

06/10/12

## Geography Paper-II

V.P.GALITHAM ①

Shola forest (Forest/Agric/Resources/Industry/Population/Rivers/transport)

A peculiar forest found at a height of above 700m in the mts.

### Silent Valley (Kerala)

Why silent valley?

Chikara (a nocturnal insect) which makes sound in the night is absent.

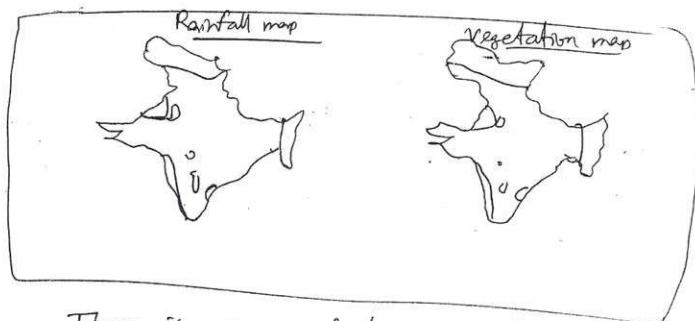
→ Vegetation in India is a mirror image of the monsoon.

### VEGETATION

A plant community, left undisturbed for a long period of time, becomes adapted to a particular region by itself naturally.

### Monsoon

A highly unpredictable seasonal reversal of winds.



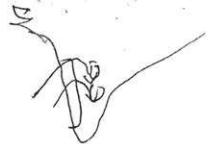
There is a perfect coincidence on superimposing the maps of rainfall & vegetation distribution.

### Evergreen forest



- SW monsoon obstructed by mts. Heavy rain ( $>400\text{cm}$ ) on windward side.
- Supports luxuriant vegetation (redwood, rosewood, etc.).

### Dry deciduous



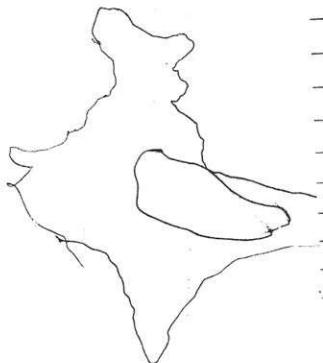
- Leeward side. No moisture with the wind. Subsidence  
anticyclonic - aridity. (Vidarbha, Telangana) ↓ forest fires common  
• semi-arid desert ⇒ dry deciduous (Sal, Teak, Acacia)  
Desert ↓ north ↓ south

### Desert



Parallelism of S.W. monsoon (Arabian Sea branch) with the Aravallis. No obstruction. No orographic rainfall. < 40 cm.  
Desertic ... Rajasthan  
No vegetation (only cactus).

### Wet deciduous forests.



#### Consequences of deforestation

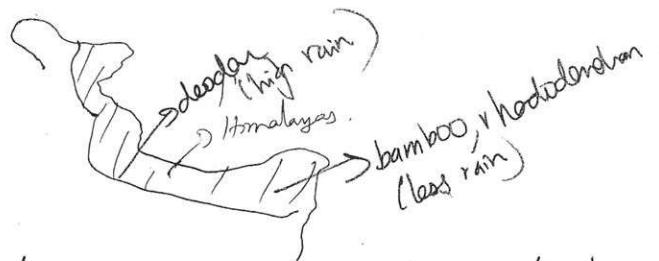
- 1) Accelerated global warming
- 2) Loss of Carbon sinks.
- 3) Loss of habitat to numerous animals.
- 4) Soil erosion, floods, landslides.
- 5) Intense wind (No shelter belts).

→ Northern plains.

→ 100 cm - 200 cm rainfall.

→ All 3 branches meet in this region, bring rain.

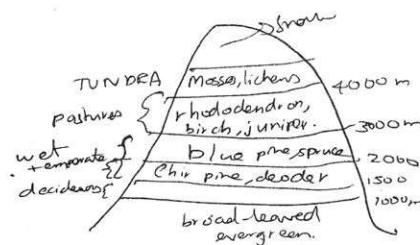
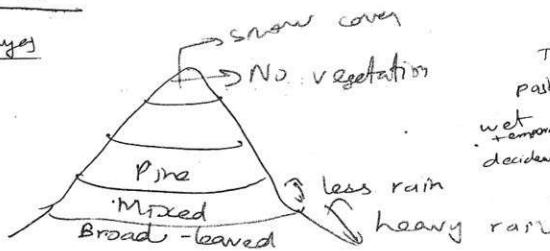
(3)



Himalayas  $\Rightarrow$  rainfall decreases from west to east  
 $\hookrightarrow$  (Uttarakhand, H.P.)  
 west  $\rightarrow$  more rainfall  $\Rightarrow$  deodar,  
 east  $\rightarrow$  less "  $\Rightarrow$  Rhododendron, bamboo.  
 $\hookrightarrow$  (Sikkim, N.E.)

### ALTITUDE

#### Himalayas



Himalayas very high mountain. The bottom portion receives majority of orographic rain from ascending monsoon. So, broad leaved trees.

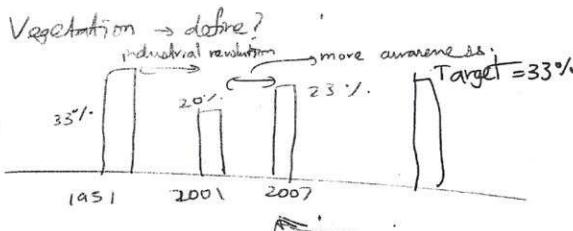
#### Western Ghats



$\nwarrow$  shola forest  $\Rightarrow$  a temperate forest, stunted growth.

is Critically examine the distribution of vegetation in India.

↓  
read India's People & economy (for basic data)



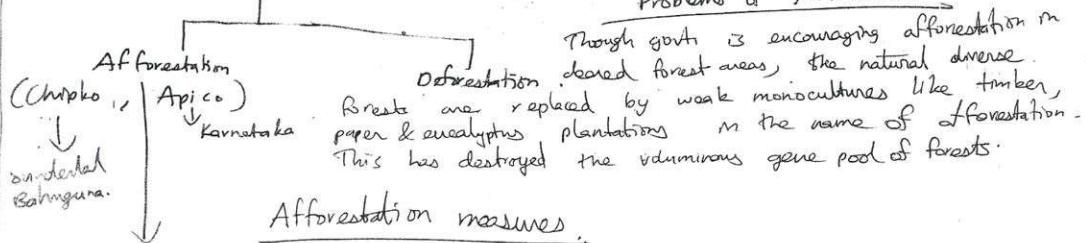
### Distribution :

Spatial

Temporal

Anthropogenic factors Temporal distribution mainly influenced by Anthropogenic factors & also due to climate change.

### Problems of Afforestation



### Afforestation measures.

1. Reserved forests, sanctuaries, national parks, protected forests.
2. Social forestry, community forestry (unutilised land, roadside fallow.)  
→ Making Indian Forest Service an All India Service in 1991.
3. International Conventions (CBD, Biosphere Reserves) Ramsar convention  
Public Trusteeship → Community protection of forests is the best method of conservation.
4. Joint forest management (govt. & public)
5. Green India Mission (increase 20,000 hectares of forest by 2022)  
↳ chair: PM.
6. Bamboo mission (N.E. India)  
Legislative measures → Forest Rights Act 2006, National Biodiversity Act 2002.
7. Van Mahotsav [Forest Festival → awareness of importance of forests]  
— Amendment to Forest Act.
8. Awards for forest conservation to individuals, NGOs.
9. Intro of LPG has reduced deforestation for fuel wood.
10. Planting saplings (celebrity involvement)

## Deforestation

(5)

1. Rapid urbanization → human settlements.
2. Industrialisation → for raw materials, space  
MoEF: - 15,000 hectares of forests legally diverted to mining activities last yr.
3. Mining → Posco, Vedanta (Goa, Karnataka, Odisha, Jharkhand).
4. Development projects (railways, road), dams.  
 Konkan Narmada → submerged.
5. To bring more land into cultivation, to feed the exponentially growing population.
6. Unsustainable tourism.

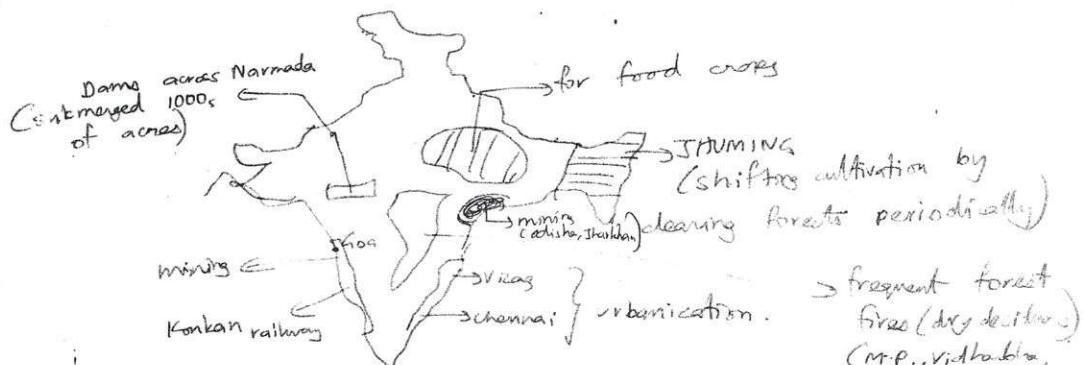
SPATIAL DISTRIBUTION → Colonization & invention

- Replacing oak by chir pine in Himalayas.
- Planting of tea, coffee in Nilgiri slopes.
- Rubber & teak monoculture in Western Ghats, top-skip.

Spatial distribution is mainly due to climate & rainfall.

Write the prev. answer (vegetation is a 'mirror of monsoon') in a condensed manner.

Natural vegetation is ~~most~~ mainly affected by local factors (eg: - Shifting in N.E.). also.



### LOCAL REASONS FOR DEFORESTATION

N.E. ⇒ shifting cultivation

T.N. ⇒ urbanization

Northern plains → food, crops ⇒ (Haryana, Punjab have less than 5% forest cover)

Plantations ⇒ Colonial period → Kerala, Karnataka, Assam  
rubber coffee tea.

Vidarbha, Telangana → Forest fires (dry forests)

Western Ghats → mining, Konkan Railways

Forests can live without man; Man cannot live without forests.

→ Collect similar quotations (from govt. depts & ministries)

### CONSERVATION OF FORESTS



In situ

Ex situ

rather than just listing the species in the proposed area, the impact  
of the project on each species should be studied.

1. Strict EIA & envt. clearance procedures.

2. Reduc<sup>re</sup> Dependence on paper (e-tickets, etc...).

3. Protect tribal areas (187/593 districts are tribal areas.  
They have 59% of India's forest cover,  
despite having only 33% of area.)

4. Restrict tourism

in forest areas (pollution, plastics).

5. More ~~taught~~ forest guards.

6. Strict punishment for those involved in illegal logging.

7. While afforestation, diverse varieties of species (that were erstwhile existent in the area) have to be planted, instead of weak MONOCULTURES.

8. Community protection of forests to be encouraged (Forest Rights Act, 2006).  
q. Access & Benefit Shares to the local pop (Nagoya Protocol, NBA-2002)

→ How can we mitigate the impact of flood & drought.

Flood

- ① soil-based (land-based)
- ② crop-based
- ③ technology
- ④ admin'

1. Embankment

Checkdams

Mulching

Grass cover

Afforestation

Bench terracing

Contour bunding

Remove encroachments on river channel.

Reservoirs.

Reduce run-off.

Desilting of dams.

Depopulation of flood plains.

Drought

Drought control

1. farm pond

2. More water storage  
- lakes, reservoirs

3. Underground water recharge  
→ rain water harvesting

4. Check indiscriminate use of  
ground water.

5. Sprinkler irrigation, drip irrigation

6. Drought resistant crops.

7. Watershed mgmt

8. Interlinking of rivers.

9. Proper crop selection.

+1000  
Flood-prone zone mapping

Early warning system

(Cyclone centres,  
remote sensing) ...

Interlinking of rivers.

Post-drought mgmt. (J)  
10. Back-end facilities for storing  
food grains.

11. Free seed supply.

12. Proposing alternate crops  
(crop diversification)

13. Restructuring loans.

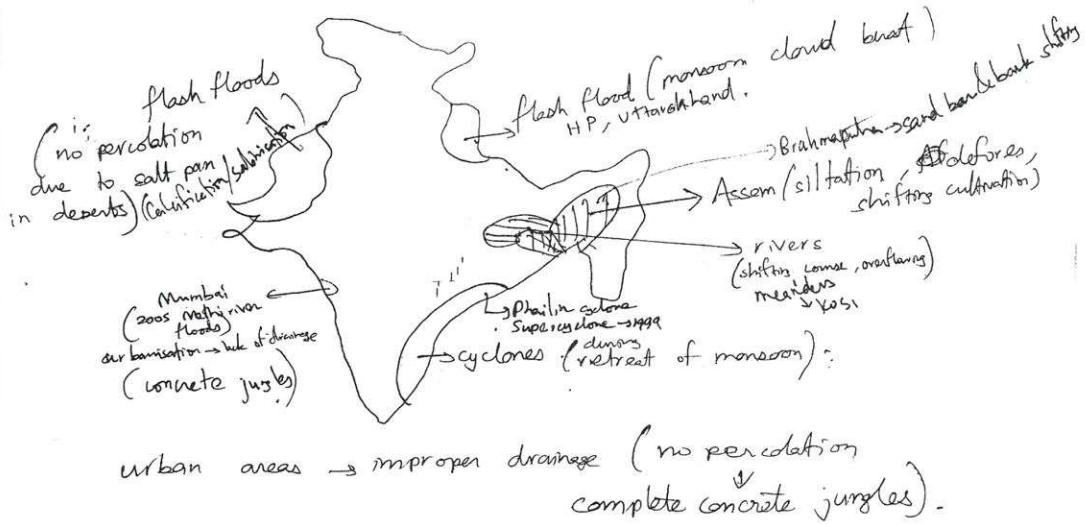
Step 1: Irrigation

### Drought control

1. Reducing seepage loss -  
(e.g.: loss of water from Indira Gandhi  
canal).

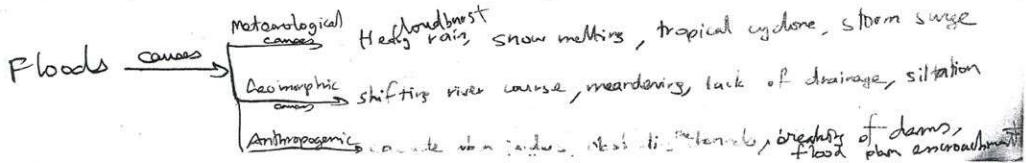
- Preserving natural sources of water: from  
pollution (lakes, rivers) ..

→ Discuss the causes of flood & drought in India.



• First mention monsoon & its effect @ floods.

• Now, also mention other types of drought.



## DROUGHT

1. Meteorological drought (inadequate rain)
2. Agricultural drought (lack of soil moisture)
3. Hydrological " (lack of water in reservoirs)
4. Ecological drought (reduction of ecological productivity).

## CAUSES

### 1. MONSOON

spatial variation → Rajasthan      ?  $< 40 \text{ cm. rain}$   
 Vidarbha, Telangana      ~~100~~  $\text{cm. rain}$

Temporal variation → 80% rainfall in 3 months.  
 Other months drought.

- a) Late-onset
- b) Early withdrawal
- c) Breaks in monsoon.

### 2. Selection of wrong crops in wrong areas

(e.g.: high water consuming crop in water-deficient areas).

### 3. Indiscriminate use of groundwater (Punjab, Rajasthan, Haryana).

### 4. Lack of storage facilities of water & irrigation facilities.

### 5. Lack of modern techniques of agri.

### 6. Heavy run-off.

→ Though floods & drought are natural phenomena,  
 its extent & intensity is greatly altered by humans. Discuss.

→ despite the high amt. of rainfall in India, it is

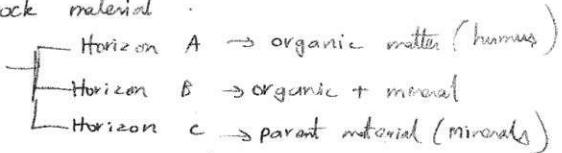
Known for drought - Discuss.

→ Discuss the basis for distribution of soils in India. (9)

## SOIL

Top layer of the earth's crust due to degradation & weathering of parent rock material.

### SOIL PROFILE



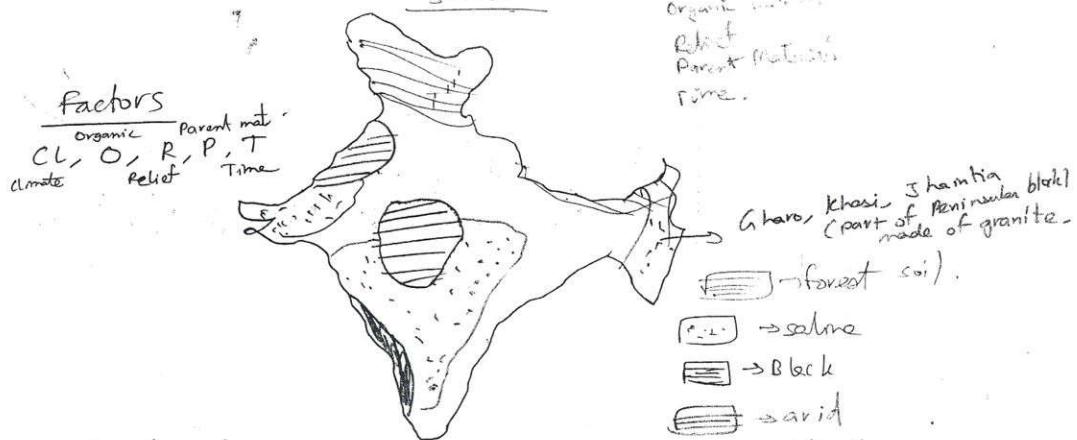
### Basis for distribution

- i) Rainfall
- ii) Rivers, deposition
- iii) Irradiation
- iv) Type of parent material

### Factors of soil formation

### Soil Distribution in India

#### SOILS



### Alluvial soil

- 40% of India
- from east Punjab to Ganga delta.
- Deposition of silt by perennial rivers.
- High fertility → Humus → (O) due to heavy rain in siwaliks.
- Khadar → new alluvium → in delta region (flood areas)
- T/R { Bhangular → old alluvium → away from floodplains.

### BLACK SOIL

- Deccan plateau. (M.P., Maharashtra, Gujarat, Andhra)
- Mainly basaltic → supposed to be volcanic ash; black due to ~~iron~~ rich iron oxide (P).
- In geological history, this mass of peridotite plateaus was over a volcanic hot spot & it would have spewed out

## RED & YELLOW SOIL

- From crystalline **GRANITIC ROCKS**:  $\downarrow$  **(P)**  $\rightarrow$  **(A)**  $\rightarrow$  **(C)**  $\rightarrow$  **(R)**  $\rightarrow$  **(Y)**  $\rightarrow$  **(O)**
- **weakening of granite**
- **From quartzite & gneiss.**
- **Precipitate of weathering (T.N., Karnataka).**
- **Yellow + hydrated red soil.**
- **Orissa, Chhattisgarh (due to flood  $\Rightarrow$  hydration of red soil!).**

## LATERITE SOIL

- **in high temp. & heavy rainfall areas; due to steep relief (R)**
- **red in colour due to exposure of iron oxide.**  $\downarrow$  **P:**
- **Leached**  $\downarrow$  **Si**  $\downarrow$  **Fe + red colour**  $\rightarrow$  **due to heavy leaching of top layer of soil. (silica)**
- **due to sudden & heavy rainfall.**  $\downarrow$  **high monsoon areas (Kerala, Maharashtra, Orissa).**

## ARID SOIL

- **Saline  $\rightarrow$  salt deposited on surface due to evaporation of water -**
- **No rainfall  $\rightarrow$  (C)**  $\downarrow$  **Time (T) is a major factor, some parent material converted to sand (desert).**
- **W. Rajasthan (No monsoon rain  $\Rightarrow$  parallelism of Aravallis).**

**SALINE SOILS**  $\rightarrow$  **No role for P; all parent materials converted to desert.**  $\downarrow$  **same type of desert soil due to high temp. & low rainfall.**

- **Large proportion of Na, K, Mg.  $\rightarrow$  sea water intrusion.**
- **Dry climate, poor drainage, (C)**
- **Arid, semi-arid, swampy, waterlogged areas.**
  - $\downarrow$  **wetland**
  - $\downarrow$  **sunderbans**
- **Punjab, Haryana  $\Rightarrow$  excessive irrigation in dry regions (capillary action).**
- **Gujarat & R. Kutch  $\Rightarrow$  intrusion of sea water.**

## FOREST SOILS

- **sufficient rainfall**
- **foothills of Siwaliks (monsoon obstructed by ~~Himalayas~~ Himalaya).**
  - $\downarrow$  **W.H.P., Uttarakhand, Summer, Siwalik**

→ Characteristics of soil in India.

(11)

### ALLUVIAL

- Silt deposition by Himalayan rivers  $\Rightarrow$  fertile plains
- Very fertile due to rich Humus content in silt.
- Rice, sugarcane, jute.
- Low water retention  $\Rightarrow$  absorbs all the water (best among all Alluvium  $\nearrow$   $\nwarrow$ )
- 1. Bhargav 2. Khadar 3. Bhabar 4. Terai.

### BLACK

- Basaltic (volcanic ash)  $\Rightarrow$  volcanic hotspot in historic periods.
- Iron content  $\Rightarrow$  black colour & humus  $\nearrow$ .
- High water retention  $\Rightarrow$  causes water logging.
- Self ploughing  $\Rightarrow$  develops cracks in dry season.
- Cotton, sorghum
- Gujarat, Maharashtra, M.P.  $\rightarrow$  Deccan plateau.

### RED SOILS

- Granite & Gneiss disintegration  $\Rightarrow$  high temp. disintegrates.
- Hydrated red soil  $\rightarrow$  yellow in colour.  
 $\downarrow$   
due to rich iron content.
- Groundnut, chilli, tobacco, papaya.

### LATERITIC SOIL

- Due to heavy leaching of top soil (silica)  
 $\downarrow$   
due to high rainfall
- Lateritic soil  $\Rightarrow$  red in colour due to IRON OXIDE.
- Fertile top layer leached. Does NOT support crops, except cashew.
- Kerala
- Soil is used for brick & tile-making

## SOIL

(13)

Soil is a function of CLOR PT.

Factor of soil distribution

CL  $\rightarrow$  Climate  $\rightarrow$  Temp; rain

O  $\rightarrow$  Organic material  $\rightarrow$  humus (vegetation);

R  $\rightarrow$  Relief  $\rightarrow$  slope, altitude

P  $\rightarrow$  Parent material  $\rightarrow$  rock

T  $\rightarrow$  Time

Active factors

absorbs certain nutrients, changing the colour & fertility.

Passive factors

SOILS

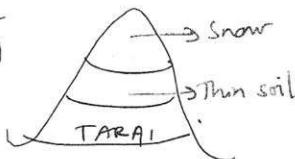
$\left[ \begin{matrix} \text{ex situ (alluvium) transported from outside by rivers.} \\ \text{in situ} \end{matrix} \right]$

### Climate

In TN, Red soil is found in most areas, while black soil is found in interior TN (Kovilpatti). Inspite of the same <sup>parent</sup> material, diff. types of soil are formed due to difference in Climate (CL).

### Altitude

(Relief)



### Vegetation (organic material)

Type of crops absorb nutrients of a specific land, changing the colour & fertility.

After decay, the plant forms humus - altering soil fertility.

### Time

In Rajasthan, irrespective of different types of parent materials, all of them are converted into sandy desert soil, if wind operates & erodes them for a period of time in the geological time scale.

→ Discuss the problems of soil in India. Discuss measures to improve soils.

### Problems of soil in India

#### Causes for soil problems

1. Dumping of industrial pollutants

(Shahrukh paper mill, leather industry in Ambur)

2. Improper agri-practices (monocropping) → (leads to depletion of some types of minerals from same depth)

3. Overgrazing

4. Deforestation → desertification → arable land becoming uncultivable.

5. Excessive irrigation → capillary action → salinity in Punjab, Haryana

6. Wind & water erosion → gullies & ravines;

7. Intensive agri. → no time period b/w two cropping seasons (no fallow).  
no time for soil to regenerate; (no nitrogen fixation, etc.).

8. Excessive chemical fertilizers → kills microbes → no microbial activity → soil becomes poor.

Types of soil problems. 9. Overuse of urea  $N:P:K = 4:7:29:1$   
optimal use  $N:P:K = 4:2:1$

1. Soil erosion

2. Degradation of soil.

3. Water logging

4. Salinity

### PROBLEM SOILS

1. Acid soil

2. Alkali (sodic) / saline soil

3. Fluffy soils (due to waterlogging)

4. Soil erosion.

5. Cracks of soil.

6. Soil fertility depletion (nutrient mining)

7. Soil pollution.

### Measures to check soil problems

1. Modern agri-practices → Cropping rotation

2. Use of organic manure (Organic forms) → FYM (Farm Yard Manure), vermicompost

3. Controlled usage of fertilizers & pesticides. (Integrated nutrient management)

4. Sewage & effluent treatment plants.

5. Sustainable agriculture → (Green revolution → Evergreen revolution)  
CBP

6. Check erosion on farm boundary, shelter beds, terraced, mulching.

06/10/12

## INDIA - MAJOR RIVERS

(15)



→ Critically compare the peninsular rivers with the Himalayan rivers.

- Conserve soil by conserving its physical structure, micro & macro nutrients, microbial activity.
- 8. Proper ratio of chemical fertilizers ( $N:P:K = 4:2:1$ )
- 9. Lay the land fallow for a short time, b/w 2 cropping seasons.

→ Bring India's People & Economy tomorrow.

## Himalayan rivers

1. Perennial
2. Snow-fed mainly.
3. Young (it forms deep valleys & gorges)
4. Navigable. Used as inland waterways
5. Huge volume of water
6. Deltaic region is swampy, marshy, supports mangrove.
7. forms larger deltas.
8. All Himalayan rivers form deltas.
9. Make meanders (since soft, alluvial soil).
10. Dendritic pattern
11. ~~Antecedent also (Indus, Brahmaputra, Arun)~~

## Peninsular rivers

1. Seasonal.
- Only rain (monsoon)-fed.
- Old (belongs to the old peninsular block, gentle valleys).
- Not navigable since it is dry in some seasons.
- Lesser volume of water.
- Deltaic region is cultivated land
- Its delta area is small
- They form deltas & estuaries.
- No meanders (hard, granitic rock).
- Dendritic, pteridite.
- only consequent.

## DRAINAGE TYPE

### DRAINAGE PATTERN

Spatial arrangement

- DRAINAGE TYPE
1. Consequent ~~pattern~~
  2. Subsequent ~~pattern~~
  3. Obsequent ~~pattern~~
  4. Antecedent ~~pattern~~

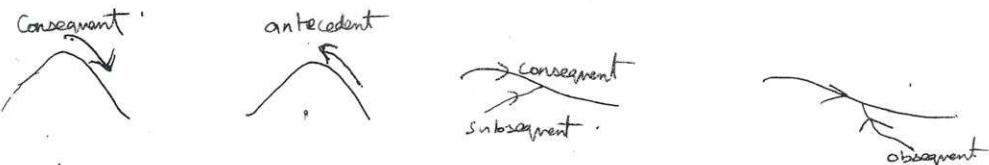
CONSEQUENT PATTERN → when the river follows the slope. (eg:- rivers in w. Ghats)

ANTECEDENT → when the river transcends the slope, moving across the slope. (because the river exists even before the formation of mountains & maintains its path even after the upheaval of the mountain) (eg:- Indus → it existed even before the formation of Himalayas).  
Indus @ Nanga Parbat, Brahmaputra @ Namche Barwa.

CONSEQUENT → main branch of river (Ganga, Kaveri)

SUBSEQUENT → the tributaries that join the main branch subsequently. (eg:- Son, Kosi, Gomati are subsequent rivers of Ganga).

OBSEQUENT → a tributary which joins the main branch, in a opposite direction opposite (upstream) to the main branch.



### DRAINAGE PATTERN

Radial (Centrifugal) pattern

A river originating on top of a hill drains into all directions.



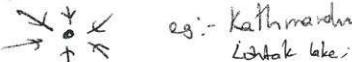
eg:- Amarkantak plateau, (Chhattisgarh)  
Son, Narmada

Girnar hills  
(Gujarat)



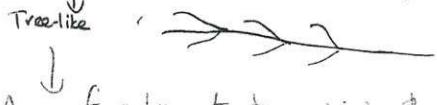
### Centripetal

In case of a valley surrounded by mountains on all sides, the rivers originating in the mountains drain into the same valley from all the sides.



eg:- Kathmandu valley (Nepal)  
Lake side;

Dendritic pattern (Nerve-like) ⇒ Most famous pattern (all major rivers have this drainage pattern)



A no of subsequent streams joins the consequent river, at regular intervals, on either side due to narrow v-shaped valleys. eg:- Ganges, Yamuna

Contd. .... due to soft, alluvial soil

(Turn 3 pages ahead)

## HIMACHAL PRADESH

Kalka - Shimla  $\Rightarrow$  Heritage train (toy train)

↓  
Other heritage trains in India

- 1. Darjeeling
- 2. Nilgiris

Kasauli  $\rightarrow$  Malaria vaccine production.

Mandi  $\rightarrow$  rock salt production (rather than sea salt as in coastal areas)

↓  
lack of iodine  $\Rightarrow$  Thyroid problem in hilly areas.

Kullu - Manali  $\rightarrow$  tourist hill stations.

PUGA VALLEY  $\rightarrow$  Manikaran  $\Rightarrow$  Hot water spring of India.

↓  
Geo thermal energy production.

• Shimla  $\rightarrow$  capital of H.P.

→ summer capital of British India

→ Port Blair Research Instt.

→ 'evergreen valley'

→ Highest polo ground.

- Shimla deputation  $\xrightarrow{1906}$  Muslim League's request for communal electorates

- Simla Conference  $\xrightarrow{1972}$  Indira Gandhi & Zulfikar Ali Bhutto

→ after Indo-Pak War (1971)

→ Kullu <sup>Chamba passes through it</sup> valley  $\Rightarrow$  northernmost f.p.

• Dharamshala  $\rightarrow$  Buddhist monastery

→ Dalai Lama lives in exile  
Tibetan govt. in exile

→ Highest cricket ground.

• Highest polling booth  $\rightarrow$

- CULTIVATION → only apple. (k) terraced farming)

(19)

↓ south Himachal.

North Himachal → snow-covered.

• H.P. → least urbanized (most rural) state of India.

↓  
- Himalayan foothills

• ECONOMIC ACTIV

RIVERS - Source of Chenab & Beas.

• Sutlej passes through H.P.

↓

Naptha Jhakari → largest HEP in India across Sutlej

RESERVOIRS

• Govind Sagar

• Pong Reservoir → supplies water for Indira Gandhi canal.

## JAMMU & KASHMIR

Passes → Bara, Laptcha, La

will enter from H.P. into Leh.

- Leh (capital of Ladakh).  
dist.

↓  
→ Buddhist monasteries

→ part of Ancient Silk Route.

→ Highest telescope

→ Highest airport

LADAKH → cold desert of India.

Passes from Kangil to Srinagar → Zojila, Nathula.

↓  
Kangil war

SRINAGAR → Summer capital of J&K

## SRINAGAR

- Srinagar silk.
- Pashmina shawl  $\Rightarrow$  Pashmina goat  $\rightarrow$  Pashmina Research hoff., Srinagar now cloning of Pashmina goat.
- Saffron  $\rightarrow$  from flower bud  $\rightarrow$  gives fairness to skin.
- Srinagar is located on Jhelum river bank.
- KAREWA  $\Rightarrow$  soil deposited by Jhelum.
  - ↓
  - supports paddy cultivation
- LAKES in Srinagar
  - 1. Dal Lake
  - 2. Wular lake

↳ houseboat (Shikara).
- PASSSES from Sri Nagan to Jammu
  - 1. Pir Panjal pass
  - 2. Rohtang pass.
- GUJJAR TRIBES  $\rightarrow$  transhumance  $\rightarrow$  pass through this pass from plains to mountains.
- JAWAHAR TUNNEL  $\rightarrow$  longest tunnel in India (from Srinagar to Jammu).
- Sensitive Areas
  - Anantnag
  - Kupwara

## PILGRIMAGE

VAISHNODEV  $\Rightarrow$  temple  $\rightarrow$  Karst (limestone topography)  
 (on Chenab River)  $\downarrow$  Durga God  $\uparrow$  tunnel through temple

AMARNATH Cave  $\Rightarrow$  Shiva temple  
 snow lion (woof) of Amarnath.

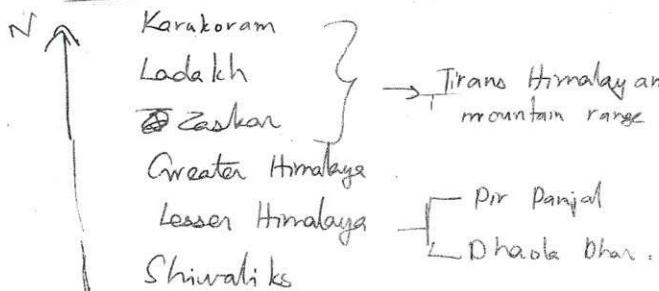
Cul Marg  $\rightarrow$  golden grasslands

Meadow  $\rightarrow$  grassland

Any place ending with

Marg  $\rightarrow$  grassland (culmarg, Sonamarg...)  
Tal  $\rightarrow$  lake (Nainital, ...)

### MOUNTAINS IN J&K



Highest peak in India  $\rightarrow$  K2 (8611 m)  
 $\downarrow$   $\hookrightarrow$  Godwin Austen.  
 on Karakoram mountains

SIACHEN GLACIER  $\rightarrow$  strategic glacier  $\Rightarrow$  heavy avalanche deaths  
 $\hookrightarrow$  (India-Pak prob.)

WORLD'S 5 LARGEST GLACIERS ARE IN INDIA

East to West  $\rightarrow$

1. Batura
2. Hispar
3. Biafo
4. Baltoro
5. Siachen.

### NATIONAL PARK

Dachigam Panchsheel

Hemis high altitude.  $\rightarrow$  snow leopard, Kashmir stag (Himalay)

Salim Ali National Park

↓  
PROJECT HANUML

### HIGHWAY

JAMMU - BARAMULLA HIGHWAY to provide all weather round-the-year connectivity with mainland.

Z-Morh & Zojila tunnels  $\Rightarrow$  Leh to Srinagar

by BRO (Border Roads Organisation). through Kargil, Sonamarg, Ladakh.

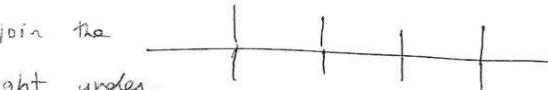
• See all major projects

1. Project Tiger
2. Project elephant
3. Project crocodile
4. Project vulture
5. Project Hanuman

..... Contd. (from drainage patterns)

### Pteriles pattern

Subsegments join the consequent at right angles, equally from both sides.



~~eg: Narmada~~; due to narrow rift valley & hard rock.

### Rectangular pattern

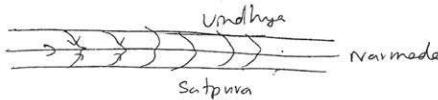
Subsegments join the consequent river at right angles, but only from one side at a particular point.



### Pinnate pattern

When the valley is very narrow, the length of subsegment rivers (tributaries) is usually very short.

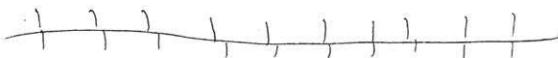
Eg:- Narmada river (narrow valley of Vindhya & Satpura)



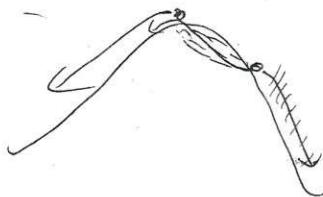
### Herring pattern

Very long valley with a large no. of short tributaries joining the consequent mostly at right angles.

Eg:- Rivers in Scandinavia.



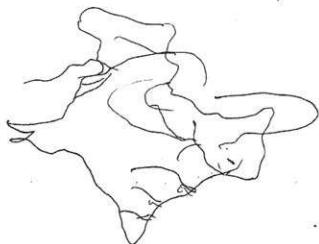
## River capture



eg:- Jog falls (Sharavati river)  
Karnataka.

→ Compare the drainage pattern of Himalayan & peninsular rivers.

Drainage → Major rivers.



1 - Drainage pattern

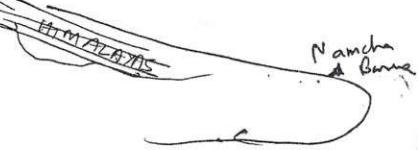
Himalayan river → antecedent

Transcends ↓ all the Himalayan ranges (NOT follows slope)



eg:- Indus, Brahmaputra existed even before formation of Himalayas

Peninsular → Follows slope of w.h.tals (except Sharavati)



## 2. DRAINAGE PATTERN

Himalayan rivers  $\Rightarrow$  mostly, centripetal drainage (eg:- Kathmandu valley)  
 since a no. of Himalayan ranges are present.

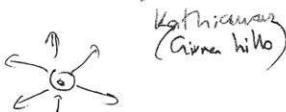


dendritic

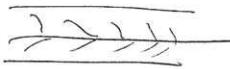


Peninsular rivers  $\Rightarrow$  a variety of drainage patterns

Radial  $\Rightarrow$  Amarkantak



Pinnate  $\Rightarrow$  Narmada



## 3. River capturing

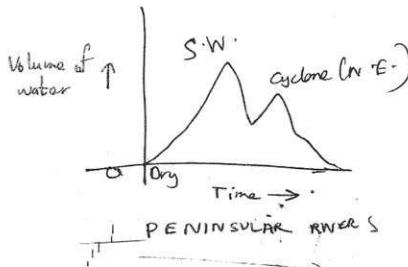
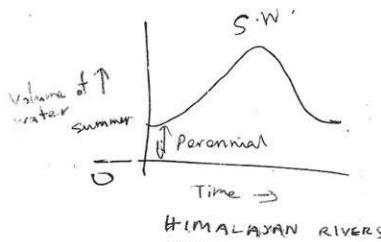
Most of the Himalayan rivers indulge in river capturing.  
 eg:- Kosi.

No river except Shrawasti indulges in river capture.

## f. Volume of water flow

### HIMALAYAN RIVERS

- It is perennial, fed by melted snow in summer & rain during monsoon.



## 5. Meandering

Himalayan rivers  $\rightarrow$  meandering (because of loose soil) (25)  
 eg:- Kosi shifting course  $\rightarrow$  Brahmaputra  $\sim$  alluvial

Peninsular rivers  $\rightarrow$  not meandering (because they flow on hard granitic rocks of the penins block)  
 (granite & gneiss)

## 6. Age (Stage)

Himalayan rivers  $\rightarrow$  young stage (indicated by v-shaped valleys, canyons & gorges).  
 (juvenile)

Peninsular rivers  $\rightarrow$  mature stage (not much deep valley).  
 (senile)

## 7. Volume of water @ mouth & source

Himalayan rivers  $\Rightarrow$  volume is high at mouth, since a large no. of tributaries join at near the mouth.

Peninsular rivers  $\Rightarrow$  volume is high at the source, since there are a large no. of tributaries at the waters only.

## 8. Delta & estuary formation

Himalayan river  $\rightarrow$  only deltas.

Peninsular rivers  $\rightarrow$  ~~because~~ forms both delta & estuaries.  
 Narmada, Tapti;

## 9. Delta size

Himalayan rivers  $\rightarrow$  large deltas (underdeposited) due to the ~~is~~ great length and hence the greater amount of eroded material, which is deposited as silt in delta.

Peninsular rivers  $\rightarrow$  smaller deltas, due to ~~the~~ small amount of silt carried (~~the~~ small length)

## 10 Navigation

## HIMALAYAN

- Navigable  $\rightarrow$  ~~young~~ not much undulations.

e.g. :- NW 1 → Allahabad - Haldia  
NW 2 → Sadiya - Dibruri

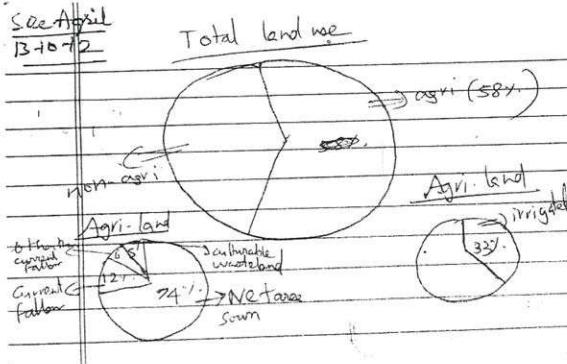
- Non-navigable → large no. of undulations; for half of the year, they are dry.

## FACTORS FOR LAND USE PATTERN CHANGE

1. Change in size of economy
  2. Change in structure of economy
  3. Increased pressure on agri. land (increase in population)

TRENPS

<u>Increasing</u>	<u>Fluctuation</u>	<u>Decreasing</u>
i) Non-agriculture ii) Forest	i) Curred fallow	i) Net sown area ii) Water bodies/other waste iii) Pastures



07/04/12

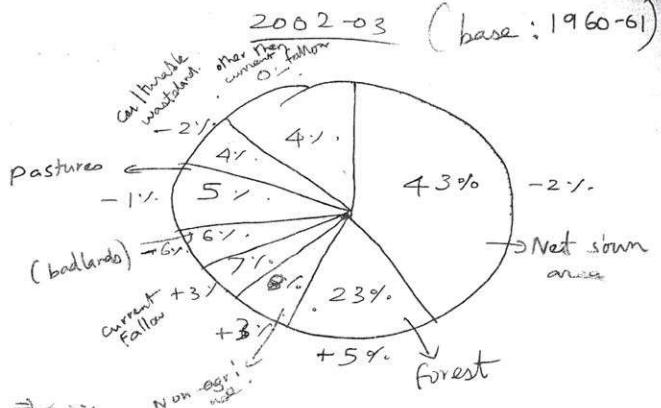
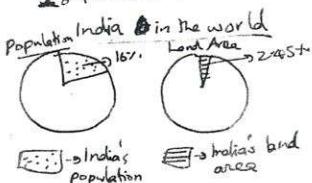
## LAND RESOURCES

(27)

→ India → 16% of world population

↓  
2.45% of world's land area

28.9 m sq.km.



Net sown area ⇒ +4.3%.

- Declined by 2% compared to 1960-61.

• Why decline?

1. Industrialisation
2. Urbanization
3. Improper agri-practices
4. Green Revolution → NOT sustainable
5. Desertification.

6. Climate change → drought (unpredictable monsoon)

7. Many farmers migrating to urban areas, abandoning their lands
8. Pollution of land by tourists & pilgrims (eg: - Himalayas → mountain explorers; Aravallis - Badrinath → pilgrims).

Forest area ⇒ 23%.

- Increased by 5%.  
Mainly due to increase in demarcated area, rather than any actual increase in area.
- Due to Afforestation measures by govt (In the last 1 decade, 5 million hectares of forests have been added in India)
- Reduced fuel dependence from forests. (due to LPG)
- 2-world. Reduced dependence on paper.
- Strict envt. clearance norms (EIA).

But, most of these have been timber & paper monocultures, in whose place pristine forests were in the past.

## Barren & wasteland (6%).

- Reduced by 6%.
- More pressure on land due to increasing population, more barren land is converted to agri. land, by reclamation measures.
- Urbanisation  $\Rightarrow$  many flats <sup>1</sup> on barren lands.

## Other than agri use

### Non-agri use (8%).

- Increased by 3%.
- Industrialisation
- Urbanisation.

## Permanent pastures

- Despite India having one of world's largest populations of cattle (16% of world's cattle), the area of pasture lands is very meagre (only 5% of total Indian land).

## LAND RECLAMATION & CONSERVATION MEASURES.

1. Contour bunding
  2. Bench terracing
  3. Mulching
  4. Cover-cropping
  5. Checkdams
  6. Shelter belts
  7. Gully plugging (stabilisation of ravines & gullies)
- } to control soil erosion by water
- } prevent wind erosion
- $\Rightarrow$  divert water from gully head (prevents water erosion)
- promote deposition.
  - afforestation around the gully.

6. Prevent over grazing
7. Gypsum application  $\rightarrow$  to remove salinity.
8. Alkaline application  $\rightarrow$  to remove acidity.
9. Sewage treatment plants
10. Industrial effluent treatment plants }  $\Rightarrow$  check pollution of soil.
11. Afforestation  $\rightarrow$  binds the soil, prevents erosion.
12. Sand-dune stabilization  $\rightarrow$  to prevent shifting of sand dunes by winds.  
(Controls desertification).
13. Controlled use of chemical fertilizers & pesticides
14. Modern agri. practices (avoid monocropping,  
 $\hookrightarrow$  crop rotation)
15. Organic farming  $\rightarrow$  FYM (Farm Yard Manure), compost, agri. residue, vermi-compost.
16. Sustainable agriculture
17. Land-levelling.

### Changes in Land use pattern

Spatial change  
Punjab, Haryana  $\rightarrow$  more net sown area increased,  
due to irrigation (Indira Gandhi canal)

Madhya Pradesh, Chattisgarh  $\rightarrow$  Deforestation, forest area reduced,  
agri. area increases.

T.N.  $\Rightarrow$  rapid urbanization, net sown area decreases,  
non-agri land increased.

Kerala  $\Rightarrow$  Rubber plantation  $\Rightarrow$  more agri area increases;

## Temporal change

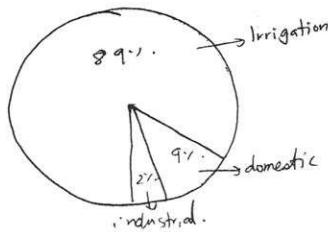
Non-agri  $\Rightarrow$   $\uparrow \rightarrow$  urbanisation, industrialisation,  
horticulture

Forest area  $\Rightarrow \uparrow \rightarrow$  More awareness, Afforestation measures,  
Protected forests (Sanctuary, N.P.)

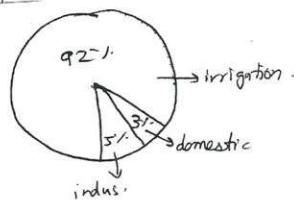
Barren lands  
or wastelands  $\Rightarrow \downarrow \rightarrow$  more utilised for non-agri use such as  
housing, industries, etc.

## WATER RESOURCES

### Use of surface water



### Use of ground water



### Water Policy 2002

Order of importance :- 1. Drinking water 2. Irrigation 3. HEP 4. Navigation 5. Industrial

## Water Resource

In India, State List List II of Schedule VII;

World  $\rightarrow$  75% water  
 1. Utilisable freshwater  
 3%  $\rightarrow$  freshwater  
 3%  $\rightarrow$  available water  
 3%  $\rightarrow$  available for use  
 (31)

$\downarrow$  Water from precipitation  $\rightarrow$  4000 cu.km.  
 16% of world's population.  
 but, only 1% of world's water.

4000 cu.km. (avil. from rainfall)

$\downarrow$  1869 cu.km (surface & groundwater)

Every human requires  
 240 litres of water,  
 for his every day activities  
 (drinking, cooking,  
 bathing, washing)

1122 cu.km (utilisable water resource)

$\downarrow$  690 cu.km (available groundwater).

$\downarrow$  690 cu.km (available surface water).

(just 17% of the total rainfall)

$\downarrow$  India is a case in point of "scarcity amidst plenty."

Why this scarcity?

"water cannot be produced or added  
 technologically - It can only be recycled,  
 reused, conserved!"

$\rightarrow$  Lack of infra

- Not much dams, reservoirs  
 - No cheap tech for desalination  
 MDG: 7(C)  $\rightarrow$  To halve the no. of ppl without access to safe drinking water.

$\rightarrow$  Nature of monsoon

$\searrow$  - Huge temporal variation



Suggestion:- INTERLINKING.

$\rightarrow$  Huge spatial variation (heavy rain in a particular region,  
 absence of rain in other regions)

Ganga  $\Rightarrow$  Kanpur to Diamond Harbour  $\Rightarrow$  faecal waste

$\rightarrow$  POLLUTION Yamuna  $\Rightarrow$  Hauz Khas to Agra water Pollution in India

- Rapid industrialisation

- Uneducated pilgrims  $\rightarrow$  Hardwar to Allahabad

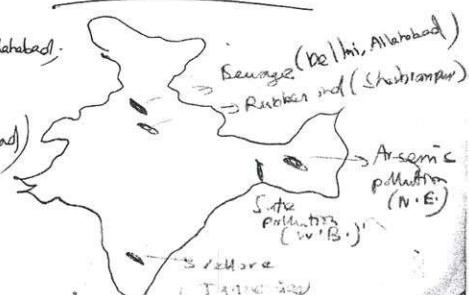
- Sewages  $\rightarrow$  urbanization.

ag :- Ganga, Yamuna -

- Immersions of Ganeshha Idols

(Hrusoog Sagar Lake, Hyderabad)

- Jute



$\rightarrow$  EUTROPHICATION of lakes....

$\rightarrow$  SEEPAGE LOSS, PERCOLATION LOSS, etc.  
 (In a dry canal).

## → CONCRETE SANGLES (RUN-OFF)

- Buildings, tar roads.
- No infiltration.
- Heavy run-off.

## → TERRA RAPHTY

• Himalayan lakes → inaccessibility

→ hard terrain

N.E. states

## → MISUSE, UNUSE, OVERUSE

- for wrong reasons
- ↓
- dumping of waste
- wastage due to seepage loss (in canals)
- dripping taps.
- driving boulders.
- Lack of tech.
- (no dams to store water)
- lack of cheap tech.)
- inaccessible terrain.
- untapped run-off.
- excessive drilling of groundwater (T.N., Maharashtra)
- indiscriminate water use for irrigation (Punjab, Haryana)

## → ABUSE

↓

Pollution  
(Industrial effluent,  
sewage)

eutrophication;

R R R ⇒ Reduce, Reuse, Recycle.

## Conservation measures

1. Rainwater harvesting ⇒ recharge groundwater. ⇒ prevent unuse
2. Waste water treatment plants ⇒ ag effluent treatment. → abuse
3. Misery use of water ⇒ sprinkler & drip irrigation → overuse
4. Reduced use of chemical fertilizers → to prevent eutrophication of lakes. ↓ algal bloom
5. Watershed management. → unuse
6. 'Polluter Pay' principle → pollution
7. Water user charges → diverse legislations → Env. Protection Act, 1986; water (prevention of pollution) Act, 1976.
8. CPCB (Central Pollution Control Board) → Clean Mission Ganga → To ensure min 1600 m<sup>3</sup>/litre/day & will take care of clean water flow in Ganga.

8. Increasing forest cover  $\rightarrow$  misuse (runoff)  $\rightarrow$  surface runoff, subsurface runoff.
9. Contour bunding, bench terracing  $\rightarrow$  increased recharge of groundwater.
10. Cheaper technologies for  $\rightarrow$  misuse (new tech.)  $\rightarrow$  to tap ocean water.  
desalination (River Osmosis)
11. Reduce seepage loss & percolation loss, evaporation loss  
 $\downarrow$   
mainly along Indira Gandhi canal.
12. Land-leveling.  $\rightarrow$  misuse (runoff)  $\rightarrow$  overuse  
13. Inter-river linkage (misuse).
14. Separation of electricity feeders for domestic & agricultural purposes. (To prevent misuse of subsidised electricity for drawing water for domestic use).
14. Making groundwater a national resource (to prevent over-drawing of groundwater).  $\rightarrow$  overuse  
contd... (below)

### Types of irrigation

1. Canal  $\rightarrow$  U.P., Rajasthan, Punjab, Haryana (stored soil, water can't be stored).
2. Tank  $\rightarrow$  S. India  $\rightarrow$  hard granitic soil, water can be stored.
3. Well  $\rightarrow$  Maharashtra & Gujarat  
(tube well, borewell)  
 $\downarrow$   
(groundwater)

See map on Pg no 34

- contd on
15. Doctrine of public ~~safety~~  $\rightarrow$  to involve the public in maintaining & creating water storage structures.

16. National Water policies (of 1987 & 2002)  $\Rightarrow$

17. Release of 'Aquifers map' of India, by Min. of Water resources, which shows the change in groundwater level in various regions.

18. Awareness among citizens.  
i) Turning off water while brushing teeth.  
ii) Plant a drinking tree.  $\rightarrow$  misuse

## Mineral Resources

- Questions mostly NOT possible. Just have a glance.

## ENERGY RESOURCES

- Mainly, focus more on NON-CONVENTIONAL energy resources

### Mineral fuels

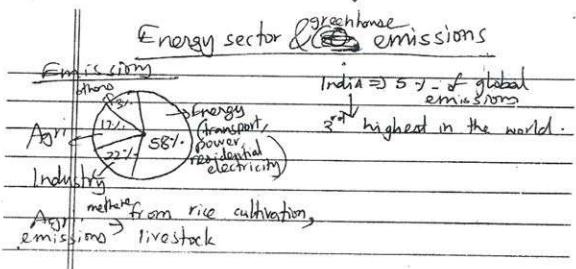
Coal  $\rightarrow$  55%

Petroleum  $\rightarrow$  26%

Natural gas  $\rightarrow$  14%

Lignite  $\rightarrow$  4%

See map on Atts page no. 38.



### Energy resource

Primary global energy source

Firewood (till 17<sup>th</sup> cen.)

↓  
Coal (After 17<sup>th</sup> cen.).

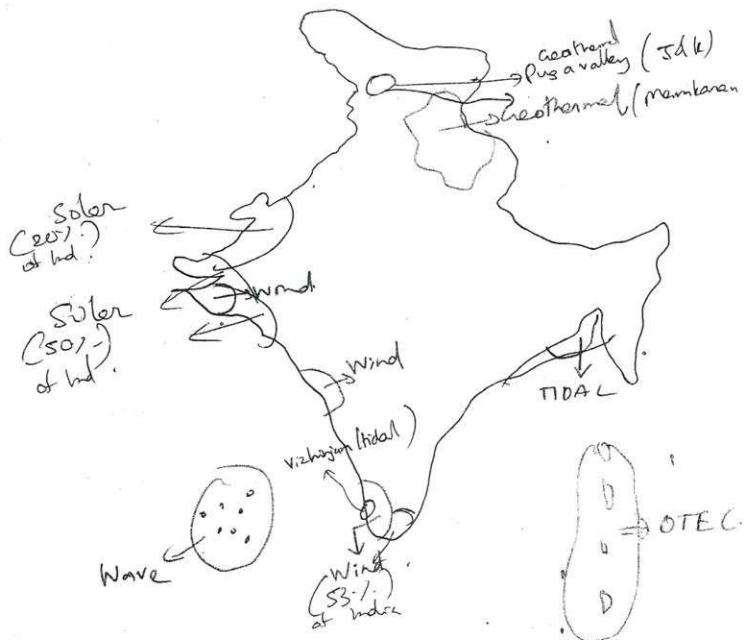
↓  
(20<sup>th</sup> cen.)  $\infty$  Oil  $\Rightarrow$  should be RENEWABLE

↓  
? (should be renewable).

## NON-CONVENTIONAL ENERGY RESOURCES:

(35)

1. Wind
- (only 28,000 MW production)
2. Geothermal.
3. Tidal
4. Bio diesel  $\rightarrow$  Jatropha. (Invis oil plant).
5. Biogas
6. Wave energy
7. OTEC (Ocean Thermal Energy Conversion)



Go to Min of Non Renewable resources size

Collect basic facts  
Tidal potential.  
Tapped %.

Renewable energy has to be propelled by market forces. In Tamil Nadu, wind energy sector (50% of India's total wind energy) is being promoted by the textile industry, as it is a cheaper source of energy.

→ What is Energy Crisis? Elaborate its causes.  
Discuss the govt. measures in this regard

### ENERGY CRISIS

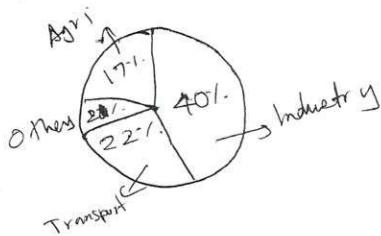
Lack of sufficient energy resource to fuel the demands of the economy, resulting in a demand-supply mismatch.

### CAUSES

#### DEMAND-DRIVEN

1. Exponential growth of population.
2. Rapid industrialisation esp. in a developing country like India.
3. In this Age of Mass Consumption, luxurious consumption due to increased std. of living.  
 $\downarrow$   
(ACs, cars, etc.) ~~ATMs, Trans, Dist. bases~~

#### Diesel consumption



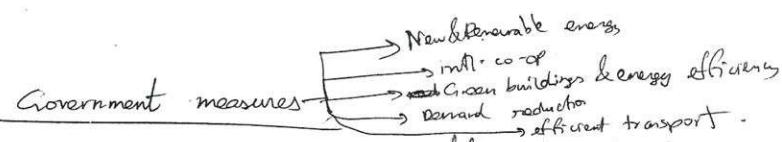
About  $\frac{1}{3}$  of total energy is spent inside buildings (greater than the transport sector)  
~~second only to~~

#### SUPPLY-SIDE

1. Over-dependence on conventional resources (oil, coal)  $\rightarrow$  demanding reserves
2. War (1973 - Oil shock, due to Yom Kippur war).  
1990-91  $\rightarrow$  Iraq-Kuwait war.
3. Cartel formation, creating artificial demand (OPEC) ..
4. Speculation <sup>trading</sup>, esp. in forward markets (futures).
5. Delay in clearances of energy projects  
(due to local resistance, environ-safety concerns, red-tapism).
6. Economic sanctions (on Iran).
7. Lack of inclination to explore & exploit energy resources

## 8-GTD (Generation, Transmission & Distribution) losses.

(37)



1. HVDC → to increase efficiency of transmission

High Voltage Direct Current → efficiency

from Talcher (Orissa) to Kolar (Karnataka)

2. BEE → Bureau of Energy Efficiency ⇒ effi c  
↳ gives star ratings to electrical appliances based on efficiency
3. CDM of Kyoto protocol to distribute LEDs & CFLs (energy efficient).  
↳ effi c

4. JNNSM ( Jawaharlal Nehru National Solar Mission ).  
20,000 MW solar energy by 2020. ⇒ non-con

5. Allowing GASOL (Gasoline + Ethanol) ⇒ E blend-blended petrol.  
E-10 fuel ⇒ 10% ethanol blended.

India has allowed 5% use of ethanol.  
1st gen Biofuel → from sugars & oils in edible crops (conven)  
2nd gen biofuel → from crop residue (waste, algae, woody matter). More 2nd gen biofuel is to be encouraged.

6. Subsidy and tax rebate non-conventional energy generating industries.  
eg:- subsidy for windmills in ~~Tamil~~ solar plants by Gujarat;  
non-con v Accelerated depreciation, generation based incentives

7. NELP → National Exploration Licensing Policy ⇒ conventional supply  
To explore new reserves; with the help of pvt & foreign players. PPA made; Production sharing contracts (RIL → KG basin);  
Barmer (Rajasthan) → R.P.

### Oil Energy.

This has resulted in exploration of shale gas, onshore oil fields.

8. R&D to develop hydrogen power. ⇒ non-con

9. Energy production from wastes, bagasse (sugarcane). ⇒ non-con biomass

10. Introduction of CNG (Cryogenic fuel) in Delhi ⇒ off.

11. Nuke power projects ( Indo-US Nuke Deal )  
RKMNP, Jaitapur → non-con.  
Current: 4700 MW  
2022: 20,000 MW

12. National Highways → offi.
13. MRTS (Mass Rapid Transit System) & promoting public  
↳ New metros & monorails in Chennai, Kochi. → reduce demand
14. Car-pooling (share auto) → reduce demand
15. ONGC-Videsh Ltd's investment abroad, for exploring  
new resource. (ONGC's investment in Sudan, stake in Canadian  
transnational oil & gas pipelines (PPI, TAPI). <sup>conven-supply</sup> energy deal with TAJIKISTAN <sup>state reserves</sup>)
16. ~~more~~ More R&D on FBTR → Fast Breeder Test Reactor  
↓  
to use Thorium (available aplenty in India) as a nuclear fuel.
17. Rationalisation of fuel prices demand  
(rationalisation of LPG, reducing subsidy on diesel).  
→ Nuclear deals (India-US; ENR from France; NSG waiver) → non-conven-supply
18. Moves by the govt. to impose extra tax on diesel vehicles  
(to reduce exploitation of subsidised diesel) reduce demand
19. Joint HEP with Nepal <sup>Mahendra project</sup> <sup>Bhutan, Sikkim, Arunachal Pradesh, Subansiri, Tipamukh</sup> conven-supply
20. Allowing 49% FDI in Power exchange <sup>conven-supply</sup> efficiency (prevent transmission loss)
21. NHAI (NH Authority of Ind) & IRO (Indian Roads Organisation)'s recommendation to introduce separate lanes for  
bicycles in all SH & NH. → reduce demand
22. According to a UN-Habitat report, large amount of power consumption <sup>(20%)</sup> can be reduced by using energy efficient practices in the building sector.  
i) Using shaded roofs & smartly designed windows → reduces 10-15% power used for A/C  
ii) More att. should be taken of natural daylight, to reduce power consumed for ~~daylight~~ artificial lights  
iii) Glass & Aluminium increase cooling load (increase power reqd. for cooling a building → A/C)  
∴ They must be avoided.
23. OVL (OIL & VIDESH LTD) acquiring rich stakes in oil rich regions like Canada, TAJIKISTAN... <sup>conven-supply</sup> around 40MMBbl under construction. → (conven-supply)

## UTTARAKHAND $\Rightarrow$ Country of Gods.

Residence for Tetiyas sea (fierce sea)  
Nainital  $\Rightarrow$  lake city  $\Rightarrow$  multiple river theory.  
 $\Downarrow$  Pilgrimage  
 Charan-shedy place.

Sources of Ganga & Yamuna  
 $\downarrow$   
 Gangotri, Yamunotri  
 glaciers.

Pindari glacier  
 $\downarrow$   
 Pindar river  
 $\hookrightarrow$  a tributary of Alaknanda

### Pilgrim spots

Badrinath, Kedarnath  $\Rightarrow$  Shiva temple

Rishikesh Badrinath, Kedarnath, Uttarkashi, Siyaganj, Rishikesh  $\Rightarrow$  flash floods.

Haridwar  
 Gaumukh  $\Rightarrow$  mouth of Gangotri glacier (most declared it be ESZ) but not implemented

Devprayag  $\rightarrow$  Meeting pt. of Alaknanda & Bhagirathi to form Ganga.  
 $\downarrow$   
 meeting place.

### DEHRADUN $\rightarrow$ Capital

- National Defence Academy.
- ~~Inst.~~ of Geological Survey & Map-making.

### MUSAONI

~~LBS NAA~~  $\Rightarrow$  Lal Bahadur Shastri National Academy of Administration.

Roorkee  $\rightarrow$  first technical univ. (later converted to IIT Roorkee)  
 (1804) Curzon's period.

### HARIDWAR $\rightarrow$ Pilgrimage

$\downarrow$   
 Vaccines production  
 Ganges enters the plains from the hills (break point)  
~~KNEE POINT~~

Famous hill stations

Almora, Nainital, Mussoorie, Ranikhet

## IN-SITU CONSERVATION

- Nameri → Biosphere Reserve
- make it Valley of flowers
- Corbett N.P. (Tigers).

## ECONOMIC ACTIVITY

- Mainly Tourism.
- Little Apple cultivation
- Agri → possible only in one season.

## ASSAM

- National waterway 2 ⇒ Dibrugarh (east) to Dhubri (west)  
(Brahmaputra) bordering Bangladesh

(National waterway 1 ⇒ Allahabad to Haldia)

National waterway 3 ⇒ Kollam to Kottapuram

National waterway 5 ⇒ East coast waterway:

N.W. ⇒ Kakinada to Madras (Pondicherry).

- Digbo → first oil field (1907) ⇒ Curzon's

- Majuli riverine island → largest inhabited riverine is. of Asia  
huge silt deposit ⇒ largest riverine is. in the world

## ENERGY

Dibruri

Lakhimpur ⇒ coal (but poor quality due to high moisture)

Lakhimpur-Bhoga ⇒ NWG (across R. Barak)

heavy smoke during combustion

## NATIONAL PARKS

IN-SITU

Kaziranga → N.P. → One-horned rhinoceros → Vision 2020  
 ↓  
 (CAlong Karbi-Angring hills)  
 flood prone  
 poaching.

↓  
 To increase rhino population from 2000 to 3000

MANAS → Biosphere reserve  
 ↓  
 tiger, rhino.

commercial capital of Assam.

GUWAHATI → only int'l. airport in N.E.

DISPUR →

JORHAT → National Research Instt. for Manohar deciduous forests.  
 ↳ Capital of India.

SILCHAR → hill station → domestic airport.

↓  
 Ortho medical college.

East - West Corridor  
 (Silchar) - (Porbandar)

When this project is completed, N.E. will feel more connected with mainland.

OIL REFINERY → Borgaon.

North-South corridor → Kanyakumari to Agra.

Meeting pt. of N-S & E-W corridors → Shanti (U.P.)

## CULTURE

Festival → Bihu.

Assam → only N.E. state to have plains.

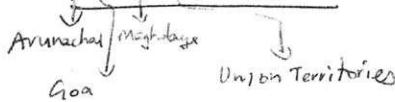
↓  
 highest flood-prone area (Brahmaputra)

## CROPS

Jute, Tea, Areca nut (Licit - Sugarcane)

## BODOLAND

## AGM U.T Cadre



• Transferable cadre

## Arunachal Pradesh

- Capital :- Itanagar.
- 'Land of Rising sun' in India

## Nagaland

- Capital  $\Rightarrow$  Kohima
- Commercial capital  $\Rightarrow$  Dimapur.
- English  $\rightarrow$  official language.
- Private forests allowed.
- Naga Councils  $\Rightarrow$  NSCN (Isak-Muivah)  
National Socialist Council of Nagaland.

tribes:- Angami Nagas, Naga, several tribes, more than 60 dialects

RACE:- Mongloid

that's why English is  
commonly used.

## MANIPUR

- Loktak lake  $\Rightarrow$  world's only floating national park.  
(due to deposition of rivers, which resulted in a  
small island in the lake due to siltation & compression).

Cap:- IMPHAL.

## MIZORAM

Cap:- Aizawl.

## Tripura

Capital :- Agartala.

(43)

- only state with Communist rule (CM Manick Sarkar)

## Meghalaya

- Hills → Garo, Khasi, Jaintia.
- Tribes also in the same name

These hills belong to the PENINSULAR SYSTEM.

- Highest rainfall in India. (from S.W monsoon of Bengal branch)
  - Cherrapunji } more than 1000 cm rainfall.
  - Mawlynnam }

NORTH-EAST ⇒ Read more about N.E. in India Year Book.

Go I

Trend ⇒ ~~UPSC~~ wants us to know more about J&K and N.E.

## TRIPURA

Attained statehood in 1972.



Tripura → borders B'desh in the west and Assam & Mizoram in the east.  
& south  
(landlocked).

## HISTORY

- former princely state.
- Attained statehood in 1972.
- 45 yrs of militant activity troubling the state.

## CONNECTIVITY

NH 44 → Agartala to Amrahati

↓  
now extended from Agartala to SABROOM.

↓  
connected to CHITTAGONG (B'desh) through  
a bridge across River FENI.

## AGRICULTURE

- Tripura → mainly agri-dependent population.
- Jhumia (shifting cultivation) ⇒ formerly practised in Tripura by clearing forests.
- SRI (System of Rice Intensification) & HYV (High Yielding Varieties) have been adopted successfully, achieving the targeted replacement rate of HYV seeds.
- KCC (Kisan Credit Card) to farmers
- Good irrigation facilities (as % of land is under irrigation).
- Crops → rice, tea, rubber, jute

## OTHER ECONOMIC ACTIVITIES

- Fishery
- Rubber plantation (Tripura is the 2<sup>nd</sup> largest rubber producer after Kerala). A rubber park is coming up (2<sup>nd</sup> of its kind in India after Rubber Park @ Irupuram in Kerala).

## DEVELOPMENT

• 4<sup>th</sup> most literate state (after Kerala, Mizoram)

↓ 88% (2011 census)

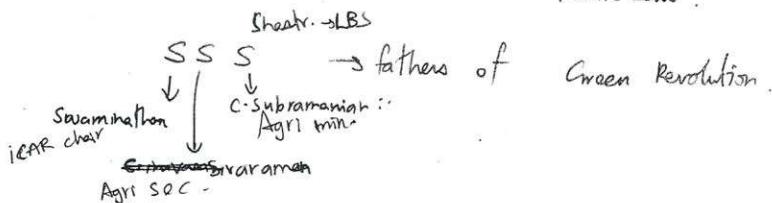
↓ mainly due to Left Govt's social welfare policy, local self govt, Tripura autonomous council (Schedule ~~6~~ 6), NGOs.

- Emergency Medical Transport Services (EMTS) under NRHM.
- Welfare package for weaker sections → 33% of population ⇒ TRIBES  
→ 19% SC, 7% Muslim.

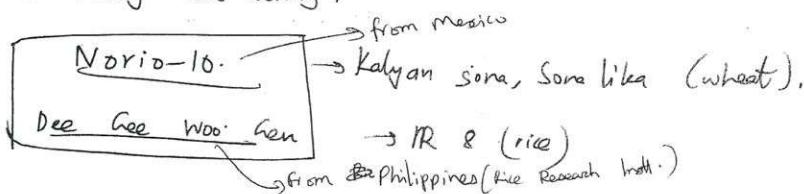
## ~~Agri~~ AGRICULTURE

### Green Revolution.

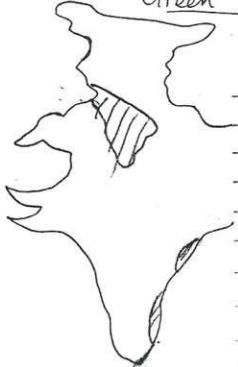
After 1950s, India faced an acute food shortage, due to the lack of agri. technology and high yielding varieties. India was forced to import wheat from U.S., under humiliating conditions, prescribed by PL 480. (Ship to mouth assistance) Public Law.



They visited the Maize Research Instt, Mexico, where Norman Borlaug was working.



### Green Revolution.



Impact of climate change on agri-

- Increase in no. of global extreme weather events (hurricanes → Sandy, typhoon → Sanba)
- Surface temp. increase of  $0.5^{\circ}\text{C}$  by 2100 destroying wheat → a photosensitive crop
- $3.5^{\circ}\text{C}$  increase in air temp. → 20% high rain from monsoon more heavy rainfall events damage to crops

IADP → Intensive Agri Dpt. Pgms

HYVP → High Yield Variety Plants

IADP + HYVP → Green Revolution

seed - water - fertilizer policy

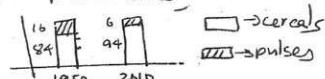
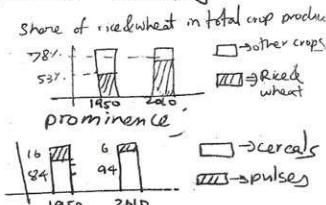
## Positive impacts of Green Revolution.

- (A-fold increase b/w 1950 to 2000)
1. India became self-sufficient in food production -  
Drought resistant crops → promoted dryland farming.
  2. Change in agri. from subsistence farming to commercial cash crops.  
Irrigation → reduced the overdependence on monsoon → mitigated massive crop failure.
  3. Mechanisation of agriculture → power lifting of water,  
higher productivity relieved labour (made agri. less labour intensive)  
↳ health concerned, children went to school.
  4. Eliminated the concept of FAMINES.  
→ Photo insensitive crops → intro hitherto unknown plants into a region (eg:- wheat in S. India)
  5. Income of farmers increased → purchasing power of rural economy increased.  
wider market for goods.
  6. Increase in food production from 50 m tonnes to 250 m tonnes  
due to high yielding varieties, productivity increased → production increased.
  7. Food habit changed → completely rice & wheat based food  
from the traditional food.
  8. India became an exporter of surplus → bridge CAD.  
more FOREX.
  9. DPSP → Organising agri. in modern lines (Art. 48 → organising agri. & animal husbandry on modern lines)
  10. PDS to all poor people (reduced the impact of poverty).  
↳ (food security : Art. 47 → raise the level of nutrition)

## Negative impacts of Green Revolution

1. Created regional disparity (islands of prosperity (Punjab, Haryana, western UP, Krishna delta, Cavery delta) amid oceans of poverty).
2. Inter-crop disparity (Rice, wheat gained pulses, oil seeds were neglected).
3. Inter-class disparity widened (only the large farmers were able to utilise the benefits of green revolution, as he was only able to buy costly fertilisers, tractors).

4. Genetic erosion of desi varieties (ponni, samba rice)  
India traditionally grew 502 varieties of paddy. After green revolution, only 25 remain.



5. Improper use of chemical fertilizers has led to ~~to~~ soil degradation, alkalinity, salinity.

6. Improper proportion of use of N, P, K micro nutrients  
'N' (urea) shows immediate results and there is also a heavy subsidy for 'N' (urea) fertilizers now, NPK: 4.7:2.9:1  
ideally 4:2:1

7. Established rice & wheat monocropping (has led to the depletion of nutrients of the same type from the same depth).

8. Deforestation for expansion of agriculture (Punjab, Haryana has the least forest cover)

9. Pesticides → development of super-pests.

→ embourgeoisement of a few, but proletarianisation of many.

→ A new class of rich middle stratum of peasantry came up.

→ Feudalistic & customary form of tenure system is replaced by CAPITALISTIC form of wage labour system

10. Intro. of pumpssets - irrigation → overdraining & over utilisation of ground water. → depletion of water table.

11. Heavy mechanisation → unemployment.

↓  
migration to urban areas.

- hybrid seeds made farmers perennially dependent on MNCs.

12. Health hazards to human, due to consumption of pesticide sprayed food crops (Bio-magnification of pesticides),

• Did NOT conc. on dryland farming. (60% of India is dryland agr.)

13. Nutrition deficiency → same type of food (only rice & wheat dependent).  
food security, but no nutritional security.

14. Eutrophication in lakes → due to fertilizers from agri. land.  
↳ completely destroys the lake ecosystem.

15. Huge energy demand due to free power for ~~people~~ agri.

16. Huge fiscal burden on govt. due to subsidy for fertilisers, MSP for crops.

→ Increasing CAO, due to increasing volume of nutrient import for fertilisers

17. Soil degradation due to accumulation of chemicals.  
& overuse.

18. Landless labourers lost jobs → social unrest

(most in subjugated from Amritsar-Delhi).

- Green revolution has created islands of prosperity amidst oceans of poverty. Discuss.
- Green revolution, rather than making India green, how made India grey. Discuss  
 → impact of fertilizer
- Discuss the positive and negative impacts of green revolution in Tanjore region (or) Punjab region.
- first Green revolution has benefited a few. The next Green revolution should target the entire India, all the sectors, all the people, all the regions. In the light of the above statement, discuss how 'evergreen revolution' should be brought about.  
 → dryland, scale-neutral; all agri-sectors.

### Problems to be solved in agri.

1. Out-dependence on monsoon. → break in monsoon; late onset; early withdrawal; DROUGHT & FLOODS → TWIN MENACE.  
 By water harvesting structures.  
 Agri. insurance.
2. Labour shortage → due to MNREGA.  
 Mechanization
3. Fragmented land →  
 due to increasing population pressure.  
 uneconomic, intensive  
 Consolidation of land → Land reforms  
 second consolidation → for next gen. fragmentation.
4. Subsistence agri. is practised in 2/3 of India.  
 Self-consumption.  
 Modernization Commercialization.
5. Large no. of middlemen (Weak FORWARD & BACKWARD LINKAGE).  
 in procurement & marketing. [Est. TRIMARFD, Uchavari Sandesh]  
 Model APMC Act
6. Standardisation of agri. for making crops export-quality.  
 Branding, grading, packaging, quality check.  
 Gramin Bharatya Yojna.
7. The harvest is sold as a raw material.  
 Value-addition → Mango → Mango juice.  
 Edit in multibrand detail. Lime → Lime pickle.
- Agro-based industries:  
 - price fluctuations due to speculation, hoarding  
 MSP, RNP

8. Information of diffusion to farmers  
 KVKS, e-choupal, Extension → info. from lab
9. Lack of credit facilities. (Resource intensive approach)  
 ↓  
 high cost of inputs  
 Timely credit → Kisan Credit Card, NABARD, Vanjha Bima, Farm Income Insurance scheme, weather-based crop insurance

10. Inadequate irrigation  
 Only 35% of total agri. land has irrigation facilities.

11. Low productivity ⇒ due to intensive agril; low labour productivity.

12. Seasonal unemployment  
Evergreen Revolution  
 ↓  
 13. Degradation of land ⇒

agro-forestry, crop rotation, cover cropping (leguminous)  
 2. Crop-based strategy → proper crop selection (millets in dry areas)

1. Land based strategy  
 (land reforms, consolidation, reclamation)

3. Waterbased strategy.  
 drip, sprinkler, watershed mgt.

4.

Watershed management, mulching, terraced farming, mulching, organic farming, Integ. Nutrition mgt., Integ. Pest mgt.; sustainable agri., biofertilizers,

Second green revolution → 1. scale-neutral (i) Dryland farming  
 2. Organic farming  
 3. Eco Agri.  
 4. White farmers  
 5. One straw farming;  
 Efficient Microbes

Agri. policy → 1. Soil conserv 2. Marketing facilities  
WHITE REVOLUTION 3. Tech. knowhow 4. Water conserv. 5. INPM;  
 Dr. Man Singh → (i) genetic engineers  
 (ii) animal husbandry.

Varghese Kurien → 'Operation flood' → ANAND, Gujarat  
 ↓  
 Flooding the village with Milk.

Phase I 1970-80

Phase II 1986-85

Phase III 1985-95

Vision 2020.

→ Ppl in high rainfall areas benefited from Green Revolution,  
 People in dry areas benefited from White Revolution. Discuss.

### White revolution

- Supplying cattle to farmers  $\Rightarrow$  hybrid breeds!
- Health & nutrition mgmt - strategies.
- veterinary care.
- . proper fodder supply  $\rightarrow$  CPR, grazing lands
- good & effective forward linkage  $\rightarrow$  co-op dairy societies  $\rightarrow$  good bargaining power.
- modern preservation, processing techniques

### Various co-op societies.

Amul  $\rightarrow$  Gujarat ; Mother Dairy  $\rightarrow$  Delhi;  
Aavin  $\rightarrow$  T.N.; Milma  $\rightarrow$  Kerala ; Nandluni  $\rightarrow$  Karnataka.

### Positive impacts

1. Made India the largest producer of milk in the world.  
150 m tonnes.
2. Nutritional security (Art. 47  $\rightarrow$  DPSP)  
ICMR's recommendation  $\rightarrow$  270 g of milk per day.  
 $\downarrow$   
rich in 'Vitamin A' & Ca.  
we have reached 250 g of consumption every day.
3. Value added products  $\rightarrow$  Dairy based industry.  
 $\downarrow$   
Export  
 $\nwarrow$  AD reduced; Cheese, butter, ice-creams.
4. Eliminated middlemen  $\rightarrow$  more profit to farmers.
5. Dairy industry  $\rightarrow$  ~~single largest contributor~~ of Agri GDP.  
6% to total GDP.
6. Women empowerment  $\rightarrow$  70% of dairy labourers are women  
 $\downarrow$   
dairy money goes into the woman's hand.  
more spending on education & health of children.

- (51)
- 7. New exotic breeds of cattle  
Holstein Friesian, Jersey.
  - 8. Modern preservation techniques!  
Pasturisation, containerisation.
  - 9. A sense of community feeling.  
First success of co-operative farming.
  - 10. Effective & efficient utilisation of fertilisers.  
Cow dung - manure  
straw → fodder  
cotton seed → fodder.
  - 11. ~~Benefited~~ Social inclusion was very high.  
Even landless labourers benefited.
  - 12. Increased India's ~~for~~ export potential.  
Export to S.L. & 'desh', ~~Afghanistan~~
  - 13. Established a good forward linkage.  
Milk grid → a farmer in Punjab, Haryana was able to sell his produce in Delhi.
  - 14. Reduced MIGRATION.  
By providing employment throughout the gr. (no seasonal unemployment, as in crop cultivation)
  - 15. Reduced Regional Disparity.  
Benefited even dry areas. (mainly Rajasthan, Gujarat, Vidarbha, Telangana)
  - 16. Effective supplement to crops. (Risk mgmt. during crop failure).  
Mixed farming
  - 17. Energy demand reduced.
    - Biogas.
    - Reduced power demand in bulk milk carts.

18. Co-op societies became "temples of modern village".

- Exchange of social ideas.
- Liberalisation of ideas.

When a country develops, share of agri. in GDP reduces, but the share of dairy industry in GDP increases. So, Dairy industry is an industry for the future. If we organise dairy on modern lines, then we

Livestock →

Dairy →

Cattle →

#### Limitations of Dairy Revolution

1. No corresponding increase in pasture lands (only 4%) but huge increase in cattle population (90% of world's cattle is in India).
2. Religious feelings (cow slaughter is considered unholy).
  - No development of meat industry
  - No allied industry (leather).
  - No culling out (eliminating) of old, unworthy cattle.
3. Methane gas formation → Cow dung → Global warming.
4. Zoonotic diseases → Anthrax, Mastitis, Endoparasites

5. High bacterial content in milk (as, US has banned imports of Indian milk). (53)
6. Low yield per cattle.
7. Inadequate mechanisation.
- Neelam co.
8. Artificial insemination, (~~cross breeding~~) is NOT successful in India. (only 40% successful).
- Failure of Artificial insemination results in increase in waste (non-lactation) period.
9. As Dairy-based industry has not been transformed to small scale level.
10. Balanced - scientific diet is NOT available for cattle.
11. Extension services, health-care management is NOT well established.
12. Hindrance of WTO. Inability to meet intl. standards like  
i) CAC  $\rightarrow$  Codex Alimentarius Committee.  
ii) HACCP.  $\rightarrow$  Hazard Analysis Critical Control Point.  
has resulted in restriction on Indian milk exports.
13. Dairy farming is still considered a secondary activity by farmers, rather than specialised primary activity. So not much time is dedicated to the cattle.

- 
- $\rightarrow$  Impacts of drought on a particular region (as: Gujarat):-
- i) ~~Impact on crops~~ ii) Impact on cattle iii) Impact on employment  
iv) Impact on migration.

Blue revolution  $\rightarrow$  fisheries

- Analyse blue revolution on the same lines as white revolution, but with certain altered points.
- Collect some basic data on coastal fishing, inland fishing.  
Use pie charts.

## PULSES

Cowpea  $\rightarrow$  गिली लड्डू

Chitpore  $\rightarrow$  घोरेंगी बच्चा

Tur

Red gram

Bengal gram  $\rightarrow$

Green gram  $\rightarrow$  उत्तमु लड्डू;

Gram  $\rightarrow$  अनामु बाजान (ट्रॉटले);

- All pulses are leguminous plant (nitrogen-fixing);-

Pulses, oil seeds  $\rightarrow$  Rabi crops

Dryland crops  $\rightarrow$  does NOT require ~~so much~~ much water.

(2)

Cotton & sugarcane  $\rightarrow$  ~~in~~ same areas in Peninsular India.

North  $\rightarrow$  cotton  $\rightarrow$  only Punjab

Sugarcane  $\rightarrow$  Punjab, U.P.

Bajra  $\rightarrow$  बोल्हा;

Oil seed  $\rightarrow$  sesame, sunflower;

Jatropha & pongamia  $\rightarrow$  oil seed (petroleum).

Euphorbiaceae → fruits - yielding

eg :- rubber.

five finger shaped petals.

(15)

Malvaceae →

cotton, brinjal, bendi (ladies finger) ..

MILLETS (or coarse cereals) → high nutritional value, effective in controlling obesity & diabetes.

Jowar, bajra, pearl millet.

→ INS Imp (Initiative Nutrition Security)

Bajra/millets → minor millets. through Intensive Millet Promotion)

To improve nutrition std. of children through millet food in ICDS & Mid-day Meal Scheme.

Coffee → S. Karnataka (Coorg - Chickmaglur)

E. Kerala

N.W. Tamil Nadu

Sorghum (jowar)

finger millet (raji)

pearl millet (bajra)

Tea → coastal Kerala.

Siliguri (Darjeeling)

Assam.

SPICES & CANTIMENTS.

both aroma & flavour ↓  
only aroma.

ARECANUT → Assam, S. Karnataka, N. Tamil Nadu.

COCONUT → entire Coromandel coast.

Konkan coast (Kerala & Karnataka coast.)

• How to find out density (percentage) of forest cover.

• Higher the development, lower the forest cover.  
eg :- TN, Maharashtra, Delhi, Gujarat

• Higher the plain area, lower the forest cover.

eg:- Bihar, U.P., Punjab, Haryana

- In the Himalayan states, eastern states have higher density of forest cover, than the western states, due to latitude (west <sup>Himalayan</sup> higher lat  $\rightarrow$  snow covered).

e.g.: - Arunachal has 'higher forest cover' than Uttarakhand which has higher forest cover than H.P.

- More the tribal & underdeveloped areas, higher the forest covers.

e.g.: - Andaman, Lakshadweep.

- Do NOT memorize facts, look for the logic behind the facts.

- More the urbanizations, higher is the forest cover.

# → India - Physical

(57)

## Mountains

Trans Himalayas → Karakoram  
Ladakh  
Zanskar

## Greater Himalayas

Lesser Himalayas → N.W. - S.E.  
↓  
S.E. or E. mountain chain :-

Pir Panjal, Dhauladhar, Mahabharat (Nepal)

Shivaliks → continuous mountain chain without any break  
↓  
Himalayan foothills upto W. Bengal

## Peaks

S&K Nanga Parbat  
W. to E.

Nanga Parbat, Masherbrum, K2, Gasherbrum.

## Uttarakhand

W. to E.

Kamet → Nanda Kot → Nanda Devi

## Nepal

W. to E.

Dhaulagiri, Annapurna, Manaslu, Gauri Shankar, Everest, Makalu

Darned when you bore

Put ~~CEM~~ when you marry

After marriage, you'll become Kanjooos ⇒ Kamjonchangs

### Highest peaks

Everest

K2      → Highest in India.

Kanchenjunga }

Macaluru

Dhaulagiri      } MDM K ↑

Marsru

Nanga Parbat

Annapurna

Gasherbrum

Measherbrum

Nanda Devi

Karnet

Gauri Shankar.

MAAN ↑

### Aravali

Oldest in India (residuary mountain)  
during Panga split

Highest peak → Guru Shikar (Mt. Abu)

### Vindhya & Satpura

Block mountains & rift valley (Narmada valley).

### W Ghats

#### Highest peaks

Anaimalai

Doda Betta

### Tamil Nadu

Nilgiri

Anamala;

Palani

Cardamom.

## Sahyadri (in Maharashtra)

Mahadeo hills (M.P. & Maharashtra)  
Ajanta range → Panchmarhi National park.  
Ellora "  
Bulaghat "  
Harishchandre "

Maikala range → boundary b/w M.P. & Chhattisgarh.

Rajmahal hills  
(Bihar; Jharkhand) → Peak! - Parasnath.

## Eastern Ghats

Broken isolated mountain chains.

N ↑  
Nallamala  
Velikonda }  
Balakonda } , Andhra.  
Javadi ⇒ Vellore  
Shavaroy ⇒ Salem.

Highest peak in E. Ghats → Mahendragiri (Orissa).

## Purvanchal (Eastern Himalayas)

Dhartai. Bum  
Naga " "  
Mizo

Broken Peninsular mt. (in Meghalaya).

W → E  
Garo Khasi Jaintia

Abteans

Chotanaspur → Hazaribagh,

Malwa

Deccan plateau

Vidarbha

Telangana.

—  
—

Buy A 3 maps...

14/10/12      INSTITUTIONAL & INFRASTRUCTURAL FACTORS IN AGRICULTURE

Infrastructure

1. Irrigation
2. Seed
3. Fertilizer
4. Power
5. Warehousing.
6. Transport.

Institutional factors.

1. Banks (credit facilities).
2. Land reforms (land tenure, land ceiling, land consolidation, co-operative, abolition of intermediaries).
3. Marketing facilities. (MarFed, TriFed) ...
4. R & D (meteorology, seed improvement)
5. Information Diffusion (Extension).
- 6.

$$\text{Productivity} = \frac{\text{Yield}}{\text{hectare}}$$

$$\text{Intensity} = \frac{\text{Gross cropped Area}}{\text{Net sown area}}$$

IRRIGATION → only 30% of agri. lands in India have <sup>strong infra for</sup> irrigated <sup>The rest 70% depend on rainfall.</sup>

- Increased intensity, ⇒ Gross crop area (more no. of seasons) ↑  
Net sown area (in dry lands) ↑.

Indira Gandhi canal → Jaisalmer, Bikaner...  
Cauvery canal  
East Godavari canal.

Impacts

- 1) Increased gross cropped area.
- 2) Increased not sown area.
- 3) Reduces dependence on monsoon.
- 4) Increased agri. productivity.
- 5) Success of green revolution is due to irrigation facilities.  
(Since the HYV crops need more water).

## 6) Change in crop pattern

e.g.: Monocropping in canal-fed areas

(e.g.: Rice monocropping in Cauvery delta).

Sorghum to cotton  
(before irrigation) (after irrigation)  $\Rightarrow$  Vidhan bhav

Emergence of plants

### 7) commercial status to agri.

Irrigation facilities has led to plantations (account)  
commercial crop like SUGARCANE.

### Seeds

1. Increased productivity (H X V seeds).

2. Photoinsensitive seeds have changed cropping pattern -  
(e.g.: rice has been introduced into Punjab).

3. Increased intensity (by increasing gross cropped area, by  
(by reduced crop duration) reducing the duration of crop).

4. Drought resistant varieties  $\Rightarrow$  security to farmers

5. Disease resistant varieties

6. New seeds have increased the shelf life of crops  
 $\downarrow$  storage period.

7. Increased the germination percentage. (Above 90% successful  
germination possible)

8. Negative Seed has increased the cost of production  
(by increasing the dependence on pvt. cos.).

## Fertilizers

(63)

1. Increased yield per hectare. (productivity)

e.g.: - Punjab region → Productivity is three times the productivity.

2. Decreased dependence on the nature of soil.

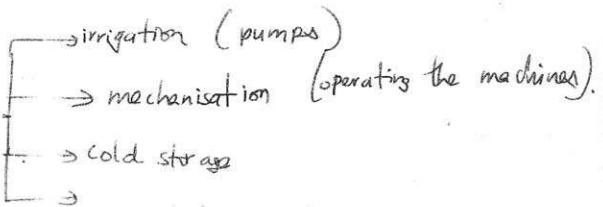
## Mechanisation

Tractors, combined harvestors, seed drill, seed breakers,

- 1) Reduced the shortage of labour.
- 2) Increased gross cropped area → by reducing the time taken to do by speeding up agri. activities.  
↓  
(harvest, land preparation).
- 3) Post-harvest losses is reduced.
- 4) More scientific & standardising procedures have increased quality  
(grading) removing chaffy grains.
- 5) Increased the market access. (by speedy transport to markets).
- 6) Cold storage facilities. (increased perishable duration)
- 7) Value addition to agri. products (quality control, processing)
- 8) Multiple parallel operations. (fertigation → fertilisers & irrigation through the same drip irrigation tube).
- 9) Precision farming (like drip irrigation) has increased the efficient usage of water and elimination of weeds.

## Power

Power required for



e.g. free power in TN & Punjab has assisted farmers and increased productivity.

## LAND REFORMS

Abolition of Intermediaries → Great success

Intermediaries → Zamindar, Jagirdar, Mahajane.

### IMPACT

1. ~~Reduced~~ Reduced oppression of peasants.
2. More rights to peasants has become an incentive to the peasants to work hard.
3. Direct contact
4. More investment on land

Land ceiling → success only in W.B & Kerala.  
→ 25 lakh ppl of the total 53 lkh beneficiaries in India

### Impact

1. Eliminated Absentee landlordism (~~(\$5000)~~)
  2. The ownership to real tillers of the land increased the investment into land, as the real tillers had more concern over the land
- Potential land ceiling surplus → 21 million hectares.
  - No. of rural landless in India → 18 million
  - 11th FYP → 10 to 15 cents of land to every landless family, priority to female-headed families.
  - National Council for Land Reform → 2007 → under PM → no meeting; inactive
  - Recent 'Jan Satyagraha' by Ekta Parishad (Gwalior to Delhi)  
Rural min. promised 10 cents of land to every landless family.

## Land consolidation

### Impacts

1. Increased mechanisation.
2. Extensive farming.

3. Cost of agri. comes down; as the land area increases.
4. Decreased land litigation problems

success in fertilizers.  
success in Dairy (Vergasse Kurien) 97th Amend.  $\Rightarrow$  Art. 19(4)  
Right to form Group

Co-operatives [failure in farming, insurance, etc.]

service cooperatives a success; farmers coop a failure.

1. Increased participative democracy & equality.
2. Bargaining power increased.
3. Cost of agri. comes down.
4. Pooling of land helped increase mechanisation.

5. Easy input & credit supply. (through Primary Agri. Coop Societies)

seeds, fertilizer

6. It is a social enterprise  $\rightarrow$  puts people before profit (Profit is NOT the sole aim).

7. It involves women & gives them more empowerment.

8. Cooperatives all over the world have successfully stemmed the tide of economic recession, whereas corporates have tumbled.

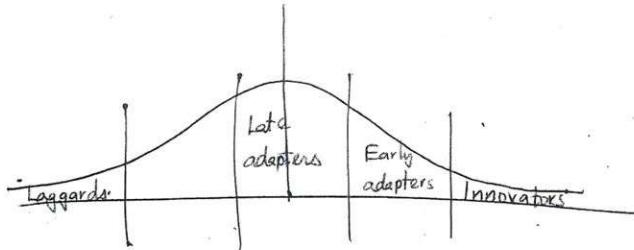
### CREDIT

1. Came to the timely help of ~~agri~~ farmers.
2. KCC (Kisan Credit Cards)  $\rightarrow$  Financial Inclusion.
3. Crop insurance. } Reduced the impact of
4. Loan waivers & debt restructuring } flood & drought.
5. Reduced rate of interest (through Priority Sector Lending).
6. Reduced oppression by money lenders.
7. Allowed the farmer to utilize the benefits of green revolution.  
(e.g.: buy fertilizer, motors, etc.)

Govt. should take steps (for second CONSOLIDATION), as the consolidated land has been further fragmented by next gen.

- R & D → Only 0.5% of India's GNP is spent on agri. R&D.  
ICAR (Indian Council of Agri. Research)
- ARI → Indian Agri. Research Instit.; State Agri. universities  
• only hundreds of Agri PhDs in India, compared to 6000 in China.
1. Seed upgradation.
  2. Increase in shelf-life of the product
  3. Promoted agro-based industry
4. APEDA (Agri-process & Export Devt. Authority) ⇒ increased the export quality of products.
5. Value addition to crops.
  6. New ~~Hi~~ crops like soya bean, sunflower were introduced into the country.
  7. E-Choupal (Choupal ITC AgroS) diffuses info about market rates, when to sell the produce.
  8. Information Village schemes of MSSRFI, Chennai.  
- Virtual knowledge Centre MSSRFI;
  9. Future markets (forward commodity markets like NCDEX, MCX).
  10. Indigenous knowledge upgradation → National Innovation foundation ⇒ GIANT Home base network  
, grassroots level innovation  
(e.g. - using bamboo for drip irrigation in N-East).
  11. Protected the gene pool, by storing the seeds - (Seed Bank)  
CCMB (Centre for Cellular & Molecular Biology) ; Seed bank in Delhi. Sugarcane Seed Vault Norwegian Arctic - ICRISAT
  12. KVK (Krishi Vigyan Kendra). ⇒ Info. Diffusion from lab to fields.
  13. Institutional support has enhanced the confidence of farmers,  
by introducing MSP (Minimum Support Price), Procurement Price, etc.
  14. Increased the standard of agri. products (e.g.: BIS)  
• Cyclone monitoring centres. } Agromet Bureau of Indian Standard!  
• Direct cash transfer for fertilizer subsidy.

→ 2012 MAINS  
How has innovation diffused to the agri. domain?



### Technology Achievement Index (TAI)

TAI > 0.5 → Leaders  $\leq$  0.35 - 0.49 → Potential leaders 0.20 - 0.34 → Dynamic adaptors.

3 targets of innovation diffusion

KA S → Changing Knowledge, Attitude & Skill.

↓  
info. about modern mind set to accept innovations. ↓  
scientific practices:-

→ Info. diffusion is now rapid due to ICT (Info. Communication & Technology).

→ Discuss the role of infra factors in changing the cropping pattern of India.

→ Region-specific question may be there.

→ What are the factors that increased the intensity, productivity, cropping pattern in agri.?

→ How has irrigation changed agri. in Vidarbha region?

## Intensity



■■■ → High intensity  
 ■■■ → Moderate intensity  
 ■■■ → Low intensity

## DRYLAND FARMING

Why should we improve dryland farming?

- $\frac{2}{3}$  of India's <sup>cultivable</sup> area is dryland.
- 60% Indian population live in dryland region.
- This is a region of important crops like oilseeds (pulses), cotton, groundnut, ~~coarse cereals~~ (bajra, jowar)
- There is a need to improve the pulse production, which has gone down from 16% to 6% in last 50 yrs.
- To reduce the regional disparity in the country.
- To reduce migration & the resultant pressure on cities.
- This is a region of social unrest (farmer suicides, <sup>widower</sup> <sub>dalit</sub> <sup>racism</sup>)
- poverty, unemployment) To reduce these illas, improvement in Dry Land farming is very essential.
- To feed the evergrowing population of the country, it is necessary to bring more lands into cultivation. Drylands are the only potential areas to be tapped.

# Drylands of India



→ Drylands.

## Problems in dryland farming

Low grass crop area  $\Rightarrow$  only 1 season cultivation  
Low net sown area  $\Rightarrow$  most lands are uncultivable  
(Barren & wastelands)

1. Low intensity (due to lack of rainfall in all seasons)
2. Low productivity (due to low fertility)
3. Salinity of soil (due to high evaporation)
4. Wind erosion.
5. Shifting sand dunes (desertification)
6. High urban migration
7. Low std. of living.
8. Social unrest.
9. Lack of modern tech.
10. No road connectivity  $\rightarrow$  no market access.
11. Seasonal unemployment  $\rightarrow$  as only 1 season agri. activity is done.



→ Problems of dryland farming - only agri. perspective.

→ Problems of dryland areas  $\Rightarrow$  all aspects (agri, social, economic, political).

Strategies to improve dryland farming.

Water-based

1. Year-round irrigation facilities.

2. Drought resistant seed varieties.

3. Technology (modern irrigation) <sup>sprinkler & drip</sup> :-

4. Watershed mgmt.

5. Water harvesting -

6. Farm ponds ;

Land-based

1. Shelter belts.

2. Sand dune stabilisation.

3. Integrated Nutrition mgmt -

4. Organic farming -

5. Agro-forestry -

6. Afforestation

7. Social forestry.

8. Integ. pest mgmt -

9. Contour bunding .

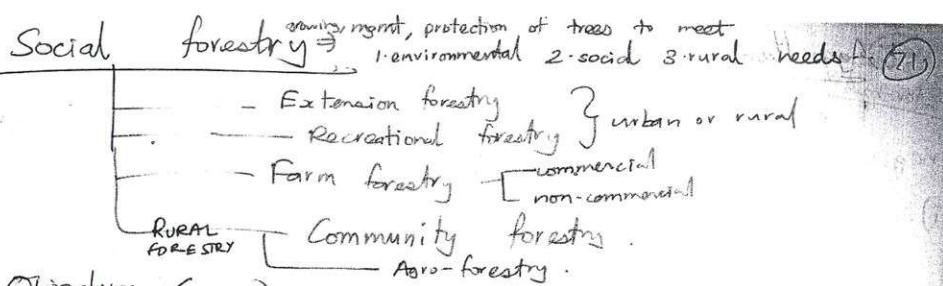
10. Wind breakers.

Crop based

1. Drought resistant ~~—~~ varieties.

2. Selection of proper crops, that do NOT require much water -

3. Choosing a crop that does NOT require too much external fertilizer application.



## Objectives (5 E)

1. Food 2. Fodder 3. Fertiliser 4. Fuel 5. Fibre

## Problems of social forestry in India

1. Eucalyptus → biological drainage (depleted large amounts of underground water).  
Decreased soil moisture & productivity of crops.  
Home for 'pests'.
  2. Wrong selection of trees like Casuarina, teak, which did not cater to the five 'Fis'.  
Absentee landlordism
  3. Conversion of agri. lands (rather than wastelands) to forests, for govt. subsidy. It resulted in a decrease in the country's food security.
  4. Though it resulted in increase in forest cover, it was mainly a weak monoculture of teak or other timber.

## Benefits of social forestry

- 1. Arrested desertification. • Marginalised sections → a sense of ownership & access to land.
  - 2. Prevented sand dune shifting. • Women → easy access to fuel.
  - 3. Increased the forest cover of India.
  - 4. More income to village admin.
  - 5. Prevented soil erosion. 7. Basic amenities (SAs) of the village was fulfilled.
  - 6. Communal forestry enhanced a feeling of unity. 8. Act as shelter belts.  
can be used in social forestry (protect crops from heavy winds)

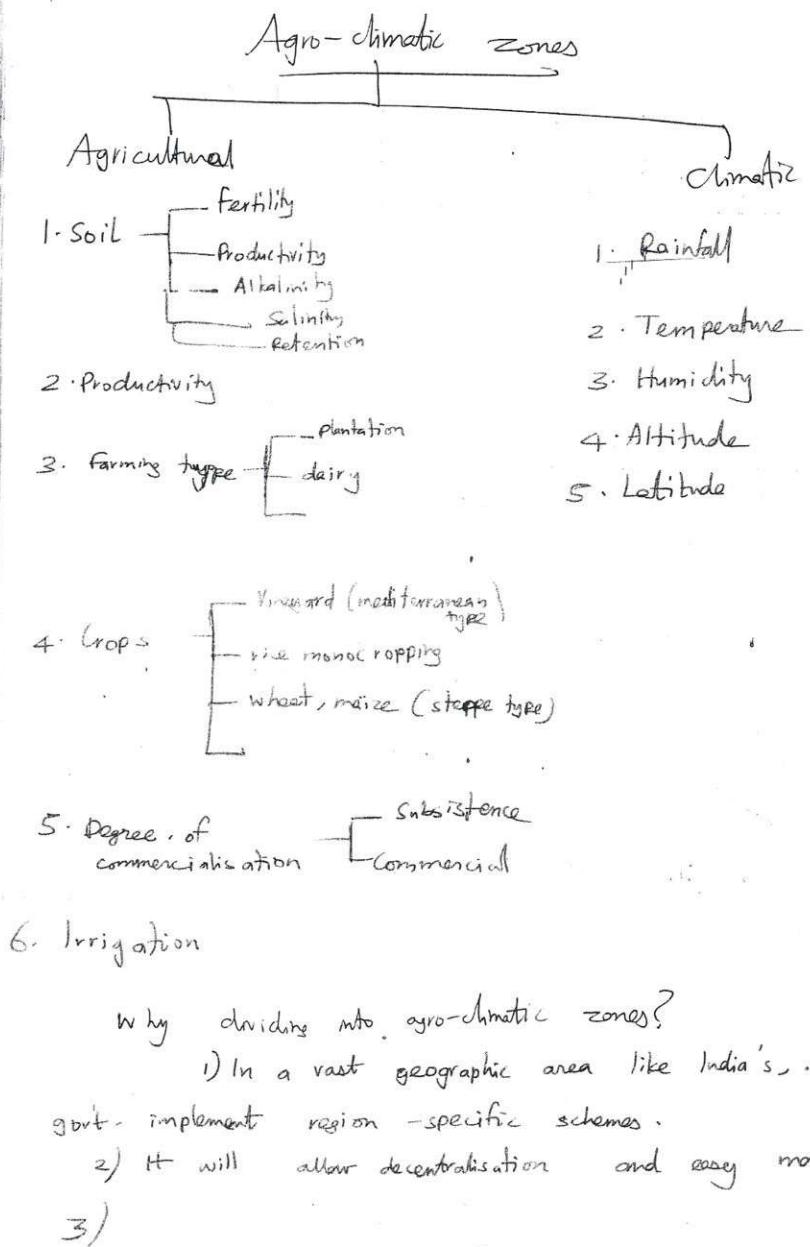
new

## Why social forestry failed?

Why social forestry failed:  
Women's opinion was NOT garnered, during selection of crops.

## Agricultural regionalisation

There is no particular criterion for agri-regionalisation. As Regionalisation is can be based on  
i) intensity ii) soil iii) cropping pattern iv) . . . .



India → 15 Agro-climatic zones.



### Middle gangetic

#### Area

→ E. Uttar Pradesh :-

#### Soils

Khader, Bangar, Terai.  
Highly fertile silt.

#### Rivers -

Kosi

#### Availability of water

Throughout the year (monsoon rainfall).

#### Crops

Sugarcane, Rice, jute, potato.

### Rainfall

100 cm. - 200 cm.

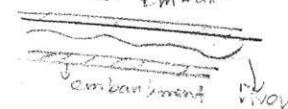
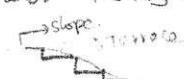
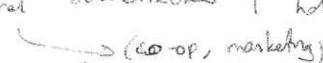
### Temperature

25°C - 27°C.

### Problems

1. Flood → meandering nature of Kosi river.
2. Water logging → due to floods.
3. Absence of marketing facilities.
4. Lack of penetration of technology.
5. Arsenic pollution.
6. High water erosion (in S.Bihar).

### Measures

1. Catchment area → bordering Nepal  
Afforestation in catchment areas.
  2. Promotion of agro-based industry (litchi, mango, banana)
  3. Promotion of cottage industry
  4. Improving storage structures by desilting.
  5. Creation of embankments to restrict meandering. 
  6. Promotion of inland fishing.
  7. Beach terracing 
  8. Remove institutional bottlenecks (still, zamindars have a great hold → Rambir Sena). 
  9. Removing intra bottlenecks
  10. Farm ponds, check dams, mulching to reduce water erosion in ~~S.~~ S.Bihar.
- 
- Khanna report → on Agro-climatic zones.
  - \* See the FYP on agri-sector -

WEST COAST PLAINS → XII climatic zone;  
West coastal plains & Ghats (2)

Area:- Kerala, coastal Karnataka, Goa.  
SOILS:  
↳ no cultural homogeneity.

- Mainly Lateritic, due to high rainfall.
- Coastal alluvium due to deposition.

~~Soil~~

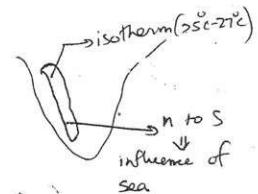
### RAINFALL

>200 cm. rainfall; mainly during SW monsoon  
windward slope of N.Ghats. orographic rainfall

June 1. High literacy  
Crime rate high.

### RIVERS

No major river basin. Pampa, Bhavathapuzha.



### AVAILABILITY OF WATER

Throughout the year (rainfall, tank irrigation)

Transport Inland waterways  $\Rightarrow$  3 : Good road connectivity...  
(Kottapuram, Tollyganj)

CROPS  $\rightarrow$  no RABI & KHARIF distinction  $\Rightarrow$  both RICE.

Mainly plantation  $\Rightarrow$  coconut, cashew, rubber, coffee,

Paddy  $\Rightarrow$  Kuttanad (below MSL cultivation) SPICES, are canut  
Good forest cover (Highlands of Western Ghats in Kerala, TN)  $\downarrow$   
Highlands of Western Ghats in Kerala, TN  
 $\frac{2}{3}$  coffee.

### Temperature

27° - 30° C :-

Green revolution reached no East coastal plains (communist govt.)

Dams displacing PPL iron & Mn

PROBLEMS Many in Goa, Karnataka (S.C. ban);

### Advantage

Land reforms  $\rightarrow$  complete success

(communist govt.)

1. Small land holdings.  $\rightarrow$  due to success of land reform.

2. Lack of mechanised agri. (lack of tech. penetration)

3. Monocultures  $\rightarrow$  soil nutrition depleted from same depth. (Rice monocropping)  
High plantations.

4. Run-off  $\Rightarrow$  water erosion:  $\Rightarrow$  lateritic soil  $\rightarrow$  poor fertility

5. Lack of investment in agri.

6. Youth not taking up agri.

7. Lack of HYV seeds.  $\rightarrow$  gap (fallow) b/w two seasons. Does not give time for the crop to recover.

8. Lack of investment in ~~agri~~ the crop to recover.

## MEASURES

Human devt.: High literacy, low poverty, high sex ratio  
less than avg. health mkt., low access to safe drinking water

1. Value addition to products like spices.
2. Spice board of India  $\rightarrow$  spice markets  $\Rightarrow$  processing  
 $\downarrow$  Idukki... value-addition.
3. Rubber Parks  $\rightarrow$  Idukki, Kerala.
4. Prevent leaching of soil  $\rightarrow$  by checkdams, afforestation,  
mulching, contour bunding, terraced farming.
5. Multi-tier cropping can be encouraged to promote  
all round employment. (gives produce in all seasons (diff plants-diff seasons))
6. Fishing in the paddy fields.  $\Rightarrow$  Integ. agri  $\rightarrow$  mixed farming.
7. ~~Distri.~~, Agri-based industry (Coir industry) :-
8. Govt. should uphold the prestige of agri. as an  
occupation.
9. Diffusion of info to the farmers, through more  
agri. universities & extension facilities.
10. Govt. should invest more in agri.  
 $\rightarrow$  More private sector participation to be encouraged.
11. Traditional agri. practices should be replaced by  
modern scientific practices.  
Access & benefit sharing  $\rightarrow$  Komi tribes  $\rightarrow$  Arayappa...
12. More garden-farming should be encouraged.  
 $\rightarrow$  forward & backward linkage  $\Rightarrow$
13. In small landholdings, co-op farming can be  
encouraged. 14. Tourism  $\rightarrow$  houseboats in ~~Nerul~~  $\frac{1}{\text{Human Resource}}$   
 $\downarrow$  Lack of IT, employments,
15. Small HEP
16. Coconut Palm Insurance Scheme  $\rightarrow$  50%  $\Rightarrow$  Centre; 25%  $\Rightarrow$  states; 25%  $\Rightarrow$  farmers
17. Brackish water aquaculture.
18. Green

## Disadv.

crime rate high; esp. insecurity of women;  
unemployment - lack of good quality  
edu. mkt.,

# INDIA - RIVERS

## Ganges

Source :- Gangotri (Uttarakhand)

Alaknanda & Bhagirathi join at Devprayag. to form Ganga.

Ganga enters plains @ Haridwar.

Left hand tributaries  
Ramganga → first left tributary of Ganga.

W ↑ E Comati, Sarda → left (looking from the source to mouth)

Sarda joins with Ghaghra.

Gandak

Burhi Gandak.

Kosi → sorrow of Bihar.

Mahananda.

Right hand tributaries.

Yamuna → Chambal, Sindh, Betwa, Ken.

Soni

→ Banas, Kali Sindh, Parbati

When Ganga enters into Bengal, India has constructed Farakka barrage to divert water from Ganga into the Hugli river.

- Damodar joins the Hugli river

- Damodar makes distributaries Ajay, Selsi, Rupnarayan ..

- ~~Hooghly~~

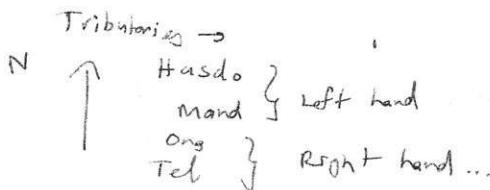
ORISSA → Swarna → gold  
Lym Brahmani Subarni

Subarni → gold placer deposits.

Brahmani;

Gaitavari;  
Brahmani

MAHANADI



North Koel → tributary of Son river.

South Koel → tributary of Brahmani

GODAVARI → Dakshin Ganga

Left hand Indravati → Maharashtra, Andhra, Chattisgarh border

Sabari → Chattisgarh & Odisha border

Si Lora → Odisha & Andhra border

↓  
Machhadkund receiving Balimela reservoir

CRPF vs Naxals

Wainganga }  
Penganga }  
Wardha } → Pranhita.

source : - BETUL PLATEAU (M.P.)

Purna }  
Budha } → Ajanta range (Whots)

RIGHT-HAND -

Pravara }  
Mula-Mutha } Harischandra range (Whots)

(pure) Major right hand tributary → MANJRA → (from Nizam Sagar dam)

Krishna → Nagarjuna Sagar dam

Ghod

Sina

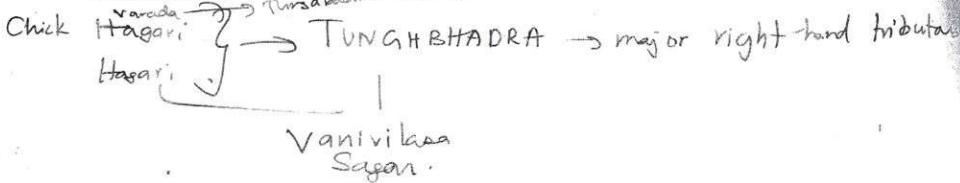
Bhim

Musi

### RIGHT HAND

Malprabha

Rhata Prabha

Chick Hageri 

TUNGABHADRA → major right-hand tributaries

Vanivilasa  
Sagari

Catory  
Pennem,  
Papagni

~~Kaveri~~

Kaveri

Anayavati Lakshman tritha → Krishna Raja sagar dam

Arkaveti Kabbani Arkavati

Noyil Bhavani Sagari dam

Amaravati

Nanganti

### Distributary

Kollidam

Sabarmati → originates in Aravali }  
Mahi }  
} Drains into  
} Gulf of Khambhat

Luni → originates in Rajasthan.  
↳ drains into Rann of Kachch.

Ghaggar → remains of ancient Saraswati  
↳ great origin of Indira Gandhi Canal.

## Eastern Himalayas

### Region

N.E. states + Northern part of West Bengal.

### Topography

Mountainous terrain. / Assam → plain.

### Rivers

Brahmaputra & its tributaries.

Dihing  $\swarrow$  Teesta  
Dibang  $\searrow$  Lohit

### Rainfall

> 200 cm. (due to Eastern Himalayas blocking)

Cherrapunji?.

Mawsynram?.

$\downarrow$   
Naga, Mizo, Pak  
Pakta Bum, Naga, Mizo :-

### Climate type

Tropical Savanna  $\rightarrow$  Tripura & Mizoram

Tropical

Monsoon  $\rightarrow$  plains of Assam.

### Soils

Assam plain  $\rightarrow$  fertile alluvium deposited by silt of Brahmaputra ...

Northern Himalayas  $\rightarrow$  Sikkim, Arunachal

Red  $\rightarrow$  Pakta Bum, Mizo.

Laterite  $\rightarrow$

### Cultivation

- Shifting cultivation by clearing forests  $\rightarrow$  Jhumming

- Bench terracing

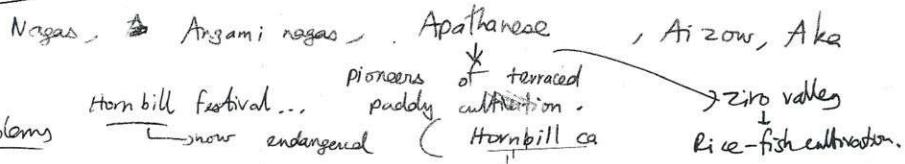
### Crops

Rice, jute, sugarcane, Tea, arecanut.

## Advantages

- Fertile soil.
- Forest cover → apiculture, lac, wax;
- \* Valleys & terrains.
- , Assam → sericulture;

## Tribes



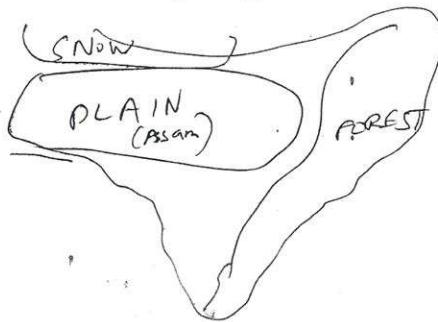
## Problems

- Floods
- Floods due to changing river course, flooding of Brahmaputra
- Landslides ..
- Deforestation - infra
- Drug trafficking to drug triangle
- Poaching - one-horned rhinoceros, hornbill.
- Low literacy
- Erosion of ..
- Jhumming - Lack of connectivity
- AFSPA.

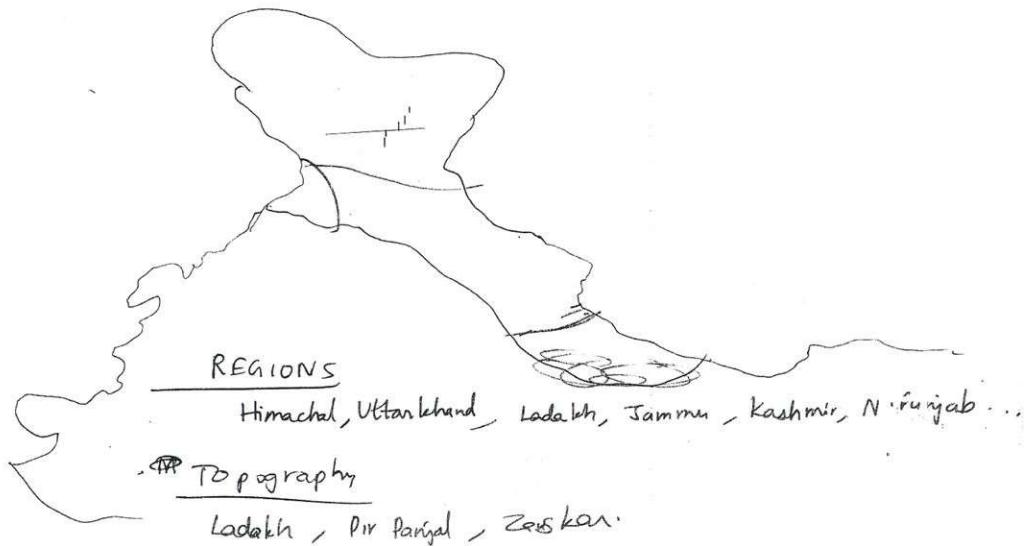
## Strategy

- Prevent jhumming
- Bench terracing, contour bunding, contour ploughing.
- Modern
- Awareness
- 'Public trusteeship' of forest cover.
- Trifed, Mafed → for forest products marketing.
- Transport connectivity → East-West Transport corridor (Silchar-Porbandar), National waterway - 2 (Kolkata to Sittwe to NF - road cum sea)
- Disast
- Small checkdams & embankments on the course of Brahmaputra
- Involving PESA in development.
- Bamboo-based, cane-based cottage industries → National Bamboo Mission.
- Orchids promotion. ⇒ epiphytes (vanda) → cacti (home gardens)...
- National horticulture mission

## ~~BB~~ Eastern Himalayas



## WESTERN HIMALAYAS



### Rivers

Indus, Sutlej - Jhelum, Chenab.

Largest glaciers of the world.

### Problems

- Unfavourable climatic conditions. Heavy snow in winter.
- Landslides; Flash floods.
- Lack of connectivity..
- Terrorism, insurgency.
- Isolation from mainland, esp. in snow-covered winter.
- Cloudburst, flashflood (esp. in Uttarakhand, during S.W. monsoon).
- Inadequate infra.
- Absence of market
- Tourism affects environment.
- Lack of employment to youth.
- Absence of industries
  - Lack of technical education (due to domination of Madrasa edu.)
  - Lack of urbanization;
- Infra. & connectivity

### Forest

- Hornis high Altitude
- Salim Ali
- Snow leopard, Bengal (National)
- Transhumance for grazing (Lohars, Agarwals).
- Low forest

### Crops

- Apple → H.P..
- Plums
- Saffron, Rice → Kulu region.

## Strategy

- To reduce impact of landburst.
  - Agro-based horticulture industries, for export based products like apple (Value addition → processing, packers)
  - Promoting eco-tourism  

(~~Stithi~~ <sup>Sikara</sup> bathhouse at Dad & Wanar lake, Kulu Manali in H.P., Pilgrimage in Vaishno Devi temple, Amarnath ji,
  - Controlled grazing by transhumance.
  - Keeping a vigil on the border (esp. Nepal border) to check illicit poaching.
  - Securing elephant corridors.
  - Est. industries, by incentive-based attraction.
  - Skill devt. to youth → Himayat (a skill training pgm. for wage emp. under PMKVY )
  - Check unemployment, to prevent youth from getting wooed by terrorists.
  - Providing technical education, (increasing the no. of universities)
  - A feeling of integration with the mainland is to be promoted.
  - Increasing the productivity of paddy in Jharkhand.
  - ~~Rejoice~~ Communal harmony to be entertained.
  - Promote DEODAR-based agri industries.  
Transport → Z-Mesh tunnel, Zojila tunnel → with road connectivity with the island.
- Public Information Bureau -

# LOWER GANGETIC PLAINS



## Regions

West Bengal, Eastern Bihar

## Soil

Fertile alluvium. (Khader → new alluvium).

## Natural vegetation

Teak, sal,

## Crops

Paddy, jute, potato, Tea (Koch Bihar, Jalpaiguri, Siliguri)

Silk → Murshidabad;

Rivers Eri, Muga, Tescari, Munberry.

Ganga, Damodar ..

## Potential ad-

Irrigation well developed around DVC. (Damodar Valley Corp.)

- Inland fishing → WB has a very great demand for fish!
- WB → highest per capita consumption of fish.

- Sunderbans → world's largest mangrove forest

↓  
abode to Royal Bengal Tiger.

- Alluvial soil → groundwater recharge good.  
↳ aquifer.
- presence of fish coop.

Problems No diffusion of Green revolution.

- Monocropping (either jute or rice)...
- Border disputes (enclaves), New Moore is.)
- Insurgency, illegal migration.  
• Floods → Kosi, Damodar.
- W.B. → very high population density  
0.8 ha/person (land fragmentation → reduced INTENSITY  
and mechanisation).

- Cattle → dairy → yield low.
- Agro-based
- Lack of dairy coop.
- Infra very low (except for Calcutta) → high waste...
- Deforestation → esp. MANGROVE. Arsenic pollution.

### Strategy

- Agro-based industry → jute-based...
- New cold storage facilities.
- Desilting
- Check dams & embankments to check meandering of rivers.
- Conservation of sundarbans → Theme of CBD 2012  
conserving coastal & marine areas...
- Application of  $\text{CaCO}_3$  to reduce acidification of  
soil in areas away from the main river.
- Integrated farming → to promote fisheries.
- Connectivity with N.E. → significant connectivity

- Augmentation of port facilities (which is affected by siltation, since ~~Kolkata~~ Kolkata is a tidal port).
- Western part of W-B.  $\rightarrow$  check water erosion by check dams, embankments.
- Flood prone area mapping.
- Crop rotation.
- frequent desiltation.
- Connectivity to ASEAN countries  $\rightarrow$  Kolkata to Sittwe (Myanmar)  


Kolkata - Sittwe - N.E  
sea road
- Gateway to ASEAN.
- BnREI  $\rightarrow$  Bringing Green Revolution to Eastern India  
 $\downarrow$   
to improve productivity of rice?

TRANSPORT

(29)

Roads

NH 1 → Jammu to Delhi

NH 2 → Delhi to Kolkata (

NH 3 → Delhi to Mumbai (via Agra, Bhopal)

NH 4 → Mumbai to Chennai

NH 5 → Chennai to Kolkata

NH 6 → ~~Mumbai~~ Kolkata to Mumbai;

NH 7 → Kanyakumari to Varanasi.

NH 8 → Delhi to Mumbai

NH 15 → <sup>Border road (Indo-Pak)</sup> Amritsar to Kendria (Kutch) (through ~~B'dh~~ Gangotri)

NH 17 → West coast (Mumbai to Trivandrum).

NH 22 → Shimla to Kolkta

India-China

NH 31 → Siliguri

↓  
Lifeline of N.E.

NH 39 → Kohima - Imphal

↓  
India - Myanmar

NH 35 → Kolkata to B'desh border.

India - B'desh

NH 37 → through Kaziranga.

NH 28 A → India - Nepal

↓  
3 Rasam

## Roadways

well developed  $\rightarrow$  Kerala, Punjab, Karnataka.

Poor developed  $\rightarrow$  Jammu, N-East.

Moderately developed  $\rightarrow$

NH  $\Rightarrow$  2% of total transport  
but carries 40% of goods & services.

Invite roads; - Initiate civilizations

R NHA)  $\rightarrow$  website -

20/10/12

RAILWAYS

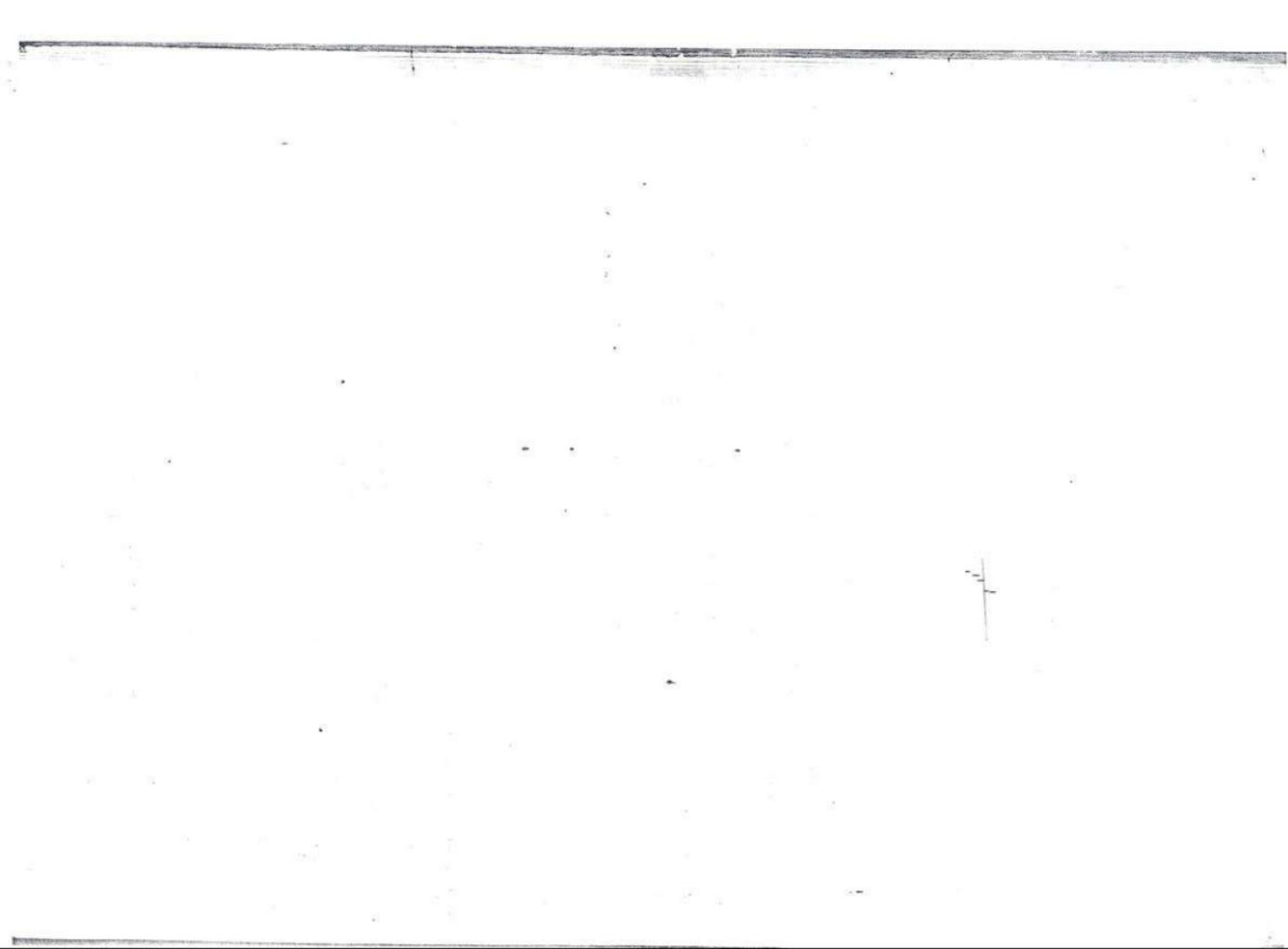
(H)

Well-devd. railways  $\Rightarrow$  Gangetic plains, TN

Moderate  $\Rightarrow$  Peninsular

Low  $\Rightarrow$  N.E; Himalayan, Jammu.

- 17 Railway zones  $\rightarrow$  road.



## Waterways

- Inland waterway
- 1  $\Rightarrow$  Allahabad to Haldia (Canges)
  - 2  $\Rightarrow$  Dibrugarh (<sup>Sadiya</sup>) to Dhubri (Brahmaputra)  $\dots \dots$
  - 3  $\Rightarrow$  Kollam to Kottapuram
  - 4  $\Rightarrow$  Marakkaram to Kakinada (<sup>Godavari</sup>  
<sup>Krishna</sup>) } notified
  - 5  $\Rightarrow$  Puri to Kolkata (<sup>Brahmani, Baitarani</sup>) } only n. 20

- Talcher - Dhamra  $\rightarrow$  R. Brahmani
- Dhamra - Chabua  $\rightarrow$  R. Matai
- Morigaon - Barak  $\rightarrow$  R. Matan;
- (6) Lakhimpur - Bonga (R. Barak)
- 4500 km of waterways by motorboats
- Used  $\rightarrow$  3000 km

$$\text{Untapped potential} \Rightarrow 4500 - 3000 = 1500 \text{ km}$$

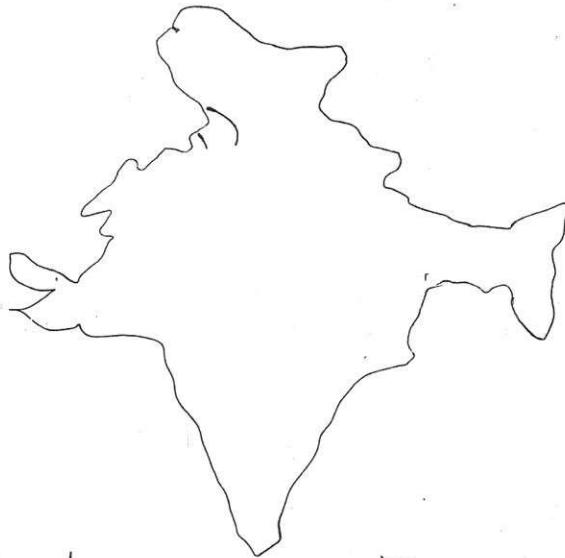
- Govt has identified 10 national waterways, but notified only 5.

Invest in waterways; Re-invent civilizations.

## Advantage of Waterways

- Less fuel requirement.
- Suitable for cargo movement
- Cheap-
- non-polluting

## Pipelines in India



### Oil pipelines

HB I → ~~Hajipur~~ (Assam) or HV I Hazra, Bijapur, Jagdishpur → (U.P.)  
Vijaypur (M.P.)

Dibrugarh to Guwahati to Baruni; to ~~Howrah~~ Allahabad - Kanpur.

Gas pipelines Baroda (Vadodara) to Mumbai High - Sabarmati (Gujarat) - Mathura - Delhi - Sonipat - Jalandhar,

Kandla to Luns (through Mathura).

### Iron ore pipeline

Kudremukh to Mangalore (iron fluey).

## Major sea-ports (12)



## Minor ports-

Dhamra (Orissa)

Kakinada (Andhra)

Gujarat has 52 minor sea-ports.

## AIRPORTS (int'l.)

Past civilization in waterways; present civilization in roadways;  
future civilization in airways

- Role of roadways in development
- Discuss the competitive & complementary role played by roadways & railways in Regional Development
- Critically analyse the roadways in India & its role in regional devt.

### Major airports

→ Same type of questions come for waterways, ports, airports or pipelines.-

- Complementary role of one mode of transport with another
- All these questions are to a particular region.

### Agro-based industries

→ Rubber, coffee, tea, fruit(litchi),



## Role of roads in regional devt.

(97)

1. Accessibility → Rural connectivity.
2. A feeling of national integration, by promoting natural & cultural interchange  
eg:- Canadian - Pacific railway (integ. of British Columbia with Canada)  
Trans - Siberian Railway (St Petersburg to Vladivostok).
3. Market access (esp. perishable goods (veg, dairy))  
eg:- Milk produced in Rajastan sold in Delhi.
4. Tourism → generates employment.  
eg:- Access to all tourist places
5. Roads will act as linear growth pole  
(attracts settlements, IT industries, motels,
6. Feeders to Railways.  
eg:-
7. Provides effective forward linkage & backward linkage  
It produces
8. Construction & maintenance of NH generate 1 lakh jobs.
9. Indirect employment generation (cements, fuel )
10. Speedy disaster management.  
eg:- Tsunami relief work in TN was greatly aided by road & railroads.

11. BRD builds roads for national security by enhancing speedy mobilisation of troops.

Eg:- India lost 1962 India-China war, due to lack of road infra. in the border.

12. Energy security  $\rightarrow$  fuel economy

40% fuel savings after NH construction.

13. Long arteries of Roads has integrated the national economy.

14. Development of Conurbations:

Eg:- Bangalore-Hyderabad highway.

15. Efficient roads play an important role in Industry Location, as it reduces transportation cost.

Eg:- Bhilai

16. Health security  $\rightarrow$  easy & fast access to modern health services in towns.

Eg:- MMR is low in TN (good road connectivity).

17. Promotes rural economy by easy &

$\rightarrow$  Trans-national trade; Eg:- ICP (Integrated Checkpost) @ Wagah-Affai border.

18. Trans-national roadways promote int'l. coop.

NH 20 at India-Nepal.

India-Myanmar-Thailand tri-lateral highway;

19. Reduces permanent migration, by increasing the speedy daily commutation.
20. Regional disparity is reduced.
21. Road connectivity is important for integration of backward ppl to mainstream and reduces insurgency & Anti-social elements. NH-52B  $\Rightarrow$  connects NH-37 & NH-52, part of Bogibeel road cum rail project (over Brahmaputra) in Assam.
22. Speedy road transport has reduced agri-wastage.
23. Road access has ensured transport of food grains to surplus areas to deficit areas and has eliminated FAMINE.
24. Settlement pattern has altered : Resulted in the road-centric settlement.
25. Resulted in Urban sprawl. (city to city movement)  
eg:- Mumbai-Pune  
Mumbai-Nashik
26. Connectivity to ports. Port development & int'l trade.  
roads  $\rightarrow$  backward chain to
27. Good Roads attract FDI:  
eg:- Chennai  $\rightarrow$  Ford, Hyundai.
28. Roads have promoted door-to-door service, and has changed the MARKET DYNAMICS. Eliminated concept of Central Goods.

29. Good roads & HDI go hand in hand.

e.g.: - good road connectivity in Kerala  $\rightarrow$  High HDI.

30. Roads can be laid easily, quickly, with low initial investment and also can be laid in any terrain.

→ Repeat similar benefits

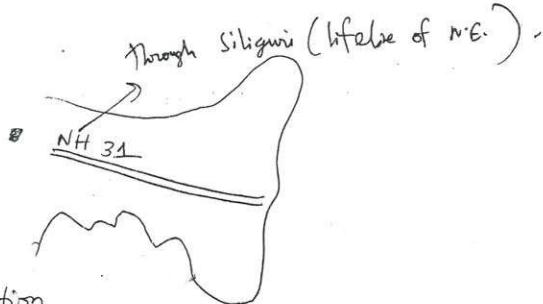
ECONOMIC  $\rightarrow$  movement of ~~raw material~~, labor, finished product; job creation; forward & backward linkage  $\rightarrow$  trickle down effect. FDI: fuel economy; tourism feeds ports, railways; door to door service.

POLITICAL  $\rightarrow$  connectivity  $\rightarrow$  integration into mainstream; insurgency combat; CNRNS/NH 35, 32, J&K; cross-country roads  $\rightarrow$  NIT-28A  $\rightarrow$  J&K; Pak  $\rightarrow$  Srinagar; cross-country roads  $\rightarrow$  NIT-28A  $\rightarrow$  J&K; co-op (India-Myanmar tribal +<sup>in</sup>) urban sprawl, conurbation

SOCIAL  $\rightarrow$  cultural exchange; reduced migration; linear settlement pattern, better health facilities  $\rightarrow$  HDI; fast movement  $\rightarrow$  no famine, no disparity, disaster relief.

To present these points in a more geographical manner, take a particular region and apply some pts to each region.

N.E. India



1. National integration

2. Counter-insurgency

3. Disaster mgmt.  $\rightarrow$  Floods (Brahmaputra-Assam)

4. Anti-poaching (Kaziranga NH-37).

5. Perishable goods (through Siliguri corridor)

6. Cultural exchange

T.N.

Chennai

- IT industry → goods & services (OVR-Rajiv Gandhi Highway - IT corridor)
- Settlement pattern altered. ⇒ ribbon sprawl.
- Connectivity with port (Chennai) & Detroit of India
  - ↳ Automobile exports
- Madurai-Chennai Highway → granite industries
- Commutation → Expansion of Chennai, upto Mettaiyapuram.
- Increased commutation → Daily, to workers travel from outskirts of Chennai to Chennai.
- Chennai → Market dynamics changed
  - Door-door delivery.
  - (Change in nature of Central goods/services)

Kerala

High HDI

- Good road connectivity → High HDI.

## GOVERNMENT MEASURES

- NHAI → National Highway Authority of India.
- North-South Corridor.
- East-West Corridor (Silchar to Porbandar)
- Golden Quadrilateral (Delhi-Mumbai-Chennai-Kolkata)
- Dedicated Freight Corridor
- Express Highways (Yamuna express highway).
- Pradhan Mantri Gram Sadak Yojna. ( $\frac{500 \text{ ppt}}{200 \text{ ppt}} \rightarrow 2.5 \text{ times}$ )
- Bharat Nirman.
- PPP models  $\Rightarrow$  BOT (Build, Operate, Transfer)
  - ↳ Toll plazasBOLT (Build, Operate, Lease, Transfer).
- Intelligent Transport Systems; Indo-Canada MoU on roads infra.
- Special N.E. Road dept (Integrated road and rail project; NIA-S2B) NIA-37
- BRO → Border Roads Organisation.
  - Increase troop mobility.
- Creation of Ring Roads, Express around major towns to avoid congestion.
- J&K specific  $\rightarrow$ 
  - north Z-tunnel
  - Zojib tunnel
  - Jawahar tunnel
- A special Infrastructure fund is Deepak Parekh panel
- R&D to create Plastic roads (out of wastes).
  - Coir  $\rightarrow$  prevents erosion.

## Bottlenecks in Road dept.

1. Capital inadequacy.
2. Land acquisition.  
eg:- Yamuna express highway
3. Topography & Relief.
4. Heavy rainfall.  
This is the reason for moderate roads in  
Congestion along!
5. Soil  
Loose alluvial soil is a great
6. Delay in clearances result in cost over-runs  
esp. envt. clearances (Cabinet Committee on  
environmental)  
↓
7. Maintenance, other than in NHs, is not proper.  
- Overload on National Highways (2/3 NH serves 40% traffic).
8. Red tapism & corruption → bad quality roads  
low life

### BOTTLENECKS

#### Geographical constraints

1. Topography & relief

2. Soil

3. Rainfall

#### Economic

1. Low viability → (upto 20%)  
(VGF)

2. Lack of capital  
(National Int'l. Fin. Corp.)

3. Less NH (2/3 NH serves  
40% traffic).

#### Social

1. Projects

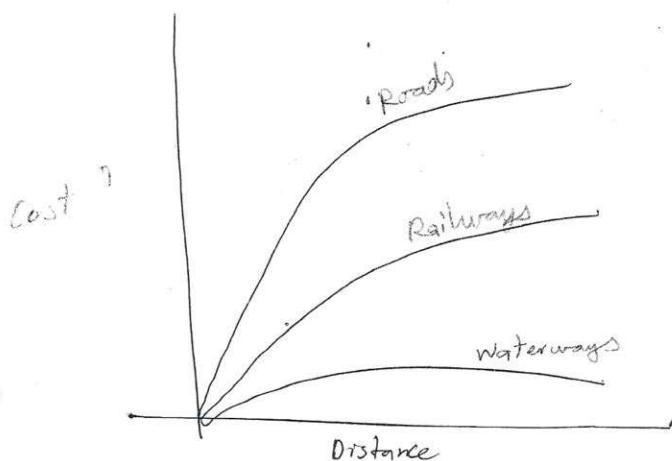
2. Land acquisition

3. Red tapism  
corruption

## RAILWAYS

1. Cost of transportation is less.
2. Bulkier goods can be transported.  
↳ e.g. for INDUSTRY.
3. Suitable for long distant travel.
4. Less polluting than roads.
5. Heritage trains → Darjeeling, Nilgiris
6. Largest employment generation ↑
7. Speedy transportation.
8. Less congestion. (not)
9. Can carry more people at a time.

10.



### Ideal situation

1. Roads : Rail  $\Rightarrow$  40:60

India (1950)  
(Ind Ind)  
(75:25)

2. Short distance  $\rightarrow$  roads

\* Medium & long dis  $\rightarrow$  rails.

Why roads dominate rails in India?

1. Roads  $\Rightarrow$  access to all areas.
2. Road trans.  $\Rightarrow$  high frequency.
3. Roads  $\rightarrow$  laid more easily in rugged relief.
4. Roads  $\rightarrow$  initial investment is low.
5. Roads  $\rightarrow$  suitable for unplanned transport.
6. Railways  $\rightarrow$  lesser trains per capita.
7. Road  $\rightarrow$  PPP (private capital - stage dept.)
8. Rail  $\rightarrow$  Delay in converting metre gauge to broad gauge.
9. Rail  $\rightarrow$  public sector  $\rightarrow$  less efficient employers -  
high social responsibility (deficit budgeting)  
lack of modernisation -
10. ~~Rail~~ Roads  $\Rightarrow$  shuttle trips (short-distance travel).

## Govt.'s measures to improve railways

### Vision 2020 document of Railways.

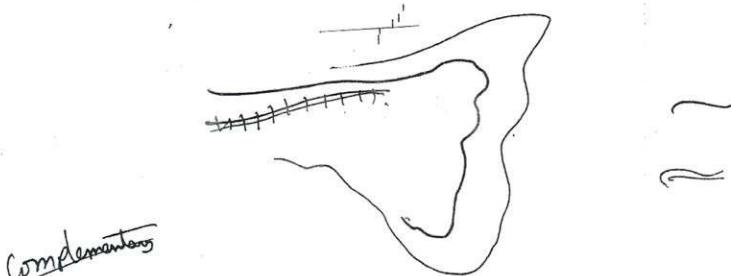
increase no. of coaches

increase no. of routes

increase of rail from 4000 to 7500

1. Limited PPP in certain areas.
2. Introduction of METRO & MONO RAILS. (MRTS)
3. Integrating tourism with Railways (Ocean Odyssey)
4. Electrification of Railways.
5. Modern ICFs in Chittaranjan,
6. New concepts like 'Own your Wagon' for college IVs,
7. Digitisation  $\Rightarrow$  IRCTC -
8. Modernisation of toilets  $\Rightarrow$  Bio-toilets.
9. ICT  $\rightarrow$  wifi, cell phone charger,  $\overline{T}$   
RDSO  $\rightarrow$  R&D and Stat. Organ  
~~10. RPF  $\rightarrow$  safety alarms, anti-collision, automatic doors, fire alarms.~~  
~~safety measures~~
10. Protection of tracks / heritage trains  
Kalka Simla, Duronto  $\rightarrow$  Kolkata, Nilgiris.
11. Eco-measures  $\rightarrow$  Gunny bags, clay pot tea.
12. Sl. reservations for women, disabled, senior citizens  
Rajdhani, Duronto non-stop
13. Sky bus  $\rightarrow$  Mumbai.  
Luxury train  $\rightarrow$  Rajdhani

→ Discuss the complementary & competitive role of roadways & railways in regional devt -



Complementary

### ① Location

Railways → only in plains of Assam.  
not possible in hilly, undulating terrain.

Roads → connects the entire N.E;

less developed in <sup>PLAINS</sup> Alluvial soils → loose  
in PLAINS

Lack of ~~rocks~~ rocks for  
construction of ROADS

### ② Roads As feeders to railways

③ Purpose of travel :- short distance → road  
long distance → rail.

④ Type of travel :- Planned → rail  
unplanned → road.

### Competitive

Roads reducing the competition (75:25), rail (40:60)

~~initial~~, initial investment for ~~road~~ road.

road has attracted most of the goods traffic (trucks) → Indo-Pak trade  
India-Nepal.

Expressways compete with rail, in speed.

Heavy goods: coal → rail beats road. Road attracts most of PPP invest.

Metro, mons, suburban railways. Discuss

→ Triple mode of transport

Land, air & water.

## INDUSTRIES

### IRON & STEEL

#### Evolution & growth

1) Before independence . IRON & STEEL INDUSTRY → backbone for industrial growth of a country

→ all sectors of industry are dependent on iron & steel industry for their basic infra (capital goods).

1. First Iron & steel plant  $\Rightarrow$  TISCO, Jamshedpur.

2 - IISCO  $\rightarrow$  1) Hirapur 2) Kulti 3) Burnpur (W.B.)  
India

3 - Viswesvaraya Iron & Steel Ltd.  $\rightarrow$  (Mysore Iron & Steel), Bhadravathi;

2) During 2<sup>nd</sup> 5 year plan. (1956-61)

1. Rourkela steel plant  $\rightarrow$  Sundergarh, Orissa  
German collaboration

2. Bhilai steel plant  $\rightarrow$  Durg, Chhattisgarh  
Russian collaboration.

3. Durgapur steel plant  $\rightarrow$  West Bengal  
UK collaboration

4. Bokaro steel plant  
Russian collaboration

1973  $\rightarrow$  Est. of SAIL, to manage these PSUs.

3) New steel plants.

4<sup>th</sup> Plan period

1. Visag steel plant

2. Vijaynagar steel plant, Hospet, Karnataka.

3. Salem steel plant, TN

India  $\rightarrow$  4<sup>th</sup> largest exporter of steel, largest exporter of sponge iron.

Shift from raw material based location to market (port) based location.

here, scrap metal is the raw material.

## Distribution/location factors $\Rightarrow$ Chota Nagpur plateau;

Iron & steel industry  $\Rightarrow$  WEIGHT-LOSING INDUSTRY.

located near Raw material location

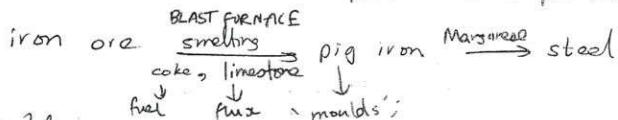
- Raw materials  $\Rightarrow$  iron ore  
coking coal  
manganese  
limestone  
dolomite
- REQUIREMENT  
Iron ore : coking coal : limestone = 4 : 2 : 1

Power

Water  $\rightarrow$  from rivers, for cooling

Railways  $\rightarrow$  to carry raw material to plant

Port  $\rightarrow$  to export finished products.



### Problems

1. Certain high quality & graded iron & steel is ~~not~~ (like hot rolled coils, cold rolled coils) are not produced in India due to low demand. So, India has to depend on imports to meet these demands, making India a net  $\oplus$  importer of finished steel, thus increasing CAD.

2. R & D in Iron & steel industry in India is very low (0.2% of annual turn-over of the iron & steel industry), as against the 1-2% of int'l. companies.

3. High use of coking coal  $\rightarrow$  release of CO<sub>2</sub> during smelting  $\rightarrow$  pollution

4. Lack of availability of coking coal.

5. Low labour productivity.

6. Inadequate infrastructure.  $\Rightarrow$  Recently, FDI has brought in new technology.

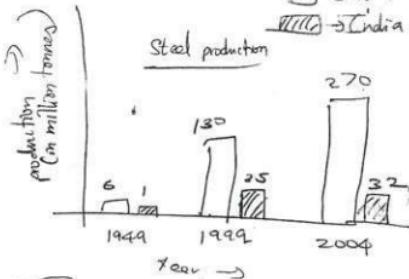
7. Irregular energy supply

8. Not much domestic consumption

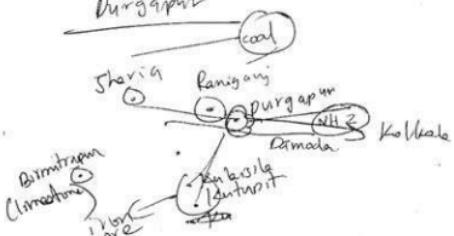
q. Lack of a quantum jump in recent

415.

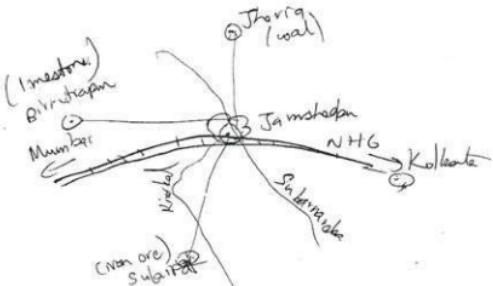
## Iron & Steel plants



Durgapur



 Jamshedpur



## Cotton Textile

### Evolution & history

Cotton textile  $\Rightarrow$  traditional industry of India.  
 ↑  
 1st ever industry in India  $\Rightarrow$  1854  $\rightarrow$  cotton mill in Mumbai by Cowasjee

- Ancient & medieval period  $\Rightarrow$  cotton textile was a cottage industry

Muslin, calico chintz  
 fine cotton textile

- Factors that favoured cotton industry in traditional India -  
 → tropical climate & black soil of Deccan (cotton growing Maharashtra and Mad)  
 → Abundant skilled labours  $\rightarrow$  due to high population.
- SWADESHI movement  $\Rightarrow$  gave an impetus to indigenous cotton textile
- After partition, cotton textile plunged into recession, since 70% of cotton growing areas went to West Pakistan. But, it has recovered well after independence.



### Distribution (Location factors)

#### Tradition

- Cotton  $\rightarrow$  pure Raw material  
 ↓  
 NOT weight losing.

So, industry may NOT be located near raw material.

So, other factors like

- Market
  - Power
  - Labour
  - Capital
- play a major role.



- Traditional centres  $\Rightarrow$  e.g. - Mumbai, Ahmedabad,

Very close to cotton growing areas.

Port facility to import machinery for mills.

Urban area  $\rightarrow$  high labour availability.

Town  $\rightarrow$  market;

Rural area  $\rightarrow$  capital was available.

2. Power → e.g.: - Tamil Nadu (Coimbatore, Tirunelveli)

High availability of hydel power; wind power;  
It is the textile industry which gave an impetus to wind power production in India.

3. Low labour cost → e.g.: - Coimbatore, Ujjain, Agra.

Low labour cost  
Mumbai

4. Capital → e.g.: - Kanpur

Local investment was available:

Tamil Nadu has the largest no. of cotton mills in India. But, most of them are spinning mills (produce YARN) rather than cloth. Coimbatore has more than 50% of TN's cotton mills.

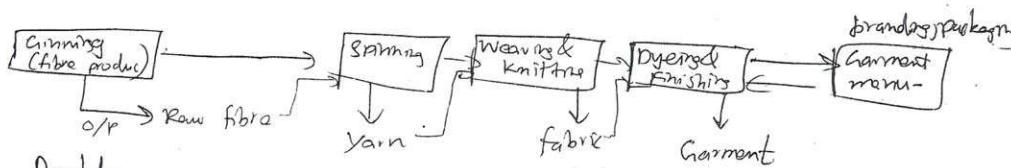
int'l quality yarn → export to Japan, US, UK.

Telangana region → Hyderabad, Secunderabad, Guntur, Warangal  
spinning mills (YARN)

Traditional centres:

Ahmedabad, Bhavnagar, Solapur, Kolhapur, Nagpur, Indore

Kanpur → J.P.



### Problems

1. Tough competition from synthetic cloth.

2. Lack of Power availability & frequent shutdowns  
power has resulted in the demise of several small scale  
power households.

3. Lack of good quality machinery, esp. in knitting & weaving sector. As a result, we are forced to import fabric, which is the input for the garment industry.

4. Low labour output.

### Significance of cotton textile.

- 14% of industrial production.

- Employment generation (35 m pol)  
↓  
second only to agri.

- 4% of GDP.

- Only completely self-reliant industrial chain in India  $\Rightarrow$  conserves FOREX.

### Production of fabric by various sectors in India.

sector	Share of production
Mills	6%
Powerloom	54%
Handloom	23%

### Measures

1. National fibre policy.

2. Mandatory use of jute bags  $\Rightarrow$  to increase demand.

3. Recent environ. concerns  $\rightarrow$  so, jute is preferred to other non-biodegradable packages

4. R-TVFS

→ Traffic pattern of roads.

- 1) 2% of NH serves 40% of traffic.
- 2) Roads mostly short & medium distance.

Emerging trends in roads

- 1) Express highways → online access, eCRVS, electronic toll payment, ICT
  - 2) Outer Ring roads
  - 3) By pass roads
  - 4) 6 lanes <sup>two-lane part of</sup>
- Intelligent transport system →
- 1) Networked database on road infra & transport.
  - 2) National register on licences, registered vehicles, road safety data.
  - 3) Intelligent & dynamic user interface with various agencies.
  - 4) Tracking vehicles, containing accidents ; 5) Capture of environmental data (pollution, weather)
- Delta regions of East India:
- both Ganges & Brahmaputra

- Roads

NH 31 → through Siliguri.

NH 35 <sup>Kolkata</sup> → to Bangladesh

Inland waterway

~~waterway~~ 1, 2

Port → NOT very good natural ports, since it is an emergent coast. (~~coastal~~)

Hbl., Kolkata → to Chennai, S.E. Asia;  
(Diamond harbour)

Commodities

Jute, tea, rice, silk...

Basis on which network of Airways is built in India.

Traditional

1) High economic power. (business-class travel)

eg: Mumbai

2) High mobility of ppl. (globalization → increasing no. of ppl going abroad  
int'l. emigration → adm, professionals, etc.)

3) Proximity to other countries.

4) Business opportunities (liberalisation → more FTAs, RTAs, ~~etc.~~ FDI,  
businessmen often visit)

5) Availability of light cargo. (diminishing size of goods)  
eg: electronic goods

eg: - Recent i-phone 5 launch saw a sudden upsurge in air cargo.

Recent

Domestic air travel ⇒ white collar jobs; short-time shuttle trips;  
fast-moving world → need for a quick transport

1) Political considerations

a) National integration

b) Supply of essential goods.

2) Inter governmental conferences

3) High competition ⇒ cheap airfare → budget flights → Spice, Air Asia

4) Tourism → 'Drive to maturity stage' → change in lifestyle → holidays, vacation  
↳ liberalised VISA regime  
↳ geographical impediments in drpt. of inland waterways

1) Meandering of rivers  
eg: Kosi

2) seasonal nature of rivers

eg: - Peninsular river

3) Undulating topography (presence of waterfalls) in case of youth stage  
↳ rapids

eg: - Hogenakkal in kerala..

4) Siltation of river

eg: - Kolkata

5) TIDAL VARIATIONS

eg: Kolkata

5) Uneven distribution of rivers.  
Lack of inter-linking of rivers.

6) Frequent flooding poses danger to life..  
eg:- Brahmaputra ..

7) Presence of man-made geographical impediments-  
eg:- Stanley reservoir on Cauvery

8) Erratic nature of monsoon.

21/10/12

### Pipelines



### ESSAY

Dissect the question. Understand its essence;  
First list down the points.

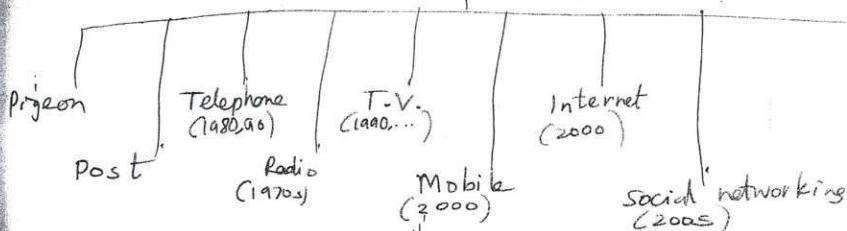
Decide the approach.

- Organise cohesively -
- Classify under various heads.

### COMMUNICATION

Education → e-learning e-book, scientific interaction R&D, multi-tasking modules,  
cheaper ↓ internet

# Communication



The years indicate the widespread diffusion in India.

## IMPACTS OF COMMUNICATION & INFO TECH - (ICT)

- 1) Information diffusion → Access of info. even to remote areas.
- 2) Political democracy → right to expression, (Art. 19(1))  
eg:- Blogs.
- 3) Information revolution → India was the first to catch up with it - Tertiary sector flourished.
- 4) Long distance, quick & easy communication.
- 5) Cheap communication (One-India plan).
- 6) International World → a global village.
- 7) Cultural exchange → easy info. flow between countries.
- 8) HOTLINES → instant int'l. communication b/w top leaders.  
eg:- e-champ (ITC). Agri. markets;
- 9) E-governance → efficiency of administration.
- 10) Social networking → free flow of info & group relationships  
↳ a new dimension of personal & group relationships
- 11) New facet of Trade → Online capital markets.  
↳ futures market.
- 12) Exchange of money → NEFT, RTGS, FOREX  
E-BANKING (real-time banking experience)  
↳ click & go

- 13) More awareness among ppl, formation of opinion, empowers ppl.
- 14) R&D → advanced by INTERNET
- 15) Publication of e-journals → a knowledge revolution.
- 16) Online encyclopedias → repository of free info  
eg:- Wikipedia.
- 17) E-mails → a new facet of communication, even for formal transactions, online contracts replacing the time consuming letter formats.
- 18) Online applications, online scanned certificates.
- 19) TVs → the most penetrated communication device.
- 20) Mobiles → increased personal bonding.
- 21) ~~E-portals~~ → NATHRID → National security by exchanging ~~inf~~ intelligence info. crime & criminals tracking, ~~tribuna~~.
- 22) Satellite tech. → Remote sensing & disaster response  
→ border vigil.  
→ identify property tax evaders  
→ GAGAN → safe air transport.  
→ GPS → road & sea navigation.  
→ environmental mapping, management, conservation.

- 23) Saved a lot of time  $\rightarrow$  e-payment of bills. (17)
- 24) Eliminated red-tapism & undue delays in govt. of fics.  
eg:- Passport Seva Kendra.
- 25) More efficient service delivery by identifying citizens.  
eg:- Aadhar ID cards.
- 26) NPR  $\rightarrow$  National Population Register.  $\Rightarrow$  digitisation of info.,  
easy access.
- 27) Telemedicine  
eICUs.  $\Rightarrow$  reduce health disparity in the country.
- 28) Entertainment-  
A central good made a home good.
- 29) Extension  
Information dissemination to farmers.  
~~Risan~~ Kisan Call Centres
- 30) LIVE TELECAST  
Instant info..
- 31) Voice calls, Video calls on Internet  
VoIP (Voice over Internet Protocol).
- 32) Increased Transparency in governance.  
Lok Sabha TV...
- 33) Employment.

34) Prevented corruption: - (by removing intermediaries).

- e-transfer of pensions, salaries,
- e-filing of tax returns.

35) ~~Eco~~ Saved paper

e-mails. (eco-friendly)

36) Sedentary life style

Obesity, hypertension, stress...

37) Modern science & Tech

Supercomputers  $\Rightarrow$  quantum physics / complex calculation

38) Modern warfare

Cyber warfare (sending viruses, spam, (STUXNET, FLAME))

Missile tech.

Nuke. tech (simulation testing).

39) Women empowerment:

- More employment to women in IT sector -
- Even housewives can work from home ...

40) electronic wastes / ~~toxic~~

~~toxic~~ (Art. 21)

- 43) Cloud computing  
Sharing of resources.
- 44) Moral erosion  
- Access of adulterous content to children.
- 45) Threat to national security.  
Easy spread of unauthenticated info.
- 46) Judicial process strengthened.
- 47) Electoral reforms  
eg:- EVMs.
- 48) Re-inforced capitalism.
- 49) Social entrepreneurship encouraged.  
→ Small website designs.
- 50) Reduced migration
- 51) Brain drain.
- 52) Extra Terrestrial Research.
- 53) Promotion of INDIVIDUALISM :-

54) Labour shortage is reduced by in western countries  
by BPO, KPI.

55) new political envt - changed.

Chaos theory  $\Rightarrow$  an uprising in one part of the world spills over to the entire world.

56) Cultural amalgamation.

why this fusion?

Gangam dance style  
Pizza in India

57) Life has become materialistic.

58) Promoted consumerism by increasing the choices.

benefits

Communication  $\Rightarrow$  education, civil rights, governance, security, economic, social.

wiki, e-book online encyclo, network b/w scientists, Education  $\Rightarrow$  e-learning, R&D, digital libraries, multi-tasking modules, e-journal publication (OA = Open Access)

Social  $\rightarrow$  reduced migration, promoted universal values, cultural amalgamation.

Women empowerment, increased bonding in this work-centric world, exposure, telemedicine.

$\rightarrow$  sector  $\rightarrow$  alienation (detachment from real world), materialism, individualism, loss of identity, moral erosion.

Economic  $\rightarrow$  Banking, online stock market, Services sector, small entrepreneurs, cloud computing

$\downarrow$  marketing, info. diffusion & extension of R&D from lab to field, labour mobility

\$50 b India consulting report.

Domestic, ITC, AGRIS, e-commerce

$\rightarrow$  Reinforces capitalism, sedentary lifestyle, Westernization (only physically), brain drain

Governance  $\rightarrow$  Direct service delivery, eliminate middlemen, red-tapism, efficiency of admin.

quick communication, hotlines with relation, EVM, saves paper, transparency, chaos effect (Arabs spring)

Civil rights  $\rightarrow$  freedom of expression, informed decisions, freedom of association (groups)

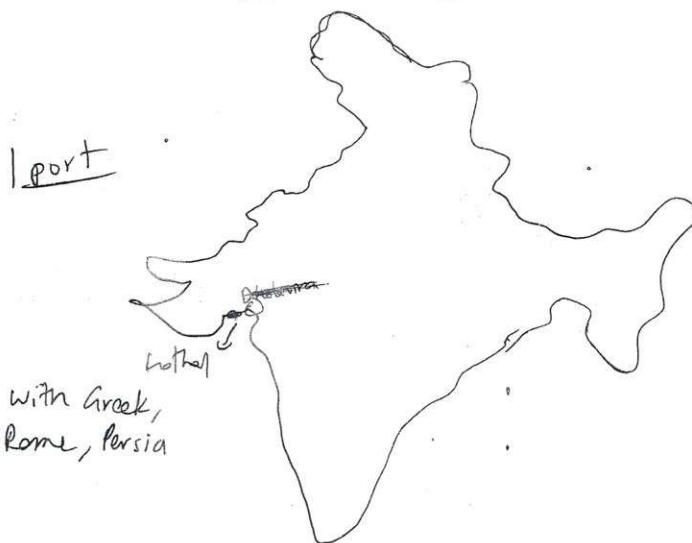
$\rightarrow$  privacy affected, no reasonable restriction, trolling.

Security  $\rightarrow$  satellite, RADAR, wireless for police, GANAN, GPS, disaster detection, CCTNS,

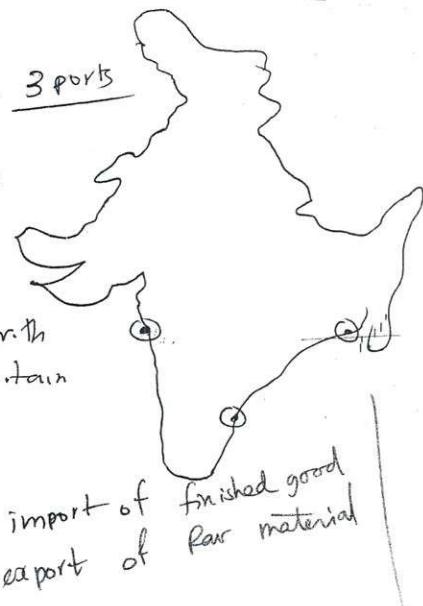
$\rightarrow$  mobile phones, virus ...

→ Growing importance of ports in foreign trade of India.

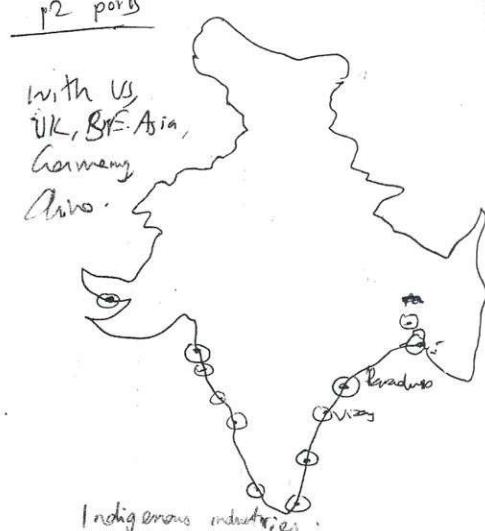
### Ancient India



### British India



### Past - independence



## Post liberalisation

### Impact

#### Post - 1973

- Oil shock  $\rightarrow$  19
- Importance of oil increased
- Oil imports increased.  
↳ o.p. of Indian imports )

## Post liberalisation

- Imp. of commodity trade decreased (due to ICT services revolution)
- Imp. of ports declined slightly.
- Major Ports  $\rightarrow$  12



# Industry

125

## Location

1. Weight triangle
2. Agglomeration
3. Isotropes



## Growth & evolution

- ~~IRON & STEEL~~ 1) Ancient India → Cotton
- 2) Medieval → Qutb Minar → standing eg. of Indian iron & steel industry.
- 3) Pre-Congress British rule → indigenous industry ruined.  
India made an importer of finished goods, and an exporter of raw materials.
- 4) Swadeshi movement → gave an impetus to indigenous goods. (Bengal Chemicals factory - P.C. Roy)  
~~Loyalty~~ → V.O.C.
- 5) 1<sup>st</sup> WW → demand for goods decreased worldwide...  
raw material supply decreased  
Industry falls.
- 6) Great depression (1929) → British <sup>India out</sup> changed its policy  
Import duty was increased.  
Export duty was decreased  
Indian industry flourished
- 7) 2<sup>nd</sup> WW → huge demand for iron & steel  
(for weapons, gunny bags)
- 8) Partition → 70% of cotton & jute growing areas went to ~~West~~ W. & E. Pakistan.  
A great blow to Indian textile industry.

9) 2<sup>nd</sup> Plan period → Mahalanobis plan  
 → investment in heavy industry / basic or capital goods industry  
 more investment in R&D in industry

CSR  
ISRO  
DRDO

Bokaro  
Rourkela  
Bhilai  
Durgapur

(10) ; Post liberalisation period.

- Manufacturing → tertiary (services).
  - ~~Agriculture~~ Info & Comm., share of manu- sector came down drastically
  - Processing
  - Value-addition - Consumer based goods;  
Increased competition from foreign players
- Posco, Arcelor mittal.

### Factors affecting industry location

#### Geographic factors

1. Raw material
2. Power
3. Water
4. Labour
5. Transport  
Market
6. Climate
7. Topography

#### Non-geographic factors:

1. Govt. policy
2. Availability of Capital
3. R&D
4. Inertia (mobility to move on from the historical context)
5. Security
6. Quality entrepreneurship
7. Competitive environment

## Problems faced by Industry

(127)

1. ~~Inadequate~~ Inadequate capital.
2. ~~Infra~~ Infrastructure bottlenecks.
3. Low investment in R & D.
4. Outdated technology and old machines.
5. Power shortage.
6. Labour strikes & lockouts. (maladjustment b/w labour & mgmt.)
7. Lack of skilled labor.
8. Environmental factors (<sup>carbon tax, emission cuts</sup> envt., greenpeace activists, clearance from MoE)
9. Red tapism, corruption <sup>→ License Raj...</sup> <sup>clearance from several ministries</sup>
10. Lack of employability
11. Stiff competition from global companies..
12. Shortage of Raw material.
13. Lack of quality entrepreneurship.
14. Land acquisition problems

## Fertilizers

- HFL (Hindustan Fertilizer Ltd.)
- SPIC (Southern Petrochemical Industries Co. Ltd.)
- NFL (National Fertilizer Ltd.)
- FACT (Fertilizer & Chemicals of Travancore Ltd.)
- RCL (Rashtriya Chemicals Ltd.)
- Co-operative

IFFCO

KRIBCO

## Bio-fertilizers

Pseudomonas

Azospirillum

Azotobacter

Growth & evolution Ancient → shifting cultivation; no need of fertilizer;

Ancient → settled cultivation → soil fertility depleted

Sindri (Jharkhand) → first plant.

## Green Revolution

Nitrogen Phosphorus Potash

• NPK fertilizers

↓  
+ 2:1 → recommended (need 0.7:2.9:1)

↳ India's soil is ~~more~~ deficient in nitrogen.

## Green Revolution

• Quantum jump in chemical fertilizer consumption

• Nitrogen → fertilizers industry high growth  $\xrightarrow{\text{due to}}$  high demand

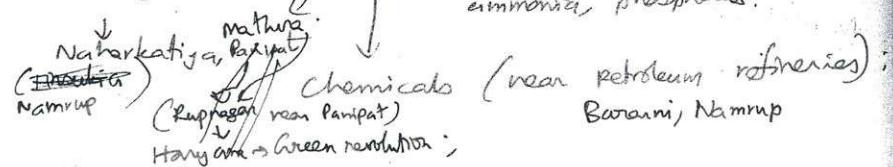
• Phosphate fertilizer → mostly imported ..

• Potash : → not used much .....

## Location (factors)

### Naharkatiya

1. Availability of Raw materials  $\Rightarrow$  chemicals like ammonia, phosphorus.



### 2. Market

very close to areas where Green Revolution has trickled down (Punjab, Haryana, TN)  $\downarrow$   $\downarrow$   $\downarrow$   
 Punjab (near Panipat)  $\downarrow$   $\downarrow$   $\downarrow$   
 Haryana  $\rightarrow$  Green revolution;  $\downarrow$   $\downarrow$   $\downarrow$   
 SPIC  $\downarrow$   
 Nayveli.

### Transport

3. Near ports  $\rightarrow$  Mangalore, Visag  
 since it is dependent on imported raw materials.  
 oil pipeline.  $\downarrow$   $\downarrow$   $\downarrow$   
 (phosphorus)

### 4. Water

$\downarrow$  No fertilizer industry in drylands of India.  
 bcoz high amt. of water is reqd. for agri., consuming fertilizers

### 5. Type of crops

Rice  $\rightarrow$  mera

Pulses  $\rightarrow$  hyspium

### 6. Nature of soil :-

Terai region  $\rightarrow$  high fertility and need of fertilizers

## 7. Type of agri.

Monocropping  $\rightarrow$  high depletion of fertility ;  
more fertilizer consumption .

Crop rotation  $\Rightarrow$  replenishment of soil nutrition ;  
no need for high fertilizer consumption .

## Non -geographic factors

- 1) Heavy subsidy .
- 2) Minimum support price .
- 3) Awareness about use of fertilizers .
- 4) Good network of cooperatives  $\rightarrow$  regional input supply chains

## Problems of fertilizers

1. Overconsumption of Nitrogenous (urea) fertilizers due to heavy subsidy & immediate visible results ( $N \rightarrow$  excess growth foliage)
2. Overuse leads to ~~inappropriate~~ unbalanced demand for  $N:P:K$ :  
 $9:7:2.9:1$  (ideal:  $4:2:1$ )
3. Subsidy on fertilizers increases fiscal deficit .
4. Dependence on imports for raw materials (phosphorus) increases CAD .
5. Causes eutrophication .

6. Kills beneficial organisms.

7. Environmental Concerns → fertilizer production releases GHGs like  $\text{NO}_x$ ,  $\text{SO}_x$  (Kyoto Protocol - B)

2014 CBD → looks to remove subsidy on fertilizers (Korea)

8. Evergreen farming → limits the scope of chemical fertilizers and promotion of organic manure.

### Cottage industry



→ How has location of industry changed in the post-liberalisation period?

→ How will the second set of economic reforms (Diluting FDI) affect industry location?

Agro-based industry → may be cottage, MSMEs, big industry etc  
pickle! sugar mills

Raw materials → agri. products.

### Cottage industry

- Raw materials → locally procured.
- Labour → family members.
- Factory → home.
- Power → low or no power; no mechanisation; traditional knowled

→ discuss the factors for location of cottage industry in India.

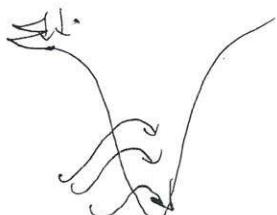
- Discuss the problems associated with cottage industry & the strategy to overcome them.
- Significance of cottage industry in India.

### Factors

#### Kerala

- Heavy rain from S.W. monsoon → heavy leaching <sup>top soil washed</sup> → iron content exposed → raw material for tile.

### Salt-making

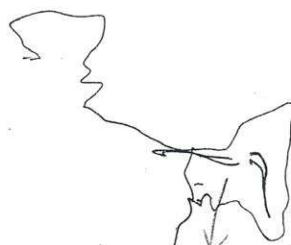


- High moderation tropics
- Subsiding of air mass
- Coast  $\Rightarrow$  sea water  $\rightarrow$  evaporation  $\Rightarrow$  salt  
eg: - Gujarat; Turticorm.

### Incense sticks

- Dry deciduous forest
- Sandalwood  $\rightarrow$  kankar soil
  - eg: - Karnataka

### Bamboo, cane



- high rainfall
- Close to tropic

$\rightarrow$  Bamboo grassland

Tribes  $\rightarrow$  traditional knowledge of bamboo  
(how it can be used for manufacturing)

eg: The recent bamboo cycles

### Sports good

- Sutlej, Beas river
- Shiwaliks  $\rightarrow$  trees  $\rightarrow$  raw material
- . Skilled labour

### Pashmina shawl

Kashmir

High latitude, cold temp; low rain  $\Rightarrow$  Pashmina goat

Cold climate  $\rightarrow$  demand for shawl

## Jharkhand.

- ↓
  - High rain → short duration
  - Sal tree, tendu leave, lac insects.
  - Tribes → traditional knowledge

## Paper

Supply of raw material

- ↓
  - Darjeeling → Bamboo
  - Shahrapur (UP) → Sisal grass
  - Karnataka, Maharashtra → Bangalore bazaars

## Pickle

Andhra

- Telangana → semi-arid climate
  - ↓
    - no food crops
    - chillis

## Skilled Labour

Silk → Kanchipuram. → classical example for industrial inertia.

Lock → Aligarh, Dindigul.

Glassware → Mysore/Bengaluru

Papad industry → Tirunelveli, TN.

Raw materials → Black gram → Virudhunagar  
Tasty water → Tamirabovani

Labour → Housewives:-

## Problems & limitations of cottage industry

(135)

1. Seasonal nature of availability of raw materials.
2. Inability to compete with modern industries.
3. Lack of branding → loss in demand.
4. Exploitation by intermediaries.
5. Education, modernisation & westernisation has led to the ppl involved in cottage ind. to quit it.
6. Organised markets can NOT be provided by the govt. due to the
7. Luxurious lifestyle → change in ppl's preference:  
Jasery to Sugars.
8. Pull factors of urban centres & migration has led to the decline of cottage industries.  
over population
9. Inability to tap the int'l. market...
10. Less no. of women as homemakers (due to emp. opportunities)  
They are the most active ppl in cottage industry
11. Disguised unemployment → more no. of ppl involved in a less productive work.

## Significance

1. Biggest employer of rural ppl.
2. ~~Fund~~ No need for skill imparting. (this is done through family institution itself)
3. Efficient use of resources.
4. Eco-friendly.
5. Considerably reduce urban migration.
6. Women empowerment. (women involve in economic activity).
7. Community dpt.
8. Grass root level dpt.  $\Rightarrow$  bottom-up approach.
9. Tool for inclusive growth.
10. Labour intensive
11. Our country's dpt. lies in the dpt. of villages.  
~~Our econ~~ The dpt. villages lie in the dpt. of cottage industry.  
— Gondhi

## Strategy

1. Cooperatives.
2. Elimination of intermediaries.
3. Value addition.
4. Govt. support.
5. Mar Fed., Tri Fed.

Art 40  $\Rightarrow$

27/10/12

## Agro-based

### Cotton textile industry

Page No. 137

#### Growth & evolution

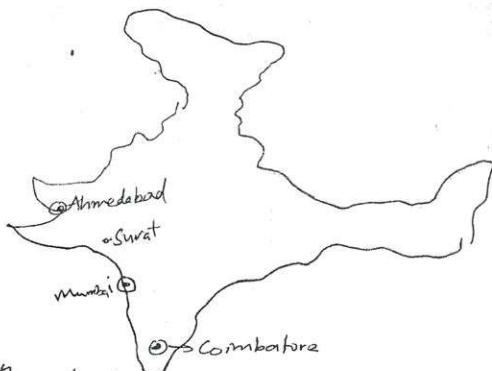
IVC → cotton → Sindh

Traditional → spinning & weaving.

1854 → Mumbai → first cotton mill;

Swadeshi;

Partition;



#### Factors

e.g.: - TN → Coimbatore

1. Black soil
2. Palghat gap → conducive for cotton climate.
3. Cheap labour from southern TN.
4. Well connected roadways to ports
5. Benefits of green revolution to cotton growth.
6. Modernisation → spilled over to Tirupur as knitwear industry

#### Mumbai

1. Black soil
2. Thal ghat & Bor ghat → allows easy collection of raw material.
3. Port facility → import of capital good; export of textile.
4. Availability of Capital → Rich Parsi ppl invested.
5. Coastal climate → conducive for cotton industry.
6. Cheap labour from Vidarbha.

Nasik, Akola, Amravati

New cotton industries spreading (in the form of powerlooms) with well connected road & rail! as cotton is NOT a weight-lossing raw material (industry can be located even away from cotton growing region)

#### Ahmedabad

- Largest no. of cotton mills in India.

- Mumbai → high congestion.

## Kanpur

- NOT cotton growing -
- . Well connected by NH 2 (Delhi-Kolkata)
- Main pull factor :- cheap labour (labour isodope).

Post-liberalisation

- . Due to govt's promotion policies, powerlooms have been dispersed everywhere in the country

## IRON & STEEL

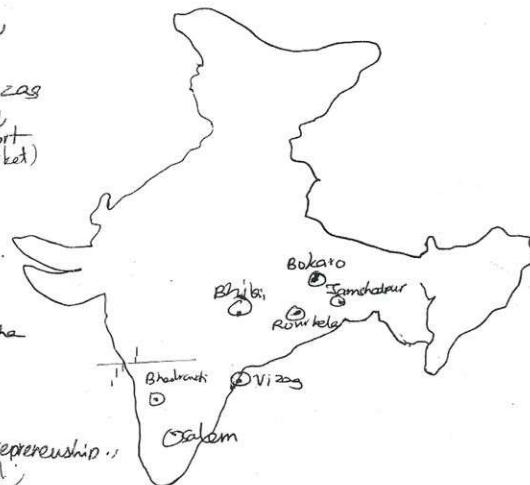
GOm. → explain all 6 industries;

BOn → Bhilai, Bhadravati, Visag  
 ↓  
 Durg (raw material) coal (raw material) iron ore (raw mat.) port (market)  
 footloose → Salem.

Raw materials → coal & iron ore

both weight-losing

→ the plant is located near the raw material.



TISCO → non-geographic factors → entrepreneurship, capital;

Bhilai → non geo fac. → dpt. of backward areas in MP Chhattisgarh  
 To create a growth pole. ⇒ govt policy intervention  
 But, growth has not spread.  
 (Only backwash; no spreadwash)

## Automobile

(139)

→ port facility → market  
Chennai

- Non geo → govt - policy to promote exports by SEZs. → Gurgaon, Chennai

• Availability of cheap spare parts.  
↳ Hosur

### Quality

- Cheap, skilled engineers → Chennai;
- High demand in domestic market.

↳ growing middle class; 'Drive to Maturity' stage → restrain needs



## Silviculture

South (Mulberry)  $\rightarrow$  domesticated

- Cool climate

- Cheap labour.

- Demand in domestic market (cultural tradition)

- Traditional knowledge (on silk weaves)

- It is more a cottage industry (Kanchipuram).

North  $\Rightarrow$  mainly Eri.

$\downarrow$  wild

- presence of forest area (high rainfall 100cm-200cm).

- Cheap labour from Jharkhand, Bihar.



## Significance

- Labour intensive (and more employment to women  $\rightarrow$  empowerment)

- Traditional industry

- Distributed throughout India  $\Rightarrow$  (removes regional disparity)

- Considerable foreign exchange earner by export to Indian diaspora.

## Problems

- Stiff competition from Bdesh & China (Sichuan, Yunnan).

- No marketing (brand value).

- ~~inadequate~~ inadequate tech.

- Stiff competition from synthetic silk.

- Reducing demand, as we begin to deviate from our rich cultural tradition.

11

Poultry

Egg                      Broiler chicken

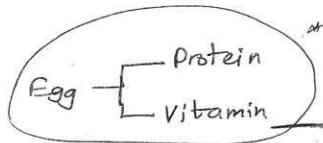
- Predominantly south India

TN (Nanakkal)

Karnataka

Andhra.

Northern region → no



Why TN, Andhra has good poultry?

- Dry climate preferable (Karnataka, Telangana)
- High Non-Veg population
- Evolution of contract farming → Suguna chicken.
- Export market through preserved egg exports / egg powder to counter Salmonella Typhi

### Apiculture

4 sp. → Apis

1) Honey  
nutrition  
preservative  
significance

2) Honey comb → wax  
medicinal value

3) Bees → Pollinator.  
increases yield

Nicotinoids  
Strong collapse disorder

- Throughout the yr.
- Employment generation  
shift planning → good demand. Not labour intensive ⇒ bees do most of the work
- Export → medicinal purposes of the work ⇒ less pd needed  
saves a lot of labour cost
- Mixed farming.
- Make farmer independent. frees up labour for other sectors.

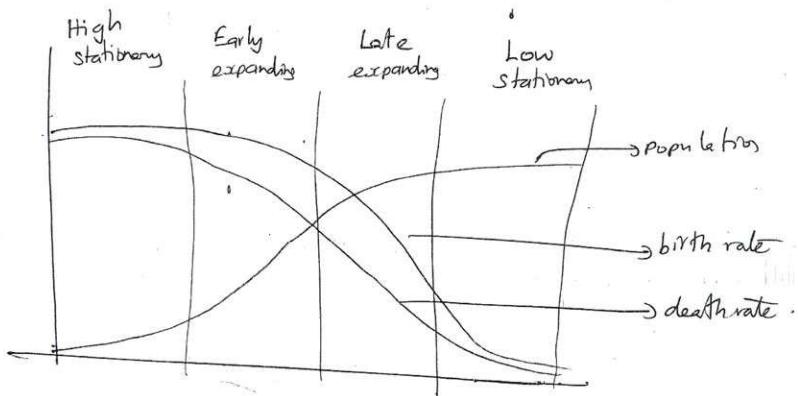
### Govt. measure

NATIONAL HORTICULTURE MISSION → to promote apiculture.

Collect some basic facts like export share much %, how much employment,

## Cultural Setting

### GROWTH & DISTRIBUTION OF POPULATION IN THE WORLD



Population  $\Rightarrow$  No. of ppl in a given area.

Population growth  $\rightarrow$  No. of increase in no. of ppl in a given area, between two points in time.

Factors of population growth

1. Birth Rate
  2. Death rate
  3. Migration
- INDIA  $\rightarrow$  Temporal Growth

till 1911  $\rightarrow$  High stationary

1911-21  $\rightarrow$  negative growth (watershed)

1921-71  $\rightarrow$  Early expanding

1971-2011  $\rightarrow$  Late expanding

after 2075 (expected)  $\rightarrow$  Low stationary (Population stabilisation)

## Early expand

- Abolition of epidemics.
- Death rate reduced → positive check (of Malthusian) is thus nullified.
- No awareness of contraceptives.
- Early marriage.
- Agri → need for family labour → more children.
- Religion (Hinduism) advocated many children (children are gifts of God).

## Late expand

- Awareness of family planning. (preventive check).
- Booming economy.
- Urbanisation → info. diffusion;
- Education.
- One child & 2-children families have become the norm of the society.
- work-centric men → no time for family; no time for social relations  
↳ self isolation (singleness)

## Spatial growth

1991-2001 ⇒ Growth rate ⇒ 21.1% (national average),  
2001-2011 ⇒ 17.1%

Low ⇒ Kerala (9.1%), TN (11.1%)

Late expanding ⇒ Andhra (14.1%), Karnataka (17.1%);

Early expanding ⇒ Maharashtra, Punjab, Gujarat, Haryana  
22.1%, 20.1%, 22.1%, 28.1%

High stationary - early expand ⇒ Nagaland (60%), Mizoram (20.1%),  
Meghalaya (35.1%), Sikkim (33.1%), Bihar (28.1%)

→ N.E. & tribal ⇒ high birth rate; (traditional)

↳ No education;  
high death rate (lack of health);

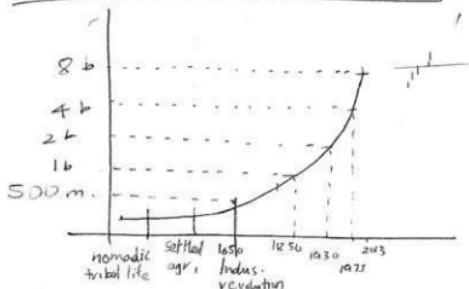
child marriage;

## Low (TN & Kerala)

- Health facilities.
- Long period of edu. → late marriage.
- Maturity & awareness among ppl.
- Individualism → desire to fragment property.
- Kerala → Christian missionary.

## Distribution of population

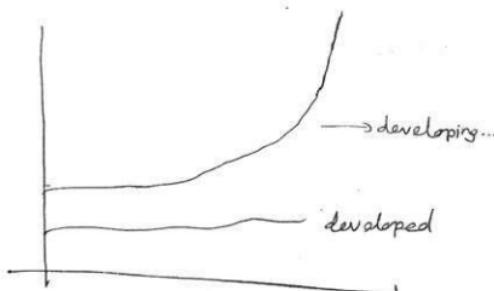
### Growth of World Population



Year	Population	
1650	500 m	
1850	1 b	} Doubling period = 200 yrs
1930	2 b	} Doubling period = 80 yrs
1975	4 b	} Doubling period = 45 yrs
2013 (expected)	8 b	Doubling period = 38 yrs

World → now, it is in the 'EARLY EXPANDING STAGE.'  
 ↓  
 World is likely to move into late expanding stage in a short while.

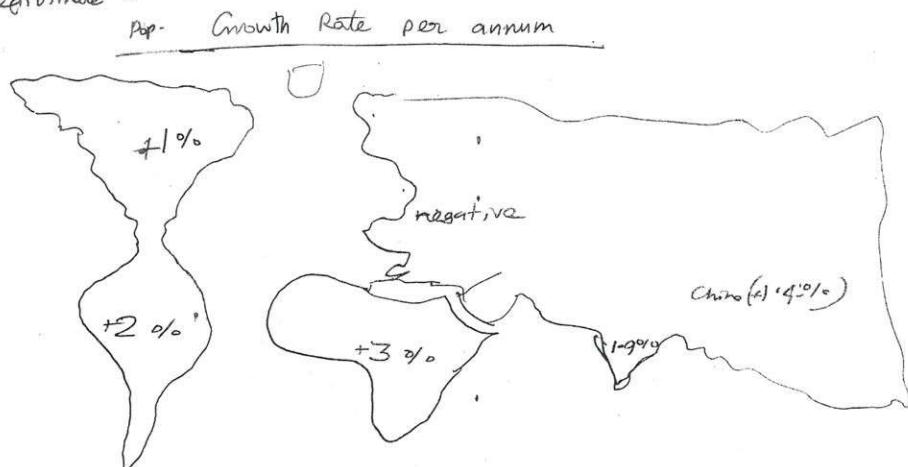
### Spatial growth



Why No 'J' curve in developed countries?

(145)

1. Penetration of health tech. was slow & gradual. This was accompanied by a corresponding maturing of the society - so, the perception towards birth control was also accepted as legitimate.



Europe → beyond 4<sup>th</sup> stage

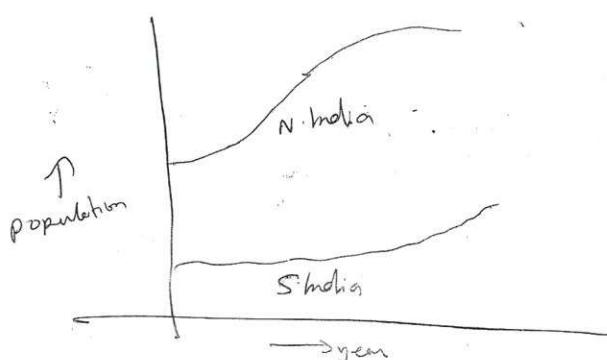
N. America → low stationary (4<sup>th</sup>)

China → late expanding (3<sup>rd</sup> stage)

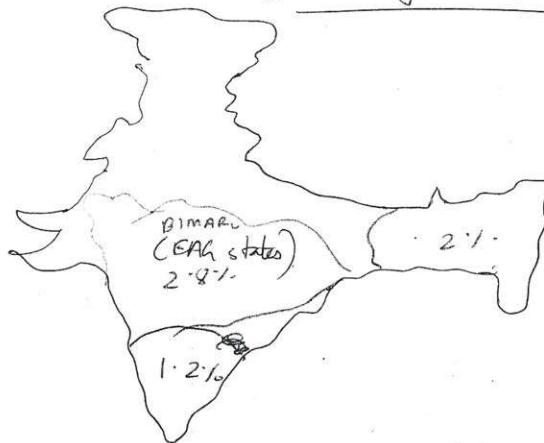
India, S. America → Early expanding (2<sup>nd</sup>)

Africa → High stationary (1<sup>st</sup> stage)

### INDIA



Spatial growth per annum



## DISTRIBUTION OF POPULATION

### factors

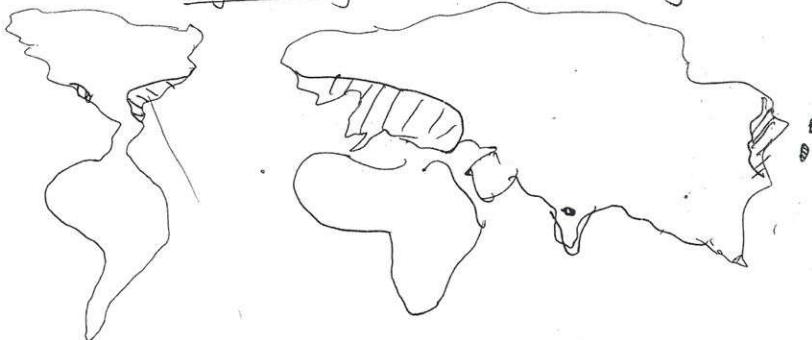
#### Geographic factors

1. Climate → desert / low snow / population.
2. Relief → mountain → low population.
3. Resources (agri.)  
↓  
for subsistence

#### Non-geographic factors

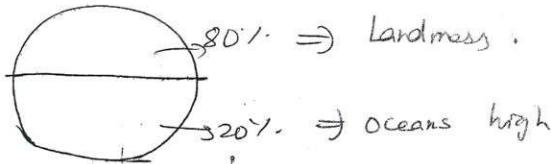
1. Industrialisation - employment
2. Education
3. Health呐
4. Political climate / stability.
5. Social unrest
6. Economy

### High density region

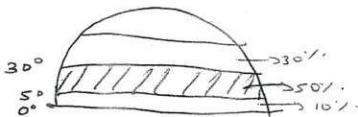


## Hemispherical

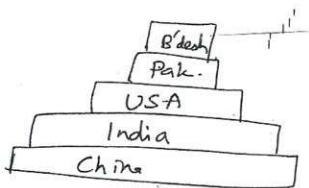
(147)



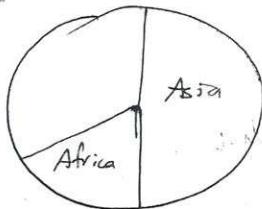
## Latitudinal



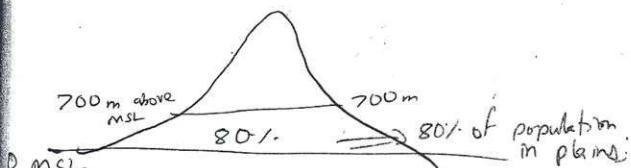
## Country



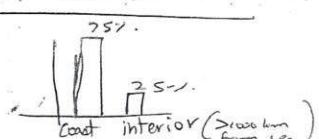
## Continental



## Altitude

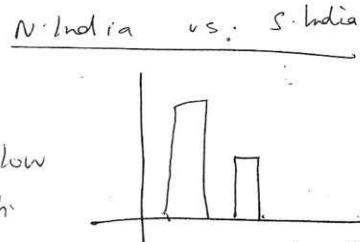
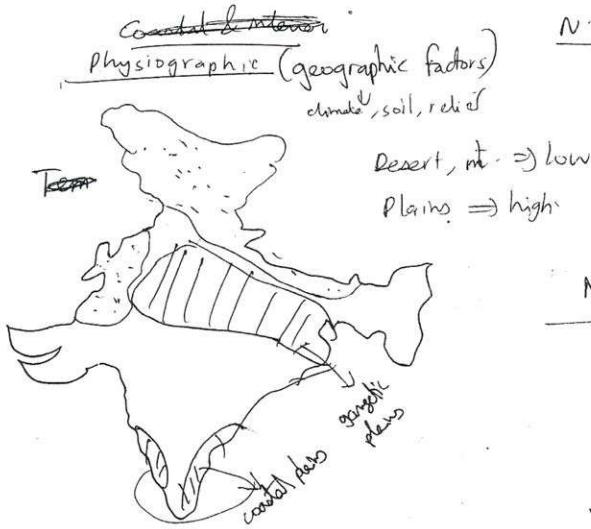
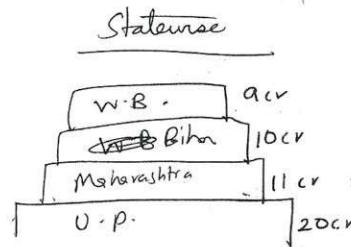
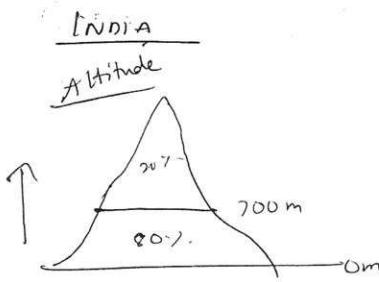


## Distr. of land & sea

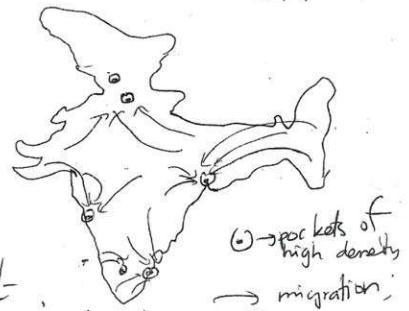


< 500 km of sea ⇒  $\frac{2}{3}$  of population

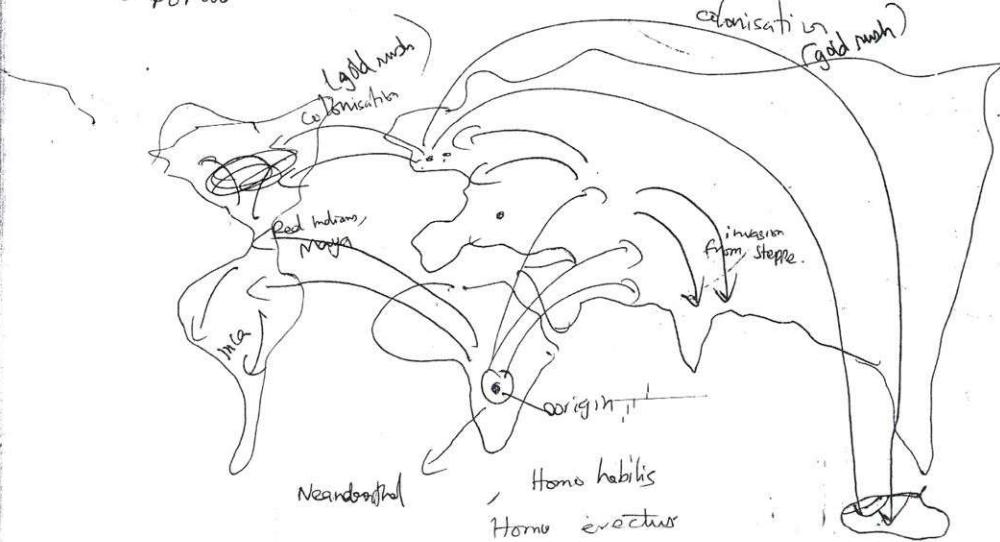
< 1000 km of sea ⇒  $\frac{3}{4}$  of population



Non-geographic factors (migration)  
employment, amenities

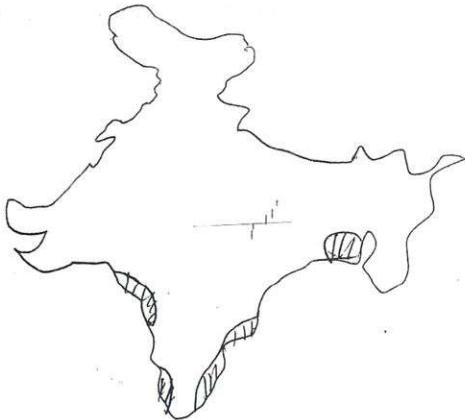


Temporal evolution of spatial dist.



~~Physical~~ ~~geographic regions~~ Coastal vs. interior

(145)



using

- Compare African population growth with S American pop. growth.
- Problems of population growth in Mali.
- Compare population growth & dist. in southern hemisphere countries.