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How the Netherlands Finance Public Water Management

Introduction

This contribution explains the essentials of finance to fund the costs of the public water management activities in The Netherlands. Insight in costs and financing possibilities are important aspects to realise water management on national, provincial, regional and local level. Justification of the spending of public money for measures serving water related interests provides insight in the relative weight of each interest in water management issues.

To give an impression of costs and financing, the most recent data are presented. In 1998, the costs of public water management by the three governing levels in The Netherlands amounted to EUR 3,173,000,000² in total. This is 1% of the national income. Fifteen percent of the costs are spent on flood protection, 20% on quantitative water management and 65% on water quality issues.

Three sources finance these issues: the general budget for 30%, the profit principle for 18% and the polluter-pays rule for 52%.

History defined the institutional and financing structure

In The Netherlands, the inhabitants themselves organised flood protection and water management. Before the 13th century, the organisation was limited to local flood protection. Every inhabitant had to maintain his part of the dike. The local society regularly inspected the condition of the dikes. The community exercised the rule: "he, who will not dike, has to leave". A necessity, as many lives and properties depended on the weakest spot.

In the 13th century damming off the tidal inlets and creeks connected local dikes. Many towns and cities (Amsterdam, Rotterdam, etc.) were the consequence of these actions. Sluices in the dams drained off superfluous water. As the inspection of the dikes and sluices in the dam could not be longer exercised on local scale, the involved communities began to send representatives to meetings where these common interests were discussed. The meetings resulted into a still existing institution, the water board (waterschap).

The water board is based on the triplet **interest-taxation-representation**. The size of everybody's profit by the activities of the institution defines the tax contributed to and the participation in the board. Created by the inhabitants themselves and applying people participation rules, the water boards are considered as the oldest democratic institutions in this country. Democracy in The Netherlands is waterproof!

This institution was self-supporting. That is the reason every ruler in history recognised the water board as competent regional, rural authority. In time, rulers came and disappeared, but

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² 1 EUR = 1.97 NLG = 0.99 USD in 1998.

the water board survived all ruler institutions. The rulers mainly got their income from tax on consumer goods and food.

In the 17th and 18th century it became evident that the flood problems of Rhine and Meuse could not be tackled jointly by the Republic of the seven confederated provinces of The Netherlands. The co-ordination between the independent provinces failed. Moreover, mismanagement of some provinces created obstacles in the riverbed, jamming the discharge of water and ice. Inundations frequently occurred. It took centuries before the necessity of supra provincial water management was recognised as vital element for The Netherlands as a whole.

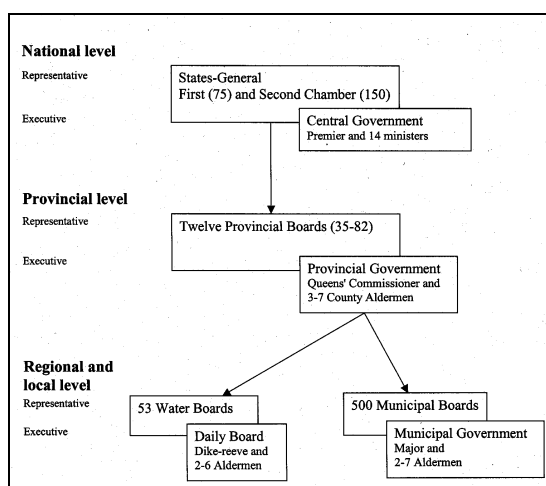


Figure 1: Institutional structure

The Netherlands got a central government in 1798. This government created the state water authority (Rijkswaterstaat, in English the Directorate-General of Public Works and Water Management). It is functioning without interruption since then, underlining its necessity. The province remained competent to create or wind up water boards, under supervision of the central government. This shows that history defined the institutional structure (Fig. 1).

The general budget finances the state flood protection and water management as well as the provincial activities in this field. Water boards finance the regional flood protection and quantitative water management issues in accordance with the profit principle. Population and industry grew considerably after the Second World War. Both caused a steadily increasing pollution of the watercourses. It negatively affected or even eliminated other water-related interests. Government and Parliament ordered the authorities to fight the pollution by adequate sanitation measures. They also decided that the sanitation costs would be financed according to the polluter-pays-principle, the reflection of the profit-principle. The sanitation costs have to be paid by the dischargers to the management institutions of surface waters (since 1-1-2000 only to Rijkswaterstaat and 27 water boards).



Priorities for financing public activities

Public authorities have the duty to fulfil the requirements formulated by state or provincial governments. In this framework, authorities have to apply the following order of priorities to finance costs.

Interested parties or authors of harmful activities get the **first** priority to finance the cost. E.g., the costs to meet the licence requirements for the emission of substances in surface water have to be financed by the polluter himself. Sometimes water authorities are requested to realise additional measures. In these cases, the bill for the additional requirements must be passed to the profiting party. For instance, a provincial government earmarked surface water as appropriate for swimming water. The water board concerned is obliged to take all efforts to meet the European swimming-water-standards. If a bathing-organisation wants a sandy beach or other swimming facilities to be realised by the water board, the bill for these additional measures is passed on to the bathing-organisation.

Necessary, common provisions get the **second** priority. Common provisions are required when individual measures are ineffective or make no sense; for instance, flood protection and water management. Levies or taxes finance these provisions. Today, tax or levy always requires:

- Valid legislation
- Criteria for levy or tax
- Definition of tariff
- Taxable facts
- Assignment of the taxpayers
- Fair execution by proper government
- Appeal to higher court.

If these requirements are not fulfilled, the authorities cannot introduce a tax or levy.

The costs of exceptional activities define the **third** and lowest financing priority. In exceptional cases, the general budget bears the costs. E.g., when the polluter(s) of contaminated sediments cannot be identified, the cost of sanitation measures can exceptionally be passed to the general budget. In this framework, the strengthening and maintenance of dikes and the fight against the muskrat have to be mentioned. Because of their exceptional character, the general budget partly bears the financial consequences.

The financing of state flood protection and water management tasks

The source to finance the state flood protection and water management activities is the general budget as explained before. These activities concern:

- Formulation of the national, strategic policy on flood protection and water management, supervision of its realisation and enforcement.
- The realisation of the operational tasks concerning the infrastructure as represented in Fig. 2:



Figure 2

- The flood protection works lacking hinterland or financial capacity; the Main Dike separating the Wadden Sea from the Lake IJssel (Afsluitdijk), dams and barriers in the estuaries, dunes and dikes on the Wadden islands;
- The preservation of the coast by fighting the structural erosion;
- The operational management of the state waters. These waters concern the Rhine with its branches, the Meuse, the Scheldt, the Lake IJssel, the estuaries, the principal canals and the territorial and international sea;
- The promotion of the (inter)national shipping routes.
- These operational activities are financed from the general budget, because they are considered essential for the entire Netherlands.

Polluters of state managed waters have to pay a pollution levy to the Rijkswaterstaat. The state levy was introduced in the seventies to subsidise sanitation measures of industries, municipalities and water boards. The huge amount of untreated wastewater in the seventies granted a sufficient budget to subsidise all activities. Due to the sanitation, the levy income decreased in time. The state quality management costs, as monitoring, licensing and enforcement increased in time. Since 1988 a small part of the cost is financed by levies from industries and water boards directly discharging polluted substances (wastewater or effluent)



into state managed waters. The levy amounts to EUR 31.80 per pollution unity. Water boards directly discharging into state managed waters pay EUR 15.90 per pollution unity.

The financing of the provincial flood protection and water management issues

The province takes care of the interpretation and application of the national policy in the provincial context. The province is responsible (with approval of the central government) for the creation and termination of the water boards. The province defines the flood protection and water management tasks of the water boards. The province formulates the strategic policy for flood protection and water management issues. The provincial government defines the functions of the non-state managed waters. The province harmonises the water policy with other policy fields such as spatial planning and environment. The province supervises the policy realisation by water boards and municipalities.

The province exercises the following operational task(s):

- The management of deep ground water
- Occasionally the operational management of provincial shipping routes.

These activities have a general or supra regional character. Consequently, these activities are financed from the general budget of the province. This budget is supplied by the state budget via the Provincial Fund and by surcharges on the motorcar tax. Some issues of ground water management can be financed by the ground water tax.

Financing of the water boards' duties

From the 13th century onwards, the water board defined the construction, maintenance and operational management of the local and regional flood protection and water management. This organisation defined and still defines the financial or physical contribution to these tasks by the interested parties, originally the landowners. The contribution of the individual landowner (because of its imperative character considered as tax) was and is based on the profit principle. The size of the interest in the water board activities defines the tax to be paid. Until the 20th century, the tax or physical contribution only depended on the extent of the taxpayer's land area. Since 1920, owners of houses and buildings have to pay too. According to the Surface water Pollution act (1970), the inhabitants and users of commercial and industrial buildings/areas pay a pollution levy. In 1970, nine provinces charged water boards with wastewater treatment and the qualitative management of non-state managed surface waters. Three provinces created their own provincial water quality authorities.

The Constitution (1983) and the Water Board Act (1992) charge the water boards with the operational tasks for local and regional flood protection and water management. Responding to this development, the three self wastewater-treating provinces transferred their tasks to the water boards. This is completed in January 2000.

According to the Water Board Act, the costs of these tasks can only be passed to five interesting categories: landowners, tenant farmers, owners of houses and buildings, users of commercial facilities and inhabitants. Depending on the interest of every category in the water board activities, the costs are shared.

To finance the costs three taxes are applied:



1. Inhabitant tax, every main tenant of a living accommodation has to pay for flood protection and quantitative water management
2. Property tax, owners of land and estates also pay for flood protection and quantitative water management
3. Pollution levy paid by households and facilities contributing to the water pollution

The tax criteria for flood protection and quantitative water management are the surface of land areas and the economic value of houses and buildings. The pollution levy is applied to oxygen consuming substances, heavy metals and chlorides, sulphates and phosphates.

The actual discharge of polluting substances, determined by measurements, defines the levy to be paid. The imposed pollution load is expressed in pollution units. The pollution unit for oxygen consuming substances is based on the average oxygen consumption of 136 gram/person/day = 49.6 kg oxygen/person/year. Actual discharge measurement is not applied to activities discharging less than 1,000 kg oxygen/ year. In some cases, the pollution units can be defined by multiplying the water quantity extracted from ground and surface water, taking into account the wastewater factor annexed to the act.

The threshold of 1,000 kg oxygen mainly excludes the pollution from households and small business. These polluters are assessed at three pollution units. Single people can ask for a one-unit assessment.

For chromium, copper, lead, nickel, silver and zinc the unit amounts 1 kg discharged metal per year; the pollution unit for arsenic, mercury and cadmium is 0.1 kg per year. The pollution units for chlorides, sulphates and phosphates are 650 kg, 650 kg and 20 kg respectively.

The levies of the water boards varied from EUR 28 to EUR 68 per p.u. per year. Differences in size, nature, population density, and degree of industrialisation in the territories of the water boards define the variation. Another important element is the time of investment and exploitation. Water boards that started their wastewater treatment activities in the fifties and sixties have nowadays often the lowest levies.

The cost sharing also defines the representation of the categories in the general assembly and executive body of the water board. E.g., the general assembly of the densely populated water board "Delfland" has nineteen seats for the category inhabitants, five seats for landowners, thirteen seats for owners of houses and buildings and five seats for users of commercial and industrial facilities. Its reflection in the executive body is two seats for inhabitants, one seat for landowners, two seats for house-owners and one seat for industrial users. The budget of Delfland amounted to EUR 99,300,000 in 1998.

The water board Rhine and IJssel differs from Delfland. The general assembly has eleven seats for the inhabitants, nine seats for the landowners, five seats for owners of houses and buildings and five seats for users of commercial and industrial facilities. The 1998 budget was EUR 50,800,000.

The chairman of the water board chairs the assembly and the executive body. The chairman is appointed by the Minister of Transport, Public Works and Water Management from the persons recommended by the general assembly of the water board.



The Dutch Water Board Bank (Nederlandse Waterschapsbank)

The storm surge disaster of 1953 led to important changes in the world of the water boards. The water boards had to be scaled up. The country counted 2,500 water boards in 1953, today only 59. In 1953, the water boards needed substantial capital to finance the massive repair work. The often small-scaled water boards were individually not strong enough to attract long-term funds at a favourable rate. That was the reason that the water boards together created their own “borrowing alliance”, the Nederlandse Waterschapsbank (NWB) in 1954.

The aims of the NWB are to extend up-to-date financial services, concerted borrowing of long-term funds, the formation of a joint central treasury and to concentrate specific financial expertise for individual regional public authorities. It led to cost savings, positive balance returns to interested parties. The NWB is a public limited liability company. Shareholders are public authorities (water boards 81%, central government 17% and provinces 2%). Total assets are EUR 17,000 million, shareholders' equity EUR 750 million, net profit EUR 100 million and income/expenses ratio 7.6%. Compared with other Dutch banks the NWB ranks fifth.

Financing municipal water management activities

Today, drainage of superfluous precipitation in urban areas is an important issue. The drainage task of water board and municipality were not clearly defined in the past. Nowadays the municipality is responsible for the drainage of urban areas created after 1994. Drainage water of urban areas has to be drained into the surface waters of the water board.

Another important municipal task is the collection of urban wastewater. The cost of the wastewater collection by sewerage systems is differently financed. About 80% of the municipalities created the sewerage tax. The yield of this tax can only be used for sewerage facilities. The other municipalities finance the sewerage cost from the owner estate tax. The number of these municipalities is decreasing.

Cost and finance of public water activities in 1998

The previous considerations aim to provide insight into the financing structure of flood control and water management activities in The Netherlands. Transparency in cost and finance highly serves confidence of the public. The water authorities have to justify and specify their activities in annual reports. These reports need the approval of the representative bodies on every governing level according to the rule: support visionary intentions but verify the results.

The author figured out cost and financing in 1994, 1996 and 1998. More recent data, covering all governing levels, were not available. Every year the total costs increase, but they follow the development of the national income. During the mentioned years, the total cost amounts to 1 % of the national income. Because of the reshuffling of tasks between provinces, municipalities and water boards, a slight shift occurs in the total costs, moving from the provinces and municipalities to the water boards.

The figures of Table 1 and 2 are based on the data collected for the annual report of the Directorate-General of Public Works and Water Management (Rijkswaterstaat) 1998 and the 2001 handbook of the Central Bureau of Statistics in The Netherlands.



Table 1. Public water management costs in 1998 in 10⁶EUR

Inst. level Task	State ¹	Provin- ces	Water boards	Munici- palities	Total	in EUR per capi- ta
Flood protection	236	98	115	-	449 15%	28.7
Water quantity management	125 ²	38	436	50	649 20%	41.5
Water quality management	277 ²	40	962	796	2,075 65%	132.6
total	638	176	1,513	846	3,173	202.8

1 These data concern the efforts of the Ministry of Transport, Public works and Water management and contain the substantial overhead cost. The data also include the modest financial contribution of other ministries. The overhead of these ministries is unknown.

2 The operational water management and navigation tasks of the Rijkswaterstaat are considerably interlinked. Since 1998, the Rijkswaterstaat does not distinguish financially between these tasks. The presented figures have been based on the relations in the past.

Financing sources discriminate between the general budget, the water board tax (related to the profit principle), the polluter pays based levy to water quality authorities and the municipal sewerage tax. It should be noted that both Tables contain only cost and financing by public authorities. The figures exclude the cost and finance of specific supplies as drinking water, water for agriculture and industry.



Table 2. Finance of public water management in 1998 in 10⁶ EUR

Inst. level	State	Provin- ces	Water boards	Munici- palities	Total	In EUR per capita
paying principle						
General budget	605	136		213	954 30%	61.0
Water board tax			547		547	35.0
Ground water tax		11			11 18%	0.7
Pollution levy	33	30	907		1,060 33%	67.7
Sewerage tax				633	633 20%	40.5
Balance goods, services and inte- rest			-31		-31 -1%	-2.0
Total	638	177	1,513	846	3,173	202.9

Drinking water supply is not a matter for the public water authorities, although provinces and municipalities own the water companies. To complete this contribution an impression of the price for drinking water in The Netherlands is necessary. Data of the Netherlands Water Works Association (VEWIN) showed that the price varied between EUR 0.73 and EUR 1.92 with an average of EUR 1.28 per m³ in 1998. The variation is due to the application of ground water or surface water as raw material and the eco-tax on ground water extraction. To green the tax-system, extraction of ground water was charged with EUR 0.17 per m³. The households consumed 725 million m³, 126 litres per capita per day. This means EUR 58.30 per capita as average figure for 1998.

Liberalisation and privatisation

The Dutch drinking water companies (owned by provinces and municipalities) and public waste water treatment function well. In many countries, drinking water supply, wastewater collection and treatment are often unreliable, give inadequate service, are unfriendly to consumers, show bad maintenance and low investments. To improve these situations, liberalisation and privatisation are propagated, particularly for urban water supply and wastewater treatment. A market-oriented approach would improve management, make the service more consumers friendly and reduce the influence of politicians. These developments and the liberalisation in the EU energy sector provoked discussions about liberalisation and privatisation of governmental responsibilities in the water sector in this country,

After long discussions, Government and Parliament concluded that the vulnerability of the product drinking water and the vital interest of the public water supply made it necessary to



strengthen the position of this sector. They decided:

- To maintain the governmental ownership of water supply companies, particularly to protect captive users
- A further up-scaling of the supply companies
- An integrated quality control of the chain extraction, production and distribution
- To stimulate the co-operation in the chain drinking water, sewerage and waste water treatment

Government and Parliament confirmed the present situation in which large industries are licensed to have their own treatment facilities or to let treat their wastewater by third parties. They considered wastewater treatment of households and small businesses strongly related to water quality management. Not only the quality of the effluent is important, but also the point where the effluent is discharged in surface waters. They considered the wastewater treatment of households and small business a governmental task. The water boards are responsible for its proper realisation. Law will establish this task. Tendering of activities is a common practice in Dutch water management since centuries. In this line, Government and Parliament will investigate the efficiency of tendering the wastewater treatment activity. On the other hand, the efficiency of treatment of industrial wastewater by water boards in free competition and equal conditions has also to be examined.

Conclusions

- The triplet interest-taxation-representation is the backbone of the water management efforts in The Netherlands over more than seven hundred years. It is the application of the profit principle to local and regional flood protection and water management issues. Size and weight of the different groups interested in these issues defined the financial contribution in the cost, but also the participation in the assembly and executive of the water board.
- Wastewater collection and treatment by local and regional authorities are financed according to the polluter-pays-principle, the reflection of the profit principle. Polluters discharging harmful substances in the state-managed waters also pay this levy for water quality control activities.
- Supra regional water control activities are financed from the general budget since 1798.
- Of the 1998 water management costs, 15% is spent on flood protection, 20% on quantitative water management and 65% on qualitative water issues. The financing of these activities in that year is provided by the general budget (30%), the water boards' profit principle (18%), according to the polluter-pays-principle by the water board (33%) and by municipality sewerage tax (20%).
- Flood protection and water management tasks cannot be privatised. However, tendering of (more) activities is appropriate and during centuries practised to realise these tasks.



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