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Geography (UACE 250/2) paper 2 Revision questions for famine, desertification in the world

1. To what extent have physical factors contributed to the famine problem in Sub-Saharan Africa? (Candidates should define famine; identify sub-Saharan region and the most hit area by famine in Sahel region; describe the physical factors that contributed to famine and finally evaluate the question with the other factors responsible for famine.)

Solution

Famine is a situation where there is food shortage/people lack enough food to eat due to harsh climatic conditions.

Sub-Saharan region is a region of the Sahara desert. Countries affected/ hit by famine include Sudan, Somalia, Ethiopia, Eritrea, Mali, Chad, Mauritania and others outside the Sahel e.g. Zambia, Tanzania, Mozambique, Zimbabwe etc.

Physical factors responsible for famine

- Harsh climatic conditions such as prolonged drought in Somalia, Mali, Mauritania or floods e.g. in Senegal that destroy crops and limit livestock rearing have led to widespread scarcity of food termed as famine.
- Poor soils of low productivity, for example porous sandy soils of the Sahara (Mali, Mauritania, Sudan and northern Kenya, Somalia cannot support growth of food hence food scarcity that culminated into famine.
- Influence of dry winds e.g. the North East Trade Winds in Somalia; Northern Kenya, Southern Sudan and the dry Harmattan winds in the Sahara bring arid conditions that don't favor agriculture such hence famine.
- Pests and diseases that destroy both crops, livestock and humans. For example locusts in the Sahel and Sahara desert destroy crops for example in Mali, Darfur in Egypt, Chad, and Mauritania leading to food scarcity. Other pests are weevils, caterpillar (moths) and army worms which destroy cassava, beans and banana. Tsetse flies in Niger and Nigeria have killed many cattle leading to scarcity of beef.
- Limited surface water / poor drainage to support crop production and livestock rearing. There is limited surface water for irrigation in the Sahel region such as Senegal, Niger, and Somalia to support the growth of pastures for feeding livestock: or growth of crops. This has led to occurrence of famine.
- Relief factors such as relatively flat lands of Sudan, Senegal, and Mali are associated with high temperature not capable of supporting impressive agriculture.

- Highland areas e.g. the Ethiopian highlands limit mechanized farming resulting into food scarcity.

Other factors responsible for famine in sub-Saharan

- Political instabilities in Somalia, Zimbabwe, Ethiopia, and Sudan disrupt agricultural activities in that people have no time to attend to crops in the field or rear livestock.
- High population growth in Somalia, Zimbabwe, and Ethiopia has led to limited land available to be used in food production thus resulting into widespread scarcity of food or famine because the available land cannot be used to produce enough food for the rising population.
- Poor transport facilities to link food production areas to market centres have led to famine in Sudan, Somalia, Ethiopia.
- Inadequate storage facilities to store food during the harvesting period has resulted into loss of foods hence food shortage during the drought season in Zambia, Chad, Mali.
- Limited/ inadequate capital to purchase agricultural equipment, fertilizers, Hi-breed seeds have led to low agricultural productivity in Mali, Kenya, and Somalia resulting into famine.
- Rural-urban migration has led to limited labour to attend to agriculture in rural areas resulting into reduction of livestock and food crops thus escalating the problem of food scarcity.
- The colonial policies which emphasized production of cash crops like rubber in Liberia, cotton, coffee and tea in Tanzania, Uganda and Tanzania, sisal in Tanzania, etc. lead to limited food production.
- Subsistence farming system lead to low food production.
- Low levels of education to adapt better farming techniques such as crop rotation, mulching, irrigation have led to low level of agricultural productivity hence food shortages.
- Bush burning, shifting cultivation and deforestation in Niger, Sudan, Zimbabwe led to land degradation, reduced rainfall resulting into reduced land productivity hence famine.
- Poor land tenure system where much of the land belongs to a few people who often have failed to optimally utilize that land have led to decline in food production thereby off-setting famine.

2. To what extent have human factors contributed to widespread famine in Africa?(25 marks)

(Candidates should define **the term famine and name countries affected, explain human factors that contribute to famine and finally windup with other factors**)

Solution

Famine is an acute shortage of food

Countries affected by famine in Africa include Sudan, Kenya, Zambia, Uganda, Tanzania. Ethiopia, Eritrea, Somalia, Chad, Nigeria. Angola, Mauritania etc.

Human factors that have led to wide spread famine in Africa include

- Poor farming methods like monoculture, over cultivation, overstocking leading to poor food yields.
- Unfavourable government policies e.g. insufficient investment in agriculture, provision of extension services etc.

- The poor storage and preservation methods e.g. the granaries do not, preserve food for very long period leading to food wastage.
- The emphasis on subsistence production of food crops doesn't allow presence of food surpluses to be consumed in case of crop failure.
- Political instabilities in Somalia, Zimbabwe, Ethiopia, and Sudan disrupt agricultural activities in that people have no time to attend to crops in the field or rear livestock.
- High population growth in Somalia, Zimbabwe, and Ethiopia has led to limited land available for food production.
- Poor transport facilities to link food production areas to market centres have led to famine in Sudan, Somalia, Ethiopia.
- Inadequate storage facilities to store food during the harvesting period has resulted into loss of foods hence food shortage during the drought season in Zambia, Chad. Mali.
- Limited capital to purchase agricultural equipment, fertilizers, and Hi-breed seeds have led to low agricultural productivity in Mal, Kenya, and Somalia resulting into famine.
- Rural-urban migration has led to limited labor to attend to agriculture in rural areas resulting into reduction of livestock and food crops thus escalating the problem of food scarcity.
- The colonial policies which emphasized production of cash crops like rubber in Liberia, cotton, coffee and tea in Tanzania , Uganda and Tanzania, sisal in Tanzania, palm oil in Nigeria, cocoa in Ghana and in much of Africa have led to scarcity of food to cater for the increasing population thus the occurrence of famine.
- Subsistence farming systems like small holder farming, shifting cultivation have limited production of food to sustain the growing Population resulting into famine in Mali, Mauritania, Somalia.
- Low level of education to adopt better farming techniques such as crop rotation, mulching, irrigation have led to low level of agricultural productivity hence food shortages.
- Bush burning, shifting cultivation and deforestation in Niger, Sudan, Zimbabwe led to land degradation, reduced rainfall resulting into reduced land productivity hence famine.
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Physical factors responsible for famine

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- Influence of dry winds e.g. the North East Trade Winds in Somalia; Northern Kenya, Southern Sudan and the dry Harmattan winds in the Sahara bring arid conditions that don't favor agriculture such hence famine.
- Pests and diseases that destroy both crops, livestock and humans. For example locusts in the

Sahel and Sahara desert destroy crops for example in Mali, Darfur in Egypt, Chad, and Mauritania leading to food scarcity. Other pests are weevils, caterpillar (moths) and army worms which destroy cassava, beans and banana. Tsetse flies in Niger and Nigeria have killed many cattle leading to scarcity of beef.

- Limited surface water / poor drainage to support crop production and livestock rearing. There is limited surface water for irrigation in the Sahel region such as Senegal, Niger, and Somalia to support the growth of pastures for feeding livestock: or growth of crops. This has led to occurrence of famine.
- Relief factors such as relatively flat lands of Sudan, Senegal, and Mali are associated with high temperature not capable of supporting impressive agriculture.
- Highland areas e.g. the Ethiopian highlands limit mechanized farming resulting into food scarcity.

3. Examine causes and effects of desertification in **either** California or Namibia. (25 marks)
Or Account for the environmental degradation in **either** Namibia **or** the Sahel region of Africa. (25marks)

(The Candidate is expected to select one country and explain the causes and effects of desertification i.e. in either California or Namibia.)

Solution

Desertification is a process whereby desert conditions e.g. very dry, very hot conditions etc. are extended to the Marginal lands.

The causes and effects of desertification are more or less similar in either California or Namibia.

Causes

- Persistent drought conditions throughout almost the whole of Namibia are greatly responsible for desertification.
- The influence of dry winds. There is effect of Berg wind i.e. a hot dry wind blowing down the great escarpment from the high central plateau to the coast which undergoes further warming by adiabatic processes. This is responsible for the hot and dry conditions along the coastline of Namibia
- The absence of water bodies. Namibia is a very large country but with few water bodies such as Lake Otjikoto, R. Hoanib, L. Guinas, R. Hoarusib and R. Ugab. These are not enough to neutralize the effect of long spells of drought
- The influence of the rain shadow in leeward effect. Central Namibia is characterized by rolling hills and mountains like Auas Mountain to the west of Windhoek capital and Eros Mountains in the east. But Namibia almost doesn't have snow so the berg winds that ascend the mountains are always dry leaving both sides of the mountains dry and hot
- The influence of distance from the sea/ Continentality. Namibia is a large country and great part of it is far from the Atlantic Ocean and water bodies and therefore don't enjoy the benefits of

sea and land breeze which culminates into rain fall and reduced temperatures.

- The absence of vegetation cover/ scanty vegetation. Much of Namibia is savannah. This is characterized by thorn bushes, acacia bushes, camel-thorn trees and others. These do not lead to formation of rainfall hence responsible for aridity in such areas.
- The presence of poor/ unproductive soils. The soils in Namibia are exposed to sweeping dry winds leaving them bereft of the nutrients. These do not support farming/vegetation and therefore are responsible for aridity in the areas.
- The influence of pests and wild animals. The wild animals in Namibia feed on the scanty vegetation worsening the already dangerous situation hence accelerating the rate of aridity.
- The poor farming method e.g. monoculture, bush burning, overgrazing etc. All these leave the grounds bare and therefore subjected to strong sweeping dry winds leading to aridity.
- The destruction of vegetation by man. People are cutting down trees to use them as a source of fuel. In such areas, there is nothing to protect the soil, this therefore turns to dust and is blown away by wind leading to desertification
- Swamp reclamation leads to depletion of water resources. This takes place mainly along Orange River in Namibia. This has caused River beds to be dry leading to aridity
- The sinking of boreholes and construction of dams. Several dams such as Omatako Dam, Von Bach Dam in central Namibia tend to drop the water table that is a source of water for vegetation. This is followed by increasingly poor and scanty vegetation.
- Pollution especially through industrial emissions. This leads to destruction of the ozone layer leading to increasing temperatures.
- Mining and quarrying. For example the mining of Diamond at Roessing mine of Arandis in the Khan Mountains and Australian Paladin mine at Langer-Heinrich leads to destruction of vegetation thus elimination of the source of atmospheric vapour. This also leads to accelerated soil erosion which culminates into desertification.
- Population pressure due to limited land for agriculture has led to destruction of vegetation and water resources in the marginal lands for farming.
- The cold Benguela ocean currents that originates from upwelling of water from the cold depths of the Atlantic ocean leading to dry onshore winds.

Effects of desertification

- Destruction of trees created energy crisis.
- The resultant very dry conditions have led to persistent famine/ food crisis.
- There is death/ loss of low diversity e.g. animals, birds and people.
- The increased to increase water shortage.
- It contributed to the refugee problem/ wandering/ displacements.
- It contributed to poverty.
- Generation of conflicts.
- It has led land reclamation.

4. To what extent are natural factors responsible for the expansion of deserts in Africa? (25

marks)

(Candidates are expected to explain the contribution of **natural** factors **and the human** factors to the expansion of deserts in **Africa**.)

Solution

Expansion of deserts is a process where countries at the margins of the deserts are experiencing characteristics of the desert e.g. very hot temperatures, low water levels, very dry conditions etc.

The countries that are affected by desert expansion include, republic of South Africa, Botswana, Ethiopia, Chad, Nigeria, Sudan etc.

The natural factors that have led to desert expansion in Africa include:

- **Influence of dry winds.** The Harmattan wind from Sudan is hot and dry and tends to bring high temperatures in northern Uganda. The North east trade winds from Ethiopia lose moisture along the Ethiopian highland and descend in the south as dry and hot winds, causing desertification in Northern Kenya. They cause desertification in the Turkana land, Pokot land and Chalbi desert.
- **Flat landscape** has also led to desertification. The absence of mountains to trap rain bearing winds has led to desertification in the rift valley region like L. Albert flats, North Eastern Uganda, Northern Tanzania particularly around the Olduvai Gorge and Serengeti plains and Nyika Plateau in Kenya
- **Continental** or distance from the sea has also led to desertification. Areas distant from the ocean or big water bodies like L. Victoria tend to be affected by desertification. e.g. much of Zambia, Zimbabwe, central Tanzania and Northern Kenya are far from the major water bodies and therefore don't enjoy the benefits of land and sea breeze which culminates into rainfall and reduced temperatures.
- **Coriolis force** lead to desertification in that much of the winds are deflected to the right and therefore end up in the Indian ocean thus depriving much of East Africa particularly central Tanzania and Northern Kenya off rainfall
- **Perturbation** is another cause for aridity in East Africa. The Indian Ocean is often a region of high temperature and therefore low pressure. Winds are sucked or drawn from the continental interior into the low pressure zone (Indian Ocean), hence causing desertification in the interior like Northern Kenya while forming heavy rains in the ocean.
- **Climatic changes** e.g. increase in atmospheric temperatures.
- **Poor soils.** These do not support the growth of proper vegetation leaving the soils exposed to the agents of erosion hence leading to high temperatures.
- Limited surface water.
- **Influence of pests** e.g. locusts and wild animals.
- **Natural hazards** such as floods, volcanic eruption, natural fires cause destruction of vegetation

The human/actors include:

- Practices of overstocking by Masai in Kenya and Tanzania, Fulani in Nigeria, Mali, Bedouin Arabs

in Egypt, Darfur of Sudan reduces / destroys vegetation which is a source of vapour through transpiration. This has led to desertification in the Nigeria, Somalia, Mali etc.

- Overgrazing by livestock and wild animals in game parks like Okavango basin in Angola, Masai - Mara in Kenya and Tanzania leads to reduction in vegetation thus affecting formation of rainfall through evaporation/transpiration.
- Deforestation e.g. depletion of Gabonese forests in Gabon, forests in Ivory Coast eliminates the source of atmospheric moisture through transpiration. This leads to increase in temperature and changes in rainfall season is a result of deforestation..
- Wetland reclamation either for settlement or growing of rice /agriculture for example at Port Harcourt in Nigeria, along the shores of lake Volta in Ghana eliminates source of vapour through evapotranspiration. This leads to scarcity of rainfall as well as reduction in humidity leading to desertification..
- Bush burning by farmers particularly the Fulani pastoralists in Nigeria destroys vegetation leading to reduced atmospheric vapour. The smoke contributes to the greenhouse effect leading to increasing temperatures thus desertification.
- Industrialization leads to desertification through a number of ways. First it involves wetland reclamation and Deforestation to create land for industrial establishments. This eliminates source of atmospheric vapour.
- Greenhouse gases and smoke from industries leads to destruction of the ozone layer leading to increasing temperature.
- Drilling bore holes and construction of valley dams in Sudan, Somalia, Nigeria, Angola, Zambia and Turkana region in Kenya tend to drop the water table that is a source of water for vegetation. This is followed by increasingly poor and scanty vegetation.
- Mining and quarrying for example the Zambia copper belt, Katanga region of DR. Congo leads to destruction of vegetation thus elimination of the source of atmospheric vapour. This also leads to accelerated soil erosion which culminates into desertification.
- Along the Ethiopian highlands, Fouta Djallon, Adamawa highlands of Cameroon, poor methods of cultivation such as up and down ploughing across a slope, growing of crops in dry areas have significant impact in causing desertification. Such methods leads to soil erosion which also eliminates vegetation cover.
- Political conflict and wars especially in Somalia; Liberia., Angola, have led to destruction of vegetation.
- Forests are partly destroyed in the bid to eliminate rebel hiding grounds. Consequently this eliminates the source of atmospheric vapour leading to reduced humidity, rainfall, and rising temperatures hence desertification

5. Examine the causes and effects of desertification in the Sahel region in Africa. (25marks)

(candidates should define the term desertification, then explain the causes and effects of desertification)

Solution

Desertification is the process of turning productive area into unproductive land. This takes place in areas mainly adjacent to the desert area of Sahara, Chad, Somalia, Ethiopia, Senegal, Mali and Sudan.

It is characterized by frequent draught, large expanse of bareland, low and unreliable rainfall of less than 500mm per annum, reduced productivity of land, soil erosion, reduced water levels in rivers, lakes and swamps

Causes of desertification

Human factors

- Overstocking by pastoralists reduce/destroy vegetation causing reduction of transpiration and rainfall.
- Overgrazing by livestock and wild animals in national parks destroy the vegetation cover
- Deforestation due cutting down trees for fuel, construction, removes sources of moisture as a result of transpiration.
- Wetland reclamation either for settlement or agriculture reduces the source of atmospheric moisture leading to a reduction of rainfall.
- Bush burning destroys vegetation cover exposing soil to agents of erosion.
- Industrialization causes desertification by removing vegetation cover and release of greenhouse gases to the atmosphere.
- Drilling of boreholes lowers the water level denying vegetation access to water.
- Mining and quarrying destroy forests and vegetation cover leading to desertification.
- Poor methods of cultivation such as monoculture reduces the soils ability to support plant growth
- Political instability lead desertification because vegetations are destroyed by explosives and forests are cutdown to eliminate rebel hide outs.

Physical factors

- **Influence of dry winds.** The Harmattan wind from Sudan is hot and dry and tends to bring high temperatures in northern Uganda. The North east trade winds from Ethiopia lose moisture along the Ethiopian highland and descend in the south as dry and hot winds, causing desertification in Northern Kenya. They cause desertification in the Turkana land, Pokot land and Chalbi desert.
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Plateau in Kenya

- **Continentality** or distance from the sea has also led to desertification. Areas distant from the ocean or big water bodies like L. Victoria tend to be affected by desertification. e.g. much of Zambia, Zimbabwe, central Tanzania and Northern Kenya are far from the major water bodies and therefore don't enjoy the benefits of land and sea breeze which culminates into rainfall and reduced temperatures.
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- **Climatic changes** e.g. increase in atmospheric temperatures.
- **Poor soils.** These do not support the growth of proper vegetation leaving the soils exposed to the agents of erosion hence leading to high temperatures.
- Limited surface water.
- **Influence of pests** e.g. locusts and wild animals.
- **Natural hazards** such as floods, volcanic eruption, natural fires cause destruction of vegetation

Effects/impacts of desertification

- Reduces land for settlement and agriculture activities
- Leads to famine and prolonged drought causing deaths
- Encourages nomadism in search for water and pasture for animals
- Makes construction of transport lines expensive
- Lowering of water table increases aridity
- Leads to concentration of settlement along water points.

Thank you

Dr. Bbosa Science