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ADVANCED INTEGRATED MENTORSHIP

GEOGRAPHY ASSESSMENT TEST-10

(To be filled by candidate)

Test Code : TC__

Name of Candidate : Abhishek singh

NEXT IAS Roll No. : AIM24GCL1035 **Date of Examination :** 28-08-2023

Exam Centre : Old Rajinder Nagar ☐ Bhopal ☐ Online ☒

GENERAL INSTRUCTIONS

This Question-cum Answer (QCA) Booklet contains 32 pages. Immediately on receipt of the booklet, please check that this QCA booklet does not have any misprint or torn or missing pages or items, etc. If so, get it replaced by a fresh QCA booklet.

Candidates must read the instructions on this page and the following pages carefully before attempting the paper.

Candidates should attempt the questions strictly in accordance with the instructions specified in the question paper and in the space prescribed under each question in the booklet. Any answer written outside the space allotted may not be given credit.

Question paper will be provided separately and can be taken by the candidates after conclusion of the exam.

SUBJECT/PAPER
GENERAL STUDIES

Invigilator's Sign. :

Student's Queries for the Evaluator (if any write them below)

Plz giver feedback in clear cut language.

[To be filled by the EXAMINER]

Evaluator's response

(For filling by Examiners only)

Evaluator Code :

Q.No	Pg No.	Maximum Marks	Marks	Total
1	1			
2	3			
3	5			
4	7			
5	9			
6	11			
7	14			
8	17			
9	20			
10	23			
Grand Total				

Signature

MACRO COMMENTS

Q-11

Discuss the Cause of Tsunami & their impact on Coastal areas. What measures can be taken to mitigate the impact of tsunami?

Tsunamis are water waves of very large wavelength which hits the Coastal area & causes large scale damage.

Cause of Tsunami

- ① Earthquake: at tectonic boundaries release lots of energy can translate into water waves.
- ② Shift in water volume: Due to faulting water may get into Subduction zone & can cause upward force which generates waves.
- ③ Movement of tectonic plates
ex: Convergent boundary during 2001 Indian Ocean tsunami

Impact on Coastal areas

- flooding with huge waves.
- Property damage e.g. rail infra.
- loss of human life
- Displacement of Coastal Community
- destruction of mangroves forest
- affecting fishing & navigation

measures to be taken

- Pre-Tsunami
 - Hazard mapping
 - awareness campaign
 - alerting NDRF team
 - Readyng goods of urgent need
- During Tsunami
 - Protection in shelter homes.
 - Advisory for steps to be followed by people.
- After Tsunami
 - Rehabilitation
 - social
 - Economic
 - political
 - Resettlement

Indian Ocean Tsunami warning System set up by INCOIS is a positive step for future disaster events management.

Q12

India is endowed with large rivers emerging from the great himalayas yet the region faces water shortage. Discuss. Also, give solutions to deal with the problem of water shortage.

Ans

India has 18 % of world population but it uses only 4 % of water resources.

Endowed with large rivers

↳ Ganga, Yamuna, Brahmaputra, etc.

Reasons for water shortages

① Uneven distribution of Rainfall :

for eg: Cheranpuri → 1100 cm / year
Rajasthan → 20 cm / year.

② Mismanagement of water : due to
water - boundary disputes.

eg: Cauvery water dispute.

③ River pollution : Some rivers like
Yamuna has huge pollution.

④ Climate change : The amount of
water in rivers fluctuate & becoming

difficult to predict (glacial melting)
 ⑤ Over use in Agriculture: Irrigation in Punjab Haryana.

Solutions

- ① Water harvesting of rain: to use for future use
 for ex: Tamil Nadu made mandatory to harvest water in all houses.
- ② Resolving Inter State water disputes
 for ex: Cauvery water tribunal.
- ③ Traditional methods: ex: Johad in Rajasthan
- ④ Awareness Campaign: Maharashtra's Paani Panchayat.
- ⑤ Efficient use of water in Agriculture
 for ex: per drop more crop Scheme
Rajiv Kumar Committee recommendation on sustainable water use should be implemented to deal with water scarcity.

Q3

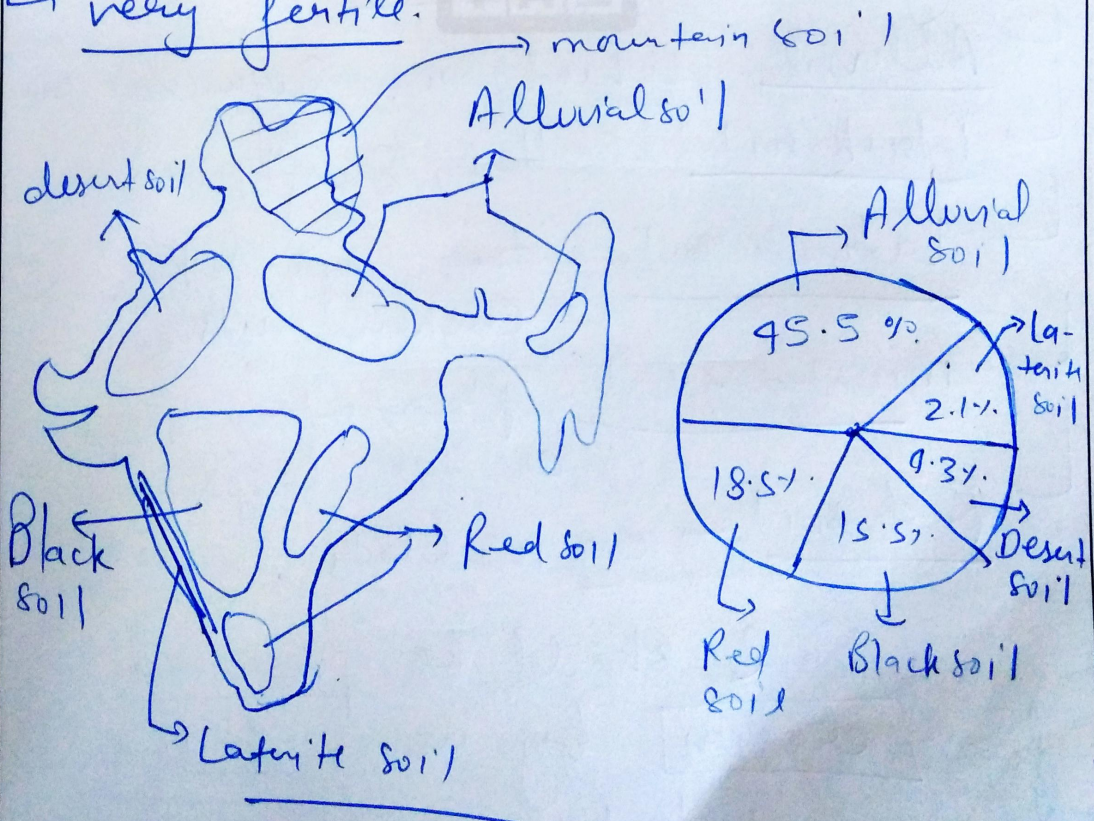
Discuss the diff. types of soils found in India & their significance for Agriculture.

India has huge diversity of soil which also impacts variety of Agricultural crops.

Types of soil

① Alluvial soil

- ↳ largest group of soil
- ↳ Sand sediments deposited by rivers on flood plains create it
- ↳ very fertile.



② Black soil

- ↳ formed due to weathering of Deccan trap
- ↳ Self cultivating property.

③ Red soil

- ↳ formed in area of moderate rainfall
- ↳ appears yellow in hydrated form

④ Laterite soil

- ↳ High temperature & High rainfall area.

⑤ Desert soil

- ↳ lowest rainfall area.

Significance in Agriculture

- ↳ Alluvial: wheat, rice, sugarcane etc
- ↳ Black soil: cotton, sunflower etc
- ↳ Laterite soil: tree crops like cashew nuts
- ↳ mountain soil: plantation crops
ex: tea, coffee
- ↳ Red soil → ex: millets.

Soil should be preserved from erosion by using soil management techniques like Conservation Agriculture

Q14 Differentiate the causes of landslides in Himalayan region & western ghats.

Himalayan & western ghats are prone to landslides due to many factors which differ depending on location.

Causes of landslides in Himalayas

- ① Seismic activity due to movement of tectonic plates
- ② Very steep slope adds to the downward movement
- ③ Sedimentary rocks : rocks are fragmented & easily move downward.
- ④ Huge rainfall : Causes saturation of soil & downward movement.
e: cloudburst.
- ⑤ Glacial effect : Outbursting of glacial lakes causes landslides
for e: Gashwal landslide (2002)
- ⑥ Infrastructure development is unsustainable.
e: tourism industry.

landslides in western ghats

- ① Orographic rain: huge rain during monsoon saturates water & causes downward flow
- ② cyclonic rain: cyclones originating in Arabian sea bring huge rain
e: cyclone Biparjoy.
- ③ Mining activity: destroying forests & weakening soil stability
- ④ Human settlements on slopes
- ⑤ unsustainable tourism

Steps to be taken

- ↳ ① Gadgil Committee report on western ghats should be implemented
- ↳ ② Green infrastructure
e: konkan railways
- ↳ ③ Best practice e: sikkim's organic farming.

W.G and himalayas have breath taking beauty & are home to huge biodiversity & it should be preserved on war footing basis.

Q5

Major hot deserts in northern hemisphere are located b/w $20-30^{\circ}$ North & on western side of continents. why?

Hot deserts are created due to many factors ranging from ocean currents, latitude, winds etc.

$20-30^{\circ}$ North

↳ This area is a subtropical High pressure belt

↳ Dessicating effect: Air descends which minimizes precipitation.

↳ Horse latitude is very Calm region & brings stability.

Example: Sahara desert, Mojave desert.

Western side

↳ Cold oceanic currents:

↳ Cold ocean currents decrease the temperature of coastal

areas $\Rightarrow$ very less evaporation
of water vapour $\Rightarrow$ less rainfall.

for eg: $\rightarrow$ Peruvian current made
atacama desert

offshore winds

$\rightarrow$ Winds blow from land to
Sea in $20-30^\circ N$ latitudes

$\rightarrow$ causes upwelling of cold water
on Coastal areas $\Rightarrow$ less rainfall.

Presence of hot desert is due to

Combined effect of High pressure,
Cold current and offshore
winds.

Q.6 Explain the mechanism of the Indian monsoon. what role do El-Nino & La-Nina play in its development over the Indian Subcontinent?

Ans Indian monsoon is a phenomenon of seasonal reversal of winds blowing from ocean to land.

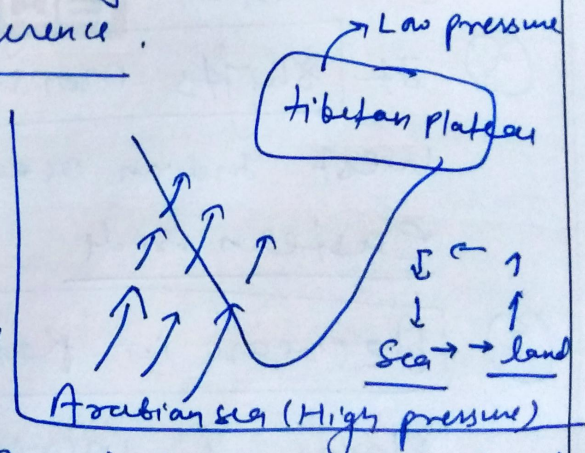
Mechanism of monsoon

① Differential heating: of land surface & sea surface causes temperature difference.

② Pressure gradient

Tibetan plateau gets heated quickly compared to sea.

(Specific heat of sea is higher than land)
It creates pressure gradient.



③ Wind Blowing: from High pressure (Mascarene high) region in Indian Ocean to mainland India

- (4) In summer ~~South~~ westerly jet stream over Indian Subcontinent is replaced by easterly jet stream.
- (5) ITCZ: Inter tropical Convergence zone oscillates over India with sun's movement causing variation in rainfall.

Role of El-Nino

- (1) El nino is warming of central & eastern pacific ocean
- (2) It shifts moisture of South West Indian ocean winds towards eastern side
- (3) Decrease in Rainfall in Indian plains & increased rainfall on peruvian coast
- (4) Drought may set in due to low rainfall.

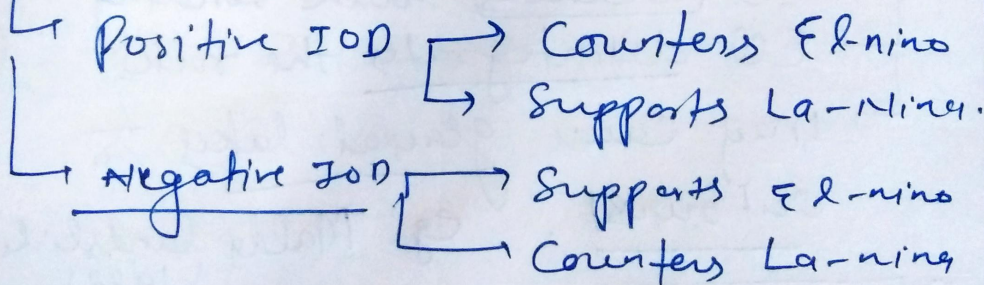
Role of La-Nina

↳ La-Nina is sudden cooling of central & eastern Pacific ocean.

↳ Increase in Rainfall in India as more moisture gets added to Indian Ocean South west winds.

↳ Flooding may happen

However Role of El-nino & La-Nina is affected by Indian Ocean dipole



IOD = temperature difference between western & eastern Indian ocean.

Monsoon is a very Complex phenomenon & yet to be understood fully & its unpredictability is increasing with climate change.

Q-7

Discuss the ways in which earthquakes can trigger secondary hazards such as landslides, tsunamis, & liquefaction. Assess the relative risks associated with these hazards & the measures that can be taken to mitigate their impact.

Earthquake is sudden shaking of ground surface due to faulting & folding of tectonic plates.

Triggering Secondary hazards

① Landslides

- ↳ EQ weakens soil bonding
- ↳ EQ disintegrates the rocks
- ↳ may cause glacial lakes to outburst. eg: Malda landslide (1988)

② Tsunamis

- ↳ EQ can displace large quantity of waters $\Rightarrow$ huge energy is released & translated into wave energy.

for eg: 2001 Indian Ocean tsunami

(3) Liquefaction:

↳ It happens due to ~~St~~ Saturation
of soils

↳ EQ increases the rate of saturation

Relative Risks

(1) Road blocking: due to landslides
in Himalayan regions

for eg: blocking of Kullu manali
highway (2022 landslide)

(2) Floods: 2013 Kedarnath flood
caused due to glacial lake
outburst.

(3) Coastal Infrastructure loss due
to tsunami waves.

(4) Displacement of people: especially
of marginalized section &
severely impacts child, women &
old age person.

Pratrayan

- ⑤ Huge cost to exchequer in rehabilitation, resettlement & infrastructure rebuilding.

Measures to be taken

- ① Hazard mapping of potentially risky areas
- ② Disaster Resilient Infrastructure Creation
- ③ Advanced Early warning system
⇒ more R&D required
- ④ Self defense & awareness technique
should be spread.
- ⑤ fund allocation : In Advance
for these areas.
for ex: National & state disaster funds.

India is highly prone to Earthquake. (~59%) as it sits on a tectonic plate & diverse topography. Above steps should be taken to mitigate its effects.

08

How do the melting of the Arctic ice & glaciers of the Antarctic differently affect the weather patterns & human activities on the earth? Explain.

Arctic & Antarctic regions are coldest places on earth & have significant impact on weather pattern & human activities.

Effect of Arctic on weather pattern

- ① Arctic Amplification : Arctic is warming twice as fast as lower latitudes. $\Rightarrow$ more pronounced effects.
- ② Polar vortex : Expanding towards lower latitude. It disturbs jet streams & causes extreme weather
 ex: Chilling cold in USA
Heat dome in Europe
- ③ Temperate cyclones : It is created

due to fronts formed by Cold air mass coming from poles. $\Rightarrow$ Can impact frequency & intensity of cyclones

④ Oceanic circulation: melting ice sinks & drives circulation

Eg: AMOC = Atlantic meridional oceanic circulation may get impacted

Effect of Arctic on human activities

- ↳ ① New trade routes are created due to ice melting
- ↳ ② Resource exploitation: Arctic has rich oil & gas resources.
- ↳ ③ Wild-human conflict: Arctic animals like walrus moving to land $\Rightarrow$ Conflict.

Effect of Antarctic on weather pattern

① Atlantic circumpolar current

↳ may get variations in temperature & affect weather pattern.

- (2) Widening of ozone hole may get exacerbated.
- (3) Sea level rise: due to ice melt may cause flooding, cyclones etc.
- (4) Permafrost thaw: releases greenhouse gases $\rightarrow$ positive feedback for climate change.

Effect of Antarctic on human activity

- (1) Research & development:
Antarctic has many research bases.
It may get affected negatively.
E.g. Bhaito.
- (2) Human-animal Conflict: penguins venturing into human habitat.
- (3) Doomsday glaciers: may raise water level in huge quantity & stop many human activity.

Antarctic pole is regulated by Antarctic treaty system, but there is no treaty for Arctic. Global Community should create similar treaty for Arctic as well.

Q9

Explain the origin of Indian Islands in the Bay of Bengal & the Arabian Sea.

A →

Islands in Indian ocean has been created due to many significant processes over the years.

Indian Islands

↳ ① Arabian Sea

↳ Lakshadweep

↳ Mauritius, Maldives, Reunion etc.

↳ ② Bay of Bengal

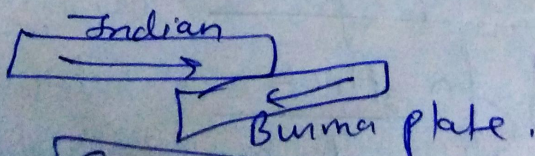
↳ Andaman & Nicobar Is.

Origin of Indian Ocean Islands

① A & N Islands

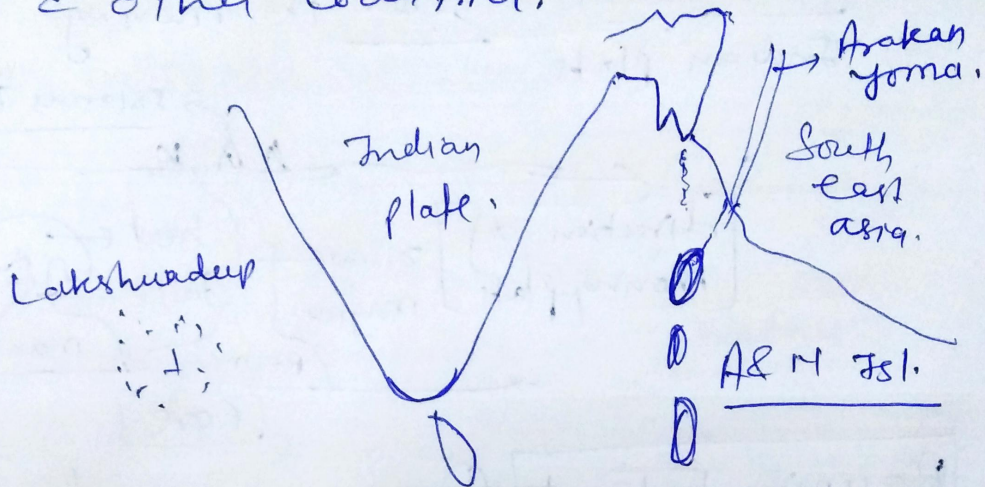
Continent - Continent Convergence

↳ Subduction of minor Burma plate under Indian plate



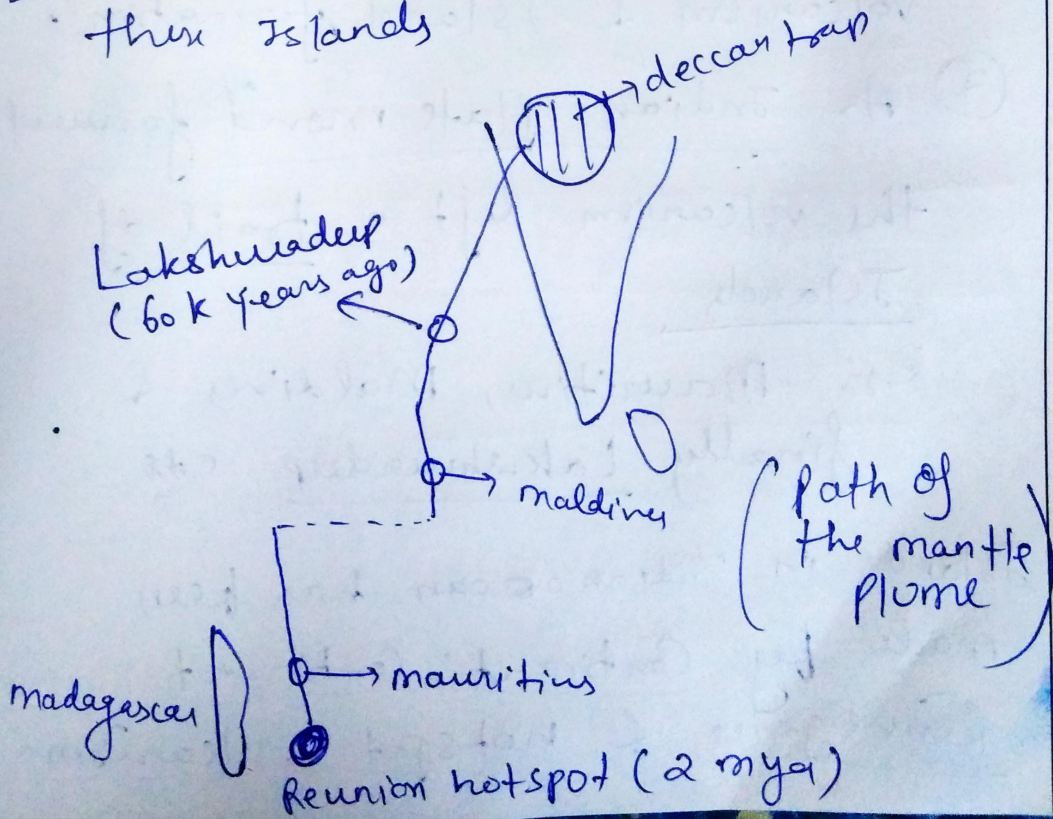
Compression

↳ It is also an extension of Arakan Yoma range of Myanmar & other countries.

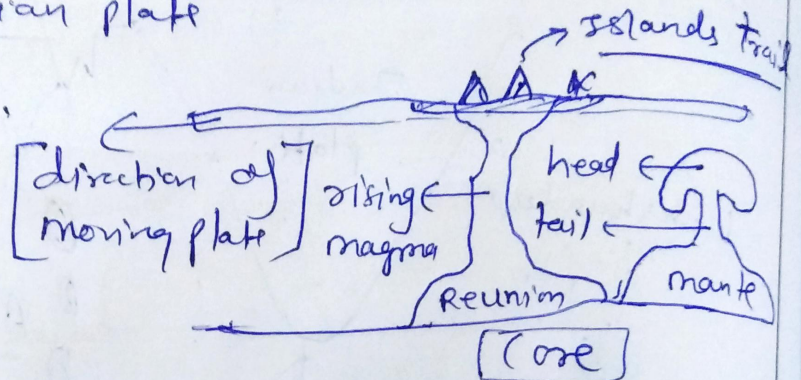


② Lakshadweep Is.

Hotspot volcanism is responsible for these Islands



mantle plume : formed at mantle-core boundary
 ↳ very hot magma rising to surface
 ↳ fixed location below the moving Indian plate



Reunion hotspot : ① plume rising from this hotspot ~~to~~ struck Indian plate 2 mya $\Rightarrow$ caused Volcanism & Island formation.

② As Indian plate moved forward the volcanism left a trail of Islands

e.g. Mauritius, Maldives & finally Lakshadweep etc.

Islands in Indian ocean has been made by Continent-Continent Convergence & hotspot volcanism.

Q-70 How has the global warming impacted the frequency & intensity of extreme weather events such as cyclones, floods, and drought, & what are the implications of these changes for vulnerable communities?

Global warming due to Anthropogenic & natural factors has caused widespread changes in weather pattern on the earth.

Impact on Extreme weather events

① Cyclones

↳ warming sea surface temperature has increased frequency of cyclones
for ex: Arabian sea's cyclones,

↳ Intensity : has increased in some areas & decreased in others

↳ unpredictable cyclonic event
ex: California hurricanes.

② Floods

- ↳ Glacial lake outburst floods increasing
ex: kedarnath 2013 flood.
- ↳ urban flooding more severe
ex: Delhi, Bangalore (2022)
- ↳ Huge monsoon (exacerbated by El-nino)
ex: kerala floods (2019)

③ Drought

- ↳ Intensity is becoming more severe
for ex: southern Europe (2023)
- ↳ Causing wildfires & further drought
ex: Australian bushfire (2018)
- ↳ frequency is increasing
ex: western USA.

Implications on vulnerable Communities

① Economic Impact

- ↳ Agricultural productivity decreases
- ↳ Inflation & price rise of perishable goods ex: Tomato.

② Social Impact

- ↳ Increasing poverty level (World Bank report)
- ↳ more effect on women, child & old aged people.
- ↳ Increasing disease burden.

③ political impact

- ↳ Promises made by political parties to mitigate global warming.
⇒ hurting marginalized sections.

Steps that can be taken

- ↳ Global collaboration: more serious efforts from developed nations needed
 - ↳ Agenda 21 (1992): Community Participation ex: LIFE Campaign.
 - ↳ funding: mobilization ex: through green bonds.
 - ↳ Insurance of marginalized community against climate disaster.
- fighting from global warming
need holistic, comprehensive &
multi pronged approach.