المركز الإحصائي لدول مجلس التعاون لدول الخليج العربية GCC-STAT

الرقم المرجعي لمهمة الدعم الفني	عنوانالمهمة	تاريخ المهمة	الجهة/الدولة
	دورة تدريبيةحول بعض مواضيع اطار تطوير احصاءات البيئة وفقاً لتصنيف الأمم المتحدة وربطها بالظروف الطارئة (فيروس كورونا - كوفيد-19)	22-23 إبريل 2020م	دول مجلس التعاون الخليجي

الشروط المرجعية و المخرجات المحددة

الأهداف والنتائج المرجوة:

نظم المركز الإحصائي لدول مجلس التعاون لدول الخليج العربية من 22 إلى 23 ابريل 2020م دورة تدريبية حول بعض مواضيع إطار تطوير إحصاءات البيئة جمعت مراكز الإحصاء لدول مجلس التعاون والمؤسسات الوطنية الأخرى ذات العلاقة بموضوع الورشة "التركيز على بعض مواضيع إطار تطوير إحصاءات البيئة وفقاً لتصنيف الأمم المتحدة وربطه بالظروف الطارئة (فيروس كورونا - كوفيد-19).

و تتمثل أهداف الورشة فيما يلي:

- تعزيز فهم المعايير الدولية المتعلقة بإحصاءات قطاع البيئة في النظام الإحصائي لدول مجلس التعاون لدول الخليج العربية.
- شرح الروابط بين مجموعات بيانات ومؤشرات البيئة ومناقشة متطلبات المستخدمين من أجل تحسين ونشر البيانات الرسمية.
- تعزيز تبادل المعرفة والتعاون بين منتجي إحصاءات البيئة.
- ربط إحصاءات البيئة بالظروف الطارئة (فايروس كورونا- كوفيد 19).

القضايا التي تم تناولها والتوصيات

تم عقد الدورة التدريبية عن بعد وفق جدول الأعمال التي

اليوم الأول الإثنين 20 أبريل 2020م: مخصص للمكون الفرعي 131 حول جودة الهواء

اليوم الثاني الثلاثاء 21 أبريل 2020م: مخصص للمكون الفرعي 411 و412 حول الكوارث الطبيعية وتأثيراتها والمكون الفرعي 521 حول الأمراض المحمولة جوا والظروف.

أهم التوصيات

- جمع البيانات حسب المتغيرات المطروحة المواضيع 131 و 412 و 521
- حساب المؤشرات التالية:
  - AQI للمدن الرئيسية للربع الأول من عام 2020 مقارنة بالربع الأول من عام 2019 (يومي وأسبوعي وشهري)
  - معدل التغيير لـ NO2 و PM10 لنفس المدن والفترة الزمنية
- عدد الأيام التي تم فيها تجاوز الحد الاقصى المسموح به
- حساب معدل الانتشار بسبب Covid-19 من إجمالي الأمراض المنقولة جوًا لنفس المدن والفترة الشهرية
- حساب معدل الوفيات بسبب Covid-19 من إجمالي الأمراض المنقولة جواً لنفس المدن والفترة الشهرية
- حساب جزء التأثير الاقتصادي لكوفيد 19 إلى التأثير الكلي على اقتصاد الكوارث الطبيعية.

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3	ابتهاج السيابي	احصائي	
4	خالد الدروشي	رئيس قسم اللجان	

الخطوات اللاحقة

الخطوات القادمة

1. **متابعة العمل وفق النقاط المذكورة أعلاه.**
2. **موافاة المركز الإحصائي الخليجي بالمعلومات والبيانات المطلوبة.**

التقييم وفق مؤشرات الأداء الموضحة في تقرير ما قبل المهمة

- **نسبة القضايا المحددة التي تم تغطيتها و التي اعطت نتائج: 100%**
- **نسبة مشاركة اعضاء قسم البيئة والاقسام ذات العلاقة في المهمة: 100%**

المخرجات:	مؤشرات الأداء

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	أرقام التواصل	24346462	
قام (المركز الإحصائي الوطني) بمراجعة هذا التقرير ومرفقاته(........) وتم اعتماد النسخة النهائية بتاريخ:			

(مرفق 1)

SEEA-Water

Chapter III - Physical water supply and use tables

C. Physical supply and use tables

3.20. Physical supply and use tables for water describe the three types of flows mentioned above: (*a*) from the environment to the economy; (*b*) within the economy; and (*c*) from the economy into the environment. In particular, the use table is obtained by merging informa-

31 It should be noted that the term "water loss" may have a different meaning in different contexts. Here, the term refers to a loss of water from the economic system. Part of such losses can be seen as an actual resource from the point of view of the inland water resource system, since water, by returning to water resources, becomes available for use again.

32 See sect. C.1 for further details.

tion on water use: the total water intake of an economic unit is the result of direct water abstraction (flow from the environment to the economy) and water received from other economic units (flow within the economy). Similarly, the supply table is obtained by merging information on the two types of water flow that leave an economic unit: one destined for other economic units (flow within the economy) and the other destined for the environment (flow from the economy into the environment).

3.21. Physical supply and use tables can be compiled at various levels of detail, depending on the policy concern of a country and the availability of data. A simplified standard supply and use table, which countries are encouraged to compile, contains basic information on the supply and use of water and affords an overview of water flows. In addition, all the information contained in the table is balanced, that is, supply equals use. As a second step, a more detailed supply and use table can be compiled, with a more detailed breakdown of items in the simplified supply and use table.

1. Standard physical supply and use tables for water

3.22. Table III.1 shows the standard physical supply and use tables for water. The breakdown of the economic activities, classified according to ISIC Rev. 4, distinguishes the following groups:

(*a*) ISIC divisions 1-3, which include agriculture, forestry and fishing;

(*b*) ISIC divisions 5-33 and 41-43, which include mining and quarrying, manufacturing, and construction;

(*c*) ISIC division 35: electricity, gas, steam and air-conditioning supply;

(*d*) ISIC division 36: water collection, treatment and supply;

(*e*) ISIC division 37: sewerage;

(*f*) ISIC divisions 38, 39 and 45-99, which correspond to the service industries.

3.23. ISIC divisions 35, 36 and 37 have been identified separately because of their importance in the supply and use of water and water-related services. In particular, ISIC divisions 36 and 37 are identified separately because they are key industries for the distribution of water and wastewater. Cost-recovery policies and policies aimed at improving access to safe drinking water and sanitation are examples of policies involving almost exclusively these two economic activities.

3.24. ISIC division 35 is a major user of water for generating hydroelectric power and for cooling purposes: it abstracts from and returns enormous quantities of water into the environment. Aggregating information on water supply and use under ISIC division 35 with that of other industries would provide misleading information, as the water use (and returns) under ISIC division 35 alone may outweigh that of any other industry.

3.25. Table III.1 presents a detailed description of each flow of water in the simplified standard physical supply and use table.

3.26. **Abstraction** is defined as the amount of water that is removed from any source, either permanently or temporarily, in a given period of time for consumption and production activities. Water used for the generation of hydroelectric power is also considered to be abstraction. In table III.1 water abstraction is disaggregated according to purpose (abstraction for own use and for distribution) and type of source (abstraction from inland water resources, that is, surface water, groundwater and soil water as in the asset classification, and from other sources, which include sea water and precipitation).

3.27. Water is abstracted either to be used by the same economic unit which abstracts it, **abstraction for own use**, or to be supplied, possibly after some treatment, to other economic units, **abstraction for distribution.** As mentioned previously, most of the water is abstracted for distribution under ISIC division 36, water collection, treatment and supply; however, there may be other industries which abstract and supply water as a secondary activity.

3.28. **Abstraction from water sources** includes abstraction from inland water resources as well as abstraction of sea water and the direct collection of precipitation for production and consumption activities. Water is abstracted from the sea generally for cooling purposes (the corresponding wastewater flow is normally returned to the original source of water, that is, the sea or ocean) or for desalination processes. Desalinated water could be returned to the inland water resource and constitute a resource. A typical example of the collection of precipitation is the harvesting of rainwater from roofs by households.

3.29. **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. It is important to record this flow for several reasons: one reason is that it shows the relative contribution of rain-fed and irrigated agriculture to food production. In view of the importance of rain-fed agriculture worldwide (more than 60 per cent of all food production in the world is produced under rain-fed conditions), such information can be used to assess the efficiency of rain-fed agriculture, that is, to determine the crop production per volume of water used, and to formulate water policies.

3.30. Within the economy, the **use of water received from other economic units** refers to the amount of water that is delivered to an industry, household or the rest of the world by another economic unit. Such water is usually delivered through mains, but other means of transport are not excluded, such as artificial open channels. It also includes the flow of wastewater to sewerage, which is identified separately along with reused water. The **use of water received from other economic units** by the rest of the world corresponds to the **export** of water. It is generally the industry under ISIC division 36 that exports water.

3.31. The **total water use** (row 3 in table III.1) of an industry is computed as the sum of the amount of water directly abstracted (row 1 in the table) and the amount of water received from other economic units (row 2 in the table). Although it might be perceived that water abstracted for distribution is counted twice—first as a use when water is abstracted by the distributing industry and second when it is delivered to the user—water abstracted for distribution is a water use of the distributing industry even though that industry is not the end-user of the water.

3.32. The **supply of water to other economic units** refers to the amount of water that is supplied by one economic unit to another. The supply of water is recorded net of losses in distribution. The supply to other economic units generally occurs through mains, but can also occur through artificial open channels, trucks and other means. It should be noted that the supply of water by the rest of the world corresponds to the **import** of water.

3.33. The supply and use of water to other economic units can be disaggregated into several categories. However, in the standard tables only **reused water** and **wastewater to "sewerage"** are explicitly identified in view of their importance in water conservation policies.

3.34. The concept of reused water is linked to that of wastewater. **Wastewater** is water that is of no further immediate value with regard to the purpose for which it had been used or in the pursuit of which it was produced, because of its quality, quantity or time of occurrence. Wastewater can be discharged directly into the environment (in which case it is recorded as a return flow), supplied to a treatment facility (under ISIC division 37) (recorded as waste-

Table III.1
Standard physical supply and use tables for water

A. Physical use table (*physical units*)		Industries (by ISIC category) 1-3	5-33, 41-43	35	36	37	38, 39, 45-99	Total	Households	Rest of the world	Total
From the environment	1. Total abstraction (= 1.a + 1.b = 1.i + 1.ii)										
	1.a. Abstraction for own use										
	1.b. Abstraction for distribution										
	1.i. From inland water resources:										
	1.i.1. Surface water										
	1.i.2. Groundwater										
	1.i.3. Soil water										
	1.ii. Collection of precipitation										
	1.iii. Abstraction from the sea										
Within the economy	2. Use of water received from other economic units										
	of which:										
	2.a. Reused water										
	2.b. Wastewater to sewerage										
	3. Total use of water (= 1 + 2)										

B. Physical supply table (*physical units*)		Industries (by ISIC category) 1-3	5-33, 41-43	35	36	37	38, 39, 45-99	Total	Households	Rest of the world	Total
Within the economy	4. Supply of water to other economic units										
	of which:										
	4.a. Reused water										
	4.b. Wastewater to sewerage										
Into the environment	5. Total returns (= 5.a + 5.b)										
	5.a. To inland water resources										
	5.a.1. Surface water										
	5.a.2. Groundwater										
	5.a.3. Soil water										
	5.b. To other sources (e.g., sea water)										
	6. Total supply of water (= 4 + 5)										
	7. Consumption (= 3 - 6)										

Note: Dark grey cells indicate zero entries by definition.

water to "sewerage") or supplied to another industry for further use (reused water). Table III.1 calculates the total wastewater generated by an economic unit as the sum of the supply of reused water, wastewater to sewerage and returns into the environment.

3.35. **Reused water**, defined as wastewater supplied to a user for further use with or without prior treatment, excludes that water which is recycled within industrial sites. It is also commonly referred to as "reclaimed wastewater". It is important to record this flow because the reuse of water can alleviate the pressure on water resources by reducing direct abstraction of water: for example, golf courses and landscaping alongside public roads can be watered with (treated) wastewater instead of surface water or groundwater. Some industries, such as power plants, can use reclaimed wastewater. A considerable volume of water is needed to cool electricity-generating equipment; using wastewater for this purpose means that the facility would not have to use higher-quality water that could be used more advantageously somewhere else.

3.36. In order to avoid confusion, it should be noted that, once wastewater is discharged into the environment, its abstraction downstream is not considered a reuse of water in the accounting tables, but a new abstraction from the environment.

3.37. As previously mentioned, reused water excludes the recycling of water within the same industry or establishment (on site). Although information on recycled water would be very useful for the analysis of water use efficiency, generally it is not available; thus, the simplified standard tables do not report it explicitly. However, a reduction in the total volume of water used while maintaining the same level of output can provide an indication of an increase in the efficiency of water use, which, in turn, may be due to the use of recycled water within an industry.

3.38. Within the economy, water can be exchanged between water producers and distributors (under ISIC division 36) before being effectively delivered to users. Such water exchanges are referred to as **intrasectoral sales**. An example is when the distribution network of one distributor/producer does not reach the water user and that network must then sell water to another distributor in order for the water to be delivered to the intended user. Such sales artificially increase the physical supply and use of water within the economy, but do not influence the global (physical) balance of water within the environment, and thus they are not recorded in the physical supply and use tables.

3.39. **Total returns** include water that is returned into the environment. Total returns can be classified according to (*a*) the receiving media, that is, inland water resources (as specified in the asset classification) and sea water, and (*b*) the type of water, such as treated water and cooling water. The standard tables report only the breakdown according to the receiving media in order to ensure that the links are maintained with the flows in the asset accounts. More detailed tables can be compiled to show returns of different types of water.

3.40. The **total water supply** (row 6 in table III.1) is computed as the sum of the amount of water supplied to other economic units (row 4 in the table) and the amount of water returned to the environment (row 5 in the table).

3.41. **Storage of water**. It should be noted that water can be stored temporarily in the economy, for example, in water towers and in closed cooling or heating circuits. Therefore, when comparing the situation at the beginning and the end of the period, some changes in inventories may occur. However, those changes are generally rather small (because water is a bulky commodity and thus costly to store) in comparison with the other volumes of water; therefore, the changes in inventory are not reported in the physical supply and use tables.

3.42. Table III.1 can be supplemented with information on the number of persons with sustainable access to an improved water source and with access to improved sanitation reported in supplementary tables, as presented in annex II. This information is particularly important for the management of water resources and for the reduction of poverty: it is used to monitor progress towards attainment of target 7.C of the Millennium Development Goals, that is, to "halve, by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation". Presenting all water-related information, including social information, in a common framework has the advantage of enabling consistent analyses and scenario modelling. For example, analysis of the impact that investing in water infrastructure would have on the number of people with access to improved water sources can be undertaken easily if the information is organized according to the accounting framework.

3.43. In order to gain a complete picture of the water flows within the economy, table III.1 can be supplemented with detailed information on the origin and destination of water flows by identifying who is supplying water to whom. Table III.2 presents a matrix of transfers within the economy. Each entry represents a water exchange from a supplier (by row) to a user (by column). For example, the intersection of row ISIC division 37 with the column containing ISIC division 45, wholesale and retail trade and repair of motor vehicles and motorcycles, represents the amount of water that is supplied under ISIC division 37 to ISIC division 45, which could use treated wastewater, for example, for washing cars.

Table III.2
Matrix of flows of water within the economy (*physical units*)

	User	Industries (by ISIC category)							Households	Rest of the world	Supply of water to other economic units (row 4 of table III.1)
Supplier		1-3	5-33, 41-43	35	36	37	38, 39, 45-99	Total			
Industries (by ISIC category)	1-3										
	5-33, 41-43										
	35										
	36										
	37										
	38, 39, 45-99										
	Total										
Households											
Rest of the world											
Use of water received from other economic units (row 2 of table III.1)											

2. Water consumption

3.44. The concept of water consumption gives an indication of the amount of water that is lost by the economy during use, in the sense that the water has entered the economy but has not returned to either water resources or the sea. This happens during use because part of the water is incorporated into products, evaporated, transpired by plants or simply consumed by households or livestock. The difference between the water use (row 3 in table III.1) and the water supply (row 6 in the table) is referred to as **water consumption**. Water consumption can be computed for each economic unit and for the whole economy. The concept of water consumption that is used in SEEA-Water is consistent with the hydrological concept. It differs, however, from the concept of consumption that is used in the national accounts, which instead refers to water use.

3.45. For the whole economy, the balance between water flows can be written as follows:

> Total abstraction + use of water received from other economic units = supply of water to other economic units + total returns + water consumption

It should be noted that since the total water supply to other economic units equals the total water use received from other economic units, the identity can be rewritten as follows:

> Total abstraction = total returns + water consumption

3.46. Water consumption can include water that is stored, for example, in water towers, but this quantity is usually very small because water is generally stored only for a short period of time.

3.47. Water consumption computed for each industry gives an indication of the industry's water use efficiency. Since water supply does not equal water use by industry, water consumption is computed as the difference between the use and supply by industry, using the following formula:

> Water consumption by industry *i* = total use of water by industry *i* – total supply of water by industry *i*

3.48. From the perspective of the inland water resource system, discharges of water into the sea should also be considered as lost water since this water, once in the sea, is not directly available for further use as it would be, by contrast, when discharged into a river, where discharged water becomes a resource for downstream uses. The concept of "inland water consumption" has been introduced in order to give an indication of the amount of water that is not returned to the inland water system. Inland water consumption is thus calculated as follows:

> Inland water consumption = water consumption + returns to other sources (e.g., sea water)

3.49. The concept of consumption can also be adapted to specific resources. For example, the 2002 OECD/Eurostat joint questionnaire on inland waters used the concept of "freshwater consumption", which takes into consideration water that is abstracted from freshwater sources but discharged into non-freshwater sources.[33]

3.50. Since water consumption is calculated as the difference between water use and water supply, the term may include flows that are very different in nature: for example, the part of the losses in distribution which do not return to the water resources. For analytical purposes it is useful to distinguish water consumption that results from evaporation and transpiration or enters into products, as a result of the production process, from water "consumption" that is the result of malfunctioning meters or illegal tapping.

3. Supplementary items in the physical supply and use tables for water

3.51. The standard physical supply and use table in table III.1 contains aggregate flows. In practice, when compiling these accounts, a more detailed breakdown, both on the industry side and on the type of water, is often necessary for making more detailed analyses. The level of detail depends on the country's priorities and the availability of data. Table III.3 presents an example of the breakdown of water flows (shown in italics) which are useful for analytical purposes, together with a numerical example.

3.52. In Table III.3, abstraction for own use is further disaggregated into the following uses:

- Hydroelectric power generation
- Irrigation water
- Mine water
- Urban run-off
- Cooling water

3.53. Water used for **hydroelectric power generation** consists of water used in generating electricity at plants where the turbine generators are driven by falling water. Usually, such water is directly abstracted by the power plant and returned immediately into the environment. It is important to record the amount of water used and discharged by a hydropower facility, especially for allocation policies, as water used for the generation of hydroelectric power may be in competition with other uses.

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33 The desalination of sea water, where carried out, should, on the contrary, be counted as negative consumption.

3.54. **Irrigation water** consists of water which is artificially applied to land for agricultural purposes.

3.55. **Mine water** is water used for the extraction of naturally occurring minerals, including coal, mineral ore, petroleum and natural gas, and it includes water associated with quarrying, dewatering, milling and other on-site activities carried out as part of mining operations. Mine water use generally involves removal and displacement of water in the environment (during dewatering processes) when the mine extends below the water table. It might be argued that this should not be considered part of abstraction. However, it is important to record this flow as it often results in the disposal of large volumes of water and the displacement of such volumes could be damaging to the environment.

3.56. **Urban run-off** is defined as that portion of precipitation in urban areas that does not naturally evaporate or percolate into the ground, but flows via overland flow, underflow, or channels, or is piped into a defined surface water channel or a constructed infiltration facility. It is also referred to as "urban storm water". It should be noted here that the term "urban areas" may also include rural residential zones. When urban run-off is collected into the sewage system, it is recorded in the use table as an abstraction from other sources (in particular from precipitation) under ISIC division 37; when it is discharged into the environment, it is recorded in the supply table as a return flow.

3.57. It is important to record the collection and discharge of urban run-off for the following reasons: (*a*) for management purposes, in order to design policies aimed at reducing the negative impacts of urban run-off on water resources, as urban run-off usually contains relatively high concentrations of pollutants, including bacteria and viruses, solid waste and toxic substances, such as heavy metals and petroleum-based compounds, which reach receiving waters; (*b*) for consistency with the monetary tables, because the value of corresponding services (collection of urban run-off) is recorded in the economic table; and (*c*) for practical reasons, in order to measure consistently the total supply and use of water under ISIC division 37. Since urban run-off ultimately merges into the return flow from ISIC division 37 into the environment, the total return of ISIC division 37 in the supply table would include urban run-off in addition to the discharge of wastewater collected from industries and households.

3.58. Although separate estimates for urban run-off may be available in some countries, these flows generally cannot be measured directly. What can be measured is the difference between the volumes of wastewater discharged by economic units (industries and households) into sewers and the volumes of wastewater leaving the sewers with or without treatment.

3.59. **Cooling water** is defined as water which is used to absorb and remove heat. Cooling water has the potential not only to induce thermal pollution but also to emit pollutants that are collected in the water during use, for example, when water is also used for rinsing in the manufacture of basic metals.

3.60. It should be noted that in table III.3, abstraction for own use under ISIC division 36 (water collection, treatment and supply) represents part of the total abstraction for own internal use, such as the cleaning of pipes and backwashing filters. This water is then discharged into the environment and is recorded as a return flow from ISIC division 36. In the numerical example, ISIC division 36 abstracts a total of 428.7 million cubic metres of water, of which 23.0 million cubic metres are for own use and the rest is for distribution.

3.61. Returns to the environment (row 5 of table III.3) can also be further disaggregated according to the type of water use. The following categories can be distinguished:

- Hydroelectric power generation
- Irrigation water
- Mine water

- Urban run-off
- Cooling water
- Losses in distribution owing to leakages
- Treated wastewater

3.62. It can be relatively straightforward to collect information on the returns of **urban run-off** when a storm sewer system is in place and urban run-off is discharged separately from wastewater. In other cases, when the discharge of ISIC division 37 combines urban run-off with other wastewater discharges, estimates are necessary. In table III.3, the sewerage system collects 100 million cubic metres of urban run-off, 99.7 per cent of which is discharged into the environment.

3.63. In table III.3, 404.2 million cubic metres of water are abstracted from the environment by the industry ISIC division 35 (electricity, gas, steam and air conditioning supply), of which 300 million cubic metres are used for hydroelectric power generation and 100 million cubic metres for cooling purposes.

3.64. Losses in distribution, which are discussed in detail in the next section, are allocated to the water supplier. In the numerical example of table III.3, the losses in distribution owing to leakage occur in the water supply of ISIC division 36, water collection, treatment and supply.

Table III.3
Detailed physical water supply and use tables[a]

A. Physical use table (*millions of cubic metres*)		Industries (by ISIC category)							Households	Rest of the world	Total
		1-3	5-33, 41-43	35	36	37	38, 39, 45-99	Total			
From the environment	1. Total abstraction (= 1.a + 1.b = 1.i + 1.ii)	108.4	114.5	404.2	428.7	100.1	2.3	**1 158.2**	10.8		**1 169.0**
	1.a. Abstraction for own use	108.4	114.6	404.2	23.0	100.1	2.3	**752.6**	10.8		**763.4**
	Hydroelectric power generation			*300.0*				***300.0***			***300.0***
	Irrigation water	*108.4*						***108.4***			***108.4***
	Mine water							***0.0***			***0.0***
	Urban run-off					*100.0*		***100.0***			***100.0***
	Cooling water			*100.0*							
	Other		*114.6*	*4.2*	*23.0*	*0.1*	*2.3*	***144.2***	*10.8*		***155.0***
	1.b. Abstraction for distribution				405.7			**405.7**			**405.7**
	1.i. From inland water resources:	108.4	114.5	304.2	427.6	0.1	2.3	**957.1**	9.8		**966.9**
	1.i.1. Surface water	55.3	79.7	301.0	4.5	0.1	0.0	**440.6**	0.0		**440.6**
	1.i.2. Groundwater	3.1	34.8	3.2	423.1	0.0	2.3	**466.5**	9.8		**476.3**
	1.i.3. Soil water	50.0						**50.0**			**50.0**
	1.ii. Collection of precipitation					100.0	0.0	**100.0**	1.0		**101.0**
	1.iii. Abstraction from the sea			100.0	1.1			**101.1**			**101.1**
Within the economy	2. Use of water received from other economic units	50.7	85.7	3.9	0.0	427.1	51.1	**618.5**	239.5		**858.0**
	of which:										
	2.a. Reused water	*12.0*	*40.7*					***52.7***			***52.7***
	2.b. Wastewater to sewerage										
	2.c. Desalinated water										
	3. Total use of water (= 1 + 2)	**159.1**	**200.2**	**408.1**	**428.7**	**527.2**	**53.4**	**1 776.7**	**250.3**		**2 027.0**

B. Physical supply table (*millions of cubic metres*)		Industries (by ISIC category)							Households	Rest of the world	Total
		1-3	5-33, 41-43	35	36	37	38, 39, 45-99	Total			
Within the economy	4. Supply of water to other economic units	17.9	127.6	5.6	379.6	42.7	49.1	**622.5**	235.5		**858.0**
	of which:										
	4.a. Reused water		10.0			42.7		**52.7**			**52.7**
	4.b. Wastewater to sewerage	17.9	117.6	5.6	1.4		49.1	**191.6**	235.5		**427.1**
	4.c. Desalinated water				*1.0*			***1.0***			***1.0***
Into the environment	5. Total returns (= 5.a + 5.b)	65.0	29.4	400.0	47.3	483.8	0.7	**1 026.2**	4.8		**1 031.0**
	Hydroelectric power generation			*300.0*				***300.0***			***300.0***
	Irrigation water	*65.0*						***65.0***			***65.0***
	Mine water							***0.0***			***0.0***
	Urban run-off					*99.7*		***99.7***			***99.7***
	Cooling water			*100.0*							
	Losses in distribution because of leakages				*24.5*			***24.5***			***24.5***
	Treated wastewater		*10.0*			*384.1*	*0.5*	***394.6***	*1.5*		***396.1***
	Other		*19.4*	*0.0*	*22.9*		*0.2*	***42.5***	*3.3*		***45.8***
	5.a. To inland water resources (= 5.a.1 + 5.a.2 + 5.a.3)	65.0	23.5	300.0	47.3	227.5	0.7	**664.0**	4.6		**668.6**
	5.a.1. Surface water			300.0		52.5	0.2	**352.7**	0.5		**353.2**
	5.a.2. Groundwater	65.0	23.5		47.3	175.0	0.5	**311.3**	4.1		**315.4**
	5.a.3. Soil water							**0.0**			**0.0**
	5.b. To other sources (e.g., sea water)		5.9	100.0		256.3		**362.2**	0.2		**362.4**
	6. Total supply of water (= 4 + 5)	**82.9**	**157.0**	**405.6**	**426.9**	**526.5**	**49.8**	**1 648.7**	**240.3**		**1 889.0**
	7. Consumption (= 3 - 6)	**76.2**	**43.2**	**2.5**	**1.8**	**0.7**	**3.6**	**128.0**	**10.0**		**138.0**
	of which:										
	7.a. Losses in distribution not because of leakages				0.5			**0.5**			**0.5**

Source: SEEA-Water-land database.
Note: Dark grey cells indicate zero entries by definition; blank cells indicate cells which are non-zero, but small in the numerical example.
a The breakdown of water flows is shown in italics.

The remaining part of the losses in distribution, which in the table corresponds to 0.5 million cubic metres (row 7.a of table III.3), includes losses owing to evaporation and apparent losses due to illegal use and malfunctioning meters.

3.65. In addition to the breakdowns shown in table III.1, it may be useful to identify explicitly the supply of "desalinated water" (row 4.c of table III.3) for countries which rely on water desalination as a source of fresh water. It is generally under ISIC division 36 that water is desalinated and supplied within the economy. Other industries may also desalinate sea water, but often it is for their own use.

3.66. Table III.4 shows the matrix of flows associated with table III.3. This numerical example shows the origin and destination of the water flows within the economy. In particular, it can be seen that ISIC division 37, sewerage, supplies reclaimed wastewater to ISIC divisions 5-33 and 41-43, mining and quarrying, manufacturing, and construction (40.7 million cubic metres) and to ISIC divisions 1-3, agriculture, forestry and fishing (2 million cubic

Table III.4
Matrix of water flows within the economy *(millions of cubic metres)*

Supplier		Industries (by ISIC category) 1-3	5-33, 41-43	35	36	37	38, 39, 45-99	Total	Households	Rest of the world	Supply of water to other economic units *(row 4 of table III.3)*
Industries (by ISIC category)	1-3					17.9		**17.9**			17.9
	5-33, 41-43	10				117.6		**127.6**			127.6
	35					5.6		**5.6**			5.6
	36	38.7	45	3.9		1.4	51.1	**140.1**	239.5		379.6
	37	2.0	40.7			0.0		**42.7**			42.7
	38, 39, 45-99					49.1		**49.1**			49.1
	Total	**50.7**	**85.7**	**3.9**	**0.0**	**191.6**	**51.1**	**383.0**	**239.5**		**622.5**
Households							235.5		235.5		
Rest of the world											
Use of water received from other economic units (row 2 of table III.1)		50.7	50.7	85.7	3.9	0.0	427.1	**51.1**	618.5	239.5	858.0

Source: SEEA-Water-land database.

metres). In addition, agriculture, forestry and fishing also receive reused water from mining and quarrying, manufacturing, and construction (10 million cubic metres).

4. Losses in distribution

3.67. Within the economy, water supply is recorded net of losses in distribution. Losses in distribution are recorded in the tables as follows:

(*a*) The net supply plus the losses are shown in the amount abstracted from the environment by the suppliers of water (typically ISIC division 36);

(*b*) The losses are allocated to the supplier of water but are not explicitly shown in table III.1, although they are shown in the more detailed table III.3;

(*c*) Losses due to leakage are recorded in the return flows to the environment;

(*d*) Losses due to evaporation that occurs when, for example, water is distributed through open channels are recorded as water consumption because the losses do not return directly to water resources;

(*e*) Losses due to illegal tapping and meter malfunctioning are included under water consumption of the supplier of water.

3.68. A supplementary table can be constructed to show explicitly the losses in distribution. Table III.5 shows gross and net supplies of water within the economy as well as the losses in distribution. The data are obtained by reorganizing entries in the physical supply and use tables. Table III.5 enables the direct calculation of losses in distribution as a proportion of the gross water supply, thus producing an indicator of the efficiency of the distribution network.

3.69. It should be noted that losses in distribution are generally calculated as the difference between the quantity of water supplied and that received. In this case, losses in distribution include not only real losses of water (due to evaporation and leakage) but also apparent losses, which consist of unauthorized water use, such as theft or illegal use, and all the inaccuracies associated with production and customer metering.

Table III.5
Supplementary table of losses in distribution (*millions of cubic metres*)

	Industries (by ISIC category)							Households	Rest of the world	Total
	1-3	5-33, 41-43	35	36	37	38, 39, 45-99	Total			
1. (Net) supply of water to other economic units	17.9	127.6	5.6	379.6	42.7	49.1	**622.5**	235.5		**858.0**
2. Losses in distribution (= 2.a + 2.b)	0	0	0	25.0	0	0	**25.0**	0		**25.0**
2.a. Leakages	0	0	0	24.5	0	0	**24.5**	0		**24.5**
2.b. Other (e.g., evaporation, apparent losses)	0	0	0	0.5	0	0	**0.5**	0		**0.5**
3. Gross supply within the economy (= 1 + 2)	**17.9**	**127.6**	**5.6**	**404.6**	**42.7**	**49.1**	**647.5**	**235.5**		**883.0**

Source: SEEA-Water-land database.

3.70. There are cases where illegal tapping, that is, the illegal removal of water from the distribution network, is sufficiently significant in magnitude not only to affect the efficiency of the water distribution network but also, at times, to cause major problems within the network, such as enabling contaminants to enter into the mains via back-siphonage. Specific analyses may be required to determine the extent of this phenomenon.

3.71. For countries where illegal tapping is significant, it may be useful to identify the units (households or industries) responsible for illegally connecting to the distribution network, as well as the amount of water used by such units. This can easily be shown as a supplementary item in the table. This information would be very useful for policy purposes as it provides a more accurate indication of the actual level of water use by industries and households. When linked to the monetary accounts, the information could be used in formulating pricing policies.

3.72. Consistent with the 2008 SNA, where illegal tapping is not considered to be a transaction (use) in the supply and use tables, SEEA-Water does not explicitly record such activities in its standard tables.