

over a period of time. Due to diversion in the river's flow, estuaries are also affected because less fresh water enters and flushes the estuary. Consequently salt concentration increases profoundly *affecting the estuary's ecology.*

#### 4.4.3 Consequences due to the Depletion of Groundwater

If the groundwater withdrawals exceed its recharge, the **water table falls**. When the water table falls, the springs and seeps start drying up and even the stream and the rivers are affected. Thus **surface water diminishes** and this creates the same results as the diversion of surface water. Over the ages, groundwater has leached cavities in the ground. The water fills these spaces and helps support the overlying rock and soil. Due to fall in water table this support is lost and there may be a gradual settling of the land, known as **land subsidence**.

Land subsidence may cause building foundations, roadways, and water and sewer lines to crack. In coastal areas this phenomenon may cause flooding.

Another problem resulting from dropping water tables is **saltwater intrusion**. In the coastal areas, the springs of overflowing groundwater may lie under the ocean. As long as a high water table is maintained a sufficient head of pressure is available in aquifer and freshwater will flow into the ocean. Thus wells in the coastal areas have fresh water. Lowering of water table at a rapid rate reduces pressure in the aquifer and thus permitting salt water to flow into the aquifer and hence into wells.

#### 4.4.4 Water Conservation and Management

Water resources can serve more people by wise use and good management. Every human being has the responsibility to conserve water used in the various activities. Several approaches to conserve and manage the water resources are:

- **Avoid Polluting**—Pollution makes water unfit for use. Renewing takes time and nature may not be able to renew it if the pollution is bad. Properly dispose off oil so it does not get into water. Use pesticides sparingly and donot use excess of detergents and soap.
- **Dispose off properly**—Proper disposal of wastewater helps protect natural supplies. Wastewater can be partially renewed in treatment plant facilities.
- **Install conservation practices**—Many approaches can be used to conserve water supplies and quality. Approaches that conserve soil also conserve water. Terraces, ponds, and mulches can be used to reduce water runoff. Factories can seek more efficient ways of using water.
- **Have good equipment**—Pipes, pumps, and other facilities should be free of leaks. Leaky equipment wastes water. It also costs more to operate a leaky system because more water must be pumped just to have enough to do what is needed. More energy is needed to power the pumps.
- **Reuse**—Water used for one purpose can often be used for other purposes before it is released. The additional uses may help clean



the water. An example is using wastewater to raise fish and grow non edible plants. Both activities remove nutrients in wastewater from food manufacturing operations.

- **Renew used water**—Renewing wastewater is helping nature do its job. It may involve filtering to remove solid materials. In holding reservoirs, it might include promoting the growth of microbes so processes occur, such as the nitrogen cycle.
- **Efficient use of water**—Everyone can make better use of water by consuming a little less water for the daily chores.

### Water Harvesting for Conservation

In India, from the ancient times there exists an extraordinary tradition of water-harvesting system. People have in-depth knowledge of rainfall regimes and soil types and thus have developed various techniques to harvest rain water, ground water, river water and flood water in keeping with the local ecological conditions and their water needs. In hills and mountainous regions, people build **diversion channels** like the 'kuls' of the Western Himalayas for agriculture. **Roof top rain water harvesting** is commonly practiced to store drinking water in Rajasthan. Huge underground tanks are built inside the main house or courtyard and are connected to the sloping roofs of the houses through a pipe. Rain water falling on the rooftops flows down into the tanks through the pipes. This technique is being intensively used in villages of Kerala and Karnataka. In Meghalaya, a very old system of tapping stream and spring water by using bamboo pipes which is known as **Bamboo drip irrigation system** is prevalent. About twenty liters of water enters the bamboo pipe system and gets transported over hundreds of meters and finally reduces to forty to fifty drops per minute at the site of irrigation.

#### 4.4.5 Floods

Flood is a general or temporary condition of partial or complete inundation of normally dry land areas from overflow of inland or tidal waters or from the unusual and rapid accumulation or runoff of surface waters from any source. **Flooding and flash flooding are the deadliest of natural disasters.** Floodwaters claim thousands of lives every year and render millions homeless. One of the more frightening things about flooding is that it can occur nearly anywhere, at any time. It can result from excess water jams on rivers, even moderate rain, or a single very heavy downpour.

Heavy downpour in the form of rain brings down more water than can be disposed off by combined factors natural and man-made systems causing flooding. The rivers overflow embankments may be breached. Generally rains following storm and hurricane are heavy and bring unmanageable amount of water causing floods.

In India, floods bring much havoc causing loss of life and property each year. Due to flood, the plains become silted with mud and sand, thus affecting the cultivable land areas. The worst suffering states are Assam, Bihar, Orissa, U.P. and West Bengal.