Write your name here

Surname	Other names

Pearson Edexcel GCE

Centre Number	Candidate Number

Global Development

Advanced Subsidiary
Unit 2: Global Development Challenges

Friday 9 June 2017 – Morning
Time: 1 hour 45 minutes

Paper Reference
6GL02/01

You must have:
Resource Booklet

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided
  – *there may be more space than you need.*

Information

- The total mark for this paper is 90.
- The marks for **each** question are shown in brackets
  – *use this as a guide as to how much time to spend on each question.*
- Questions labelled with an **asterisk** (*) are ones where the quality of your written communication will be assessed
  – *you should take particular care on these questions with your spelling, punctuation and grammar, as well as the clarity of expression.*

Advice

- Read each question carefully before you start to answer it.
- Try to answer every question.
- Check your answers if you have time at the end.

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Answer ALL questions.

SECTION A

The challenge and impact of sustainable development

1 (a) (i) Outline what is meant by **environmental sustainable development**.

(4)

(ii) Explain why achieving environmental sustainability might not be a priority for all governments.

(6)

(b) Explain the possible impact of population growth on achieving sustainable development.

(10)

(Total for Question 1 = 20 marks)

The challenge and impact of conflict

2 (a) Outline **two** reasons given to justify international interventions in conflicts since World War II.

(4)

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(b) Explain why conflicts often have a negative impact on social development.

(6)

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(c) Using examples, examine how successful international interventions have been in resolving conflicts.

(10)

(Total for Question 2 = 20 marks)

TOTAL FOR SECTION A = 40 MARKS

SECTION B

The challenge and impact of crises and humanitarian disasters

Using the Resource Booklet and your own knowledge and understanding, answer the following questions.

3 (a) (i) Explain why natural hazards are more likely to lead to disaster in some places than in others.

(6)

(ii) Examine the reasons why disasters are likely to become more common.

(8)

*(b) Sources A and B suggest that Hurricane Katrina was largely a man-made catastrophe that was typically uneven in its social impact.

To what extent do you agree with this view?

(16)

*(c) 'In the long-term New Orleans has no future.'

Discuss this view.

In your answer you should use the Resource Booklet and your own knowledge and understanding of the:

- role of technology in assessing risks, in responding to events and in post-event reconstruction work
- impact of the response on long-term economic, environmental and societal development goals
- impact of the response on society, politics and the economy.

(20)

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(Total for Question 3 = 50 marks)

TOTAL FOR SECTION B = 50 MARKS
TOTAL FOR PAPER = 90 MARKS

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Global Development

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Do not return this Resource Booklet with the question paper.

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The issue: The reasons for humanitarian disasters are often a complex mix of natural and human causes

Natural disasters are rarely completely 'natural'. Although hazards can be reasonably divided into natural events over which humankind has no control, such as earthquakes and volcanic eruptions, the scale of the impact of those events can be very different according to the vulnerability of the population.

In early 2010, two major earthquakes shook the Americas. The first, measured at 7.0 on the Moment Magnitude Scale, had its epicentre just outside Port-au-Prince in the Caribbean island of Haiti. It killed over 250 000 people and the country has still not recovered from the devastation despite an extremely expensive aid programme. The second earthquake, which struck south of Santiago, Chile, was about 500 times stronger measuring 8.8 on the Moment Magnitude Scale and yet it killed only 521 people because Chile was both better prepared for such events and also able to mobilise an effective disaster response.

The contrast between the two earthquakes, in which the less powerful event did more damage, makes it obvious that risks to societies from natural hazards are the product not of nature alone, but of a complex relationship between the natural system and the human system. This can be summarised with an equation:

Risk = Hazard x Vulnerability

In this equation, risk refers to the threat to humans and the property that we value from a hazardous event. Hazard refers to the characteristics of the natural event itself – for example the location and magnitude of an earthquake.

Vulnerability refers to the susceptibility of a human society to various types of damage, given a certain hazard event. Since vulnerability varies so widely between and within societies it is fair to claim that there is no such thing as a purely 'natural disaster'. So although we can blame the earthquake for the plight of the Haitian people we can also blame poverty, colonialism, international incompetence and corruption.

Vulnerability is often broken down into three elements which can be summarised in another equation:

Vulnerability = Exposure x Resistance x Adaptive Capacity

Exposure: Exposure refers to how far the hazard event overlaps with the human systems at risk. For example the poor are often more exposed to flooding because they live on floodplains whereas richer people can afford properties that are on higher ground and so less vulnerable.

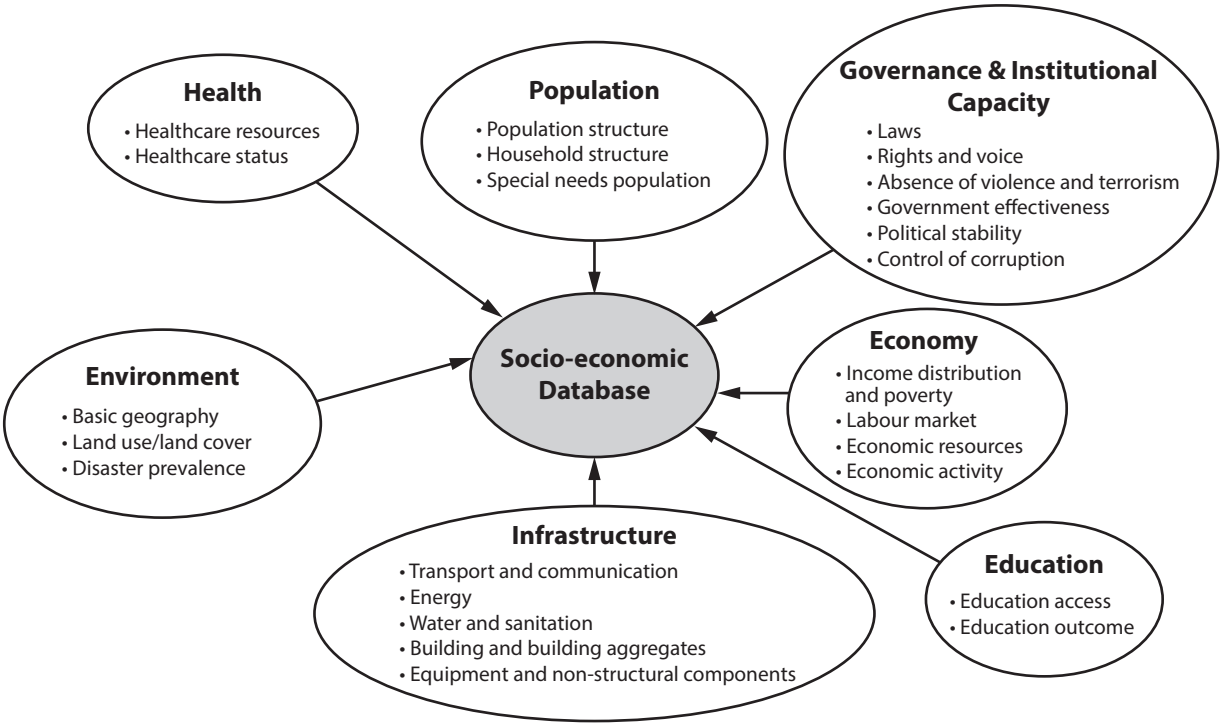
Resistance: Resistance is a measure of how resilient the human environment is when the event occurs. Earthquake-proof buildings are more resistant than those that are not and thus the people living in them are less vulnerable.

Adaptive capacity: Adaptive capacity refers to a person or community's ability to deal with, and recover from, the disaster. Insurance policies are an important part of adaptive capacity, allowing victims of a hazard to rebuild their homes and their lives. Someone who lacks insurance would be less able to adapt to the hazard, and so more vulnerable to it.

In general terms vulnerability often correlates well with deprivation and poverty. In various ways, poor people, ethnic minorities, women, and less able-bodied people are usually more likely to suffer from hazard events.

Indeed, some would argue that differences in vulnerability are an important way that inequalities can be maintained and even reinforced. Communities and groups that are obliged to deal with challenging risks can prevent that community or group from achieving equality.

In order to evaluate these risks, social vulnerability can be assessed by measuring a wide range of social and economic data which can be presented as a Social Vulnerability Index.



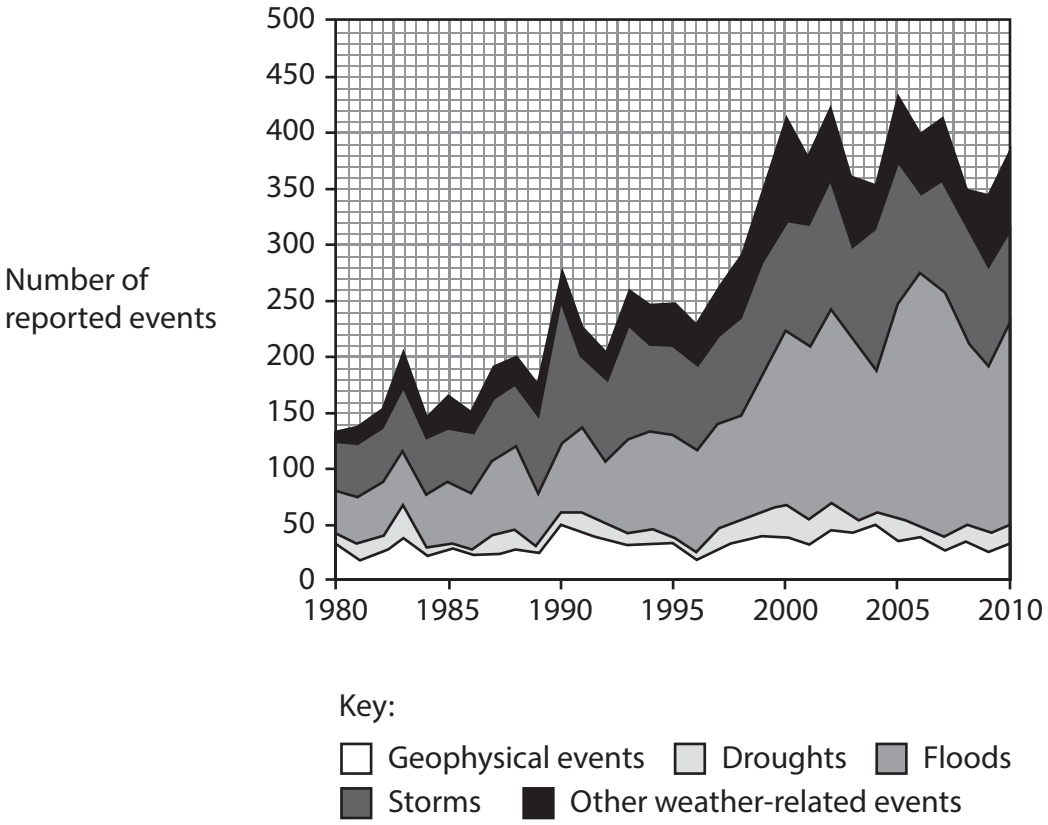
(Source: adapted from http://www.globalquakemodel.org/what/physical-integrated-risk/socio-economic-vulnerability/)

Figure 1

The variables measured in order to construct a Social Vulnerability Index

The issue: Protecting New Orleans is expensive and may not be worth the money

Unlike earthquakes and volcanic eruptions flooding, whether by rivers or on coasts, is not entirely natural. Of course rivers flood whatever human beings do or have done and coastal flooding took place long before *homo sapiens* appeared and will continue after we have gone. However, the frequency of such floods is rising (see Figure 2) and it is very probable that this is, in part, caused by human activity. The level of that activity is so great that some geologists regard this current period as the Anthropocene – in other words a geologic era in which human beings are playing a major part in changing the physical environment.



(Source: Steve Jennings, 'Time's Bitter Flood', http://reliefweb.int/node/405520)

Figure 2

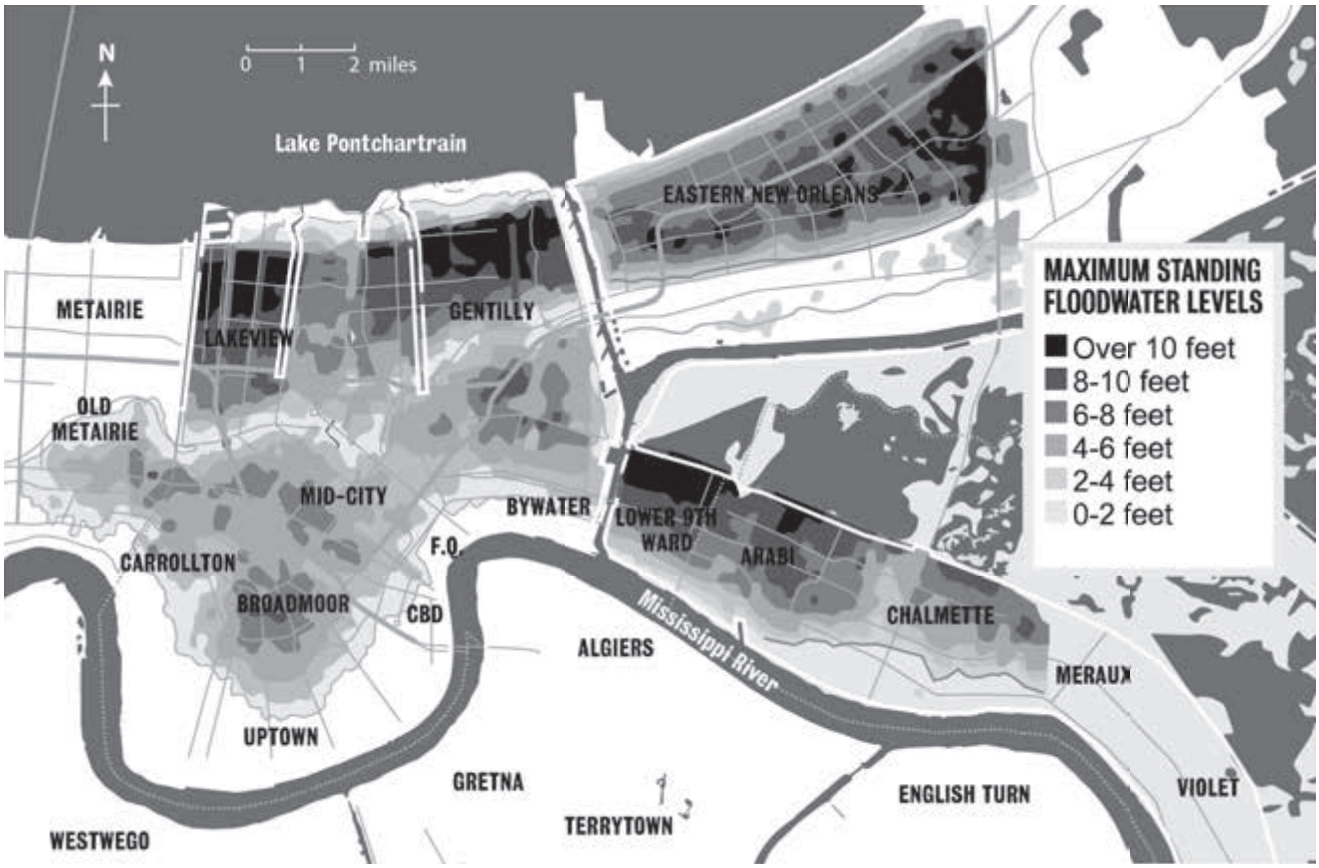
The trends in reported hazardous events

Nowhere is this more obvious than in the United States city of New Orleans where a combination of human actions and an exposure to hazardous events came together in August 2005 to pose significant risk to the population, or at least part of that population.

Hurricane Katrina was only a Category 3 storm when it hit New Orleans yet it flooded 80% of the city and caused more damage and loss of life than any other disaster in the history of the United States.

The levées protecting the city failed, which was partly through poor design and partly through neglect. Changes in the natural environment, with less sediment being discharged into the Mississippi delta since the river has been managed, have meant that off-shore islands that once gave some protection to the city have been subject to erosion. In addition, New Orleans is sinking with much of it now below sea level, increasing exposure to flooding if the levées do not hold.

Some commentators put the cost of saving New Orleans from future disasters as high as $50 billion, which is not money that is likely to be forthcoming from either local or national government.



(Source: adapted from http://media.nola.com/hurricane_impact/photo/graphic-katrina-flooding-1jpg-b37680dbc82e6ffb.jpg)

Figure 3

The flooding of New Orleans as a result of Hurricane Katrina

Source A: The demographics of death – Caroline Heldman, PhD on August 29, 2011

During disasters, poor people, people of colour, and the elderly die in disproportionate numbers and Katrina was no exception. Many decisions were made in the days leading up to and shortly after Katrina that amplified loss of life for these groups. New Orleans is both a poor (23% poverty rate pre-Katrina – twice the national average) and segregated city, and these factors led to loss of life. First, an effective evacuation plan was not in place that accounted for the 112 000 poor, mostly black New Orleanians without cars. Additionally, the timing of the storm at the end of the month meant that those receiving public assistance were unusually cash-strapped. To make matters worse for poor people with children, school had just started so expenses for the month were higher than usual.

The immobile poor were disproportionately left behind and lost their lives.
A comprehensive study of evacuees moved to Houston after the flood (who had stayed behind during the storm) found that 22% were physically unable to evacuate, 14% were physically disabled, 23% stayed in New Orleans to care for a physically disabled person, and 25% were suffering from a chronic disease. Also:

- 55% did not have a car or a way to evacuate
- 68% had neither money in the bank nor a useable credit card
- 57% had total household incomes of less than $20 000 in the prior year
- 76% had children under 18 with them in the shelter
- 77% had a high school education or less
- 93% were black
- 67% were employed full or part-time before the hurricane

Age was also a factor in fatalities. Nearly 40% of those who died in Katrina were elderly, and many more elderly individuals died from the stress of evacuation and home loss.

Mayor Nagin received nearly $20 million to establish a workable evacuation plan in plenty of time for Katrina, but it's questionable whether it was ever developed, and it was never disseminated. Two months before Katrina, Nagin spent money to produce and distribute DVDs in poorer neighborhoods to inform residents that they would be on their own if a storm hit because the city could not afford to evacuate them. In the days before the storm, Nagin sent empty Amtrak trains out of the city, failed to mobilised available school and other buses, and waited an entire day to call for a mandatory evacuation so he could determine whether the city would face lawsuits from local businesses. All of these decisions were deadly. The federal response was no better. The city was quiet after the storm whipped through late Sunday night/early Monday morning when President Bush announced that New Orleans had "dodged a bullet". Within hours, three major levée breaches and over fifty minor breaches flooded the city. Despite Governor Blanco's request for federal assistance on Saturday (two days before the storm made landfall) and concern from local media on Sunday (one day before the storm) that the levées wouldn't hold, they breached on Monday morning with only two Federal Emergency Management Agency (FEMA) workers on the ground. It would take two days for 1 000 additional officials to arrive.

(Source: adapted from http://thesocietypages.org/socimages/2011/08/29/hurricane-katrina-and-thedemographics-of-death/)

Source B: Mississippi River mouth must be abandoned to save New Orleans from next Hurricane Katrina – Mark Fischetti, on August 20, 2015

Hurricane Katrina demolished New Orleans 10 years ago, a grim anniversary to be marked next week. Huge earthen levées dissolved and concrete floodwalls toppled over. But the real culprit when the tropical cyclone made landfall was outside the city. Thousands of square miles of wetland marshes and swamps that had once provided a buffer between the city's coastline and the ocean had been badly damaged from decades of human use. Thick, robust wetlands would have absorbed much of the surge of water that Katrina pushed up from the Gulf of Mexico. But levées had starved the wetlands of needed nutrients, making plants weak, and thousands of miles of man-made canals had torn the vegetation apart, allowing Katrina's onrushing storm surge to flow right into New Orleans.

Extensive studies done after Katrina verified what lifelong residents of southeastern Louisiana already knew: unless the rapidly disappearing wetlands are made healthy again, restoring the natural defence, New Orleans will soon lay naked against the sea.

So, how does one reengineer the entire Mississippi River delta – one of the largest in the world – on which New Orleans lies?

Three international engineering and design teams have reached a startling answer: leave the mouth of the Mississippi River to die. Let the badly failing wetlands there completely wither away, becoming open water, so that the upper parts of the delta closer to the city can be saved. The teams, winners of the Changing Course Design Competition, revealed their detailed plans on 20 August 2015.

Scientists worldwide agree that the delta's wetlands disintegrated because we humans built long levées – high, continuous ridges of earth covered by grass or rocks – along the entire length of the lower Mississippi River. The levéed river rims the southern boundary of New Orleans and continues another 40 serpentine miles until it reaches the gulf. The levées, erected almost exclusively by the U.S. Army Corps of Engineers, prevented regular floods from harming farms, industries and towns along the river's course. However these floods also would have supplied the brackish marshes with massive quantities of silt and freshwater, which are necessary for their survival.

Silt carries nutrients that grasses and mangroves need to stay lush, and it provides new material to build up the soft substrate beneath those plants, which subsides naturally under its own weight. Incoming freshwater mixes with the delta's saltwater to create the reduced salinity required by the region's vegetation. This mixture also prevents pure ocean water from intruding further inland, which kills grasses and trees from the roots up.

Instead, hundreds of miles of navigation channels, cut by the Corps for more than half a century through the wetlands have torn the wetlands apart from within. So have thousands more miles cut by industry during the same period to build and maintain oil and gas pipelines running in from the Gulf.

The studies done by university experts, engineering firms and the Corps itself since Katrina concur that the only realistic way to reconstitute healthy wetlands is to make cuts in the levées, install gates, and open those gates periodically to allow sediment and freshwater to once again flow into the marshes. The three winning design teams rely heavily on that strategy, yet they also differ in where and how to use the so-called diversion structures.

The river nowadays only carries perhaps half of the sediment it used to, because communities on its banks for hundreds of miles siphon off water for irrigation, industry and many other uses. There is simply not enough sediment to rebuild the entire delta, according to the winning teams, which operated independently. Rather than try that and fail, the teams found it is better to essentially end the river many miles north of the current mouth, where much sediment is sent like a shot out into the deep ocean and lost. Then engineers could redirect all the sediment to portions of the delta closer to New Orleans. "Capture every grain," is one team's slogan.

The need to let the end of the delta, known as the bird's foot because of its shape, die is also assumed in the official Louisiana Comprehensive Master Plan for a Sustainable Coast, although not necessarily called out in detail. The plan took seven years to develop, after significant political wrangling among state, federal and local authorities.

The master plan would tap about half the river's sediment for diversions, and try to restore as much of the delta as possible. Founders of the Changing Course Design competition, led by the Van Alen Institute and the Environmental Defense Fund, and supported by the Rockefeller Foundation, Kresge Foundation and other large institutions, saw that approach as a weakness, and announced the competition to seek alternative ideas.

The competition also encouraged a 100-year outlook for the delta, instead of the 50 years outlined in the master plan. In the end, the three winning blueprints, chosen from 21 entrants, complement the state plan well, says Steve Cochran, director for Mississippi River Delta Restoration at the Environmental Defense Fund, who oversaw the competition.

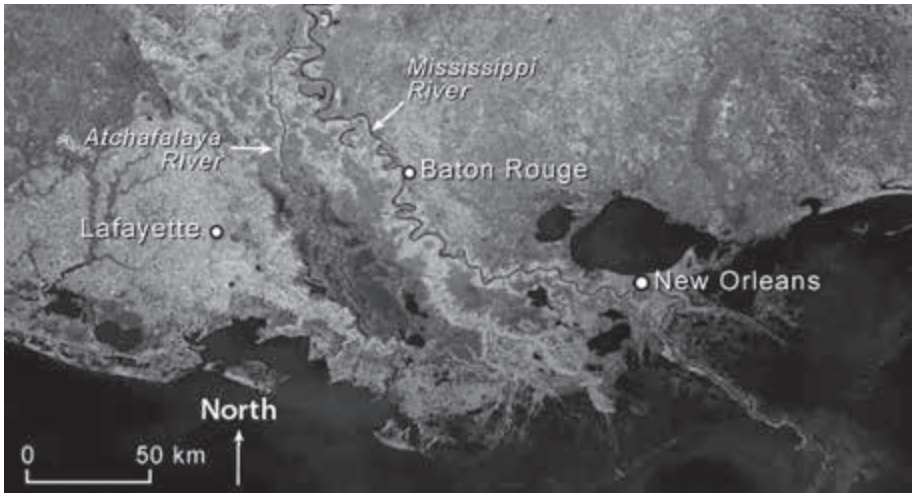
Cochran also hopes the winning designs will prove valuable to other delta regions around the world: "Every place is different, but the kinds of innovations needed are similar".

Only one of the three groups, the Baird Team, included a cost estimate: between $4.3 billion and $5.7 billion. But it also cited savings of up to $2 billion in eliminating the need to replace certain ageing flood control structures now on the river. The other two plans are larger in scope and would likely be more expensive. Cochran says his committee did not require cost estimates "because the state and the Corps would decide which aspects of the plans to implement, and do their own estimates".

The winning teams received neither prize money nor other rewards. The teams got involved primarily to gain notoriety for potential large contracts in the future. "The coming work in southeastern Louisiana is huge, even on a global scale," Cochran notes. The real goal for Changing Course was to educate the state, the Corps and other industries and authorities that will be involved in reengineering the region about how to exploit the Mississippi River to save the region. "The teams have been explaining their ideas to all these people along the way," Cochran says.

The full set of designs can be obtained online from Changing Course.

(Source: adapted from http://www.scientificamerican.com/article/mississippi-river-mouth-must-be-abandoned-to-save-new-orleans-from-next-hurricane-katrina/)



(Source: USGS and NASA)

Figure 4

A satellite image of the lower Mississippi River

A satellite image of the lower Mississippi River shows that south of New Orleans the wetlands are severely damaged, allowing hurricanes and other storms to push surges of water from the surrounding Gulf of Mexico right into the city, largely unimpeded.

Source C: Adapted from 'The Case for the Greater New Orleans Area: Why We Matter and Why We Should Exist' – Chris Dier, on September 1, 2012

After multiple hurricanes, severe flooding, staggering death tolls, expensive rebuilding price tags, and the likes, the critiques that New Orleans shouldn't exist, be rebuilt, or similar sentiments, are gaining traction. As Hurricane Isaac just passed, people are voicing these opinions. Glenn Beck epitomises this sentiment:

"I find it hard to feel sorry for New Orleans." … "We should just walk away from that city. Why are we there?" … "I'm not sure if we should bother rebuilding it." … "Why are we spending all this money in New Orleans? We shouldn't spend a single dime of tax-payer money." … "How much do I think should be spent on New Orleans? Zero. Nothing. Not a dime." … "The Big Easy is a lost cause."

So many from all over the political spectrum and various walks of life agree. A lot less crazy people than Beck, as well. These opinions may sound rational on the surface, but deeper analysis exposes their simplicity and absurdity. I write this in a coffee shop, because my house has no electricity due to Hurricane Isaac, in an area that was obliterated by Hurricane Katrina. And less than ten minutes away from me, houses in Braithwaite, Plaquemines Parish, are completely submerged. Here's my case:

New Orleans is nowhere near as much at risk to the problems we face and will face compared to other global cities. According to a report by the Organisation for Economic Co-operation and Development (OECD), the rise of sea levels put multiple U.S. cities ahead of New Orleans in terms of risk. The most at risk city in the world is Miami, followed closely by New York City and Newark. Even around the world, the OECD puts Chinese cities Shanghai, Guangzhou, Tianjin, Hong Kong, and Ningbo more at risk than New Orleans. Kolkata, Mumbai, Tokyo, and Bangkok were also ahead of New Orleans on the list. So the notion that New Orleans is the most doomed city in the world and should simply be abandoned is unfounded. In order for such sentiment to be logical, one must conclude that these cities should not exist as well, even more so than New Orleans. If not, the hierarchy of what cities deserve the "right to exist" is illogical. Nonetheless, who determines such a decision anyway?

Cities around the world are at risk from all sorts of disasters. If you live in an earthquake prone area, you build infrastructure to withstand heavy earthquakes. Dozens of cities around the globe and in the U.S., like San Francisco and Los Angeles, are built on fault lines. Unfortunately, if you do not build up to a certain code, for whatever reason, an earthquake could be disastrous. We witnessed this in the Haitian Earthquake of 2010, where over 250 000 people died and over a million were left homeless. That earthquake registered a 7.0 on the Richter scale. However, in Chile, an 8.8 earthquake happened in the same year but the death toll and damage did not even compare to Haiti. This is thanks to Chile's seismic building code adapted by Salvador Allende in 1972. The logic is the same with cities along the coast.

There are no logical and well thought-out reasons why New Orleans deserves to be left to drown. It is a city that must and should be protected. With rising sea levels and waters getting warmer, investing in smart building is the right thing to do, and we know it can be done. We will continue to rebuild, preserve our heritage, live life to the fullest, and move forward. It's going to take a lot to wipe us off the map, and we are not going anywhere anytime soon.

(Source: adapted from https://thecaseforneworleans.wordpress.com/2012/09/01/the-case-for-the-greater-new-orleans-area-why-we-matter-and-why-we-should-exist/)

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