Humanities Department
H2 Geography (9173)

Name: _____ Class: _____ Duration: 1 h 30 mins

Senior High 1 H2 Geography Seminar Test 1 – SUGGESTED MARKING GUIDE

Section A

Cluster 2: Tropical Environments

1 Resource 1 shows land use changes within the Enkare Narok drainage basin in Narok county in Southwest Kenya from 1985 to 2019. Resource 2 shows an aerial view of the Enkare Narok River within the Enkare Narok drainage basin. Resource 3 shows a news excerpt on Naroosura River's flow. Resource 4 shows flood risk map of Kenya.

(a) Describe the changes in land use within Enkare Narok drainage basin shown in Resource 1. [4]

Award 1 mark for each description of the changes in land use, up to a maximum of 4 marks. Award a maximum of 1 additional mark for further development of each description, where applicable.

Possible responses include:

- [General] Forest and rangeland land uses were dominant in 1985 but in 2019, agriculture became the dominant land use in Enkare Narok drainage basin [1 mark].
    - In 1985, forest and rangeland accounted for 98.1% of land use whereas in 2019, agriculture made up more than half (55.4%) of the land use [1 additional mark]
- [Specifics] Agriculture experienced the largest increase in terms of land use, from 0% in 1985 to 55.4% in 2019 [1 mark]
- [Specifics] On the other hand, forest saw the largest decrease in terms of land use, from 46.5% in 1985 to only 6.2% in 2019 [1 mark]
- [Specifics] Built up area made up 1.9% of the land use in northwest region of the drainage basin. It then spread north and eastwards to make up 12.5% of the drainage basin in 2019 [1 mark]
- [Anomaly] Agriculture and built up areas saw increase in land uses from 1985 to 2000 and then from 2000 to 2019 while forest saw a decrease over the 2 time periods. However, rangeland saw an increase [1 mark]
    - of 2.5% from 1985 to 2000 then a decrease of 27.2% from 2000 to 2019 [1 additional mark]

AO2

(b) With reference to Resource 1, explain how land use changes may affect water storages and pathways in the Enkare Narok drainage basin. [6]

Award 1 mark for each explanation of how land use changes may affect water storages and pathways in the Enkare Narok drainage basin, to a maximum of 6 marks.
Award a maximum of 1 additional mark for further development of each explanation, where applicable.
Award a maximum of 3 marks for explanation of either impact on pathways or water storages only.

Possible responses include:
Impact on pathways:

- The decrease in forest and rangeland land uses and increase in built up areas and agriculture would lead to the reduction in density of vegetation within the drainage basin and cause less infiltration and percolation, but more overland flow [1 mark].
    - This is because vegetation helps to intercept precipitation and reduce the intensity of rainfall reaching the earth's surface, thereby increasing the chance of infiltration OR The decomposition of vegetation also produce humus that helps to increase soil porosity and hence, infiltration capacity of the ground which promotes infiltration [1 additional mark]
- The lowered amount of precipitation infiltrating into the ground means that there would be less sub-surface lateral flows (e.g. throughflow and baseflow) [1 mark]
- As there is the generation of more overland flow, water would be transported to the channel much faster, which increases the peak channel flow with a shorter lag time [1 mark]

Impact on water storages:

- The change in dominant land use from forest and rangeland uses to built up areas and agriculture means that there is presence of less dense vegetation. This would mean less interception storage within the drainage basin [1 mark]
- Due to less infiltration and percolation, sub-surface water storage which include both soil moisture and groundwater storage would be less, particularly for areas covered by built up areas [1 mark]
- In general, channel storage as a whole could be reduced due to less evapotranspiration (due to reduction of vegetation) and hence less precipitation into the drainage basin [1 mark]

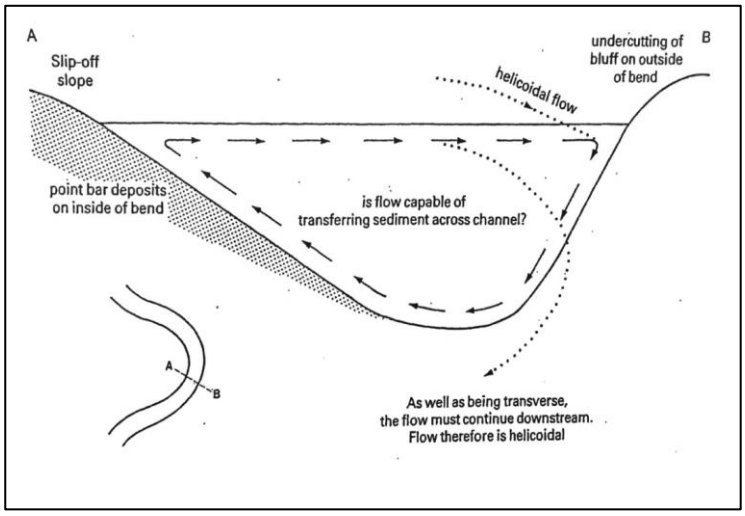
AO2

(c) Describe the main features of a meander, such as the one shown in Resource 2, using a well-labelled cross-section diagram. [4]

Award 1 mark for each description of the main features using a well-labelled cross section diagram, up to a maximum of 4 marks.
Award a maximum of 1 additional mark for further development of each description, where applicable

Possible cross-section diagram labels include:

- Asymmetrical cross section
- Concave bank
  - River cliff
- Convex bank
  - Point bar and slip off slope
- Sinuous channel (if aerial view is accompanied with the cross section diagram)



AO1

(d) Explain how meanders, such as the one shown in Resource 2, are formed. [6]

Award 1 mark for each explanation of the formation of a meander, to a maximum of 6 marks.
Award a maximum of 1 additional mark for further development of each explanation, where applicable.
Award a maximum of 3 marks for explanation of meander from the aerial view or from the cross section view only.

Possible responses include:
Aerial view:

- [flows] In an almost straight channel (sinuosity<1.5), there is a main downstream flow with thalweg that swings from side to side, and a secondary helicoidal flow [1 mark]
    - A sinuous path is created within a straight channel [1 additional mark]
- [riffles] Alternating bars of sediment form by deposition in the lower velocity areas on either side of the thalweg and extend downstream [1 mark]
    - These bars deflect the flow against the opposite bank, initiating erosion, channel curvature and the formation of meanders. [1 additional mark]
- [pools] At areas where velocity is higher, erosion takes place, resulting in the formation of pools [1 mark]
    - As this process continues, a series of pools and riffles is soon formed. [1 additional mark]

Cross section:

- [concave bank + river cliff] Helicoidal flow causes the water to pile up against the outer concave bank resulting in the formation of river cliff [1 mark]
- [convex bank + slip off slope] When the water moves towards the convex bank due to the helicoidal flow, frictional drag with the river bed will lead to a loss of energy. Deposition of materials takes place at the convex bank. Formation of a slip-off slope at the convex bank. [1 mark]
- [surface flow] The surface flow of water from the convex bank back to the concave bank then completes the cycle. [1 mark]

AO1

(e) Using Resource 3, explain the possible changes to fluvial processes in the Enkare Narok River over a year. [4]

Award 1 mark for each explanation of possible changes to fluvial processes in the Naroosura River, to a maximum of 4 marks.
Award a maximum of 1 additional mark for further development of each explanation, where applicable.

Possible responses include:

- The rainfall pattern of Narok County in Kenya shows that it has 2 wetter seasons which peak in Apr and Dec and dry season in the middle of the year (May – Oct), as well as in Jan – Feb [1 mark]

- Wet season: higher discharge would mean that the river has higher energy to engage in erosion [1 mark]
- Dry season: lower discharge at the start and middle of the year would result in lower energy and hence capacity to transport load, resulting in deposition to be more dominant [1 mark]
- Transportation: In terms of transportation, wet seasons would see the river carrying higher amount and larger sized load as compared to dry seasons where the river only has sufficient energy to carry smaller amount of load and smaller-sized sediments due to lowered competence [1 mark]

AO2

(f) With reference to Resource 4, suggest reasons to account for the variations in flood risk in Kenya. [6]

Award 1 mark for each suggestion on the variations in flood risk, to a maximum of 6 marks.
Award a maximum of 1 additional mark for further development of each suggestion, where applicable.

Possible responses include:

- [Hazard] Areas with higher flood risk could be experiencing higher magnitude and frequency of floods [1 mark]
    - For example, the county Tana River has 2 rivers running across it and these rivers may be of larger capacity, such that when it floods, it can cause greater damages [1 additional mark]
    - Some counties, such as Mandera, may have unfavourable topography (as indicated by 'inaccessible flood-affected areas') that brings precipitation quickly to the river, resulting in less reaction time between the rainfall and flood events [1 additional mark]
- [Vulnerability] Across the various counties, vulnerability of people to flood could differ due to socio-economic conditions, where the access to greater resources could lead to greater preparation to reduce the impact of flood [1 mark]
    - For example, despite many rivers running through some counties like Marsabit, the number of people displaced is the lowest (below 5000). This could be due to the counties making up of more people with higher economic status who are able to afford and access more flood-proof housing, hence resulting in less impact as compared to those with lower economic status [1 additional mark]
- [Capacity to cope] Various counties may put in place different strategies to cope with flood. Counties with ample flood management strategies (mitigation and response) would be of less flood risk compared to other counties with little to no flood management strategies [1 mark]
    - This is seen in Resource 4 where some counties are at risk of active transmission of cholera or chikugunya (e.g. Kiambu, Mombasa) possibly due to lack of drainage capacity or sewerage system that lead to accumulation of waste and water, and hence the transmission of such disesases [1 additional mark]

Commented [CCV1]: Is it necessary to identify example(s)? Cos the above point does (Tana River)

Commented [ALJW2R1]: Have edited such that reference must be made to the resource!

Commented [CCV3]: Was just wondering if there is a difference between flood risk and flood management

Commented [ALJW4R3]: In this case, yes because flood risk equation looks at capacity to cope as a variable as well, which we then used flood management strategies as the proxy

Section B

Cluster 2: Tropical Environments

2 'Natural factors have a large influence on hydrological processes that take place within a drainage basin in the tropics.'

Evaluate the validity of the statement.

Indicative Content
Candidates should be able to evaluate the extent to which natural factors have an influence on hydrological processes within a drainage basin. This entails an understanding of hydrological processes – which includes the input, outputs, transfers and storages within the hydrological system.

Candidates should be able to explain how natural factors influence hydrological processes that take place within a drainage basin. Natural factors include climate and surface ground characteristics. Possible points include how climate and surface ground characteristics influence hydrological processes that take place in the drainage basin. Climate influences hydrological processes by affecting the amount of water that gets circulated within the drainage basin influencing input and output of the hydrological cycle. Surface ground characteristics influences the proportion of water that is transferred and stored in the various transfers and storages.

In this essay, students should focus on evaluating the role of natural factors and its influence on the various processes in the drainage basin. The discussion should also include other factors that could influence hydrological processes (e.g., human factors like deforestation and urbanisation) but comparing it with natural factors to make a holistic analysis on the extent of influence exerted by natural factors on hydrological processes. Human activities have the potential to modify the water balance influenced by climate or through changing surface ground characteristics directly, changing in how hydrological processes operate within a drainage basin as a result.

A higher-level response will be exemplified with relevant case studies from the tropics. It will also adopt a system approach in its analysis, recognising the interdependence of many various factors that influence hydrological processes in the drainage basin. The use of key geographical concepts such as scale, time and space in the evaluation of natural factors' influence on hydrological processes in the drainage basin would also distinguish the response as a higher-level one.

Levels marked using Generic Level Descriptors for 20m H2 essays

AO3

Commented [CCV5]: Just wondering if/abt the overlap between the DRQ and SEQ.

Commented [ALJW6R5]: No overlap! The only overlap in topic is in part (b). However, part (b) requires students to make use of the resource to discuss the implications on specific hydrological processes. Whereas for this EQ, it focuses on getting students to evaluate across natural and human factors on their broad influence on hydrological processes (which includes water balance)