

CHAPTER 21=SOIL-RENEWABLE

Soil= is broken down rock.it's a layer of materials where plants grow on planet earth.

Soil is composed of 5 main ingredients which are=

(1)It consist of **mineral matter** which is **(43%)**.mineral matter contains calcium,magnesium and small stones,silt,sand and clay remains of the parent rock which was broken down

(2)**Air** which is **(25%)**.air is needed by plants and microorganisms.

(3)**water** which is**(25%)**.water dissolves the minerals and binds the soil together.

(4)**Humus** which is **(5%)**.it makes the soil more fertile and makes it a brown colour

(5)living/**microorganisms** which are **(2%)**.they break down plant litter to form humus.

Leaching=is heavy rain washing away materials.

3 types of parent rock=(1)limestone (2)granite (3)chalk

Soil profile- 4 main layers

	O horizon= contains plants and plant litter
	A horizon= (1)also called the uppermost layer (2)has lots of microorganisms (3)has a lot of humus (4)it's a very fertile layer (5)has a few pebbles and stones
	B horizon= (1)called subsoil (2)very few microorganisms (3)little humus-very light brown (4)not fertile (5)some stones and pebbles
	C horizon= (1)called bedrock or parent rock (2)upperpart broken down into bigger rocks (3)consist of igneous,sedimentary and metamorphic rock

Ireland's most common soil=brown earth soils

Factors influencing soil formation

(1)one factor influencing soil formation is Vegetation.

- if the soil has deciduous trees which are trees that lose their leaves in autumn e.g. oak trees then it's more fertile. Deciduous trees lose their leaves in autumn and winter resulting in more plant litter. Microorganisms change the plant litter into humus that gives its colour and nutrients eg brown earth soils.
- if the soil has evergreen/coniferous trees then the soil would be less fertile because there would be almost no plant litter so the microorganisms wouldn't be able to produce humus. podzols is not a very good soil.

(2)second factor influencing soil formation is parent rock

- if the parent rock is limestone then it will be easy broken down by the weather. the soil is rich in calcium carbonate which is good for the bones and teeth of cows and horses
- If parent rock is igneous eg granite, basalt, marble its difficult to break it down it also produces little soil cover. it takes over 400 years for 1cm of soil to form.

(3)third factor influencing soil formation is climate

- climate causes weathering which is the breakdown of rock such as mechanical weathering eg frost action. water enters any cracks in the soil during the day and it freezes at night. it expands by 9% and overtime it breaks down the rock into soil.
- climate also causes chemical weathering moves with Carbon dioxide forming a mild carbonic acid that breaks down the rock eg limestone into soil.

Irish soil types

-4 types of earth soils=(1)brown earth soils (2)podzols (3)gley soils (4)peaty soils

(1)brown earth soils(farming)

- ireland's most common soil type
- They are found in the Golden Vale tipperary low land areas.
- brown earth soils developed on boulder clay .
- brown earth soils form under deciduous trees(ash/oak)
- autumn =produce lots of plant litter .
- microorganisms change plant litter into humus.
- Humus is rich in nutrients and it's very fertile.
- made up of sand, silt and clay
- brown earth soil suit dairy farming allow good grass growth. cows=milk, cheese, butter and yoghurt
- brown earth soils are very good also for arable farming its the growth of a variety of crops eg oats, wheat.

(2)podzols soils

- there found in the uplands, mountains in galway or cork

- they form under evergreen,coniferous trees
- They produce very little plant litter and very little humus.
- they are infertile ,they lack minerals and nutrient eg iron,calcium
- heavy rainfall leaches these soils forming a hardpan that is impermeable.
- lots of clay more clay than sand and silt.its very damp water clogged.
- doesn't suit dairy farming/arable farming as soil is too wet

(3)peaty soils

- peaty soils are a dark colour and develop in upland areas with high rainfall and low land areas with poor drainage.
- peaty soils are waterlogged and full of organic matter that has no broken down
- there a valuable source of fuel and are found in blanket and raised bogs

(4)gley soils

- they are a grey colour and develop where bedrock or clay above is impermeable.
- They are sticky and waterlogged which means it's only used for pastoral farming.

Soils of the world

--->Tropical red soils

- They are found in areas with hot and wet climatic conditions in tropical or equatorial zones such as the Amazon basin.
- chemical weathering is caused by the high temperatures and heavy rainfall leading to the formation of very deep soil.
- constant supply of humus due to rapid vegetation growth.
- High temperatures give rise to rapid breakdown of plant litter by living organisms in the soil.
- Chemical weathering causes the breakdown of the bedrock that's increased because of the high levels of acidity from decaying humans.
- the soil has a red colour because of its high iron content.
- tropical red soils are very fertile and produce a lush vegetation cover.
- supply of humus decreased when trees are cut.soil is left unprotected and leaching increases causing soil to become infertile

Natural vegetation and soil

The influence of soil on vegetation

- (1)deep fertile soil=support a wide variety of vegetation because they have a high nutrient content
- (2)shallow infertile soil=limited type of vegetation that they are able to support.coniferous trees are often planted in such areas.
- (3)clay soils can become waterlogged easily.
- (4)sandy-soils are free-draining and have the ability to support a wide range of vegetation.

Influence of vegetation on soil

(1)vegetation provides plant litter to make humus.brown earth soils formed under deciduous forests are rich in humus and fertile while podzols soil form under coniferous forests and are infertile.

(2)vegetation bind the soil together and protects it from soil erosion and mass movement .when this cover is lost the soil is vulnerable and erosion occurs.

(3)vegetation acts as an umbrella and reduces the impact of heavy rain on the soil thus reducing the effect of leaching.

How humans interference with soil/how humans mis-use soils

(1)deforestation.

- Deforestation removes plant litter like leaves twigs and branches the soil loses its fertility which means that there is less humus mineral and nutrients.
- deforestation causes soil erosion the roots die so there nothing to bind the soil together there's no canopy which means there's no shelter
- Deforestation causes flooding because deciduous trees soak up the water but when there's no trees the land is flooded quicker.

Farming methods

(2)overgrazing

- is intensive farming meaning that herd numbers are increasing like sheep,goats.the animals are nibbling away all the vegetation exposing the topsoil/ A horizon by the sun/wind.
- roots of the vegetation are dead and there's nothing to bind the soil together and it gets washed away.soil erosion.

(3)overcropping(planting too many crops especially of the same kind)

- People over cop land to feed their families but you should allow about a year for fields to follow for soils to regain minerals and nutrients.
- monoculture (same crop year after year) that means that you take the same nutrients all the time.lots of people use the same thing because their poor and the 1 acre can feed a family of 10 in a year.

(4)desertification=

It's the spread of desert like conditions

- people misuse their soil in the sahel south of sahara desert e.g. Mali.

Exam question =

Two things farmers can do to prevent soil erosion on land

•one of the things that the farmers could stop doing to prevent soil erosion is to stop overcropping their land.especially with the same crop doing that means you take the same nutrients all the time.a lot of farmers rely on their crops to feed their family .overcropping causes soil erosion.

•the second thing that farmers can do to prevent soil erosion on land is to stop overgrazing.overgrazing leads to soil erosion.The herd numbers are increasing like sheep,goats.the animals are nibbling away all of the vegetation exposing the topsoil/A

horizon by the wind/sun.the roots of the vegetation then die and there's nothing to bind the soil together and it gets washed away causing soil erosion.

NOTE=youve to draw the soil profile on the first page