

Chapter 12

IRRIGATION

12.1. Irrigation Projects in India are classified into three categories viz. Major, Medium and Minor Irrigation. Projects which have a Cultivable Command Area (CCA) of more than 10,000 hector are termed as Major Projects, those Irrigation Projects which have a CCA of less than 10,000 hector but more than 2,000 hector are termed as Medium projects and those Irrigation Projects which have a CCA of 2,000 hector or less are known as Minor projects. A broad assessment of the area that can be ultimately brought under irrigation, both by surface and ground water, made by the various States in sixties has indicated that ultimate irrigation potential of the country would be of the order of 113m.ha (million hectare). However, the ultimate potential is 139 m.ha, the increase being primarily due to upward revision in assessed potential of minor ground water schemes and minor surface water schemes to 64 m.ha. and 17m.ha. respectively. Minor irrigation projects have both surface and ground water as their source, while Major and Medium projects mostly exploit surface water resources.

12.2. Type of Irrigation Technique: Various types of irrigation techniques differ in how the water obtained from the source is distributed within the field. In general, the goal is to supply the entire field uniformly with water, so that each plant has the amount of water it needs, neither too much nor too little. The various irrigation techniques are as under:

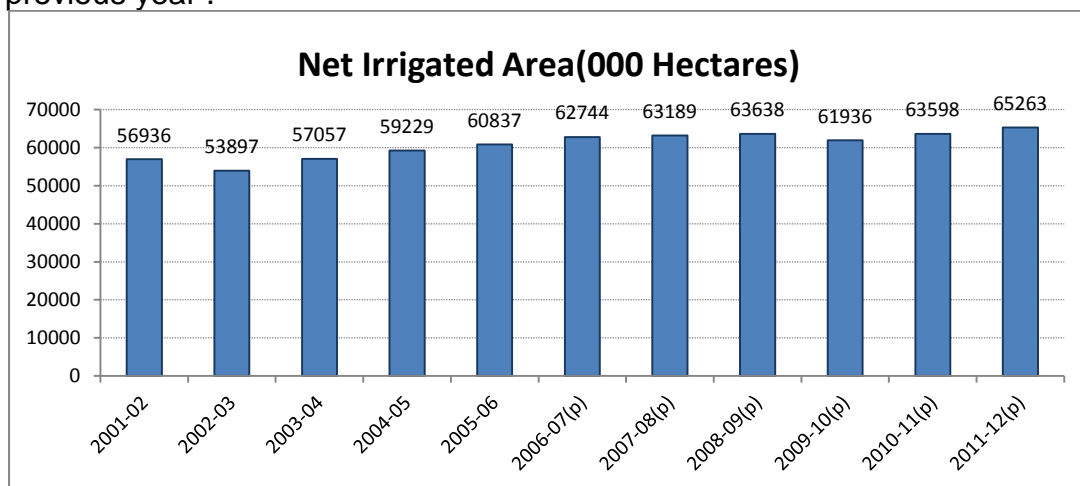
- **Surface Irrigation:** In surface irrigation systems, water moves over and across the land by simple gravity flow in order to wet it and to infiltrate into the soil. Surface irrigation can be subdivided into furrow, border strip or basin irrigation. It is often called flood irrigation when the irrigation results in flooding or near flooding of the cultivated land.
- **Localized Irrigation:** Localized irrigation is a system where water is distributed under low pressure through a piped network, in a pre-determined pattern, and applied as a small discharge to each plant or adjacent to it. Drip irrigation, spray or micro-sprinkler irrigation and bubbler irrigation belong to this category of irrigation methods.
- **Drip Irrigation:** Drip irrigation, also known as **trickle irrigation**, functions as its name suggests. Water is delivered at or near the root zone of plants, drop by drop. This method can be the most water-efficient method of irrigation, if managed properly, since evaporation and runoff are minimized. In modern agriculture, drip irrigation is often combined with plastic mulch, further reducing evaporation, and is also the means of delivery of fertilizer.

- **Sprinkler Irrigation:** In sprinkler or overhead irrigation, water is piped to one or more central locations within the field and distributed by overhead high-pressure sprinklers or guns. A system utilizing sprinklers, sprays, or guns mounted overhead on permanently installed

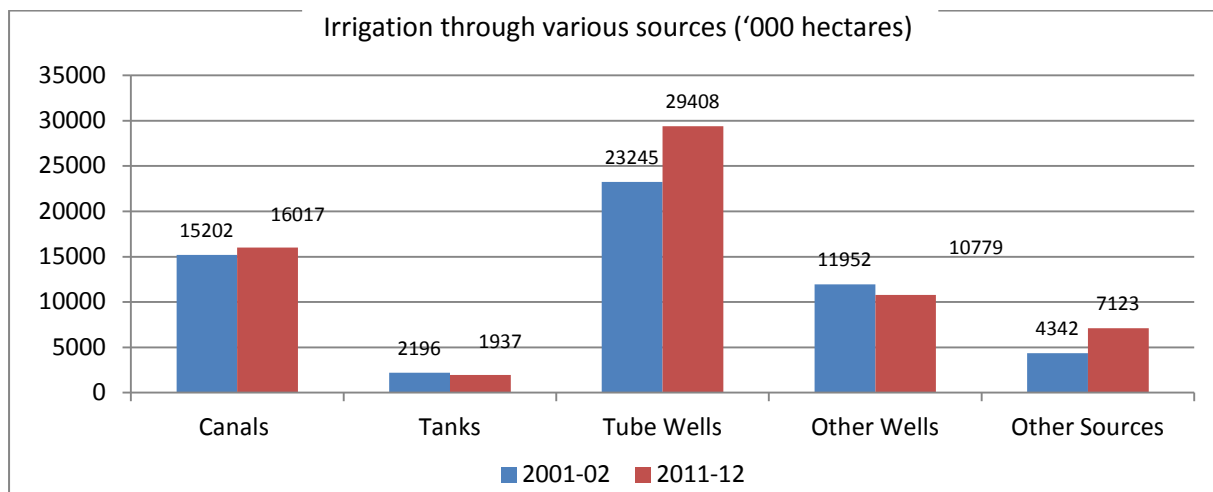
risers is often referred to as a solid-set irrigation system. Higher pressure sprinklers that rotate are called rotors and are driven by a ball drive, gear drive, or impact mechanism. Guns are used not only for irrigation, but also for industrial applications such as dust suppression and logging. Sprinklers can also be mounted on moving platforms connected to the water source by a hose. Automatically moving wheeled systems known as traveling sprinklers may irrigate areas such as small farms, sports fields, parks, pastures, and cemeteries unattended.

- **Sub-irrigation:** Sub-irrigation also sometimes called seepage irrigation has been used for many years in field crops in areas with high water tables. It is a method of artificially raising the water table to allow the soil to be moistened from below the plants' root zone. Often those systems are located on permanent grasslands in lowlands or river valleys and combined with drainage infrastructure. A system of pumping stations, canals, weirs and gates allows it to increase or decrease the water level in a network of ditches and thereby control the water table. Sub-irrigation is also used in commercial greenhouse production, usually for potted plants. Water is delivered from below, absorbed upwards, and the excess collected for recycling.

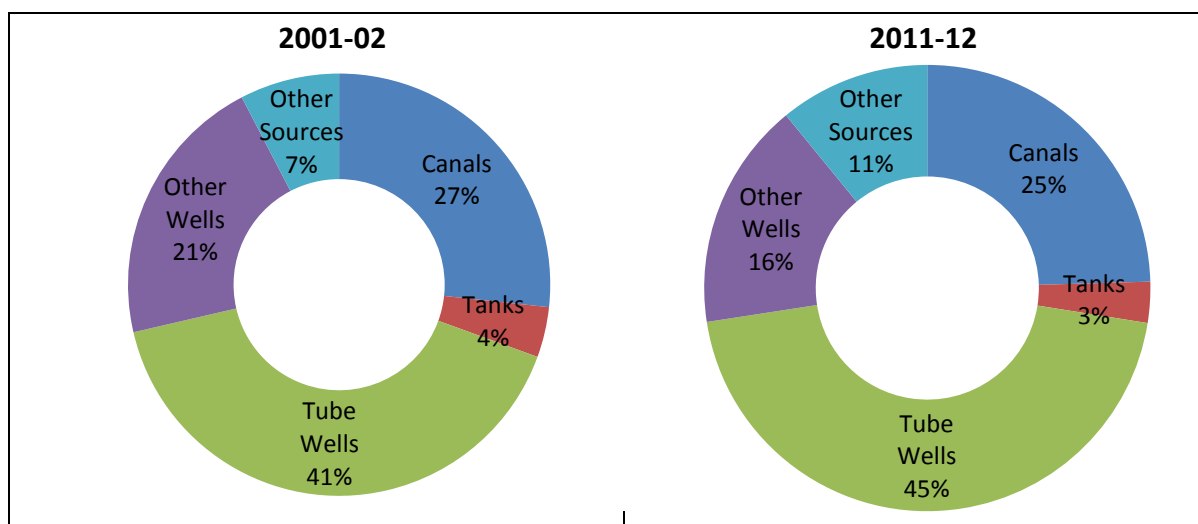
12.3 Net Irrigated Area : The net area under irrigation by all sources of irrigation increased from 56.9 million hectares in 2001-02 to 65.3 million hectares in 2011-12, indicating 15% increase over the decade. Net area under irrigation has shown an increasing trend except for 2009-10 when it dropped by about 3 % compared to the previous year .



12.4 Sources of Irrigation: Various sources of irrigation in India are canals, tanks, tube wells and other wells with tube wells and canals accounting for about 70 % of total irrigation. Compared to 2001-02, irrigation through both canals and tube wells has shown an increasing trend whereas that through tanks and other wells has shown a decline. Even in the case of irrigation through canals and tube wells, while irrigation through tube wells has increased by about 27 % since 2001-02 that through canals has increased only marginally (about 5%). Private canals comprise a meager 1 % share as most of the canals are government owned.



Irrigation Through Various Sources – A Comparison



12.5 Southern States of Tamil Nadu, Andhra & Karnataka accounted for about 65-70 percent of total irrigation through tanks. Also canal irrigation, in the southern states (combined including Kerala), accounts for marginally greater share compared to tube wells irrigation whereas in northern states of Punjab, Rajasthan, Bihar, UP

etc share of tube wells in irrigation is significantly higher. In fact, out of the area irrigated through tube wells throughout India, Uttar Pradesh alone accounted for one third of the total irrigated area.

12.6 Irrigated Area Under Crops (2011-12) : There has been about 17 % increase in total gross area under irrigation since 2001-02 with about 92 million hectares being reached in 2011-12 compared to about 78 million hectares in 2001-02. Food crops accounted for about 82 % of gross irrigated area under all crops. Amongst the 18% gross irrigated area under non food crops, oilseeds, cotton and fodder crops accounted for 8 %, 5 % and 3 % respectively. Out of the food crops, wheat and rice taken together accounted for about 71 % of gross irrigated area and about 59 % share of irrigation amongst total irrigated area under all crops (both food and non food).Out of the 59 % wheat had marginally more area under irrigation (at about 31%).

