

What issues can arise from the development of river basins?

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The pressure to develop river basins can make them increasingly vulnerable to flooding.

The study of a river basin or basins, including practical research and out-of-classroom work – fieldwork, to illustrate:

- why some river basins are naturally vulnerable to flooding;
- how development can increase the risk of flooding;
- the social, economic and environmental impacts of flooding.

Factors promoting flooding

- Seasonal snow melt
- Prolonged heavy rain
- Areas of intense convectional rainfall
- Basins with large areas of impermeable surfaces due to urbanisation and industrial development
- Areas where the natural vegetation has been replaced
- Steep slopes which lead to rapid overland flow
- Small basins in which run-off is rapid

How development can increased the risk of flooding

- Deforestation (reduces interception)
- Urbanisation (increases impermeable surfaces)
- Poor management

River Severn 2007

- Intense rainfall over several days in June/July 2007 due to the unusual position of the floodstream
- Some areas received a month's rainfall in a day or even an hour
- Water overwhelmed drains

Economic Impacts

- Average cost of flooding was £23,000 to £30,000 per flooded home but a quarter of householders were not covered by insurance.
- The average cost incurred per flooded business was between **£75,000 and £112,000**, with 95 per cent of companies covered by insurance.
- The flooding of Mythe water treatment works in Tewkesbury created one of the **UK's worst post-World War II emergencies**, leading to the loss of piped water supply to 350,000 customers in over 138,000 properties in the Gloucester area from 22 July 2007 for over two weeks.

Social impacts

- 13 people died
- 350,000 people were without water for up to 16 days
- 150,000 properties lost electricity for an average of 15 hours
- Seven motorways were shut, including the M5 which left 10,000 vehicles stranded overnight
- 70% of people surveyed said their health had been affected

Bangladesh

Natural Causes

- Confluence of three rivers: Ganges, Brahmaputra, Meghna
- Half country is less than 5m above sea level
- Monsoon
- Also subject to coastal flooding
- Snow melt from Himalayas

Human causes

- Deforestation in Himalayan uplands
- River diversion for irrigation
- Corruption
- Lack of international investment
- Fresh water wells
- International loans
- Overseas pressure
- Inadequate overseas aid

Impacts of 1998 floods

Economic	Social	Environmental
<ul style="list-style-type: none">• Income of two of the largest industries, textiles and shrimping, were 20% below their normal earnings• 400 textile factories forced to close, leaving 166000 workers jobless• Over 11,000km road damaged and communications were destroyed• 130,000 cattle killed• 660,000ha crops badly damaged (entire stock of rice wiped out)	<ul style="list-style-type: none">• 23 million people made homeless• ¼ children under 5 malnourished• Widespread starvation forecast• Sewage system collapsed leading to disease (diarrhoea and dysentery)	<ul style="list-style-type: none">• Sewage system collapsed• 660,000ha crops badly damaged (entire stock of rice wiped out)• 2007: 565,000ha farmland submerged