaknesses became apparent during the 2011 floods. In response, the Thai government drafted a Master Plan on flood management, after which it established the National Water Resources and Flood Policy Committee (NWFP) and the Water and Flood Management Commission (WFMC). These bodies formulate policies, approve investment projects, and monitor the implementation and impact of these projects.

Besides these national committees, there are three major ministe-

rial departments involved in flood management. The Royal Irrigation Department (RID), under the Ministry of Agriculture and Cooperatives, plays a significant role in constructing and maintaining waterways and flood protection systems. The Department of Disaster Prevention and Mitigation, Ministry of Interior, is responsible for the coordination during disasters and recovery management. The Department of Water Resources (DWR), Ministry of Environment and Natural Resources, monitors flood mitigation in the 25 river basins. Many other departments have specific tasks to prevent, oversee and manage floods.

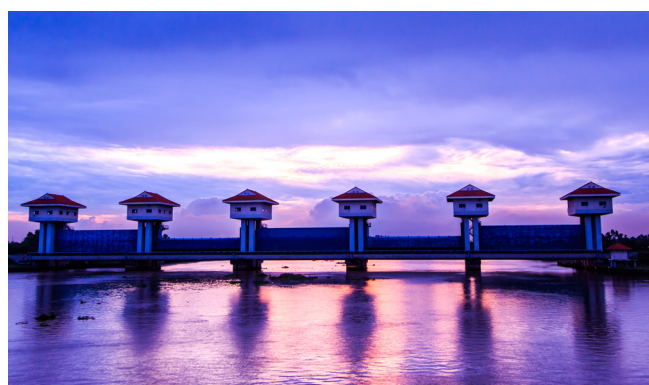
Drought

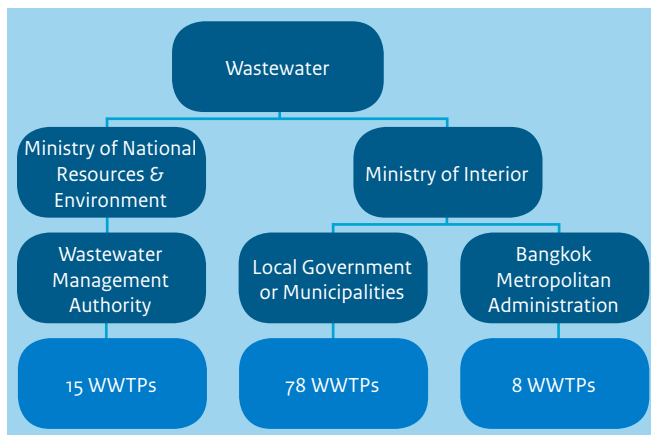
With regard to drought management, there are again three major ministerial departments involved. The RID, as the most important body within the Ministry of Agriculture and Cooperatives, is responsible for ensuring sufficient supply of water for the agricultural sector, improving reservoirs and managing surface water within irrigated areas. The DWR is responsible for managing surface water from the remaining, non-irrigated areas. The Department of Groundwater Resources (DGR) under the Ministry of Environment and Natural Resources, is managing groundwater.

There are many other departments involved in constructing small-scale projects in the irrigation field. Overlapping responsibilities, conflicting interests and a lack of coordination between these departments are regularly hampering an efficient irrigation development.

Waste water treatment

There are several ministerial departments and agencies involved in waste water treatment. The Department of Industrial Works (DIW), under the Ministry of Industry, is responsible for industrial waste water management. This consists of monitoring and inspecting factories to ensure standards of quality. The Department of Pollution Control (PCD) under the Ministry of Agriculture and Cooperatives, is responsible for the quality of natural water resources. Waste water coming from the agricultural sector is controlled by several departments of the Ministry of Agriculture and





Source: International Water Association (IWA)

Cooperatives.

Local authorities, such as municipalities, fall under the responsibility of the Ministry of Interior and are responsible for the management of community waste water. They are in charge of constructing sewage systems and (community) waste water treatment plants (WWTPs). The Wastewater Management Authority (WMA), under the Ministry of Natural Resources and Environment, provides technical assistance to municipalities in constructing WWTPs and advises on national policies concerning water waste treatment. The Bangkok Metropolitan Administration (BMA) is also in charge of managing part of the WWTPs.

Legislation

Unlike some other countries, Thailand does not have a single law governing integrated water management. National policies and laws have not been adopted due to a lack of shared vision between the institutions.

Master Plan on Water Resource Management

The 12-year Master Plan on Water Resource Management, which is currently under discussion, has several objectives: providing clean water provision for all villages, control domestic water usage, secured production, protection against floods and mitigation of flood damage, water quality, and sustainable water management with balanced development and participation from all sectors.

These objectives are to be achieved through three strategies:

1. *Water resource management*: rehabilitating deteriorated forests and watershed areas, preventing soil erosion, and store water by diverting it from natural sources to prevent water shortages;
2. *Water consumption*: reduce unequal access to basic (clean) water; and
3. *Waste water management*: reduce waste water from original sources, increase the efficiency of the treatment plants and prevent intrusion of seawater.

Each strategy has its own goals and authorities in charge. DWR is in charge of drafting the plan, but has no further authority. In September 2015 the cabinet approved the principles of the DWR draft. It is now under consideration of the sub-committee on Water of the National Legislative Assembly.

The Water Act

The Water Act is supposed to become the main legislative framework on water management. However, the act has been in the process of drafting since 1992. Again DWR is in charge of drafting the act. After the act is adopted, DWR would be authorized as the central organization for governance. It would also separate regulatory and operational tasks between institutions, and encourage active participation by locals and users.

Funds and tenders

Funds

The Thai government has been criticized for having no clear regulatory process for setting and adjusting trade tariffs, which is discouraging foreign private sector investment. Recent set-up funds show a different direction, however, indicating a determination of the government to involve expertise and experience of foreign companies.

The government has announced plans to attract greater private sector participation in order to book progress. The Public-Private Partnership act (PPP) is an example of this, and has led to the launch of three infrastructure funds. The funds have an emphasis on “improving transparency, accelerating government processes and standardizing the PPP programme”. While these funds are not directly linked to water infrastructure at this stage, it is possible that transparency and coherency with regard to PPP has a spillover effect to the water sector, making it a more attractive investment proposition.

In order to stimulate development in the water sector, the government has set-up funds to raise investment for projects organized



by Thai state-owned companies. These funds consist of tax benefits on dividends and capital gains. The Asian Development Bank (ADB) supports the private sector developments by technical assistance and funding through its Country Partnership Strategy (CPS). 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.

Tenders

Tenders are normally published through the procurement website of the Thai government. Information is mostly in Thai and usually companies can only join the bidding procedure if they are registered as a legal entity in Thailand. Foreign companies will then need to register through its Thai office as a parent supplier with the participating Thai company or organization.

The development of the earlier mentioned urgent water management projects, valued at USD 7.5 billion, are planned to start in 2016. The details of the tender procedure / bidding process have to be monitored via the responsible agency or department of the respective Ministry. Projects based on the Master Plan on Water Resource Management will for the short-term (2016) mainly cover feasibility studies and environmental impact assessments in the Chao Phraya river basin.

There are many Thai state-owned companies active in the water sector. On request, the Embassy can provide a list with state-owned enterprises which are participating in tender processes. The best way to get updates on upcoming tender procedures is to get in touch with local partners who can monitor the actual tender opportunities on a regular basis.

We support your business

The Netherlands Embassy in Bangkok offers active support to Dutch companies already present in Thailand, Laos and Cambodia, and Dutch companies interested in doing business in these countries. Our main services include the following:

- Providing information on sectors and rules and regulations.
- Finding potential business partners.
- Supporting trade missions and visiting programs to Thailand.
- Organising meetings with relevant authorities at local, provincial or government level.

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- Monitoring business opportunities.
- Trouble shooting and advice on resolving disputes.
- Advising on available instruments and services.
- Promoting Dutch business in Thailand.

Trade fairs

For exhibitions, it is recommended to focus on regional trade fairs. A wide variety of regional and domestic trade fairs is organized in Thailand:

- 3W Expo (Bangkok, 14-16 September 2016) on Water, Waste water & Waste: www.3w-expo.com
- Thai Water Expo on Water and Waste water technology (Bangkok, 7-10 June, 2017): www.thai-water.com

Please contact us for more information on relevant trade fairs and possible events organised by us during these fairs.

Business support instruments

The Netherlands government has developed several instruments to support Dutch companies in doing business in Thailand. For more information, please visit the country page for Thailand on the website of the Netherlands Enterprise Agency at www.rvo.nl/thailand (in Dutch).

Other relevant links and contacts

'NL exporteert' App

'NL exporteert' App is a free export app, designed for entrepreneurs with international ambitions. It provides information on events, the do's and don'ts of doing business, economic data and financing possibilities. Download the app in the [App Store](#) (iOS) or in [Google Play](#).

- Netherlands Enterprise Agency (RVO): www.rvo.nl
- The Netherland-Thai Chamber of Commerce (NTCC): www.ntccthailand.org
- MKB Thailand: <http://mkbthailand.com>
- Netherlands Water Partnership: www.nwp.nl
- Thailand Board of Investment: www.boi.go.th