

Tutorial Letter 202/1/2018

People and the Environment

GGH2604

Semester 1

Department of Geography

This tutorial letter contains feedback on Assignments 01 and 02.

BARCODE

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1 INTRODUCTION

Dear Student

This tutorial letter contains feedback on Assignments 01 and 02. Take note that we do not provide model answers to questions in this tutorial letter, but rather guidelines on how you could have answered the questions. When answering a question, we expect you to incorporate your own thoughts and ideas in the discussion, and provide supporting evidence and acknowledge all sources consulted.

We remind you that some of the questions in the examination are based on your assignments.

2 ASSIGNMENT FEEDBACK

SEMESTER 1		
ASSIGNMENT 01	UNIQUE NUMBER: 834785	DUE DATE: 26/02/2018

1. Briefly describe what is meant by the term “Anthropocene”.

<p>The term “Anthropocene” can be referred to as “the age of humans”, which is characterised by greenhouse gas emission levels, control of water resources, sulphur dioxide emissions, overexploitation of fisheries, fertiliser use and mining activities.</p> <p><i>Any other relevant information.</i></p> <p><i>Any relevant explanation, 2 marks.</i></p>	2
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2. The South African population is predicted to grow from 50.6 million currently to 58.5 million by 2030. Migration from neighbouring countries could push this number up to 61.5 million... (Esterhuyse et al 2016:409). Generally, South Africa is a water stressed country and an increase in population especially in the urban areas, is expected to worsen the problem. Recently, restrictions on water use were introduced in urban areas in South Africa during lower rainfall periods. Do you think the water scarcity situation in South Africa is an example of the Malthusian, Cornucopian or Marxist perspective? Motivate your answer.

<p>Malthusian perspective. According to this view, due to rising population levels and the increasing demand for resources, finite resources will eventually be exhausted.</p> <p><i>Any other relevant information.</i></p> <p><i>1 x mark for opinion and 2 marks for explanation.</i></p>	3
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3. Study table 1 below and answer the following questions:

Table 1: Population size in Khartoum over time (2000 – 2030) (Source: UN 2016)

City population in thousands			
	2000	2016	2030
Khartoum	3 505	5 265	8 158

a. Create a line graph from the data in table 1 to show the change in population numbers for Khartoum. Your graph must contain the following elements:

- labelled X-axis
- labelled Y-axis
- population size for the year 2000
- population size for the year 2016
- population size for the year 2030

Example of line graph created using Microsoft excel:

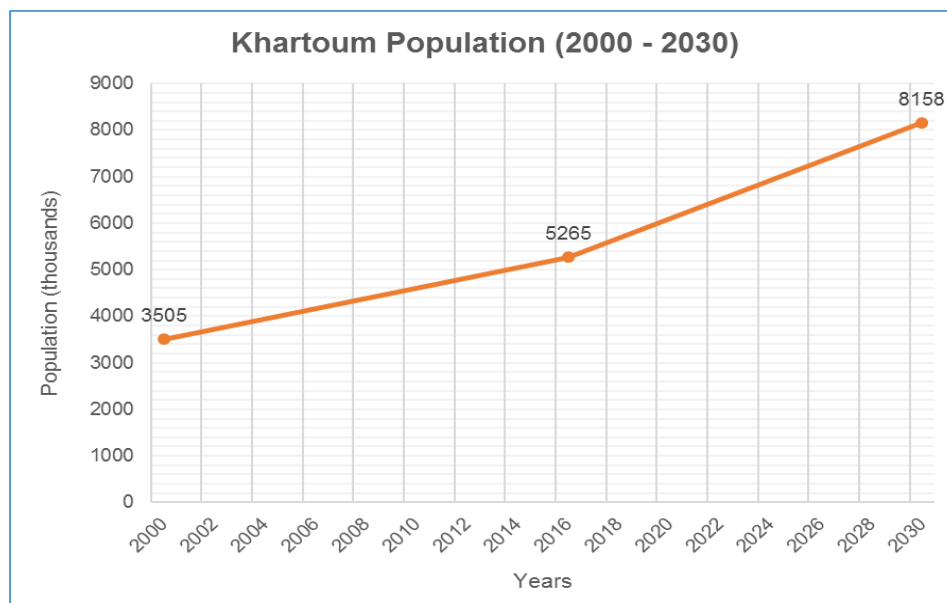


Figure Figure 1: Line graph depicting population trend in Khartoum over time (2000 – 2030).

b. Describe and explain the trends revealed by the graph.

Figure 1 above depicts an increasing trend (of about 1 760 thousand) in population size in the city of Khartoum over the period of 16 years (2000 – 2016). The city population is projected to increase by about 2 893 thousand between 2016 and 2030. <i>Any relevant explanation, 2 marks.</i>	2
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4. More than half of the global population growth between now and 2050 is expected to occur in Africa (United Nations Population Prospect 2017). The population in urban areas is expected to rise because of increasing levels of migration to cities. An increase in the population of cities usually leads to an increase in human activities, which will likely result in an increase in pollution in urban areas.

Describe two major sources of air pollution in the city of Lagos and suggest measures that can be taken to reduce air pollution in the city.

<p>Major sources of air pollution in the city of Lagos include dumpsites, open incinerators, power generators, vehicle emission due to the increase in vehicles, industrial and commercial buses, the use of chemicals, wastes and fossil fuel burning emanating from industries (Komolafe et al 2014).</p> <p><i>Any other relevant information.</i></p> <p><i>Description of any two relevant facts, 1 mark per fact.</i></p>	2
<p>Measures that can be taken to reduce air pollution in the city includes but is not limited to:</p> <ul style="list-style-type: none"> • Effective waste management through recycling • Sustainable eco-friendly transport systems and vehicle emissions monitoring. • Improvement of energy efficient performance of new and existing buildings • Development of innovative technology such as fuel-saving and low-energy appliances will help to counter balance the increase in fuel consumption. • Introduction of carbon tax and air pollution policy: Limits industries' pollution sources and encourages sustainable energy generation (renewable energy sources); introduction of green economy (tree planting); infrastructure standards, etc. <p><i>Any other relevant information.</i></p> <p><i>Any two relevant measures proposed, 1 mark per fact.</i></p>	2

5. Studies indicate that the areas that are most likely to suffer the worst impacts of climate change are Africa and South Asia. Ironically, these areas are some of the places that are the least responsible for the creation of the climate change problem and are least able to protect themselves from its impacts.

Explain why Africa and South Asia are most likely to suffer from the effects of climate change. In your answer, make specific reference to the characteristics of the two countries that make them more vulnerable.

<p>The vulnerability of regions to adverse effects of climate change will likely differ considerably across scales based on different factors. In order to answer this question, students need to understand various factors that determine the vulnerability of regions to the effects of climate change. IPPC (2007) identified the character, magnitude and rate of climate change as some of the factors that determine the extent to which a system is susceptible to the adverse effects of climate change. According to (Mahendra Dev 2012) regions that are vulnerable to effects of climate change can be identified based on three framework namely: exposure, sensitivity and adaptive capacity. The adaptive capacity of a region depends on the factors such as the economic conditions, political stability, infrastructure development etc.</p> <p>In Africa, warming is projected to be larger than the global annual mean; this is coupled with a decrease in annual rainfall in most areas within the continent (IPPC 2007). Thus, the temperature and precipitation changes are expected to shift the pattern of the agro-ecological zones (Kurukulasuriya & Rosenthal 2003). Consequently, higher temperatures will dry up soils, increase risks of pest and disease, shift suitable areas for growing crops and livestock. This will have a negative impact on agricultural crop production (Knox et al 2012) which accounts a substantial share of the continent economy (Diao et al 2010). Over 60% of the population livelihood in Africa, is dependent on the agricultural sector, which is mainly rain, fed and particularly exposed to climate variation (Collier 2008).</p> <p>As is the case in Africa, climate projections for southern Asia indicate above global mean temperature and increased risks of tropical storms (IPCC 2007; Christensen et al 2007). Low-lying areas of the region are highly vulnerable to rising sea level, which increase the risks of flood (Mahendra Dev 2012). Nearly three quarters of South Asia population depend on agriculture for livelihoods. Smallholder and subsistence farmers, coastal populations and artisanal fisher tribes who have limited capacity to adapt will suffer greater risk from food insecurity (Mahendra Dev 2012). In the coastal areas, rising sea levels – intrusion of seawater into freshwater and decline of water supply may negatively affect coastal agriculture. Extreme climate conditions such as drought or floods may also reduce inland agricultural production. Consequently, a reduction in agricultural production as result of climate change will hinder the development of this sector, which aims to reduce poverty in region (Zhai & Zhuang 2012).</p> <p>Vulnerability of Africa and Asia to impacts of climate change is worsened by their limited adaptive capacity. The reason being that, most areas in these developing countries are characterised by high levels of poverty, lack of infrastructure, weak economies, dependence on rain-fed agriculture which limit their ability to cope and adapt.</p> <p><i>Any other relevant information.</i></p> <p><i>Any six relevant facts, 1 mark per fact.</i></p>	6
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6. According to Willsher (2016) “... none ever returned to live in Pripjat, declared too radioactively dangerous for human habitation for at least 24,000 years”.

a. If a nuclear disaster takes place at the Koeberg nuclear power plant (in South Africa), do you think Cape Town will become a ghost town like Pripjat? Indicate whether you agree or disagree and motivate your opinion in one or two sentences.

<p>The answer to this question could be a yes or no; however, you need to provide reasons to justify your answer. There are a number of factors to consider when predicting the spread and impact of a nuclear disaster; this includes the nature and magnitude of a disaster, meteorological variables, response strategies, etc.</p> <p>For example, an explosion at the Chernobyl nuclear power plant in the Ukraine that occurred on 26 April 1986 caused a fire that lasted for ten days. The radioactive debris spread over thousands of square kilometres. The Tsunami floods in Japan on 11 March 2011, damaged the Fukushima Daiichi nuclear power plant contaminating about 1 800 km² of land.</p> <p>Koeberg nuclear power plant is located about 30 km from the city of Cape Town, If a nuclear disaster takes place at the Koeberg nuclear power plant, the spread of radioactive ions in the environment is expected, although it might not be same in magnitude. The extent of the impact of the disaster will depend on the nature and magnitude of the disaster and other factors indicated above. The bottom line is if radiation spreads over more than a 50 km radius, people residing in Cape Town may need to be evacuated, as most areas will probably be contaminated with radioactive material.</p> <p><i>Any other relevant information.</i></p> <p><i>1 mark for opinion and 1 mark for explanation.</i></p>	2
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b. Provide three examples in which nuclear power generation plants have affected the natural environment.

<p>Various ways in which nuclear power generation plants have negatively affected the environment includes, but is not limited to:</p> <ul style="list-style-type: none"> • The construction of a nuclear plant requires a large area, which leads to clearance of forests leading to loss of natural habitat for some species. • The effect of thermal discharges of unused heat from fossil fuel includes problems with reproduction, growth, survival of larval forms, juveniles and adults. • An increased amount of sulphur dioxide in the atmosphere that causes acid rain, which in turn leads to contamination of soil, damage to plants and the surrounding water bodies. • Fish, plankton and benthos are affected at various degrees by thermal discharges from power plants. • Radioactive effluents released from nuclear power plants expose the public to ionising radiation. <p><i>Any other relevant information.</i></p> <p><i>Discussion of any three relevant facts, 1 mark per fact.</i></p>	3
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6. According to Willsher (2016) “... none ever returned to live in Pripjat, declared too radioactively dangerous for human habitation for at least 24,000 years”.

Conduct research on the topic you have identified and then compile a five item reference list containing the following type of sources:

- journal article
- a book
- a chapter in a book
- conference proceedings
- a newspaper article

Consult the referencing guidelines for GGH2604 on myUnisa

<p>Example:</p> <p>Topic: Impacts of Climate Change in Africa</p> <p>A book</p> <p>Akhtar, R. & Palagiano, C. eds. 2017. <i>Climate Change and Air Pollution: The Impact on Human Health in Developed and Developing Countries</i>. Springer.</p> <p>A chapter in a book</p> <p>Cairncross, E, Dalvie, A, Euripidou, R, Irlam, J & Naidoo, RN. 2018. Climate Change, Air Pollution and Health in South Africa. In <i>Climate Change and Air Pollution</i>, edited by R Akhtar & C Palagiano. Springer, Cham: 327-347.</p> <p>Journal article</p> <p>Muluneh, A, Stroosnijder, L, Keesstra, S & Biazin, B. 2017. Adapting to climate change for food security in the Rift Valley dry lands of Ethiopia: supplemental irrigation, plant density and sowing date. <i>The Journal of Agricultural Science</i> 155:703-724.</p> <p>Conference proceedings</p> <p>Goyol, S, Pathirage, C. & Kulatunga, U. 2017. <i>Climate change risk on infrastructure and policy implications of appropriate mitigation measures in the Nigerian agricultural sector</i>. 13th International Postgraduate Research Conference (IPGRC) conference. 14 15 September 2017. UK, Manchester. University of Salford:786-797.</p> <p>News Paper Article</p> <p>Mathews, C. 2017, February. <i>Waking Africa up to the realities of climate change</i>. Available from: https://www.businesslive.co.za/bd/world/africa/2017-10-27-waking-africa-up-to-the-realities-of-climate-change. [Accessed: 19 April 2018].</p>	<p>2</p>
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SEMESTER 1

ASSIGNMENT 02

UNIQUE NUMBER: 752166

DUE DATE: 26/03/2018

The following instructions were given:

The length of each essay must **not exceed ten (10) A4 typed pages per question**. Ensure that your student number, module code and anti-plagiarism declaration appear on the cover page.

Question 1

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“With a 1-metre sea level rise accompanied by 10 per cent intensification of storm surges, the mangrove areas of Gabon, Cameroon, Guinea, Guinea Bissau and Nigeria and the coastal lagoons of Angola and Ghana, in addition to low-lying coastal urban centres and ports, will be inundated” (UNEP 2016:64).

Write an essay in which you:

- a. Discuss the role of mangroves in the functioning of an ecosystem and outline the possible causes and consequences of biodiversity loss in mangroves.**

Mangroves are coastal forests found in sheltered estuaries, and along riverbanks and lagoons in the tropics and subtropics. According to FAO (2007), mangrove ecosystems fulfil a variety of important functions and provide a wide array of ecosystem services.

The role of mangroves includes, but is not limited to:

- Conservation of biological diversity, i.e. conservation of forest genetics
- They provide habitats to a variety of marine, terrestrial and estuarine species; provide spawning grounds, nurseries and nutrients for a variety of species
- Support marine food chain – wide range of fish and shellfish depends on the mangroves
- Serve as a source and sink for nutrients and sediments for coral reefs, sea-grass
- Provide ecosystem protection against the effects of waves, wind and water current
- Water purification – absorbs pollutants from inland runoff
- Reduce coastal erosion by trapping upland runoff sediments
- Regulate the regional climate through cloud formation, regulating evaporation and the transport of energy

Any other relevant information.

*Discussion of **any three** relevant facts, 2 marks per fact.*

- b. Suggest and explain remedial actions that can reduce or prevent biodiversity loss in mangroves. You will benefit by providing real world examples in your answer.**

Remedial actions that can be implemented to reduce or prevent biodiversity loss in the mangroves includes, but is not limited to:

- Rehabilitation: Regeneration of degraded mangrove forest through reforestation and continuous monitoring of the process

- | | |
|---|--|
| <ul style="list-style-type: none">• Conservation: Conservation of critical mangroves ecosystem• Legislation: Implementation and enforcement legislation to protect mangrove areas• Regulation: Regulate the harvest of mangrove forest products to sustainable levels <p><i>Any other relevant information.</i></p> <p>Any three relevant suggestion, 1 x mark per suggestion.</p> | |
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Question 2

Mountain farming communities have evolved over centuries and have practised a range of soil conservation technologies to safeguard their soil resources.

Write an essay in which you:

Examine the origin and characteristics of the following soil conservation techniques that have been adopted by the farming communities in East Africa and assess their effectiveness in soil conservation:

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In order to answer this question, you needed to read pages 4 - 9 in the module study guide (GGH2604/1/2018) and consult other additional sources. You should have examined the origin and characteristics of the soil conservation techniques that have been adopted by the farming communities in East Africa and assess their effectiveness in soil conservation. Below I give an indication on how you could have answered the question. Please note that these are just guidelines not model answers.

(a) Konso terracing practised in Ethiopia

Konso terracing dates back to about 400 years ago; however, the estimated origin is questionable (UNESCO 2011; Watson 2009; Engdawork & Bork 2014). This technique was traditionally developed to reduce and conserve soil. Terraces have a long tradition in the area, and farmers are specialists in construction of stone walls. The traditional Konso bench terraces are established by building stone embankments along the contours and gradually levelling the land in between risers (Linger et al 2011). Levelling is done actively and by siltation processes. This technology has evolved over time from stone embankments to bench terraces in response to increasing population and land pressure (Linger et al 2011). The stone walls are supported on the downslope side by trees and legumes including coffee, pigeon pea, etc. The purpose of the structures is to break the slope length and reduce runoff concentration thereby controlling erosion, increasing water stored in soil and harvesting eroded sediments. This method is complemented by other indigenous soil fertility management methods such as crop rotation, manuring and farm level plantation (Engdawork & Bork 2014). Although Konso bench terracing has been successful in addressing soil erosion, improving soil moisture by improving water infiltration and increasing crop yields, this technology is reported to be labour intensive and the construction takes about 5 years and terraces require regular maintenance.

Any other relevant information.

Examination of origin = 2 marks, 1 x mark per fact; Characteristics = 4 marks, 2 x mark per fact;

Effectiveness = 4 marks, 2 x mark per fact

(b) Fanya juu terracing in Machakos, Kenya

Fanya juu terraces are thought to have been developed in the 1900s. Under colonial regimes, large areas of communal lands were compulsorily terraced in the 1950s (e.g. in Kenya, Malawi and Zambia) through the construction of ridges or bunds (Mati 2006). Later, after independence, the technology was rejected. Then, a period of rapid spread occurred during the 1970s to 1980s with the advent of the National SWC Programme in Kenya. Fanya juu terrace is made by digging a trench and ditches along the contour lines and throwing the soil uphill to form an embankment, which can also be reinforced using grass cover to stabilise the soil and promote siltation of eroded soil (IIRR & ACT 2005; Linger et al 2011). The embankment serves to impound runoff water, eroded soil and nutrients to maintain crop yield. Established grass cover can be used as fodder for

livestock. The fanya juu terraces are effective in reducing soil erosion and improving conditions for plant growth. Fanya juu terraces are associated with hand construction, and are well suited to small-scale farms. Nevertheless, they are also labour intensive and require maintenance to avoid accelerated soil erosion. Moreover, cows can damage terraces easily; ditches for Fanya juu terraces can reduce land for production. In semi-arid areas, the structures are laid out along the contour to maximise water retention, whereas in sub-humid zones they are laterally graded to discharge excess runoff.

Any other relevant information.

Examination of origin = 2 marks, 1 x mark per fact; Characteristics = 4 marks, 2 x mark per fact;

Effectiveness = 4 marks, 2 x mark per fact

(c) Contour terracing in Kigezi region, Uganda

Contour terracing in Kigezi region in Uganda (now called Kabale) dates back to the early period before the colonial era (Carswell 2003). This is an indigenous soil and water conservation method practiced in the cultivation of the steep slopes over the regions. This practice involved growing crops in strips across the slopes with intervening strips of uncleared land (Miuro 1999). In the 1920s, the colonial government echoed the problem of soil erosion and landslides triggered by intensive cultivation and farming on the steep slopes. Consequently, the district agriculture official at the time introduced measures for combating soil erosion, which included building ridge terraces at the bottom of the plot running along the contour. The effectiveness of this method is optimised by integrating additional soil conservation measures such as planting of elephant grass strips along the contour (Miuro 1999; Carswell 2006). The colonial administrators implemented strip cultivation on the contour and bunding approach later in the 1940s (Bolwig 2002). Planting vegetation strips and grasses reduces runoff and increases the soil moisture content through improved infiltration. Although contour terracing was effective in conserving the soil to some extent, some farmers later abandoned this approach due to a number of issues, which includes terraces requiring routine maintenance and repair, which is labour intensive; loss of land for farming due to risers of terraces; rodents and pest problems in the vegetation and grasses strip.

Any other relevant information.

Examination of origin = 2 marks, 1 x mark per fact; Characteristics = 4 marks, 2 x mark per fact;

Effectiveness = 4 marks, 2 x mark per fact

b. Suggest the most effective approach and provide reasons to support your opinion.

The answer to this question could be any relevant approach; however, you need to provide reasons to justify your answer. It is essential to note that the efficiency of terracing in conserving the soil depends on various factors, which includes the local climate conditions, physiography, soil characteristics, farmers' capacity etc. In East Africa, local farmers have adopted and integrated the practices that are now an essential part of the district farming community (Miuro 1999; Carswell 2006).

Suggested approach, 2 marks.

Any relevant explanation, 3 marks.

Total: [60]

3 SOURCES CONSULTED

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4 ACKNOWLEDGEMENT

Dr SC Nenwiini compiled this tutorial letter.