<u>Eco-efficient water infrastructure practices in Japan</u>

Benchmarking approach is one of the ways to promote the eco-efficient water infrastructure in Asian countries. The thorough evaluation of good practices through benchmarking provides some of the best practices within a sector through selection of plausible indicators with a comparison of performance. This method also helps explore the advantages and disadvantages and make the best practice (ESCAP, 2007b).

A shortage of water resources and a high degree of variability are the two major challenges of water resources management in Japan. In order to overcome such challenges, the country has striven to secure water resources as much as it can via construction of a number of dams and other water storage facilities since the 1960s (World Bank, 2006). The commitment of the government to water security through construction of physical water infrastructure has been possible through an enormous amount of subsidies. Most of the construction costs of dams and other infrastructure projects in the water sector have been heavily subsidized by the central and local governments. For instance, two thirds or half of the capital costs of physical infrastructure in domestic water supply have been financially supported via subsidies (World Bank, 2006).

A series of innovative attempts to promote eco-efficiency in water infrastructure in Japan are found in the reform of non-physical water infrastructure. First, it is worth paying attention to the introduction of increasing block charges and differential charges by water pipe size. This policy measure aims to facilitate an efficient use of domestic, sewerage and industrial water. Table 1 illustrates the structure of water tariff in Japan (World Bank, 2006).

Table 1. Structure of Water Tariffs in Japan

	Fixed Charge			Variable charge		Water tariff structure
	Minimum charge		Flat charge (per surfaced area irrigated)	Increasing block charge	Constant volumetric charge	
	Differential charge (by water pipe size)	Flat charge				
Domestic water	O	X	X	O	X	Two part charged (fixed + block charge)
Sewerage water	X	O	X	O	X	Two part charge (minimum or block charge)
Industrial water	O	X	X	X	O	Two part charge (fixed + volumetric charge)
Agricultural water	X	X	O	X	X	Flat charge

Source: World Bank (2006), p11.

The second case is associated with a limited but innovative attempt to manage the agricultural water use. Under the current regime, Japanese farmers are not charged based on water meters but on the flat rate pricing scheme as seen at Table 1. But the farmers working in ‘Land Improvement District’ are allocated certain water rights which do not allow them to use more than a certain level of water. In particular, if the districts faced a drought, the farmers would be urged to use less water from rivers or canals. The recognition of water rights between the farmers in the districts can enable them to sell their water rights to urban water utilities in order to level down their water bills (World Bank, 2006).

Third, the ‘Special Purpose Tax’ system in Japan is discussed. In addition to the tax revenues from normal taxes, i.e. income and corporate tax, the Japanese government has special purpose taxes in order to channel revenues in favor of specific purposes such as the conservation of forests, which are instrumental for groundwater preservation, flood control, and reduction of CO_2 emission. One of the good examples in the special purpose tax system is the ‘Forest Conservation Tax.’ In 2002, local governments were given a mandate to draw up new special purpose taxes from the central government, and there had been 13 prefectural governments which have adopted similar laws until 2006. In general, this kind of tax does not generate a large amount of revenues, amounting to less than 1% of local tax revenues. The fundamental virtue of this tax lies in the presentation of the government’s political commitment to environmental protection and conservation activities (World Bank, 2006).

Fourth, the development of Performance Indicators (PIs) in water services in Japan is referred to as the evidence of the Japanese effort to introduce eco-efficiency in water infrastructure. This work has been conducted as part of the Japanese response to the establishment of the International Organization for Standardization /Technical Committee (ISO/TC) 224 on service activities relating to drinking water supply and sewerage. Regarding drinking water supply and sewerage services, a set of ISO standards (ISO 24510, ISO 24511, ISO 24512) have been discussed in order to assess the level of various services in the water sector with internationally recognized standards. The standards encompasses Performance Indicators (PIs) as an appendix to show the performance of waterworks services.

The establishment of the ISO/TC 224 was initiated by France in 2001, and Japan had continued to create its own guidelines and submitted them with 137 items to the ISO/TC 224 in January 2005. The guidelines are called, ‘The Guidelines for Waterworks (JWWA Q100)’, which includes performance indicators (PIs) in the Japanese context. The Japanese PIs are useful helping 1) understanding the current status and changes of their own utilities; 2) conducting comparative analyses with other waterworks and illustrating the future direction of performance enhancement; 3) achieving efficiency in operations; and 4) improving management skills (Matsui, 2007).