**LESSON NOTE WEEK 7**

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| **EARTH’S EXTERNAL PROCESSES**  **ACTION OF RUNNING WATER**    When rain falls on the earth, it is distributed in various ways and flow directly off slopes to join streets and rivers, eventually reaching streams and rivers, oceans and seas, known as ***runoff.*** The source of a river may be spring, lake or marsh, but they generally flow from uplands to lowlands. The run-offs carve out channels as they flow and they transport and deposit materials for very great distances along the course making running water a great agent of denudation.  Running water refers to any mass of water flowing over the land surface. Rivers are involved in erosion transportation and deposition of materials.  **TERMS ASSOCIATED WITH RIVERS**  **Source of River:** The source a river refers to where a river starts or begins, usually around highlands.  **Course of a River:** This refers to the path or channel through which the river flows.  **Mouth of River:** This is where the river ends or where it enters into the sea, ocean or lake.  **Watershed or water divide:** It is the highland area which separates two or more rivers or two river basins. It is from the watershed that rivers take their sources.  **River Regime:** This refers to the seasonal changes in the volume of water in a river in a year.  **Tributaries:** These are smaller rivers or streams that join together to form a larger river.  **Distributaries:** These are channels formed by the division of a river as it flows into the sea. They are usually found in the delta region of a river.  **River Energy:** It refers to the velocity of a river. The efficiency of a river to erode and transport the eroded materials depends very much on its velocity.  **STAGES OF A RIVER**  **course of river development**  The entire length, valley or course of a river is divided into three main stages.  - The upper course or mountain course (Youthful stage).  - The middle course or valley course (Mature stage).  - The lower course or plain course (Old stage).  **UPPER COURSE OF A RIVER**  The upper course is the section at the beginning of the river, nearest the source. Rivers usually begin in an upland area, like the top of a mountain. Snow melts or rain falls on high ground and begins to flow downhill. The upper course of a river is usually steep and narrow.  UPPER COURSE  CHARACTERISITICS OF UPPER COURSE   1. Found around the river source 2. Has steep side V-shaped valleys 3. Swift and fast flowing 4. Head-ward erosion occurs and it is dominantly vertical.   **MIDDLE COURSE OF A RIVER**  The section of the river which comes between the upper and lower course. It is usually wider and deeper than the upper course and the water flows slowly.  middle course of river Middle or mature stage  CHARACTERISTICS OF MIDDLE COURSE OF A RIVER   1. Valleys are U-shaped and widened 2. The river load increases 3. The slope is more gentle 4. Velocity is reduced 5. Meanders begin to form etc.   **LOWER COURSE OF RIVER**  The final section of a river which flows into another body of water which could be a loch, the sea, an ocean or even another river. A river's lower course is slower and has less energy to carry material, like sand and sediment.  lower course old stage of river lower course  CHARACTERISTICS OF LOWER COURSE OF RIVER   1. Deposition occurs here 2. Water volume increases as a result of additional tributaries 3. Gentle slope 4. The meanders are more pronounced 5. Presence of deltas, , braided channels, sand dunes, distributaries etc. |

**LESSON NOTE WEEK 8**

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| **RIVER PROCESSES**  They are the interactions between the flowing water and the river channel, which result in changes to the landscape along the river's course. River processes are also called Fluvial processes.  river process  Examples of river processes are;   1. **Erosion**: River erosion is the process through which the river bed and bank are worn away. It also includes the wearing down of the sediments carried by the river. River erosion can be lateral and vertical. The processes of erosion include; Hydraulic action, Abrasion, Attrition, Solution.   **PROCESSES OF RIVER EROSION**  The erosive work of a river consists of four interacting processes:   1. HYDRAULIC ACTION: the wearing down of the load as they collide with one another and with the floor and sides of the valley. 2. CORROSION: the wearing away of the sides and the floor of the river valley with the aid of sand pebbles, slit and boulder which are being transported. They widen and deepen the river valley 3. ATTRITTION: the loads of materials being transported wear down as they collide with one another as boulders are broken down into smaller pebbles. 4. SOLUTION: the chemical action of water on materials it touches when flowing, causing a dissolution of rock particles and carried away in solution.   river erosion River erosion   1. **Transportation**: Transportation is when rivers carry their load downstream. Like erosion, there are four types of river transportation processes:Traction, Saltation, Suspension, Solution.   **Processes of river transportation**   1. SOLUTION: dissolved rock materials are carried from upper course of the river 2. SUSPENSION: lighter materials are carried as suspension as the water flows 3. SALTATION: larger particles are moved in hops or jumps along the stream bed 4. TRACTION: very large fragments of materials are rolled or pushed into the river.   river process transportation   1. **Deposition**: Deposition is the process through which the river drops its load. This happens when the river's speed decreases due to a loss of energy or a reduction in discharge. In most rivers, deposition takes place in a sequence according to the size of the material. Larger, heavier materials such as boulders are deposited first, and finer materials such as clay are deposited last.   river deposition River processes and land-forms The river or fluvial processes of erosion and deposition, aided by transportation, help the river to alter the landscape and form different types of fluvial land-forms. LAND-FORMS FROM RIVER EROSION. The river's upper course is dominated by vertical erosion since most of the river's energy is used to cut downward. In this part of the river, you will find the fluvial land-forms of waterfalls, gorges and interlocking spurs. *Waterfalls and gorges* Waterfalls are sudden drops along a river's course. They form when the river erodes exposed soft rock which is layered over a band of hard rock. Over time the hard rock is left overhanging. The overhang will then collapse because it is no longer supported. After the collapse, the stream falls over the remaining ledge as a **waterfall**. When waterfalls continuously erode backwards, they leave a steep-sided valley called a **gorge**. The image below shows a waterfall and a gorge.  waterfall Gurara water fall *Interlocking Spurs* Interlocking spurs are outcrops of harder rock that alternate projecting from either side of a v-shaped valley which causes the river to flow around them. They are also found in the river's upper course and fit together in a "zip-like" manner.  interlocking spurs spurs LANDFORMS FROM RIVER EROSION AND DEPOSITION. In the river's middle course, erosion and deposition work together to form landforms. Here, vertical erosion replaces lateral erosion. In this part of the river, you will find the fluvial landforms of meanders and ox-bow lakes. *Meanders* Meanders are bends in the river. They develop when lateral erosion, which occurs on the river's outer bank, is coupled with deposition on the river's inner bank. These dual processes working together eventually cause the river to curve.  meander_GSC_large meandears *Ox-bow lakes* An ox-bow lake is a horseshoe, or crescent-shaped lake found close to meanders. They represent former meanders that were cut off by the river during a period of flooding.  oxbow lake oxbow 2 LANDFORMS FROM RIVER DEPOSITION. In the river's lower course, deposition is the dominant process because the river's gradient is very gentle, and the speed of the water is also slower. Here, you will find the fluvial landforms of flood plains, levees, and estuaries. *Flood plains* A flood plain is the area of flat land on either side of a river. They are commonly made of silt, fertile, and often flooded by the river.  flood plain *Levee* A levee is a raised river bank. Continuous deposition of sediments along the river bank after repeated flooding events causes their formation.  levee levee 2  **DELTA FORMATION**  river deltas   A delta is a landform created by the deposition of sediments that is carried by a river as the flow leaves its mouth and enters slow-moving or stagnant water. Deltas are very fertile.  There are various criterions which constitute the formation of a river delta. Under this segment of the article, we will discuss some of those points:   1. The river needs to carry sufficient sediment to deposit at its mouth to form the delta. 2. The tidal currents or waves of the river need to be weak. It is because the river is unable to carry the sediments into the body of water which it joins. 3. The river must drain into a body of water that is either static or has a slow flow rate to prevent the fast removal of sediments carried by the river at its mouth.  Types of River Deltas The main types of deltas are wave-dominated deltas, tide-dominated deltas, Gilbert deltas, inland deltas, and estuaries. 1. Wave-dominated deltas In wave-dominated deltas, wave-driven sediment controls the shape of the delta. Waves also cause deltas to retract and reflect by eradicating sediments from the river’s mouth. 2. Tide dominated deltas A tide controls the shape of the delta in the case of tide-dominated deltas. Erosion plays a significant role in shaping such deltas. The Ganges river delta is a great and famous example of the tide-dominated delta.  **IMPORTANCE OF DELTAS**  River deltas have been important to humans for thousands of years because of their extremely fertile soils. Major ancient civilizations grew along deltas such as those of the Nile and the Tigris-Euphrates rivers, with the inhabitants of these civilizations learning how to live with their natural flooding cycles.  **HOME WORK**   1. List and briefly explain 3 other landforms associated with the stages of river development. 2. List 3 importance of deltas to man. 3. Write short notes on the formation of deltas mentioned in this lesson.   (USE YOUR ESSENTIAL GEOGRAPHY TEXTBOOK TO ANSWER THE QUESTIONS) |