

## Cluster 2 : Tropical Environments

1. Resource 1 shows the climategraph of La Paz, Bolivia. Resource 2 shows the location of La Paz, Bolivia. Resource 3 shows floods which inundated parts of La Paz, Bolivia. Resource 4 shows deforestation data in La Paz, Bolivia.

- (a) Cite data from resource 1 to describe the temperature and rainfall patterns of La Paz, Bolivia. (5m)

- Aw climate **(this is a must point)**
- Average temperature is 26.6 degrees
- Total rainfall is 1666mm
- Temperature range is 28.5-25=3.5 degrees
- Distinct wet and dry climate
- 6 months of rainfall above 100 mm between May to October

- (b) Account for the rainfall pattern of La Paz using resources 1 and 2. (4m)

- Explain for the high and the low rainfall
- 15 degrees **North**, within the Tropics
- Temperatures high between March to April and then from October to November when the region is intercepted by the ITCZ, high rainfall and high temperature, when the trade winds converge – ITCZ, convectional rainfall
- Low rainfall, ITCZ moves or shifts away from La Paz to the South region
- The movement from 15 degrees to 10 degrees, location of La Paz, rainfall for the 3 months
- Effect of the ITCZ felt by 5 to 7 degrees

(Have to give details of rainfall from the Climate graph and give evidence from Res 2)

(Lack of specific info from Res, to cut up to a maximum of 2marks)

- (c) Explain the reasons for flooding in La Paz using resources 2, 3 and 4. (5m)

- 3 reasons – rainfall and ITCZ, high rainfall, convectional rainfall (Res 2)
- Urbanisation, concretized floor and roads, lack of infiltration (Res 3)
- Deforestation, overland flow increases (Res 4)

(All 3 resources must be used specifically, lack of use of res to cut up to a max of 2marks)

- (d) Account for the effects of floods in La Paz, such as that seen in resource 3. (5m)  
Effects can be

- Social (people having diarrhoea, spread of diseases, lack of water)
- Economic (transport, communication affected, productivity affected, inability to function for a few weeks, depending on the situation etc)
- Environment (floods, mosquito breeding, human environment affected)

(Have to have at least 2 types of effects, either LT and ST or SEE, make sure that the Res is well described, lack of use of Res to cut up to a max of 2marks)

(e) With reference to resource 4, explain how deforestation can affect stores and flows in the Rio Beni and Rio Mamore basins. (6m)

- Stores (lack of interception, no trees, no percolines for water to be infiltrated)
- Stores (lack of underground water and also soil moisture storage, lack of infiltration due to impermeable land and also lack of soil or natural ground)
- Lack of Baseflow to the rivers
- Stores (Channel flow/Lakes/Rivers have more discharge, overland flow and HOF and also floods)
- Flows (HOF than SOF, higher overland flow)
- Flows (Vertical and Lateral Sub-Surface flows will be affected gravely, cease due to the concrete ground, lack of infiltration and so percolation will reduce. Then for throughflow there will be a lack of it due to the impermeable ground and so base flow will eventually reduce).
- Higher flows into the rivers

(f) Explain 2 measures that you would recommend in La Paz, to manage floods such as the one seen in resource 3. (5m)

- Drains (deep, wide channels) or maintain the ones that they may or may not have to cater to increase in water discharges due to heavy rainfall and deforestation
- Reafforestation program to reduce flooding in the future, to increase interception storage and also allow for infiltration and percolation
- Channelisation of the 2 Rios (deepen, widen and straighten the river channels especially at the part where La Paz is at)

(pls be careful that not all strategies can be used eg: Dams or Land Use Pattern, considering the fact that it is a developing country)



### Legend



Rivers (Rio)



La Paz, Bolivia

Resource 3 : Floods in La Paz, Bolivia (2021)



Resource 4 : Deforestation in selected South American countries, (2010-2017)



