

URBANISATION

Urbanisation is a major cause of flooding and reduction of the lag time of the hydrograph. It destroys the vegetation and covers the surface of the earth with bricks concrete and tarmac. This prevents infiltration and increases overland flow, taking the water rapidly to any nearby streams and rivers. Water is also quickly transported to gutters and drains which move water quickly to river systems raising the peak of the hydrograph.

DEFORESTATION

When the vegetation is cleared from the landscape interception no longer occurs. This allows precipitation to immediately reach the surface making it more likely that the infiltration capacity will be exceeded by the rainfall intensity, leading to overland flow which rapidly moves water to streams. The lack of trees also cuts down on interception loss, when water held on leaves is evaporated and never reaches the ground, and transpiration from leaves. Water reaches the river more quickly to give a 'flashy' hydrograph.

AFFORESTATION

Planting of trees has the opposite effect to deforestation. Interception, interception loss and evapotranspiration are all increased meaning that less water reaches the surface and overland flow is reduced. This increases the lag time, lowers the peak of the hydrograph and makes floods

ECOSYSTEM CONSERVATION

The protection and conservation of ecosystems is particularly important in areas such as Tropical rain forests and semi-arid and Mediterranean scrublands. National Parks and National Forests may be set up to protect the ecosystems, habitats, flora and fauna. The Angeles National Forest and the San Dimas Forest Experiment are examples in southern California where vegetation is preserved helping prevent flooding.

HUMAN FACTORS AFFECTING DISCHARGE AND THE STORM/FLOOD HYDROGRAPH INTENTIONAL / UNINTENTIONAL

FIRES

Forest fires can be caused naturally by lightning or by inappropriate human activity. The result is a destruction of the natural vegetation, and increased overland flow and surface erosion. Both of these will raise the hydrograph and reduce the lag time, increasing the chance of flooding. This whole process can be prevented by fire watches and efficient fire fighting which reduce the impact of fires. Regulations may also be put in place to restrict access to fragile areas in the dry season when fires are likely.

DEBRIS DAMS

High levels of discharge in a river can cause a great deal of erosion. This eroded sediment makes the channel downstream far less efficient, slows the flow of water down and makes flooding more common. Debris dams allow the water to pass, but hold any sediment, thus preventing the material from affecting downstream channels. Any debris collected during the wet season is removed mechanically during the dry season, ready for the next years floods.

SPREADING GROUNDS

Spreading grounds are constructed behind low earth dams. During a storm and flood water is held behind the dams and spreads out onto the land behind. This water will gradually percolate into the local aquifer which may aid water supply. This water is prevented from entering the river downstream, lowering the hydrograph. During the dry season the land behind the dam can be used for recreational purposes.

HOLDING DAMS

Holding dams create reservoirs of water. This water can be used for supplying towns and cities, for generating Hydro Electric Power and for recreation. Another major benefit of dams and reservoirs is that by holding the water back they lower the peak of the storm hydrograph and make flooding less likely. Of course if there is a dam failure catastrophic floods can occur.

INTENSIFICATION OF FARMING

The intensification of arable farming usually involves the use of more machines. More mechanisation compacts the ground. Intensification of pastoral farming usually involves an increase in the numbers of beasts per hectare which also compacts the ground. Compaction of the ground squashes grains together reducing the permeability of the surface layers. If infiltration is slower overland flow is more likely giving a 'flashy' hydrograph and a greater chance of floods.