and their contents moved up to higher floors in time of flood and that the construction materials are able to withstand immersion without damage. Wet floodproofed buildings must be able to withstand the drag and scour effects of the flood waters, just the same as dry floodproofed buildings.

Floodproofing is sometimes regarded as a "poor man's solution" to flood problems in that it provides a low level of protection when more satisfactory solutions are not available. It can, nevertheless, be valuable in this role. It is also valuable when normal flood defences fail either because the flood exceeds the design level or because the defences have not been properly maintained. It is for this reason that some authorities require all properties in the flood plain, even those behind a dyke, to be floodproofed. The infrastructure systems such as the electricity and water supplies, the telephone system and the sewer system must always be floodproofed. Modern society is so dependent on these systems that they must be designed and built to resist floods.

Soil and water conservation

As noted previously, most human changes in a catchment tend to reduce infiltration and increase runoff and erosion. The aim of soil and water conservation is to reverse this tendency and to preserve soil and water resources by good land-use practices, which also help reduce floods. Overland flow, resulting from poor infiltration, gives rise to rapid increases in river flows (i.e. floods) and to soil erosion. Good land-use practices enhance infiltration, which reduces overland flow and erosion and by delaying the movement of water to the stream reduces flood peaks. The infiltrated water will appear in the stream much later, increasing dry weather flow so that more water is available when it is needed. The diagram, figure 5.1, summarizes the methods used.

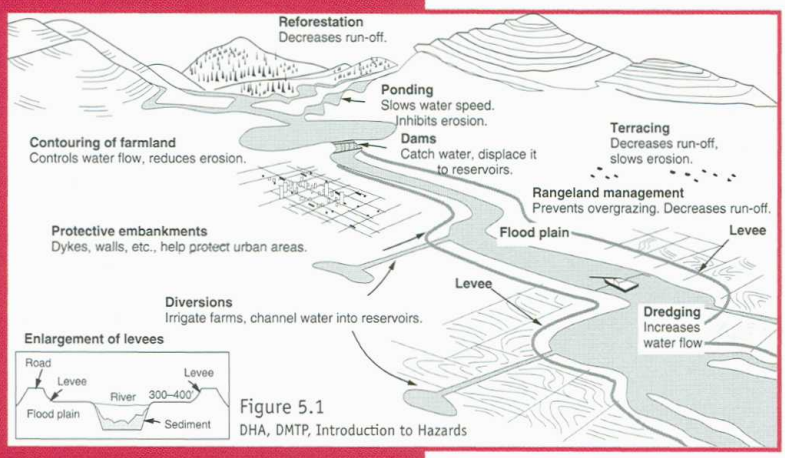

Figure 5.1
DHA, DMTP, Introduction to Hazards

Reforestation decreases runoff and stabilizes soils. In many cases, excessive deforestation has produced bare soils, extremely prone to erosion, with poor absorptive capacity and that are often of little value for agriculture. Replanting the forest is a long-term measure, requiring some decades to become fully effective. Existing forests need careful management if they are to continue to provide protection. Over-mature forests need to be rejuvenated by planting new trees. Herbivorous animals, such as deer, need to be controlled to protect the forest. Cattle grazing in forest pastures can be even more damaging than deer because they eat much more. Grazing therefore needs to be carefully controlled. For commercial reasons, large areas are often planted with a single, fast-growing species of tree. These monocultures are especially at risk from disease, so a healthy mix of species is needed in any forest.

Reforestation is not always possible and when the land is used for agriculture or grazing, sensitive land-use practices need to be applied. Steeper land has to be terraced. This not only provides flat areas for growing crops, but also makes more water infiltrate, reducing floods and adding to water resources. Where terracing is not possible, techniques such as contour ploughing must be used. If the plough furrows run downhill, they provide a ready path for water, leading to increased