

The impact of flood control measures on river processes | Sample answer

2017 Q 1. C

The impact of flood control measures on river processes

The human activity of constructing dams as a flood control measure interferes with the river's ability to carry its load to sea and consequently, negatively affects the river processes of transportation, erosion and deposition.

The Three Gorge Dam built on the river Yangtze in China is the world's largest dam with a height of 181 metres and a length of 2335 metres. It was built to stop and use the flow of water while preventing flooding. In 1931, 250,000 people were killed when the Yangtze and Whang ho river flooded. Over the last hundred years, one million people have lost their lives from the Yangtze flooding. By building a dam you are creating an artificial lake behind the dam known as a reservoir. The Three Gorges reservoir is 5600 kilometres long. However, along with the trapped water behind the dam is also the river's load. Therefore, the river process of transportation is affected. As the sediments accumulate, they are removed by dredging, the cleaning of the river bed by scooping out built up sand and mud particles to maintain the efficiency of the turbines. The removed sediments will never make it downstream to be deposited as fertile alluvial soil, as a result this has greatly affected the quality of the farming that lies downstream on the floodplains of the Yangtze river.

On the plus side, the reservoir's flood captivity is 22,000 cubic kilometres, reducing major downstream flooding to once every 100 years to once every 10. The water that passes through the penstocks and turns the turbines generates 22,500 megawatts of energy a year. The water that passes through the penstocks is under greater pressure and has a higher velocity than before entering through the dam. It therefore erodes in the old age stage when it is meant to be depositing. The delta region is now being rapidly eroded at the East China Sea and the freshwater ecosystem has been destroyed. There is also reduced water passing through the dam that results

in a lower volume of water at the river mouth which has caused the white river dolphin to become extinct.

Delta erosion on the river Nile to Aswan Dam in Egypt has lead to the costly replacement of delta material,as the city is built on the delta. However, the water of the reservoir can be used to irrigate the land and has lead to increased food production.