Grant Aid Projects/Standard Indicator Reference (Water Supply)

Examples of Setting Indicators for Each Development Strategic Objective

Development strategic objectives (*1)	Mid-term objectives	Sub-targets of mid-term objectives	Types of infrastructure	Standard indicators		Policy and methods for setting indicators	Examples of project objectives (getting a clear image of the project)	Country name	Project name	FY of evaluation
2. Water supply which takes efficiency, safety and stability into account	2-3. Improving water use efficiency	Improving water use efficiency in water supply (reducing non-revenue water)	Rehabilitation of water supply facilities (Measures to control an increase in water leakage due to deterioration, etc.)	**Operation indicators**	**Basic indicators** The water supply amount (m^3/day) Service population (number of people) The non-revenue water rate (%) **Supplementary indicators** The leakage ratio (%) The water supply hours (hours/day)	● The water supply amount (m^3/day): The maximum daily water supply amount = the largest amount of water supply in a day during one year The average daily water supply amount= (the total annual water supply) ÷ (the number of days in the year) (recorded on a yearly basis) ● Service population (number of people): The population provided with water supply services (recorded on a yearly basis) ● The non-revenue water rate (%) = (the amount of non-revenue water, i.e. the amount of water which is not billed) ÷ (system input volume) × 100 ● The leakage ratio (%) = (the amount of leakage) ÷ (system input volume) × 100 (recorded on a yearly basis) ● The water supply hours (hours/day): The number of hours water was supplied per day (hours/day) is often used, but the number of hours water was supplied per week is sometimes used depending on the water supply situation. ● The daily water supply amount per capita (L/person/day): The maximum daily water supply amount per capita = (the maximum daily water supply amount) ÷ (service population) The average daily water supply amount per capita = (the average daily water supply amount) ÷ (service population) (recorded on a yearly basis)	・The objective of the project was to reduce the amount of non-revenue water and equally distribute the increased amount of water available, thereby improving water supply condition in the Tafieleh Governorate in the southern part of Jordan, by restructuring the water supply systems (including the construction of distribution reservoirs, the replacement of distribution networks, zoning distribution areas, the installation of pressure breaking facilities, the installation of distribution monitoring systems, and optimization of water transmission pumps).	Jordan	The Project for Rehabilitation and Improvement of Water Facilities in Tafieleh Governorate	2011
				Effect indicators	**Supplementary indicators** The daily water supply amount per capita (L/person/day)					
3. Sustainable supply of safe water	3-1. Securing water resources		The development of water storage and intake facilities	**Operation indicators**	**Basic indicators** The amount of water made available through development (m^3/second) The amount of water intake (m^3/second or m^3/day) **Supplementary**	● The amount of water made available through development (m^3/second): The additional amount of water intake that can be taken in from a water source without affecting the normal flow of water in a reservoir development plan ● The amount of water intake (m^3/second or m^3/day) = (the annual amount of water intake) ÷ (the number of seconds in a year or	・Water resources development lagged behind the need in the eastern part of Indonesia which had low levels of precipitation. The objective of the project was to supply domestic water to rural villages as well as to supply water for animal	Indonesia	The Reservoir (Embung) Development Project in East Nusa Tenggara	1999

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					indicators Service population (number of people)	the number of days in a year) ● Service population (number of people): The population provided with water supply services (recorded on a yearly basis) ● The daily water supply amount per capita (L/person/day): The maximum daily water supply amount per capita = (the maximum daily water supply amount) ÷ (service population) The average daily water supply amount per capita = (the average daily water supply amount) ÷ (service population) (recorded on a yearly basis)	husbandry and irrigation where possible in East Nusa Tenggara through storing the scarce water effectively , by constructing five dam reservoirs and related facilities (pipelines, irrigation channels, etc.).			
				Effect indicators	**Supplementary indicators** The daily water supply amount per capita (L/person/day)					
3. Sustainable supply of safe water	3-2. Improving access to water supply services in urban areas		The construction or expansion of water supply facilities (Facilities for storage (reservoir), intake, conveyance to water treatment plants, water treatment, transmission , and distribution)	**Operation indicators**	**Basic indicators** The water supply amount (m^3/day) Service population (number of people) The number of connection (number of connection) **Supplementary indicators** The amount of water intake (m^3/day) The water supply hours (hours/day) The capacity of the facilities (m^3/day, L/second, etc.) (the capacity of a water treatment plant, etc.)	● The water supply amount (m^3/day): The maximum daily water supply amount = the largest amount of water supplied in a day during one year The average daily water supply amount = (the total annual water supply) ÷ (the number of days in a year) (recorded on a yearly basis) ●Service population (number of people): The population provided with water supply services (recorded on a yearly basis) ● The number of connection (number of connection): The number of connection to water supply services (recorded on a yearly basis) ● The amount of water intake (m^3/day): The maximum amount of water intake = the largest amount of water intake in a day during one year The average amount of water intake = (the total annual amount of water intake) ÷ (the number of days in the year) (recorded on a yearly basis) ● The water supply hours (hours/day): The number of hours water was supplied per day (hours/day) is often used, but the number of hours water was supplied per week is sometimes used depending on the water supply situation. ● The capacity of the facilities (m^3/day, L/second, etc.): The capacity of a water treatment plant, etc.	･The objective of the project was to provide safe and stable water supply services in Abbottabad City (including Nawanshehr) in the Abbottabad District in Khyber Pakhtunkhwa and four areas around the city, by constructing gravity-fed water supply systems of surface water, and groundwater supply systems, and providing technical guidance on operation and maintenance for engineers from the implementing agency, etc. ･The objective of the project was to increase the service population in Embu and the surrounding areas by rehabilitating and constructing water supply facilities in the areas. The project aimed to improve access to safe water, by developing available water resources in Kenya, which has limited water resources.	Pakistan Kenya	The Project for the Improvement of Water Supply System in Abbottabad The Project for Improvement of the Water Supply System in Embu and the Surrounding Area	2010 2010
				Effect indicators	**Basic indicators** Water supply coverage (%) **Supplementary indicators** The daily water supply amount per capita (L/person/day) Population affected by the suspension of the					

Development strategic objectives (*1)	Mid-term objectives	Sub-targets of mid-term objectives	Types of infrastructure	Standard indicators		Policy and methods for setting indicators	Examples of project objectives (getting a clear image of the project)	Country name	Project name	FY of evaluation
					water supply (number of people) The improvement in water rationing (days/year)	● Water supply coverage (%) = (service population) ÷ (population in the area) × 100 (recorded on a yearly basis) ● The daily water supply amount per capita (L/person/day): The maximum daily water supply amount per capita = (the maximum daily water supply amount) ÷ (service population) The average daily water supply amount per capita = (the average daily water supply amount) ÷ (service population) (recorded on a yearly basis) ● Population affected by the suspension of the water supply (number of people): The population supplied with water in an area where the water supply was suspended ● The improvement in water rationing (days/year): Year-to-year comparison of the number of days subject to water rationing in a year			
3. Sustainable supply of safe water	3-2. Improving access to water supply services in urban areas		Rehabilitation of water supply facilities ((1) Measures to control a decline in the facility operating rate due to deterioration, etc.)	**Operation indicators**	**Basic indicators** The water supply amount (m^3/day) Service population (number of people) The facility utilization rate (%) **Supplementary indicators** The leakage ratio (%) The amount of water intake (m^3/day) The water supply hours (hours/day) The capacity of the facilities (m^3/day, L/second, etc.) (the capacity of a water treatment plant, etc.)	● The water supply amount (m^3/day): The maximum daily water supply amount = the largest amount of water supplied in a day during one year The average daily water supply amount= (the total annual water supply amount) ÷ (the number of days in the year) (recorded on a yearly basis) ●Service population (number of people): The population provided with water supply services (recorded on a yearly basis)● The facility utilization rate (%): The facility utilization rate (maximum) = (the maximum daily water supply amount) ÷ (the capacity of the facility) × 100 The facility utilization rate (average) = (the average daily water supply amount) ÷ (the capacity of the facility) × 100 ● The leakage ratio (%) = (the amount of leakage) ÷ (system input volume) × 100 (recorded on a yearly basis) ● The amount of water intake (m^3/day): The maximum amount of water intake = the largest amount of water intake in a day during one year The average amount of water intake = (the	・The objective of the project was to achieve the stable water supply services to the citizens of Podgorica, by renewing the facilities for water, transmission and distribution as well as introducing systems for monitoring the operation of the facilities and the water transmission & distribution ・The objective of the project was to improve the water supply situation in Ndola City, by rehabilitating and expanding the existing water supply facilities in the city.	Montenegro	The Project for Urgent Rehabilitation of Water Supply System in the Capital City Podgorica	2010
				Effect indicators	**Supplementary indicators** Water supply coverage (%) The daily water supply			Zambia	The Project for the Improvement of	2011

Development strategic objectives (*1)	Mid-term objectives	Sub-targets of mid-term objectives	Types of infrastructure	Standard indicators		Policy and methods for setting indicators	Examples of project objectives (getting a clear image of the project)	Country name	Project name	FY of evaluation
					amount per capita (L/person/day) Population affected by the suspension of the water supply (number of people) The improvement in water rationing (days/week, days/year, etc.)	total annual amount of water intake) ÷ (the number of days in the year) (recorded on a yearly basis) ● The water supply hours (hours): The number of hours water was supplied per day (hours/day) is often used, but the number of hours water was supplied per week is sometimes used depending on the water supply situation. ● The capacity of the facilities (m^3/day, L/second, etc.): The capacity of a water treatment plant, etc. ● Water supply coverage (%) = (population supplied) ÷ (population in the area) × 100 (recorded on a yearly basis) ● The daily water supply amount per capita (L/person/day): The maximum daily water supply amount per capita = (the maximum daily water supply amount) ÷ (population supplied with water) The average daily water supply amount per capita = (the average daily water supply amount) ÷ (population supplied with water) (recorded on a yearly basis) ● Population affected by the suspension of the water supply (number of people): The population supplied with water in an area where the water supply was suspended ● The improvement in water rationing (days/year): Year-to-year comparison of the number of days subject to water rationing in a year			Water Supply Condition in Ndola City	
3. Sustainable supply of safe water	3-2. Improving access to water supply services in urban areas		Rehabilitation of water supply facilities ((2) Measures to control an increase in water leakage due to deterioration, etc.) Same as 2-3 above.	**Operation indicators**	**Basic indicators** The water supply amount (m^3/day) Service population (number of people) The non-revenue water rate (%) **Supplementary indicators** The leakage ratio (%) The water supply hours (hours/day)	● The water supply amount (m^3/day): The maximum daily water supply amount = the largest amount of water supplied in a day during one year The average daily water supply amount = (the total annual water supply) ÷ (the number of days in a year) (recorded on a yearly basis) ● Service population (number of people): The population provided with water supply services (recorded on a yearly basis) ● The non-revenue water rate (%) = (the amount of non-revenue water, i.e. the amount of water which is not billed) ÷ (system input	・The objective of the project was to reduce the amount of non-revenue water and equally distribute the increased amount of water available, thereby improving water supply condition in the Tafieleh Governorate in the southern part of Jordan, by restructuring the water supply systems(including the construction of distribution reservoirs, the replacement of distribution	Jordan	The Project for Rehabilitation and Improvement of Water Facilities in Tafieleh Governorate	2011
				Effect	**Supplementary**					

Development strategic objectives (*1)	Mid-term objectives	Sub-targets of mid-term objectives	Types of infrastructure	Standard indicators		Policy and methods for setting indicators	Examples of project objectives (getting a clear image of the project)	Country name	Project name	FY of evaluation
				indicators	**indicators** The daily water supply amount per capita (L/person/day)	volume) × 100 ● The leakage ratio (%) = (the amount of leakage) ÷ (system input volume) × 100 (recorded on a yearly basis) ● The water supply hours (hours/day): The number of hours water was supplied per day (hours/day) is often used, but the number of hours water was supplied per week is sometimes used depending on the water supply situation. ● The daily water supply amount per capita (L/person/day): The maximum daily water supply per capita = (the maximum daily water supply) ÷ (population supplied with water) The average daily water supply amount per capita = (the average daily water supply amount) ÷ (population supplied with water) (recorded on a yearly basis)	networks, zoning distribution areas, the installation of pressure breaking facilities, the installation of distribution monitoring systems, and optimization of transmission pumps).			
			Rehabilitation of water supply facilities ((3) Improving the water pressure and the flow rate through the improvement of water distribution systems (the improvement of distribution efficiency)	**Operation indicators**	**Basic indicators** The inappropriate water supply pressure rate (%) The water supply amount (m^3/day) **Supplementary indicators** The non-revenue water rate (%) The leakage ratio (%) The water supply hours (hours/day)	● The inappropriate water supply pressure rate (%) = {(the number of sites where the pressure was outside the appropriate range × the number of days) ÷ (the total number of sites where the pressure was measured × the number of days in the year)} × 100 ● The water supply amount (m^3/day): The maximum daily water supply amount = the largest amount of water supplied in a day during one year The average daily water supply amount = (the total annual water supply) ÷ (the number of days in the year) (recorded on a yearly basis) ● The non-revenue water rate (%) = (the amount of non-revenue water, i.e. the amount of water which is not billed) ÷ (system input volume) × 100 ● The leakage ratio (%) = (the amount of leakage) ÷ (system input volume) × 100 (recorded on a yearly basis) ● The water supply hours (hours/day): The number of hours water was supplied per day	・The objective of the project was to reduce the amount of non-revenue water and equally distribute the increased amount of water available, thereby improving water supply condition in the Tafieleh Governorate in the southern part of Jordan, by restructuring the water supply systems (including the construction of distribution reservoirs, the replacement of distribution networks, zoning distribution areas, the installation of pressure breaking facilities, the installation of distribution monitoring systems, and optimization of transmission pumps).	Jordan	The Project for Rehabilitation and Improvement of Water Facilities in Tafieleh Governorate	2011
				Effect indicators	**Supplementary indicators** The daily water supply amount per capita (L/person/day) Population affected by the suspension of the water supply (number of people) The improvement in					

Development strategic objectives (*1)	Mid-term objectives	Sub-targets of mid-term objectives	Types of infrastructure	Standard indicators		Policy and methods for setting indicators	Examples of project objectives (getting a clear image of the project)	Country name	Project name	FY of evaluation
3. Sustainable supply of safe water	3-2. Improving access to water supply services in urban areas				water rationing (days/week, days/year, etc.)	(hours/day) is often used, but the number of hours water was supplied per week is sometimes used depending on the water supply situation. ● The daily water supply amount per capita (L/person/day): The maximum daily water supply per capita = (the maximum daily water supply) ÷ (population supplied with water) ● Population affected by the suspension of the water supply (number of people): The population supplied with water in an area where the water supply was suspended ● The improvement in water rationing (days/year): Year-to-year comparison of the number of days subject to water rationing in a year				
			Rehabilitation of water supply facilities ((4) Improving the quality of treated water)	**Effect indicators**	**Basic indicators** The quality of the treated water (the color unit (degree), the turbidity (NTU), the iron content (mg/L), the manganese content (mg/L), etc.)	● The quality of the treated water: The values for items that should be checked during water quality test Recorded on a yearly basis (or a seasonal basis, etc. if the results are expected to fluctuate depending on the season, etc.)	･The objective of the project was to improve water quality, increase the amount of water supply and improve residents' access to safe water in Concepcion and Pilar Cities, by renewing water intake facilities and constructing water treatment facilities which use the rapid filtration method suitable for treating highly turbid raw water in the cities.	Paraguay	The Project for the Improvement of Water Supply System in Concepcion and Pilar Cities	2011
			Rehabilitation of water supply facilities ((5) Improving energy efficiency (replacement of pumps, etc.))	**Operation indicators**	**Basic indicators** Pump efficiency (%) **Supplementary indicators** Electric power consumption rate (electricity consumption kWh / the pump discharge amount m^3) The water supply amount (m^3/day)	● Pump efficiency (%) = (pump output power) ÷ (pump input power) × 100 ● Electric power consumption rate (electric power consumption kWh / the pump discharge amount m^3) = (the annual electric power consumption) ÷ (the annual pump discharge amount) ● The water supply amount (m^3/day): The maximum daily water supply amount = the largest amount of water supplied in a day during one year The average daily water supply amount = (the total annual water supply) ÷ (the number of days in a year) (recorded on a yearly basis)	･ The objective of the project was to reduce CO2 emissions (as a mitigation measure) through the reduction of energy consumption related to conveying and distributing the water as well as stabilizing water supply (as an adaptation measure) in the project area of the Zarqa Governorate, by taking the following measures: procuring pumping equipment, pipe materials and equipment for	Jordan	The Project for Energy Conservation through Upgrading Water Supply Network in the Hashemite Kingdom of Jordan	2009
				Effect indicators	**Basic indicators** The reduction in operation and					

Development strategic objectives (*1)	Mid-term objectives	Sub-targets of mid-term objectives	Types of infrastructure	Standard indicators		Policy and methods for setting indicators	Examples of project objectives (getting a clear image of the project)	Country name	Project name	FY of evaluation
					maintenance costs (yen/year) **Supplementary indicators** The reduction in CO2 Emissions (tons/year) The reduction in electric power consumption (1,000 kWh/year) The reduction in electricity charges	● The reduction in operation and maintenance costs (yen/year) = (the electricity rate) × (the reduced annual electric power consumption) ＋ the reduced pump repair costs, etc. ● The reduction in CO2 emissions (tons/year) = (the CO2 emissions coefficient for electricity (ton CO2/kWh)) × (the reduced annual electric power consumption (kWh/year)) ● The reduction in electric power consumption (1,000 kWh/year) = (the actual power) × (the number of operating hours) - (the rated power) × (the number of operating hours) × (1 - the power reduction rate × the safety factor) ● The reduction in electricity charges = (the electricity charge) × (the reduced annual electric power consumption)	transmission and distribution pipelines; installing the equipment and pipes; and providing technical support for training on the operation and maintenance of the pumping facilities as well as distribution facilities.			

(*1) Development strategic objectives “1. Promoting integrated water resource management,” “4. Improving access to sanitary facilities and improving hygiene activities” and “5. Mitigating water-related disasters” were omitted because they do not apply to any grant aid projects. The mid-term objectives and the sub-targets of mid-term objectives which do not apply to grant aid projects were also omitted.