Paper

Water Accounts for the Netherlands

Compilation of Physical Supply and Use tables, Asset Accounts and Policy Indicators for Water 2018-2020

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Explanation of symbols

Empty cell	Figure not applicable
.	Figure is unknown, insufficiently reliable or confidential
*	Provisional figure
**	Revised provisional figure
–	(between two numbers) inclusive
0 (0.0)	Less than half of unit concerned
2021–2022	2021 to 2022 inclusive
2021/2022	Average for 2021 up to and including 2022
2021/'22	Crop year, financial year, school year, etc., beginning in 2021 and ending in 2022
2019/'20–2021/'22	Crop year, etc., 2019/'20 to 2021/'22 inclusive

Because of rounding, some totals may not correspond to the sum of the separate cells.
Revised figures are not marked as such.

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1. Introduction

1.1 Background

Water is a natural resource of tremendous importance to all life and to the economy. The economy depends on water in many ways. Water is used as drinking water, irrigation of land for agricultural production, cooling purposes, as input for production in manufacturing, for transportation and more. To ensure the availability of water for these different purposes, water resources need to be managed. Managing water resources requires information on supply of water by the environment and (waste)water treatment industry and on the other hand the use of water by households and economic sectors for a variety of purposes. The Netherlands is a country with - at first sight - an abundance of water; on the annual scale precipitation usually exceeds potential evapotranspiration, and some major rivers find their way to the sea in the Netherlands. However, water issues are increasing in number and diversity, such as seasonal droughts, temporal drinking water scarcity or regional desiccation due to climate change or other factors. Therefore, availability of well-founded data on supply, use and assets of water are becoming more important for policy and decision making.

The System of Environmental Economic Accounting (SEEA) framework provides a methodology for measuring and monitoring the flows and assets of water (UNSD, 2012), namely in the physical supply and use table (PSUT) and asset accounts for water. Environmental Accounts give a clear, coherent and consistent overview of the link between environment, nature and sustainability on one side and economy, society and welfare on the other side. It is a conceptual framework according to internationally agreed standards, definitions and concepts guided by the United Nations. One of the modules of the Environmental Accounts is the Water Accounts[1]. When referring to the Water Accounts in this report, both the PSUT for water and the Physical Asset Account for water are meant. This project is based on the general methodology SEEA Central Framework (SEEA CF) and SEEA Water (UNSD, 2012).

Statistics Netherland has been working on water statistics and water accounts for several years. This study in this report builds upon the feasibility study that has been carried out by Statistics Netherlands (Graveland, et. al., 2017). The main conclusion of this research was that it is possible to develop PSUT and asset accounts for water, but that certain elements of the accounts still needed further attention. These insights are implemented in this project with further use of available registers, like the re-designed National Groundwater Register and extensions of the Annual Environmental Reporting systems.

1.2 Objectives

The key aim of this 2021–2022 Eurostat grant project is to ensure well-directed information on water supply, use and resources in the Netherlands to the users of the data such as policy makers and researchers. The first objective is testing the proposed format of Eurostat's tables

[1] Eurostat proposed a legal base for five Environmental Accounts in 2019. Water accounts was one of the topics for possible future inclusion in Article 10 of Regulation (EU) 691/2011. The module on water accounts can provide well-organised statistical information on water. After considering the input of the member states it was concluded to postpone a legal base for Water Accounts.

on the Water Accounts for reporting year 2018 and compiling a time series (2018-2020). Data gaps and data of poor quality should be identified and new data sources or methods should be analysed to improve the compilation of the tables. Some adjustments or refinements of the format are made based on user needs, data availability or the situation in the Netherlands.

The second objective is setting up a statistical production process for future annual updates of the water accounts. This involves the establishment of reliable and frequent data sources and a robust production process with appropriate IT infrastructure in the statistical programming language R.

The third objective is exploring data needs on water issues and gain insight in possibilities to improve the water accounts for the usability for policy makers. Elements of the Water Accounts are mapped out with possibilities on temporal and regional breakdowns. Subsequently, relevant policy indicators are developed using the Water Accounts. Thus showing policy makers the possible applications of the PSUT and asset account and connect the data availability with the data needs.

1.3 Structure of the report

The report is structured as follows. Chapter 2 focuses on the water PSUT and chapter 3 focuses on the water asset accounts. These two chapters explain the data sources and their quality, definitions and interpretation of the variables, methodology used including assumptions and choices made, recommendations on the Eurostat table and results. Chapter 4 explains the production process in R. Chapter 5 elaborates on policy indicators, combining the results with monetary variables and gives a summary on the stakeholder workshops that have been conducted to gather user information on policy data needs. Chapter 6 concludes and gives recommendations to other member states, Eurostat and on future steps.

Regarding chapter 2 on the Physical Supply and Use tables, it is important to mention that each part of the use (chapter 2.1) and supply (chapter 2.2) starts with the results. This is done in order to introduce the structure and items of each subcategory. After the results, the definitions, methods and data-gaps are discussed.

2. Physical Supply and Use Table for water

Physical Supply and Use Tables (PSUT) provide insight on the volumes of water exchanged between economy and environment, and between economic units. It basically covers three flows. First, water flows from the environment to the economy: abstractions. Second, water flows within the economy: own use, distribution of water from one sector to another or to households, exchanges with the rest of the world and wastewater flows. Third, water flows from the economy back to environment: returns. Evapotranspiration and water in products is also included in the PSUT for water (UNSD, 2012). Supply and use tables for water are designed as follows. In the rows, the variables on the different water flows are distinguished:

I. Water flows from environment to economy
II. Abstracted water
III. Wastewater flows within the economy
IV. Return flows of water
V. Evapotranspiration and water in products

The variables in the columns represent the suppliers and users of water including the environment. For the purpose of this study, the suppliers and users are as follows:

- Economic sectors:
  - Agriculture, forestry and fishing (NACE A)
  - Mining and quarrying (NACE B)
  - Manufacturing (NACE C)
  - Energy sector (NACE D)
  - Water collection, treatment and supply (NACE E36)
  - Private wastewater treatment (NACE E37)
  - Waste management services (NACE E38-39)
  - Construction (NACE F)
  - Public wastewater treatment (NACE O84.1)[2]
  - Services (NACE G-U excluding O84.1)
- Final users and suppliers
  - Households
  - Import or Export
  - Environment

An important distinction in the tables is fresh and non-fresh water, these flows are both included and usually indicated in the variables. The definitions used are in general from SEEA Water (UNSD, 2012) and the Joint Questionnaire on Inland Waters (Eurostat, 2020) unless otherwise stated. The complete structure and results of the physical supply and use tables for water can be seen in the annex. The design of the tables allow for balancing supply with each corresponding use variable. The tables cover one calendar year for the area the Netherlands and has the unit million m^3. Time series for the years 2018, 2019 and 2020 have been compiled for the Netherlands. The starting point of this study is the supply and use tables as proposed by

[2] In the Netherlands, public waste water treatment plants are managed by the water boards. As water boards are regional public bodies, they have NACE code O84. NACE code E37 thus only includes Private Industrial wastewater treatment: companies whose main activity is to treat industrial wastewater for other companies.

Eurostat, see the Annex. Alterations to these tables have been made to better align with user needs, data availability and the situation in the Netherlands. In this chapter, the recommendations on these alterations of the proposed Eurostat table will be given. This chapter starts with the use (2.1) and then supply (2.2) of water and is structured according to the five water flows stated above. Each paragraph starts with the results and follows with definitions and interpretation of the variables, data sources, gaps and quality. The Methodology used is explained, including the assumptions and choices made and steps taken to calculate the water flows.
In the tables with results all numbers are presented with 1 decimal.

2.1 Use table for water

The use table for water is discussed first, since it makes it clear which sectors and for which purpose water is abstracted from the environment by the economy. In paragraph 2.2 the supply of corresponding variables is discussed. Annex 7.6 shows the use table as proposed by Eurostat and annex 7.7, 7.8 and 7.9 show the results for the Netherlands in 2018, 2019 and 2020. The classifications match the ones in the supply table apart from abstracted water for own use: the use table contains specific entries on how this water was used. The compilation of each variable in the use table is discussed below. Data sources, applied concepts and definitions, data gaps, assumptions and made estimations are discussed. This chapter shows blocks of results per water flow to explain these parts step by step. However, for the complete overview, it is recommended to look at the annex.

2.1.1 Water flows from environment to economy

Results

Table 1. Use of water in 2020 – from environment to economy

Use in 2020	Agri-culture, forestry and fishing	Mining and quarry-ing	Manufac-turing industry	Energy sector	Water collection, treatment and supply	Private waste-water treatment	Waste manage-ment services	Construc-tion	Public waste-water treatment	Services	House-holds	Accumu-lation	Export	Environ-ment	Total use
Million m^3	A	B	C	D	E36	E37	E38-39	F	O84.1	G-U					
(I) Water flows from environment to economy	**372.2**	**29.4**	**3,089.8**	**8,742.5**	**1,333.5**	**1.0**	**721.9**	**45.0**	**897.6**	**47.0**	**0.0**				**15,279.9**
Inland water resources	307.2	2.7	2,420.8	3,520.6	1,333.5	1.0	720.3	45.0	380.2	47.0	0.0				8,778.3
Groundwater	214.2	0.3	113.2	0.3	839.8	0.2	3.1	45.0	380.2	47.0	0.0				1,643.3
Soil water	-														-
Surface water	93.0	2.4	2,307.6	3,520.3	493.7	0.8	717.2	0.0	0.0	0.0	0.0				7,135.0
Other water sources	65.0	26.7	669.0	5,221.9	0.0	0.0	1.6	0.0	517.4	0.0	0.0				6,501.6
Precipitation	65.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	517.4	0.0	0.0				582.4
Sea water	0.0	26.7	669.0	5,221.9	0.0	0.0	1.6	0.0	0.0	0.0					5,919.2

A total of 15.280 million m^3 of water is abstracted from the environment for economic activities in the Netherlands in 2020. Large volumes of groundwater abstraction take place by water companies, public wastewater treatment and agriculture. The energy sector is responsible for a large sum of surface water abstraction, both fresh and salt (sea water).

Definitions and interpretation on variables

Groundwater: Water which is being held in, and can usually be recovered from, an underground formation. It includes permanent and temporary deposits of water, and both artificially charged and naturally. Groundwater is pumped or otherwise abstracted from underground formations. This may be fresh water, but can also be brackish or salt water.

Soil water: The definition of SEEA – Water 3.29 is: Abstraction from soil water includes water use in rain-fed agriculture, which is computed as the amount of precipitation that falls onto agricultural fields. The excess of water, that is, the part that is not used by the crop, is recorded as a return flow into the environment from rain-fed agriculture (UNSD, 2012). This type of water is currently not included in the water statistics and accounts of the Netherlands due to lack of data and therefore indicated in the table with an '-'.

Surface water: Fresh surface which flows over, or rests on the surface of a land mass, natural watercourses such as rivers, lakes, streams, brooks, etc., as well as artificial watercourses such as canals, drainage systems and artificial reservoirs. Salt/marine surface water (sea water) is not included in this variable.

Precipitation: Rain/sky water that ends up in the economy, on for example agricultural fields or the drainage system, this includes the collected rainwater in basins. Difference with soil water is that precipitation is collected water.

Sea water: Salt/marine surface water, in this case the North Sea.

Data sources and methods

Groundwater:

The data source for groundwater use by agriculture (NACE A) comes from Wageningen Economic Research (WEcR). The methodology of WEcR is as follows. The calculation of the water use is based on the results of the sample farms in the Business Information Network, where the amount of water used is recorded. By weighing the results of the sample farms using statistical matching, an estimate can be made of the total water use by the agricultural sector (Meer, van der, 2022). This data source provides information on the different types of water use by agriculture, namely tap water (for watering livestock and other), groundwater (for irrigation, watering livestock and other), surface water (for irrigation, watering livestock and other). This is allocated to arable farming, horticulture, fruit farming, livestock farming and other agricultural activities by WEcR. This data is also geographically split over 7 river basins and 12 provinces. Statistics Netherlands accepts these data with no to little changes.

The data source for groundwater use by industry (NACE B-E) is the Annual Environment Reporting system (RIVM, 2022b).This register provides information on the main abstractions of groundwater as well as surface water by industrial facilities in the manufacturing industry, the energy sector and the waste processing sector.

Water abstracted but not used in production, such as water flows in mine dewatering, could also be recorded. Mining activities are only able to take place if water is removed from the mine. Agricultural activities are sometimes only able to take place if water abstracted to keep farmland dry. Construction activities are sometimes only able to take place if water is removed at building sites. In theory these water flows should be taken into account and the figures also seem policy relevant. Eurostat recommends on this topic for every country to tailor the PSUT to the conditions relevant for a country. However, in practice it seems difficult to obtain the data for all of these activities. Therefore, only the water removal by construction is taken into account in the PSUT of the Netherlands. The National Groundwater Register provides information on groundwater in the Netherlands including spatial information (Baas & Graveland, 2014). Recently this register has undergone a revision of the whole data structure. There is still a long way to go for this register to be suitable as a reliable data source because there remain many data gaps. However, the groundwater use by construction (NACE F) could be distilled from the database of the register. This 45 million m^3 of water in 2020 represents the water that has to be pumped out, to be able to construct infrastructure or buildings on site.

In the Netherlands, a large part of the sewerage system lies below groundwater level. As a result leakage of sewer pipes causes drainage of groundwater. The amount of drainage is larger than the amount of leakages that occur when sewer pipes lie above groundwater. The drainage of groundwater by sewer pipes should be recorded as abstraction from the environment by public wastewater treatment plants (O84.1). These amounts are calculated as a balance item and can be estimated by the total waste water that enters the wastewater treatment plants (influent volume) minus discarded waste water (90% of tap water use) and minus precipitation that enters the sewage system. Precipitation that enters the sewage system is estimated via a model (see Partners 4urban water, 2020) that is used in the Dutch Emission Inventory system. This model takes into account the amount of yearly precipitation in the Netherlands, the surface of paved area draining to the sewer system, the percentage of rainwater that enters the sewage system (taken from Partners 4urban water, 2020) and the type of sewage system (part of the rainwater drainage in urban areas is discharged directly to surface water).

Source data for groundwater use by NACE G-U is the National Groundwater Register. The exact groundwater abstraction by households is unknown in the Netherlands, but can be expected to be small, so therefore is set to zero.

Soil water:
Currently data on soil water is lacking. This data should be equal to evapotranspiration from cultivated crops plus harvested biomass. In the past, data on evapotranspiration was obtained from E-Leaf, a consultancy firm. By combining the E-leaf data with the Statistics Netherlands land use data, the amount of evapotranspiration from agricultural land can be determined. E-leaf data is not freely available and only data for 2018 was purchased by Statistics Netherlands. Unfortunately it seems not possible to extrapolate the 2018 data in order to predict other years because evapotranspiration depends largely on weather conditions. Due to a lack of data on evapotranspiration, abstraction of soil water and water harvested in biomass is indicated with an '-' in the PSUT. This data item and its potential data sources needs further investigation in the future.

Surface water; fresh and sea water:
The data sources and methods of the abstraction of surface water is similar to groundwater. Therefore, the description on groundwater above can be consulted for agriculture (NACE A), industry (NACE B-E) and services (NACE G-U). Surface water abstraction by construction (NACE F) and households is set to zero. Sea water abstraction is assumed to be equal to the amount of sea water used for cooling. Desalination by using sea water does not occur in the Netherlands. Also, growing fish in demarcated areas in the sea (aquaculture) is not included as this is regarded as in-situ use.

Precipitation:
Greenhouse horticulture collects roof top rain water in basins. Rainwater harvesting by agriculture is calculated by multiplying the maximum potential of collected rainwater in artificial

reservoirs by the percentage used. The maximum potential of collected rainwater is calculated by the rainfall (measured in 300 stations) multiplied by the area of greenhouse horticulture. The percentage used (75%) is an estimate based on expertise from Wageningen Economic Research. SEEA-CF regards artificial reservoirs as part of the environment, not as part of the economy. Therefore abstraction from artificial reservoirs would be recorded as use of surface water. However, Statistics Netherlands has a good data source for the other surface water use by agriculture. So, for analytical purposes, it is chosen to record this as use of precipitation water. Due to lack of data, precipitation collected by households is not included in the figures.

Run-off rainwater from paved urban areas to the sewer system is recorded here as abstraction of precipitation by NACE O84.1. For the methodology used, see the description provided above in the paragraph on groundwater (2.1.1).

Data gaps, items for improvement

- Precipitation collected and used by households in rain barrels (small, but increases and is policy relevant).
- Distinction of water extracted but not used for production. For example, water removed by agriculture (NACE A) to make the land arable and water removed by mining industry (NACE B) to be able to mine. This is the same type of water use as construction (NACE F) that removes water to be able to build.
- Groundwater abstraction by services, such as the irrigation of sport fields. This is compiled using either outdated data of the National Groundwater Register, proxies or assumptions rather than direct source information. Abstraction for households is set to zero. The new version of the National Groundwater Register is analysed in this study to see whether an improvement can be made to current figures. Unfortunately, the conclusion is that the register is still not of good quality yet for the use of statistics, because it is far from complete and some water users don’t provide data to this register. In 2022, the provision of data became mandatory so in the future the use of this register for statistical purposes increases.
- Soil water. This data item and its potential data sources needs further investigation in the future.

Recommendations for Eurostat table

According to the SEEA-CF, following the general treatment of household own-account activity, the abstraction of water by households for own consumption should be recorded as part of the activity of the water collection, treatment and supply sector (NACE 36). For the water PSUT of the Netherlands, it is decided to deviate from this approach because the amount of water abstraction, especially precipitation, by households is a relevant figure with regard to issues related to water savings (storing water for dry periods), water buffers (capture water in wet periods) and a more circular water use (use of rain water for irrigation instead of tap water). This approach follows the approach Eurostat proposed in the water PSUT questionnaire. Unfortunately, data on the abstraction of water by households is not available and therefore, it is not yet included in the statistics.

2.1.2 Abstracted water

Results

Table 2. Use of water in 2020 – abstracted water

Use in 2020	Agri-culture, forestry and fishing	Mining and quarry-ing	Manufac-turing industry	Energy sector	Water collection, treatment and supply	Private waste-water treatment	Waste manage-ment services	Construc-tion	Public waste-water treatment	Services	House-holds	Accumu-lation	Export	Environ-ment	Total use
Million m^3	A	B	C	D	E36	E37	E38-39	F	O84.1	G-U					
(II) Abstracted water	**414.1**	**31.7**	**3,293.7**	**8,753.0**	**116.7**	**3.0**	**726.7**	**47.8**	**903.2**	**148.5**	**855.3**		**2.0**		**15,295.7**
Distribution	41.9	2.3	209.0	10.5	8.0	2.0	4.8	2.8	5.6	101.5	855.3		2.0		1,245.7
Drinkingwater	41.9	2.3	140.1	2.6	8.0	2.0	4.5	2.8	5.6	101.5	855.3		2.0		1,168.6
Industry water	0.0	0.0	68.9	7.9	0.0	0.0	0.3	0.0	0.0	0.0	0.0		0.0		77.1
Own use	372.2	29.4	3,084.7	8,742.5	108.7	1.0	721.9	45.0	897.6	47.0	0.0		0.0		14,050.0
Aquaculture	0.0														0.0
Cooling (fresh water)		2.2	2,126.8	3,168.3			646.9	0.0							5,944.2
Cooling (seawater)	0.0	26.7	669.0	5,221.9	0.0		1.6	0.0		0.0					5,919.2
Hydroelectric power generation				0.0											0.0
Irrigation	333.5									0.0	0.0				333.5
Mine water		0.0													0.0
Other uses	38.7	0.5	288.9	352.3	108.7	1.0	73.4	45.0	897.6	47.0	0.0				1,853.1

Water that has been abstracted must be either used by the same economic sector that abstracts it (referred to as abstracted water for own use) or distributed, possibly after some treatment, to other economic sectors (referred to as abstracted water for distribution). In table 2 it is shown that 1,169 million m^3 of the abstracted water is distributed as drinking water in 2020 in the Netherlands, of which households consume 855 million m^3 drinking water. The energy sector and the manufacturing industry use a large sum of surface water for cooling, which is shown for both fresh and salt water. Agriculture uses 334 million m^3 water for irrigation and 39 million m^3 water for other agricultural purposes such as watering livestock or cleaning the stables.

Definitions and interpretation on variables

Water for distribution can be broken down into drinking water and industry water. This breakdown is added by Statistics Netherlands to the Eurostat table because it is a relevant distinction to make and there is data available.

Drinking water: Water is received and produced by the water supply companies and is suitable to drink. This is either purified groundwater or surface water, being transported through a network of pipes or (tap) water network. Export of drinking water is traded bulk water to another territory (bottled water is not included).

Industry water: Water of different, usually lesser quality than drinking water, but is also being transported through a network of pipes or (tap) water network.

Aquaculture: Water use for the breeding, growing and harvesting of fish and aquatic plants.

Cooling (fresh water): Fresh water use to absorb and remove heat, for example for the generation of electricity in power stations or other industrial processes.

Cooling (sea water): Salt water use from the North sea to absorb and remove heat, mainly for the generation of electricity in power stations along the coast.

Hydroelectric power generation: Water that is used to generate electricity, by using the force of water flow. This is an in-situ use, meaning that the water is needed for production, but not consumed.

Irrigation: Water which is applied to soils in order to increase their moisture content and to provide for normal plant growth. This occurs mainly in the agricultural sector, but is also possible for sport fields, parks or gardens in other sectors.

Mine water: Water pumped out of mining structures to be able to mine (mine dewatering).

Other uses: Water abstracted for own use that does not fall under any of the above stated categories, mainly water use in production processes.

Data sources and methods

Distribution:

The data source for drinking water is Vewin, the national association of water companies in the Netherlands. Vewin reports to Statistics Netherlands data on the use of drinking water by economic sectors (as a whole), households, imports and export (see VEWIN, 2019, 2020 and 2021). The breakdown of the use of drinking water by sector (NACE code) is carried out by Statistics Netherlands. Export of drinking water is a very small amount where the tap water network is just across the border of Belgium and Germany. Some steps have to be taken to balance the use and supply of drinking water:

Supply by E36 + imports = use by economic sectors + households + exports

The imported water use by households and exported water remain the same as reported in the data source. The use by sectors is increased by the amount of imports. The supply by E36 is increased by the exports. This way the supply of drinking water equals the use.

An allocation of the drinking water totals from the data source to each sector has to be made. Agricultural drinking water use comes from WEcR (Van der Meer, 2021), industrial drinking water use (and industry water use) come from the AER on NACE B-F. Source data for drinking water use by NACE G-U is lacking, and therefore estimated using data from the National Accounts, namely the Labour Accounts. The assumption is made that drinking water use is related to the number of employees. The development of the FTE of each sector is set on earlier water use data based on water efficiency coefficients to get the drinking water use by each sector. In the water PSUT, the services sector (NACE G-U) is aggregated as one column, therefore, the poor quality of this data on individual sector level is not shown. Subsequently, adjustments are made to balance drinking water across the various industries to the Vewin totals.

Own use:

For abstracted water for own use different types of use among which cooling water and irrigation are distinguished. Intra-industry water flows should be recorded following standard accounting principles, however, these exchanges are not recorded in the PSUT, as this would increase the total flows recorded.

Aquaculture and hydroelectric power generation are small in the Netherlands, and due to lack of data it is assumed to be zero. Fresh and salt water for cooling purposes come from the AER. The assumption is made that all salt surface water is used for cooling purposes. Irrigation data is taken from WEcR, see 2.1.1 for an elaborated explanation on the data source and methodology.

Source data on irrigation by government, sport clubs and households is lacking. Mine water data is also lacking, see 2.1.1. The category “other uses” is added by Statistics Netherlands to get a complete overview own abstracted water for own use. Water abstracted by NACE 37 and O84.1 as a result of rain water and groundwater entering the sewage system is also recorded as “other uses”. Other uses also encompass water use in production processes.

Data gaps, items for improvement

- Source data on irrigation by government, sport clubs and households is lacking. However, in the JQ-IW, only agriculture is taken into account, so this matches between the questionnaire and PSUT.
- Source data on aquaculture, hydroelectric power generation and mine water is lacking.
- Source data on abstraction for own use by households is lacking.

In order to guarantee the supply and use balance, missing data is accounted for as “other uses”. In order to make an estimate of “other uses” it is assumed that the total amount of water abstracted water for own use must equal the total flows from the environment to the economy minus the supply of water for distribution.

Recommendations for Eurostat table

In the SEEA-CF SUT the own use of abstracted water (II) of E36 is not equal to the own use in supply table. The reason for this is that abstraction of water by households in the use table is recorded as abstraction by E36. However, in the supply table this extraction is recorded as own use by households in the supply table. In the PSUT for the Netherlands, abstraction by households is not included at all due to lack of data. If data was available, it would be desired to record this at the same sector in both supply and use, to get a clear overview for policy makers on the actual use.
The breakdown of the own use category is altered by Statistics Netherlands to make it more clear. In the Eurostat table, type of water (e.g. sea water) and the purpose of water (e.g. for irrigation) was in the same list. Also, not all the water flows could be recorded in one of the categories. So “of which: for cooling” and “of which: sea water” are changed to “cooling (fresh water)” and “cooling (sea water)” and “other uses” is added for a complete overview.

2.1.3 Wastewater flows within the economy

Part III of the use table provides information on the volumes of wastewater received (or “used”) from other economic activities as well as households. In general the wastewater receiving sectors are i) the public WWTP’s (NACE O84.1), ii) private companies with main activity industrial WWT (NACE E37) and companies that treat wastewater from other neighbouring companies together with their own wastewater (mostly in sector C manufacturing industry). Moreover, a small part of the effluents from public WWTP’s is provided for re-use in other activities. The re-used volumes are reported here in the column of the receiving sector.

Results

Table 3. Use of water in 2020 – wastewater flows within the economy

Use in 2020	Agri-culture, forestry and fishing	Mining and quarry-ing	Manufac-turing industry	Energy sector	Water collection, treatment and supply	Private waste-water treatment	Waste manage-ment services	Construc-tion	Public waste-water treatment	Services	House-holds	Accumu-lation	Export	Environ-ment	Total use
Million m^3	A	B	C	D	E36	E37	E38-39	F	O84.1	G-U					
(III) Wastewater flows within the economy	**0.0**	**0.0**	**9.9**	**0.0**	**0.0**	**3.4**	**1.1**	**0.0**	**1,055.0**	**0.7**	**0.0**		**0.0**		**1,070.1**
Reuse	0.0	0.0	2.3	0.0	0.0	0.0	1.0	0.0	0.0	0.4	0.0				3.7
Wastewater	0.0	0.0	7.5	0.0	0.0	3.4	0.1	0.0	1,055.0	0.3	0.0		0.0		1,066.3
Own treatment	0.0	0.0	7.5	0.0	0.0	0.0	0.1	0.0	0.0	0.3	0.0				7.9
Wastewater (to) treatment					0.0	3.4			1,055.0				0.0		1,058.4

More than 1 billion m^3 of wastewater is received by the public WWTP' (NACE O84.1) from households and companies. This amount only reflects the wastewater part of the influent of the public WWTP's. Run-off rainwater entering the sewer system in the urban environment and net drainage of groundwater to sewer systems is excluded here. These flows are regarded as abstracted amounts of precipitation and groundwater respectively and likewise are reported in part I of the use table.
Small amounts of treated effluents are re-used by the Manufacturing industry (NACE C), Waste management services (NACE E38-E39) as well as by other services (NACE G-U), in total nearly 4 million m^3.
Companies in the manufacturing industry, Private WWTP's as well as the Services sector, receive small amounts of wastewater from other companies for own treatment in WWTP's, in total nearly 8 million m^3.

Definitions and interpretation of variables

Reuse: Reused water is wastewater supplied to a user for further use with or without prior treatment, excluding the internal reuse (or recycling) of water within economic units. In the use table the volumes are reported under the receiving economic sector. In the supply table the volumes are reported under the economic sectors that deliver the water.

Own treatment: Flows of wastewater delivered by economic units to wastewater treatment of other economic units not being public wastewater treatment plants (NACE O84.1). For example a chemical company that supplies wastewater to a neighbouring other chemical company with an on-site industrial wastewater treatment plant. In the use table the volumes are reported under the receiving economic sector. In the supply table the volumes are reported under the economic sectors that deliver the wastewater to other companies.
Own treatment does not refer to waste water treatment within a company. This kind or treatment is not part of the PSUT. The PSUT only regards end-of-pipe volumes. That means it does not consider any internal flows or treatments within the company premises.

Wastewater to treatment: Flows of wastewater supplied to public wastewater treatment plants (NACE O84.1). Flows of wastewater exchanged between sewerage facilities in different economies are recorded as imports and exports of wastewater.

Data sources and methods

Reuse:

In the Netherlands some public WWTP's (NACE O84.1) supply small amounts of water for re-use. In the use table these volumes are recorded at the receiving sector. Supply of wastewater treatment effluents by public WWTP's for re-use is recorded in the Statistics Netherlands questionnaire on public WWT, covering all public WWTP's. Data are available for all three years and published on the website of Statistics Netherlands. See for example Statistics Netherlands (2022b). For other flows of re-used (treated) wastewater, no data-sources are available although it is known that a particular brewery provides waste water to agriculture. These flows are considered small and for this study no attempt is made to estimate this. So, coverage of data on re-use is currently not 100%.

Own treatment:
Data on own treatment are derived from the Dutch Emission Inventory System (RIVM, 2022a). In this inventory, waste water discharges (loads and volumes) are recorded for all major Dutch manufacturing industries, power plants and waste processing facilities. Companies report this data to RIVM via the AER, the Annual Environmental Reports (RIVM, 2022b). Data on 2018-2020 are available on volumes of wastewater discharged either to fresh or marine surface water, sewer system to public WWTP and/or transferred to neighbouring industries providing industrial wastewater treatment services to other companies. The latter category provides the data on own treatment. In 2020 for example, in total 28 companies, mainly in sector C Manufacturing industry, transferred their wastewater to in total 11 other companies (mostly in the vicinity) where the waste water is treated in own industrial WWTP's. Recorded transferred volumes of wastewater of the 28 companies are filled in in the supply table, while in the use table the received volumes are recorded at the sectors providing the waste water treatment service.
Data on own treatment have a good quality and coverage is near to 100%.

Wastewater to treatment:
In the Netherlands, nearly 100% of the households is connected to sewer systems. Also most companies are connected to sewer systems, except large industrial facilities having their own treatment and discharging cooling water or process water directly to surface water. All sewer systems are connected to public WWTP's.
There is no direct monitoring per sector of the volumes of wastewater discharged to these sewer systems; however, exactly the total influent volumes of all public WWTP's is availble (see Statistics Netherlands, 2022c). As this is a mixture of wastewater, run-off rainwater and drainage to/leakage from sewer systems, this total influent volume cannot be used for top-down estimating wastewater production per sector. Instead, the wastewater volumes are estimated using a proxy value: the drinking water use.

Most of the wastewater produced by households, as well as by most of the companies, originates predominantly from the use of drinking water. As a first estimate the assumption was made that 90% of the drinking water used, leads to wastewater discharges to sewer systems. This value was taken from an earlier study by Statistics Netherlands (Graveland et. al., 2017) and is also reported by for example Partners 4Urban water (2020). The value was determined by evaluating the different average water uses per application within a household, for instance toilet flush water, shower, bath, dishwasher, cloth washing, preparing food, coffee and tea and direct consumption. Some uses don't result in wastewater, like for instance watering plants and garden, washing of cars, cleaning of windows and floors. These volumes are estimated to be 10% of total drinking water use; the remaining 90% is discharged to the sewer system. This percentage is also used for estimating the wastewater production of companies, as drinking water is used often only for personal care of the employees and other household-like applications within companies, like cleaning and catering.

The major data source for the supply of waste water to treatment and the use of wastewater by the wastewater treating sector, is therefore the drinking water use statistics as compiled by Statistics Netherlands (Statistics Netherlands, 2022a). Wastewater to treatment is calculated as 90% of this total drinking water use.

Data gaps, items for improvement

For part III of the use table, the same data gaps exist as for the supply table part III, except that this can be formulated from the user perspective. See paragraph 2.2.3.

Recommendations for Eurostat table

There are no recommendations for this part of the use table.

2.1.4 Return flows of water to the environment

Flows of water from the economy to the environment are called return flows. While in the supply table (see paragraph 2.2.4) the return flows are broken down to origin (sector) and type of use (cooling, irrigation etc.), in the use table return flows are only 'by the environment'. The return flows are broken down by destination: at the highest level differentiation is between inland water resources (mostly fresh water) and other sources, like marine water. Within the destination Inland water resources, the categories groundwater, soil water and surface water can be distinguished.

Results

Table 4. Use of water in 2020 – return flows

Use in 2020	Agri-culture, forestry and fishing	Mining and quarry-ing	Manufac-turing industry	Energy sector	Water collection, treatment and supply	Private waste-water treatment	Waste manage-ment services	Construc-tion	Public waste-water treatment	Services	House-holds	Accumu-lation	Export	Environ-ment	Total use
Million m^3	A	B	C	D	E36	E37	E38-39	F	O84.1	G-U					
(IV) Return flows of water														**14,458.7**	**14,458.7**
To inland water resources														6,466.6	6,466.6
Groundwater (+soil water)														333.5	333.5
Surface water														6,133.1	6,133.1
To other sources														7,992.1	7,992.1

From the table above it can be concluded that 55% of the return flows that are received ("used") by the environment are flows to 'Other sources'. These flows mainly consist of volumes of cooling water abstracted from marine waters and returned immediately after cooling to the same source, but also include discharges of treated wastewater to sea from companies and public and industrial WWTP's.

Almost 45% of the return flow goes to inland surface water. These flows exist mainly of fresh cooling water and discharges of treated wastewater to fresh waters. A small part (2,3%) is returned to soil and ground water. These flow includes irrigation water and water returned without use (from construction sites). Also losses (as quantified in the supply part of the return flows) are included in this flow.

Definitions and interpretation of variables

Inland water resources: mainly refer to surface water and ground water bodies within the boundaries of a territory and away from the coastal zone. Most inland waters are fresh waters but can also be brackish, for instance the mouth of rivers influenced by the tide, and brackish groundwater. For definitions on types of water see also paragraph 2.1.1.

Other sources: this includes (like mentioned earlier) all return flows to marine waters and estuaries, like the North Sea, Westerschelde, Oosterschelde, Wadden Sea and Eems/Dollard, as well as parts of the coastal harbours with direct connection to sea, like the Maasvlakte in Rotterdam as well as in Eemshaven, Delfzijl, Harlingen and Vlissingen (Sloegebied).

In the results of this part of the use table, there is no distinction made between soil water and groundwater; these are combined in one item and regarded as return flow to soil including the underlying groundwater layers.

Data sources and methods
Paragraph 2.2.4 on the supply of return flows to the environment addresses in detail the data sources for these flows. Nearly all discharges of waste water and cooling water, as known from the survey on public WWTP's and from the Annual Environmental reporting, have a geo location. Also the name and type of the receiving water is known. On basis of this information, the attribution to and aggregation to either inland water or other sources is made.

Data gaps, items for improvement
For part IV of the use table, the same data gaps exist as for the supply table part IV, except that this can be formulated from the user perspective. See paragraph 2.2.4.

Recommendations for Eurostat table
There are no recommendations for this part of the use table.

2.1.5 Evapotranspiration of abstracted water incorporated into products

Results
Table 5. Use of water in 2020 – Evapotranspiration of abstracted water and water incorporated in products

Use in 2020	Agri-culture, forestry and fishing	Mining and quarry-ing	Manufac-turing industry	Energy sector	Water collection, treatment and supply	Private waste-water treatment	Waste manage-ment services	Construc-tion	Public waste-water treatment	Services	House-holds	Accumu-lation	Export	Environ-ment	Total use
Million m^3	A	B	C	D	E36	E37	E38-39	F	O84.1	G-U					
(V) Evapotranspiration and water in products												0.0	12.0	824.1	836.1

In the paragraph on the supply of water incorporated into product (chapter 2.2.5) it is argued why and to what extent these water flows should be taken into account. According to SEEA guidelines water incorporated in products is used by accumulation and exports. Thus bottled water used by e.g. households is allocated to accumulation and not households. This adds an inconsistency to the PSUT as sewage water from households is recorded including the excreted water incorporated in products. For the Netherlands these amounts are relative small, around 1 percent of the tap water use by household. This might be different for countries that mainly drink bottled water. In order to align the PSUT with the ones proposed by Eurostat, the use of water incorporated in products is allocated to accumulation. The amount is estimated by taking the difference between the amount imported and exported water incorporated in products.

The remaining use of "Evapotranspiration of abstracted water and water incorporated into products" is allocated to environment. These are water flows mainly related to evapotranspiration.

2.2 Supply table for water

Previous paragraph discussed the use table for water. This paragraph discusses the supply of corresponding water variables. Annex 7.2 show the supply table as proposed by Eurostat and annex 7.3, 7.4 and 7.5 show the results for the Netherlands in 2018, 2019 and 2020. The compilation of each variable in the use table is discussed below. Data sources, applied concepts and definitions, data gaps, assumptions and made estimations is discussed. This chapter shows blocks of results per water flow to explain these parts step by step. However, for the complete overview, it is recommended to look at the annex.

2.2.1 Water flows from environment to economy

Results

Table 6. Supply of water in 2020 – water flows from environment to economy

Supply in 2020	Agri-culture, forestry and fishing	Mining and quarry-ing	Manufac-turing industry	Energy sector	collection, treatment and supply	Private waste-water treatment	Waste manage-ment services	Construc-tion	Public waste-water treatment	Services	House-holds	Import	Environ-ment	Total supply
Million m^3	A	B	C	D	E36	E37	E38-39	F	O84.1	G-U				
(I) Water flows from environment to economy													**15,279.9**	**15,279.9**
Inland water resources													8,778.3	8,778.3
Groundwater													1,643.3	1,643.3
Soil water													-	-
Surface water													7,135.0	7,135.0
Other water sources													6,501.6	6,501.6
Precipitation													582.4	582.4
Sea water													5,919.2	5,919.2

A total of 15.280 million m^3 of water is supplied by the environment for the use by economic sectors and households in the Netherlands in 2020. These figures are a results of the sum of the use in the use table of the corresponding items. A total of 1.643 million m^3 groundwater is supplied, 7.135 million m^3 fresh and 5.919 million m^3 salt surface water and 582 million m^3 of precipitation water is used and therefore allocated as supplied by environment in the supply table.

Definitions and interpretation on variables

See 2.1.1 for the definitions and interpretation on the variables.

Data sources, methods, data gaps and items for improvement

These figures are taken from the totals from the use table. See 2.1.1 for the explanation on the data sources, method, and also the data gaps and items for improvement.

Recommendations for Eurostat table

No alterations on the Eurostat table were made in this section.

2.2.2 Abstracted water

Results

Table 7. Supply of water in 2020 – abstracted water

Supply in 2020	Agri-culture, forestry and fishing	Mining and quarry-ing	Manufac-turing industry	Energy sector	Water collection, treatment and supply	Private waste-water treatment	Waste manage-ment services	Construc-tion	Public waste-water treatment	Services	House-holds	Import	Environ-ment	Total supply
Million m^3	A	B	C	D	E36	E37	E38-39	F	O84.1	G-U				
(II) Abstracted water	**372.2**	**29.4**	**3,089.8**	**8,742.5**	**1,341.3**	**1.0**	**721.9**	**45.0**	**897.6**	**47.0**	**0.0**	**7.8**		**15,295.5**
Distribution	0.0	0.0	5.1	0.0	1,232.7	0.0	0.0	0.0	0.0	0.0	0.0	7.8		1,245.6
Drinkingwater					1,160.8				0.0			7.8		1,168.6
Industry water	0.0	0.0	5.1	0.0	71.9	0.0	0.0	0.0	0.0	0.0		0.0		77.0
Own use	372.2	29.4	3,084.7	8,742.5	108.7	1.0	721.9	45.0	897.6	47.0	0.0	0.0		14,050.0

In this part of the table it is shown which sector distributes the abstracted water and which sectors have own use of abstracted water. The water companies supply 1.161 million m^3 drinking water to other sectors and the energy sector has the highest own use with 8.743 million m^3 water in 2020. In the use table, the abstracted water for own use is broken down into different types of uses, such as irrigation of cooling water. However, this breakdown is not relevant for the supply table.

Definitions and interpretation on variables

For the definitions and interpretation on drinking water and industry water (distribution) and own use, see 2.1.2.

Data sources and methods

Distribution is recorded, for the largest part, as drinking water under NACE 36, Water collection, treatment and supply, and imports. Abstracted water that is distributed as drinking water, after purification, by NACE E36 “Water collection, treatment and supply” and the import of drinking water is taken from the water balance data that Statistics Netherlands receives from Vewin. Vewin is the national association of water companies in the Netherlands (VEWIN, 2021). It is assumed that distribution only takes place via pipelines. Thus distribution of abstracted water by bottled water is not recorded here. In 2.1.2 the balancing of this variable (supply equals use) is explained.

A small amount of distributed water is industry water, which is distributed by E36 and the manufacturing industry (NACE C). The data source for industry water is the Annual Environmental Reporting system (RIVM, 2022b). Every sector abstracts water for own purposes, meaning they do not receive it from drinking companies or other sectors. This is the total of the corresponding items in the use table, where they have a breakdown by type of use, see 2.1.2.

Data gaps, items for improvement

- Data on the use of industry water are of moderate quality and rely partly on old data and estimates. In 2023 the AER system introduces a new module in which the distinction between the use of industry water and drinking water is more clear.
- Own use of abstracted water by households is not quantified and assumed to be zero. It is expected to be a small volume, nevertheless there is no clear estimate of its magnitude.

Recommendations for Eurostat table

For the Netherlands, it is useful to distinguish between drinking water and industry water when compiling data on abstracted water for distribution. Both types of water are transported via pipes and tap water network, but have a different use and quality. Policy on these different types of water may differ.

2.2.3 Wastewater flows within the economy

In the sequence of starting with abstraction of natural water resources and ending up with using it in production and consumption activities, there will be water that is no longer or not fully used by the (intermediate or final) user. A major part of this wastewater will flow within the economy, namely from production and consumption activities to wastewater treatment facilities. Wastewater can be discharged to the sewer system ending up in public Waste Water Treatment Plants (WWTP's) or resupplied, sometimes after treatment in dedicated waste water treatment facilities, often in manufacturing on industrial sites, or to other economic entities for reuse.

Results

Table 8. Supply of water in 2020 – wastewater flows within the economy

Supply in 2020 Million m^3	Agri-culture, forestry and fishing A	Mining and quarry-ing B	Manufac-turing industry C	Energy sector D	Water collection, treatment and supply E36	Private waste-water treatment E37	Waste manage-ment services E38-39	Construc-tion F	Public waste-water treatment O84.1	Services G-U	House-holds	Import	Environ-ment	Total supply
(III) Wastewater flows within the economy	**37.7**	**2.1**	**137.5**	**2.3**	**7.2**	**1.8**	**4.0**	**2.5**	**8.7**	**96.4**	**769.8**	**0.0**		**1,070.0**
Reuse						0.0	0.0		3.7					3.7
Wastewater	37.7	2.1	137.5	2.3	7.2	1.8	4.0	2.5	5.0	96.4	769.8	0.0		1,066.3
Own treatment	0.0	0.0	8.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			8.0
Wastewater (to) treatment	37.7	2.1	129.5	2.3	7.2	1.8	4.0	2.5	5.0	96.4	769.8	0.0		1,058.3

In total, 1058 million m^3 of wastewater is supplied to public WWTP's, 3,7 million m^3 is supplied for re-use after treatment by sector O84.1 Public WWTP and 8 million m^3 is supplied by industries in sector C to other companies with own treatment of wastewater.

Definitions and interpretation on variables

Reuse: The supply of flows of treated wastewater that are provided for reuse. For definition of reused water, see paragraph 2.1.3.

Own treatment of wastewater: flows of wastewater supplied to companies that treat wastewater as a service for other companies. See also definition in paragraph 2.1.3.

Wastewater to treatment: flows of wastewater supplied to private industrial WWT companies (NACE E37) as well as public WWTP's (NACE O84.1), mostly via sewer systems.

Data sources and methods

Reuse of wastewater: for data-sources, see paragraph 2.1.3. Own treatment of wastewater: for data-sources, see paragraph 2.1.3. Wastewater (to) treatment: for data-sources and estimation methods, see paragraph 2.1.3.

Data gaps, items for improvement

For category III Wastewater flows of the supply table, the following data-gaps exist:

- Volumes of re-used wastewater effluents from Industrial wastewater treatment plants. This is considered to be insignificant, but this assumption should be evaluated further in future compilation of PSUT.
- Volumes of wastewater (supplied to wastewater treatment) that stem from the use of abstracted groundwater, abstracted surface water and industry water in industrial processes. This requires extensive desktop study as well as evaluation of water balances per large industrial facility. A promising future data-source is the improved Annual Environmental Report module on water use and water discharge. This improved module is to be used for the first time in the 2023 data drive of the AER.
- Volumes of wastewater supplied to treatment from households with private groundwater abstraction facilities. These abstraction data currently are not known, but are estimated to be low compared to the wastewater production calculated on basis of use of distributed drinking water.

A subject for further improvement is the assumption made that 90% of total drinking water of households and companies results in wastewater supplied to treatment. For households this assumption seems valid but for companies this can be elaborated further and differentiated by sector. In certain sectors, like beer breweries and beverage industry, drinking water will be incorporated in products, but also groundwater can be used by these companies to produce the beverages. Water balances per company are needed to improve this assumption. Also in this case, the improved data of the AER, that will become available in 2023, will provide more basic information to improve the assumption that 90 percent of the drinking water will end up as waste water to sewer systems.

Recommendations for Eurostat table

There are no specific recommendations for adjusting the items of the supply table under category III Wastewater flows within the economy.

2.2.4 Return flows of water

Flows of water from the economy to the environment are called return flows. These flows can e.g. comprise of flows of wastewater supplied from industries directly to the environment, effluents from public wastewater treatment facilities, cooling water or irrigation water. Some return flows of water to the environment are losses of water. Losses of water encompass flows of water that do not reach their intended destination or have disappeared from storage. Losses may be caused by a number of factors including leakages from pipes.

Results

Table 9. Supply of water in 2020 – return flows

Supply in 2020	Agri-culture, forestry and fishing	Mining and quarry-ing	Manufac-turing industry	Energy sector	Water collection, treatment and supply	Private waste-water treatment	Waste manage-ment services	Construc-tion	Public waste-water treatment	Services	House-holds	Import	Environ-ment	Total supply
Million m^3	A	B	C	D	E36	E37	E38-39	F	O84.1	G-U				
(IV) Return flows of water	**268.5**	**29.6**	**2,631.7**	**8,742.1**	**101.6**	**3.4**	**674.2**	**45.3**	**1,949.5**	**12.8**	**0.0**			**14,458.7**
Cooling water	0.0	25.0	2,463.2	8,742.1	0.0	0.0	668.1	0.0	0.0	9.5	0.0			11,907.9
Irrigation	268.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			268.5
Losses through leakages					42.4	0.0	0.0		0.0					42.4
Unaccounted (fire water)					59.2	0.0	0.0		0.0					59.2
Water returned without use	0.0	0.0	0.0	0.0	0.0	0.0	0.0	38.8	0.0	0.0	0.0			38.8
Water safely treated	0.0	4.6	168.5	0.0	0.0	3.4	6.2	6.5	1,949.5	3.3	0.0			2,142.0

In the Netherlands, by far largest return flow of water is cooling water discharged ("supplied") to the environment by the Energy Sector (NACE D), Manufacturing Industry (NACE C) and the Waste management services (NACE E38-E39), with shares of respectively 60%, 17% and 5% of the total return flow of 14,459 million m^3. The category Water safely treated is also an important return flow, having a share of 18% in total return flows.

Definitions and interpretation of variables

Cooling water returns: (extra item added by Statistics Netherlands): Water which is used to absorb and remove heat. Cooling water is used predominantly in the generation of electricity in power stations, but also in other industrial processes.

Irrigation water: (extra item added by Statistics Netherlands): Water which is applied to soils in order to increase their moisture content and to provide for normal plant growth. Irrigation water is mainly used in NACE division 01, Agriculture but also can be used in other sectors, like on outdoor sporting grounds.

Losses through leakages: Volumes of water lost during production of drinking water, during transport through leakage from mains, between a point of abstraction and a point of use, between a water supplier/distributor and a point of use or between points of use and reuse. Water lost through evaporation during use is excluded here and is reported under category V (Evapo)transpiration. For the Netherlands this item covers only production losses within NACE E36 (Public water supply). Within NACE O84.1 also leakages of wastewater from sewer systems exists but these are not reported separately but are netted out with the drainage of groundwater by sewer systems. Since drainage is higher than leakage, the resulting net flows are reported in the supply table part (I) Abstraction of groundwater by sector O84.1.

Distributed and unaccounted: (extra item added by Statistics Netherlands): This item is added by Statistics Netherlands and is exclusively used to report volumes of water distributed by sector E36 but not accounted for, for example incidental spills from the networks, spills during repair and cleaning of the distribution networks and volumes of water used by fire brigades.

Water returned without use: (extra item added by Statistics Netherlands): Water abstracted from any freshwater source and discharged into freshwaters without use, or before use. Occurs primarily during mining, construction activities or in connection with spring overflows. Discharges to the sea as well as discharges after use are excluded.

Water safely treated: Volumes of treated wastewater discharged by public WWTP's (NACE O84.1) or private industrial WWTP's using at least secondary treatment methods or tertiary treatment (extra removal of nitrogen and/or phosphorus). The referral to treatment level is important here because its definitions are common with those of the European Directive on Urban Wastewater Treatment as well as with the Sustainable Development Goal 6.3.1 on wastewater safely treated.

Data sources and methods

Cooling water returns:

Data on cooling water returns are derived from the AER system (RIVM 2022b) via which all major industrial companies and power plants report the yearly volumes of cooling water returned to the environment. Statistics Netherlands has access to the data-file with individual records of all reporting companies for 2018, 2019 and 2020. For each company, the NACE code of the activity is also available.

Power plants in the Netherlands predominantly use flow-through cooling systems. That means that the (often very large) abstracted volumes are returned directly to the source of abstraction (either fresh or marine surface water) after the cooling process. For data on industrial cooling water the picture is less clear. Intake of surface water or ground water by manufacturing industries can be either for cooling purposes or for industrial process water. The latter use results often in waste water discharges (see also item Water safely treated). To distinguish between return flows of waste water and return flows of cooling water, extra information on the reported thermal discharge in Mega-Joules of heat is available from the AER. As a rule of thumb we defined that when a company reports a thermal discharge, the returned volume is considered to be 100% cooling water. If no data on thermal discharge is reported, the return flow is considered to be 100% waste water safely treated (as untreated discharges to surface water do not occur anymore). As the combined system of the Dutch Emission Inventory and Annual Environmental Reporting system provides information on all major directly discharging industrial facilities and power plants, the coverage of these data is considered to be nearly 100%.

Irrigation water:

The volumes of water used for irrigation are derived from the data-source WEcR (2022). This data-source is described in detail in paragraph 2.1.1 on part I of the use table. The WEcR data provide total volumes of abstracted ground- and surface water for irrigation purposes. As these flows are applied to the soil, it is considered as a return flow to the environment. Excluded from this return flow are the volumes of precipitation harvested by the horticultural greenhouses and used in drip irrigation in a closed circuit. Most of this water is incorporated in products or evaporates in the greenhouse or finally is discharged to the sewer system.

Losses through leakages:

Data are derived from the drinking water statistics compiled by the Dutch Association of Public water supply companies the VEWIN (VEWIN 2019, 2020, 2021). It concerns the losses during the production of drinking water exclusively (attributed to sector E36).

Distributed and not accounted for:

Also these flows are taken from the VEWIN drinking water statistics (VEWIN 2019, 2020, 2021) and attributed to sector E36.

Water returned without use:
The only known flows reported under this item are the volumes of (mainly) groundwater drained from construction sites in areas with high groundwater levels. Basic data stem from the National Groundwater Register (see also paragraph 2.1.1 describing part I of the Use table). Water in the drainage system that is not technically used, such as rainwater of leakages into the pipes, is not recorded here. These flows go through the WWTP and are therefore recorded as "returns of water safely treated".

Returns of water safely treated:
Two main data-sources are important here. First the flow of effluents of public WWTP's (sector O84.1). Data are derived from the yearly questionnaire of Statistics Netherlands among all Public WWTP's (Statistics Netherlands, 2022c). Coverage is 100% of all public WWTP's.

Second source is the Annual Environmental Reporting system (AER) (RIVM 2022b). In this reporting system all wastewater flows discharged directly to surface water are recorded. In all cases this discharge is done after preceding treatment in industrial WWTP's. In order to distinguish between cooling water and treated wastewater, it is taken into account whether a thermal discharge (of heat) is reported (see further explanation above under Cooling water returns). Given the strict rules and permit system for direct discharges of wastewater to surface waters, and the corresponding monitoring requirements, it is expected that all major direct discharges of treated wastewater of industrial activities are covered by the AER system.

Data gaps, items for improvement
Losses: there is no information available of losses of water flows during abstraction, transport and processing of water and wastewater within other sectors than E36 (public water supply) and O84.1 (public WWT).

For all industrial sectors like mining and quarrying, manufacturing industry and waste processing industry, the division of the return flows into either cooling water or water safely treated is now done on basis of extra information on thermal discharge. The already mentioned improved AER module on water use and water discharges (to be used in 2023 for the first time) will distinguish better between the two flows.

Recommendations for Eurostat table
For Statistics Netherlands it is useful to break down the return flows into separate flows of cooling water, irrigation water etc., to provide more insight in how the water was used before it was returned. In the original proposal of Eurostat only ' water safely treated' and ' losses' were to be reported separately. By adding more items, the data in the supply table provide more information about the origin of the water flows and where it was used for.

2.2.5 Evapotranspiration of abstracted water incorporated into products

Results

Table 10. Supply of water in 2020 – evapotranspiration and water in products

Supply in 2020	Agri-culture, forestry and fishing	Mining and quarry-ing	Manufac-turing industry	Energy sector	Water collection, treatment and supply	Private waste-water treatment	Waste manage-ment services	Construc-tion	Public waste-water treatment	Services	House-holds	Import	Environ-ment	Total supply
Million m^3	A	B	C	D	E36	E37	E38-39	F	O84.1	G-U				
(V) Evapotranspiration and water in products	107.9	0.0	534.4	8.6	0.0	1.2	49.5	0.0	0.0	40.0	85.5	9.0		836.1

Evapotranspiration of abstracted water:
Evapotranspiration of abstracted water can occur at different occasions. The largest flows occur as transpiration (water release) by cultivated crops. This equals to soil water uptake by cultivated crops minus the amount of water in harvested crops. Unfortunately, consistent data on water uptake by crops is not easily accessible. Therefore, transpiration by cultivated crops is not included in the tables. As a consequence the uptake of soil water is not taken into account in the water PSUT either.

Other types of flows that could be part of the PSUT are water abstracted for watering golf courses or football fields and perspiration by farm animals and human beings. Notice that in these cases a balancing item is not only needed to counteract abstracted water, but also the use of tap water. Some flows are very small or data is lacking, for example the abstraction of surface water for livestock drinking. However, an estimate of this balancing item is made by assuming that all drinking water that does not become part of a product (see below) or enters the sewage system (assumed to be 90% for most industries and households) must be added as a balancing item. This water is lost (supplied) to the environment by, for example, perspiration, transpiration or irrigation (gardens). As it is difficult to exactly quantify the volumes for this item, it is chosen to report them together with the water incorporated in products, as a balancing item of the supply table.

Water incorporated into products:
Abstracted or tap water can become part of a product. The most obvious example is the production of beverages. Once beverages are consumed they, for a large part, end up in the sewage system. Beverages can, of course, also be imported or exported. In order to balance the supply and use of water, water incorporated in products should be taken into account.

In order to ensure the supply and use of the columns balance, water incorporated in products should be included in (V) Evapotranspiration of abstracted water and water incorporated into products. Harvested crops would be eligible for this category except that, due to a lack of data, the abstraction of water by crops is not taken into account in the PSUT of the Netherlands. As a result a balancing item for water incorporated in crops is not needed. Other products that contain added bulk water are, for example soup and paint and, as mentioned above, mostly beverages.
An analyses is conducted to estimate the water added to products during the production process. Statistics Netherlands compiles a material flow monitor (Berkel and Delahaye, 2019) that consists of supply and use tables of all products. Also, for all products we have estimates of their water content. By multiplying the supply and use of products by their water content a rough estimate is calculated of the amount of water that is added to, or deducted from,

products per economic sector. If more water incorporated in products comes out than goes in, it can be assumed that bulk water is added to the product. The results show that this is the case for the food industry, chemistry and beverage industry. However, only the latter is of a substantial amount (around 5 million m^3) with regard to other water flows that go in and out of the sectors specified in the Dutch water accounts. Besides water per sector, the amount of water incorporated in imported (and exported) products is determined in this way.

In the final water PSUT all items of part V (evapotranspiration of abstracted water and water incorporated into products) are taken together. As result there are several relative small and mostly uncertain or unknown items that are part of (V). Therefore, it is decided to estimate item V of the PSUT as a balancing item in order to match total use and total supply. The balancing items have a different meaning for different sectors. For agriculture the balancing item mainly refers water consumed by animals. For industry it mainly refers to additions of water to products, among which beverages. For households the balancing item refers to water losses due to e.g. irrigation (due to a lack of data not part of item IV of the PSUT), car wash and transpiration.

In the end, water incorporated in products is part of a more comprehensive balancing item and, therefore, need not to be added as a separate entry for an economic sector. Only the import of water incorporated in products is added to the supply table. Only products intended for household consumption are taken into account.

3. Water Asset Accounts

3.1 Introduction

The Physical asset account for water following SEEA Water format and for majority relying upon water balance type of data was compiled for reporting years 2018, 2019 and 2020. Data, its processing, and the applied procedures for compilation are dealt with in this chapter.

The water asset account/water balance as presented in this chapter, is of a very basic nature, on a national scale and on yearly basis and **considers the fresh water system only**. It consists of several elements, based on a variety of stream flow data, satellite data and modelling, meteorological data as well as data on abstraction from surface and ground water and return flows. Table 11 shows the format of the simplified water asset account, as proposed by Eurostat. It considers not the stock of fresh water resources itself, because this is not easy to quantify, but only the changes in the stock as a result of additions, via precipitation, inflow from other territories and return flows from the economy to the environment, and reductions, via actual evapotranspiration and direct evaporation, outflow to sea and other territories, as well as abstractions from the environment to the economy.

Table 11. Simplified Water Asset Account according to Eurostat proposal.

billion m^3	Year
Additions to stock - total	
Returns	
Precipitation	
Inflows from other territories	
Reductions in stock - total	
Abstraction	
Evaporation and actual evaporation	
Outflows to other territories	
Outflows to the sea	
Balance: additions - reductions	

In paragraph 3.2. and 3.3 the definitions, data sources and methods for the additions to stock and reductions of stocks respectively, will be addressed. In paragraph 3.4 the complete balance is presented and the integrated results are discussed. Also in this paragraph a monthly water asset account for 2018 will be presented, showing the ranges and variability of all items of the balance over the year and the extra value of compiling these sub-annual balances compared to a national yearly balance. In paragraph 3.4, the data gaps and the recommendations for the proposed Eurostat table is discussed.

3.2 Additions to stock

Results

Table 12. National annual water asset account 2020 – additions in stock

billion m^3	2018	2019	2020
Additions to stock - total	**101.9**	**109.1**	**107.5**
Returns	6.3	6.5	6.5
Precipitation	25.2	32.4	32.2
Inflows from other territories	70.4	70.2	68.8

In the dry year 2018, precipitation was lower than in surrounding years. This causes a lower addition to stock. On the contrary, it can be observed that inflow in 2018 was slightly higher than in 2019 and 2020, as this depends on variation in precipitation in the upstream river basins of Rhine and Meuse. In paragraph 3.4 more detailed results will be presented, also in combination with the Reductions in stock and on monthly basis.

Definition and interpretation of variables

The part of the table that describes additions to the stock of water resources consist of three parameters:

Returns (return flows): the returns consider all flows of water that are returned from the economy to the environment like discharges of cooling water and waste water, losses by leakages, volumes of water applied to soil via irrigation. This parameter is linked directly to the total of Part IV of the PSUT tables: return flows from the economy to the environment.

Precipitation: Total volume of atmospheric wet precipitation (rain, snow, hail). Precipitation rate is usually measured by meteorological institutes.

Inflows from other territories: Total volume of actual flow of rivers and groundwater, coming from neighbouring territories. In this project, it is decided not to take into account the groundwater flow from other countries, as this turned out not be easy to quantify and it needs close and elaborate cooperation with hydrological institutes. This could not be established within the available time and budget.

Data sources and methods

Returns:

The total volume of returns is copied from part IV of the supply table: return flows from the economy to the environment, total returns to inland water resources.

Precipitation:

The total volume of precipitation is calculated as the mean yearly cumulative precipitation (mm) multiplied by the total surface of land and inland waters within the Netherlands territory.
The national average mm of precipitation as recorded by the Royal Netherlands Meteorological Institute (KNMI) is determined as the arrhythmic mean of 300+ precipitation stations, spread across the country. Data are available via the monthly KNMI reports on precipitation (MONV reports, KNMI, 2022). The value that is used is the average of all measuring stations, assuming that the stations are evenly spread over the country. Figure 1 shows the map of the

Netherlands with the geographical location of all the monitoring stations. The reported mean annual precipitation for 2018, 2019 and 2020 is 675, 867, respectively 860 mm.

Figure 1. Location of precipitation monitoring stations (source KNMI).

Total surface of land and fresh water basins in the Netherlands is available from the land use statistics (Statistics Netherlands, 2018). The surface taken into consideration is the sum of land and inland waters. This equals 37,390.39 km^2 for all three years.

Total inflow:

Data on inflow from Germany and Belgium were inventoried from the National Water Authority (Rijkswaterstaat) as well as from the water boards at the borders of the Netherlands. For all large and small rivers flowing into the country, data on the mean daily flow in m^3/sec were received. This enables compilation of results at aggregated monthly basis, just like with precipitation. In total, streamflow data of 2 large (Rhine, Meuse) and 22 small rivers were processed, in total 24, of which 10 flowing from Belgium and 14 from Germany. This covers nearly 100% of all transboundary flows of surface water.

3.3 Reductions in stock

Results

Table 13. National annual water asset account 2020 – reductions in stock

billion m^3	2018	2019	2020
Reductions in stock - total	**99.8**	**-**	**-**
Abstraction	8.5	8.9	8.8
Evaporation and actual evaporation	16.9	-	-
Outflows to other territories	0.0	0.0	0.0
Outflows to the sea	74.4	75.6	74.7
of which estimated	3.3	3.3	3.3

As will be explained in the section on Data sources and methods later on, data on actual Evapotranspiration are not available for 2019 and 2020. Total reductions in stock thus can only be calculated for 2018.

Definition and interpretation of variables

The part of the table that describes reduction in the stock of water resources consist of four parameters:

Abstraction: Water removed from any source, either permanently or temporarily. Mine water and drainage water are included. In the PSUT, a distinction between abstraction of groundwater, of fresh surface water, of marine water (sea, estuaries) or soil water is made. For definition of types of water, see chapter 2.1.1.

Actual evapotranspiration (ET): Total volume of evaporation from the ground, wetlands and natural water bodies, and transpiration of vegetation. The actual ET rate depends on the available solar energy, weather conditions (air temperature, humidity and wind speed), and the moisture content in the soil as well as type and density of the vegetation. It is important to mention that so-called potential evapotranspiration is not the right parameter here, since this reflects the amounts of water that would evaporate and transpire under optimal conditions, i.e. with ample water availability.

Outflows to sea: Flows of rivers, canals into the sea and estuaries, including via drains and forced outflow via pumping stations. The latter two categories are specifically important for the Netherlands in order to keep the land dry in periods with excess precipitation.

Outflows to other territories: Flows of rivers and groundwater to other territories. For the Netherlands this is not applicable. Outflow is only to sea.

Data sources and methods

Abstraction:

The total volume of abstracted fresh water is copied from part I of the use table: total abstraction from inland water resources. For more information on data sources of water abstraction see chapter 2.2.1 of this report.

Actual Evapotranspiration:
Data on actual evapotranspiration for 2018 were obtained from e-LEAF. This company developed a number of algorithms to calculate the Actual ET based on remote sensing data. These algorithms use the surface energy balance, which is based on the principle that the incoming radiation, if not reflected, heats the ground, the air, or is used for ET. Remote sensing data is used to solve the energy balance. The algorithms behind these calculations are not explained here; additional information on the related models SEBAL and ETLook can be found in Bastiaanssen et al. (1998, 2012). Unfortunately, within the available resources of this project, data on actual ET for the years 2019 and 2020 could not be obtained and processed. But in the last stage of the project, during the stakeholder workshops, information on the availability of other data-sources for actual ET that can be used in the coming years to expand the time series of ET data came to surface. See also chapter 5.2.

Outflow to sea:
Includes outflow to the sea (North Sea, Wadden Sea, Eems-Dollard and Scheldt estuary) only. As the Netherlands is situated downstream in all the relevant river basins, the outflow particularly reflects the large quantities of inflow of fresh surface water from the rivers upstream. Data on outflow were obtained from the National water authority, monitoring the large river mouths and large canals and sluices, as well as from the regional water boards, responsible for monitoring dozens of small polder outlet pumps to the sea. Data were transmitted and stored per gauging station, as daily values (m^3/day or daily mean m^3/sec), thus allowing aggregation to each desired spatial or temporal aggregation.
Unfortunately, Statistics Netherlands did not receive a complete overview of the outflow to sea. Data of outlet points in the Scheldt region and in the Eems region were not provided by the water authorities. The volumes concerned are estimated on basis of earlier datasets of 2014 and were scaled to 2018, 2019 and 2020 values using the ratio between the total outflow from the Rhine and Meuse region in 2014 and 2018, 2019 and 2020, being 0.96, 0.975 and 0.963 respectively. An estimate for the outflow of the Scheldt and Eems region is then calculated as the outflow in 2014 multiplied by the ratio per year.

3.4 Annual and monthly balance

Results of the annual balance:
By combining the two tables of additions to- and reduction of- stocks of fresh water, one can calculate the balance between the two. This is presented in table 14. In general it can be stated that on an annual basis, reductions often are smaller than the additions, mainly because precipitation is in general higher than the actual evapotranspiration.

Table 14. National annual water asset account 2018-2020 – additions minus reductions

billion m^3	2018	2019	2020
Additions to stock - total	**101.9**	**109.1**	**107.5**
Returns	6.3	6.5	6.5
Precipitation	25.2	32.4	32.2
Inflows from other territories	70.4	70.2	68.8
Reductions in stock - total	**99.8**	**-**	**-**
Abstraction	8.5	8.9	8,8
Evaporation and actual evaporation	16.9	-	-
Outflows to other territories	0	0	0
Outflows to the sea	74.4	75.6	74.7
of which estimated	3.3	3.3	3.3
Balance: additions - reductions	**2.1**	**-**	**-**

Results of monthly balance 2018:

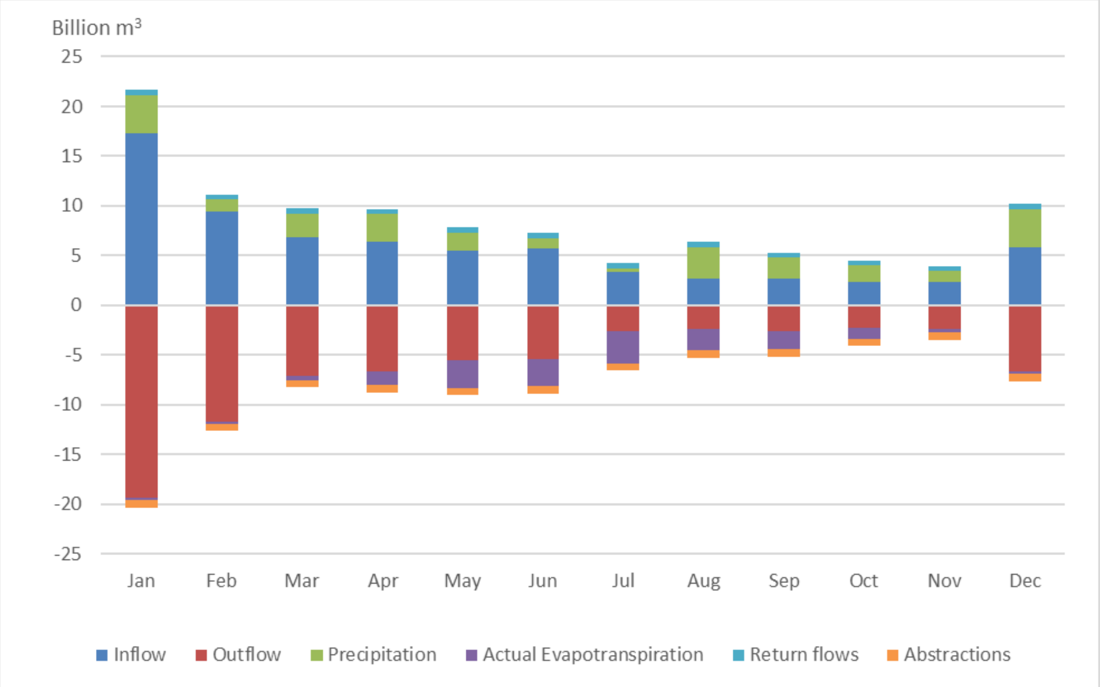
For the year 2018 Statistics Netherlands received daily or monthly data for all items of the water asset account except the abstractions and return flows. This enables the compilation of monthly water asset accounts. As a first estimate it was assumed that the abstraction and return flows are equally divided over the twelve months. This will probably not be the case, but future studies possibly can provide more insight to what extent the abstractions and returns vary per month. The results of the monthly water asset account are presented in table 15 and visualised in figure 2.

Table 15. National monthly water asset account 2018 – additions minus reductions

billion m3	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2018
Additions to stock - total	**21.7**	**11.1**	**9.7**	**9.7**	**7.9**	**7.3**	**4.2**	**6.4**	**5.3**	**4.5**	**4**	**10.2**	**101.9**
Returns	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	6.3
Precipitation	3.8	1.2	2.3	2.8	1.9	1.1	0.3	3.2	2.1	1.6	1.1	3.8	25.2
Inflows from other territories	17.3	9.4	6.9	6.4	5.5	5.7	3.4	2.7	2.7	2.3	2.3	5.9	70.4
Reductions in stock - total	**20.3**	**12.6**	**8.2**	**8.7**	**9**	**8.9**	**6.5**	**5.3**	**5.1**	**4.1**	**3.5**	**7.6**	**99.8**
Abstraction	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	8.5
Actual evapotranspiration	0.3	0.2	0.4	1.4	2.8	2.8	3.2	2.2	1.8	1.1	0.4	0.3	16.9
Outflows to other territories	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Outflows to the sea	19.3	11.7	7.1	6.6	5.5	5.4	2.6	2.3	2.7	2.3	2.4	6.6	74.4
Balance: additions - reductions	**1.4**	**-1.4**	**1.5**	**1**	**-1.1**	**-1.6**	**-2.3**	**1.1**	**0.2**	**0.4**	**0.5**	**2.6**	**2.1**

Table 15 and figure 2 provide more information of the status of the water situation in the country than the annual water balance as presented in table 14. Monthly figures reveal that in certain periods the stock is depleted (negative balance) , while this is not visible in the annual balance. Especially in months when precipitation is low and actual ET is high, like in the period May-July, there is a negative balance. This can result in decreasing levels of both groundwater and surface water, leading to temporal water shortages. Over the year there is no negative balance but that is mainly due to the high precipitation and lower ET levels in the winter months January and December.

Figure 2. Monthly water balances for 2018



Data gaps, items for improvement

A significant data gap is that data on groundwater flows was not available and is not taken into account in the water asset account. This requires close cooperation with specialised hydrological institutes. This could not be elaborated within the available resources of the project.

As already mentioned, data on actual ET are not available for 2019 and 2020. On basis of contacts with other institutions it is expected that these data will be available from free open data sources, see also chapter 5.2. This will be elaborated in future compilation of this simple water asset account.

In the monthly balances, it is also important to get a clear picture of the variety in the abstractions and return flows across the months. Abstraction for water in agriculture and for the preparation of drinking water will be higher in the summer months, but it could also occur that abstraction for cooling is higher in winter months when possibly more electricity must be produced. This is not investigated for this study but is an item that can be taken into account in future studies, including the influence on the related return flows.

Recommendations for Eurostat table

The compilation of the monthly water asset account for 2018 shows that these data provide far more insight on periods with droughts or periods with excess water with risk of flooding. An annual balance does not show these extreme situations. Compilation of monthly balances thus can provide more information to policymakers. Statistics Netherlands proposes here to expand the Eurostat table to monthly data.

Although not a direct recommendation for Eurostat, and not elaborated in this study, it is the expectation that spatially distributed water balances can also provide very relevant information on water availability. For the Netherlands case it would be useful to know the water balances per river basin or other regional division. In the (higher) southern and eastern part, many areas rely only on precipitation as the main water source, while in the lower regions in the North and West, surface water can be supplied to a great extent by diverting water originating from the Rhine and Meuse, making these regions less vulnerable for temporal droughts. But, spatial breakdown is something that cannot be done easy by NSI's; it requires a lot of resources, for instance for GIS processing, and hydrological expertise. Spatial division can only be done by cooperation with national and regional water authorities as well as hydrological institutes.

4. Production process in R

Compiling supply and use tables and asset accounts for water encompasses a great deal working with data. As explained in the previous two chapters, there are a variety of data sources and several steps that need to be taken to get the desired results. To facilitate gathering, processing and analysing the data on water, it is beneficial to automate these steps. Creating a robust production process with appropriate IT infrastructure supports the continuation of these accounts for coming years. The statistical programming language ‘R’ is chosen to automate the production process of the supply and use table for water. R is already widely used within Statistics Netherlands and the researchers are trained to work with R. It is an open source environment and it is suitable for the application in this project.

4.1 Initialisation and importing data

First, some required R packages are imported, such as *data.table* and *dplyr* but also *cbsodata* to be able to import internal data from Statistics Netherlands (CBS). In this project, Statistics Netherlands compiled 2018, 2019 and 2020. So this means that the script has to be run three times to cover the time series. Running the script takes approximately 20 seconds. The workspace location of the data sources is stated and the workspace location to export results is stated. Outside the R environment, in Excel, a template (table without data) is created in so called ‘long’ format, having the following variables:

account	Supply, Use or Asset
economic_activity	Production activities, Environment, Total, etc.
nace_code	A, B, C, D, E36/37/38-39, F, O84.1, G-U, Households, Imports, Exports, Environment, Total
nace_name	Name of corresponding NACE code, e.g. manufacturing
types_water	Variables on water e.g. (I) Water flows from environment to economy
subtypes_water	Sub aggregates on water, e.g. Inland water resources
subsubtypes_water	Detailed variable on water, e.g. Surface water or Irrigation
period	Y (year), but it could be months or seasons etc.
region	NL
unit	Million m^3
value	Grey cells are not applicable (NA in R) and a 0 indicates that a value should be given to this record

It is set up as a flexible input template. During the project some choices and assumptions were made that caused changes in the design of the supply and use table. For example, the distribution of abstracted water is extended with a breakdown into drinking water and industry water. These changes only has to be made once in the input template and this is taken into account for the further steps in the production process.
Also, bridging/linking tables are imported, such as the link between the NACE codes in the StatLine table and the PSUT. Variables are set, such as the list of NACE codes:

nace <- c('A', 'B', 'C', 'D', 'E', 'E36', 'E37', 'E38-39','F', 'O84.1', 'G-U', 'Households', 'Exports', Flows to the environment', 'Total use', 'Total supply', 'Imports', 'Environment')

After initialising the packages, workspace, variables and other steps as described above, the data from data sources is imported. First, the StatLine table on water use including corresponding metadata is imported. The column names and order are changed and it linked (merged) with the bridging tables on the NACE codes. This database covers a large part of the Water Accounts and is already compiled by Statistics Netherlands from different data sources (such as Wageningen Economic Research, Vewin and Annual Environmental reports). However, breakdowns, details and extra input is needed to compile the PSUT for water. Other data sources on for example own treatment, return flows, urban run-off and drainage into sewerage and irrigation are imported. These sheets usually have different structures and this is put in order, for example harmonising the unit (million m^3) and column names.

4.2 Data processing

4.2.1 Link and merge data

After all the data is imported, the data can be linked and merged together. Before this can be done, some steps are taken, such as that some records with too much detail (for example on business level) are summed to an aggregate. Mainly, the place in the table (supply, use or asset table / water variable in the rows / NACE in the column) are indicated for the items in the source data. Next, the so called 'water table' is created that merges all of the source data together with a *rbind*. This step ends with exporting the preliminary results (water table) to the set workspace.

4.2.2 Fill PSUT template

The empty template table as described in the initialisation step in this chapter can now be filled with data. The template is split into use and supply to create different tables and using an *merge* statement, date template is filled with data from the water table. This creates two tables in long format for one reporting year. Some check are done such as checking whether the value column has numeric values. This step ends with exporting the preliminary results (supply and use table) to the set workspace. Subsequently, calculations are made such as putting a factor on the use of drinking water that ends up in sewerage and is not used for watering gardens etc.. Also some individual cells in the tables have yet to be filled with data, so specific lines of code identify data gaps and fill them with the correct part of the source data, if necessary with a calculation. Values from one table (say use) are aggregated and put into the other (supply) table. Additions are made when cells in the table consist of values from different data sources. Some checks are done here as well. The 'Evapotranspiration of abstracted water incorporated into products' is calculated as a balancing item between supply and use.

4.2.3 Calculate totals

At this point, the tables are filled, except for the (sub)totals of the rows and columns. So the total supply and use per water variable (row) and NACE (columns) need to be calculated, as well as the subtotals on for example (II) Abstracted water, distribution = drinking water + industry water. This is done with a function that loops over the variables. This step ends with exporting the results to the set workspace.

4.3 Creating output

Lastly, the results are formatted in the desired way. Values are set to one decimal. Working with the data and making calculations as described in 4.2 required a long table. This last step converts the output to a matrix using the *dcast* statement. The output can be seen in the R environment, but is also exported to Excel. Each Excel spreadsheet represents one reporting year with three tables for supply, use and asset.
The final step of compiling the supply and use tables is not automated in R, but is done by hand in Excel, namely balancing the use and supply of each NACE category (columns). The reason that this is done outside the automated R production process is because the actions are dependent on the outcomes and therefore each reporting year has to be carefully analysed before balanced. These final steps are correcting for negative values in 'Evapotranspiration of abstracted water incorporated into products' in other parts of the table. These corrections are the last step, so the production process is complete and the output is created.

5. Policy indicators and data needs

5.1 Combined presentation on water & Policy indicators related to water

The SEEA water accounts allow the derivation of several key indicators that can be used for monitoring of sustainable water use and related policies (UNSD 2012; 2014; 2017). In this chapter some indicators that can be derived from the Dutch Water Accounts are described. First, the combined presentation for water is presented and discussed.

5.1.1 Combined presentation

The aim of the combined presentation for water is to provide a comprehensive overview of all key water data in one table (UNSD, 2017). The combined presentation for water combines information on flows of water in both monetary and physical terms, information on stocks of water, and information from the national accounts and labour statistics in order to present an overview of the physical and economic characteristics of water flows between the environment and the economy in a country. The combined presentation is a kind of intermediary between the accounts and a list of useful indicators.

Basically, the combined presentation in table 16 below shows in the columns the different economic activities as can also be found in the supply and use tables, including NACE 36 and NACE 37-39. The rows show in three sections the key environmental economic variables related to water:

- The first section of the combined presentation (items 1, 2 and 3) stem from the national accounts data and provide key economic data (monetary flows). Item 1 focuses on intermediate consumption which include the costs for natural water. Depending on data availability and analytical importance, a country may want to split out other products related to water, such as sewerage services. Item 2 provides data on gross value added for each industry, which includes sewerage and waste water taxes. Item 3 shows the employment for the economic sectors and the population in the households column.
- The second section on physical flows (items 4, 5 and 6) is directly derived from the physical supply and use tables for water, reflecting volumes of water supplied between economic units, as well as use of water and water consumption. The bulk of the supply of water to other economic units (item 4) appears in the columns corresponding to the Water collection, treatment and supply industry (NACE 36). Total use of water reflects the water intake of an economic unit. Finally, the term ‘water consumption’ refers to total water evaporated, transpired or incorporated into products.
- Finally, the third section list some ratio indicators such as the water use intensity. These indicators are directly obtained by combining the data from section 1 and 2.

The combined presentation presented below in table 16 focuses on physical and monetary flows. Omitted here is information on stocks (data on water assets, gross fixed capital formation etc.), which in principle could still be added. The scope of the water accounts include all water that is used within the economy. The combined presentation as shown in figure thus includes all water, i.e. also cooling water. As the abstraction and use of cooling water dwarfs the water use in some economic sectors, it may be worthwhile to also compile a combined presentation and derive indicators excluding cooling water (table 17).

Table 16 Combined presentation for water for the Netherlands (2020)

	2020	Industries									House-holds	Rest of the world	Total
		Agriculture, forestry and fishing A	Mining and quarrying B	Manu-facturing C	Energy sector D	Water collection, treatment and supply E36	Waste manageme nt, sewerage E37-39	Public admini-stration O	Other industries F-U	Total industries			
Monetary flows	**1. Intermediate consumption (mln euro)**	19,612	3,715	229,053	7,156	609	6,547	35,003	509,155	810,850			810,850
	of which water	58	22	293	12	6	5	30	356	782	1,100		1,882
	2. Gross value added (mln euro)	12,737	2,797	86,236	4,536	1,045	3,491	53,036	545,750	709,628			709,628
	of which sewerage and waste water taxes	23	0	89	19	0	13	69	438	651	2,378		3,029
	3. Employment (x 1000 fte); population (x 1000)	179	8	738	26	5	29	476	6,313	7,774	17,407		7,774
Physical flows	**4. Supply of water (mln m3)**												
	Distribution of abstracted water	0	0	5	0	1,233	0	0	0	1,238	0	8	1,246
	Wastewater to treatment	38	2	138	2	7	6	5	99	297	770	0	1,066
	Total return flows of water	269	3	1,963	3,520	102	676	1,950	58	8,540	0	0	8,540
	5. Use of water (mln m3)												
	Total abstracted water (gross water input)	372	3	2,421	3,521	1,334	721	898	92	9,361	0	0	9,361
	of which own use of abstracted water	372	3	2,416	3,521	109	721	898	92	8,131	0	0	8,131
	Use of distributed water	42	2	209	11	8	7	6	104	388	855	2	1,246
	TOTAL USE OF WATER	414	5	2,625	3,531	109	728	903	196	8,511	855	2	9,369
	6. Water consumption (mln m3)	108	0	534	9	0	51	0	40	742	86	0	827
Ratio indicators	Water use intensity (m3 / 1000 euro)	33	2	30	778	104	209	17	0	12			
	Water use per employee / person (m3 /fte) (m3/ person)	2,313	625	3,557	135,812	21,760	25,107	1,897	31	1,095	49		
	Wastewater intensity (m3 / 1000 euro)	3	1	2	1	7	2	0	0	0			
	Wastewater per employee / person (m3 /fte) (m3/ person)	211	263	186	88	1,440	200	11	16	38	44		
	Wastewater tax / wastewater (euro / m3)	1		1	8		2	14	4	2	3		

Table 17 Combined presentation for water for the Netherlands, excluding cooling water (2020).

	2020	Industries: Agriculture, forestry and fishing A	Industries: Mining and quarrying B	Industries: Manu-facturing C	Industries: Energy sector D	Industries: Water collection, treatment and supply E36	Industries: Waste manage-ment, sewerage E37-39	Industries: Public admini-stration O	Industries: Other industries F-U	Industries: Total industries	Households	Rest of the World	Total
Monetary flows	**1. Intermediate consumption (mln euro)**	19,612	3,715	229,053	7,156	609	6,547	35,003	509,155	810,850			810,850
	of which water	58	22	293	12	6	5	30	356	782	1,100		1,882
	2. Gross value added (mln euro)	12,737	2,797	86,236	4,536	1,045	3,491	53,036	545,750	709,628			709,628
	of which sewerage and waste water taxes	23	0	89	19	0	13	69	438	651	2,378		3,029
	3. Employment (x 1000 fte); population (x 1000)	179	8	738	26	5	29	476	6,313	7,774	17,407		7,774
Physical flows	**4. Supply of water (mln m3)**												
	Distribution of abstracted water	0	0	5	0	1,233	0	0	0	1,238	0	8	1,246
	Wastewater to treatment	38	2	138	2	7	6	5	99	297	770	0	1,066
	Total return flows of water	269	5	169	0	102	10	1,950	49	2,551	0	0	2,551
	5. Use of water (mln m3)												
	Total abstracted water	372	0	294	352	1,334	74	898	92	3,417	0	0	3,417
	of which own use of abstracted water	372	0	289	352	109	74	898	92	2,187	0	0	2,187
	Use of distributed water	42	2	209	11	8	7	6	104	388	855	2	1,246
	TOTAL USE OF WATER	414	3	498	363	109	81	903	196	2,567	855	2	3,424
	6. Water consumption (mln m3)	108	0	534	9	0	51	0	40	742	86	0	827
Ratio indicators	Water use intensity (m3 / 1000 euro)	33	1	6	80	104	23	17	0	4			
	Water use per employee / person (m3 /fte) (m3/ person)	2,313	350	675	13,954	21,760	2,800	1,897	31	330	49		
	Wastewater intensity (m3 / 1000 euro)	3	1	2	1	7	2	0	0	0			
	Wastewater per employee / person (m3 /fte) (m3/ person)	211	263	186	88	1,440	200	11	16	38	44		
	Wastewater tax / wastewater (euro / m3)	1		1	8		2	14	4	2	3		

5.1.2 Policy indicators related to water

The information presented in the combined presentation(s) for water can be used to derive a number of key indicators. The accounting approach and presentation also allows for the disaggregation of these indicators by sector to allow for more detailed analysis. Below, some of these key indicators are highlighted, noting that this is only a selection of potential indicators.

Physical water indicators:

- *Gross water input* is equal to all water extracted from the environment. This indicator expresses the pressures placed on the environment through the supply of water to the economy. Depending on the purpose, abstraction for cooling may be omitted from the total abstracted water.
- *Total water use* is calculated as the total use of abstracted water plus the total use of distributed water minus the distribution of abstracted water to other units. The total water use expresses how much water is used for the economic production of consumption activity.
- *Water consumption* refers to total water evaporated, transpired or incorporated into products. This is an important indicator for environmental pressure as it reflects the quantity of water no longer available for use. Note that the omission of soil water results in lower results for agriculture for this indicator as usually reported.
- *Total return flows* is equal to all water returned to the environment.

Ratio indicators:

- *Water use intensity*: The changes in efficiency can provide valuable information on how industries are reacting to policies affecting water usage. This indicator (or the inverse, the Water-Use Efficiency) supports SDG target 6.4. Note that the results of this indicator for agriculture are strongly influenced by weather conditions.
- *Water use per employee*
- *Waste water intensity*

Indicators from the water asset account:
Total Renewable Water Resources (TRWR) is a key indicator that can be derived from the water asset account. TRWR is the theoretical maximum annual volume of water resources available in a country. The maximum theoretical amount of water actually available to the country is calculated from data on the following:

(a) sources of water within a country itself;
(b) water flowing into a country;
(c) water flowing out of a country.

TRWR = Precipitation to run off + Natural transfer from soil water to groundwater + Inflows from other territories – Outflows to other territories – Overlap

Using the TRWR, the *water stress indicator* can be calculated (supporting SDG target 6.4): the ratio of total water abstraction to total actual renewable water resources (TARWR). This indicator provides information on the sustainability of water use in the country.

5.2 Data needs resulting from the workshops

5.2.1 Introduction

After finishing the first draft of the PSUT tables and the Water Asset Account for 2018, 2019 and 2020, the team organized two workshops for consultation of stakeholders and experts. The first workshop was held on the 27th of September 2022 'live' at the office of Statistics Netherlands. The second workshop was on-line at the 17th of November 2022. The goals of the workshops were:

- To introduce the participants to the system of water accounts, especially the structure of the Eurostat format of the physical supply and use tables for water as well the simplified water asset account / water balance.
- To present the data sources, methods and assumption for populating the tables, including data-gaps and items for improvement.
- To present the results of the tables as well as indicators that can be derived from the tables when linked to economic and monetary data.
- To discuss the possible use of the tables and indicators in policy evaluation, policy making and/or operational water management.
- To consult stakeholders and experts on alternative / new data sources within other institutes or in the academic world.
- To consult the participants in which dimension and to what extent more detail is necessary to improve the usability of the tables. This detail could be in i) economic sectors, ii) type of flows, iii) temporal dimension and/or iv) spatial dimensions.

In total 13 persons attended the workshops, representing the following organizations:

- The National Water Authority (Rijkswaterstaat),
- Ministry of Infrastructure and Water Management
- Dutch Association of Public Water Supply companies (VEWIN)
- Water board Stichtse Rijnlanden
- Wageningen Economic Research (WEcR)
- Industrial Association for Energy, Environment and Water (VEMW)
- KWR Water Research
- Dutch Institute on Applied Sciences (TNO)
- The Netherlands Hydrological Instrument (NHI)

5.2.2 Outcomes of the workshops

Suggestions for improvements of the data in the national tables:

During and after the presentations the Statistics Netherlands team received many suggestions for improvement of the figures in the national tables:

- The national Groundwater Register will be improved in the coming years. There will be a legal obligation for registration of all abstractions of groundwater.
- The volumes of drainage water and run-off rainwater entering the sewer system seem quite high. This deserves a re-evaluation of the model used to calculate these figures. Analysis of time series of influent flows and precipitation can also be valuable to better quantify run-off rainwater.
- Volumes of return flows of combined sewer overflows and storm water sewers are not included: deserves attention in future compilation.

- The use of soil water by Agriculture is not calculated by Statistics Netherlands; this is seen as a large data-gap as soil water uptake by crops is by far the largest abstraction. It can be calculated by GIS overlays of actual ET and land use. Several suggestions were made for alternative data-sources instead of data from e-LEAF: Calculation based on known coefficients of water uptake per kg crop yield; Open data on nationwide calculation of evapotranspiration (as basic layer for crop evapotranspiration) are available from a dedicated website. This will be investigated by Statistics Netherlands; first impression is that the figures presented there are based on potential ET instead of actual ET.
- The assumption that 90% of drinking water use is converted into wastewater is at least doubtful for the Agricultural sector, certainly within the livestock farms.
- Interpretation and wording on the variables describing the losses in the drinking water sector and the non-revenue drinking water differs from what the sector published itself. This can be improved.
- Instead of compiling data per calendar year it could be useful to look at hydrological years (April 1st – March 31st). But then it is difficult to link with economic and monetary data per calendar year.

Suggestions for alternative data-sources:

- The National Hydrological Instrument also inventories the abstraction of groundwater. Available years are 2010-2020. Cross-check with these data could be arranged.
- The National Hydrological Instrument also compiles water balances. An exchange of knowledge with Statistics Netherlands is planned for next year.
- Data on precipitation are also available from the Meteobase website; spatial division is done here via geostatistical (kriging) techniques. Cross-check with data from KNMI on the national average of precipitation depth (in mm) can be done.
- Data per water board are available on the website Waterspiegel. Statistics Netherlands will explore this possible data-source.

Need for more detail in the dimensions of the tables:

- The PSUT tables would gain a lot on usability when the breakdown into economic sectors would be more detailed, especially for Manufacturing Industry (NACE C) and Agriculture (NACE A).
- To monitor the sustainable use of drinking water it would be preferred if drinking water use can be split in use for low grade applications, like rinsing and cleaning, and use in high grade applications, like as input for food products and beverages. But this needs clear definitions first to make the distinction between the two.
- For the water asset account a temporal and spatial breakdown is necessary to observe the effects of for instance droughts in the water balance. Temporal breakdown per month can deliver the required detail. This is already demonstrated in this study. The regional breakdown should be along River Basins or Water boards or other hydrological units.
- Data on groundwater abstractions would gain on usability when divided into abstraction from shallow (phreatic) groundwater and from deep-lying aquifers.
- The water asset account does not include groundwater flows to and from outside territories. This is seen as an important data-gap.

Use of the data in policy-making, policy evaluation and operational water management:

- In general, the participants were enthusiastic about the tables and they emphasized that this data can be used for policy analysis, as background data for research into water-saving measures as well as for answering questions in the governmental bodies.
- Data can be compiled for T with T+15 months. This is not quite timely but for predicting long-term developments it will do.
- There is a strong need for information on the variety of drinking water use between different types of households and the regional differences of that use. The PSUT cannot provide this information with that detail, but there are possibilities to extract this information from micro-data of the public water supply companies.
- The PSUT data can also be used for monitoring sustainable water use by companies and how that changes over time.
- The coupling with economic and monetary data is seen as an important value-added of the PSUT format and is something that only NSI's can do. This combined presentation can be of help in the prioritisation of water-use in periods when water resources are scarce.
- Regional data per River Basin could also be very useful for economic analysis.

Overall, most participants were enthusiastic about the data provided in the presented tables, but also acknowledged that there is still a lot of work to be done to develop the water accounts to a level at which it can be used better by policy-makers and operational water management. Statistics Netherlands received a lot of suggestions for improving several elements of the tables. These can be used in future compilation of the water accounts.

6. Conclusions

6.1 Conclusions on the objectives

The key aim of this 2021-2022 Eurostat grant project was to ensure well-directed information on water supply, use and resources in the Netherlands to the users of the data such as policy makers and researchers.

The first objective was testing the proposed format of the Eurostat tables on the Water Accounts for reporting years 2018-2020. For most of the items of the PSUT and the Water Asset Accounts data were available and tables could be populated with figures for most of the variables. Data sources are explored, for example the National Groundwater Register, and methods are developed, to resolve for data gaps on for example water abstracted but not used. The data gaps and improvements concern quite a list that is discussed throughout this report, please see the dedicated paragraphs in chapter 2 (use and supply) and 3 (asset account) and chapter 5.2.2 (outcomes of the workshop). Still some work has to be done to fully populate the tables and fill all the data-gaps. Within certain boundaries, basic compilation of the PSUT and Water Asset Account is possible with current resources. However, for full and professional application of the water accounts some major improvements are necessary (like quantification of soil water use). This requires extra effort and resources within Statistics Netherlands and close cooperation with outside agencies and institutes. Funding of this work is not easy to establish without a legal basis for the water accounts and underlying water statistics.

The second objective was setting up a statistical production process for future annual updates of the water accounts. This has succeeded in an automated production process in the statistical programming language R.

The third objective was exploring data needs on water issues and gain insight in possibilities of the water accounts for the usability for policy makers. Policy indicators were developed that show the application of the PSUT and asset. The combined presentation for water connects information on flows of water in both monetary and physical terms. Via expert and stakeholder consultation in two dedicated workshops, elements of the water accounts were mapped out with possibilities on temporal and regional breakdowns.

6.2 Recommendations for Eurostat and member states

Based on user needs and data availability, recommendations for Eurostat for adjustment of the proposed format of the PSUT and Asset account are made. The main recommendations are:

- When starting to develop Water Accounts, it is recommended to focus on the main water flows. If water statistics is already available in your country, then this is a good starting point to fill the first parts of the PSUT for water. Also the Joint Questionnaire for Inland Waters is a good data source. From that point, one can start populating the PSUT and Asset Accounts further.
- Statistics Netherlands proposes here to expand the water asset account to monthly data to provide more information to policymakers.

- Abstraction of water by households for own consumption should be recorded as use by households instead of by NACE 36 as proposed by Eurostat.
- It is advised to distinguish water for distribution between drinking water and industry water. Both types of water are transported via pipes and tap water network, but have a different use and quality. Policy on these different types of water may differ.
- A breakdown of the return flows in the supply table into separate flows of cooling water, irrigation water etc., can provide more insight in how the water was used before it was returned.
- It may be worthwhile to distinguish water used in production and consumption (e.g. water for irrigation, drinking water, cooling water) and water that is an input into the economy but not used in production or consumption (e.g. mining water, drainage of groundwater into sewers).
- The water accounts could also be integrated with other environmental accounts. It is beneficial for Ecosystem Accounts on water related ecosystem services and condition, such as infiltration of groundwater used for drinking water.
- The data can be used for calculating the SDG indicators on Water use efficiency and Water stress.

6.3 Future steps

- Statistics Netherlands will aim to annually compile and publish the water accounts to be used in national and European policy and decision making. This project resulted in an automated production process, that can facilitate easier compilation of the tables, as long as the basic data sources stay available.
- In order to facilitate the application of the PSUT and Water Account in policy making, the experiences resulting from this project can be used to formulate a proposal for improvement of the format of the Eurostat PSUT and Asset account.
- Statistics Netherlands will aim to explore alternative data sources for future compilation of the water accounts, using the recommendations from stakeholders for improvement on for example temporal and spatial breakdown. These improvements would create tables that better suit the needs of policy makers and other stakeholders.
- The compilation of the tables of the Joint Questionnaire for Inland Waters will benefit from the results of the PSUT and Asset accounts, for example on water abstracted but not used.

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8. Annex

8.1 Acronyms and legend

Acronyms

(e-)AER	(Electronic) annual environmental report
ET	Evapotranspiration (evaporation and transpiration)
JQ-IW	Joint Questionnaire on Inland Waters (OECD/Eurostat)
NACE	Statistical classification of economic activities in the European Community
NSI	National Statistical Institute
PSUT	Physical Supply and Use Tables
SEEA CF	System of Environmental-Economic Accounting – Central Framework
SEEA-Water	System of Economic and Environmental Accounting for Water (SEEA-W)
SUT	Supply and use tables (i.e. monetary or economic SUT in National Accounts)
TRWR	Total Renewable Water Resources
WWTP	Wastewater treatment plant

Legend

372.2	million m^3 water
0.0	zero or less than 0.5 million m^3 water
-	no data available
Grey cells	not applicable

8.2 Physical Supply Table for Water – Eurostat proposal

Physical supply table for water

note: dark grey cells are not applicable

	Production activities										Final consumption		Flows from the rest of the world	Environment	
	Agriculture, forestry and fishing	Mining and quarrying	Manufac-turing	Electricity, gas, steam and air conditioning supply	Water management	Water collection, treatment and supply	Sewerage	Waste management	Construction	Services	Households		Imports	Flows from the environment	Total supply
NACE	A	B	C	D	E	E 36	E 37	E 38-39	F	G-U					
(I) Water flows from environment to economy - total supply															
Inland water resources - total															
Surface water															
Groundwater															
Soil water															
Other water sources - total															
Precipitation															
Sea water															
(II) Abstracted water - total															
For distribution															
For own use															
(III) Wastewater flows within the economy - total															
Wastewater - total															
Wastewater to treatment															
Own treatment															
Water for reuse															
(IV) Return flows of water - total															
of which: water safely treated (11)															
of which: losses through leakages															
(V) Evapotranspiration of abstracted water and water incorporated into products - total															
Evapotranspiration of abstracted water															
Water incorporated into products															

Color coding:

- legal cover
- voluntary reporting
- extension, own extra details (dropped in Eurostat table)

Notes:

#	statistical residual
(1)	JQ: cooling water only
(2)	JQ: construction only
(3)	JQ: cooling water missing
(4)	JQ combines data of UWWTD and other WWTP
(5)	share of reuse missing but small, if not negligible
(6)	share of own treatment missing but small, often negligible
(7)	might be estimated via proxy 'connection rate to independent WWT' (JQ T5)
(8)	volume discharged through sewer leaks unknown
(9)	the JQ defines precipitation harvesting as surface water abstraction; surface runoff is not covered by the JQ but addressed by WA (abstr. by E37)
(10)	direct discharge to environment unknown in JQ
(11)	'safely treated' is wording from the UN SEEA-CF; a precise list of respective treament methods will be elaborated

8.3 Physical Supply Table for Water – the Netherlands 2018

Physical supply table for water

Period	2018
Area	the Netherlands
Unit	million m3
Data source	Statistics Netherlands
Commissioned by	Eurostat (EU funding)

			Agriculture, forestry and fishing	Mining and quarrying	Manufacturin g	Energy sector	Water collection, treatment and supply	Private wastewater treatment	Waste management services	Construction	Public wastewater treatment	Services	Households	Import	Environment	Total supply
			A	B	C	D	E36	E37	E38-39	F	O84.1	G-U*				
(I) Water flows from environment to economy															**15,170.5**	**15,170.5**
	Inland water resources														8,518.7	8,518.7
		Groundwater													1,616.3	1,616.3
		Soil water													-	-
		Surface water													6,902.4	6,902.4
	Other water sources														6,651.8	6,651.8
		Precipitation													451.7	451.7
		Sea water													6,200.1	6,200.1
(II) Abstracted water			**347.6**	**36.3**	**3,112.3**	**8,872.3**	**1,323.6**	**0.3**	**654.9**	**42.4**	**747.4**	**44.9**	**0.0**	**11.4**		**15,193.4**
	Distribution		0.0	0.0	8.6	0.0	1,215.0	0.0	0.0	0.0	0.0	0.0	0.0	11.4		1,235.0
		Drinkingwater					1,143.0				0.0			11.4		1,154.4
		Industry water	0.0	0.0	8.6	0.0	72.0	0.0	0.0	0.0	0.0	0.0		0.0		80.6
	Own use		347.6	36.3	3,103.7	8,872.3	108.7	0.3	654.9	42.4	747.4	44.9	0.0	0.0		13,958.5
(III) Wastewater flows within the economy			**44.0**	**2.6**	**130.8**	**3.5**	**10.5**	**1.0**	**3.4**	**2.5**	**15.7**	**97.0**	**753.5**	**0.0**		**1,064.5**
	Reuse							0.0	0.0		11.5					11.5
	Wastewater		44.0	2.6	130.8	3.5	10.5	1.0	3.4	2.5	4.2	97.0	753.5	0.0		1,053.0
		Own treatment	0.0	0.0	8.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0			8.5
		Wastewater (to) treatment	44.0	2.6	122.6	3.1	10.5	1.0	3.4	2.5	4.2	97.0	753.5	0.0		1,044.4
(IV) Return flows of water			**264.6**	**36.6**	**2,671.5**	**8,879.7**	**98.3**	**3.8**	**617.0**	**42.7**	**1,777.2**	**21.6**	**0.0**			**14,413.0**
	Cooling water		0.0	33.7	2,491.8	8,879.7	0.0	0.0	611.2	0.0	0.0	10.1	0.0			12,026.5
	Irrigation		264.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			264.6
	Losses through leakages						45.2	0.0	0.0		0.0					45.2
	Unaccounted (fire water)						53.1	0.0	0.0		0.0					53.1
	Water returned without use		0.0	0.0	0.0	0.0	0.0	0.0	0.0	36.1	0.0	0.0	0.0			36.1
	Water safely treated		0.0	2.9	179.7	0.0	0.0	3.8	5.8	6.6	1,777.2	11.5	0.0			1,987.5
(V) Evapotranspiration and water in products			**87.9**	**0.0**	**514.4**	**10.7**	**0.0**	**0.4**	**39.0**	**0.0**	**0.0**	**30.1**	**83.7**	**9.0**		**775.4**
Total of Supply table			**744.1**	**75.5**	**6,429.0**	**17,766.2**	**1,432.4**	**5.5**	**1,314.3**	**87.6**	**2,540.3**	**193.6**	**837.2**	**20.4**	**15,170.5**	

**excluding O84.1*

8.4 Physical Supply Table for Water – the Netherlands 2019

Physical supply table for water

Period	2019
Area	the Netherlands
Unit	million m3
Data source	Statistics Netherlands
Commissioned by	Eurostat (EU funding)

	Agriculture, forestry and fishing	Mining and quarrying	Manufacturing	Energy sector	Water collection, treatment and supply	Private wastewater treatment	Waste management services	Construction	Public wastewater treatment	Services	Households	Import	Environment	Total supply
	A	B	C	D	E36	E37	E38-39	F	O84.1	G-U*				
(I) Water flows from environment to economy													**15,696.1**	**15,696.1**
Inland water resources													8,862.6	8,862.6
Groundwater													1,602.9	1,602.9
Soil water													-	-
Surface water													7,259.7	7,259.7
Other water sources													6,833.6	6,833.6
Precipitation													584.2	584.2
Sea water													6,249.4	6,249.4
(II) Abstracted water	**316.4**	**27.8**	**3,033.9**	**9,369.3**	**1,311.7**	**0.6**	**665.6**	**43.9**	**890.4**	**46.0**	**0.0**	**9.5**		**15,715.1**
Distribution	0.0	0.0	4.0	0.0	1,202.4	0.0	0.0	0.0	0.0	0.0	0.0	9.5		1,215.9
Drinkingwater					1,129.9				0.0			9.5		1,139.4
Industry water	0.0	0.0	4.0	0.0	72.5	0.0	0.0	0.0	0.0	0.0		0.0		76.5
Own use	316.4	27.8	3,029.9	9,369.3	109.3	0.6	665.6	43.9	890.4	46.0	0.0	0.0		14,499.2
(III) Wastewater flows within the economy	**39.4**	**2.0**	**142.1**	**3.9**	**8.7**	**1.3**	**4.1**	**2.3**	**8.0**	**94.9**	**736.6**	**0.0**		**1,043.3**
Reuse						0.0	0.0		3.2					3.2
Wastewater	39.4	2.0	142.1	3.9	8.7	1.3	4.1	2.3	4.8	94.9	736.6	0.0		1,040.1
Own treatment	0.0	0.0	8.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			8.4
Wastewater (to) treatment	39.4	2.0	133.7	3.9	8.7	1.3	4.1	2.3	4.8	94.9	736.6	0.0		1,031.7
(IV) Return flows of water	**215.3**	**28.1**	**2,519.8**	**9,368.7**	**100.8**	**3.5**	**621.9**	**44.2**	**1,915.8**	**10.5**	**0.0**			**14,828.6**
Cooling water	0.0	22.5	2,341.2	9,368.7	0.0	0.0	612.5	0.0	0.0	10.2	0.0			12,355.1
Irrigation	215.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			215.3
Losses through leakages					46.4	0.0	0.0		0.0					46.4
Unaccounted (fire water)					54.4	0.0	0.0		0.0					54.4
Water returned without use	0.0	0.0	0.0	0.0	0.0	0.0	0.0	37.3	0.0	0.0	0.0			37.3
Water safely treated	0.0	5.6	178.6	0.0	0.0	3.5	9.4	6.9	1,915.8	0.3	0.0			2,120.1
(V) Evapotranspiration and water in products	**105.5**	**0.0**	**591.7**	**8.9**	**0.0**	**0.7**	**44.6**	**0.0**	**0.0**	**41.6**	**81.8**	**9.0**		**883.8**
Total of Supply table	**676.6**	**57.9**	**6,287.5**	**18,750.8**	**1,421.2**	**6.1**	**1,336.2**	**90.4**	**2,814.2**	**193.0**	**818.4**	**18.5**	**15,696.1**	

**excluding O84.1*

8.5 Physical Supply Table for Water – the Netherlands 2020

Physical supply table for water

Period	2020
Area	the Netherlands
Unit	million m3
Data source	Statistics Netherlands
Commissioned by	Eurostat (EU funding)

Million m3	Agriculture, forestry and fishing	Mining and quarrying	Manufac-turing industry	Energy sector	Water collection, treatment and supply	Private waste-water treatment	Waste management services	Construction	Public waste-water treatment	Services	Households	Import	Environment	Total supply
	A	B	C	D	E36	E37	E38-39	F	O84.1	G-U*				
(I) Water flows from environment to economy													**15,279.9**	**15,279.9**
Inland water resources													8,778.3	8,778.3
— Groundwater													1,643.3	1,643.3
— Soil water													-	-
— Surface water													7,135.0	7,135.0
Other water sources													6,501.6	6,501.6
— Precipitation													582.4	582.4
— Sea water													5,919.2	5,919.2
(II) Abstracted water	**372.2**	**29.4**	**3,089.8**	**8,742.5**	**1,341.3**	**1.0**	**721.9**	**45.0**	**897.6**	**47.0**	**0.0**	**7.8**		**15,295.5**
Distribution	0.0	0.0	5.1	0.0	1,232.7	0.0	0.0	0.0	0.0	0.0	0.0	7.8		1,245.6
— Drinkingwater					1,160.8							7.8		1,168.6
— Industry water	0.0	0.0	5.1	0.0	71.9	0.0	0.0	0.0	0.0	0.0		0.0		77.0
Own use	372.2	29.4	3,084.7	8,742.5	108.7	1.0	721.9	45.0	897.6	47.0	0.0	0.0		14,050.0
(III) Wastewater flows within the economy	**37.7**	**2.1**	**137.5**	**2.3**	**7.2**	**1.8**	**4.0**	**2.5**	**8.7**	**96.4**	**769.8**	**0.0**		**1,070.0**
Reuse						0.0	0.0		3.7					3.7
Wastewater	37.7	2.1	137.5	2.3	7.2	1.8	4.0	2.5	5.0	96.4	769.8	0.0		1,066.3
— Own treatment	0.0	0.0	8.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			8.0
— Wastewater (to) treatment	37.7	2.1	129.5	2.3	7.2	1.8	4.0	2.5	5.0	96.4	769.8	0.0		1,058.3
(IV) Return flows of water	**268.5**	**29.6**	**2,631.7**	**8,742.1**	**101.6**	**3.4**	**674.2**	**45.3**	**1,949.5**	**12.8**	**0.0**			**14,458.7**
Cooling water	0.0	25.0	2,463.2	8,742.1	0.0	0.0	668.1	0.0	0.0	9.5	0.0			11,907.9
Irrigation	268.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			268.5
Losses through leakages					42.4	0.0	0.0		0.0					42.4
Unaccounted (fire water)					59.2	0.0	0.0		0.0					59.2
Water returned without use	0.0	0.0	0.0	0.0	0.0	0.0	0.0	38.8	0.0	0.0	0.0			38.8
Water safely treated	0.0	4.6	168.5	0.0	0.0	3.4	6.2	6.5	1,949.5	3.3	0.0			2,142.0
(V) Evapotranspiration and water in products	**107.9**	**0.0**	**534.4**	**8.6**	**0.0**	**1.2**	**49.5**	**0.0**	**0.0**	**40.0**	**85.5**	**9.0**		**836.1**
Total of Supply table	**786.3**	**61.1**	**6,393.4**	**17,495.5**	**1,450.1**	**7.4**	**1,449.6**	**92.8**	**2,855.8**	**196.2**	**855.3**	**16.8**	**15,279.9**	

**excluding O84.1*

8.6 Physical Use Table for Water – Eurostat proposal

Physical use table for water — note: dark grey cells are not applicable

	Production activities										Final consumption	Net changes in product inventories	Flows to the rest of world	Environment	
	Agriculture, forestry and fishing	Mining and quarrying	Manufacturing industry	Electricity, gas, steam and air conditioning supply	Water management	Water collection, treatment and supply	Sewerage	Waste management	Construction	Services	Households	Accumulation	Exports	Flows to the environment	Total use
NACE	A	B	C	D	E	E 36	E 37	E 38-39	F	G-U					
(I) Water flows from environment to economy - total use of abstracted water															
Inland water resources - total															
Surface water															
Groundwater															
Soil water															
Other water sources - total															
Precipitation															
Sea water															
(II) Abstracted water - total															
of which: for hydroelectric power generation															
of which: for irrigation															
of which: for aquaculture															
of which: mine water															
of which: for cooling															
of which: seawater															
(III) Wastewater flows within the economy - total															
Wastewater - total															
Wastewater received from other units															
Own treatment															
Reused water															
(IV) Return flows of water to the environment -															
To inland water resources - total															
Surface water															
Groundwater (+soil water)															
To other sources															
(V) Evapotranspiration of abstracted water and water incorporated into products - total															
Evapotranspiration of abstracted water															
Water incorporated into products															

Color coding:

- legal cover
- voluntary reporting
- extension, own extra details (dropped in Eurostat table)

Notes:

#	statistical residual
(1)	surface runoff entering sewer systems/wastewater treatment plants
(2)	JQ: construction only
(3)	desalination: only produced volumes known, not abstracted volumes
(4)	soil water missing
(5)	JQ: cooling water only
(6)	agriculture only (but which will dominate)
(7)	JQ has data only for NACE C and D, but which will dominate
(8)	JQ has data only for NACE E37, but which will dominate
(9)	JQ has data only for NACE A and C, but which will dominate
(10)	share of irrigation water that evaporates directly and is not returned to the soil is unknown
(11)	share of return to surface water and groundwater is unknown, but likely dominated by surface water
(12)	might be estimated via proxy 'connection rate to independent WWT' (JQ T5)
(13)	evaporanspiration in JQ T1, but no differentiation between origins (environment and NACE A)

8.7 Physical Use Table for Water – the Netherlands 2018

Physical use table for water																		
Period	2018																	
Area	the Netherlands																	
Unit	million m3																	
Data source	Statistics Netherlands																	
Commissioned by	Eurostat (EU funding)																	
			Agriculture, forestry and fishing	Mining and quarrying	Manufacturing	Energy sector	Water collection, treatment and supply	Private wastewater treatment	Waste management services	Construction	Public wastewater treatment	Services	Households	Accumulation	Export	Environment	Total use
			A	B	C	D	E36	E37	E38-39	F	O84.1	G-U*					
(I) Water flows from environment to economy			**347.6**	**36.3**	**3,112.3**	**8,872.3**	**1,312.2**	**0.3**	**654.9**	**42.4**	**747.4**	**44.9**	**0.0**				**15,170.6**
	Inland water resources		302.1	0.9	2,458.4	3,369.9	1,312.2	0.3	646.5	42.4	341.3	44.9	0.0				8,518.9
		Groundwater	225.3	0.1	132.3	3.9	823.4	0.1	2.7	42.4	341.3	44.9	0.0				1,616.4
		Soil water	-														-
		Surface water	76.8	0.8	2,326.1	3,366.0	488.8	0.2	643.8	0.0	0.0	0.0	0.0				6,902.5
	Other water sources		45.5	35.4	653.9	5,502.4	0.0	0.0	8.4	0.0	406.2	0.0	0.0				6,651.8
		Precipitation	45.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	406.2	0.0	0.0				451.7
		Sea water	0.0	35.4	653.9	5,502.4	0.0	0.0	8.4	0.0	0.0	0.0					6,200.1
(II) Abstracted water			**396.5**	**39.2**	**3,306.1**	**8,885.6**	**120.3**	**1.4**	**659.1**	**45.2**	**752.1**	**148.0**	**837.2**		**2.8**		**15,193.5**
	Distribution		48.9	2.9	202.4	13.3	11.6	1.1	4.2	2.8	4.7	103.1	837.2		2.8		1,235.0
		Drinkingwater	48.9	2.9	132.0	3.5	11.6	1.1	3.8	2.8	4.7	103.1	837.2		2.8		1,154.4
		Industry water	0.0	0.0	70.4	9.8	0.0	0.0	0.4	0.0	0.0	0.0	0.0		0.0		80.6
	Own use		347.6	36.3	3,103.7	8,872.3	108.7	0.3	654.9	42.4	747.4	44.9	0.0		0.0		13,958.5
		Aquaculture	0.0														0.0
		Cooling (fresh water)		0.7	2,156.2	3,029.4			580.1	0.0							5,766.4
		Cooling (seawater)	0.0	35.4	653.9	5,502.4	0.0		8.4	0.0		0.0					6,200.1
		Hydroelectric power generation				0.0											0.0
		Irrigation	310.1									0.0	0.0				310.1
		Mine water		0.0													0.0
		Other uses	37.5	0.2	293.6	340.5	108.7	0.3	66.4	42.4	747.4	44.9	0.0				1,681.9
(III) Wastewater flows within the economy			**0.0**	**0.0**	**10.6**	**8.3**	**0.0**	**3.8**	**0.4**	**0.0**	**1,040.7**	**0.8**	**0.0**		**0.0**		**1,064.6**
	Reuse		0.0	0.0	2.7	8.3	0.0	0.0	0.1	0.0	0.0	0.4	0.0				11.5
	Wastewater		0.0	0.0	7.9	0.0	0.0	3.8	0.3	0.0	1,040.7	0.4	0.0		0.0		1,053.1
		Own treatment	0.0	0.0	7.9	0.0	0.0	0.0	0.3	0.0	0.0	0.4	0.0				8.6
		Wastewater (to) treatment					0.0	3.8			1,040.7				0.0		1,044.5
(IV) Return flows of water																**14,413.0**	**14,413.0**
	To inland water resources															6,301.7	6,301.7
		Groundwater (+soil water)														310.1	310.1
		Surface water														5,991.6	5,991.6
	To other sources**															8,111.3	8,111.3
(V) Evapotranspiration and water in products														**0.0**	**12.0**	**763.2**	**775.2**
Total of Use table			**744.1**	**75.5**	**6,429.0**	**17,766.2**	**1,432.5**	**5.5**	**1,314.4**	**87.6**	**2,540.2**	**193.7**	**837.2**	**0.0**	**14.8**	**15,176.2**	
**excluding O84.1*																		
***including returns with unknown destination*																		

8.8 Physical Use Table for Water – the Netherlands 2019

Physical use table for water

Period	2019
Area	the Netherlands
Unit	million m3
Data source	Statistics Netherlands
Commissioned by	Eurostat (EU funding)

			Agriculture, forestry and fishing	Mining and quarrying	Manufacturing	Energy sector	Water collection, treatment and supply	Private wastewater treatment	Waste management services	Construction	Public wastewater treatment	Services	Households	Accumulation	Export	Environment	Total use
			A	B	C	D	E36	E37	E38-39	F	O84.1	G-U*					
(I) Water flows from environment to economy			**316.4**	**27.8**	**3,033.9**	**9,369.3**	**1,302.2**	**0.6**	**665.6**	**43.9**	**890.4**	**46.0**	**0.0**				**15,696.1**
	Inland water resources		253.4	0.1	2,412.8	3,770.6	1,302.2	0.6	663.7	43.9	369.2	46.0	0.0				8,862.5
		Groundwater	198.8	0.1	127.6	3.9	810.2	0.1	3.0	43.9	369.2	46.0	0.0				1,602.8
		Soil water	-														-
		Surface water	54.6	0.0	2,285.2	3,766.7	492.0	0.5	660.7	0.0	0.0	0.0	0.0				7,259.7
	Other water sources		63.0	27.7	621.1	5,598.7	0.0	0.0	1.9	0.0	521.2	0.0	0.0				6,833.6
		Precipitation	63.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	521.2	0.0	0.0				584.2
		Sea water	0.0	27.7	621.1	5,598.7	0.0	0.0	1.9	0.0	0.0	0.0					6,249.4
(II) Abstracted water			**360.2**	**30.0**	**3,242.9**	**9,381.4**	**119.1**	**2.0**	**670.5**	**46.5**	**895.7**	**146.1**	**818.4**		**2.2**		**15,715.0**
	Distribution		43.8	2.2	213.0	12.1	9.7	1.4	4.9	2.6	5.3	100.1	818.4		2.2		1,215.7
		Drinkingwater	43.8	2.2	144.6	4.3	9.7	1.4	4.6	2.6	5.3	100.1	818.4		2.2		1,139.2
		Industry water	0.0	0.0	68.4	7.8	0.0	0.0	0.3	0.0	0.0	0.0	0.0		0.0		76.5
	Own use		316.4	27.8	3,029.9	9,369.3	109.3	0.6	665.6	43.9	890.4	46.0	0.0		0.0		14,499.2
		Aquaculture	0.0														0.0
		Cooling (fresh water)		0.0	2,118.0	3,390.0			595.7	0.0							6,103.7
		Cooling (seawater)	0.0	27.7	621.1	5,598.7	0.0		1.9	0.0		0.0					6,249.4
		Hydroelectric power generation				0.0											0.0
		Irrigation	278.2									0.0	0.0				278.2
		Mine water		0.0													0.0
		Other uses	38.1	0.1	290.8	380.6	109.3	0.6	68.0	43.9	890.4	46.0	0.0				1,867.8
(III) Wastewater flows within the economy			**0.0**	**0.0**	**10.8**	**0.0**	**0.0**	**3.5**	**0.1**	**0.0**	**1,028.1**	**0.7**	**0.0**		**0.0**		**1,043.2**
	Reuse		0.0	0.0	2.7	0.0	0.0	0.0	0.1	0.0	0.0	0.4	0.0				3.2
	Wastewater		0.0	0.0	8.1	0.0	0.0	3.5	0.0	0.0	1,028.1	0.3	0.0		0.0		1,040.0
		Own treatment	0.0	0.0	8.1	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0				8.4
		Wastewater (to) treatment					0.0	3.5			1,028.1				0.0		1,031.6
(IV) Return flows of water																**14,828.6**	**14,828.6**
	To inland water resources															6,538.4	6,538.4
		Groundwater (+soil water)														278.2	278.2
		Surface water														6,260.2	6,260.2
	To other sources**															8,290.2	8,290.2
(V) Evapotranspiration and water in products														**0.0**	**12.0**	**871.8**	**883.8**
Total of Use table			**676.6**	**57.8**	**6,287.6**	**18,750.7**	**1,421.3**	**6.1**	**1,336.2**	**90.4**	**2,814.2**	**192.8**	**818.4**	**0.0**	**14.2**	**15,700.4**	

**excluding O84.1*

***including returns with unknown destination*

8.9 Physical Use Table for Water – the Netherlands 2020

Physical use table for water

Period	2020
Area	the Netherlands
Unit	million m3
Data source	Statistics Netherlands
Commissioned by	Eurostat (EU funding)

		Million m3	Agriculture, forestry and fishing	Mining and quarrying	Manufac-turing industry	Energy sector	Water collection, treatment and supply	Private waste-water treatment	Waste management services	Construction	Public waste-water treatment	Services	Households	Accumu-lation	Export	Environment	Total use
			A	B	C	D	E36	E37	E38-39	F	O84.1	G-U*					
(I) Water flows from environment to economy			**372.2**	**29.4**	**3,089.8**	**8,742.5**	**1,333.5**	**1.0**	**721.9**	**45.0**	**897.6**	**47.0**	**0.0**				**15,279.9**
	Inland water resources		307.2	2.7	2,420.8	3,520.6	1,333.5	1.0	720.3	45.0	380.2	47.0	0.0				8,778.3
		Groundwater	214.2	0.3	113.2	0.3	839.8	0.2	3.1	45.0	380.2	47.0	0.0				1,643.3
		Soil water	-														-
		Surface water	93.0	2.4	2,307.6	3,520.3	493.7	0.8	717.2	0.0	0.0	0.0	0.0				7,135.0
	Other water sources		65.0	26.7	669.0	5,221.9	0.0	0.0	1.6	0.0	517.4	0.0	0.0				6,501.6
		Precipitation	65.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	517.4	0.0	0.0				582.4
		Sea water	0.0	26.7	669.0	5,221.9	0.0	0.0	1.6	0.0	0.0	0.0					5,919.2
(II) Abstracted water			**414.1**	**31.7**	**3,293.7**	**8,753.0**	**116.7**	**3.0**	**726.7**	**47.8**	**903.2**	**148.5**	**855.3**		**2.0**		**15,295.7**
	Distribution		41.9	2.3	209.0	10.5	8.0	2.0	4.8	2.8	5.6	101.5	855.3		2.0		1,245.7
		Drinkingwater	41.9	2.3	140.1	2.6	8.0	2.0	4.5	2.8	5.6	101.5	855.3		2.0		1,168.6
		Industry water	0.0	0.0	68.9	7.9	0.0	0.0	0.3	0.0	0.0	0.0	0.0		0.0		77.1
	Own use		372.2	29.4	3,084.7	8,742.5	108.7	1.0	721.9	45.0	897.6	47.0	0.0		0.0		14,050.0
		Aquaculture	0.0														0.0
		Cooling (fresh water)		2.2	2,126.8	3,168.3			646.9	0.0							5,944.2
		Cooling (seawater)	0.0	26.7	669.0	5,221.9	0.0		1.6	0.0		0.0					5,919.2
		Hydroelectric power generation				0.0											0.0
		Irrigation	333.5									0.0	0.0				333.5
		Mine water		0.0													0.0
		Other uses	38.7	0.5	288.9	352.3	108.7	1.0	73.4	45.0	897.6	47.0	0.0				1,853.1
(III) Wastewater flows within the economy			**0.0**	**0.0**	**9.9**	**0.0**	**0.0**	**3.4**	**1.1**	**0.0**	**1,055.0**	**0.7**	**0.0**		**0.0**		**1,070.1**
	Reuse		0.0	0.0	2.3	0.0	0.0	0.0	1.0	0.0	0.0	0.4	0.0				3.7
	Wastewater		0.0	0.0	7.5	0.0	0.0	3.4	0.1	0.0	1,055.0	0.3	0.0		0.0		1,066.3
		Own treatment	0.0	0.0	7.5	0.0	0.0	0.0	0.1	0.0	0.0	0.3	0.0				7.9
		Wastewater (to) treatment					0.0	3.4			1,055.0				0.0		1,058.4
(IV) Return flows of water																**14,458.7**	**14,458.7**
	To inland water resources															6,466.6	6,466.6
		Groundwater (+soil water)														333.5	333.5
		Surface water														6,133.1	6,133.1
	To other sources**															7,992.1	7,992.1
(V) Evapotranspiration and water in products													**0.0**	**12.0**	**824.1**	**836.1**
Total of Use table			**786.3**	**61.1**	**6,393.4**	**17,495.5**	**1,450.2**	**7.4**	**1,449.7**	**92.8**	**2,855.8**	**196.2**	**855.3**	**0.0**	**14.0**	**15,282.8**	

**excluding O84.1*

***including returns with unknown destination*