Sewage System[*1]

Operation Indicator

Regarding project target area					
Category	Name	Policy and method of establishing the indicator [*2]	Target	Purpose	Remarks
Basic	Population Treated (Persons)	Population treated = (population connected to sewage network) Yearly data	To be discussed with the executing agency	To assess if the sewage water operation is properly conducted	Values should be constantly improving when the project is effective. When the population connected to sewage network is unknown, adopt similar indicators (population served with water supply, population in the area sewage system is installed, etc.)
Basic	Amount of Wastewater Treated (m^3/Day)	As shown by the name of the indicator Yearly data	To be discussed with the executing agency	To assess if the sewage water operation is properly conducted	Values should be constantly improving when the project is effective. (Indicator covers the treatment of industrial waste water as well)
	Rate of Facility Utilization (%)	Rate of Utilization = (daily average amount of treated waste water)/ (capacity of the facility) Yearly data	40% or over at the time of starting operation	To assess if the network improvement is properly conducted	This corresponds to rate of facility operation. It is desirable to indicate 40% or over three years after starting operation.
Basic	BOD Concentration—influent, effluent, reduction rate (mg/L; assessed monthly)	As shown by the name of the indicator Monthly data (monthly average of data obtained regularly)	Reduction rate: 80 - 95%	To assess if the treatment plant is properly operated	When the treated waste water is discharged into closed waters (lakes, inland sea, etc.), substitute the indicator by COD[*3]. Reduction rate: 70 - 85%
Auxiliary	Covered Ratio of Sewer Main (%)	Covered ratio = (length of sewage pipes covered)/ (planned total length) Yearly data	40% or over at the time of starting operation	To assess if the network improvement is properly conducted	Sewer main is referred to as sewage pipe that is directly connected to a treatment plant or pumping station.
Auxiliary	Suspended Solid Concentration[*3]--influent, effluent, reduction rate (mg/L; assessed monthly)	As shown by the name of the indicator Monthly data (monthly average of data obtained regularly)	Reduction rate: 80 - 95%	To assess if the treatment plant is properly operated	
Auxiliary	Form of Sludge Disposal (each form DS[*3]-T/Year)	Amount of sludge disposal by form of disposal[*4] Yearly data	To be discussed with the executing agency	To assess effect of environment burden reduction and resource recovery	Promotion of recycling should be strongly demanded as far as possible.
Auxiliary	Rate of Sludge Recycled (%)	Rate of Sludge recycled = (amount of sludge recycled)/ (amount of sludge) Yearly data	To be discussed with the executing agency	To assess effect of environment burden reduction and resource recovery	Promotion of recycling should be strongly demanded as far as possible.

Category	Name	Policy and method of establishing the indicator *2	Target	Purpose	Remarks
Auxiliary	Rate of Service Charge Recovery (%)	Rate of service charge recovery = (recovered service charge)/ (service charge claimed) Yearly data (annual average worked out from monthly data)	80% or over	To assess if guidance and dissemination to local residents are properly carried out	Management indicator: it is desirable to improve the rate closer to 100% as far as possible.

Effect Indicator

Regarding project target area					
Category	Name	Policy and method of establishing the indicator	Target	Purpose	Remarks
Basic	Percentage of Population Served (%)	Percentage of Population Served = (population that is actually served with treatment)/ (target population of treatment service) Yearly data	In five years after starting operation, 60 - 80%	To assess if the sewage water operation is properly conducted	Indicator for the whole project plan
Basic	Improvement of Water Quality (BOD/COD)	As shown by the name of the indicator Monthly data (monthly average of data obtained regularly)	Environmental standard for water quality	To assess if sewage project is effective	When the treated waste water is discharged into closed waters (lakes, inland sea, etc.), substitute the indicator by COD[*3].
Auxiliary	Percentage of Population Connected (%)	Percentage of Population connected = (population connected to sewage network)/ (target population of treatment service) Yearly data	80% of the proportion of the population served	To assess if the network improvement is properly conducted	Indicator for the whole project plan
Auxiliary	Improvement of Irrigation Water (BOD)	As shown by the name of the indicator Monthly data (monthly average of data obtained regularly)	Standard for recycling treated waste water	To assess if sewage project is effective	
Auxiliary	Ratio of Cost Recovery (%)[*5]	Ratio of cost recovery = (Amount of service charge collected)/ (cost of treatment service) Yearly data (annual average worked out from monthly data)	To be discussed with the executing agency	To asses if sewage project is properly managed	Management indicator: it should cover at least maintenance and operation costs.
Auxiliary	Reducing Ratio of Sludge Disposal (%)[*6]	(Volume recycled)/ (volume of sludge) Yearly data (annual average worked out from monthly data)	To be discussed with the executing agency	To asses if sewage project is properly managed	
Regarding whole administrative district					
Auxiliary	Percentage of Population Served (%)[*7]	Percentage of population served = (population that is actually served with treatment)/ (population in the administrative district) Yearly data	In the target year of the plan: 50% or over	To confirm the degree of contribution of the project to the whole administrative district (residents)	Not reaching the target does not always lead to low evaluation.
Auxiliary	Percentage of Wastewater Treatment (%)	Percentage of Wastewater Treatment = (volume of wastewater treatment)/ (total volume of sludge)	In the target year of the plan: 50% or over	To confirm the degree of contribution of the project to the whole administrative district (residents and industry)	Not reaching the target does not always lead to low evaluation.

*1 Basic concept of operation indicators: indicate how well the operation of a sewage project is carried out in order to have the above mentioned effects

Basic concept of effect indicators: indicate how comfortable the daily life of community people has become (percentage of population served) and how well the water environment is conserved (water

quality improvement)

*2 “Yearly data” is referred to as the values at the end of the financial year, and “monthly data” as the values at the end of the month, and “data obtained regularly” as values obtained several times/week or daily.

*3 Densities of Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand (COD), and Suspended Solids (SS) indicate the degree of organic contamination. Dried Sludge (DS) indicates the volume of sludge that is converted to this value in the case of having 0% of moisture content.
In closed waters such as bays or lakes, the value of BOD is lower than the actual sludge volume. Accordingly it is desirable to indicate it by COD.
In a case in which the treated waste water is discharged into a general sea area, it is desirable to indicate the degree of water quality improvement by the number of coli-aerogenes group or COD measured at the adjacent seashore.

*4 Forms of final disposal after sludge treatment at a treatment plant include landfill, recycled as construction material, recycled as compost, etc.

*5 Basic cost includes operation and management cost of the treatment plants and sewage network. It should be decided through discussion with the executing agency if undistributed profits are to be included in preparation for the future. Even if self-support accounting is not attained, at least maintenance and operation cost should be paid by the service chargerecovered.

*6 Generally, sludge is disposed in landfill at a cost. Promoting recycling of sludge in green or farm land will reduce the cost.

*7 As the most popular indicator in and out of Japan is percentage of population served at the autonomous community level, this indicator is established.