Bdst 2 topic 2: Climate

What is a monsoon climate

- one that experiences heavy summer (seasonal / April to September) rainfall
- due to seasonal change in the prevailing wind

Monsoon ‘gives life’ to rural areas in Bangladesh

- provides water for irrigation
- provides water for drinking

Explain why there are seasonal variations in the climate.

- seasonal monsoon winds/changing wind directions
- NE monsoon/November–February – blow from high pressure over Asia to low pressure over Indian Ocean
- deflected to right/Coriolis effect
- SW monsoon/June–September – blow from high pressure over Australia to low pressure over Asia
- pick up moisture from sea/onshore winds

Why heavy rain occurs in summer in Bangladesh

- in summer the land is warmer than the sea
- high temperatures over the land creates an area of low pressure
- high pressure develops over ocean / Australia
- winds blow from high-pressure area to low-pressure area
- winds blow from the ocean to land area
- summer monsoon winds bring in a huge amount of moisture from sea causes heavy rainfall, in late May or early June

Explain the causes of heavy summer monsoon rains

- winter in southern hemisphere/cooler air sinks
- high pressure over Australia/Indian Ocean
- high temperatures over Indian sub-continent /hot over land air rises

- low pressure over Indian sub-continent
- winds blow from high pressure to low pressure
- winds blow over Indian Ocean
- become moisture laden - rain

Explain the causes of the monsoon rains

- winds change direction
- differential heating of water and land
- due to low pressure developing over northern India
- land heats up faster than sea
- high pressure to south of equator or northern Australia
- water cooler
- winds blow from south or southeast
- coreolis effect
- winds blow across ocean and accumulate moisture
- which falls as rain over Bangladesh

Rain may also be caused by depressions. Explain the cause of this type of rainfall

- Credit will be given for the use of a diagram
- Depressions are areas of low pressure
- warm moist air from south meets dry cool air from north
- known as a weather front
- warm air rises over the cool air
- air cools as it rises
- condenses
- clouds form and moisture falls as rain

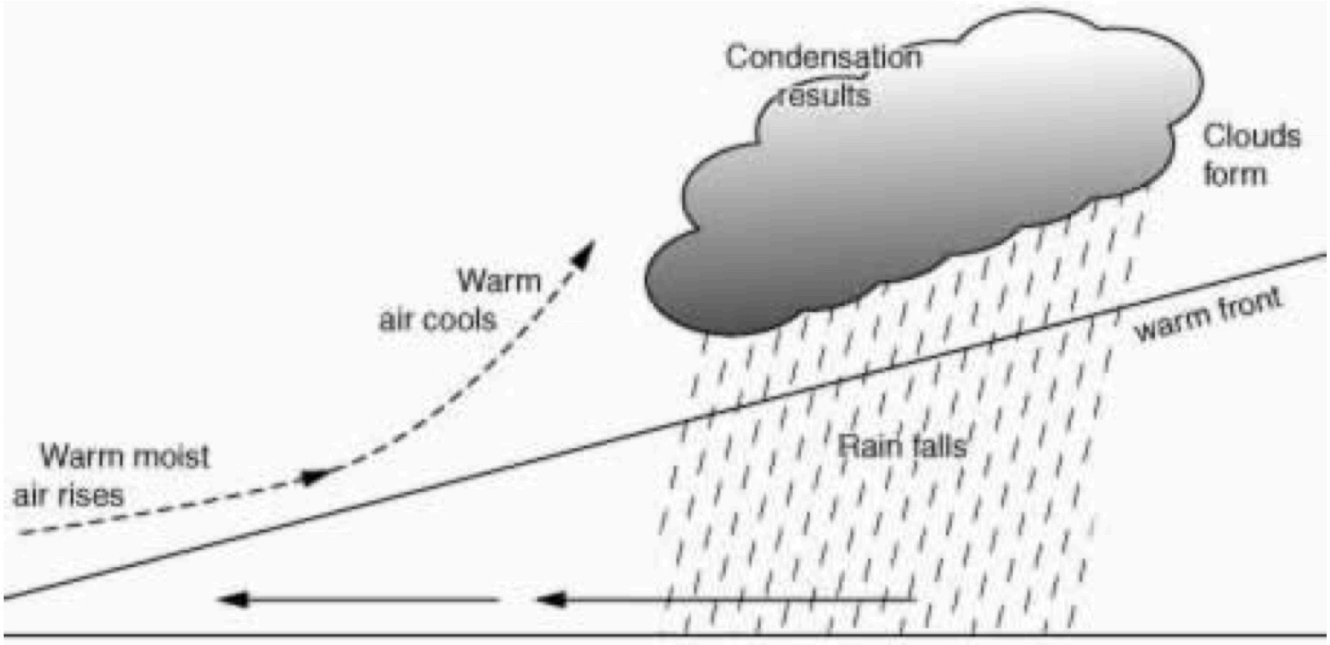


Figure 2.2 Rain caused by depressions: Section through a depression

Suggest three effects of the monsoon season on people in urban areas

- rivers may flood
- transport links may be broken
- telephone and power cables damaged
- hot and humid so unpleasant for working
- drains overflow or do not work
- damage to buildings
- relief from high temperatures preceding monsoon

Bangladesh people rely on the monsoon rains

- Needed to make crops grow
- main source of rain for Bangladesh
- land is very fertile provided there is enough rainfall
- two or three crops a year possible due to climate
- rice and jute both require plenty of water
- water supply

The monsoon brings misery to the Bangladesh people

- Monsoon is unreliable/can be disastrous if arrives too late for crops
- or too heavy so destroys crops
- causes flooding which can ruin crops
- damage buildings
- loss of life

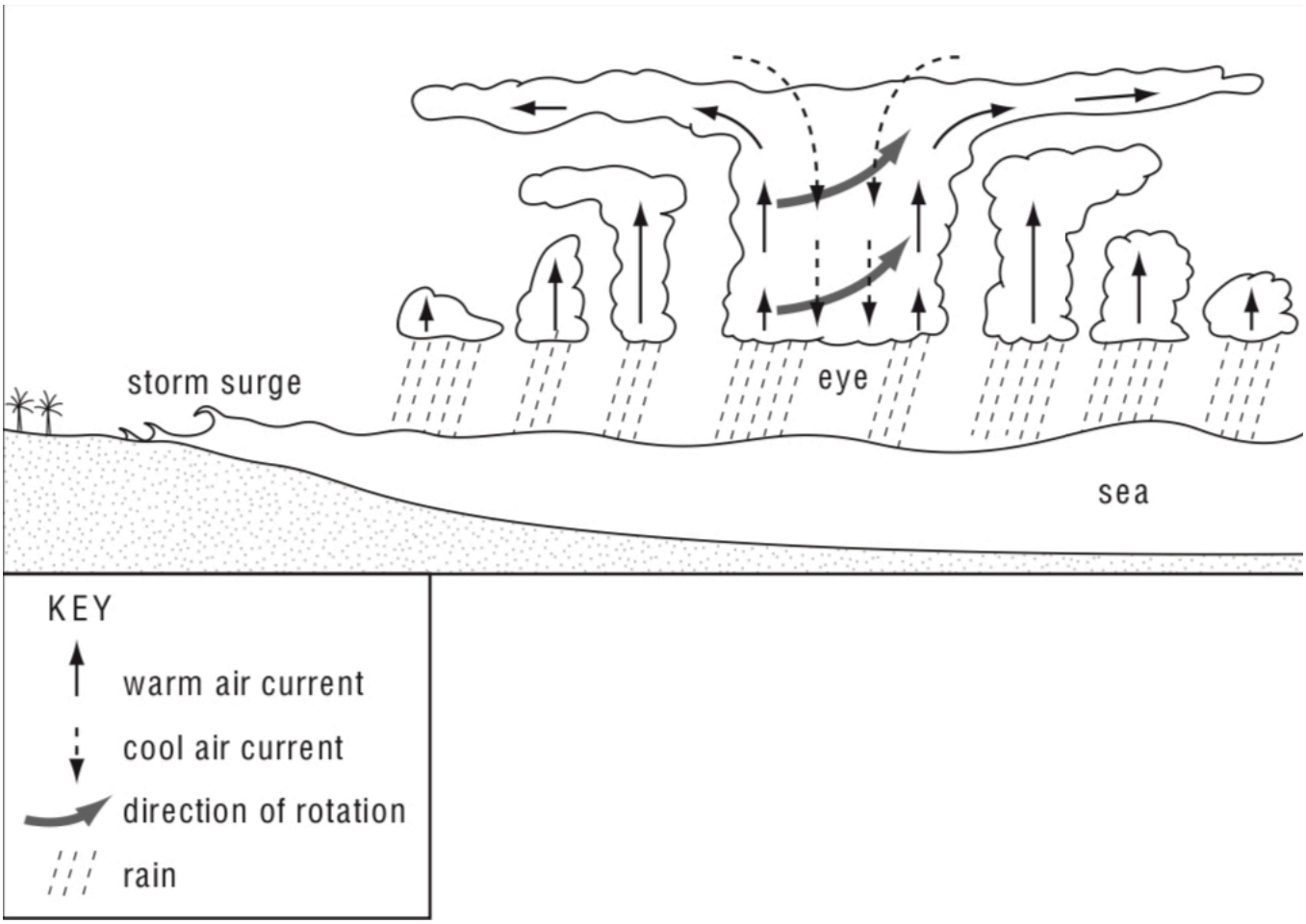
The climate of Bangladesh is ideal for growing crops

- Must have a link to the growing of crops
- warm temperatures for sowing
- length of growing season
- monsoon rain/plentiful rainfall for germination/growing
- sunny spells for ripening
- dry spell for harvesting
- very productive/list of crops that grow well

Many problems are caused for farmers by Bangladesh's climate

- flooding caused by heavy monsoon rains/excessive rainfall damages crop
- washes away fertile soil
- drought/dry period
- scarcity of surfaced water
- high temperatures – melts snows in mountains = flooding

Tropical cyclone and storm surge



Cyclones develop in a low pressure system

Explain how a cyclone is formed

- Body of warm water
- min 27
- warm air rises
- low pressure
- winds sucked in
- spiralling winds
- energy for spiralling comes from release of latent heat from rapidly cooling air
- condensation
- build up of clouds
- Coriolis effect
- moves according to prevailing winds at the time

describe how a tropical storm develops

- warm, moist air rises rapidly/evaporation from oceans cools
- condenses/creation of latent heat
- cold air drawn inwards/in spiralling motion
- torrential/heavy rain
- cold air in centre sinks

Describe the weather associated with a cyclone

- strong winds
- +120 kmh
- heavy rainfall
- calm when eye passes no rain when eye passes
- thunder and lightning

What conditions are necessary for the formation of a tropical storm

- high sea temperatures
- over 27°C
- low pressure
- converging air currents

What are the characteristics of the eye of the storm

- calm
- no rain
- clear skies

In what ways might global warming affect cyclones

- Warmer seas will give rise to more source areas for cyclones
- more intense cyclones in existing areas
- more frequent
- rising sea levels will give greater reach to cyclones

Describe the different types of damage that could be caused by a cyclone

- wind destroys property

- takes down trees
- people hurt by falling trees – buildings
- damage to communications

- main damage is from tidal surge or wall of water
- wrecking crops
- communications
- people and animals drowned

There is little that can be done to lessen the impact of cyclones on Bangladesh

- Natural phenomenon
- Much of BD is low lying
- paths of cyclones from bay of Bengal cross BD
- not a wealthy country so can't afford expensive protection schemes
- densely populated so can't move people away from danger

There is a lot that can be done to lessen the impact of cyclones on Bangladesh

- People could be better prepared to deal with cyclones
- emergency preparation
- training in what to do
- creation of early warning system
- creation of secure emergency shelters
- rapid response by emergency services to effects
- cyclones hit other countries which have densely populated areas close to coasts but effects are not so severe e.g. Japan
- effects related to development of country and its level of preparedness
- afforestation of mangroves which help to reduce force of cyclone

Describe the health related effects that people can suffer after a storm or cyclone and how to solve them

- lack of safe/clean drinking water
- leads to diarrhoea, hepatitis, cholera, typhoid/water borne diseases
- stagnant water leads to malaria, dengue fever
- also cases of pneumonia, jaundice, eye infections, skin diseases
- mental health problems

- malnutrition/famine due to loss of crops/livestock/fish
- death/injury

- water treatment plants set up
- water tankers sent
- bottled water/fresh/clean water supply
- construction of latrines/sanitation restored
- medicines/health aid/mobile hospitals/clinics
- food aid/emergency stock of food
- counselling
- vaccination/immunisation
- mosquito nets

Describe a storm surge and explain how it is caused

- rapid rise in sea level
- strong winds push sea water onto coast
- waves (several metres) high

Describe the short-term and long-term effects of a storm surge on the people living in the area

- loss of life
- injury
- houses destroyed/homeless
- crops destroyed
- livestock killed
- poverty
- famine
- loss of jobs
- lack of clean water/contaminated water disease – cholera, etc.
- communications disrupted – affect rescue
- difficult for aid to be distributed
- fishing boats destroyed

Choose some of the methods used to reduce coastal flooding and say how effective you think these have been

- embankments– strengthened new ones

- cyclone shelters – on stilts
- mangrove trees planted – absorb power of waves
- stabilise embankments education/awareness – particularly women
- evacuation – more boats, carts, etc. improved radio links
- Marks for opinions on how effective – cost, strength, durability, effect on lives, farming, etc

Formation of a Thunderstorm

- surface warms up so air rises
- rising air causes low pressure at ground which brings in more air
- strong winds
- air cools as it rises so some of moisture condenses
- creates rain clouds
- cumulonimbus clouds
- strong upward air movements create turbulence
- eventually water falls as rain
- accompanied by thunder and lightning
- static electricity in cloud makes contact with earth

formation of thunderstorm rainfall

- On hot humid days
- Sun heats ground
- Air near earth's surface / ground heated Warm (moist) air rises
- Rising air cools
- Condensation / clouds form
- Large cumulonimbus clouds
- Results in heavy rainfall

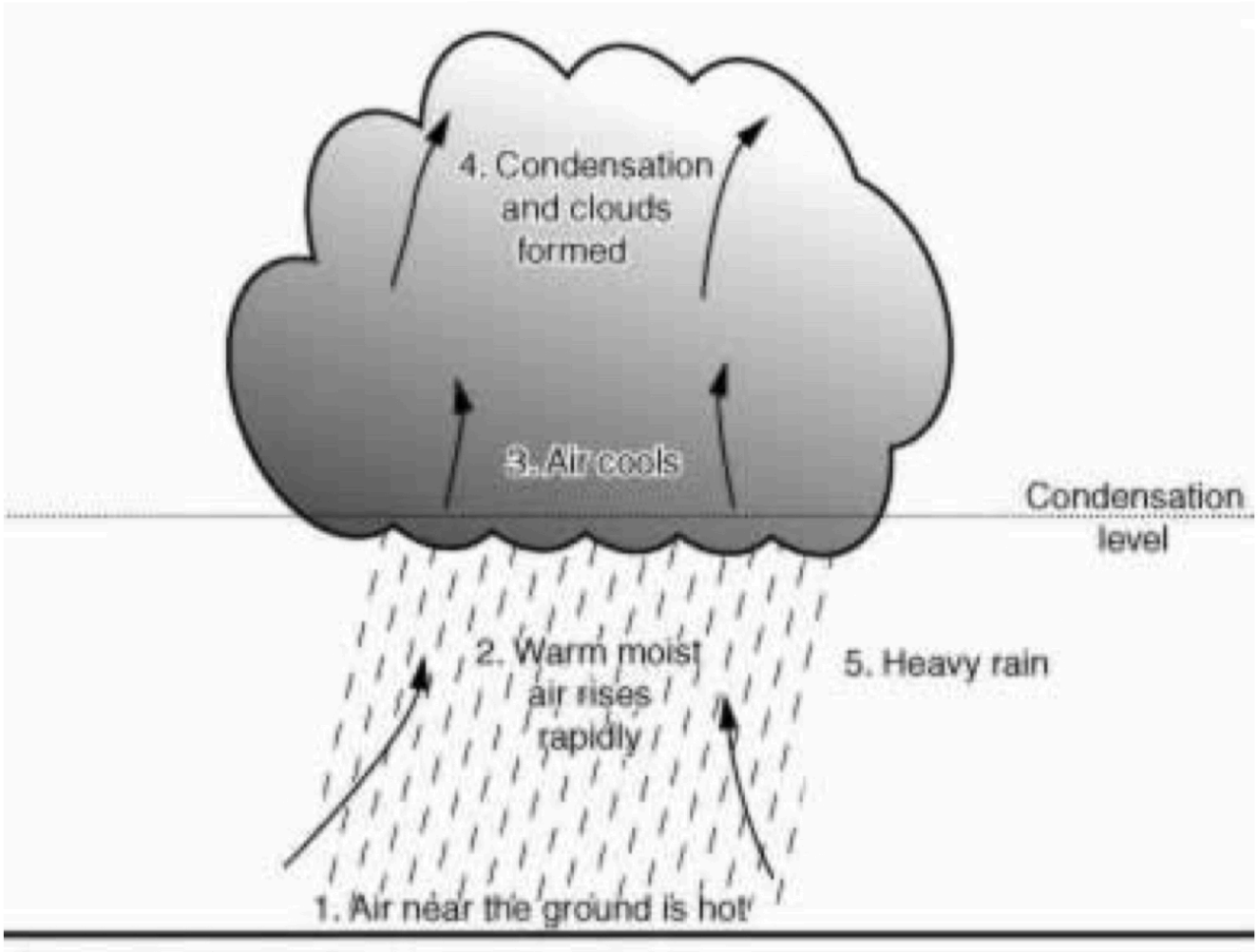


Figure 2.3 Rainfall due to a thunderstorm

State when thunderstorm rainfall occurs and explain the causes of this rainfall

- summer/March-September
- late monsoon/October–November afternoons

- on hot, humid days air above ground heated
- warm, moist air rises
- expands
- cools
- condenses into water vapour
- form cumulo-nimbus clouds – leads to rainfall