

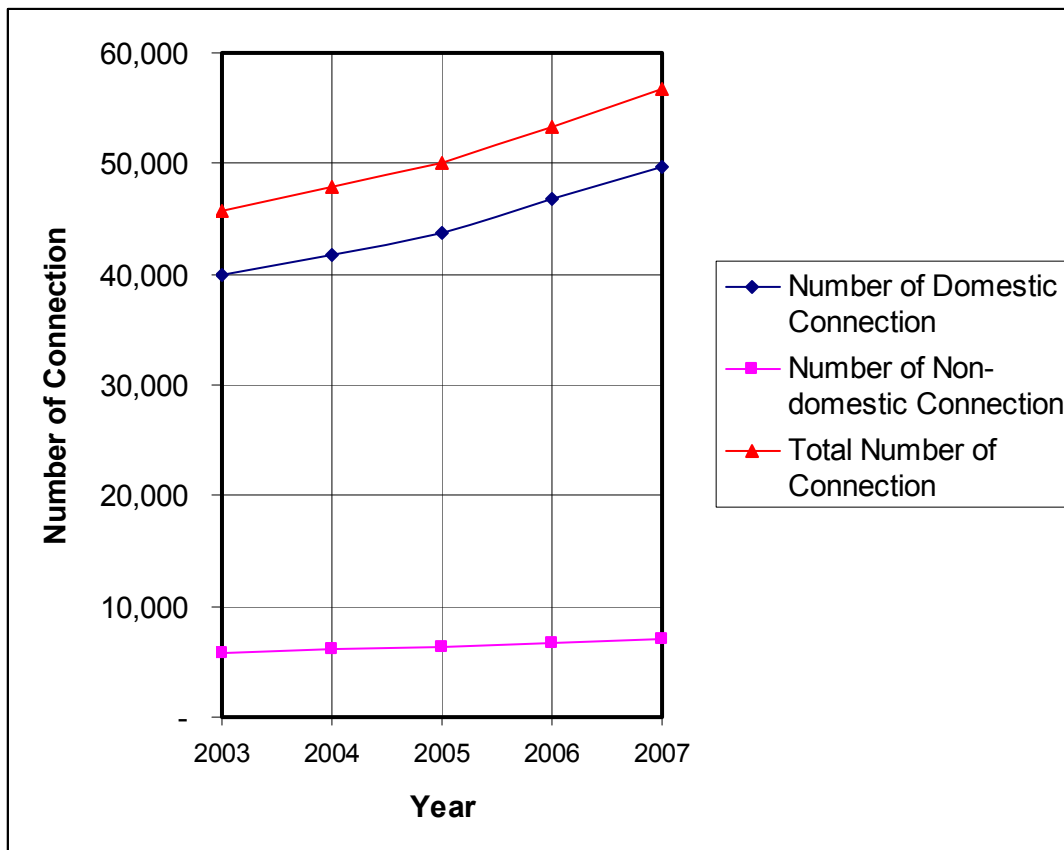
### 2.2.4 Number of Connections

The number of domestic and non-domestic connections will increase year by year as shown in Table 22-2 and Figure 22-2. The number of domestic connections will increase more rapidly than non-domestic connections and it is estimated that the number of domestic connections will reach about 50,000 connections by 2007.

**Table 22-2 Number of Domestic/Non-Domestic Connections**

	Unit	2003	2004	2005	2006	2007
Number of Domestic Connection	Nos.	39,928	41,835	43,741	46,747	49,754
Number of Non-domestic Connection	No.	5,842	6,091	6,340	6,650	6,959
Total Number of Connection	Nos.	45,770	47,925	50,081	53,397	56,713

**Figure 22-3 Number of Domestic/Non-Domestic Connections**



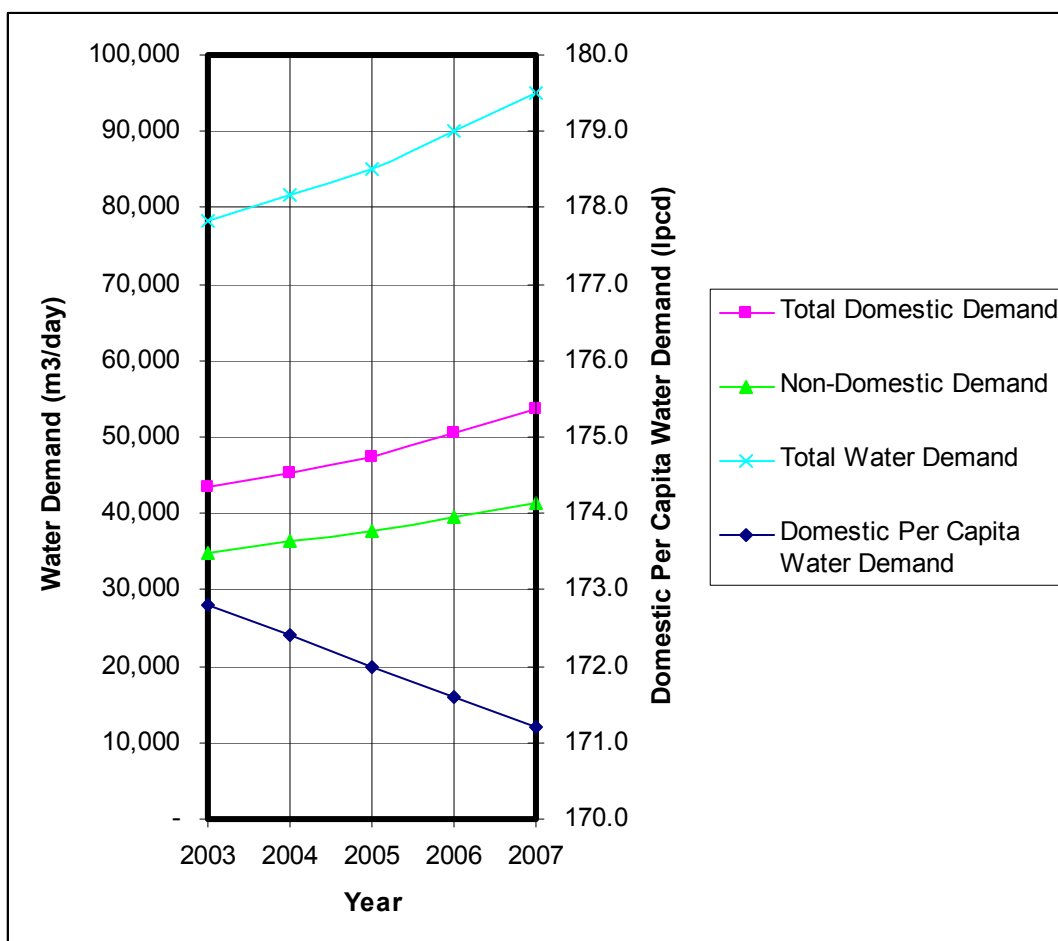
### 2.2.5 Water Demand

In the Master Plan, future water demands were forecast as shown in Table 22-3 and Figure 22-4. It is estimated that by 2007, the total net water demand will increase to 95,000 m<sup>3</sup>/day. It should be noted that the domestic per capita water demand is planned to decrease from 173 lpcd in year 2003 to 171 lpcd in year 2007. Domestic water demand in each village which will be included in the service area is shown in Annex 24.

**Table 22-3 Future Water Demand**

	Unit	2003	2004	2005	2006	2007
Domestic Per Capita Water Demand	lpcd	173	172	172	172	171
Domestic Demand	m <sup>3</sup> /day	43,439	45,418	47,398	50,507	53,617
Non-Domestic Demand	m <sup>3</sup> /day	34,812	36,296	37,780	39,626	41,472
Total Water Demand	m <sup>3</sup> /day	78,251	81,714	85,177	90,133	95,089

**Figure 22-4 Future Water Demand**

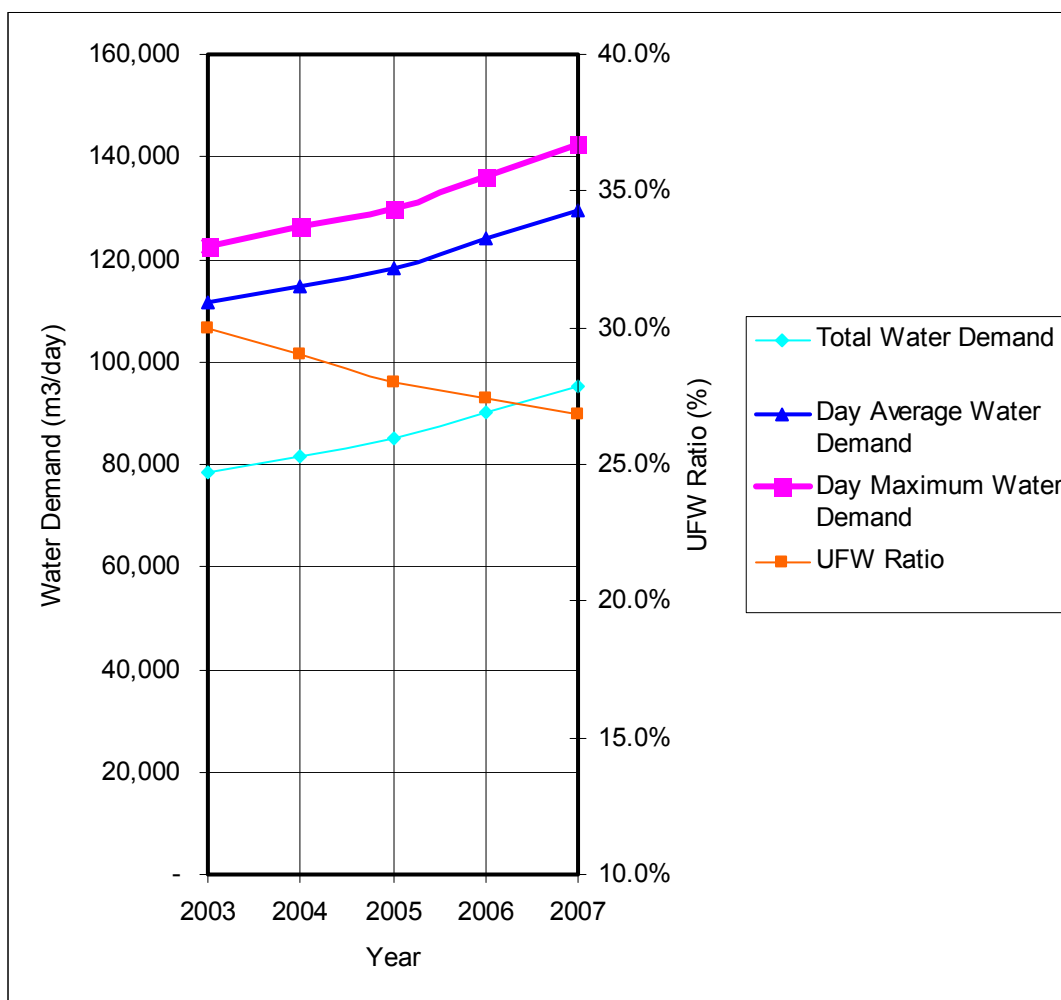


Based on the net water demand, the daily average water demand was calculated based on the estimated UFW ratio. The definition of unaccounted-for water (UFW) is difference between distributed water quantity and metered water quantity at customers' connections. Therefore, water quantity equivalent to unpaid water bill, is not included in the UFW. The daily maximum water demand was calculated from the daily average water demand and the peak factor, as shown in Table 22-4 and Figure 22-5.

**Table 22-4 Day Average and Day Maximum Water Demand**

	Unit	2003	2004	2005	2006	2007
Total Net Water Demand	m3/day	78,251	81,714	85,177	90,133	95,089
UFW Ratio	%	30.0%	29.0%	28.0%	27.4%	26.8%
Daily Average Water Demand	m3/day	111,496	114,899	118,302	123,963	129,625
Daily Maximum Water Demand	m3/day	122,645	126,389	130,132	136,360	142,587

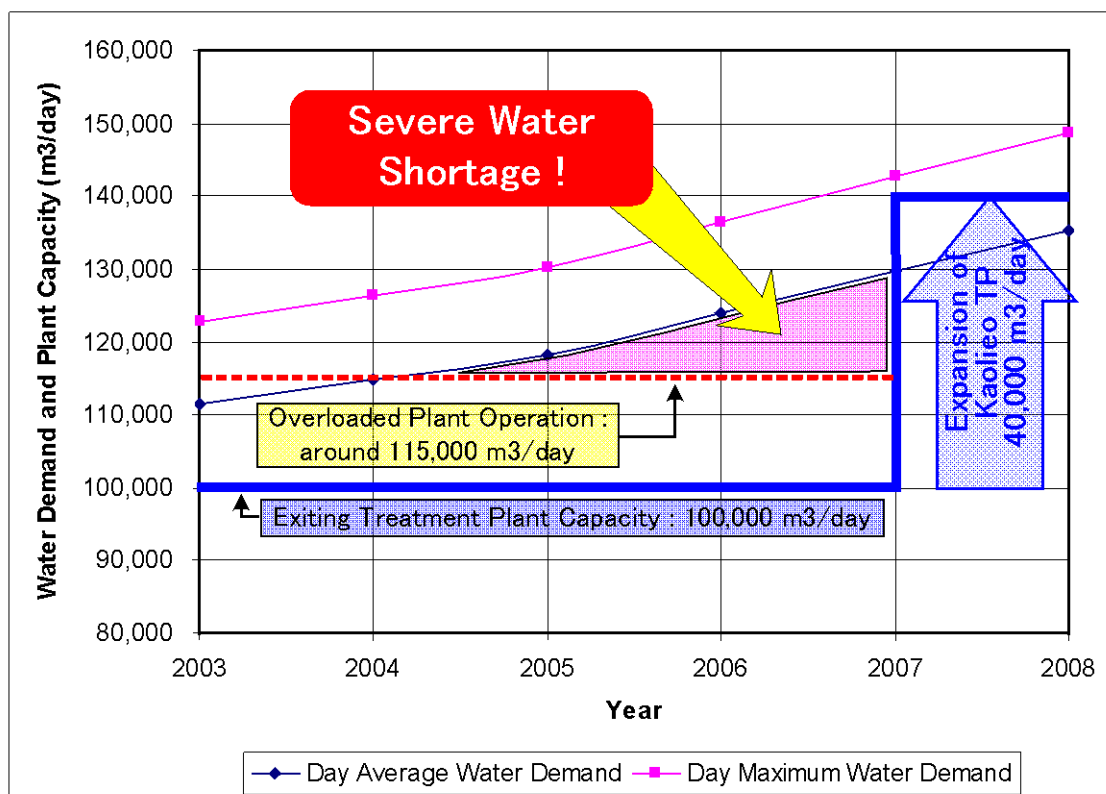
**Figure 22-5 Day Average and Day Maximum Water Demand**



Based on the water demand forecast, the priority projects were planned. To meet the future daily maximum water demand in 2007, it was planned to expand the existing Kaolieo Treatment Plant to have an additional capacity of 40,000 m<sup>3</sup>/day, bringing the total supply capacity to 140,000 m<sup>3</sup>/day, upon completion of the priority projects as shown in Figure 22-6.

As shown in this figure, it is apparent that the existing supply capacity, 100,000 m<sup>3</sup>/day, is far smaller than the day maximum water demand. Given this situation, the NPVC is operating the two existing treatment plants in an overloaded condition. According to past operation records, about 115,000 m<sup>3</sup>/day was distributed through the network, even though their design capacity is 100,000 m<sup>3</sup>/day. In this over loaded operation, the NPVC operates stand-by pumps continuously and in the event of pump breakdown, or a similar emergency, it will cause sudden termination of the plant operation since it does not have any stand-by pumps.

**Figure 22-6 Water Demand and Supply Capacity**



Although the overloaded operation is not recommended, a supply capacity of 115,000 m<sup>3</sup>/day will barely meet the day average water demand. It can be seen in the above figure that water will not be available during peak demand days in the dry season by 2004. It is also expected that the water

supply situation will further deteriorate after 2004. The supply capacity can not meet even the day average water demand and severe water shortages will occur. In 2007, it is calculated that there will be a shortfall of about 15,000 m<sup>3</sup>/day (day average basis).

To relieve or mitigate the water shortage situation in the very near future, it is strongly recommended to reduce the unaccounted-for water ratio (UFW), and initiate the promotion of water conservation and water demand management, as discussed in the following chapters.