



**ADVANCED**  
**General Certificate of Education**  
**2009**

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**Geography**  
Assessment Unit A2 1  
*assessing*  
Module 4: Physical Processes and  
Human Interactions  
**[A2G11]**  
**WEDNESDAY 13 MAY, AFTERNOON**

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**RESOURCE  
BOOKLET**

## RESOURCE 1A

### BACKGROUND TO REDEVELOPMENT OF THE PROMENADE AT NEWCASTLE, COUNTY DOWN

Newcastle, County Down is a busy coastal resort at the foot of the Mourne Mountains. The town offers many seaside attractions: a sandy beach; the Slieve Donard Hotel; the Royal County Down Golf Club; a boating lake; caravan parks; the harbour. However, for many years the town was fronted by a promenade and sea wall which offered limited access to the beach from the busy streets, so that the beach was detached from the town.

In 2002, this seawall was partly swept away during a severe storm. This provided an opportunity to redesign the promenade area in such a way as to re-integrate the town with the beach. Raised by one metre, the new promenade was opened in 2007. Its footpath has been widened, seating incorporated for visitors, and access to the beach from the street level is now provided. A curved seawall now offers protection for the town from future storms. Rock armour has been placed along areas in need of additional protection.

*Source: adapted from a range of resources by the Principal Examiner*

### RESOURCE 1B

BEACH FRONTING THE UPGRADED PROMENADE, NEWCASTLE,  
COUNTY DOWN



*Source: Principal Examiner*

### RESOURCE 1C

ROCK ARMOUR IN FRONT OF PROMENADE, NEWCASTLE,  
COUNTY DOWN



*Source: Principal Examiner*

## RESOURCE 2

### TIME LINE OF EVENTS: BOSCASTLE FLOODS

<b>Background</b>	<p>Boscastle is an expanding Cornish village, popular with tourists. The River Valency and its tributary, the River Jordan, meet on high ground above Boscastle and descend via a narrow, steep valley through the village to the coast.</p>
<b>2004</b>	<p>On 16 August, heavy rain fell on high ground above Boscastle. The river level rose by 2 metres in one hour, reaching a peak discharge of approximately 140 cumecs. At 4 pm, a 3 metre wall of floodwater hit Boscastle, probably caused by water gathering behind debris caught under a narrow bridge and then being released as the bridge collapsed. It is estimated that 2 million tonnes of water flowed through the village, with a velocity in excess of 4 m/s.</p> <p>The flash flood affected around 1000 residents and visitors. Trees were uprooted, more than 80 cars washed into the sea and debris scattered over a large area. 58 properties were flooded and the Visitor Centre and Museum severely damaged. More than 150 people were airlifted to safety – some from roofs, trees and stranded cars. The tourist industry was devastated and the cost of repairing the structural damage was estimated at £500 million.</p>
<b>2005</b>	<p>An £800 000 flood defence scheme was completed, providing a replacement overflow culvert designed to carry at least twice the floodwater of the previous one which failed in 2004. Boscastle officially re-opened for visitors on 1 May. [N.B. A culvert is a pipe through which a stream is directed.]</p>
<b>2006</b>	<p>Work started on widening and deepening the river channel to increase its capacity. The level of the car park was raised, to reduce the risk of cars being washed away by future flooding.</p>
<b>2007</b>	<p>In June, Boscastle experienced a week of steady rain followed by an afternoon of intense rainfall in which 30 mm fell in just one hour. On 21 June, water flowed into the village from saturated fields, drains became blocked with debris and some properties flooded. However, although the new flood defences reached full capacity, the river itself did not flood and damage to the village was limited.</p> <p>Consideration is now being given to the long-term management of Boscastle's flood risk and the feasibility of further works.</p>

Source: adapted from a range of resources by the Principal Examiner

**RESOURCE 3****SLASH AND BURN CULTIVATION IN  
THE AMAZON BASIN OF ECUADOR**

“It is the Achuar men who clear the ground: once they have felled the bigger trees with an axe and slashed back the remaining bushes with their machetes, they call upon the women to burn what is left. Then, once a thick carpet of ash covers the garden, the men plant banana trees and leave the other work to the women. They plant numerous varieties of vegetables and root crops, beans, squashes, yams, manioc and pineapples. Along the edge of the cleared land they plant trees whose seasonal fruits help to vary the diet. When mature, the garden resembles an orchard set in a chaotic vegetable garden. Tree branches intertwine and stoop beneath the weight of enormous bunches of fruit; the squashes swell like balloons at the foot of charred stumps; sugar cane and arrowroot flourish along the great fallen tree trunks left over from the felling operation. Weeding takes up most of the time in the garden where the apparent confusion of plants is in reality the outcome of balancing the needs of each species. Weeding helps prolong the life of the garden but after three or four years the exhaustion of the not-so-fertile soil dictates that it be abandoned.” *From, 'The Spears of Twilight', by P. Descola*

The traditional and sustainable lifestyle of indigenous groups such as the Achuar people described above is under threat. Their agricultural practice demands the availability of large areas of uncultivated primary or established secondary forest. With increased population density in forest regions this resource is diminishing. At the same time other demands on the forest resources including mining, logging and commercial farming cause large scale deforestation, inevitably creating land shortage. For a time the slash and burn system can continue but at the expense of its traditional sustainability. The garden plots are used for longer, giving lower yields and more soil depletion while tribes are forced to return and clear secondary forest before the oxisols beneath have regained their fertility.

*Source: Principal Examiner*

## RESOURCE 4

### THE BAOBAB TREE



The baobab is a tropical tree closely associated with dry regions. There are eight species of baobab, six of which are unique to the island of Madagascar. One species is found across the dry plains of northern and southern Africa. Sometimes called the bottle or “upside down” tree, the baobab is well adapted to its semi-arid home. Its thick fleshy trunk is resistant to fire and it only produces leaves during the short wet season. Shedding these leaves in the long dry season, it is said that the plant then requires no water at all. The leaves of the baobab are in tiny finger-like clusters and their small size limits water loss. A further characteristic is its ability to store water in its wide trunk, thus enabling the baobab tree to survive the long months of drought. Baobab wood is so fibrous and spongy that when someone takes an axe to the tree, it literally bounces off and even chainsaws get clogged up and jam. Luckily for the baobab, the adaptations that help it to conserve water also help it to survive the attacks of people and hungry animals.

*Source: adapted from various online sites*

## RESOURCE 5

### EXPECTED CONSEQUENCES OF GLOBAL WARMING

#### BRITISH ISLES

A thermohaline (warm, salty) circulation acts like a conveyor belt in the North Atlantic Ocean bringing huge amounts of heat from the tropics to north-western Europe. As sea temperatures rise, there is a risk that the circulation will slow down or stop, blocking the flow of the warm Gulf Stream (North Atlantic Drift) that keeps the winters of the British Isles mild.

#### SUB-SAHARAN AFRICA

This region will bear the brunt of climate change. Scientists predict a 30 per cent decline in annual water availability. Droughts will increase the incidence of crop failure and malnutrition. Many extra tens of millions of people will be exposed to lethal tropical diseases such as malaria.

#### ASIAN MONSOON

In much of India the monsoon provides between 75 and 90 per cent of annual rainfall. Global warming is expected to increase the severity, and possibly the unpredictability, of the monsoon, increasing the risk of severe flooding or even monsoon failure at the time of year when it is needed most.

#### AMAZON RAINFOREST

Continued deforestation of the tropical rainforests increases the amount of carbon dioxide circulating in the atmosphere. As temperatures continue to rise, scientists fear that local droughts and soil erosion could cause the complete collapse of the remaining forest ecosystem.

#### AUSTRALIA

Many regions of the world will become too hot for cereal crops. Vast tracts of Australia's richest agricultural land will become unsuitable for farming.

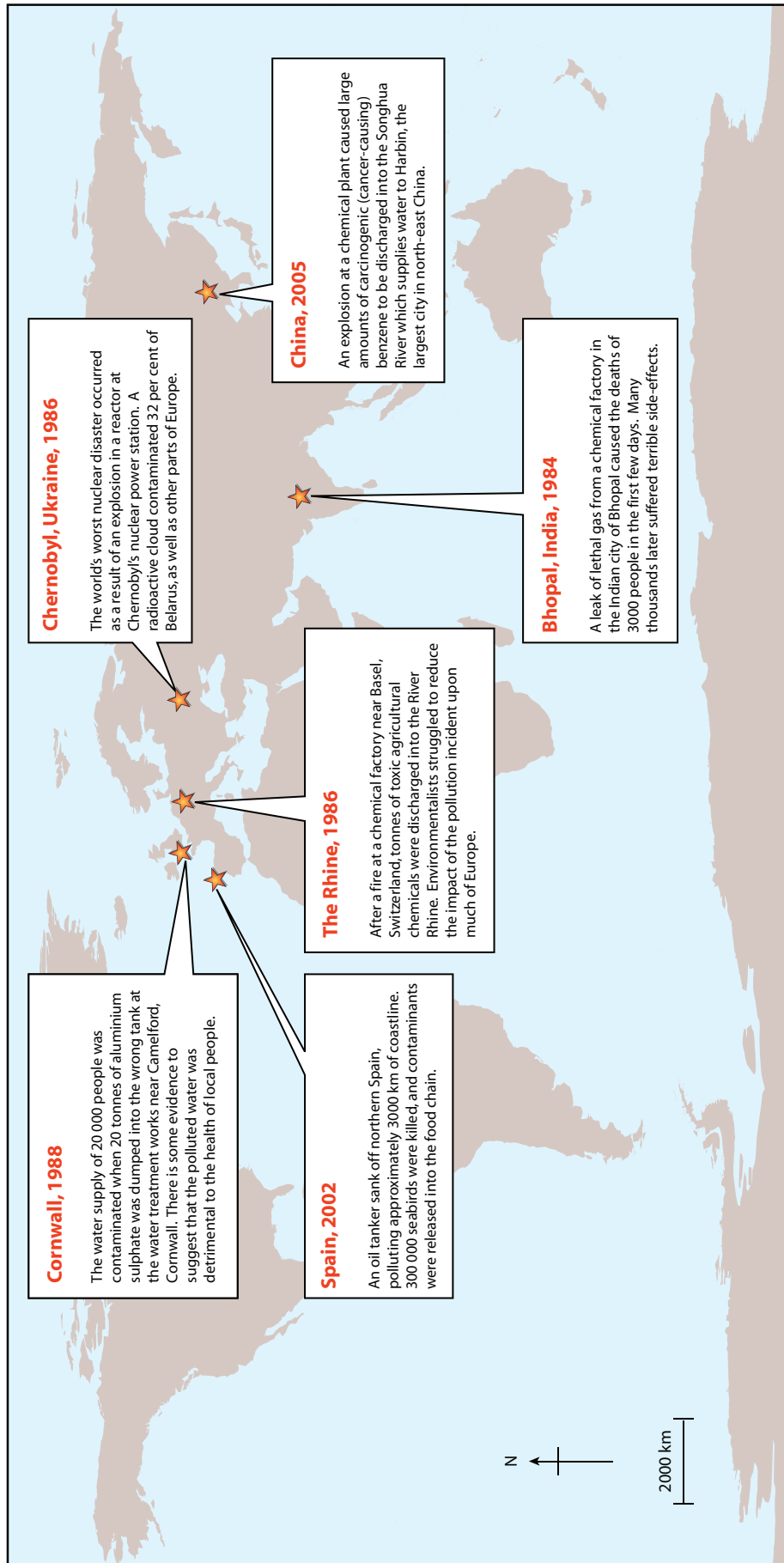
#### SOUTH ASIA AND AFRICA

Climate change is expected to increase the number of people living in poverty. An estimated 145–220 million additional people could fall below the \$2 a day poverty line and every year up to 250 000 extra children could die compared to a world without climate change.

*Adapted from: A Global Catastrophe of our Own Making by Steve Connor © The Independent, 31 October 2006*

# RESOURCE 6

## GLOBAL POLLUTION INCIDENTS





## RESOURCE 7

### THE IMPACTS AND MANAGEMENT OF THE KASHMIR EARTHQUAKE,

On Saturday 8th October 2005, an earthquake measuring 7.6 on the Richter scale struck the province of Kashmir, a disputed region on the Pakistan–India border. The epicentre was 19 km northeast of Muzaffarabad, Pakistan, and 100 km northeast of the national capital Islamabad. The focus was located at a depth of 26 km. Most of the casualties resulting from the earthquake were in Pakistan where the official death toll was 74 698. As Saturday is a normal school day in the region, many children were buried under collapsed school



buildings. Others were trapped in their homes and, because it was the month of Ramadan, many people were taking a nap after their pre-dawn meal and did not have time to escape. Reports indicate that entire towns and villages were completely wiped out in Northern Pakistan including Balakot where nearly every building in the tourist town was destroyed. An assessment of damaged buildings in Muzaffarabad showed that about 60% of them were constructed of unreinforced solid concrete block masonry. It was the collapse of these buildings that was responsible for the majority of the town's death toll of 30 000. The quake triggered landslides, burying entire villages and roads in many areas of North-West Frontier Province and Pakistani-administered Kashmir. The Karakoram highway was blocked at several points, hindering relief efforts.

In the days after the quake, the approach of winter brought snow and closed roads that had remained undamaged. The president of Pakistan conceded that the government had been slow in sending relief to the region. He blamed damaged roads and destroyed communications in the mountainous northern region. Those delays increased the risk of survivors being trapped without aid. About four million people were affected, at least 120 000 urgently needed shelter. In an unusually strongly worded statement Kofi Annan, the UN Secretary-General, declared, "... a second, massive wave of death will happen if we do not step up our efforts now." Having initially pledged £13 million, Britain responded with the promise of an additional £20 million to fund three Chinook helicopters, shelter, food and other aid.

The UN estimates that 120 000 survivors were not reached in the first few weeks and that 10 000 more children were at risk of dying from hunger, hypothermia and disease as aid workers struggled to reach them. Many died of treatable injuries as the lack of helicopters prevented help from reaching them. International health experts feared the threat of devastated public sanitation systems. Severe thunderstorms increased the risk from mudslides on the steep mountainsides. The Pakistani Foreign Minister acknowledged that the international response had been "overwhelming" and "transcended" religion and politics. "We have had over 20 countries sending rescue teams," he said. "There is hardly a country in the world that has not spoken with me." This included Pakistan's neighbour and nuclear rival India, with whom it has fought three wars.

Source: adapted from several online sources

## RESOURCE 8

### THE PREDICTION OF THE FUTURE OF INDIA'S SUMMER MONSOON

#### **Don't be fooled by India's monsoons this year!**

German climatologists believe that the extremely heavy monsoon which struck India in 2005, with devastating consequences in Mumbai, may not necessarily signify things to come. Although difficult to be accurate, the scientists predict much less, rather than much more, rain in future but with equally devastating consequences. Researchers at the Potsdam Institute for Climate Impact Research (PIK) suggest that increasing air pollution and forest clearance in South Asia could potentially lead to a failure of the Indian summer monsoon.

Delayed monsoon rains have a huge impact on the lives of people in India, for example leading to poor harvests and food shortages among the rural population (two-thirds of India's almost 1.1 billion people).

According to PIK researchers, the culprit is increasing air pollution resulting from airborne particles (aerosols) due to increased fossil fuel consumption and forest clearance by fire. This pollution leads to intensification of the Earth's brightness, or 'planetary albedo', in the region. This means less sunlight reaches the surface, causing the temperature over land to decrease. The pressure gradient is reduced and consequently the flow of moist air which feeds the monsoon rains would effectively be cut and, as a result, precipitation would decrease dramatically.

The researchers are cautious about using this model without further analysis of air pollution and land-use change in South Asia.

Another factor would be rising concentrations of greenhouse gases. These could have the opposite effect on the summer monsoon because they lead to higher temperatures over land and, hence, heavier rainfall. Without more research, scientists cannot determine which one of these two effects will dominate in the end.

*Adapted from: European Research Headlines, 26 August 2005 © European Communities, 1995-2009*



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