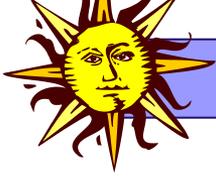


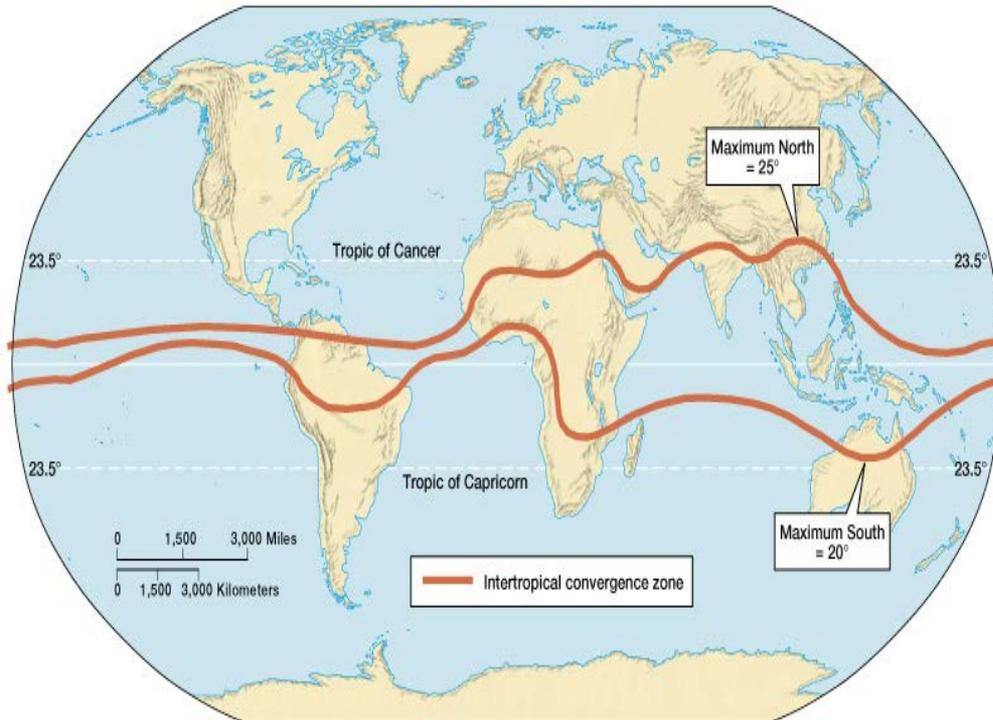
CASE STUDY AREA- the ITCZ in AFRICA

You will need to be able to give very detailed answers to a question on this area in an assessment.

This case study shows the way that the movement of the wind belts between their summer and winter positions has a profound effect on the lives - indeed the very survival- of people who live in the Sahel zone of northern Africa.



ATMOSPHERE



❖ The ITCZ is an area where two air masses meet- it brings heavy rain to the areas it passes over.

❖ It happens all round the world between the Equator and about 20 degrees N/S.

❖ Its full name is the Inter Tropical Convergence Zone. It is part of the Hadley convection cells, and has the Doldrums within its boundary.

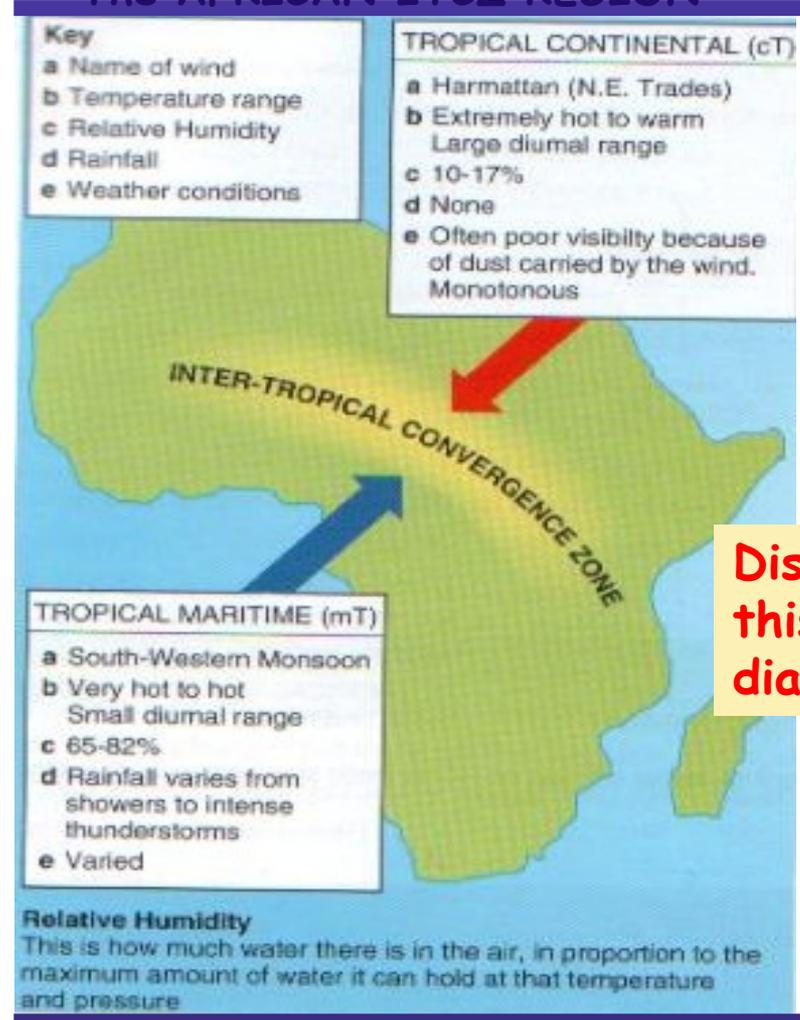


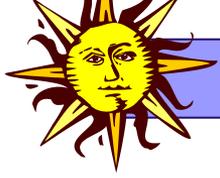
ATMOSPHERE

The ITCZ does not stay in the same area all year round but migrates to the north and then back south again.

It is this movement that matters so much to the people and animals of the area.

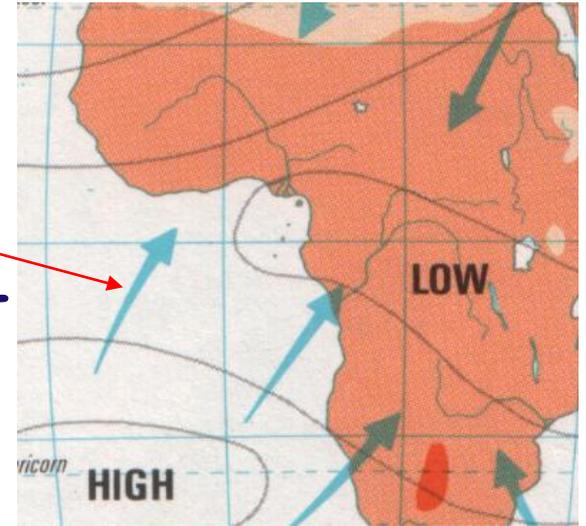
The AFRICAN ITCZ REGION





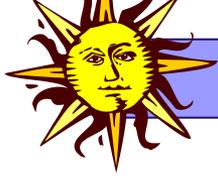
ATMOSPHERE

The trade winds (mT air mass) come into the zone from cooler areas in the southern mid- latitudes and have travelled over oceans; they are therefore carrying a lot of moisture. This is their position in January.



Once in the hotter latitudes, they are energised into huge towering cumulo-nimbus thunderclouds. These can be anything up to 10kms across, and groups of clouds can form covering 1000kms. In between the clusters are often sunny cloud-free areas.

The clusters are particularly found over land, not sea.



ATMOSPHERE

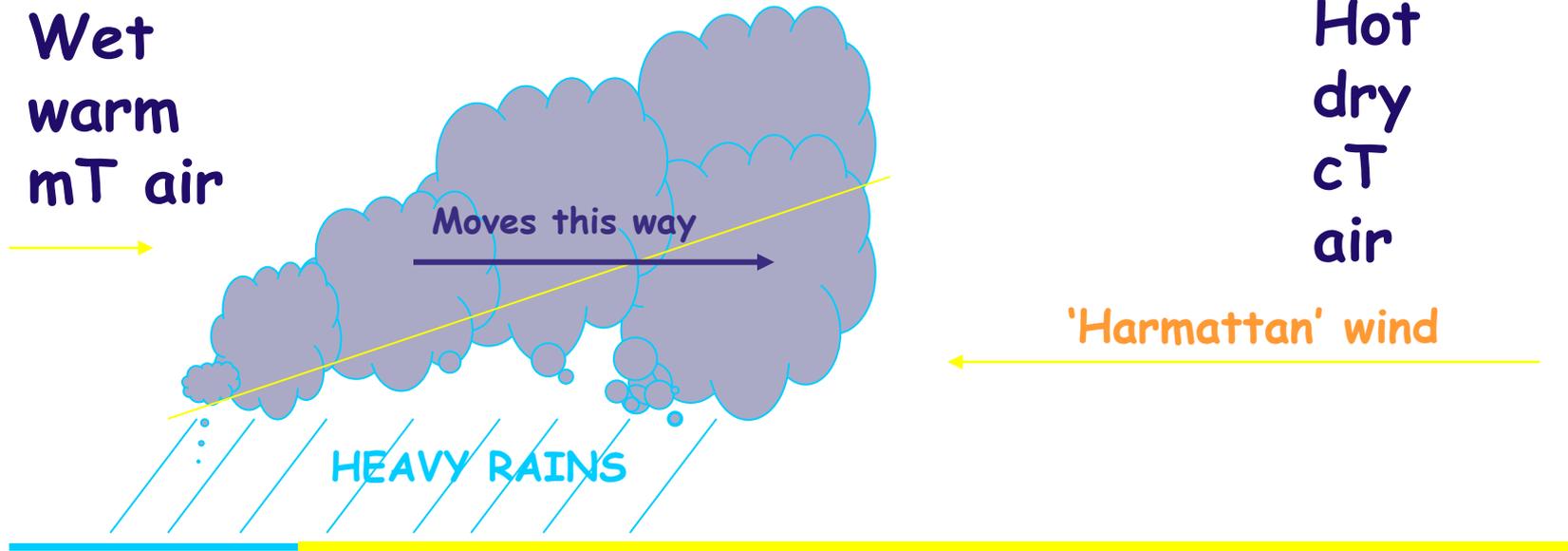
IN JANUARY

S

N

Wet
warm
mT air

Hot
dry
cT
air

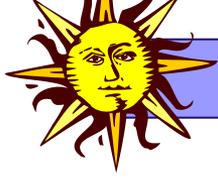


Gulf of
Guinea

Coastal
areas-
equatorial
climate

Inland areas-
savanna
climate type

Sahara-
Desert
climate
type

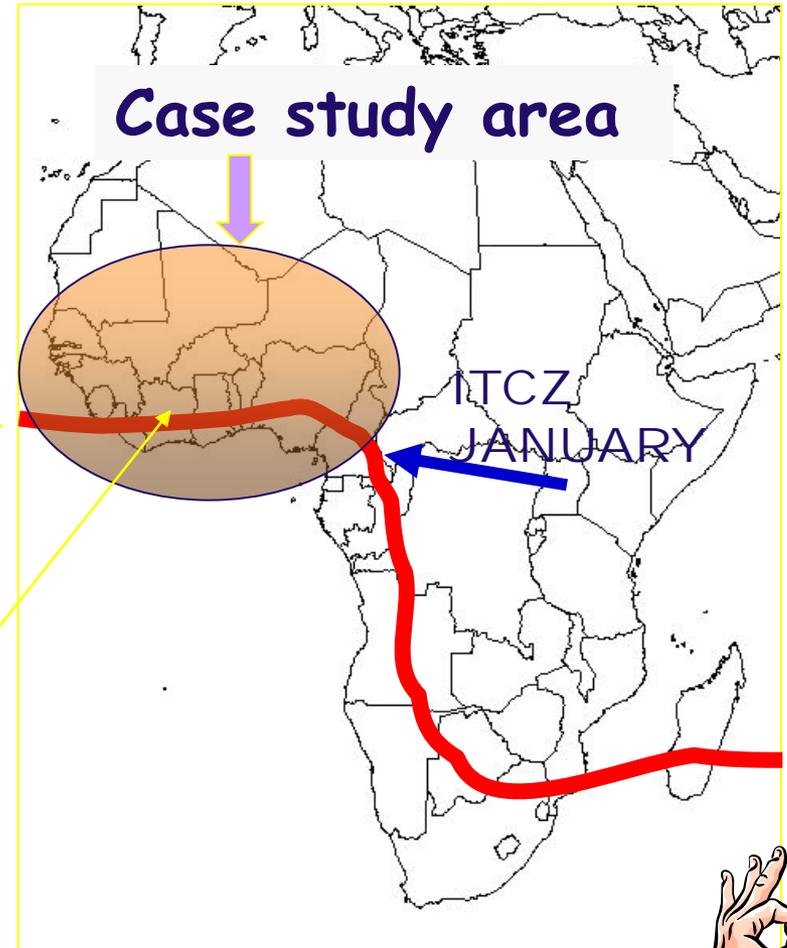


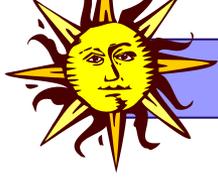
ATMOSPHERE

In January, the sun is overhead near the Tropic of Capricorn, in the southern hemisphere.

The ITCZ zone of meeting air lies well to the south, as seen here.

The rains brought by the zone are confined to the very coastal areas of Nigeria, Togo, Ghana and their neighbours.



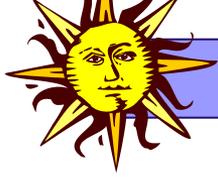


ATMOSPHERE

Here, the moist warm mT air from the Atlantic Ocean meets the hot dry cT air coming out of the Sahara Desert. Note that the desert is an area of HIGH pressure in winter and particularly strong winds blow AWAY from such areas.

The cT wind is called the HARMATTAN and is extremely hot, dry and dusty. Of course, the Harmattan cannot bring any rain to the area it travels over, and all the northern part of Africa is influenced totally by it. No crops can grow.

In the south, however, the wet moist winds from the sea are forced upwards over the land where they drench the land in life-giving torrential rains. Here crops can be easily grown, providing the soil is fertile enough and not washed away.

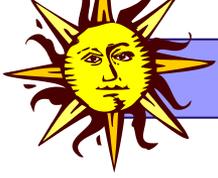


ATMOSPHERE

During the spring, the ITCZ moves slowly northwards, the Harmattan losing its dominance over the land bit by bit.

Places further and further inland get the rains that they so desperately need for people, crops and animals alike. The slight drawback is that the further the ITCZ travels north, the less water it can bring to the rainy area, so crops to the north get less than those to the south.

By mid spring, places like northern Ghana, northern Benin and central Nigeria are getting the rains. The wells are re-filled, the grass for feeding animals starts to grow and farmers can start off their crops.



ATMOSPHERE

IN JULY

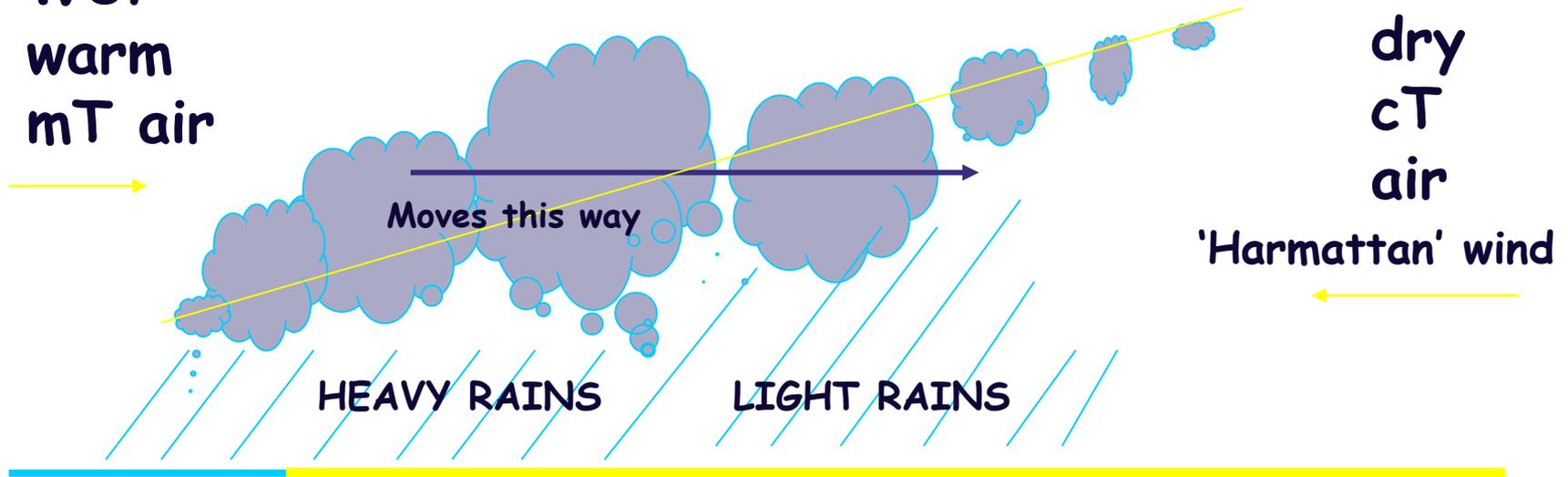
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N

Compare the January and July diagrams.

Wet
warm
mT air

Hot
dry
cT
air

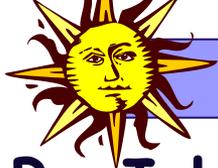


Gulf of
Guinea

Coastal
areas-
equatorial
climate

Inland areas-
savanna
climate type

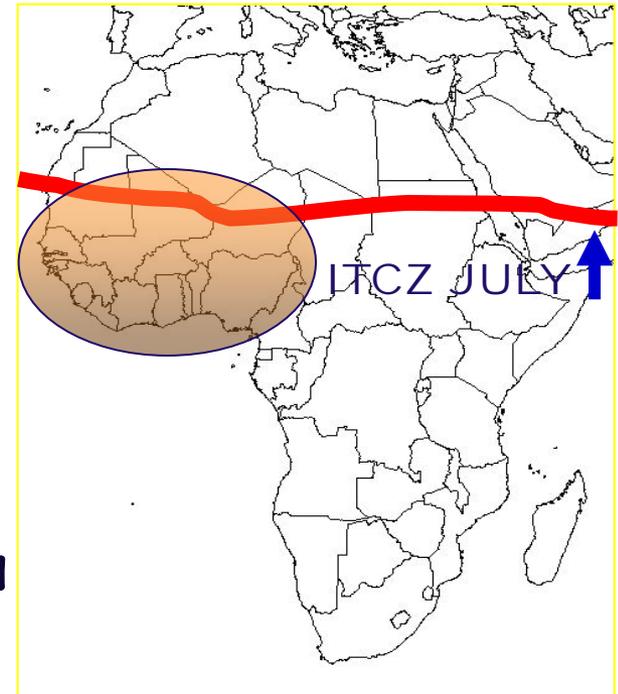
Sahara-
Desert
climate
type



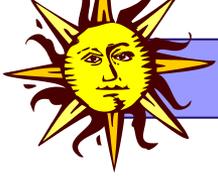
ATMOSPHERE

By July the ITCZ has reached as far north as it will go, reaching central Mali, northern Niger and northern Chad. There the Harmattan is confined to the very edges of the Sahara desert, the weakest it gets all year.

This is the Sahel zone, the area most prone to **DESERTIFICATION** that you learned about in Standard Grade.



Without these rains most years, the desert will take over yet more land, forcing poverty-stricken, hungry people to migrate southwards into other peoples' territory, with their thirsty cattle and goats.



ATMOSPHERE

After July, the belt moves back down south again, giving a second rainy spell to the lucky areas in its path.

No more rain will fall this far inland until next year!

The people rely on these rains that arrive within a week or two of the same time every year.

Recently, there have been several years where the rain has not got as far inland as normal !

What do you think has been the result of this?