


## GEOGRAPHY

Time Allowed: 3 hrs.

Max. Marks: 250

Q.	Marks	Instructions to Candidate
1.		<ul style="list-style-type: none"> <li>• There are 20 questions.</li> <li>• All questions are compulsory</li> <li>• The number of marks carried by a question is indicated against it.</li> <li>• Answer the questions in <b>NOT MORE THAN 200</b> words each. Contents of the answer is more important than its length.</li> <li>• Answers must be written within the space provided.</li> <li>• Any page or portion of the page left blank in the Question-cum-Answer Booklet must be clearly struck off.</li> </ul>
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1. Invigilator Signature 

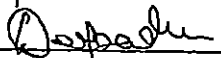
2. Invigilator Signature \_\_\_\_\_

Name DEE PANCHU

Roll No. 366

Mobile No. ~~XXXXXXXXXX~~

Date 7/11/16

Signature 

# REMARKS

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Roll No. \_\_\_\_\_

Q1. Sustainable Development Goal 14 recognizes that Oceans, along with coastal and marine resources, play an essential role in human well-being and social and economic development worldwide. Discuss their significance in the light of blue economy. (12.5 Marks)

Sustainable development goals are developed to bring prosperity to the world and simultaneously limit global temperatures to  $2^{\circ}\text{C}$  of pre-industrial levels.

Blue economy basically implies economy based around oceans which includes ports, sea lanes etc.

The significance of Oceans are :-

- (i) They provide food supplies in the form of fishes, clams, sea weeds etc.
- (ii) Oceans are channels of transportation through Straits like Malacca etc.
- (iii) Oceans form part of communication technology. Various telecom & internet lines are laid.
- (iv) Oceans provide energy resources like petroleum etc. (eg) North Sea provides Brent crude.

Remarks

- write sustainable dev issues with blue economy way forward to add diverse angle to Ans. (in short)

4/3

(v) Oceans provide minerals like polymetallic nodules.

(vi) Oceans affect the weather patterns which has direct impact on economy.

(Eg) El Niño in Pacific Ocean causing droughts in India.

(vii) Oceans hold strategic influence.

Choke points of the world like Suez Canal, Bosphorus Strait hold immense economic value because of their location.

(viii) Oceans are source of healthier economy.  
Asparagins weed is used to cure diabetes.

(ix) Oceans provide economy to coastal areas through port led development.

(x) It improves social economy. A study shows, oceans are relatively less

paternalist.  
Therefore, oceans which form 3/4 th portion of world are its vital economic resources.

Remarks

Q2. Recently Nepal successfully drained a part of a glacial lake near Mount Everest averting a risk of disastrous floods. Bring out the causes and consequences of shrinking Himalayan glaciers on human settlements and river drainage system. (12.5 Marks)

A recent study shows that over last 4 decades, Himalayan glaciers have receded by 13%. Therefore, shrinking glaciers are a cause of concern.

CAUSES →

- (1) Global warming :- Himalayas in 2015 experienced avg temp rise of more than  $4^{\circ}\text{C}$ .
- (2) Climate Change :- Has led to either drought or erratic rainfalls. The net consequence has been reduced precipitation in long period average.
- (3) Anthropological influence :- Increased human activity has led to increased exploitation of water resources. Tourism industry on an average takes 600 lpd more water.
- (4) Shift in upper air circulation :- Jet stream in upper atmosphere moved beyond Tibet failing to bring westerlies.

Remarks

CONSEQUENCES →

(1) Less water supply in the Himalayan rivers. CSE study shows only Brahmaputra river maintaining steady course of LHA.

less or impact of shrinking glacier

(2) Increased temperatures leads to stress in flora and fauna

(3) Increasing episodes of forest fires.

(4) Reduction in biodiversity. A WWF study shows 50% Himalayan bio-diversity under extreme vulnerability.

(5) Spill-over effect on MACRO-CLIMATE → Affects monsoon.

(6) Increases episodes of glacier calving and avalanches.

(7) Effect on tourism & religious industry

(8) Reduced water mostly affects women as they have to travel long distances.

All these factors makes human settlements stressed & river drainage dry & erratic.

Remarks ..

Q3. India has 7500 km long coastline, but the Indian fishery sector is not so well developed. Highlight the major impediments to the growth of this sector? Discuss. (12.5 Marks)

Indian fishery sector in recent years have shown growth rate of more than 10% according to Marine products Export dev. authority (MPEDA). But it has not been able to realize its potential.

Considering a long and diverse coastline.

The major impediments include:-

(i) lack of unified policy across coasts to utilize marine resources.

(ii) Failure to tap into the EEZ due to lack of ~~policy~~ <sup>targeted</sup> programmes.

(iii) Less mechanisation. Generally trawlers are used by developed states of Gujarat, Tamil Nadu.

(iv) Post issues :- (a) lack of proper equipment -- to store Overhaul - Cold chain etc.  
(b) lack of proper connectivity highlighted

Remarks

many key reasons cited - border disputes - Refer  
- less popular - Link

4 1/2

through Sagarmala project.

(v) Failure to involve private sector or foreign collaboration.

(vi) Branding of special Indian fishes like Pomfret etc. not envisaged.

(vii) poverty in coastal areas of West Bengal & Odisha.

(viii) less no. of cooperatives on the lines of TANWA in Tamil Nadu.

WAY FORWARD

(i) A comprehensive fishing policy linking coast to oceans and also mainland.

(ii) focus on Andaman Islands

(iii) Sagarmala project

(iv) private investment.

(v) fisherman training.

(vi) Branding through GI tagging.



Q4. In the past few years, urban floods are becoming regular and increasingly devastating and are largely due to human factors. Discuss with suitable examples. (12.5 Marks)

The Chennai floods brought the issue of urban floods to the forefront. <sup>→ have 10 marks multiple exmp</sup>  
Urban floods are marked by rapid rise in water levels even with less precipitation.

Recently NDMA has included urban floods in their disaster management plan. This shows the rising trend of urban floods. In the recent years,

urban flooding has been noted in cities of Rajasthan, Kolkata & South India.

The 2005 urban floods of Mumbai brought the serious concern regarding urban floods as reality. Urban floods are largely marked by problem of drainage.

4 1/2

Remarks

## HUMAN FACTORS

- (i) Unplanned growth leads to clogging.
- (ii) Clogging of drains due to solid waste.
- (iii) plastic as major cause of clogging.
- (iv) Concrete surfaces ~~prevent~~ prevent water permeation exacerbating the whole process.

- (v) loss of natural drainage system. Bangalore had more than 400 natural lakes presently ~~are~~ less than 20.
- (vi) Exotic rainfalls on account of climate change. This is anthropological as noted in AR 5 of IPCC.

## WAY FORWARD

- (i) City vulnerability mapping
- (ii) Smart cities to be planned for urban flood
- (iii) Reduce plastic use ⊕ proper disposal.
- (iv) people training ⊕ local solutions.

Remarks

Q5. Migration is a constant phenomenon throughout human history. People have shifted to find better pastures, more game, and other resources; similarly people have left home to escape religious or political persecution or even climate threat. Elaborate on some of the Socio-political push and pull factors, which force migration in 21st century?

(12.5 Marks)

Migration is a world wide phenomenon. The India today has been formed by waves of migration (Ronila Thapar).

However, the recent EU migration from West Asia & Africa, Rohingyas from Myanmar etc. have brought the issue to light.

### PUSH FACTORS

- (i) Constant wars eg Syria, Iraq
- (ii) Religious persecution eg Nigeria, Sudan, Rwanda
- (iii) Draughts & climate change eg Drought
- (iv) Non-employment eg Rural to urban migration in India
- (v) patriarchy eg Yazidi women, Boko Haram abduction.
- (vi) Food scarcity eg Arab Sea

Remarks

### PULL FACTORS

- (i) Better employment & from smaller towns to metro.
  - (ii) Better Quality of life & rural to urban migration.
  - (iii) Education & health standards
  - (iv) Better life chances.
  - (v) Recognition of human & human rights. ~~of~~
- Migration is a global, national & regional phenomenon. Around the world more than 1000 people applied for migration to US.

### WAY FORWARD

- (i) Strict implementation of Vienna Convention
- (ii) A global policy for systemic settlement
- (iii) Attitudinal shift that migration is good as shown by studies

Remarks

Q6. (80% of India's geographical area is vulnerable to one or other kind of disasters) thus it needs a comprehensive disaster management plan. How NDMP serve this purpose? Discuss in context of Sendai framework. (12.5 Marks)

India is a sub-tropical country with huge pressure on resources. The average popn density is 413 per sq km. Therefore disasters are chronic. elaborate  
as Intro

On this light, Sendai framework is a NDMP as a non-binding plan till

2030 based on Hyogo protocol to develop systemic disaster mgmt. plans.

NDMP serves the purpose as :-

(i) Vulnerability mapping for major disasters like earthquakes, floods, avalanches etc.

(ii) Mapping at par - India level.

(iii) Formulation of 3 tier structure to execute the plan  
 NDMA → SDMA → DDMA

(iv) Development of NDRF with 10 battalions

- Refer link for more understanding

Remarks

(v) Plan to train these forces for all kinds of disasters as also multiple disasters (2) Earthquake + fires -

(vi) Sendai focuses on prevent, protection - same as the goal of NDMP by application of Building Code 2003. Special preventive techniques for each disaster.

(vii) Both envisage global cooperation. Recently India - Russia signed disaster might pact.

(viii) Both focus on BUILD BACK BETTER

However, NDMP fails on account of:-

(i) ~~proper~~ data collection due to lack of availability.

(ii) developing financial mechanisms.

(iii) people training at comprehensive level.

(iv) mass awareness WAY FORWARD

(i) - Involve private sector.

(ii) - Utilise SHAs.

(iii) - Improve supply chain  
 - improve infrastructure

Remarks

Q7. Urbanization in India is suffering from "spatial illegality", Discuss. How urbanization should be planned to establish the right to city for every resident? (12.5 Marks)

Urbanization means growth of cities. Recently 32% of Indian population lives in cities. By 2050, 600 million more will be added.

- It suffers from SPATIAL ILLEGALITY as:-
- (i) While the rich have big houses, many poor are forced to sleep on pavements.
  - (ii) Most resources of cities are cornered by rich (e.g. 24 hour water supply, parks in good communities, etc).
  - (iii) The concept of gated communities further the divide.
  - (iv) Income inequality leads to unequal distribution of public utilities.
  - (v) Housing for poor is a problem.
  - (vi) Education - poor do not get quality education due to high fee structures.

(32)

Remarks

Demand of que is not fully addressed of Govt Schools

(vii) problems like climate change, urban flooding, affects the poor the most.

(viii) Costly healthcare.

### URBAN PLANNING SHIFT :-

- (1) Housing for poor should be first priority.
- (2) A plan should envisage migration.
- (3) Health care in the form of Mobile Clinics.
- (4) Dedicated course of teachers for quality education.
- (5) Employment creation and infrastructure to prevent exploitation.

### WAY FORWARD

- (i) Section 8(1)(b) of RTE to be implemented to provide 25% of reservation to ESl.
- (ii) Mobile clinics (ITIs) for Surwa.
- (iv) Smart cities should have

Remarks

Housing for all



Q8. How tropical cyclone is different from temperate cyclones? What are the necessary conditions for formation of tropical cyclones? (12.5 Marks)

Cyclones are temporal phenomenon marked by strong winds, mostly in tropical and sub-tropical regions. Recently, cyclone occurrence had been increasing world over with the recent Cyclone Haboob.

more adequate definition

DIFFERENCE

TROPICAL

TEMPERATE

1. Form in tropical zone with latitude 5-10° N and S

1. Form in 35-60° N-S

2. Required warm water temperatures around 27°C

Does not require warm water

frontogenesis

3. Has eye as ~~at~~ zone of calm, then vortex with strong winds followed by cumulonimbus clouds.

Frontal formation whereby movement is in direction of strong fronts

3 1/2

Remarks

- more knowledge required

4. loses energy when  
land.

Continues for days

5. Bring rainfall

not necessarily

6. frequent in both  
Northern & Southern  
Hemisphere.

Mostly in northern  
hemisphere

### NECESSARY CONDITION FOR TROPICAL CYCLONE :-

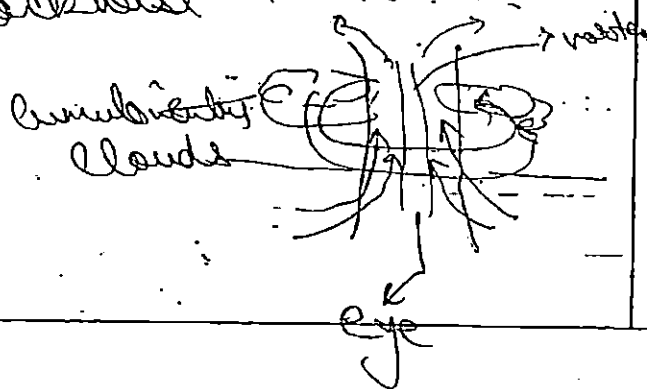
(1) Should be located between  $5-10^{\circ}N$   
-  $5$  so that Coriolis force can  
act.

(2) warm water of around  $27^{\circ}C$

(3) large mass of water-body

(4) wind formation

A cyclone moves anticlockwise in N  
Hemisphere & clockwise in South



Remarks

Q9. What are the factors responsible for generation of Oceanic currents? How these current affects the regional climate? (12.5 Marks)

Ocean currents are slow flowing ocean waters which flow perennially. They are a global concept.

Factors for generation of Ocean Current

- (1) presence of Coriolis force.
- (2) difference in temperature.
- (3) earth's rotation.
- (4) presence of horizontal temperature gradient.
- (5) coastline provides its shape.
- (6) tectonic movements.

CURRENTS RESPONSIBLE for regional climate →

- (1) Cold currents lead to desert formation on the west coast.  
 (e.g) Namibia, California, Chile

(5 1/2)

marks

Remarks

2) Warm currents bring rainfall -

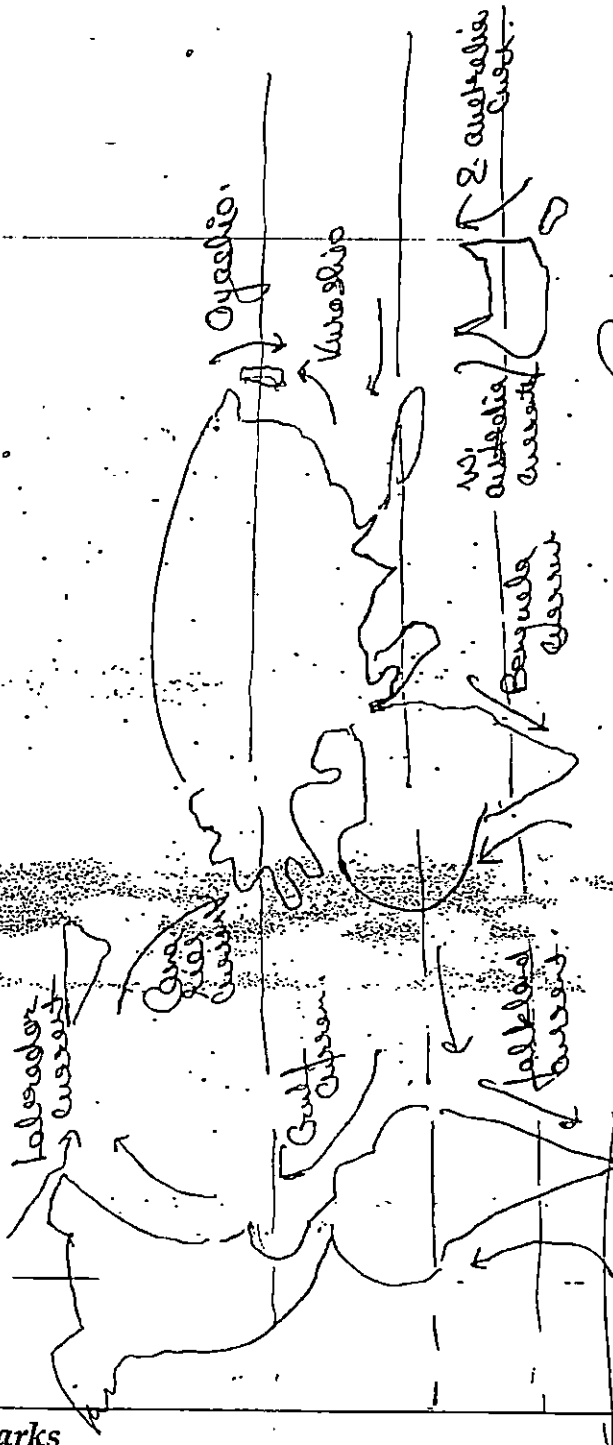
(eg)

Warm Benguer current, warm Benguela current in W Africa

(3) Currents have a moderating influence as they maintain the heat budget.

(4) Meeting of hot & cold currents provide diversity of fishing industry. The local climate witness anthropogenic effects like SMOG, oil spills etc.

Therefore it has a profound effect on earth climate.



Remarks

Q10. Corals are called as rain-forest of oceans. Highlight the significance of corals. Enlist the major threat of coral bleaching. Suggest measures to contain this problem.

(12.5 Marks)

Corals are basically polyp vesicles on which algae like plants grow. There are more than 4000 varieties of corals.

### SIGNIFICANCE :-

- ① Corals form forests, support the ocean biodiversity like fishes etc
- ② Corals provide nutrition & food
- ③ Corals have aesthetic value
- ④ Corals make ocean resilient to carbonification and acidification. (4/2)
- ⑤ They provide habitat to carbon
- ⑥ They remain major sources of  $O_2 - CO_2$  balance & buffer - carbon sink
- ⑦ They help in promotion of fishing & tourism industry.

Remarks

## Major threat of coral bleaching :-

Coral bleaching occurs when surrounding <sup>highly sensitive</sup> temperatures rise. Corals are

to temp. A shift from 32°C can cause mass destruction.

The largest coral reef is Great Barrier Reef. Currently facing high level of bleaching. Corals in Andaman & Lakshadweep are also facing the same.

## Measures to contain

- (1) Sea surface temperatures need to be prevented from rise.
- (2) Climate change to be reduced.
- (3) Follow of IPCC under Paris Deal.
- (4) A separate R & D on corals to understand physiology of corals.
- (5) Increasing temperature resistance of corals through bio-engineering.

Remarks

Q11. A map of India reveals that the North-Eastern region of our country is most prone to floods. What are the reasons for the routine occurrence of floods in these regions? How can the same be controlled? (12.5 Marks)

North-Eastern region has a vivid topography. It receives water from perennial sources like Brahmaputra and also from monsoons & western disturbances. The topography marked by mountains, plain, unplanned urban settlements make it prone to floods.

REASONS FOR ROUTINE OCCURRENCE →

① Exotic rainfalls.

② Natural topography where Brahmaputra

swells up in monsoon season  
small streams.

③ Spawning of fast streams

④ land degradation and deforestation

whereby water can't hold up.

⑤ Introduction of settled agriculture instead of forests.

⑥ presence of multiple rivers eg. Brah  
Barak, Manu

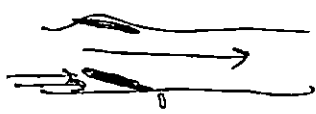
Remarks

⑦ Unplanned city formation.

CONTROL FLOOD

① River training methods :- development of embankments

groynes



Refer last  
write  
specific  
point

② Canal formation to channel excess water flow



③ Afforestation and restoration of natural forests.

④ Use of C.A.F funds for development of smart cities, sustainable cottage industries.

⑤ people training

Remarks



Q12. The food processing industry in India is not developed as per the resource endowments of different regions, many resource rich areas have practically no industry, whereas some states like Haryana and Maharashtra have high concentration of these industries, despite relatively less resources compared to some other regions. Critically analyze.

*elaborate first*

(12.5 Marks)

The unequal development of food processing industry, notwithstanding, the growth rate has been 13% for last 5 years. It has been called the **SUNRISE INDUSTRY**.

Unequal dev. →

(1) Region like North East with high horticulture potential lacks food processing industry.

(2) Haryana which is traditionally semi arid with 25-50 cm rainfall has multiple industries in Bawal, Panesar and Chardiyah - Haryana region. (1)

(3) The unequal dev. has been due to → availability of capital investment.

Remarks

- Government policies.
- proximity to metro cities which forms the market.
- Infrastructure like roads, railways connectivity as also presence of cold chains, electricity etc.
- NEP is also in turmoil due to insurgency problems.

### NOT ALTOGETHER TRUE →

- Sustained focus by Min. of food processing along with DoNER.
- Sustained programmes to develop these industries close to source raw materials.
- Utilization of cooperative model in Bihar, Jharkhand & Chhattisgarh.
- Special incentivisation policy especially Odisha & Telangana govt.

### Remarks

Food processing industry holds the potential to provide lucrative non-farm jobs. Respects must be utilized seriously.

Q13. Discuss the strengths and weaknesses of the drainage system in India? How is the river interlinking going to affect the Drainage System in India? (12.5 Marks)

Drainage system refers to the flow of water in channels. They are both natural like rivers and artificial like canals.

Strengths of drainage system in India

(i) The perennial drainage system is old & mature. Therefore meandering etc. do not happen. They become secure areas for housing & industrial dev.

(ii) Himalayan drainage is perennial which provides drinking water, water for agri & industrial year long.

(iii) Wide drainage system implies water is available to most regions of the country.

(iv) presence of alluvial soil

12

Remarks

- draw a map of drainage sys.

promote underground drainage.  
Wells in distant places: make water availability easier.

(iv) presence of multiple sources as against one as in case of Nile in Africa prevents drought & water scarcity

**Weakness**

(i) failure to control monsoon overflow

(ii) Urbanisation has led to increased runoff.

(iii) High susceptibility to monsoon.

(iv) Anthropological influence leading to weakening of natural structures.

(Eg) Lake in Kerala

(v) failure to control entry of pesticides, industrial wastes into river drainage

**RIVER INTERLINKING**

① Large scale migration

① will provide additional water to extend of 2 Andhra Pradesh.

**Remarks**

- ② balance bet. water surplus & water deficit region
- ③ net water balance.

Q14. What do you mean by Soil Quality? How does soil get deposited over the time? How Soil Health Card Scheme does aims to rejuvenate the nutrient status soil?

(12.5 Marks)

Soil Quality basically means soil health. This includes the (1) nutrients present (2) microorganism activity (3) toxicity levels (4) plasticity level. India has 46 different types of soil out of total classification of 60.

Soil gets deposited over time due to

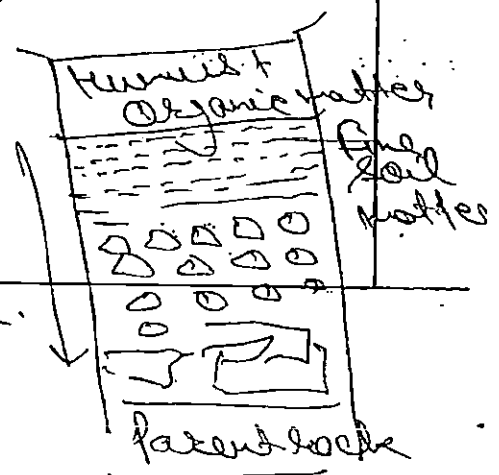
(1) weathering → physical weathering of air causes breakdown of rocks over time.

(2) Soil drought by rivers.

(3) Remains of plants & animals from the humus.

(4) Water from various sources like rain acts as buffer.

increasing particle size.



Remarks

## SOIL HEALTH CARD SCHEME aims

to rejuvenate soil health.

A ~~ICAR~~ ICAR study shows more

than 30% of agricultural soil stressed.

It shall rejuvenate through:-

(i) Currently 4:2:1 is the NPK ratio recommended but it differs from region to region. Therefore, a regional directory shall be developed.

(ii) Regular check for nutrients at every 3 years will help farmers to take necessary measures.

(iii) Promotion of best soil practices through reward mechanism.

### WAY FORWARD

(i) Infrastructure dev. in the form of ONE STOP MOBILE VAN for soil testing & solution awareness.

(ii) Use of Research & exhaustive data

Remarks


to map different agroclimates.

Q15. What do you mean by Desertification? Is India facing the same problem? What efforts have been taken both at the global as well as at national level to counter the problem of Desertification? (12.5 Marks)

Desertification is the process by which areas generally receiving more than 15 cm rainfall turn into deserts.

India is facing this problem starkly

A study by ICRIER shows deserts increasing from Rajasthan and Telangana towards the forested state of MP, Chhattisgarh etc. The state of Punjab, Madhya Pradesh, Orissa, Bihar and Maharashtra are also suffering from desertification.



### EFFORTS

- ① Formulation of UNCCD under the Rio Protocol to combat desertification
- ② India has recognised the problem at highest level :-

Remarks

The NAPCC & 4x4 Assessment envisages prevention of desertification.

(3) Measures to promote micro-irrigation through state incentives.

(4) Focus to produce less water intensive crops.

(5) Focus on regional appropriateness of crops. *less focus on adaptability but cost is the problem*

(6) Prevention of underground exploitation of water through state laws passed in Haryana etc.

(7) Curate resilient crops focused

(8) Research & development to develop such crops

(9) ICRISAT developed new climate resilient rice variety

### WAY FORWARD

(1) Prevent water wastage,

(2) True line to prevent desert invasion  
 (3) Sudan.

Remarks



Q16. What is meant by Rain Variability? What are the causes of rain variability? Discuss its impact on agricultural production and household welfare in rural India.

(12.5 Marks)

Rain variability means variation in the rainfall pattern over short term as well as long term average.

Causes of Rain variability →

→ need a long term report - refer list

(1) Natural

- Natural rain pattern of India receives 80% of its rains in monsoon season
- Natural variation of 1943 was a drought year. This happens due to phenomenon like - El Niño etc.
- volcanic eruption

(2) Anthropological

- Climate Change - California facing high rain variability - drought for 6 years & floods in 2015.
- Global warming
- Cloud seeding

refer list

32

Remarks

### Impact

#### Agri prodn.

- High rain variability is detrimental to agri prodn. Crop requires distinct season to grow; mature & ripen.
- Failure to develop policies for food ~~sec~~ security etc.

#### HOUSE HOLD Welfare

- Less food prodn. for own utilization & also for market
- Increased poverty
- Water scarcity, flooding increase vulnerability.
- Education, healthcare also suffer.
- Women remain maximally impacted.

#### WAY FORWARD

- Rainfall variability to be reduced through (1) Canal dev. → Integrated watershed
- (2) River interlinking (3) Crop ins. <sup>in</sup> <sup>the</sup> <sup>form</sup> <sup>of</sup> <sup>sub-</sup> <sup>sid-</sup> <sup>d-</sup> <sup>er-</sup> <sup>ance</sup>

#### Remarks

- (4) Sustainable (5) River  
 agriculture mainly  
 methods

Q17. "Inclusive growth in India requires collective efforts". Explain the private sector's participation in driving growth particularly in the lagged states. (12.5 Marks)

Inclusive growth means growth for all. It is one of the themes of 12<sup>th</sup> five year plan. Inclusive growth was traditionally driven by state sponsored programmes like subsidised education, electricity etc.

Improves  
welfare  
benefit  
egs  
finance

The private sector's participation in driving growth in ~~private sector~~ lagged states includes:-

- (1) Role of NRO's: Organisations like Bill & Melinda Gates foundation helped to eradicate polio, substantially reduced Japanese Encephalitis in Bihar, Madhya Pradesh.
- (2) SHG's provided microfinance as well as skill dev.
- (3) PSU Companies CSR by Tata's especially TISCO in field of

Remarks

education, housing developments etc.  
 (4) Put initiatives programmes like  
 Teach for India have made efforts  
 to promote school education.  
 However as a result, states like  
 Bihar have shown highest growth  
 rates in recent years.

### WAY FORWARD

- (1) Increased collaborations on lines of Health department of Bihar to improve attendance of doctors.
- (2) PPP projects (3) Grained funding to add new ideas as well as people funding.
- (4) Skill imparting under Skilling India.
- (5) Digital India for NOFN with the help of conglomerates like Bharti.

Remarks

Q18. Discuss briefly the theory of Isostasy? What is its role in the geo-morphological context?  
(12.5 Marks)

[Empty space for answer]

Remarks

*Remarks*

Q19. Evaluate the theory of Continental Drift as given by Wagner. How does the Plate Tectonic Theory seek to remove the shortcomings of the Continental Drift Theory?

(12.5 Marks)

The theory of Continental Drift states that the tectonic plates are in a set of perpetual motion. They are like ~~ice~~ <sup>equivalent</sup> to floating on ocean surfaces. This is because the density of ~~ice~~ <sup>granite</sup> rock = 2.7 ~~g/cm<sup>3</sup>~~ <sup>g/cm<sup>3</sup></sup>  $\downarrow$  ~~granite~~ <sup>oceanic</sup> = 3 forms ocean rocks forms continents.

The theory of Continental Drift fails to explain the formation of new land masses as also the formation of folds & faults. <sup>mainly failed to explain some of</sup> Plate tectonics provide

an answer. It envisions as initially a super-continent PANGAEA existed <sup>con. drift theory states it</sup> (2)

Remarks

lack of knowy

which broke down into Angora land & Gondwana land. Over the years plate formation took place due to geomorphological processes in the heat from inside the Earth was responsible to provide requisite force for breaking, folding & faulting. Plate tectonics has been proved through

(1) remarkable similarity in coastline of Americas & Africa.

(2) presence of same fossils (e.g. Australia, India - Africa - Antarctica).

(3) Gold paleo channels.

(4) formation of same mountain chains beneath the sea.

Continental drift theory is a predecessor to the plate tectonic theory which is found relevant today.

Remarks

Recent discoveries of Oceanic features like Sea Mounts, paleo channels has further <sup>substantiated</sup> ~~proved~~ the theory.



Q20. Compare and contrast the concept of Agro-Climate and Agro-Ecological Zoning. Which one do you think is better for agricultural planning in our country? (12.5 Marks)

Agro-climate zoning would refer to demarcation on the basis of climate zones only.

Agro Ecological Zoning would try to demarcate the interface between environment-climate-human.

The 2nd one seems more comprehensive as also important for agri planning:-

(i) Some climatic zones may have different biodiversity or population pressure. (ii) Himalayas in East and West

(ii) The 3 factors shall be able to demarcate the utilization in a better way.

3 1/2

Ans in old is asked

Remarks

(iii) Crop utilization depends on all these factors. (Eg) though Eastern India is better suited for rice production, Punjab has higher productivity, therefore factors more than climate come into play.

(iv) Focus has to be on rising population as well.

Since food crops utilise water - the adjoining biodiversity & human needs need to be looked in tandem.

### WAY FORWARD

① Agri-ecological zoning should utilise comprehensive data. It should utilise service of NBO's & RMA's.

② Time bound delivery.

③ Farmers need to be made aware.

④ Research Institutes like ICAR etc.

Remarks

develop best Agri practices in these regions.