CHAPTER 1

INTRODUCTION

WATER DEMAND

- Estimation of the future population
- Future average daily consumption per capita

WATER REQUIREMENT

The sum of

- Domestic consumption
- Public use
- Commercial and industrial needs
- Leakages and wastes

FACTORS AFFECTING WATER USE

They depend on

- Size of the community (population)
- Presence of industries
- Quality of water (color, odor, etc↗, use ↘)
- Cost of water (cost ↗, use ↘)
- Pressure (pressure ↗, use ↗, leaks ↗)
- The climate (hot → use ↗, sometimes cold → use ↗)
- Characteristics of the population
- Whether supplies are metered
- Efficiency of the system (sewer, distribution)

VARIATION AT WATER CONSUMPTION

Values given in Table 2.2 are average consumption rates which are not sufficient for the design of water systems. Water consumption varies hourly, daily, weekly, monthly and yearly.

To evaluate variations in demand, pumping records of the pumping station is needed.

The pattern of the hourly fluctuation depends on the population and habits of the people.

In smaller communities, variation is large whereas in bigger communities, water demand is closer to the average.

DESIGN PERIOD

Life of the system and its components depends on

1. The useful and economic life of the structures and equipments.
2. Initial capital, operation and maintenance cost.
3. The availability of capital.
4. The availability of the expected water consumption at the end of design period.
5. The ease or difficulty of extending the plant or increasing its existing capacity.
6. The expected rate of growth of the population.
7. Rate of inflation, the change in the purchasing power of money during design period.
8. Performance of the works during early years.

Design period is long, if:

- Extensions are difficult
- Rate of growth is small
- Interest rate is small
- Inflation is high
- Early performance is satisfactory