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**ENVIRONMENTAL SYSTEMS AND SOCIETIES
STANDARD LEVEL
PAPER 2**

Friday 7 November 2014 (afternoon)

2 hours

RESOURCE BOOKLET

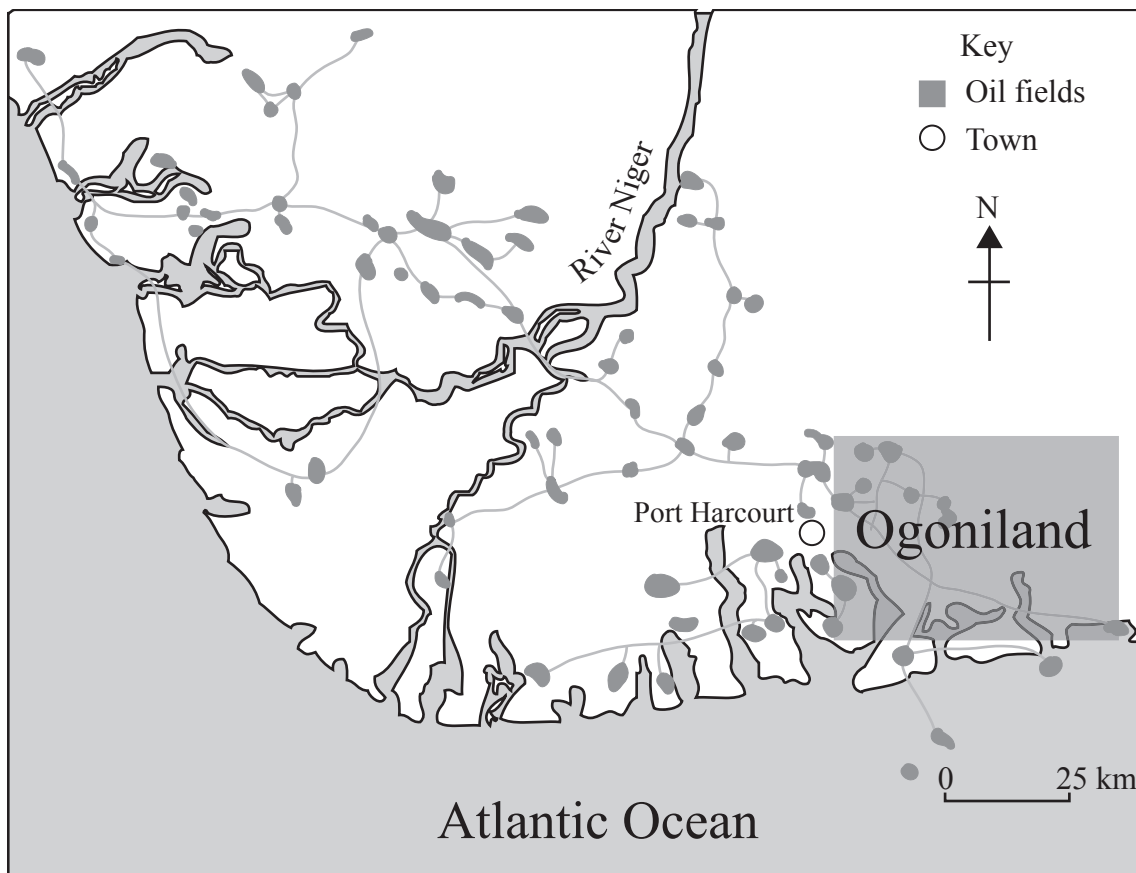
INSTRUCTIONS TO CANDIDATES

- Do not open this booklet until instructed to do so.
- This booklet contains **all** of the resources required to answer question 1.

Figure 1 World map showing location of Nigeria and the regional map showing area of case study



[Source: Adapted from www.un.org/Depts/Cartographic/map/profile/world.pdf, used with permission from the UN.]



[Source: adapted from http://postconflict.unep.ch/publications/OEA/01_fwd_es_ch01_UNEP_OEA.pdf]

Figure 2a Fact file on Nigeria

- 140 million people.
- Over 55 % live below the poverty line.
- Life expectancy is 47 years.
- Oil makes up 90 % of export earnings.
- World’s sixth largest oil exporter. Exports mainly to USA and Western Europe.
- 5 transnational corporations (TNCs) operate 159 oilfields.

Figure 2b Fact file on Niger Delta

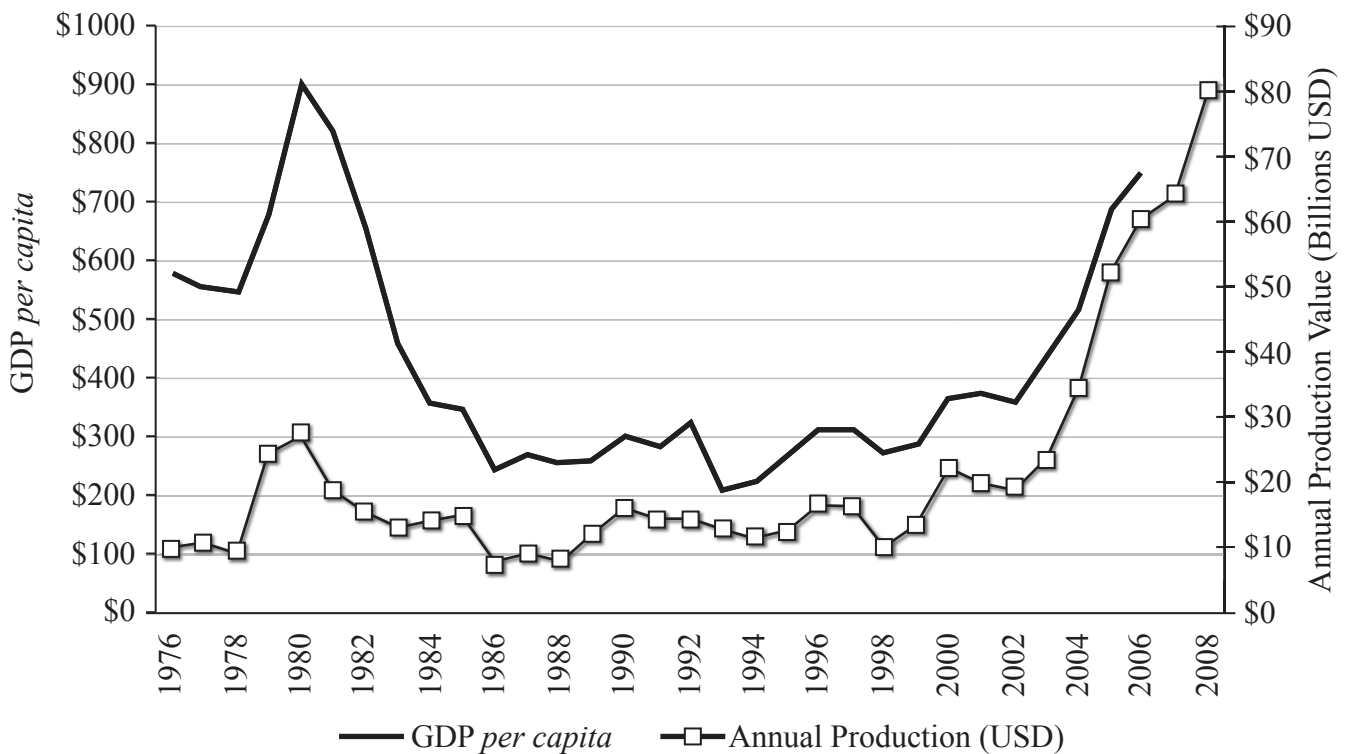
- Is home to 20 million people including many different ethnic groups.
- Covers an area of 70 000 km², making up 7.5 % of Nigeria’s land area.

[Source: <http://news.bbc.co.uk/2/hi/africa/6508055.stm> and <http://www.happyplanetindex.org/countries/nigeria/>]

Figure 3 Population Pyramid for Nigeria 2011

Removed for copyright reasons
Please refer to the graph found here:
<http://www.eniscuola.net/en/sustainability/specials/over-7-billion-people-on-earth/>

Figure 4 Nigerian oil production and GDP per capita 1976–2008



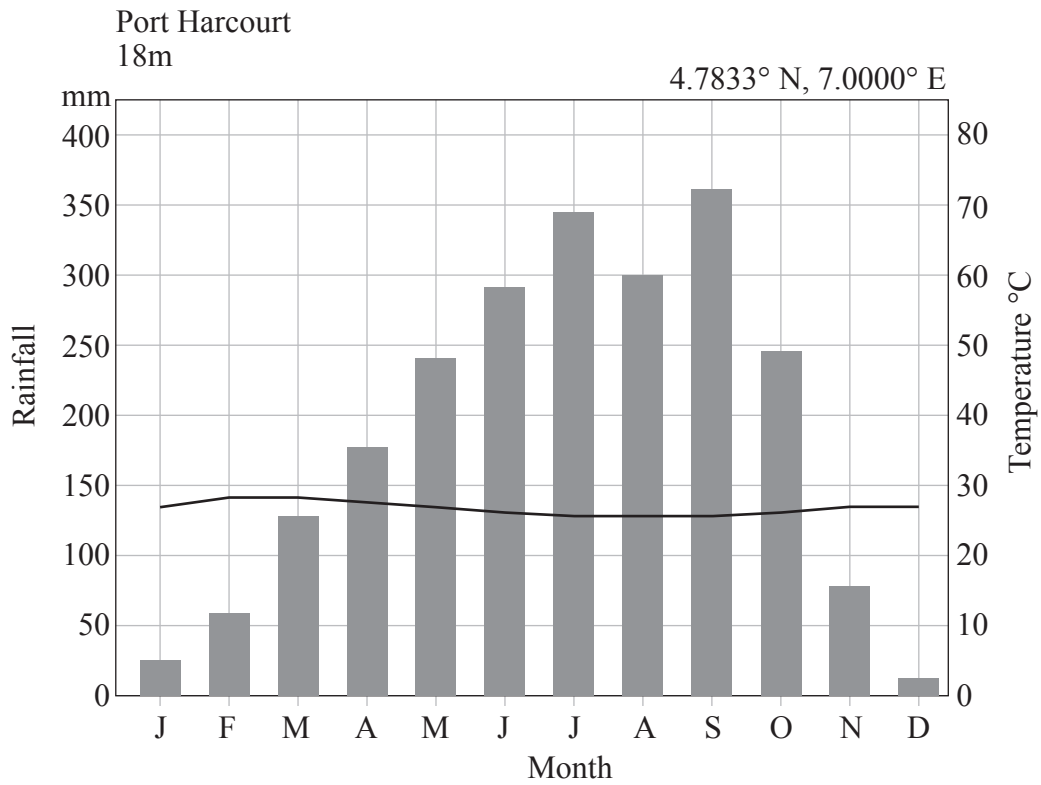
[Source: adapted from <http://thecivilisingmission.files.wordpress.com/2010/04/nigerian-gdp-per-capita-vs-value-of-oil-production1.png>
J.F. Gjersø, 2010.]

Figure 5a Information on the Niger Delta tropical swamp forest biome

- Forms on low lying coastal delta from sediment deposited by the Niger river.
- Over 80% of the delta floods seasonally. Swamps remain when flood waters drain away.
- Important role in the global economy (through the slave trade, palm oil trade and now fossil fuels) over the last 400 years.
- Conservation Status of selected organisms: Critical/Endangered.
- Flora and Fauna only systematically surveyed since 1980s.
- Endemic species such as red colobus (*Procolobus badius epieni*) and Heslop’s pygmy hippopotamus (*Hexaprotodon liberiensis heslopi*).
- Delta believed to be a meeting point for chimpanzee populations.
- Includes 75% of Africa’s remaining mangrove forests.
- Swamp forests have no large scale formal protection, although crocodiles and chimpanzees receive some protection.

[Source: adapted from http://www.eoearth.org/article/Niger_Delta_swamp_forests]

Figure 5b Climate graph for Niger delta



[Source: <http://en.allmetsat.com/climate/nigeria.php?code=65250>
Used with the permission of www.allmetsat.com]

Figure 5c Photographs showing important species in the Niger delta

Abura (*Hallea ledermannii*)



[Source: : Photo by Carel Jongkind and Fauna & Fauna Int. Used with permission.]

Chimpanzee (*Pan troglodytes ellioti*)



[Source: “2006-12-09 Chipanzees D Bruyere” by Delphine Bruyere - Own work. Licensed under CC BY-SA 3.0 via Wikimedia Commons - http://commons.wikimedia.org/wiki/File:2006-12-09_Chipanzees_D_Bruyere.JPG#mediaviewer/File:2006-12-09_Chipanzees_D_Bruyere.JPG]

Mangrove species (*Rhizophora racemosa*)



[Source: “Mangrove-1” by Leon petrosyan - Own work. Licensed under CC BY-SA 3.0 via Wikimedia Commons - <http://commons.wikimedia.org/wiki/File:Mangrove-1.JPG#mediaviewer/File:Mangrove-1.JPG>]

Niger Delta red colobus (*Procolobus badius epieni*)



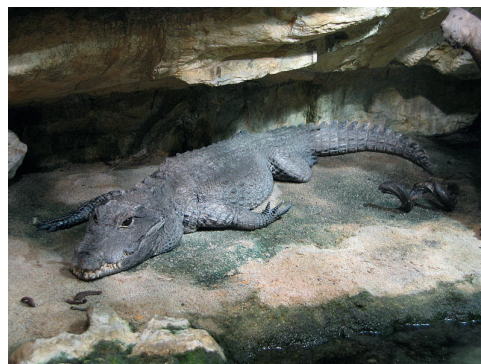
[Source: “Red Colobus monkey” by colin houston from Kilmacolm, Scotland - Red Colobus monkey. Licensed under CC BY 2.0 via Wikimedia Commons - http://commons.wikimedia.org/wiki/File:Red_Colobus_monkey.jpeg#mediaviewer/File:Red_Colobus_monkey.jpeg]

Heslop’s pygmy hippopotamus (*Hexaprotodon liberiensis heslopi*)



[Source: “Choeropsis” by Tommy from Arad - Choeropsis. Licensed under CC BY 2.0 via Wikimedia Commons - <http://commons.wikimedia.org/wiki/File:Choeropsis.jpg#mediaviewer/File:Choeropsis.jpg>]

West African Dwarf Crocodile (*Osteolaemus tetraspis*)



[Source: “Crocodile nain aquarium porte dorée Paris” by Thesupermat - Own work. Licensed under CC BY-SA 3.0 via Wikimedia Commons - http://commons.wikimedia.org/wiki/File:Crocodile_nain_aquarium_porte_dor%C3%A9e_Paris.JPG#mediaviewer/File:Crocodile_nain_aquarium_porte_dor%C3%A9e_Paris.JPG]

Figure 6a Environmental threats in the Niger delta

- Over 1.5 million tonnes of oil spilt in the delta over the past 50 years, polluting water sources, damaging crops and fishing grounds. The delta is one of the five most polluted spots on Earth.
- More than 20 000 hectares of mangroves have been destroyed by oil exploration.
- Natural gas from the oil fields is burnt off as flares. Hundreds of flares have burned for many years potentially causing acid deposition and global warming.
- Limited access to electricity, fresh water or health care.
- The oil industry provides very few jobs.
- Improving transport in the delta has enabled other Nigerians to exploit the timber and fish resources. This has led to overfishing, habitat loss, overhunting and clashes between ethnic groups. Once common Abura trees are almost completely gone.
- Rightfully or not, local people hold the oil industry responsible for environmental damage to the Niger delta. Oil pipelines and facilities are regularly attacked and oil company employees must live in heavily guarded compounds.

[Source: adapted from *GeoActive Online* 408 Paul Guinness Series 20 Spring issue Unit 408 *Recent Oil Developments in the Niger Delta* © 2009 Nelson Thornes]

Figure 6b Photos showing Gas flaring in the Niger delta



[Source: <http://www.nipptransactions.com/wp-content/gallery/omoku/gas-flaring-near-the-plant.jpg>]

Figure 7a Ogoniland and the Ogoni people

A recent UN report on pollution of Ogoniland called for a US\$1 billion clean-up fund to be set up to restore the environment.

The investigation found:

- Drinking water with dangerous concentrations of benzene and other pollutants.
- Soil contamination more than five metres deep.
- Failure by oil companies to meet their own or Nigerian minimum standards.
- Most of the spill sites claimed to have been cleaned by oil firms still highly contaminated.

[Source: <http://www.guardian.co.uk/environment/2011/aug/04/niger-delta-oil-spill-clean-up-un> and <http://www.unep.org/newscentre/default.aspx?DocumentID=2649&ArticleID=8827>]

The Ogoni People

- Fish and farm (yam and cassava).
- Worship the land and rivers as God.
- “Tradition” in the local language means the honouring of the land.
- Believe that the soul of every human being has the ability to leave its human form and enter into that of an animal. Certain animals are protected for this reason.
- Set up an environmental pressure group in 1990 to campaign against degradation of the environment.
- During their non-violent campaign, Ken Saro-Wiwa, their President, was arrested, tried and hanged in 1995. His death caused international outrage.

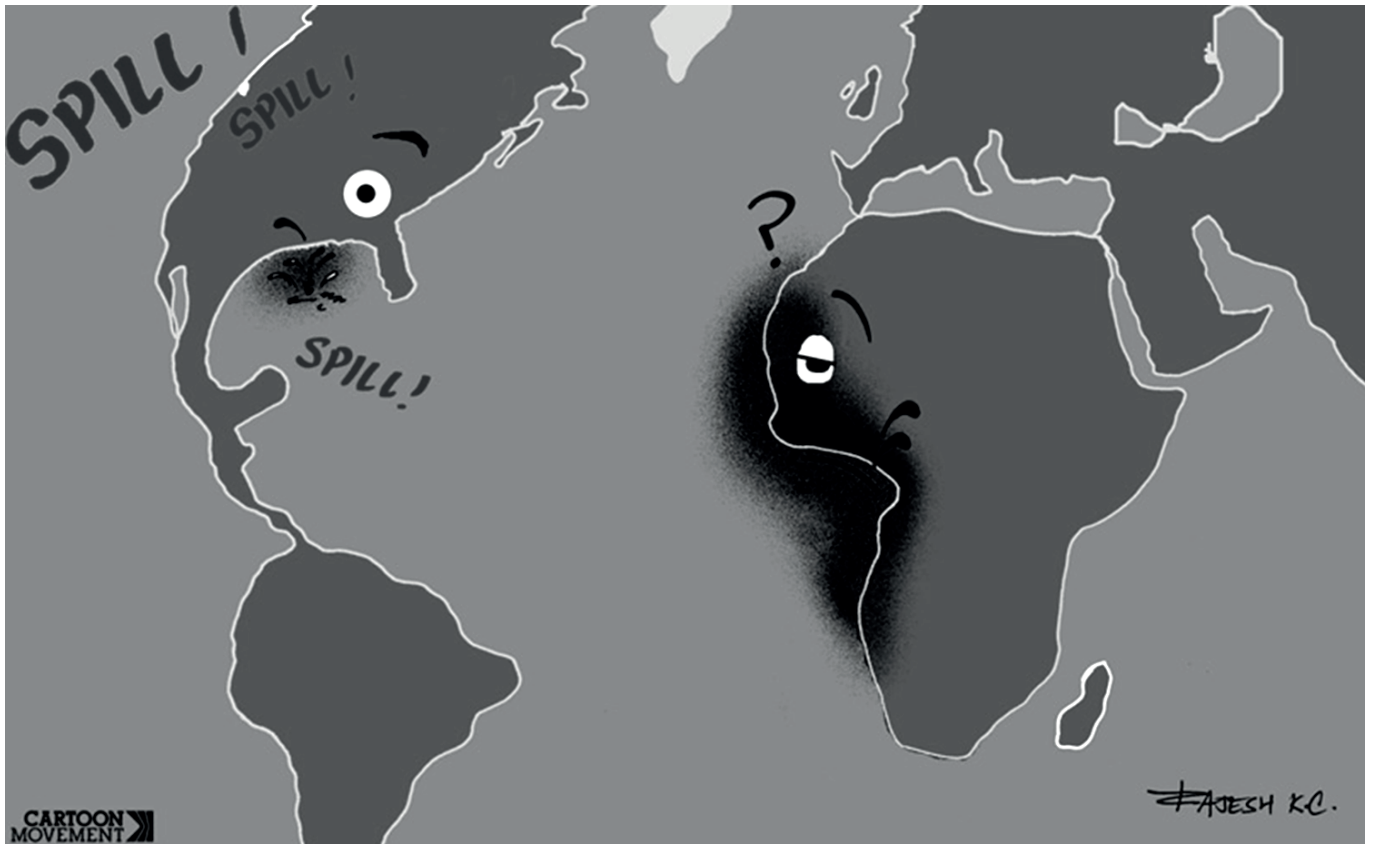
[Source: <http://www.joshuaproject.net/people-profile.php?peo3=19639>]

Figure 7b Photo of Ken Saro-Wiwa, Ogoni environmental activist



[Source: “Ken Saro-Wiwa” by Source. Licensed under Fair use via Wikipedia—
http://en.wikipedia.org/wiki/File:Ken_Saro-Wiwa.jpg#mediaviewer/File:Ken_Saro-Wiwa.jpg]

Figure 8 Cartoon comparing oil spills in West Africa with the 2010 BP Deep Horizon oil spill in the US



[Source: <http://www.cartoonmovement.com/cartoon/786>
Cartoon Movement/Rajesh KC]