
GEOGRAPHY

Economic and Human Geography

Water Resources

Natural Vegetation

Agriculture

Mineral and energy resources

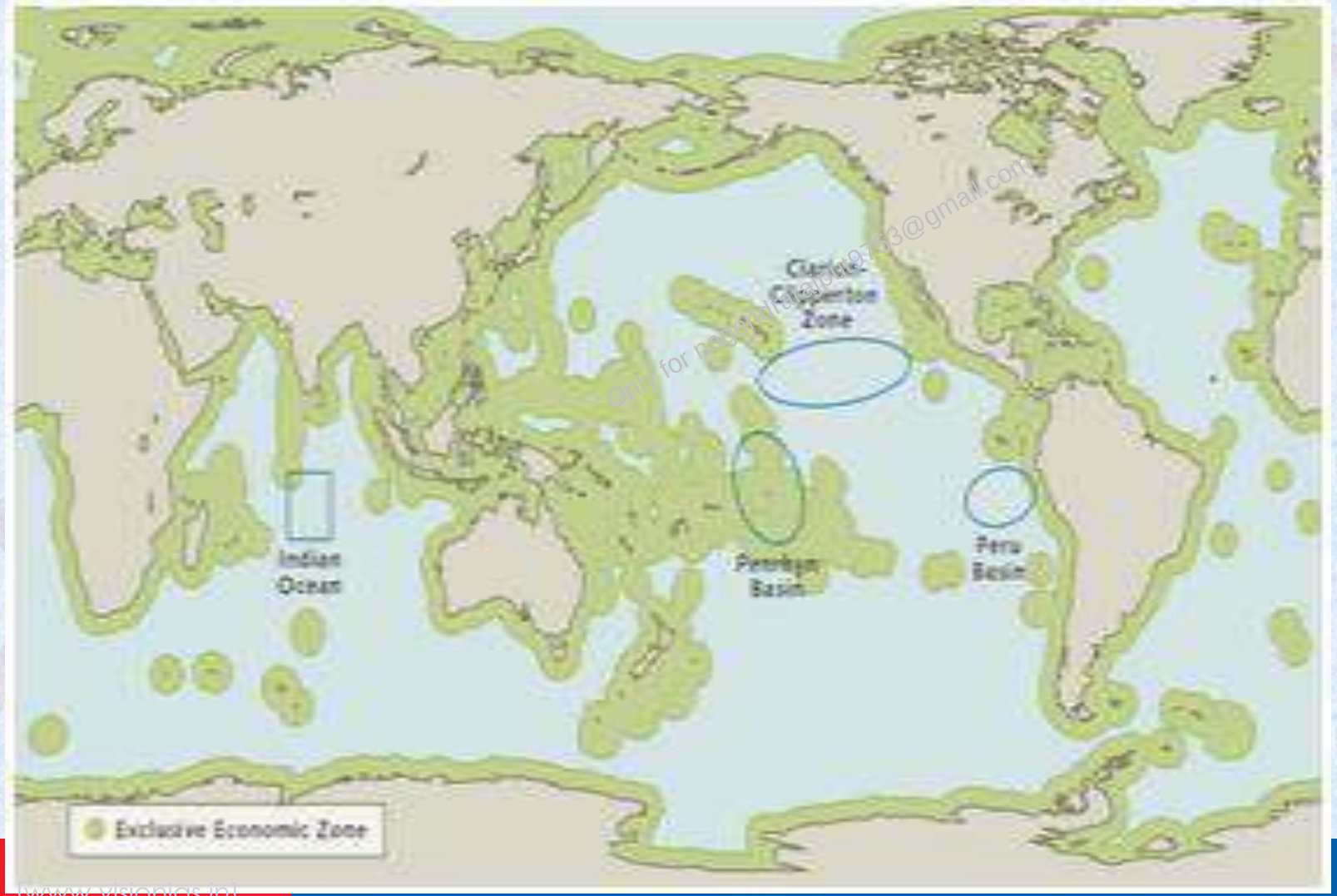
Industries & Transportation

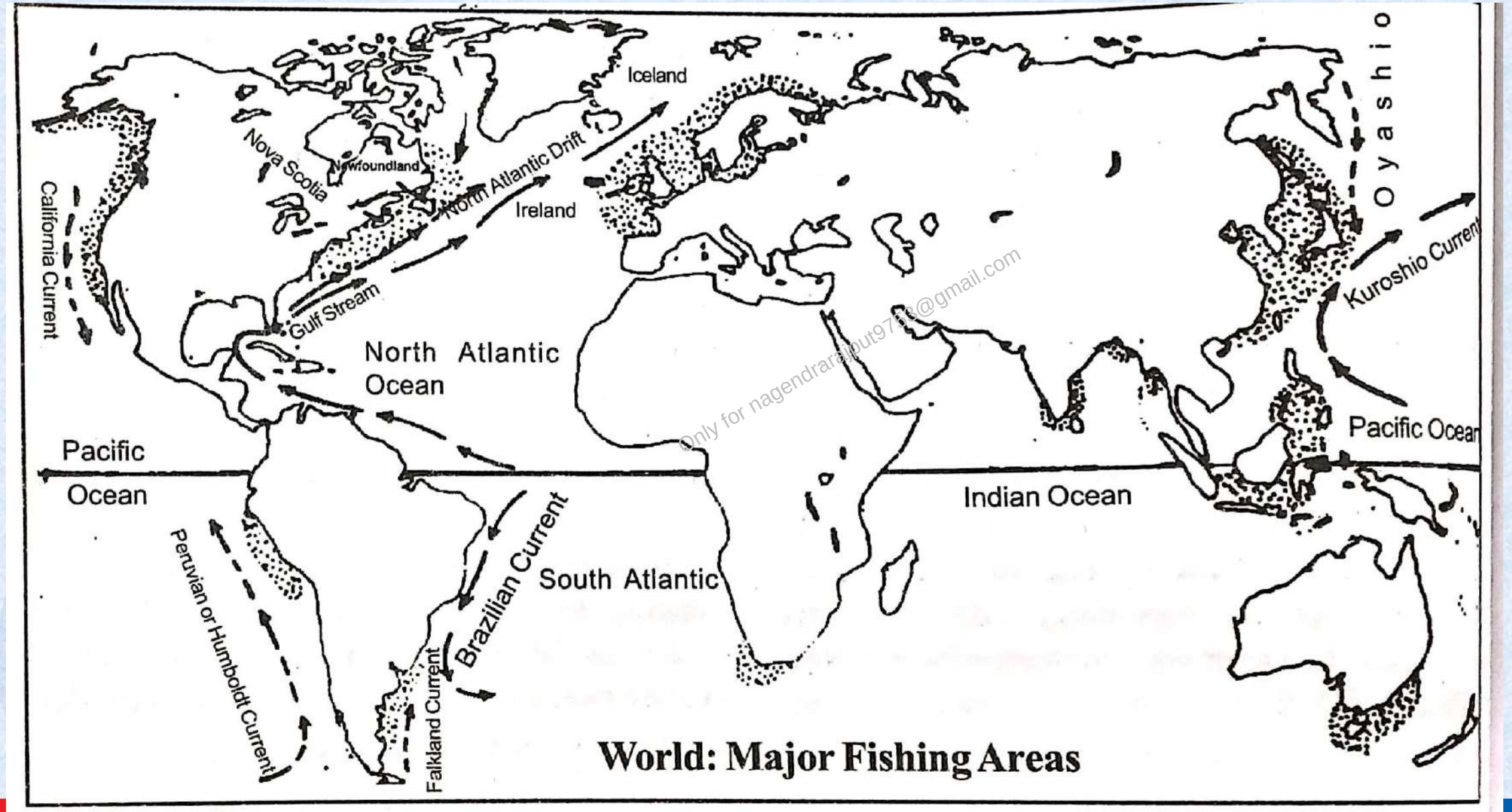
Human Geography

Syllabus

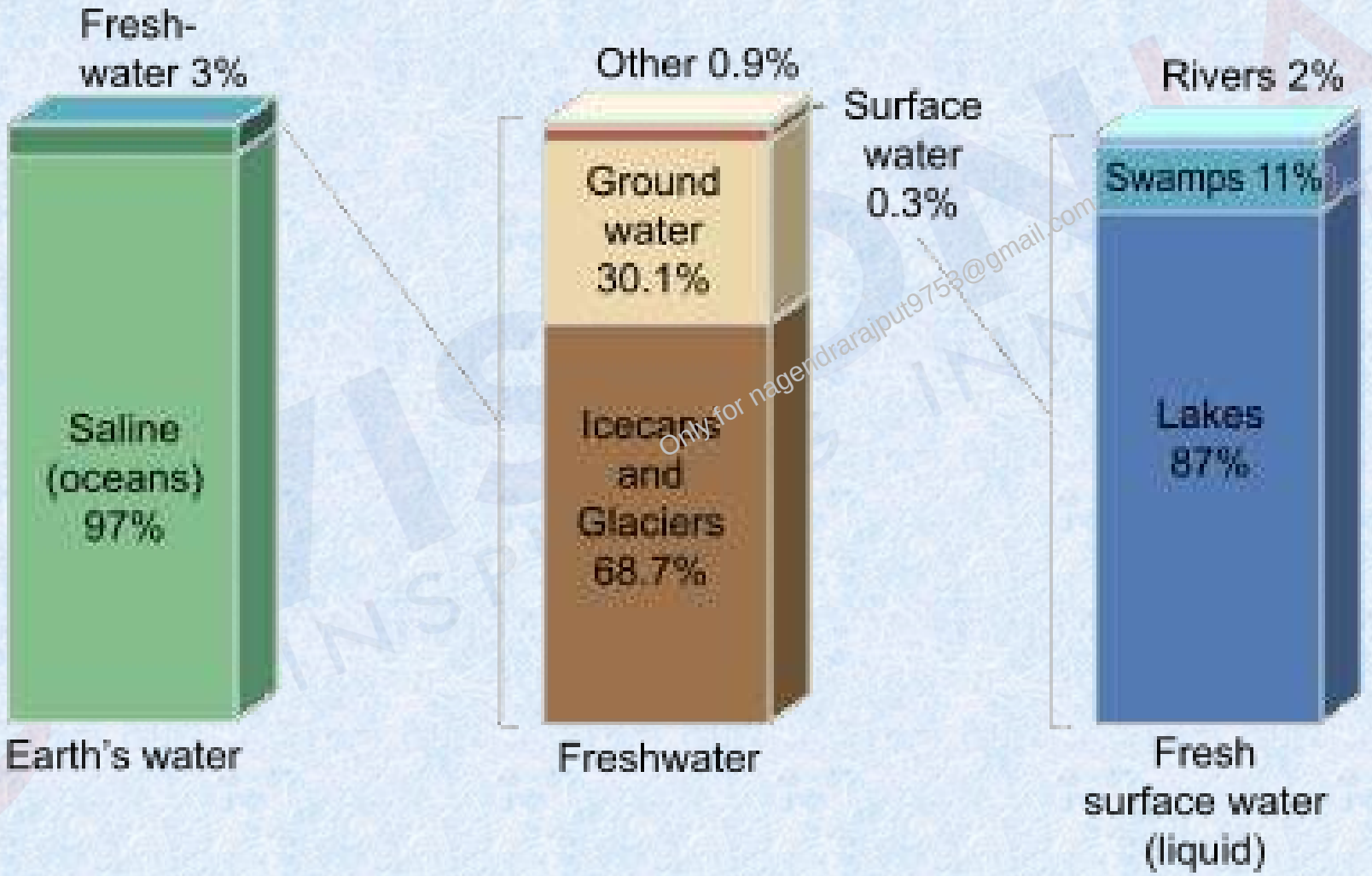
- Salient features of world's physical geography.
- Distribution of key natural resources across the world (including South Asia and the Indian sub-continent); factors responsible for the location of primary, secondary, and tertiary sector industries in various parts of the world (including India).
- Important Geophysical phenomena such as earthquakes, Tsunami, Volcanic activity, cyclone etc., geographical features and their location-changes in critical geographical features (including water-bodies and ice-caps) and in flora and fauna and the effects of such changes.

Manganese nodules





Distribution of Earth's Water



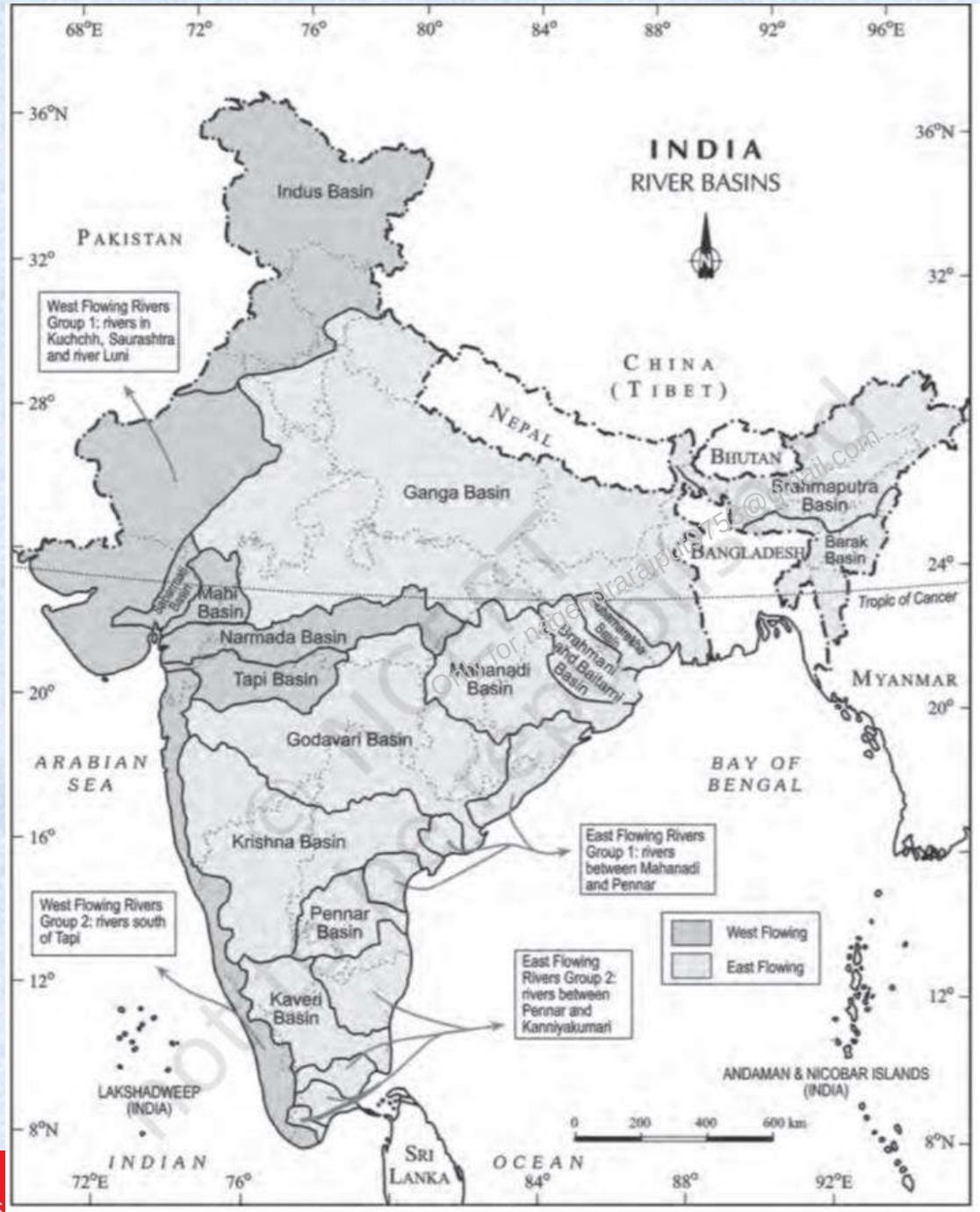
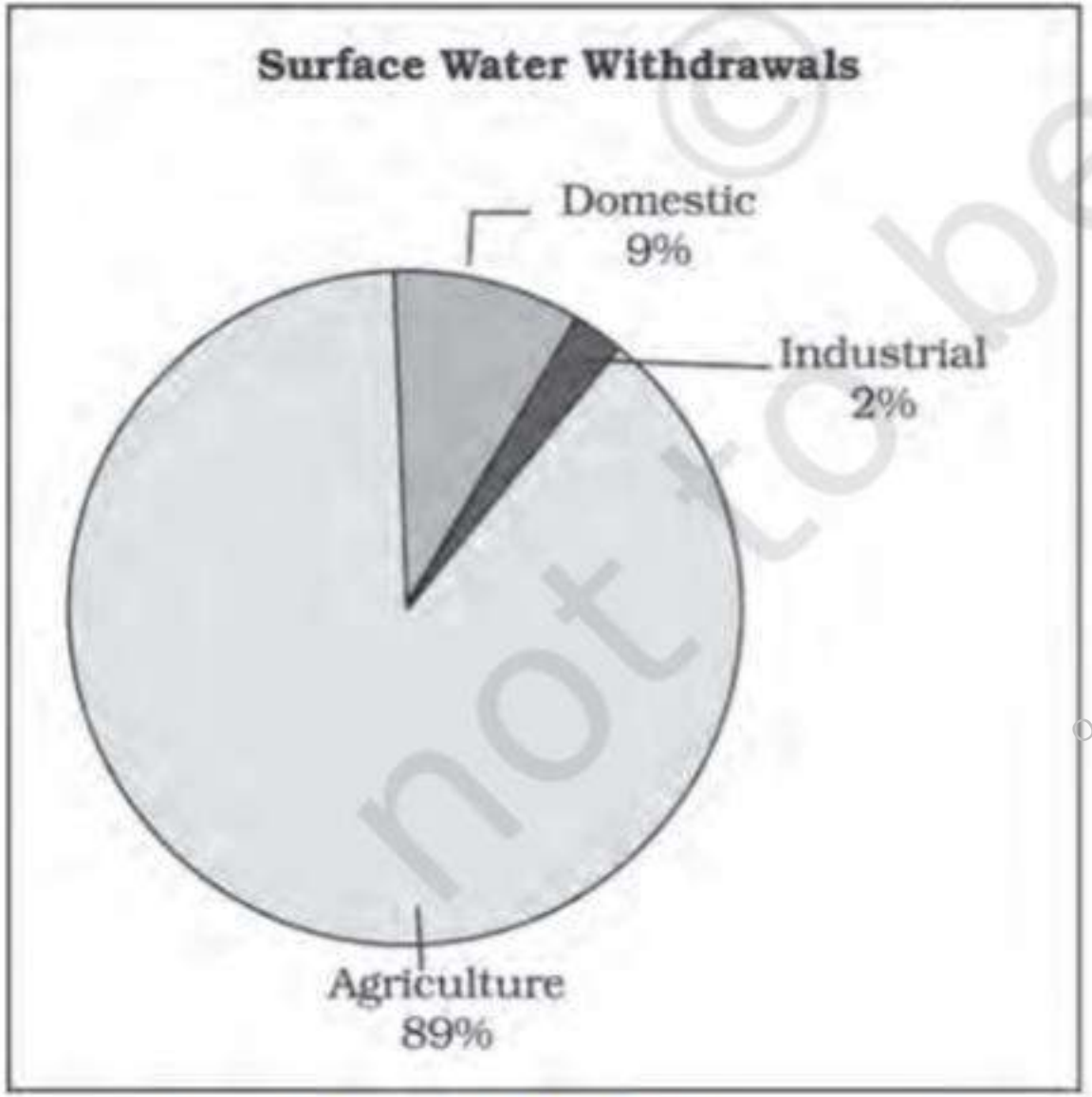
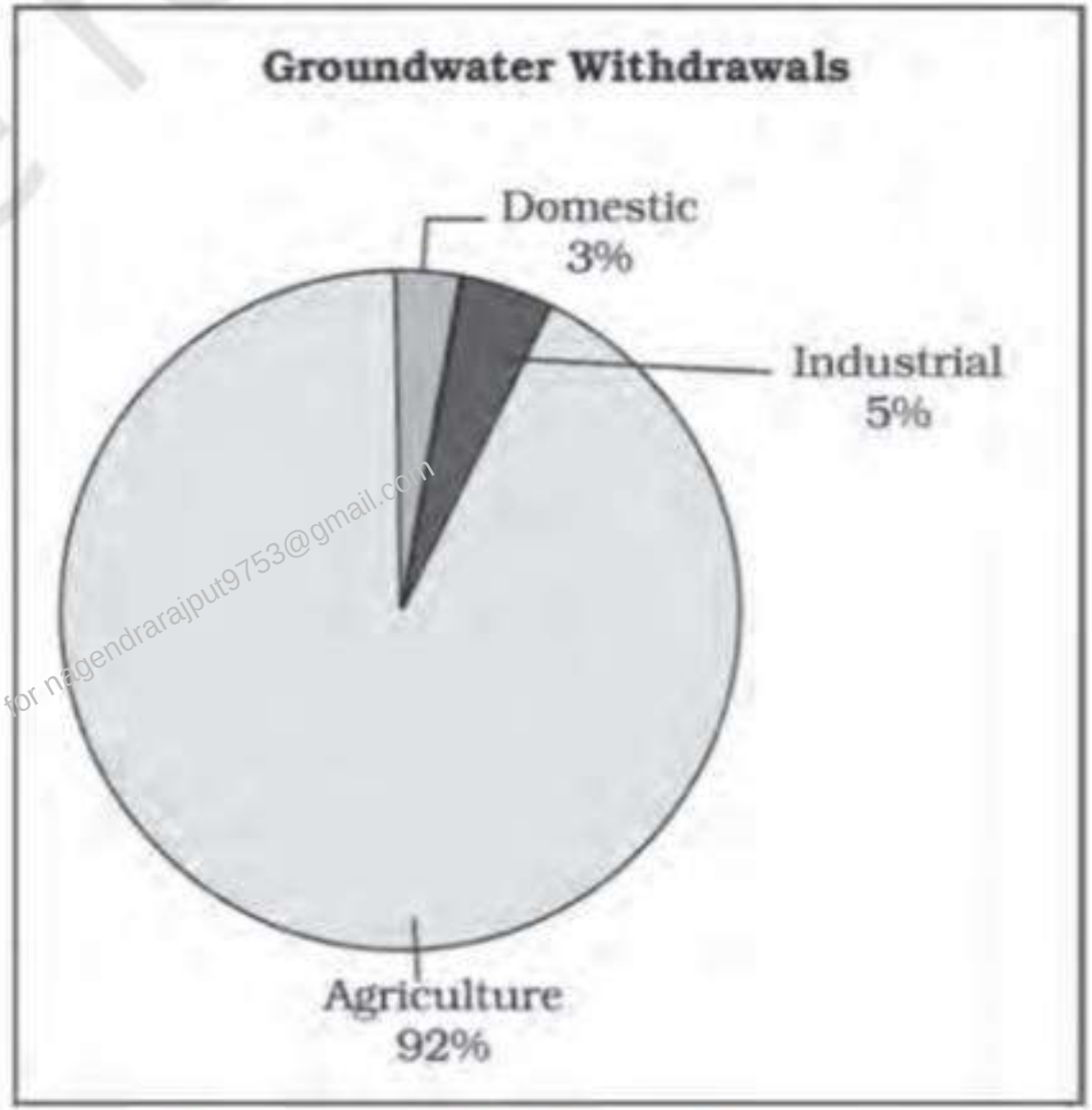


Fig. 6.1 : India – River Basins





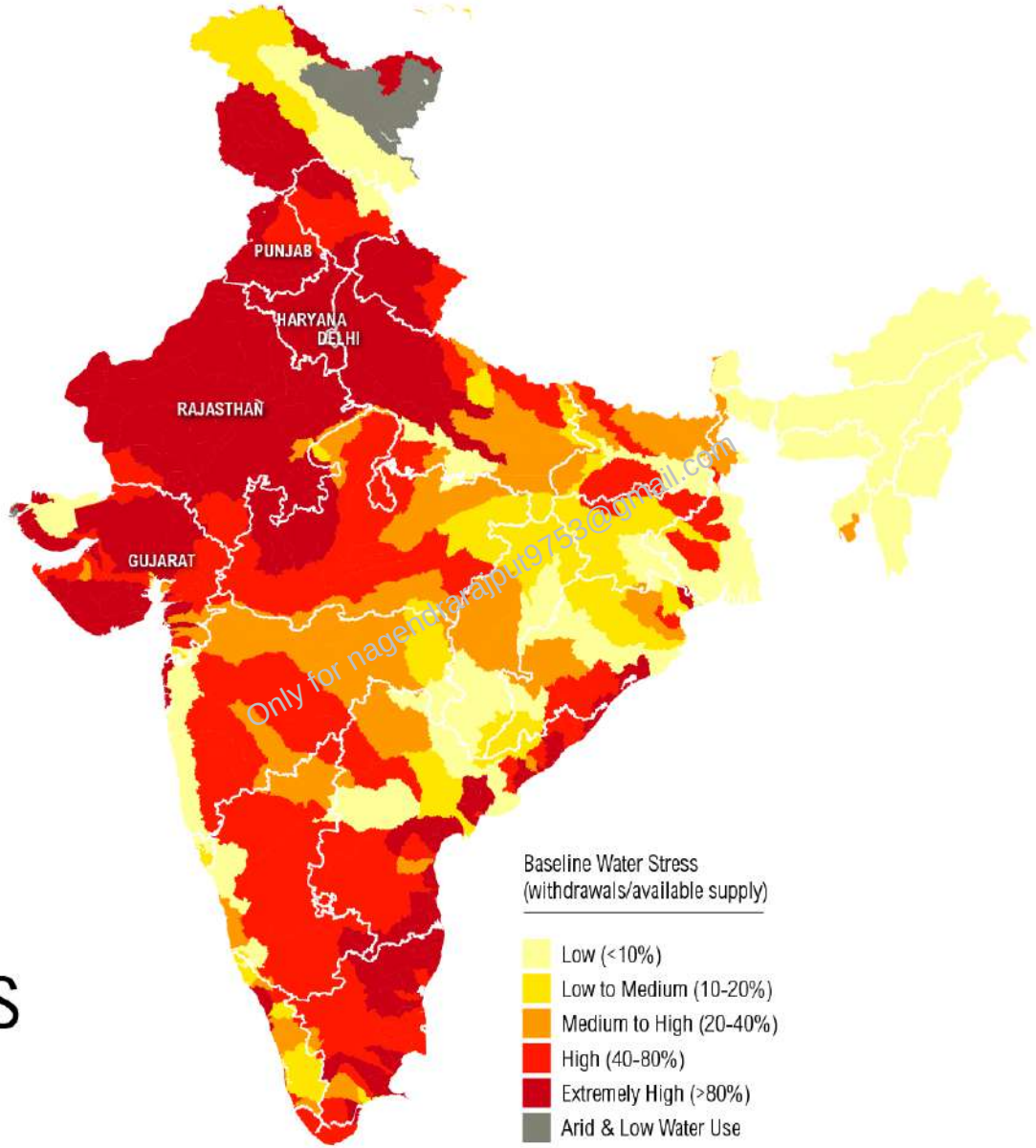
Source: Earth Trend 2001, World Resource Institute, as given in Govt. of India (2002) Report

Fig. 6.2 : Sectoral Usage of Surface Water

Fig. 6.3 : Sectoral Usage of Groundwater

54%

of India Faces **High** to **Extremely High** Water Stress



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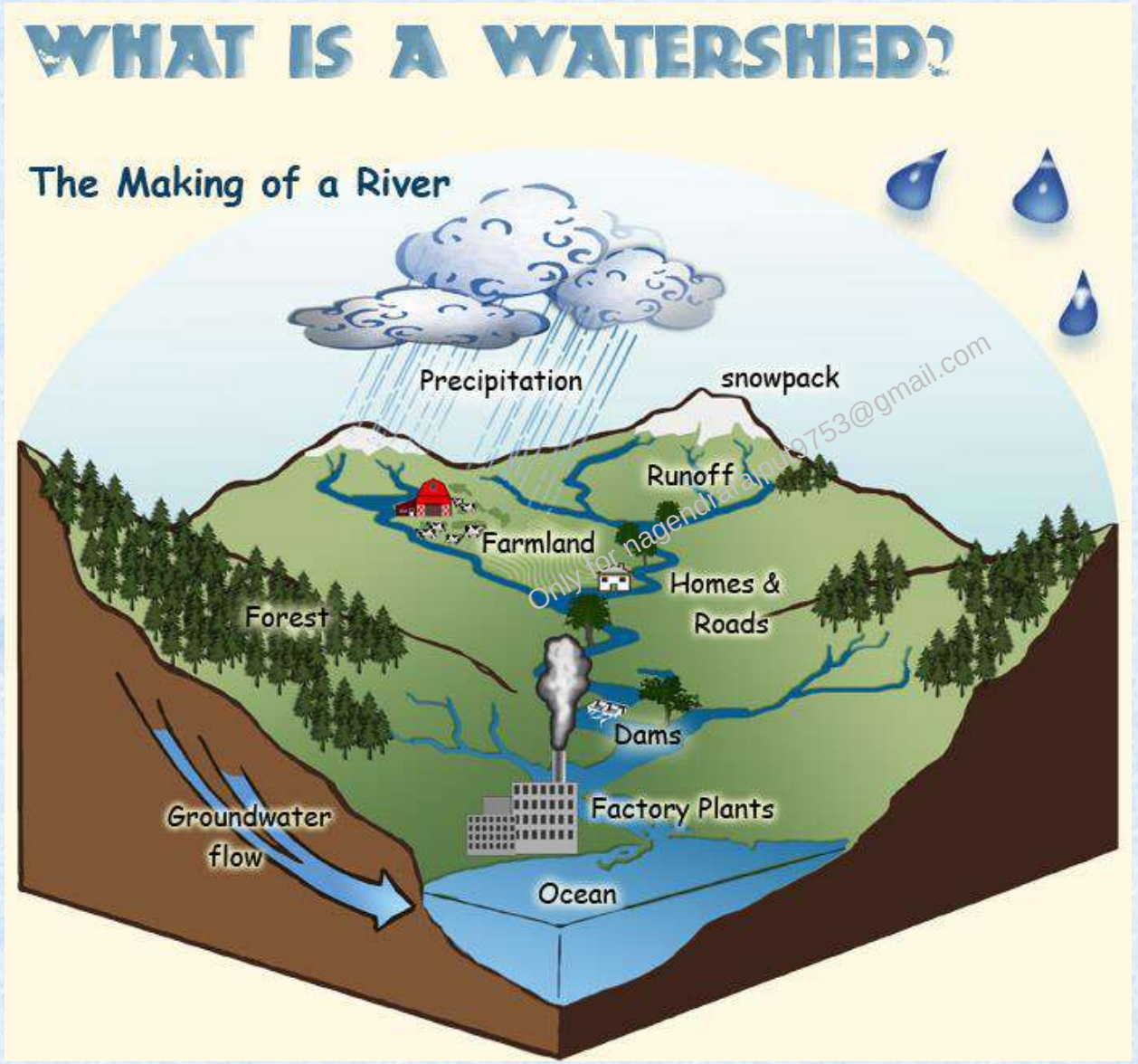
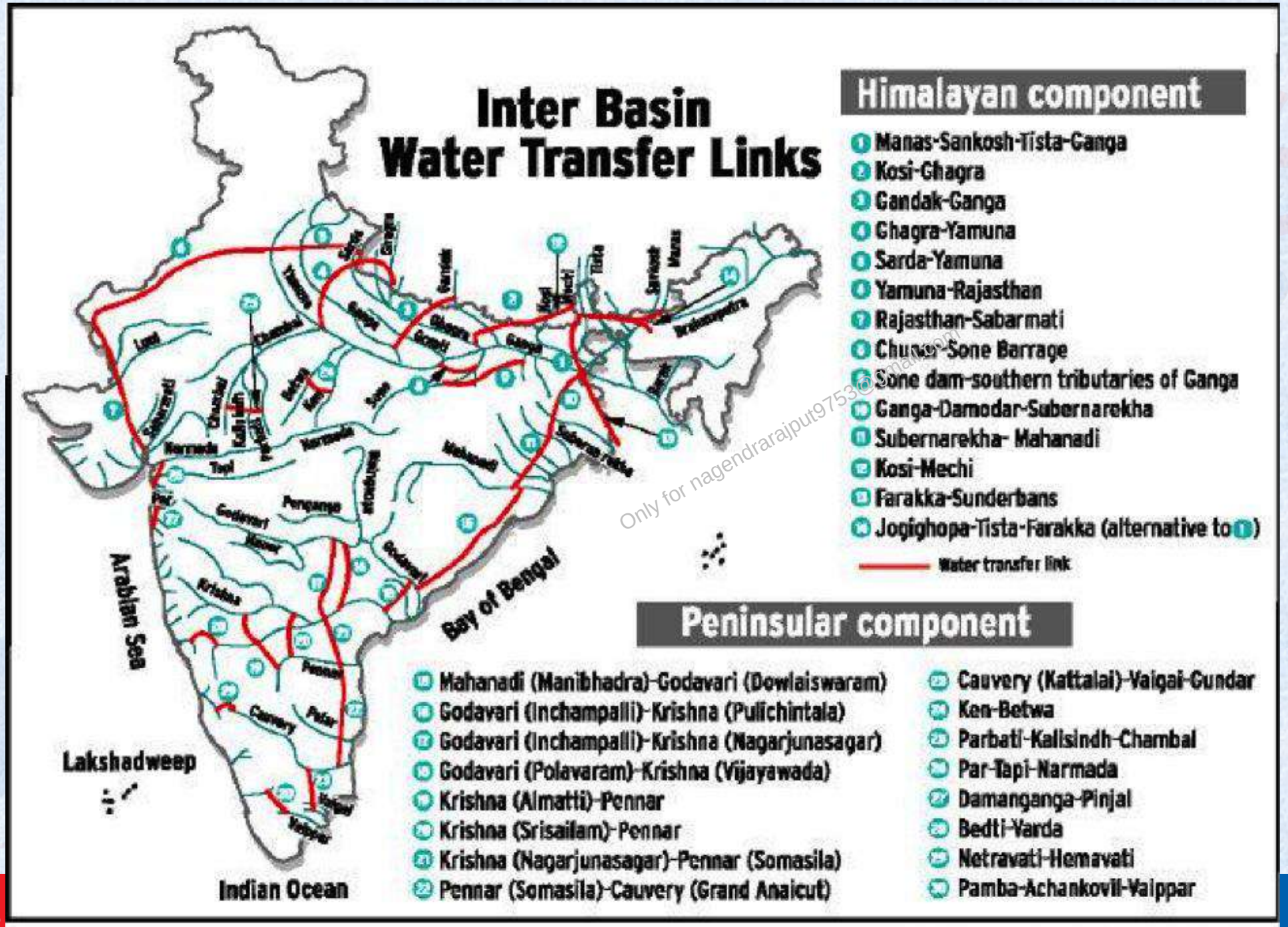
WORLD RESOURCES INSTITUTE

WHAT IS A WATERSHED?





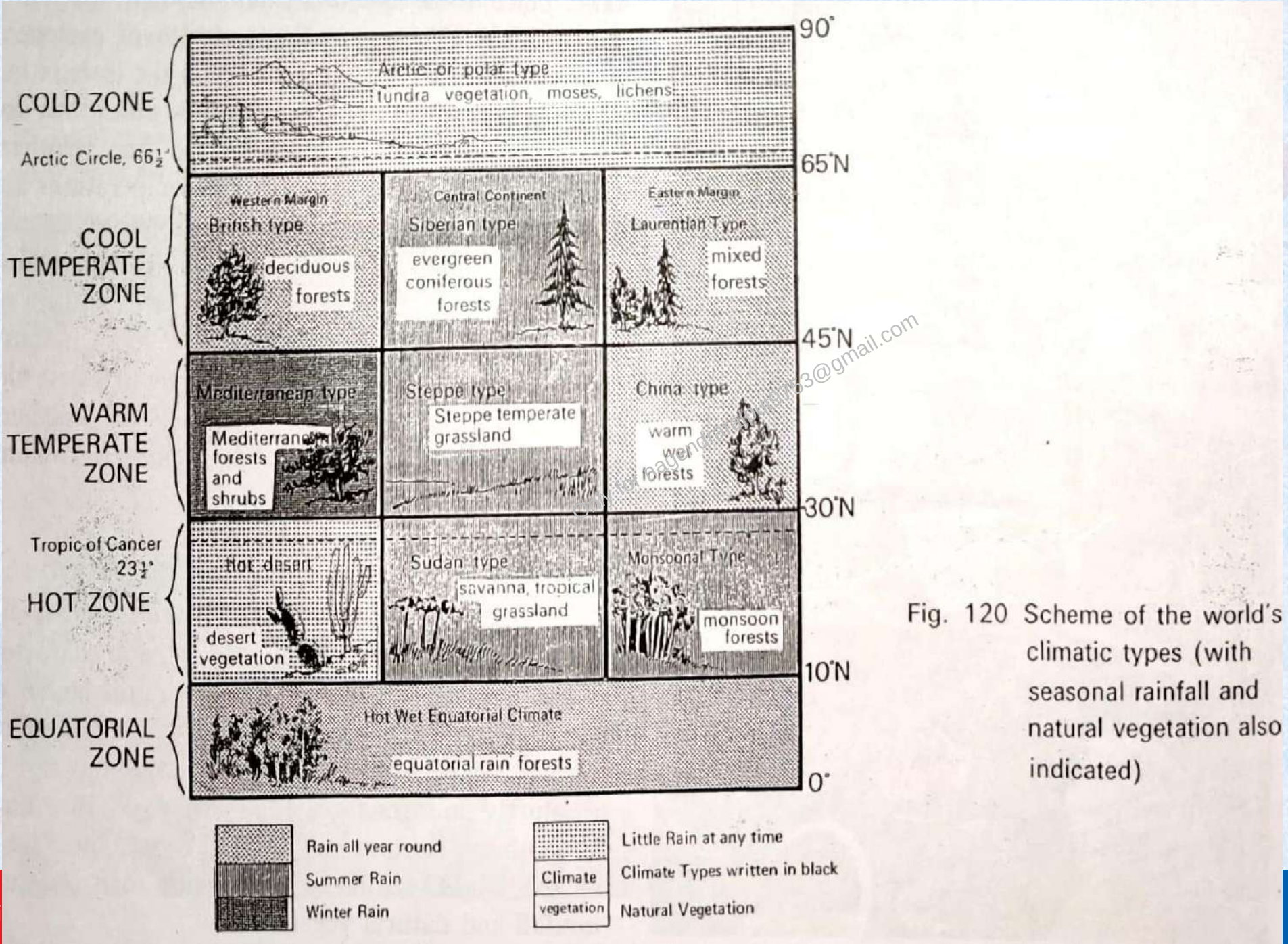
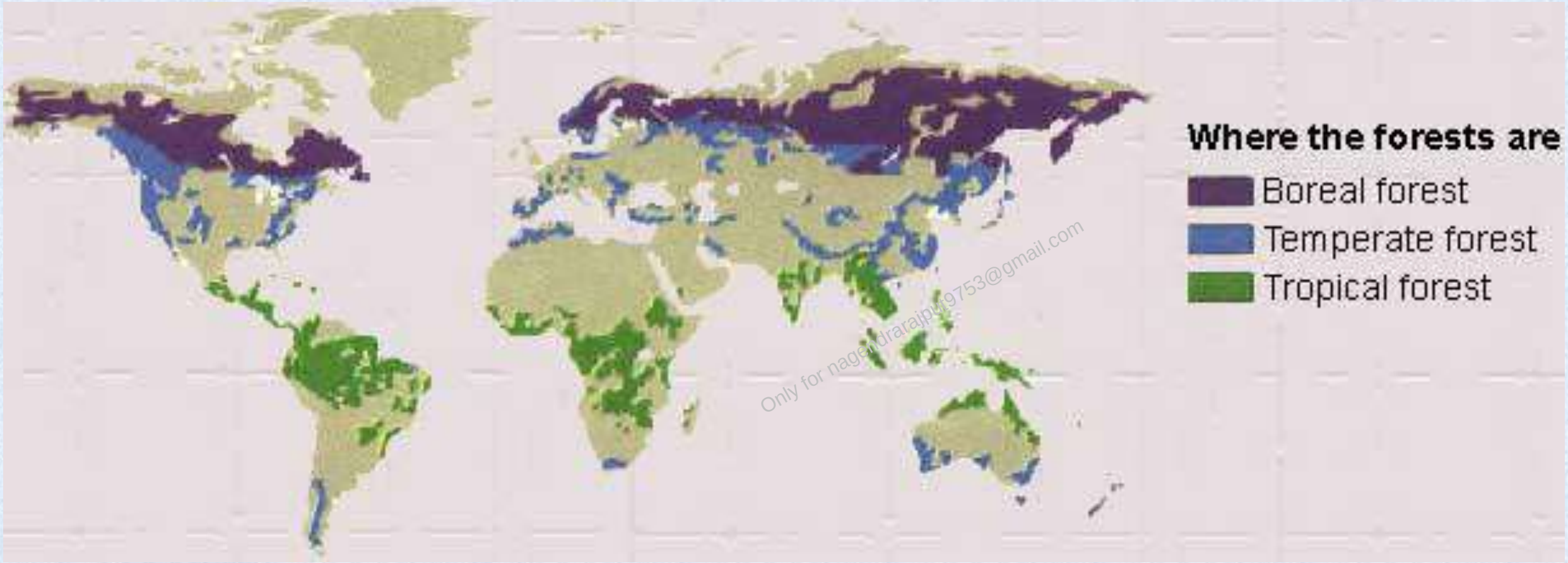


Fig. 120 Scheme of the world's climatic types (with seasonal rainfall and natural vegetation also indicated)

WORLD CLIMATIC TYPES

Climatic Zone	Latitude (approximate)	Climatic Type	Rainfall Regime (with approx. total)	Natural Vegetation
Equatorial Zone	0° – 10°N. and S.	1. Hot, wet equatorial	Rainfall all year round: 80 inches	Equatorial rain forests
Hot Zone	10°–30°N. and S.	2. (a) Tropical Monsoon	Heavy summer rain: 60 inches	Monsoon forests
		(b) Tropical Marine	Much summer rain: 70 inches	
		3. Sudan Type	Rain mainly in summer: 30 inches	Savanna (tropical grassland)
		4. Desert: (a) Saharan type (b) Mid-latitude type	Little rain : 5 inches	Desert vegetation and scrub
Warm Temperate Zone	30°–45°N. and S.	5. Western Margin (Mediterranean type)	Winter rain: 35 inches	Mediterranean forests and shrub
		6. Central Continental (Steppe type)	Light summer rain: 20 inches	Steppe or temperate grassland
		7. Eastern Margin: (a) China type (b) Gulf type (c) Natal type	Heavier summer rain: 45 inches	Warm, wet forests and bamboo
Cool Temperate Zone	45°–65°N. and S.	8. Western Margin (British type)	More rain in autumn and winter: 30 inches	Deciduous forests
		9. Central Continental (Siberian type)	Light summer rain: 25 inches	Evergreen coniferous forests
		10. Eastern Margin (Laurentian type)	Moderate summer rain: 40 inches	Mixed forests (coniferous and deciduous)
Cold Zone	65°–90°N. and S.	11. Arctic or Polar	Very light summer rain: 10 inches	Tundra, mosses, lichens
Alpine Zone		12. Mountain climate	Heavy rainfall (variable)	Alpine pastures, conifers, fern, snow.



Natural Vegetation of India

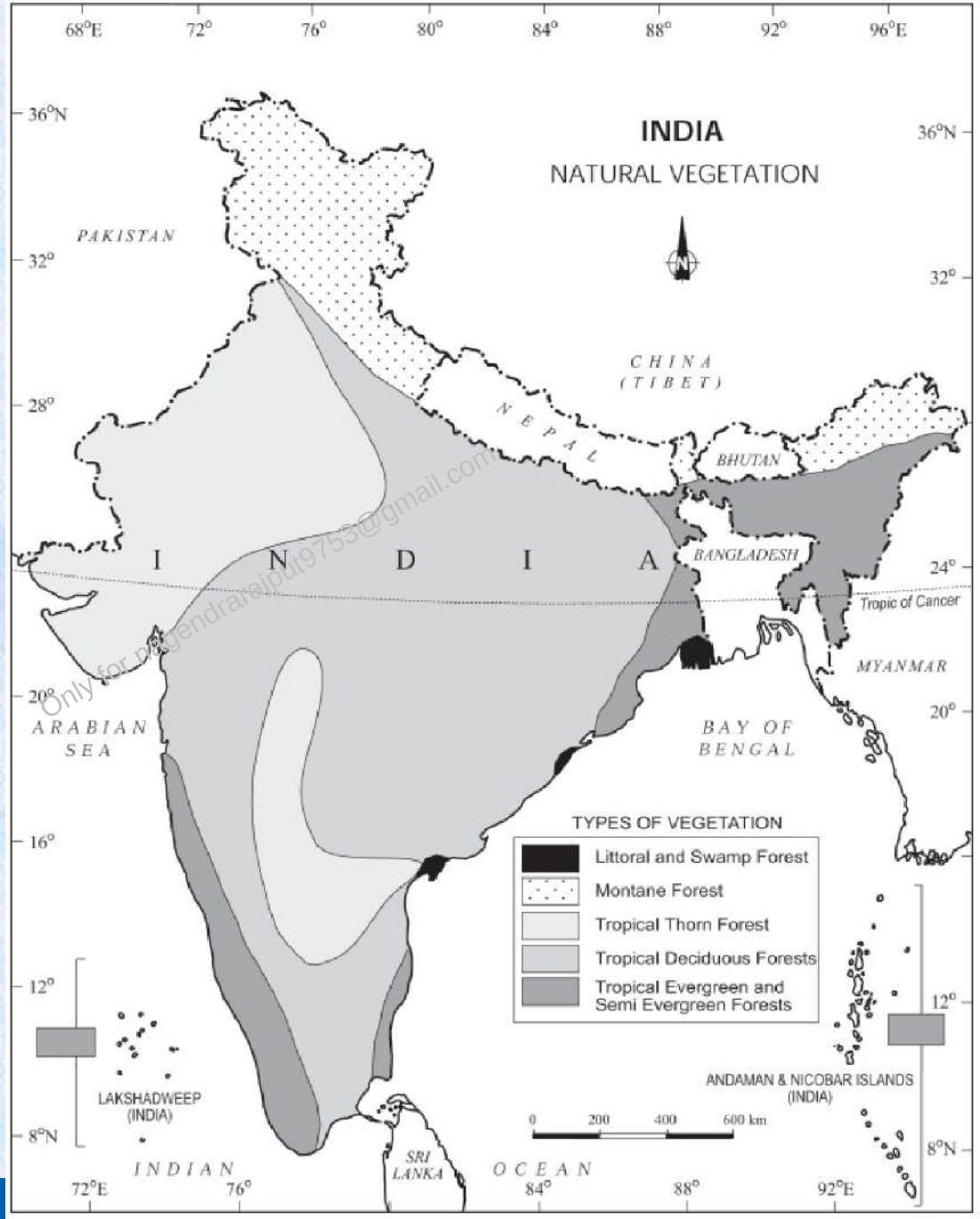
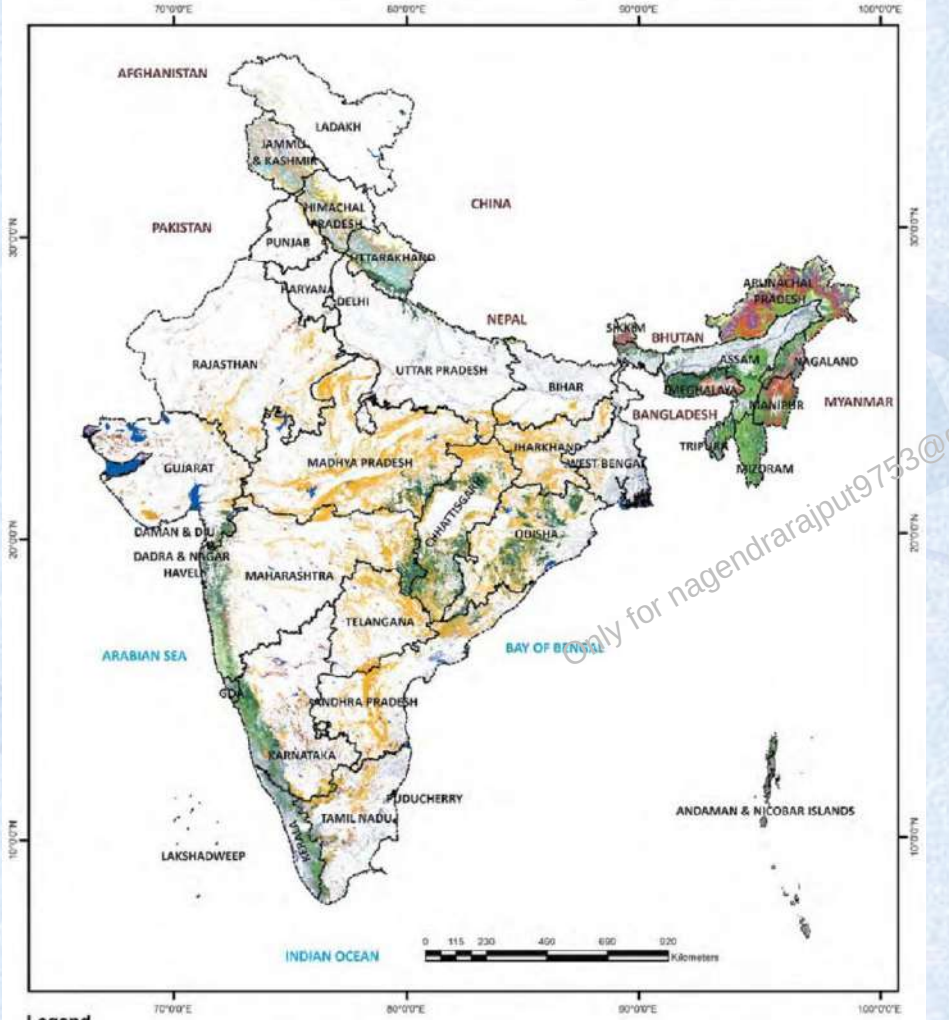


Figure 5.2 : Natural Vegetation

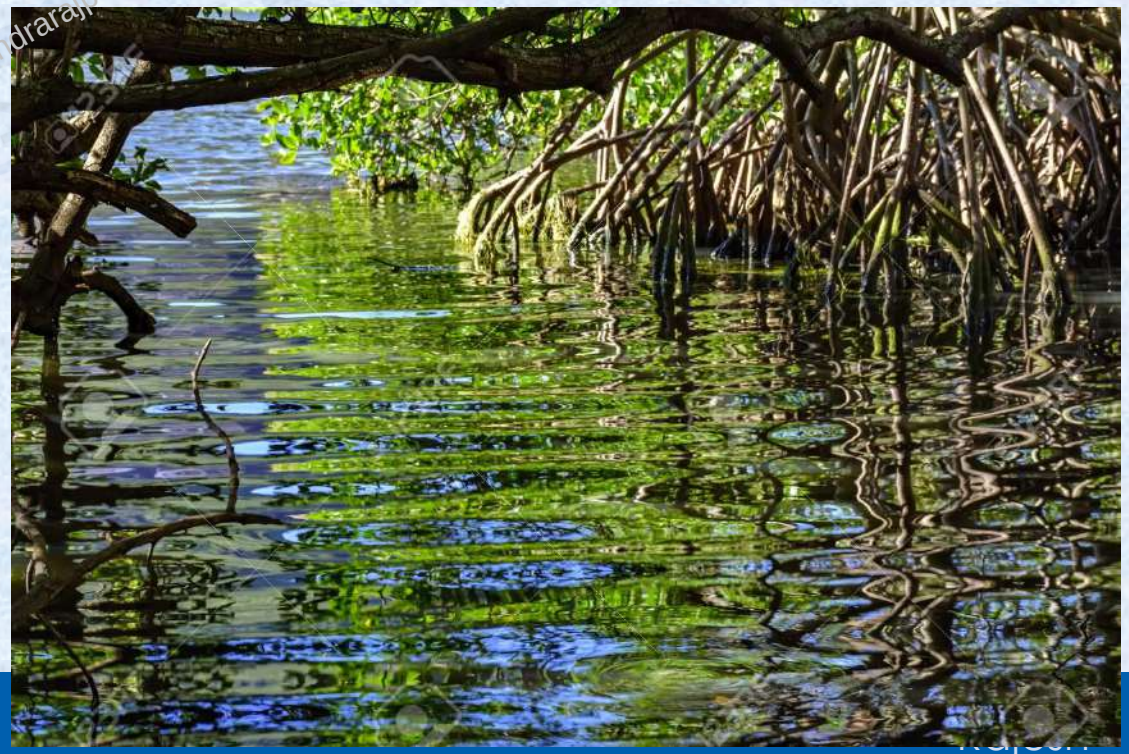
FOREST TYPE MAPPING - 2019

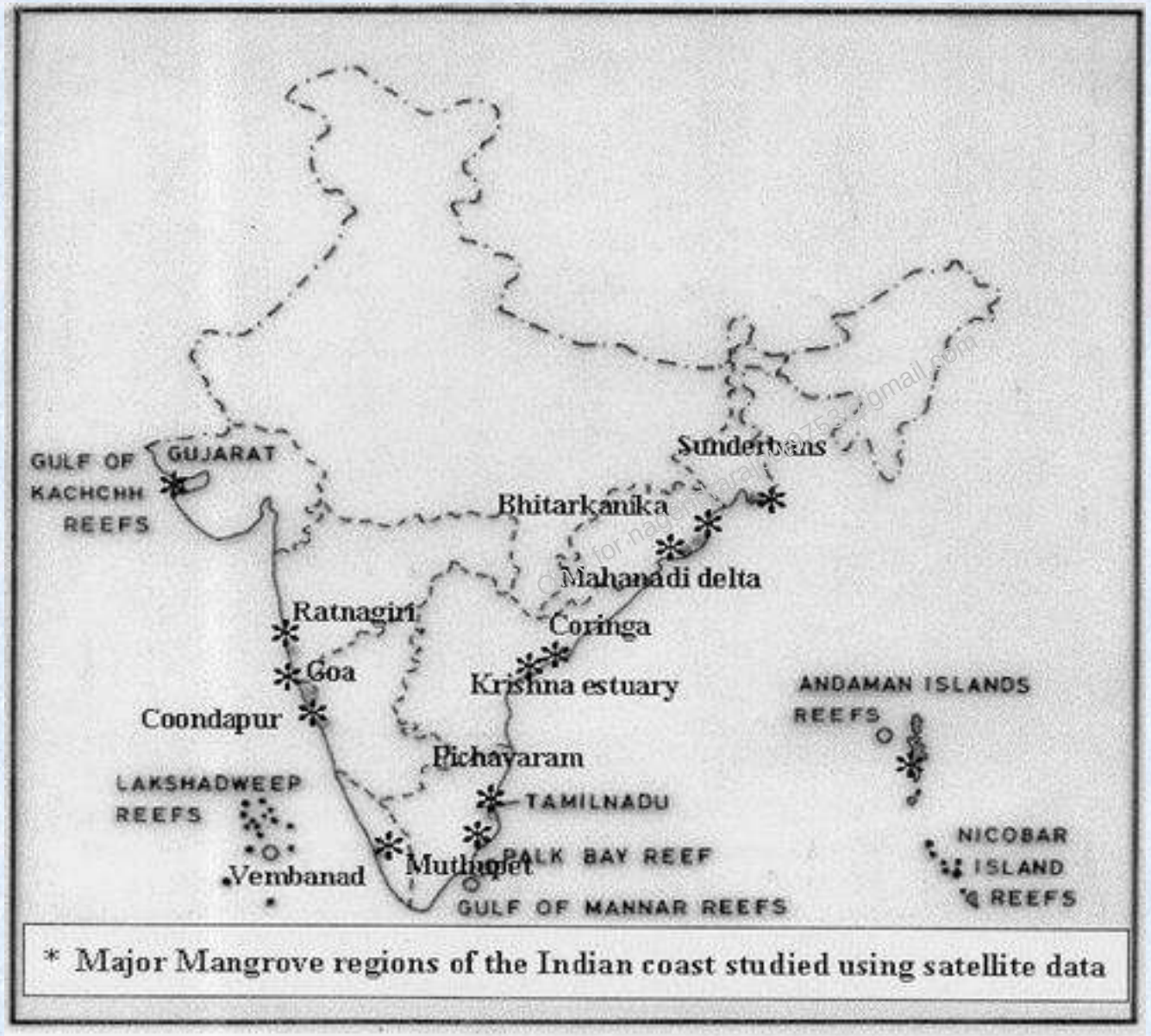
(Showing Type Groups as per Champion & Seth's Classification,1968)



Legend

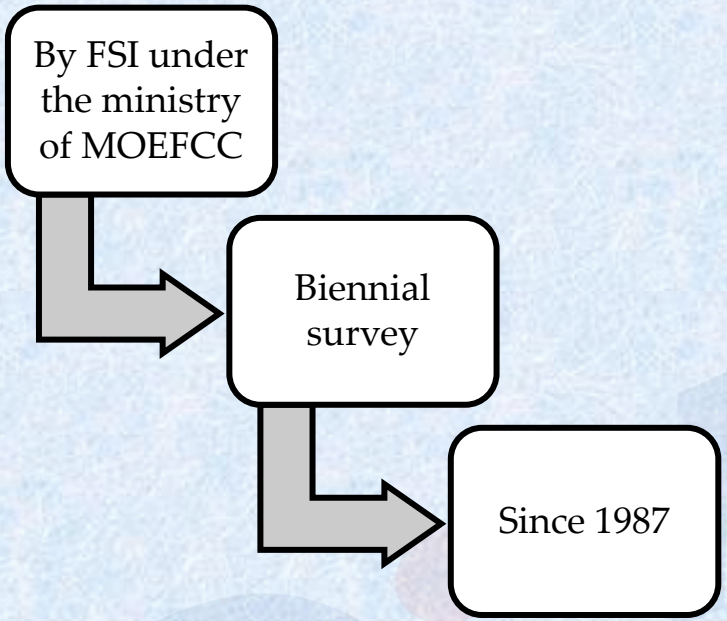
Group 1- Tropical Wet Evergreen Forests	Group 8- Subtropical Broadleaved Hill Forests	Group 15- Moist Alpine Scrub
Group 2- Tropical Semi-Evergreen Forests	Group 9- Subtropical Pine Forests	Group 16- Dry Alpine Scrub
Group 3- Tropical Moist Deciduous Forests	Group 10- Subtropical Dry Evergreen Forests	TOF/Plantation
Group 4- Littoral and Swamp Forests	Group 11- Montane Wet Temperate Forests	Water
Group 5- Tropical Dry Deciduous Forests	Group 12- Himalayan Moist Temperate Forests	Non Forest
Group 6- Tropical Thorn Forests	Group 13- Himalayan Dry Temperate Forests	
Group 7- Tropical Dry Evergreen Forests	Group 14- Sub Alpine Forests	





* Major Mangrove regions of the Indian coast studied using satellite data

INDIA STATE OF FORESTS REPORT 2021



Forest Cover

- All lands more than one hectare in area, with a tree canopy density of more than 10%

Recorded Forest Area (RFA)

- Recorded as 'Forests' in government records.

Tree Cover

- Outside recorded forest areas exclusive of forest cover and less than the minimum mappable area of one hectare.

Carbon Stock

Table 2.2 Forest cover classified in terms of canopy density classes

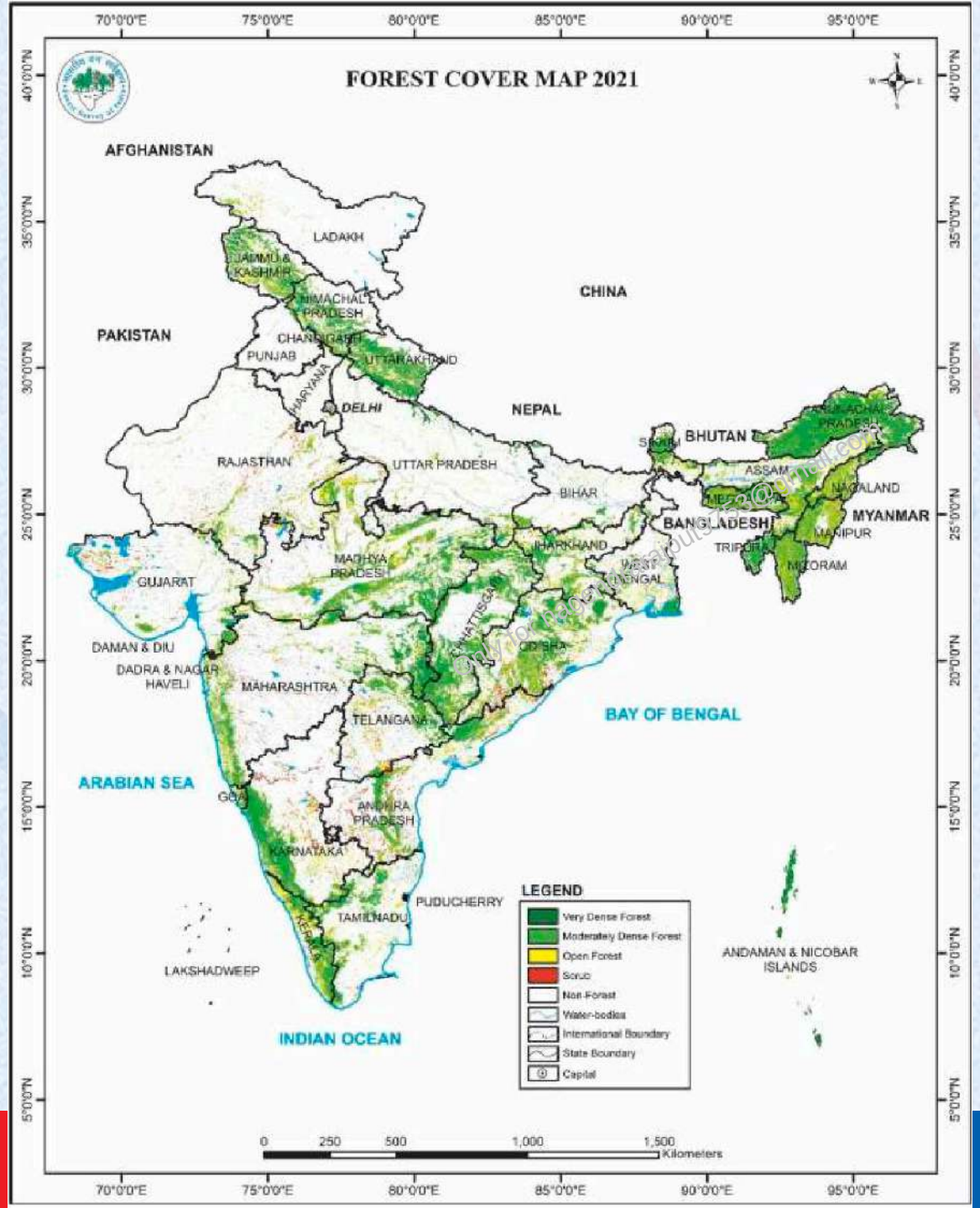
Class	Description
Very Dense Forest	All lands with tree canopy density of 70 percent and above.
Moderately Dense Forest than 70 percent.	All lands with tree canopy density of 40 percent and more but less
Open Forest than 40 percent.	All lands with tree canopy density of 10 percent and more but less
Scrub	Degraded forest lands with canopy density less than 10 percent.
Non-forest	Lands not included in any of the above classes. (includes water)

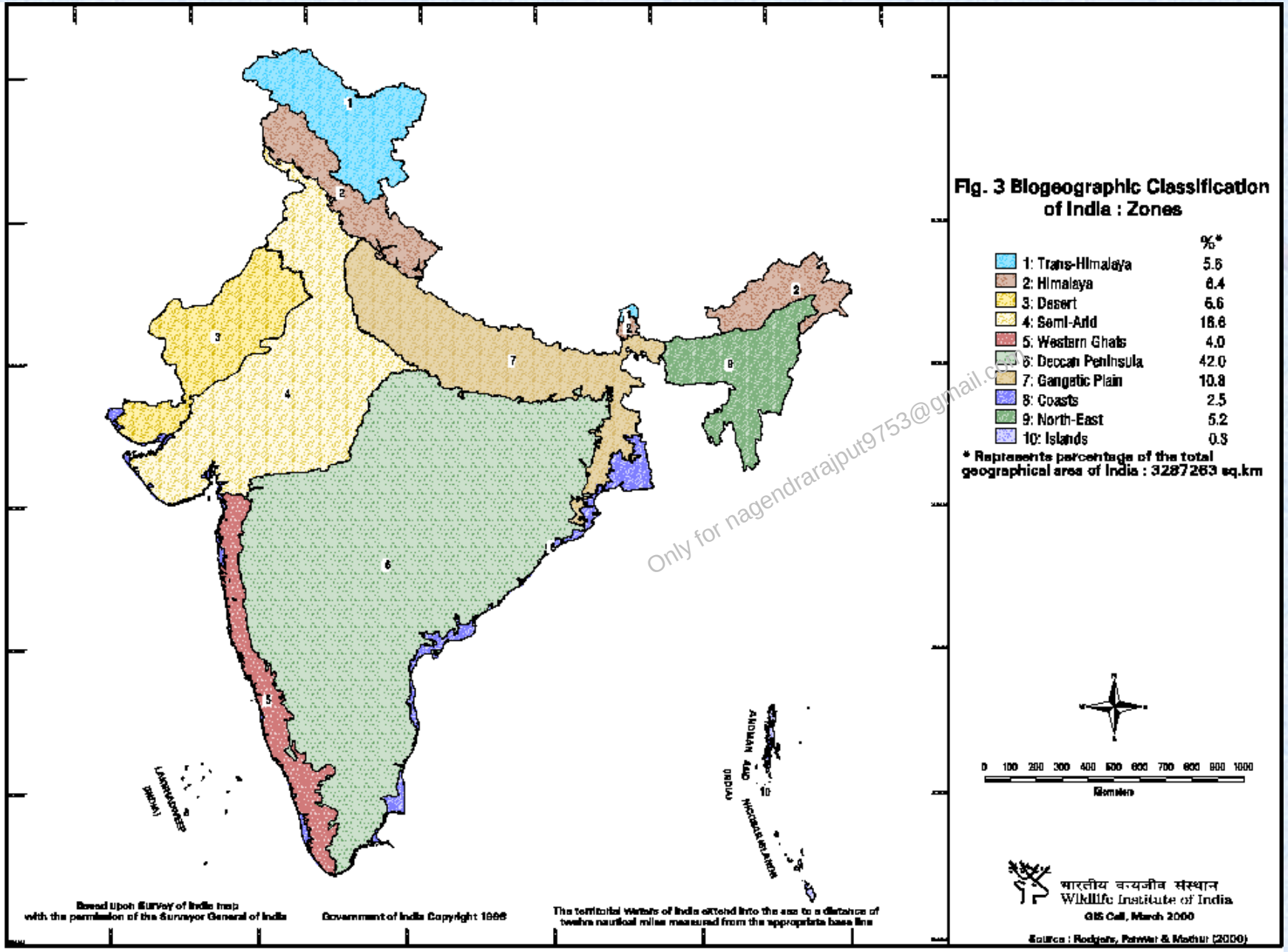
Very Dense Forest

Moderately Dense Forest

Open Forest

Scrub


FOREST COVER MAP 2021
AFGHANISTAN
PAKISTAN
CHINA
NEPAL
BHUTAN
BANGLADESH
MYANMAR
LADAKH
JAMMU & KASHMIR
HIMACHAL PRADESH
CHANDIGARH
PUNJAB
UTTARAKHAND
HARYANA
DELHI
RAJASTHAN
UTTAR PRADESH
BIHAR
SIKKIM
ARUNACHAL PRADESH
ASSAM
NAGALAND
MANIPUR
TRIPURA
MIZORAM
JHARKHAND
WEST BENGAL
MADHYA PRADESH
GUJARAT
CHHATTISGARH
ODISHA
DAMAN & DIU
DADRA & NAGAR HAVELI
MAHARASHTRA
TELANGANA
BAY OF BENGAL
ARABIAN SEA
GOA
ANDHRA PRADESH
KARNATAKA
PUDUCHERRY
TAMILNADU
KERALA
LAKSHADWEEP
ANDAMAN & NICOBAR ISLANDS
INDIAN OCEAN
LEGEND
Very Dense Forest
Moderately Dense Forest
Open Forest
Scrub
Non-Forest
Water-bodies
International Boundary
State Boundary
Capital
0 250 500 1,000 1,500
Kilometers
70°0'0"E
75°0'0"E
80°0'0"E
85°0'0"E
90°0'0"E
95°0'0"E
40°0'0"N
35°0'0"N
30°0'0"N
25°0'0"N
20°0'0"N
15°0'0"N
10°0'0"N
5°0'0"N



World Agriculture Regions

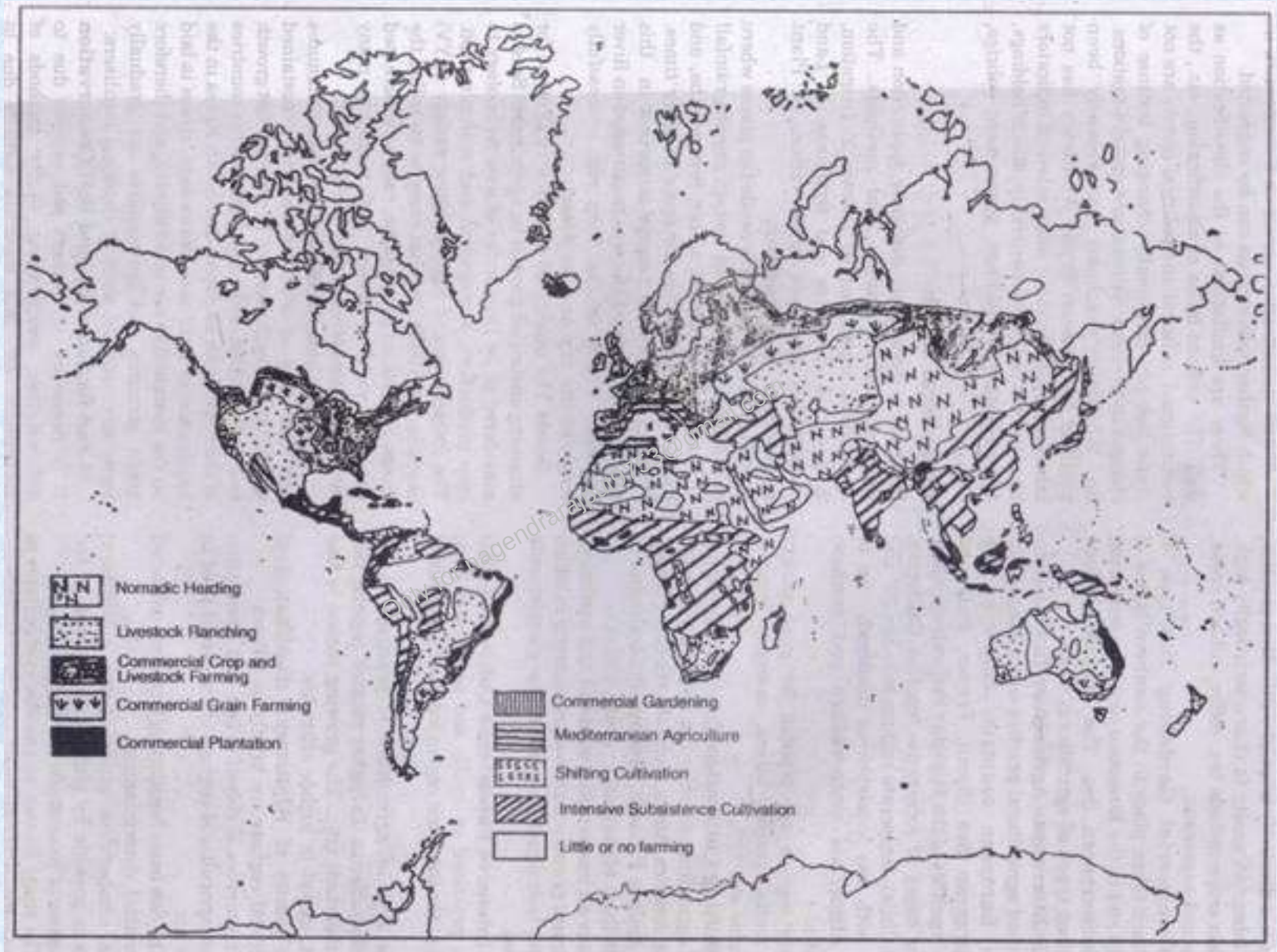
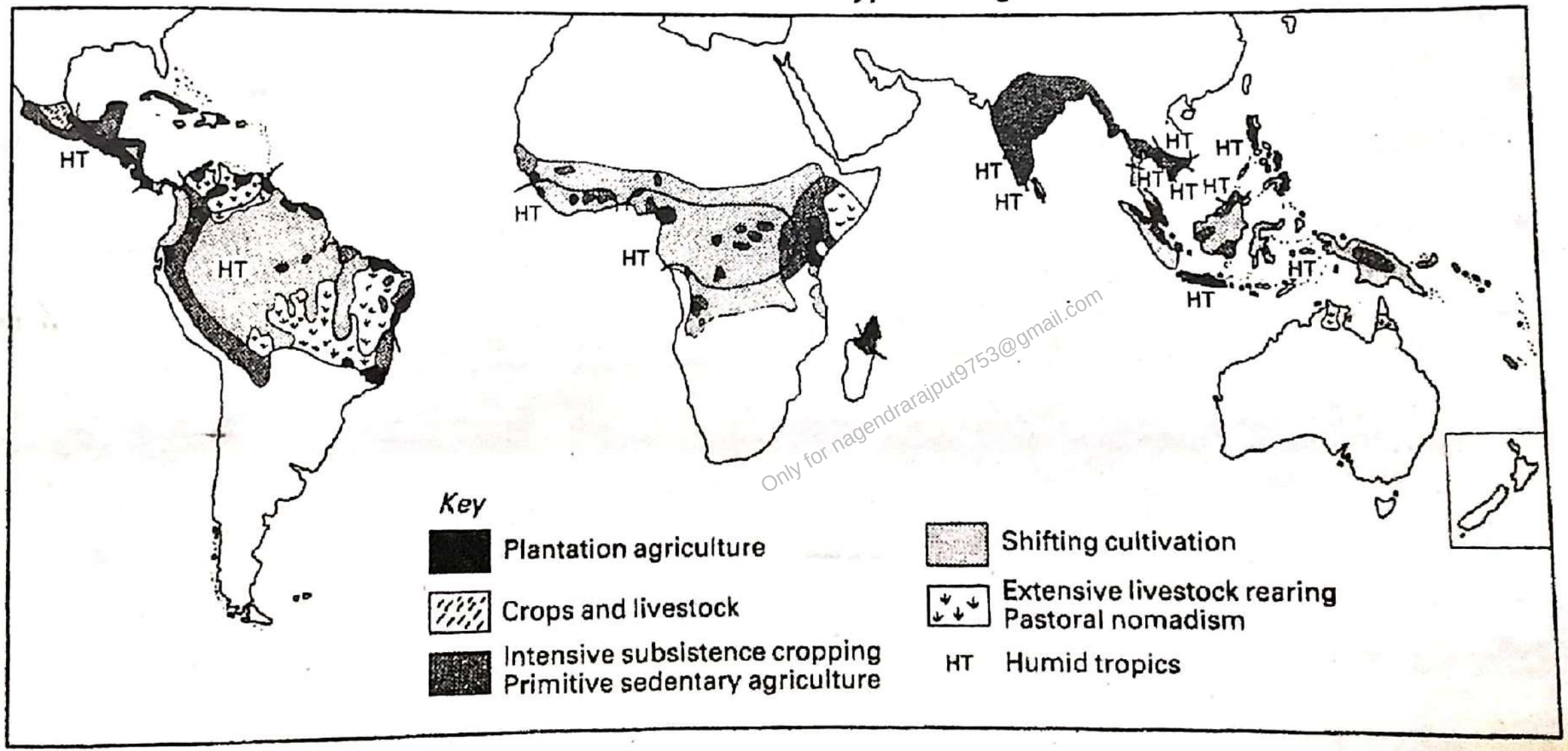
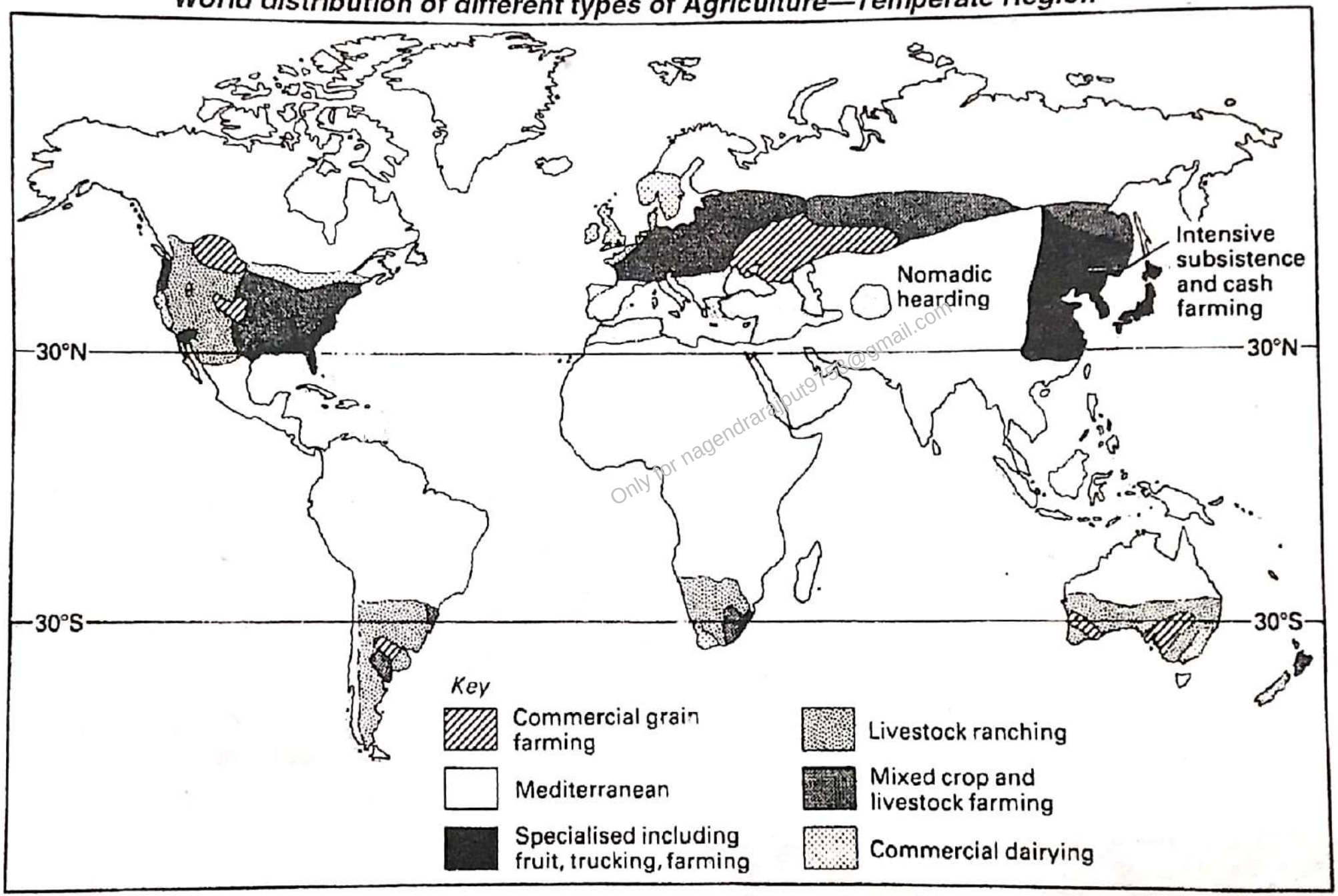


Fig. 10.19 Map Showing Whittlesey's agricultural regions.

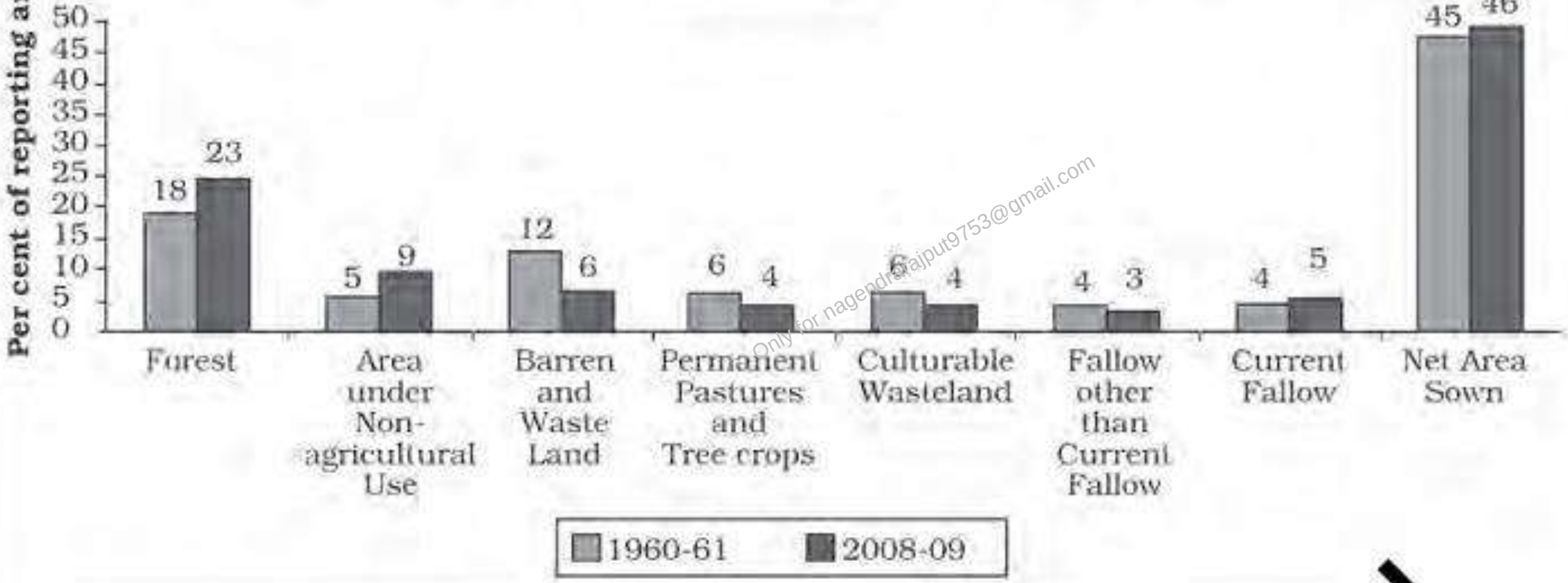
World distribution of different types of Agriculture—Humid Tropics

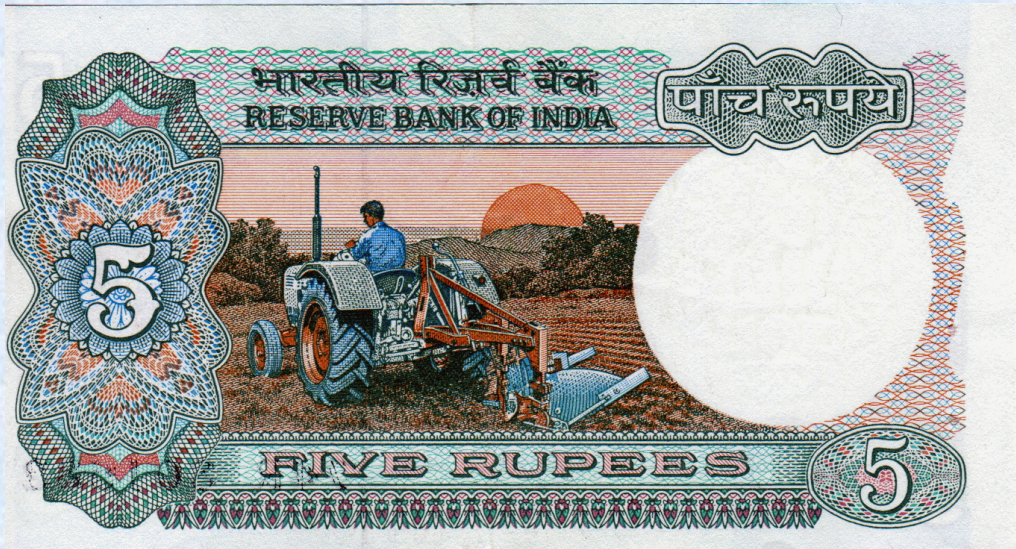


World distribution of different types of Agriculture—Temperate Region

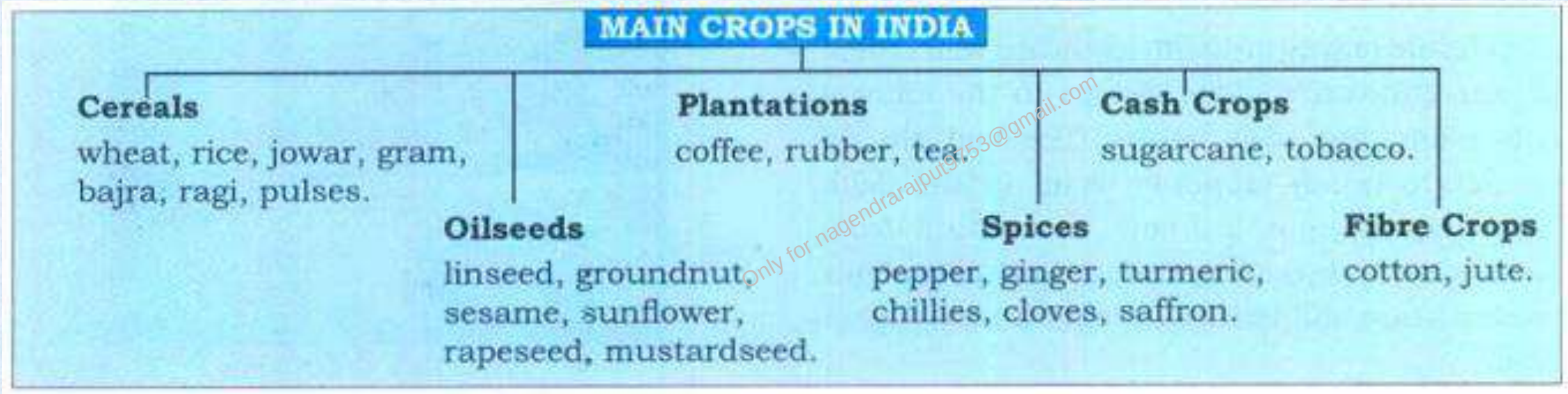


Changes in Shares of Land-use Categories in India : 1960-61 and 2008-09





AGRICULTURAL SEASONS			
	Kharif	**Rabi**	**Zaid**
1. Sowing Season	June-July	October-November	Aug.-Sept. (Zaid Kharif) Feb.-March (Zaid Rabi)
2. Harvesting Season	September-October	March-April	Dec.-Jan. (Zaid Kharif) April-May (Zaid Rabi)
3. Crops	Rice, maize, jowar, bajra, ragi, sugarcane pulses, cotton, jute.	Wheat, barley gram, linseed, mustard, potatoes.	Oilseeds (Zaid Kharif) Jowar, maize, summer vegetables and fruits. (Zaid Rabi)



Crops	Temperature	Rainfall	Soil	Leading Producers
1. Rice	Not above 35°C	150-300 cm	Clayey or loamy	West Bengal, Uttar Pradesh, Andhra Pradesh, Punjab, Tamil Nadu.
2. Wheat	10°–15°C (sowing) 21°–26°C (harvest)	80 cm	Well drained loams, and clay loams	Punjab, Haryana, Uttar Pradesh, Rajasthan, Madhya Pradesh.
3. Millets				
(a) Jowar	Not below 16°C	<100 cm	Variety of soils including clayey, sandy	Maharashtra, Madhya Pradesh, Karnataka, Andhra Pradesh and Telangana.
(b) Bajra	25°–30°C	40–50 cm	Sandy loams, black and red soils	Rajasthan, Uttar Pradesh, Gujarat, Maharashtra, Haryana
(c) Ragi	20°–30°C	50–100 cm	Red, light black and sandy loams	Karnataka, Tamil Nadu, Uttarakhand, Maharashtra and Andhra Pradesh.
4. Pulses	20°–25°C	50-75 cm	Dry, light soil	Madhya Pradesh, Maharashtra, Uttar Pradesh, Rajasthan and Andhra Pradesh.

Crop	Temperature	Rainfall	Soil	Leading States
Sugarcane	20°C–26°C	100–150 cm or irrigation facilities with high humidity.	Well-drained rich alluvial, heavy loam or lava soil.	UP, Maharashtra, Tamil Nadu (highest yield hectare), Karnataka, Andhra Pradesh.
Cotton	21°C–30°C but not below 21°C. 200 frost free days	50-75 cm or irrigation facility.	Deep black soil (regur), alluvial soils and laterite soil.	Gujarat, Andhra Pradesh, Maharashtra and Punjab.
Jute	24°C–35°C	Heavy rainfall of 150 cm with 90 per cent of relative humidity.	Light sandy or clayey loams.	West Bengal (70 per cent of the production, over 60 per cent of the area), Bihar, Assam, Odisha.

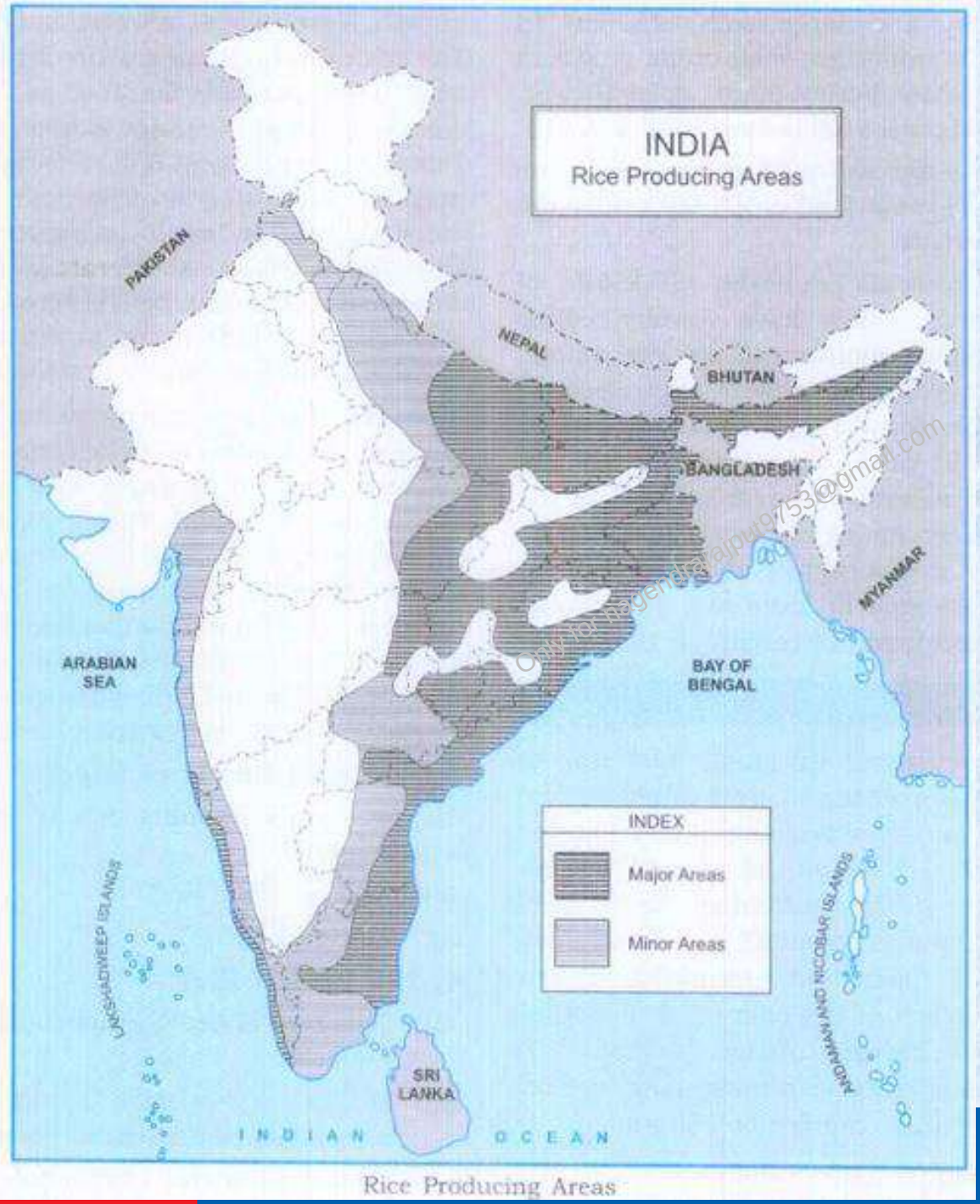
Crop	Temperature	Rainfall	Soil	Leading States
Groundnut	20°C to 25°C	50 to 100 cm	Sandy loams, loams and well-drained soils.	Gujarat, Telangana and Tamil Nadu.
Mustard and Rapeseed	10°C to 20°C	25 to 40 cm	Loams. Heavier loams (for mustard). Light loams (for rapeseed).	Uttar Pradesh, Rajasthan, Punjab, Madhya Pradesh and Haryana.
Soyabean	13°C to 24°C	40 to 60 cm	Friable loamy, acidic soils.	Madhya Pradesh, Rajasthan and Maharashtra.
Sunflower	26°C to 30°C	Less than 50 cm	Well-drained loamy soils.	Bihar, Maharashtra, Andhra Pradesh and Karnataka.
Sesamum	21°C	40 to 60 cm	Well-drained light loamy soil and black cotton soil.	Uttar Pradesh, Rajasthan, Maharashtra, Madhya Pradesh, Odisha, Gujarat, Karnataka, Andhra Pradesh, Telangana and Tamil Nadu.
Cotton Seeds	21°C to 30°C	50 to 75 cm	Black soils.	Gujarat, Andhra Pradesh, Telangana, Maharashtra and Punjab.
Linseed	15°C to 20°C	45 to 75 cm	Alluvial soils, clayey loamy soils and deep black soils.	Madhya Pradesh and Uttar Pradesh.
Castor Seeds	20°C to 25°C	50 to 75 cm	Red sandy loams in Peninsular India and light alluvial soils in the Plains.	Gujarat, Andhra Pradesh, Telangana and Rajasthan.

Important Cash Crops of India

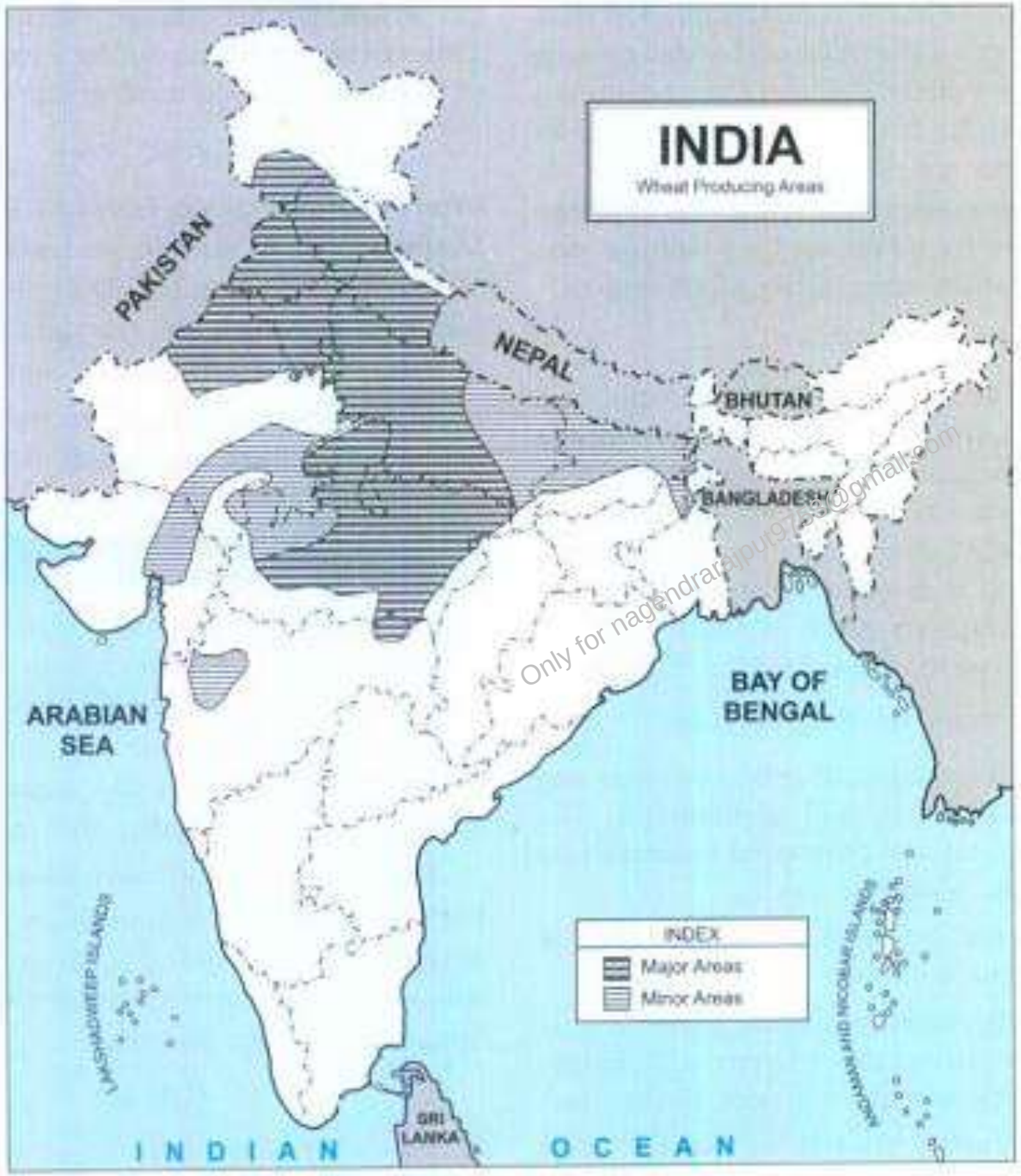
Crops	Temperature	Rainfall	Soil	Distribution
Tea	24°C-30°C	at least 150cm	forest soil; rich in humus and iron.	1. Assam: the Brahmaputra valley, Surma valley 2. West Bengal: the Duars, Darjeeling 3. Tamil Nadu: highest yield per hectare 4. Kerala
Coffee	15°C-28°C but does not tolerate frost or heat	150-200 cm	well drained, friable loamy soil, rich in vegetable mould.	1. Karnataka 70.4 % of total production; 2. Kerala 21.7 % of total production; and 3. Tamil Nadu 5.8 % of total production.
Rubber	25°C-35°C	152-200 cm	rich well drained alluvial or laterite soils.	1. Kerala: Kottayam, Ernakulum, Kozhikode and Kollam. 2. Tamil Nadu 3. Karnataka

Soil	Formation	Areas	Characteristics	Crops
Alluvial Soil	Deposition of sediments by rivers.	Inland alluvium in Punjab, Haryana, U.P., Bihar, West Bengal, parts of Gujarat and Rajasthan. Deltaic alluvium in the deltas of Ganga-Brahmaputra, Mahanadi, Godavari, Krishna and Kaveri. Coastal alluvium along the coastal strips of the Peninsula.	Loamy. Coarse and dry in upper reaches of the river and gets finer and moist as the river flows down. Rich in minerals especially Potash and Lime. Poor in Nitrogen and Humus.	Large variety of Rabi and Kharif crops; rice, wheat, sugarcane, cotton, gram and oilseeds; jute in Ganga-Brahmaputra delta.
Black Soil	Residual soils formed by weathering of lava rocks.	Deccan lava tract. Maharashtra, Madhya Pradesh, Gujarat, Andhra Pradesh, Karnataka, Rajasthan, Uttar Pradesh and parts of Tamil Nadu.	Clayey. Black in colour. Rich in lime, Magnesium. Poor in Phosphorous, Nitrogen and Organic matter. Very fertile.	Cotton, cereals, oilseeds, citrus fruits and vegetables, tobacco, and sugarcane.
Red Soil	Prolonged weathering of crystalline rocks. Differs on the basis of parent rock material and climatic conditions.	Plateau region of Peninsular India extending northwards along Konkan coast. Tamil Nadu, Karnataka, Andhra Pradesh, South-East Maharashtra, Chhattisgarh, parts of Odisha, Jharkhand, Bundelkhand, Meghalaya, Mizoram, Manipur, Telangana and Nagaland.	Loamy or Sandy. Red in colour due to large amounts of iron-oxides Deep and fertile in lowland; thin and poor in highlands. Poor in Nitrogen, Phosphorus, Potassium and Organic matter.	Vegetables, rice, ragi, tobacco, groundnut and potatoes.
Laterite Soil	Due to leaching in areas of heavy rain.	Highland areas of Peninsular plateau. Patches in Madhya Pradesh, Odisha, Maharashtra, West Bengal, Andhra Pradesh, Telangana, Karnataka, Kerala, and Tamil Nadu.	Coarse and porous. Red due to Iron Oxide. Poor in Lime, Nitrogen and Magnesium. High acidity and low moisture retention.	Tapioca, cashewnuts. With manure ragi, rice, sugarcane, tea, rubber and coffee.

Crops	Temperature	Rainfall	Soil	Leading Producers
1. Rice	Not above 35°C	150-300 cm	Clayey or loamy	West Bengal, Uttar Pradesh, Andhra Pradesh, Punjab, Tamil Nadu.
2. Wheat	10°–15°C (sowing) 21°–26°C (harvest)	80 cm	Well drained loams, and clay loams	Punjab, Haryana, Uttar Pradesh, Rajasthan, Madhya Pradesh.
3. Millets				
(a) Jowar	Not below 16°C	<100 cm	Variety of soils including clayey, sandy	Maharashtra, Madhya Pradesh, Karnataka, Andhra Pradesh and Telangana.
(b) Bajra	25°–30°C	40–50 cm	Sandy loams, black and red soils	Rajasthan, Uttar Pradesh, Gujarat, Maharashtra, Haryana
(c) Ragi	20°–30°C	50–100 cm	Red, light black and sandy loams	Karnataka, Tamil Nadu, Uttarakhand, Maharashtra and Andhra Pradesh.
4. Pulses	20°–25°C	50-75 cm	Dry, light soil	Madhya Pradesh, Maharashtra, Uttar Pradesh, Rajasthan and Andhra Pradesh.



Rice Producing Areas



Wheat Producing Areas

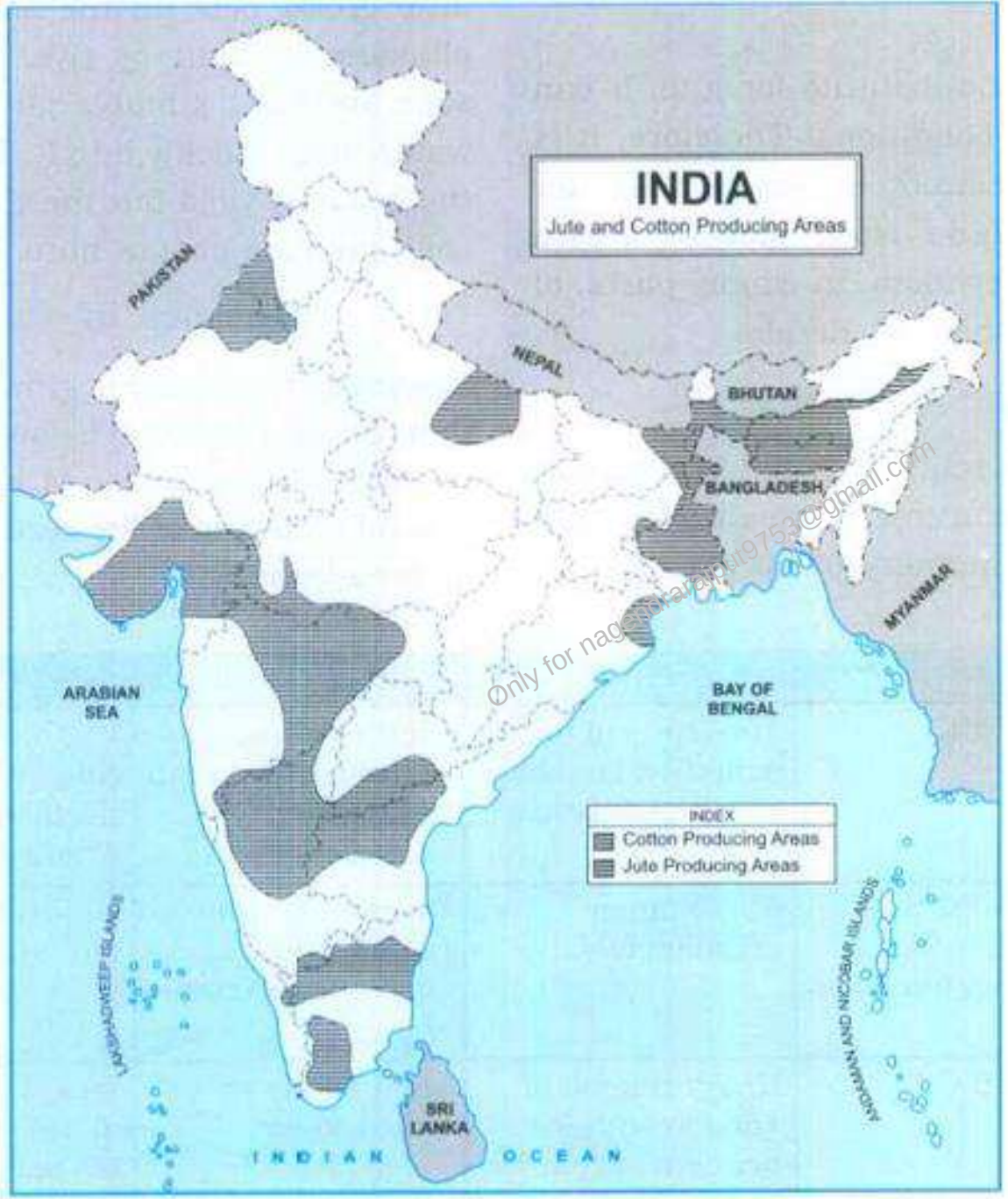
Jowar Producing Areas

Bajra Producing Areas

Ragi Producing Areas

Crop	Temperature	Rainfall	Soil	Leading States
Sugarcane	20°C–26°C	100–150 cm or irrigation facilities with high humidity.	Well-drained rich alluvial, heavy loam or lava soil.	UP, Maharashtra, Tamil Nadu (highest yield hectare), Karnataka, Andhra Pradesh.
Cotton	21°C–30°C but not below 21°C. 200 frost free days	50-75 cm or irrigation facility.	Deep black soil (regur), alluvial soils and laterite soil.	Gujarat, Andhra Pradesh, Maharashtra and Punjab.
Jute	24°C–35°C	Heavy rainfall of 150 cm with 90 per cent of relative humidity.	Light sandy or clayey loams.	West Bengal (70 per cent of the production, over 60 per cent of the area), Bihar, Assam, Odisha.

Sugarcane Producing Areas



Cotton and Jute Producing Areas

Under MSP
- Groundnut
- Soyabean
- Sunflower
- Sufflower

- Mustard/Rapeseed
- Toria (very similar to mustard)
- Sesamum/ Sesum (till)
- Nigerseed (Ramtil)

Crop	Temperature	Rainfall	Soil	Leading States
Groundnut	20°C to 25°C	50 to 100 cm	Sandy loams, loams and well-drained soils.	Gujarat, Telangana and Tamil Nadu.
Mustard and Rapeseed	10°C to 20°C	25 to 40 cm	Loams. Heavier loams (for mustard). Light loams (for rapeseed).	Uttar Pradesh, Rajasthan, Punjab, Madhya Pradesh and Haryana.
Soyabean	13°C to 24°C	40 to 60 cm	Friable loamy, acidic soils.	Madhya Pradesh, Rajasthan and Maharashtra.
Sunflower	26°C to 30°C	Less than 50 cm	Well-drained loamy soils.	Bihar, Maharashtra, Andhra Pradesh and Karnataka.
Sesamum	21°C	40 to 60 cm	Well-drained light loamy soil and black cotton soil.	Uttar Pradesh, Rajasthan, Maharashtra, Madhya Pradesh, Odisha, Gujarat, Karnataka, Andhra Pradesh, Telangana and Tamil Nadu.
Cotton Seeds	21°C to 30°C	50 to 75 cm	Black soils.	Gujarat, Andhra Pradesh, Telangana, Maharashtra and Punjab.
Linseed	15°C to 20°C	45 to 75 cm	Alluvial soils, clayey loamy soils and deep black soils.	Madhya Pradesh and Uttar Pradesh.
Castor Seeds	20°C to 25°C	50 to 75 cm	Red sandy loams in Peninsular India and light alluvial soils in the Plains.	Gujarat, Andhra Pradesh, Telangana and Rajasthan.

Important Cash Crops of India

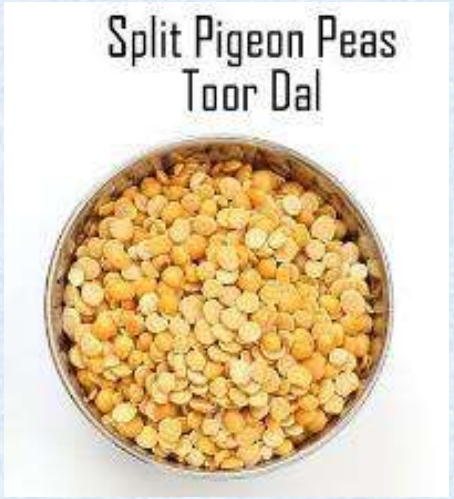
Crops	Temperature	Rainfall	Soil	Distribution
Tea	24°C-30°C	at least 150cm	forest soil; rich in humus and iron.	1. Assam: the Brahmaputra valley, Surma valley 2. West Bengal: the Duars, Darjeeling 3. Tamil Nadu: highest yield per hectare 4. Kerala
Coffee	15°C-28°C but does not tolerate frost or heat	150-200 cm	well drained, friable loamy soil, rich in vegetable mould.	1. Karnataka 70.4 % of total production; 2. Kerala 21.7 % of total production; and 3. Tamil Nadu 5.8 % of total production.
Rubber	25°C-35°C	152-200 cm	rich well drained alluvial or laterite soils.	1. Kerala: Kottayam, Ernakulum, Kozhikode and Kollam. 2. Tamil Nadu 3. Karnataka

Tea Producing Areas

Coffee Producing areas

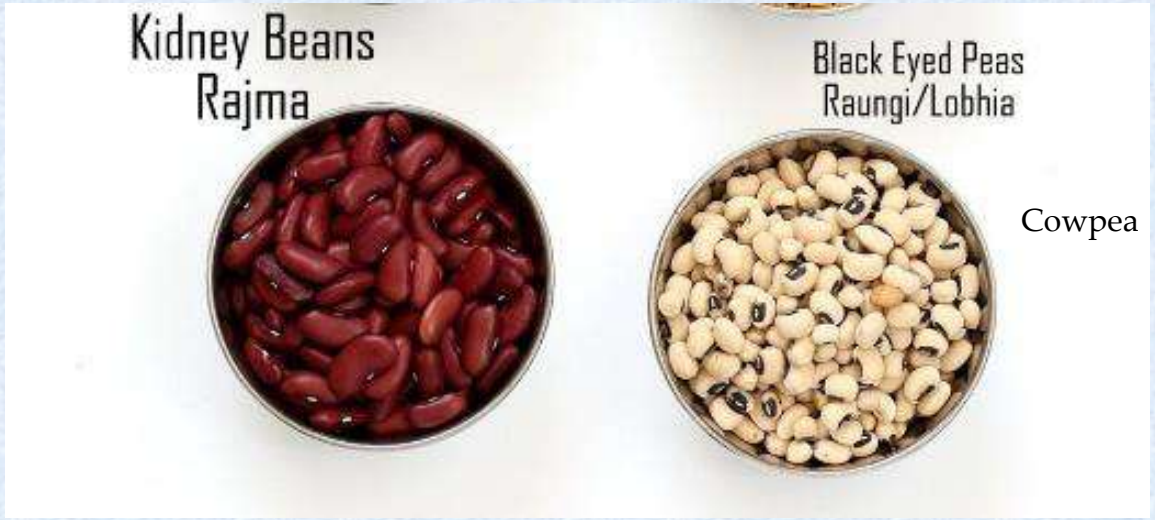
Rubber Producing Areas

Gram/
Bengal gram



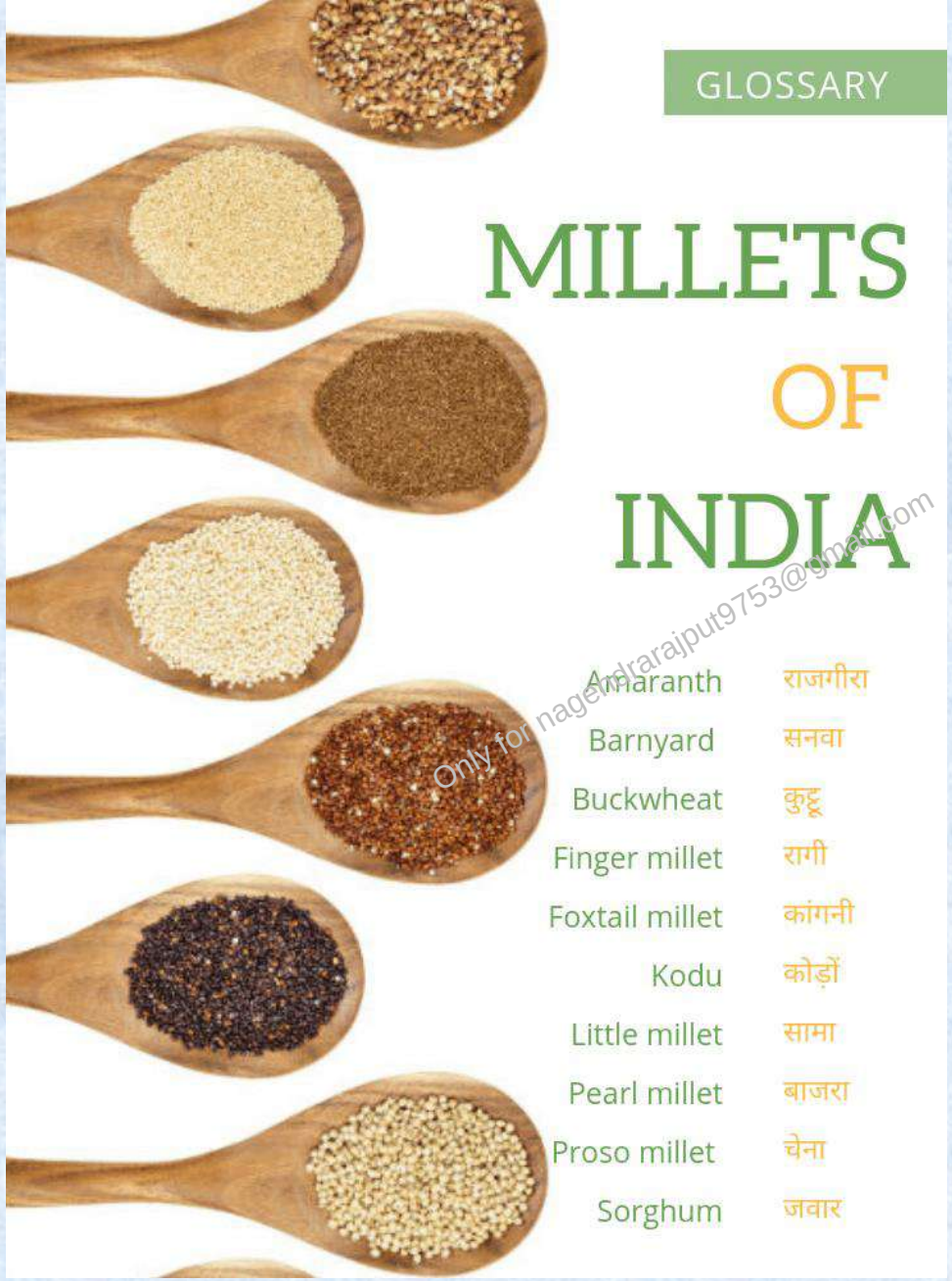
Also as just "Lentil"

Under MSP:
Gram, Arhar, Urad, Moong, Lentil



Cowpea

Horsegram



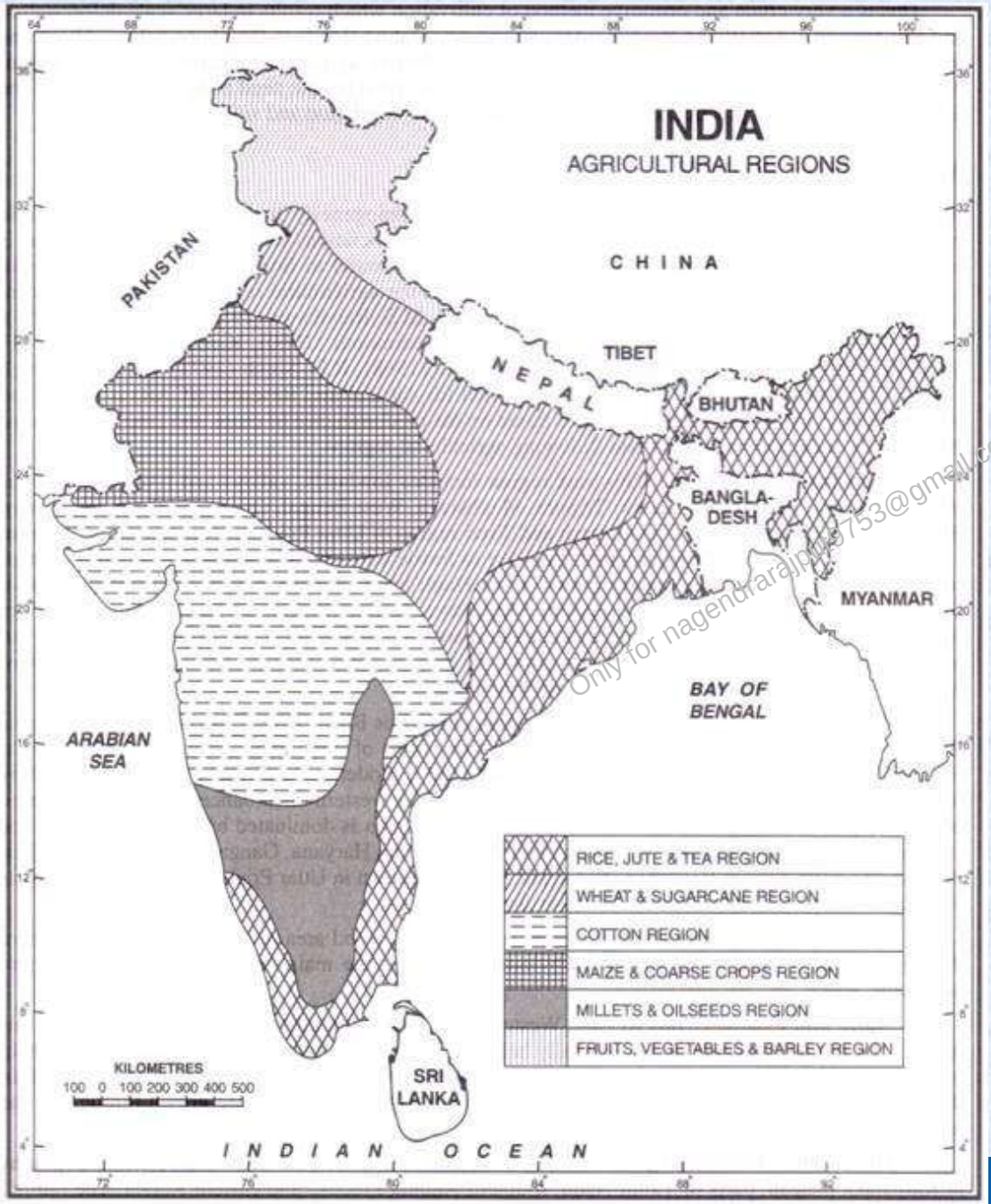


FIG. 22.1. India : Agricultural Regions

67.	Agriculture	2012	Consider the following crops of India: 1. Cowpea 2. Green gram 3. Pigeon pea Which of the above is/are used as pulse, fodder and green manure? (a) 1 and 2 only (b) 2 only (c) 1 and 3 only (d) 1, 2 and 3
68.	Agriculture	2013	Consider the following crops: 1. Cotton 2. Groundnut 3. Rice 4. Wheat Which of these are Kharif crops? (a) 1 and 4 (b) 2 and 3 only (c) 1, 2 and 3 (d) 2, 3 and 4

66.	Agriculture	2012	Consider the following crops of India: 1. Groundnut 2. Sesamum 3. Pearl millet Which of the above is/are predominantly rainfed crop/ crops? (a) 1 and 2 only (b) 2 and 3 only (c) 3 only (d) 1, 2 and 3

63.	Agriculture	2011	A state in India has the following characteristics: 1. Its northern part is arid and semi-arid. 2. Its central part produces cotton. 3. Cultivation of cash crops is predominant over food crops. Which one of the following states has all of the above characteristics? (a) Andhra Pradesh (b) Gujarat (c) Karnataka (d) Tamil Nadu
64.	Agriculture	2011	Among the following States, which one has the most suitable climatic conditions for the cultivation of a large variety of orchids with minimum cost of production, and can develop an export oriented industry in this field? (a) Andhra Pradesh (b) Arunachal Pradesh (c) Madhya Pradesh (d) Uttar Pradesh

61.	Agriculture	2010	The approximate representation of land use classification in India is? (a) Net area sown 25%; forest 33%; other areas 42% (b) Net area sown 58%; forest 17%; other areas 25% (c) Net area sown 43%; forest 29%; other areas 28% (d) Net area sown 47%; forest 23%; other areas 30%
62.	Agriculture	2011	The lower Gangetic plain is characterised by humid climate with high temperature throughout the year. Which one among the following pairs of crops is most suitable for this region? (a) Paddy and cotton (b) Wheat and Jute (c) Paddy and Jute (d) Wheat and cotton

60.	Agriculture	2010	Following are the characteristics of an area in India: 1. Hot and humid climate 2. Annual rainfall 200 cm 3. Hill slopes up to an altitude of 1100 metres 4. Annual range of temperature 15°C to 30°C Which one among the following crops are you most likely to find in the area described above? (a) Mustard (b) Cotton (c) Pepper (d) Virginia tobacco

67. "The crop is subtropical in nature. A hard frost is injurious to it. It requires at least 210 frost-free days and 50 to 100 centimeters of rainfall for its growth. A light well-drained soil capable of retaining moisture is ideally suited for the cultivation of the crop." Which one of the following is that crop?

(a) Cotton

(b) Jute

(c) Sugarcane

(d) Tea

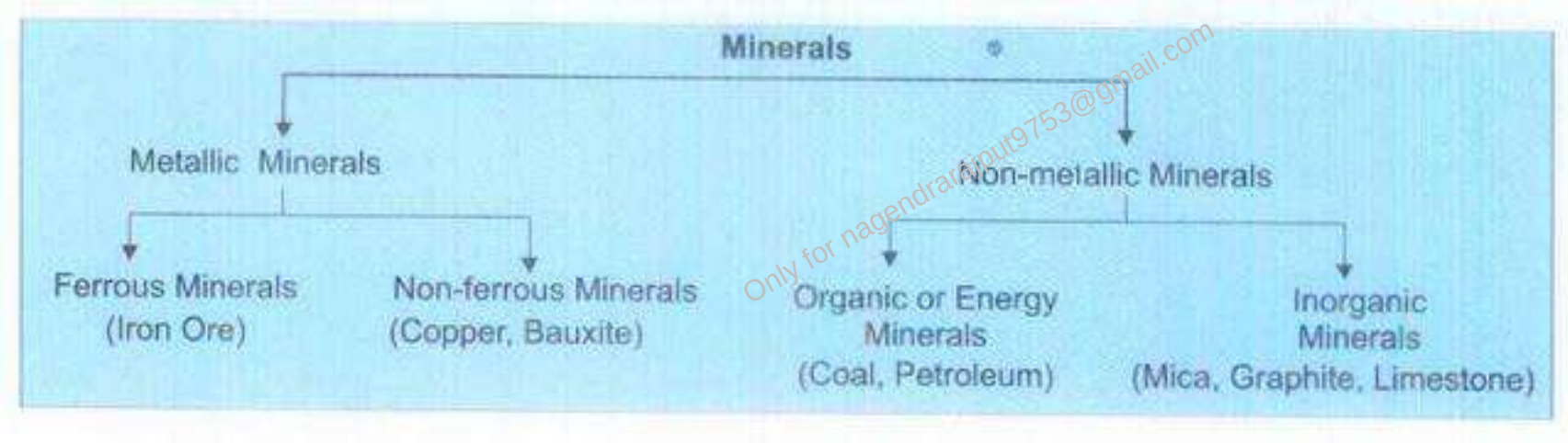
66. With reference to pulse production in India, consider the following statements:

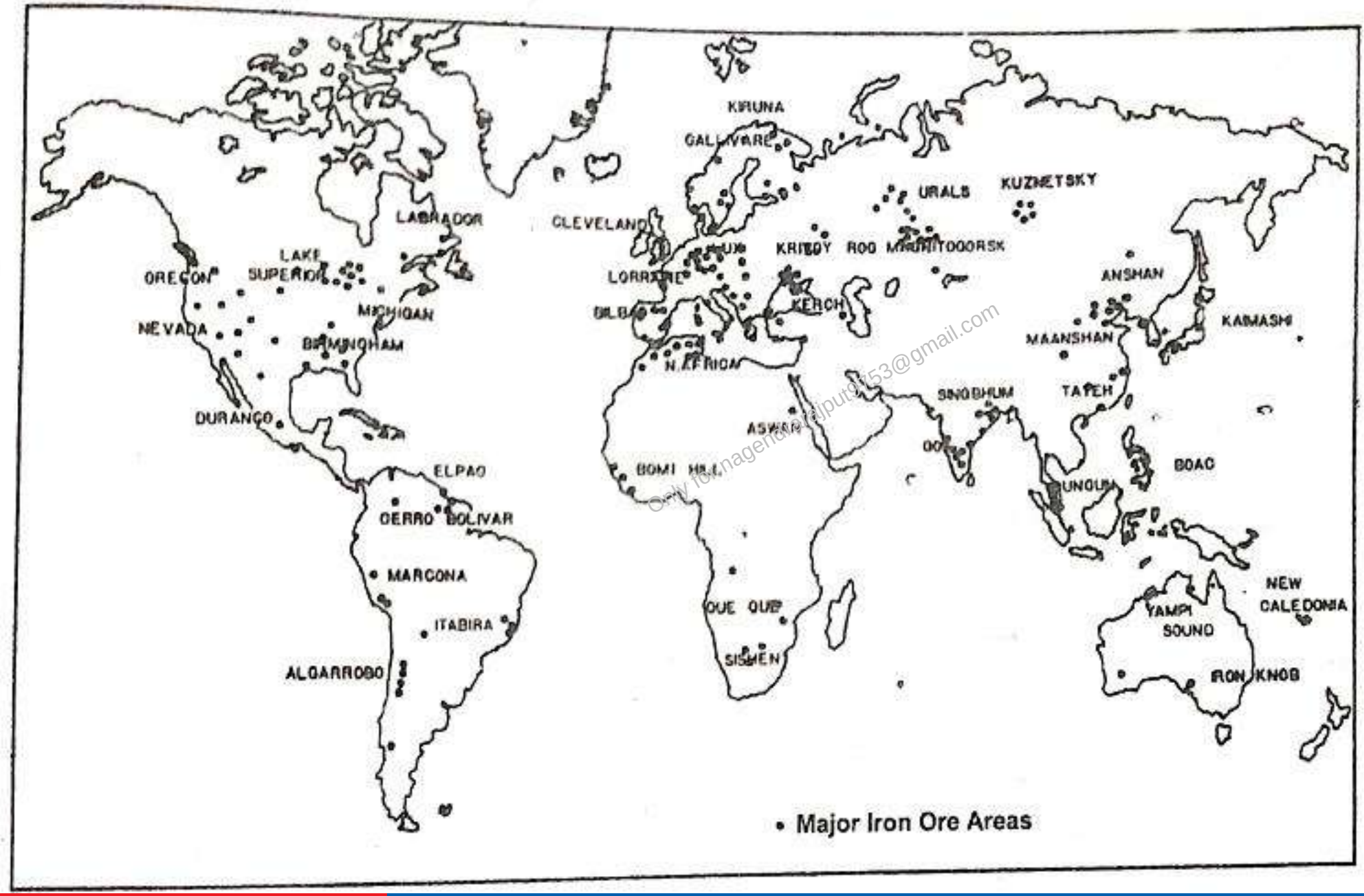
1. Black gram can be cultivated as both kharif and rabi crop.
2. Green-gram alone accounts for nearly half of pulse production.
3. In the last three decades, while the production of kharif pulses has increased the production of rabi pulses has decreased.

Which of the statements given above is/are correct?

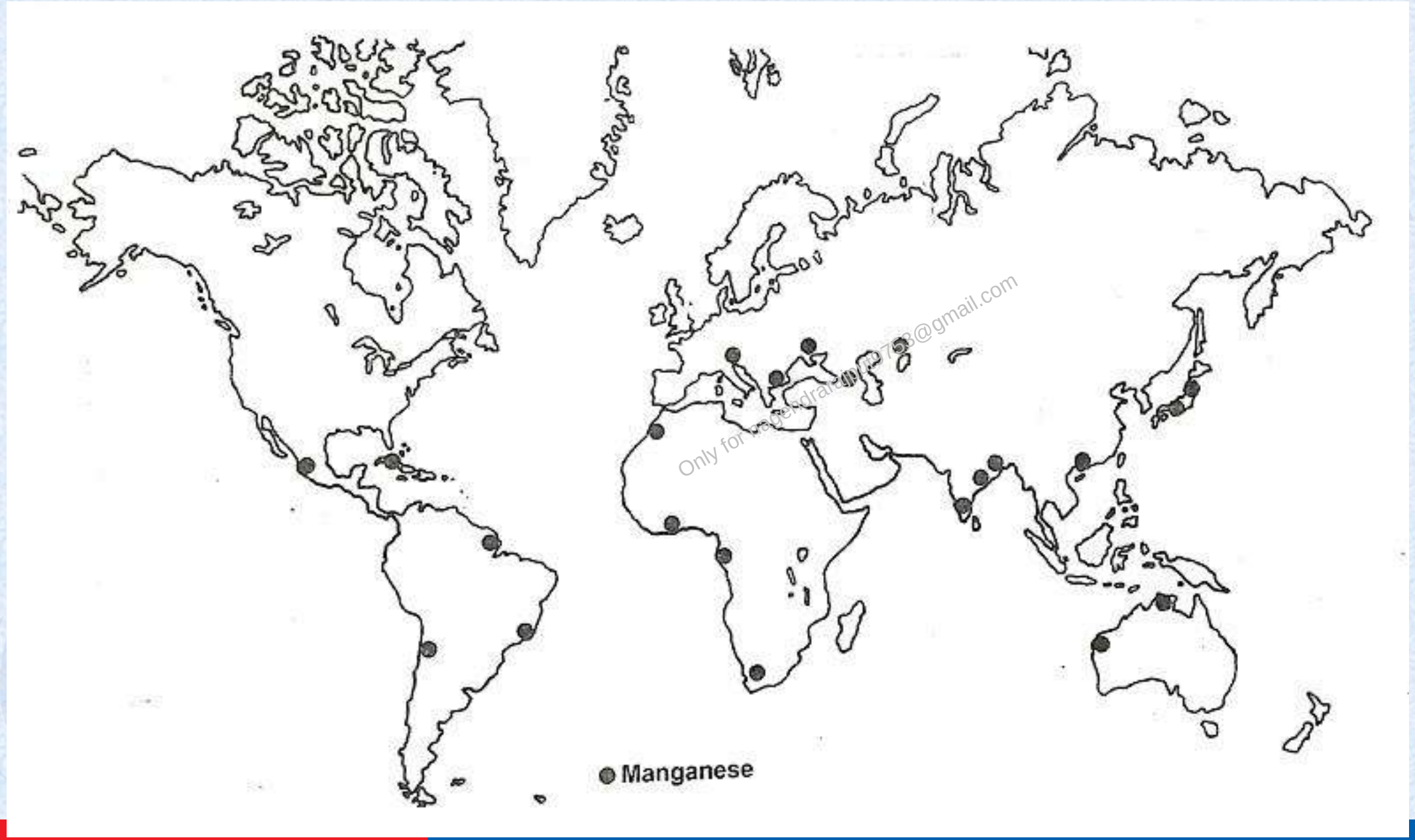
(a) 1 only
(b) 2 and 3 only
(c) 2 only
(d) 1, 2 and 3

61.	Agriculture	2019	With reference to the cultivation of Kharif crops in which in the last five years consider the following statements: 1. Area under rice cultivation is the highest. 2. Area under the cultivation of jowar is more than that of oilseeds. 3. Area of cotton cultivation is more than that of sugarcane. 4. Area under sugarcane cultivation has steadily decreased. Which of the statements given above is/are correct? (a) 1 and 3 only (b) 2, 3 and 4 only (c) 2 and 4 only (d) 1, 2, 3 and 4

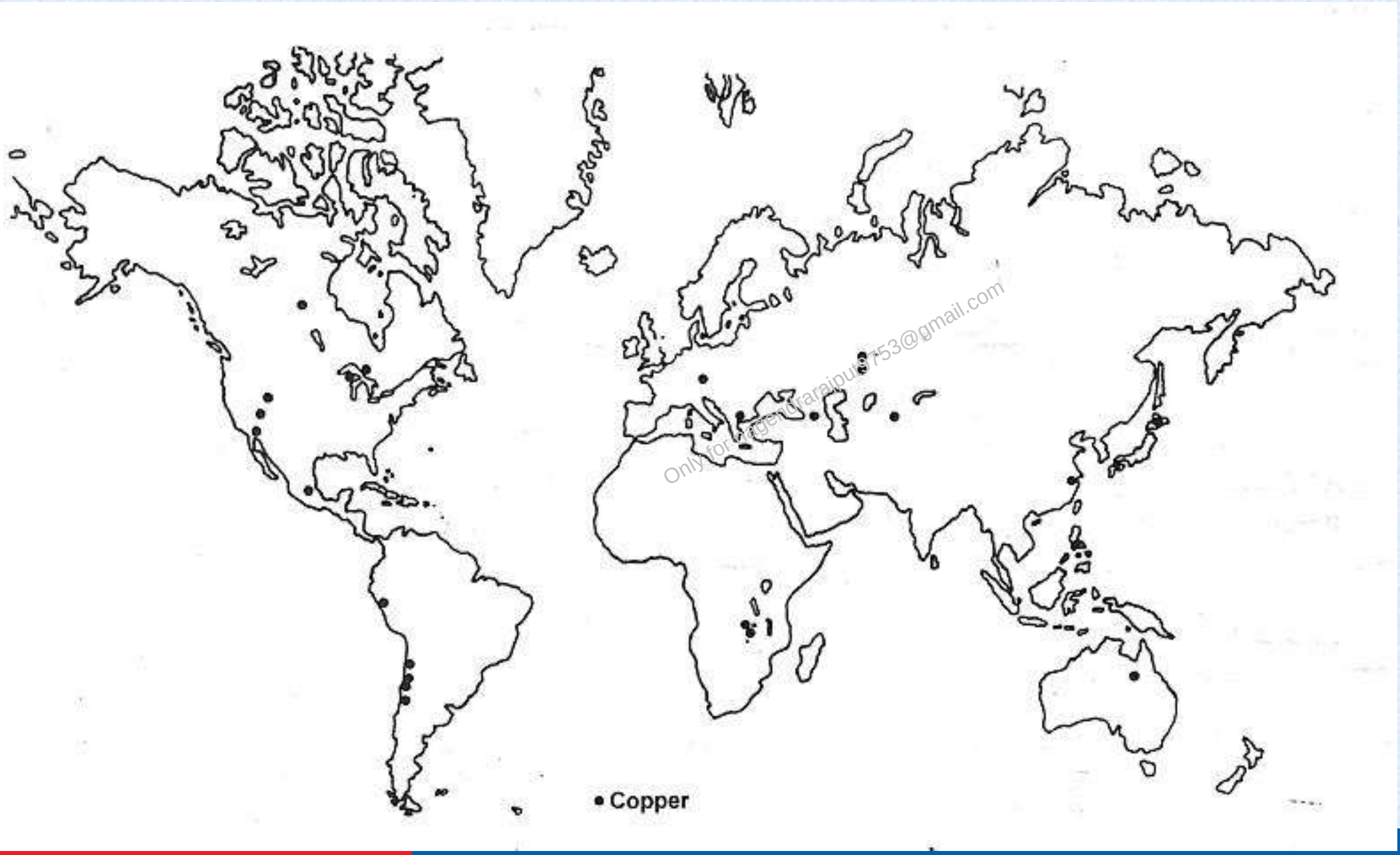




- **North America:** Lake Superior region, NE USA, Labrador, Newfoundland
- **South America:** Itabira (Brazil), Cerro Bolivar (Venezuela)
- **Europe:** Kiruna & Gallivare (Sweden), Bilbao (Spain)
- **Africa:** Bomi hills (Liberia), Postmasberg & Transval (South Africa)
- **Asia:** Krivoy Rog, Kerch (Ukraine) , Kuzbas, Magnetogorsk (Siberia), machuria (China)
- **Australia:** Iron knob, Mt.Goldsworthy

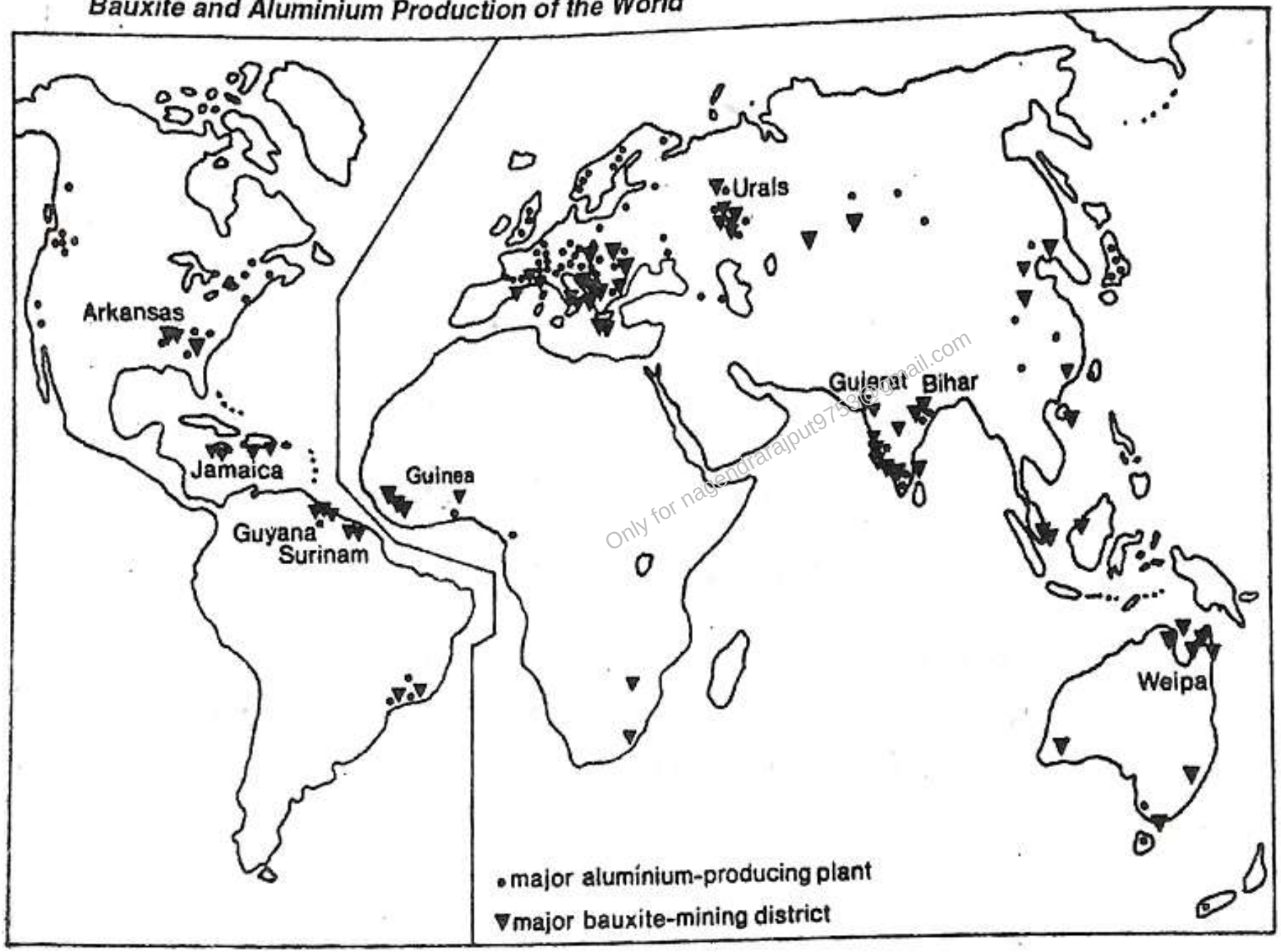


- **South America:** Macapa, Minas Geraise (Brazil), Western Mato grasso
- **Africa:** Zaire, Postmasberg (South Africa)
- **Asia:** Nikopol and Tokmak (Ukraine), Chiatura (Georgia), Urals

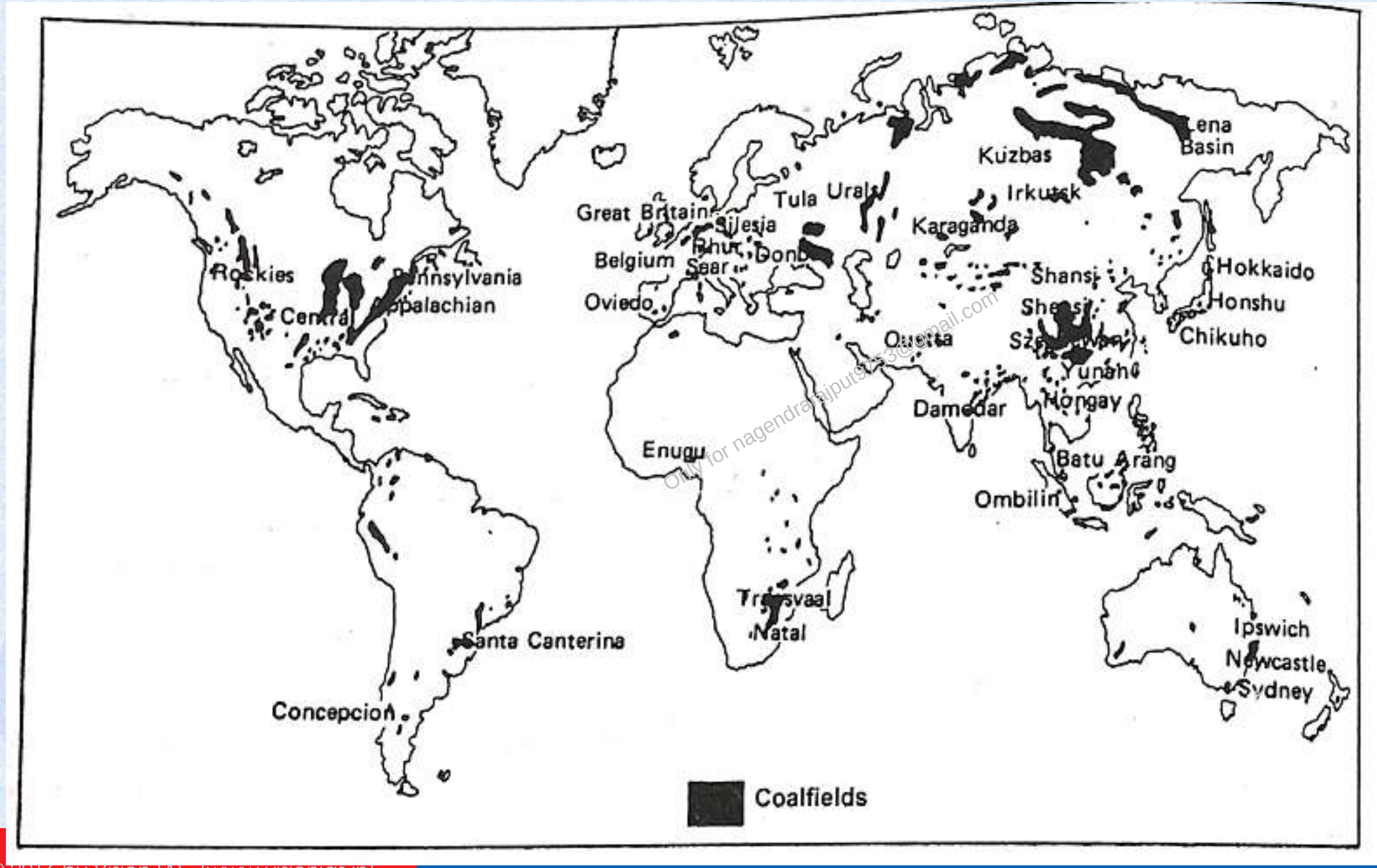


- **North America:** Sudbury, Lynn lake (Canada)
- **South America:** Casapalco (Peru), Chuquicamata & San Jose (Chile)
- **Africa:** Katanga
- **Asia:** Lake Balkash (Russia), Ulanbatore (Mongolia)

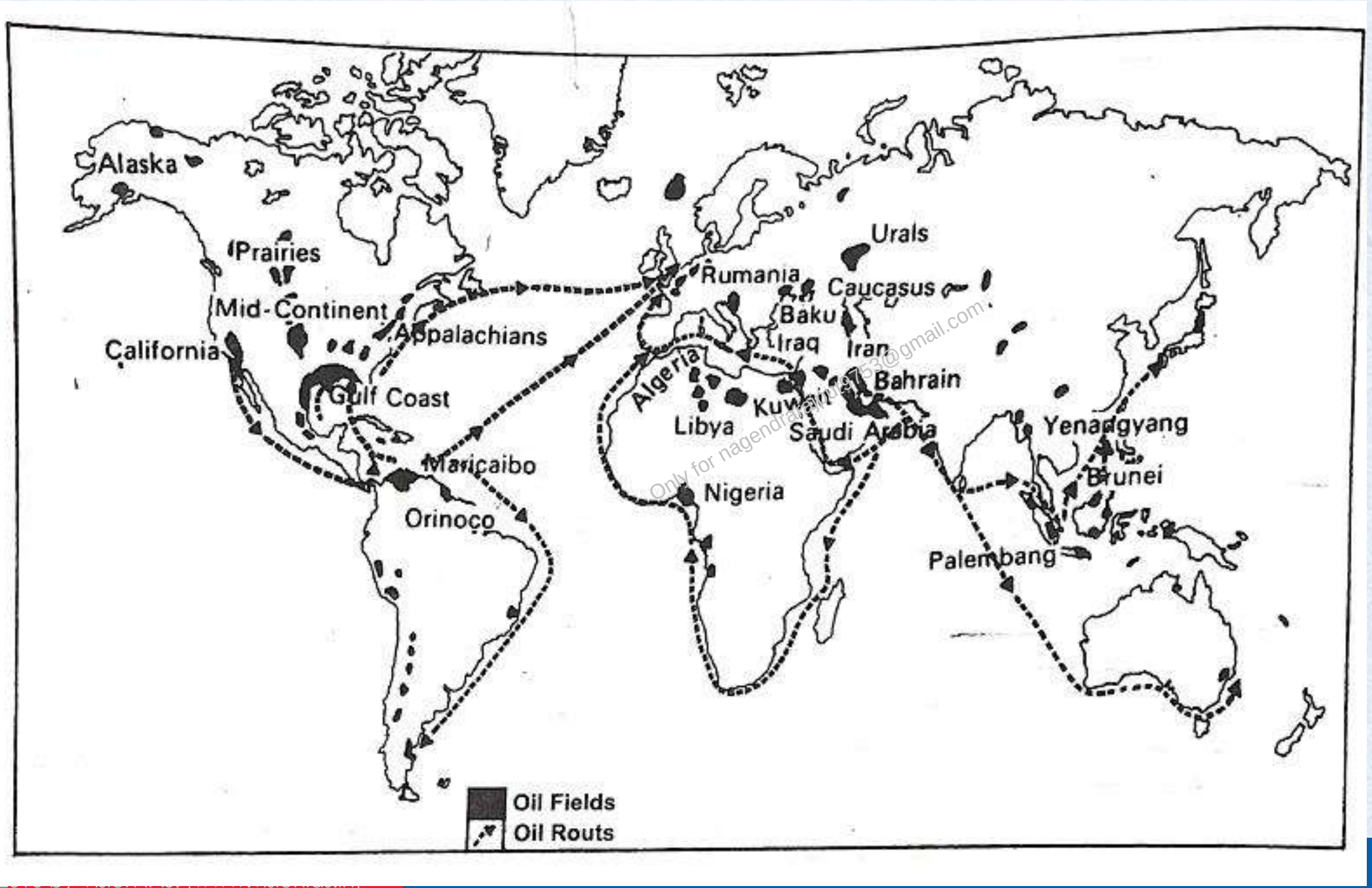
Bauxite and Aluminium Production of the World



- **North America:** Alabama, Arkansas (USA)
- **South America:** Jamaica, Guyana, Surinam
- **Europe:** France, Hungary
- **Africa:** Guinea
- **Asia:** Urals, Krasnaya (Russia)
- **Australia:** Weipa, Cape york, Darling range



- **North America:** Pennsylvania, Appalachian, Rockies, Mexican gulf (USA), Vancouver, Nova scotia (Canada)
- **South America:** Santa Canterina (Brazil), Concepcion (Chile)
- **Europe:** Great Britain, Ruhr & Saar (Germany), Spain
- **Africa:** Zambia, Zimbabwe, Enugu (Nigeria), Transval & Natal (South Africa)
- **Asia:** Donetz, Donbas, Moscow – tula, Kuzbas, Urals, Lena (Russia), Shanzi, Shantung, Yunnan (China)
- **Australia:** Ipswich, New castle



- **North America:** Gulf coast, Appalachian, California, Alaska (USA), Prairies, Edmonton, Calgary (Canada)
- **South America:** Maracaibo, Orinoco basin (Venezuela), Magdalena (Columbia), Punta Arenas (Chile), Falkland
- **Europe:** North Sea, Norway
- **Africa:** Algeria, Libya, Nigeria – Niger delta
- **Asia:** Dhaharan, Quatif (Saudi Arabia), Mosul, Kirkuk, Zubair (Iraq), Masjid Sulaiman (Iran), Kuwait, Bahrain, Qatar, Abudabhi (UAE); Baku (Azerbaijan), Urals, Caucasus, Caspian sea, NW Siberia, Sakhalin (Russia); Sumatra, Borneo (Indonesia); Brunei; Sarawak, Sabah (Malaysia), China

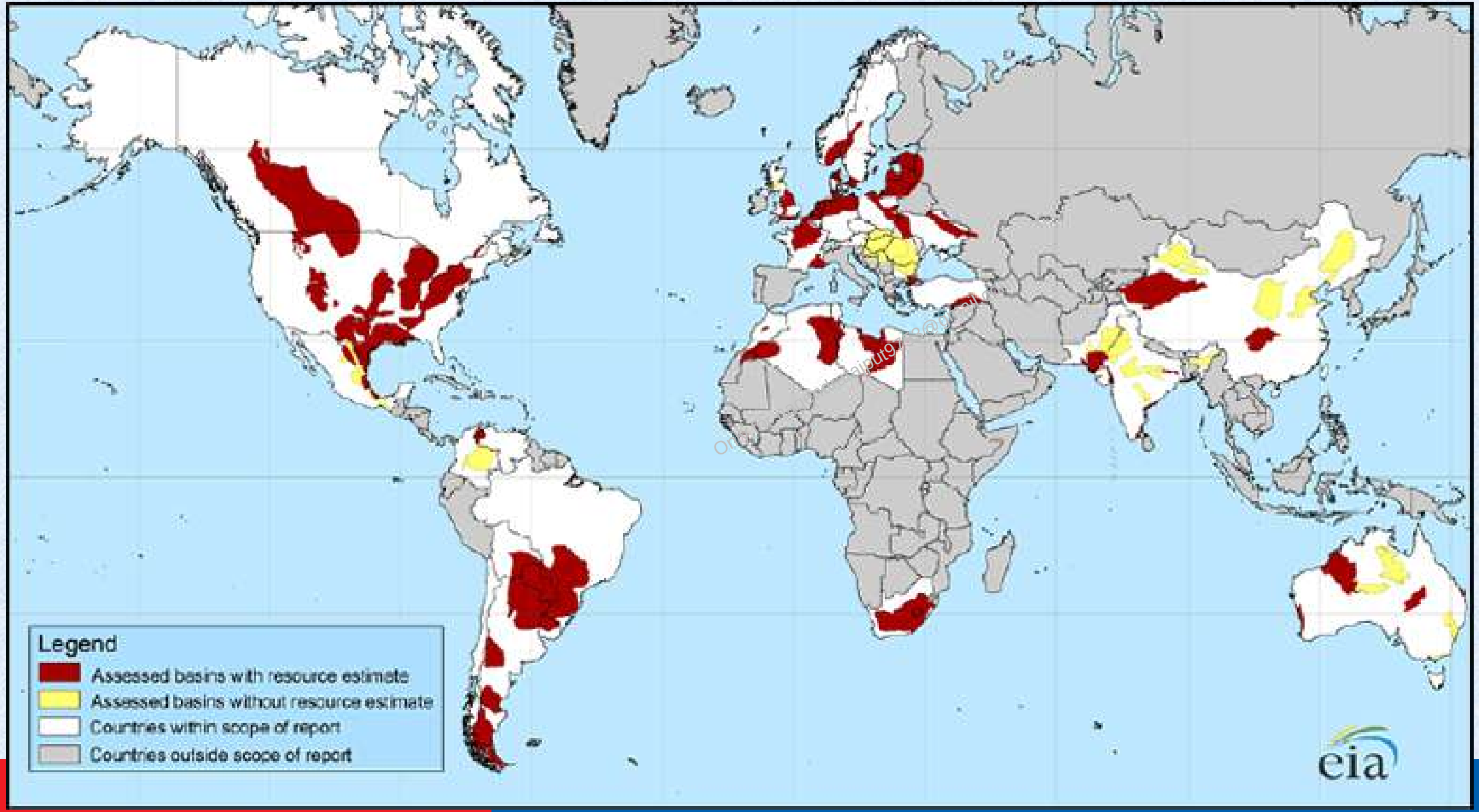
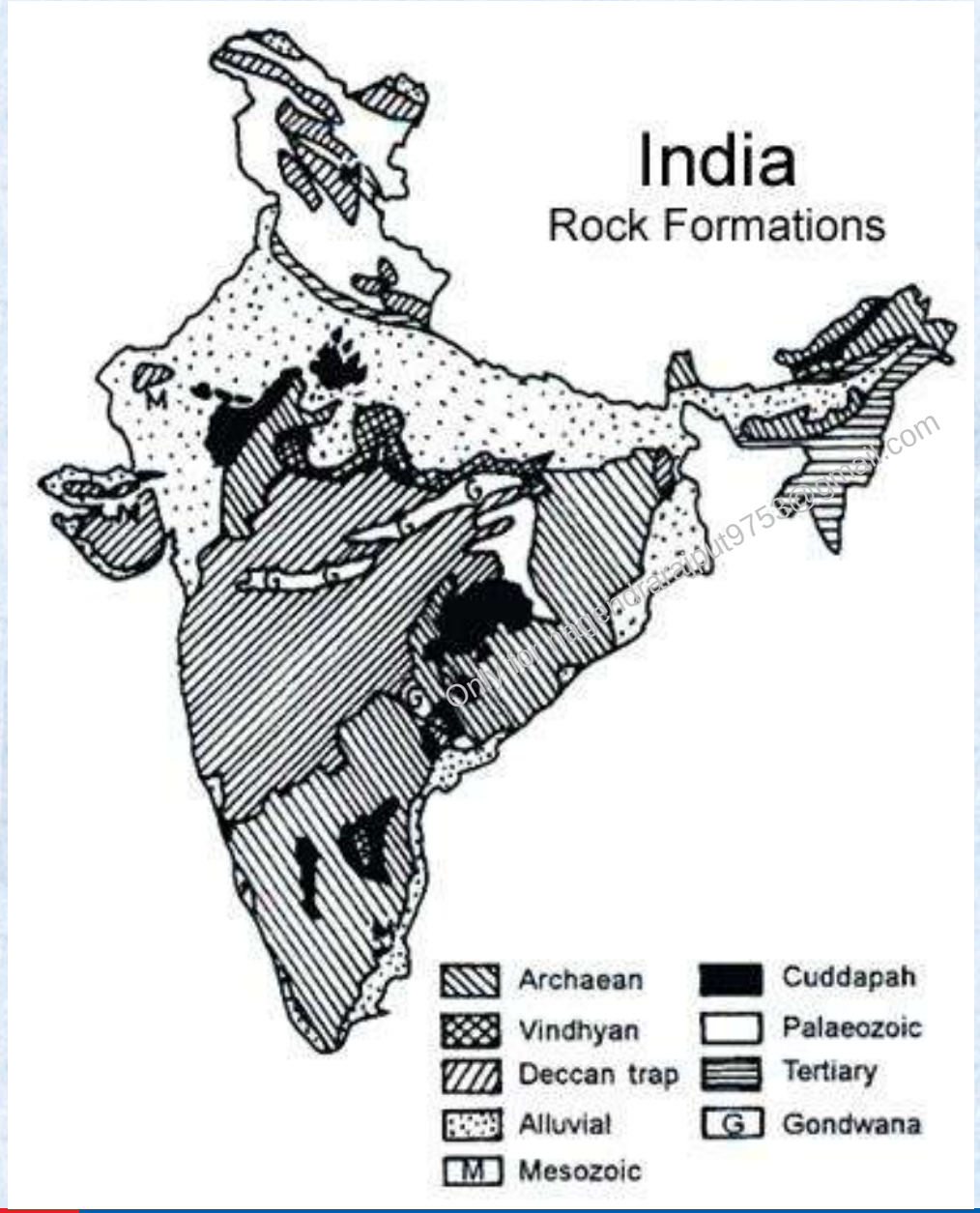

Legend
Assessed basins with resource estimate
Assessed basins without resource estimate
Countries within scope of report
Countries outside scope of report
eia

Table 1: Leading Countries with Technically Recoverable Shale Gas Resources

Rank	Country	Technically recoverable Shale gas (trillion cubic feet)
1	China	1,115
2	Argentina	802
3	Algeria	707
4	U.S.A	623
5	Canada	573
6	Mexico	545
7	Australia	429
8	South Africa	390
9	Russia	285
10	Brazil	245
11	India	96
	World Total	**7576**



Iron Ore in India.

Iron

- Odisha: Gurumahisani, Sulepat and Badam Pahar in Mayurbhanj district; Baramjader group extended in Keonjhar and Sundargarh districts.

- Singhbhum district of Jharkhand

- Bailadilla of Bastar district in Chhattisgarh;

- Sandoor Hills at Bellary - Hospet region and Bababudan Hills at Chikmanglur district in Karnataka;

Manganese Distribution in India

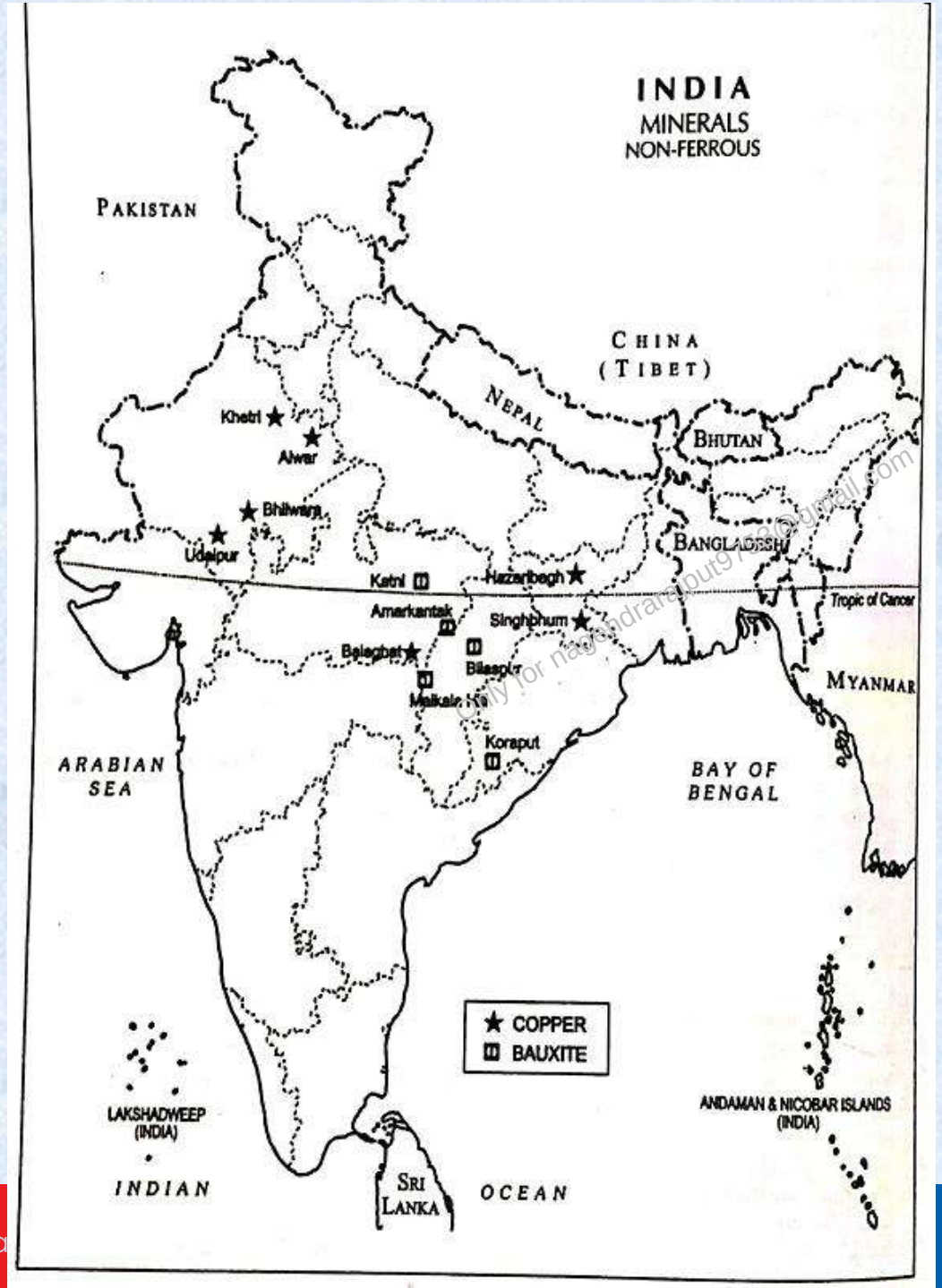
Manganese

- ✓ Keonjhar and Karaput region in Orissa
- ✓ Balaghat and Chindwara in Madhya Pradesh
- ✓ Nagpur and Bhandara in Maharashtra
- ✓ Panchamahal in Gujarat
- ✓ Vishakhapattinam and Srikakulam in Andhra Pradesh
- ✓ Singhbhum in Jharkhand
- ✓ Udaipur and Banswara in Rajasthan

Bauxite Distribution in India

Bauxite

- Ranchi and Palamau in Jharkhand
- Sarguja, Shah dole, Durg and Balaghat in Madhya Pradesh;
- Kolaba, Thane and Ratnagiri in Maharashtra;
- Belgaon and Bababudan Hills in Karnataka;
- Palni, Javdi and Shevaroy hills regions in Tamil Nadu

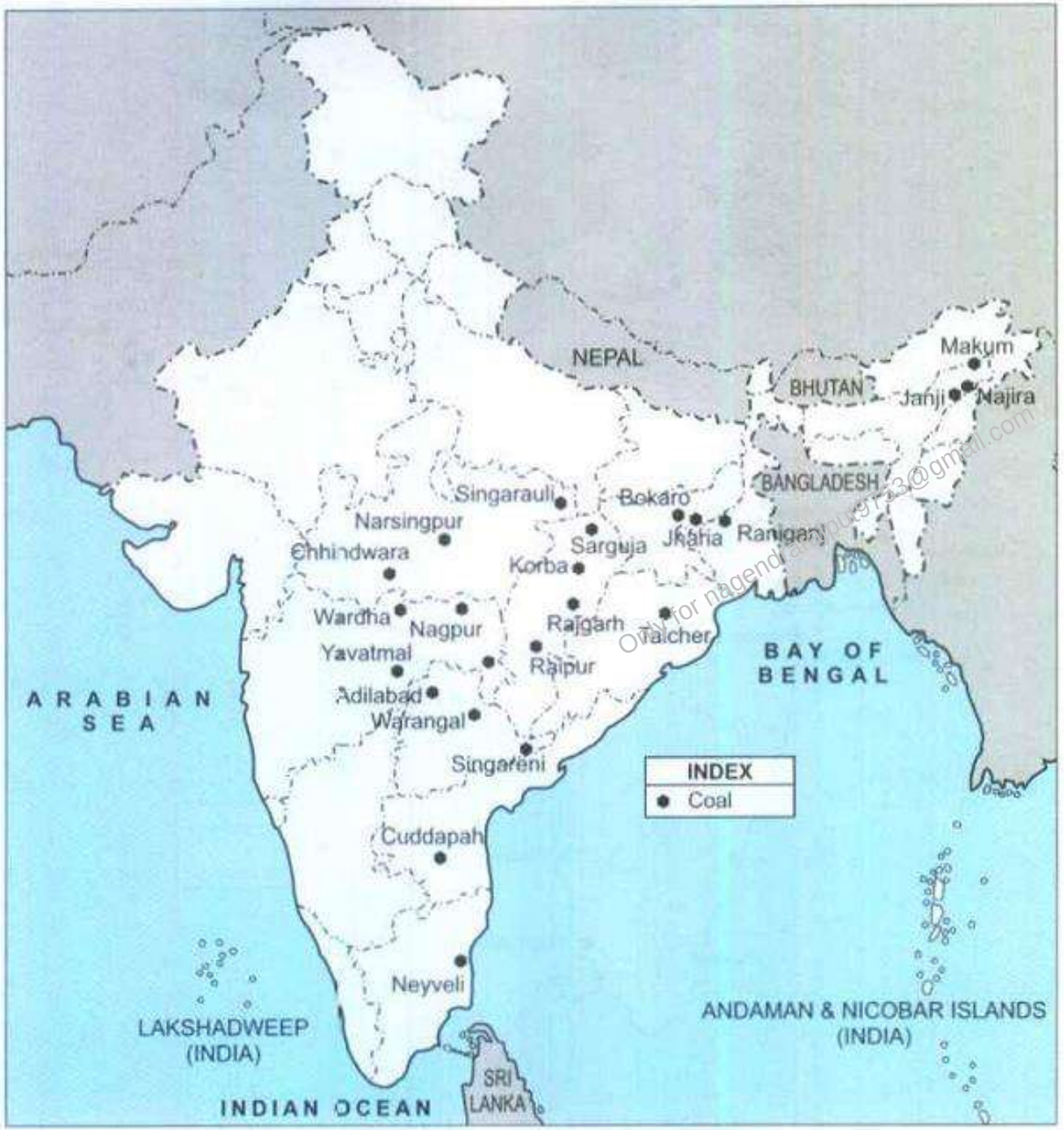


Copper

- ✓ Singhbhum in Jharkhand;
- ✓ Jhunjhunu, Bhilwara, Alwar and Udaipur in Rajasthan; Khetri Mine in Rajasthan has been a major copper extracting region since the age of Indus valley civilization.
- ✓ Balaghat in Madhya Pradesh;
- ✓ Guntur and Nellor districts in Andhra Pradesh.

Mica

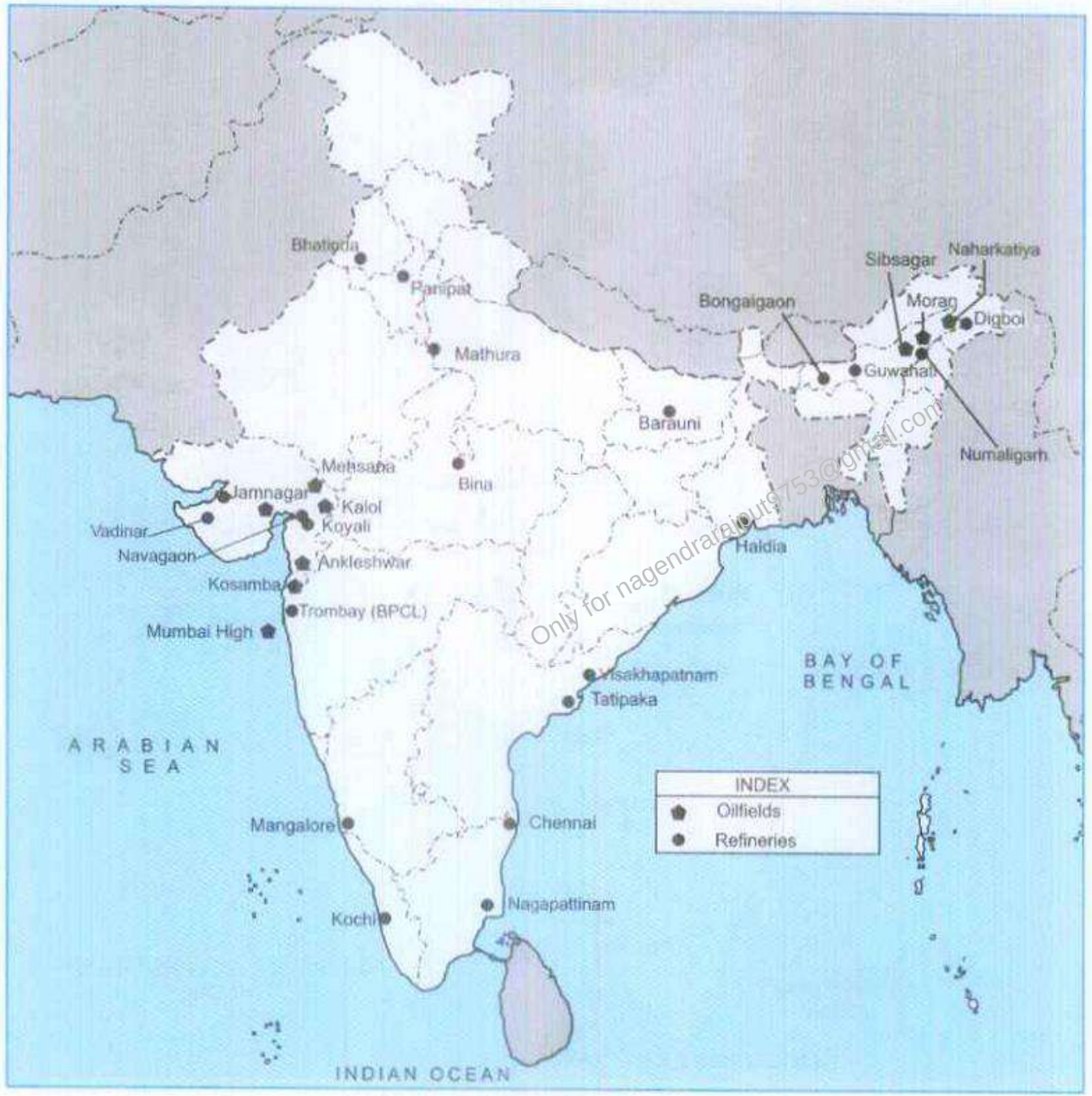
- Muscovite and Biotite types of mica are extracted from Hazaribagh, Singhbhum and Palamu districts.
- Other major mica producing regions are Gaya and Munger in Bihar
- Nellore and Khammam in Andhra Pradesh
- Udaipur and Bhilwara districts in Rajasthan.



Coal Distribution in India

Table 11.1. Gondwana Coalfields

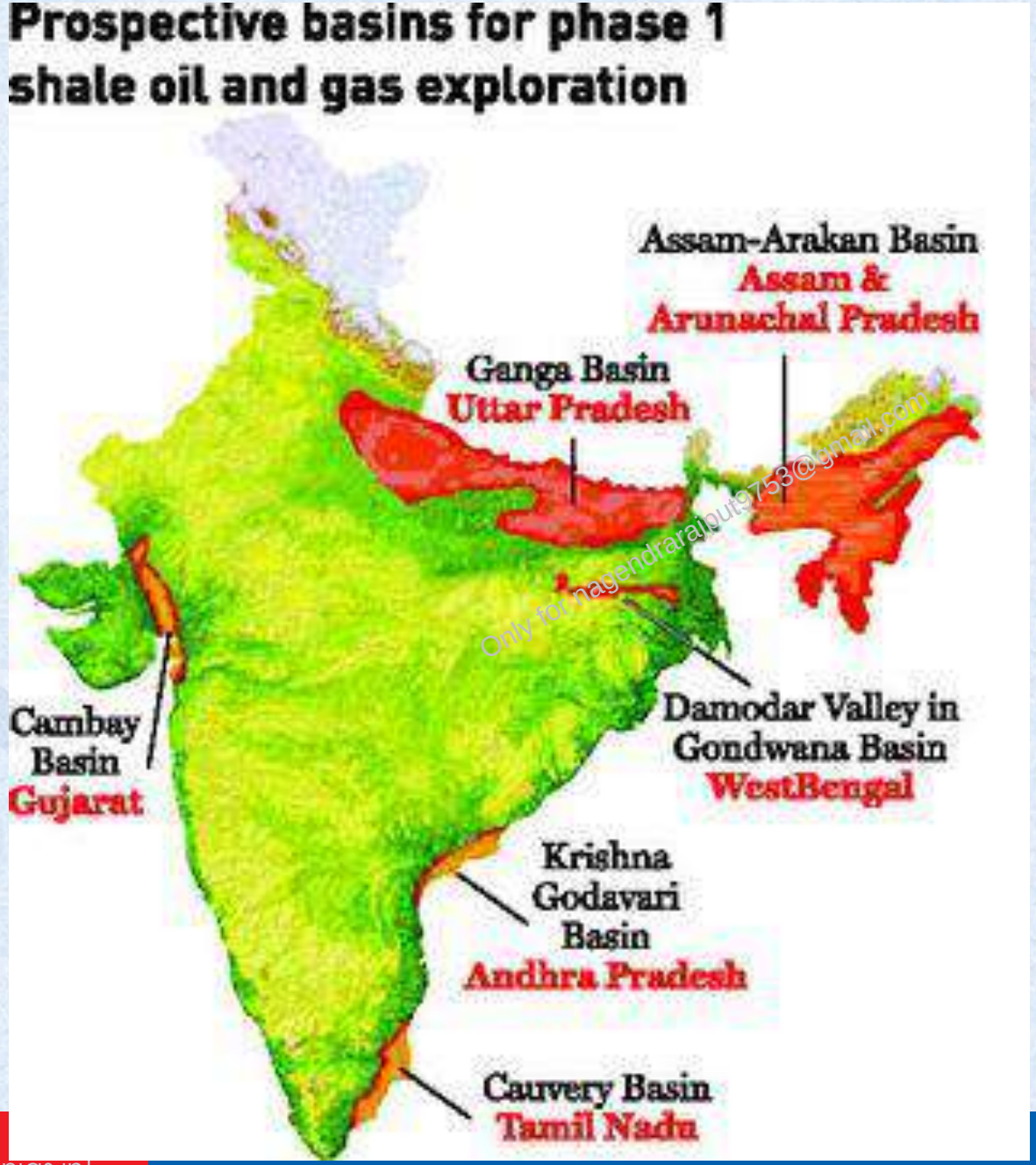
State	River Valley	Coalfields
1. Jharkhand	Damodar	Jharia, Karnpura, Ramgarh, East and West Bokaro, Giridih, Auronga, Hutar and Daltonganj.
2. Odisha	Mahanadi	Sambalpur, Sundargarh and Talcher.
3. Madhya Pradesh	Mahanadi/Son	Singrauli, Narsingpur, Chhindwara, Betul.
4. Chhattisgarh	Mahanadi/Son	Sarguja, Sendurgarh, Rampur, Korba and Raigarh.
5. Maharashtra	Godavari	Kamptee, Wardha valley, Chandrapur and Yavatmal.
6. Andhra Pradesh	Godavari	East and West Godavari.
.7. Telangana	Godavari	Adilabad, Khammam and Warangal.
8. West Bengal	Damodar	Raniganj, Bardhaman, Bankura, Purulia, Darjeeling and Jalpaiguri.

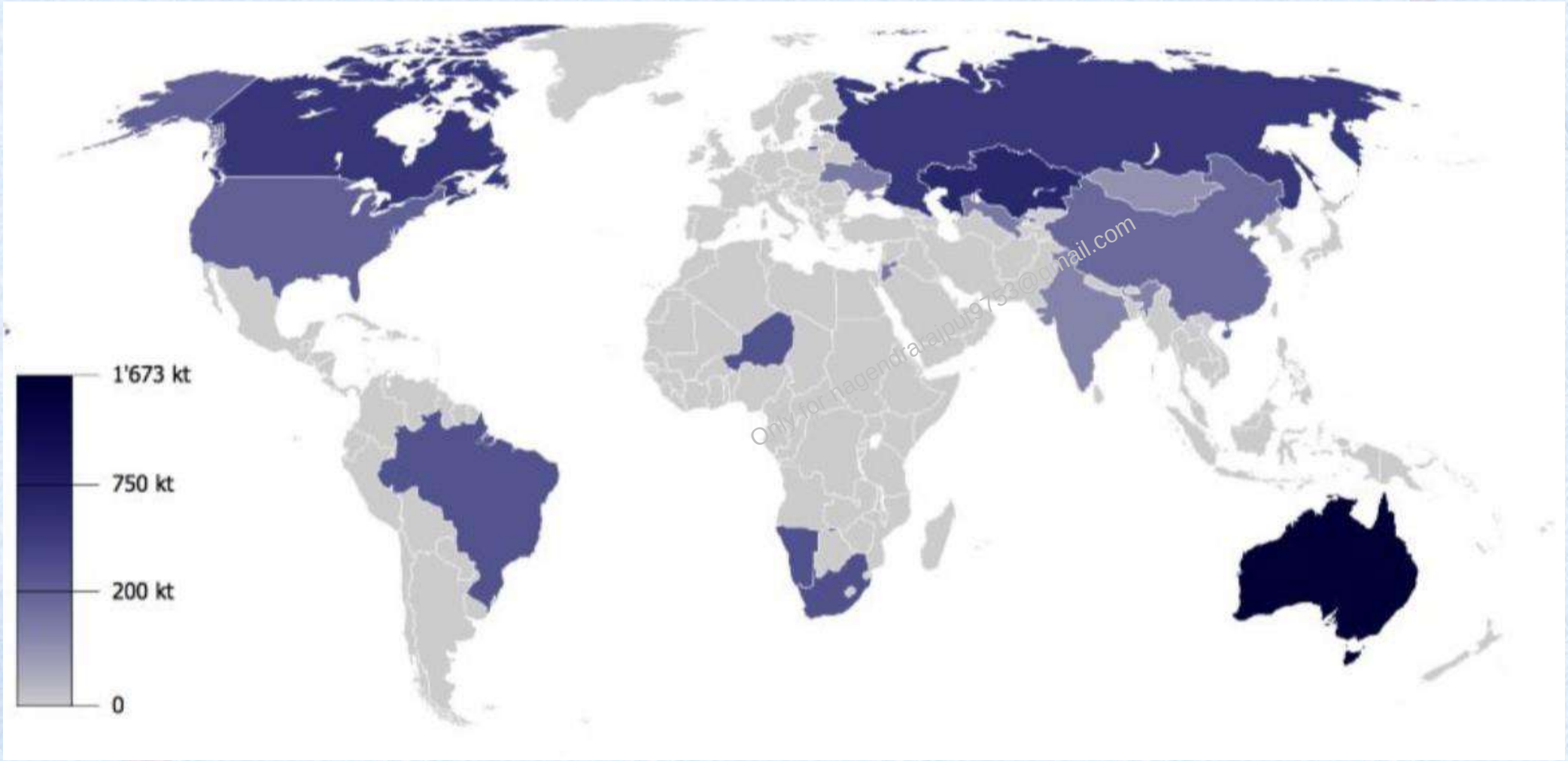


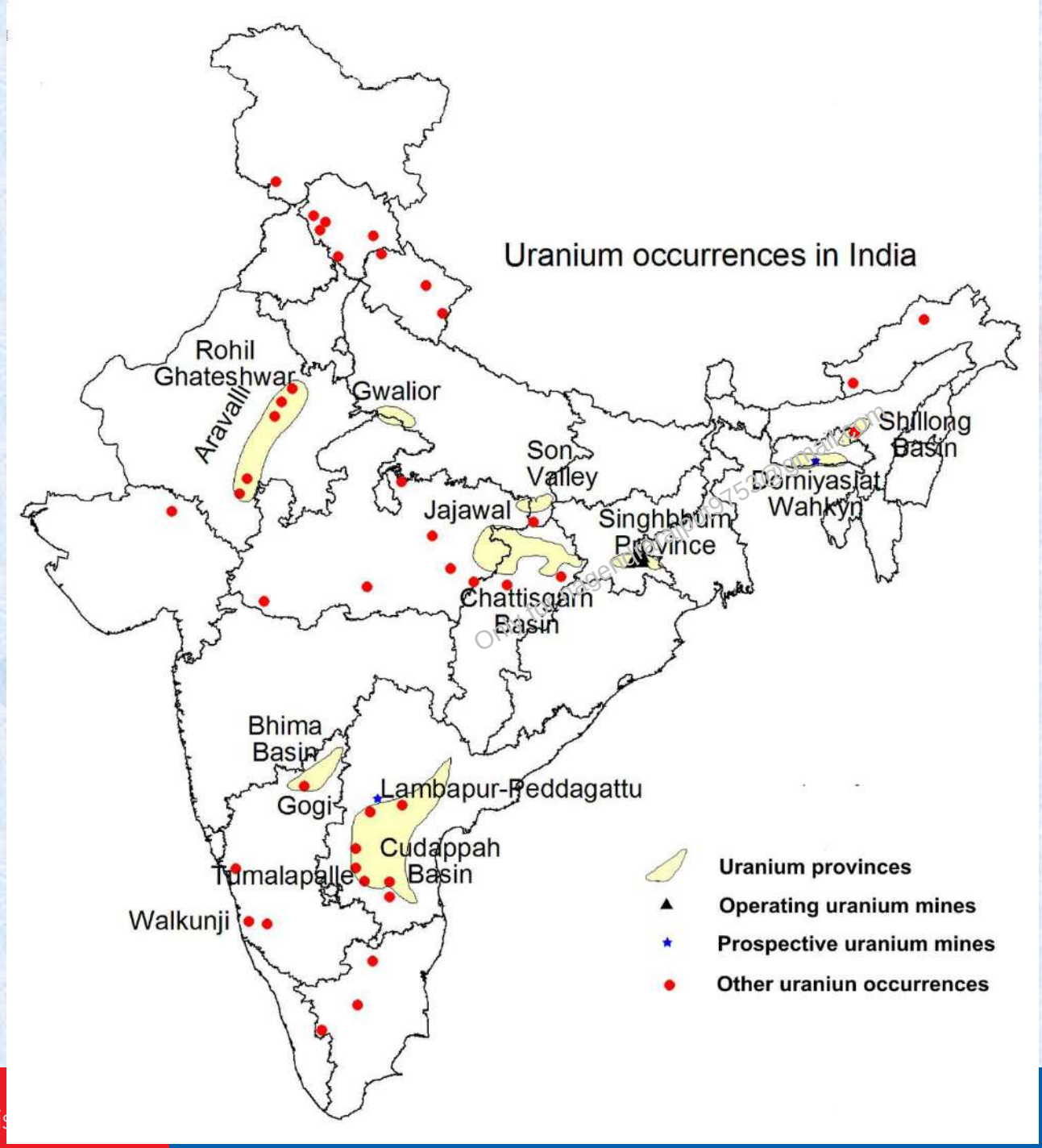
Oilfields and Refineries in India

- **Assam region**: Digboi, Naharkatiya, Hagriyan-Moran and Surma river valley. Natural gas is also found in Bagrijan-Moran area.
- **Gujarat region**: Khambakt and Ankleshwar while oil regions are extended upto Navgaon, Kosamba, Olpad, Dholka, Mehsana, Kalal etc.
- **Mumbai High region**, 176 km away from the Mumbai coast
- Region off-shore in **Krishna - Godavari** river valley.

Prospective basins for phase 1 shale oil and gas exploration

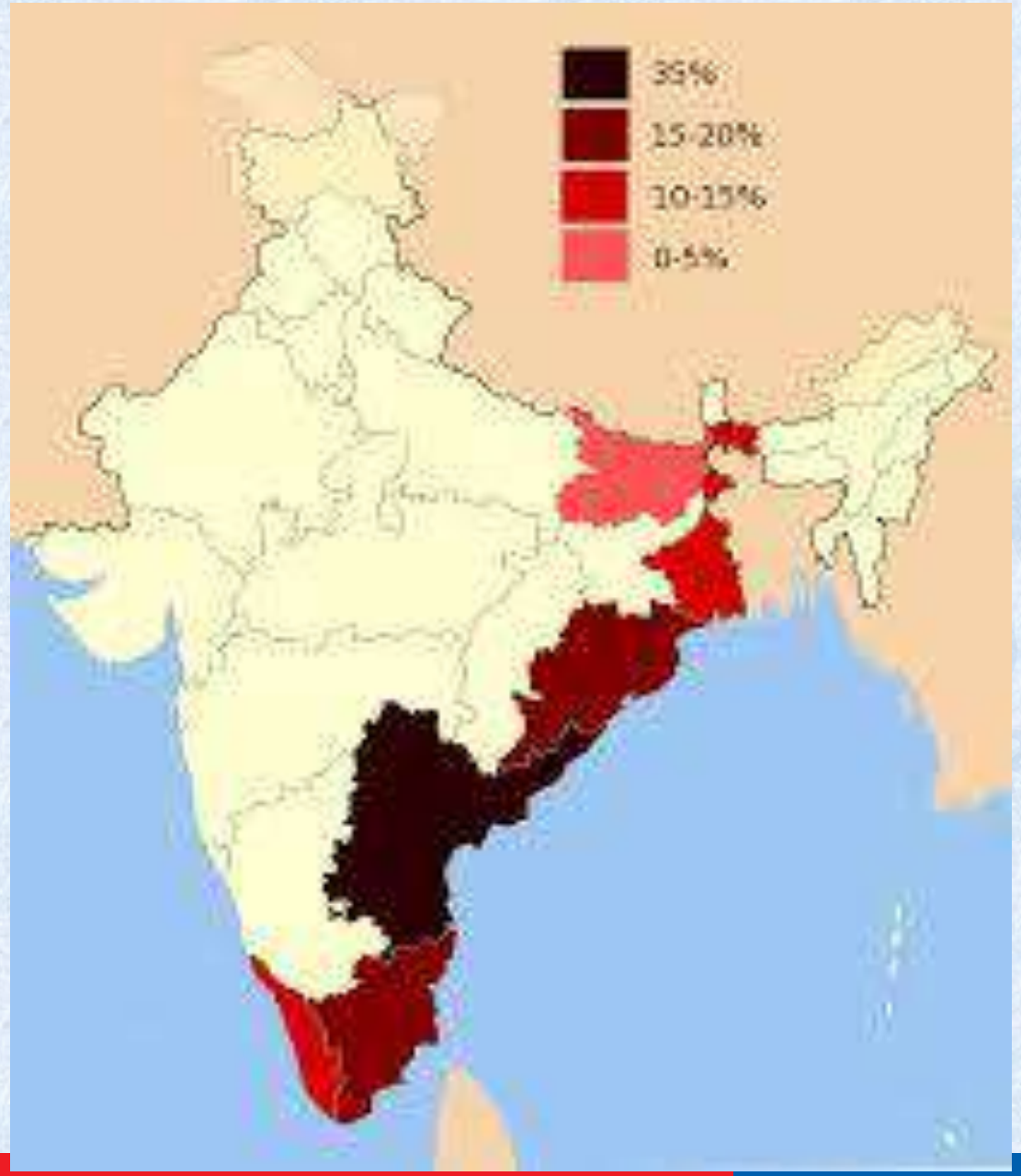






Uranium resources (as of July 2017)

State	Districts	Main deposits	Tonnes U
Andhra Pradesh	Kadapa	Tummalapalle	120,229
	Guntur	Koppunuru	2,341
Telangana	Nalgonda	Lambapur, Pedagattu, Chitrial	15,731
Jharkhand	E.Singhbhum	Jaduguda, Bhatin, Narwapahar, Turamidh, Banduhurang, Mohuldih, Bagjata,	53,237
	Saraikela-Kharswan	Bangurdih	1,367
Meghalaya	West Khasi Hills	KPM (Domiasat), Wahkyn, Wahkut	19,538
Rajasthan	Sikar, Udaipur	Rohil, Umra	7,989
Karnataka	Yadgir, S.Kanara	Gogi	3,970
Chhattisgarh	Rajanandgaon, Surguja	Bodal, Jajawal	3,380
Uttar Pradesh	Sonbhadra	Naktu	666
Uttarakhand	Rudraprayag	Pokhri-Tunji	85
Himachal Pradesh	Una, Shimla, Mandi	Rajpura	665
Maharashtra	Gondia	Mogarra	301
Total			**229,499**

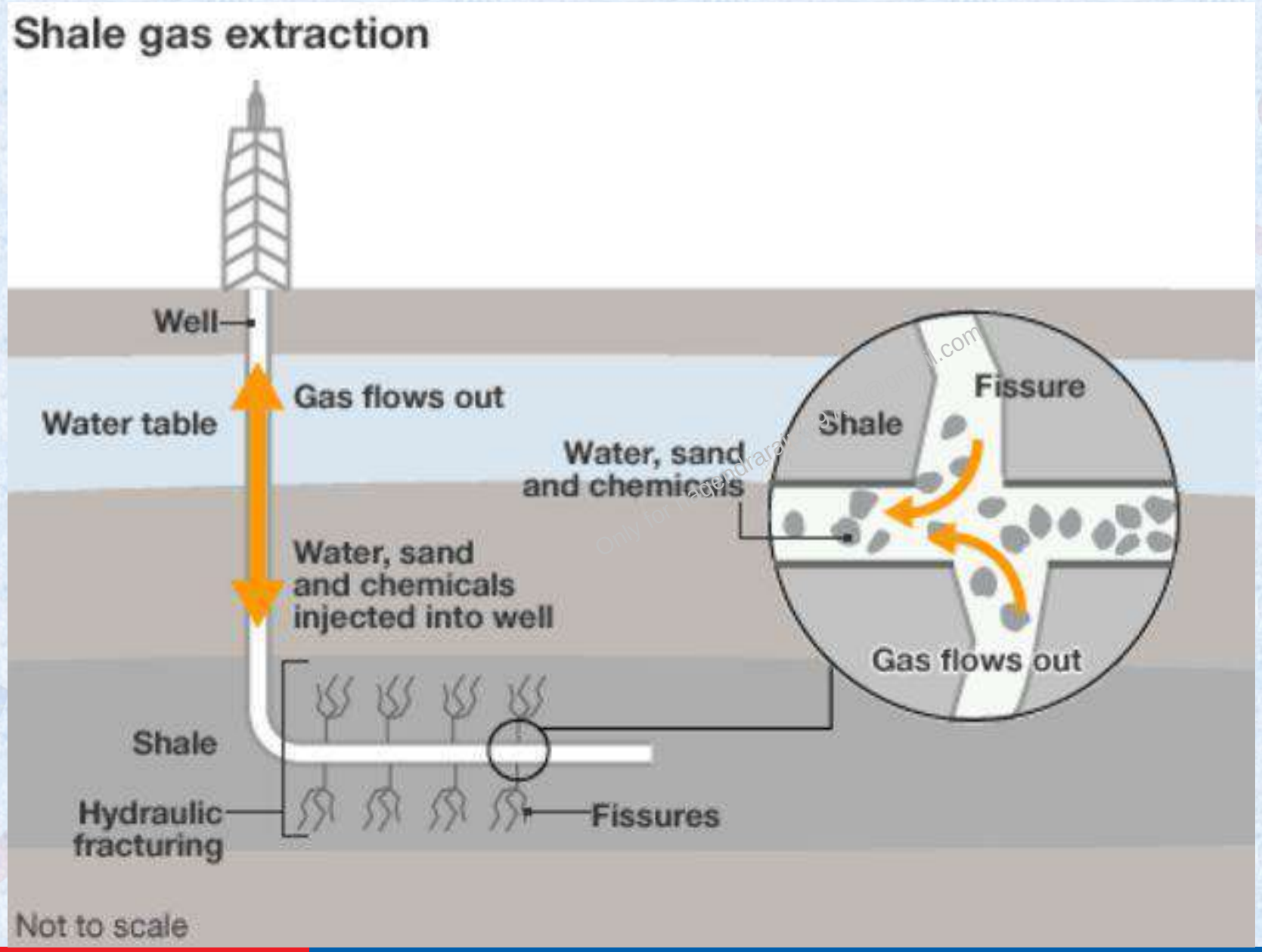


USGS Estimates in tonnes (2011)

Country	Reserves
India	963,000
United States	440,000
Australia	300,000
Canada	100,000
South Africa	35,000

State	Monazite (Million tonnes)
Odisha	2.41
Andhra Pradesh	3.72
Tamil Nadu	2.46
Kerala	1.90
West Bengal	1.22
Jharkhand	0.22
Total	11.93

Shale gas extraction



I. Major Minerals

Fuel Minerals

- Coal
- Lignite
- Natural Gas
- Petroleum (Crude)

Other Major Minerals

Metallic Minerals

- Bauxite
- Chromite
- Copper Ore
- Gold
- Iron Ore
- Lead Concentrates
- Zinc Concentrates
- Manganese Ore
- Silver
- Tin Concentrates
- Tungsten Concentrates

Non-Metallic Minerals

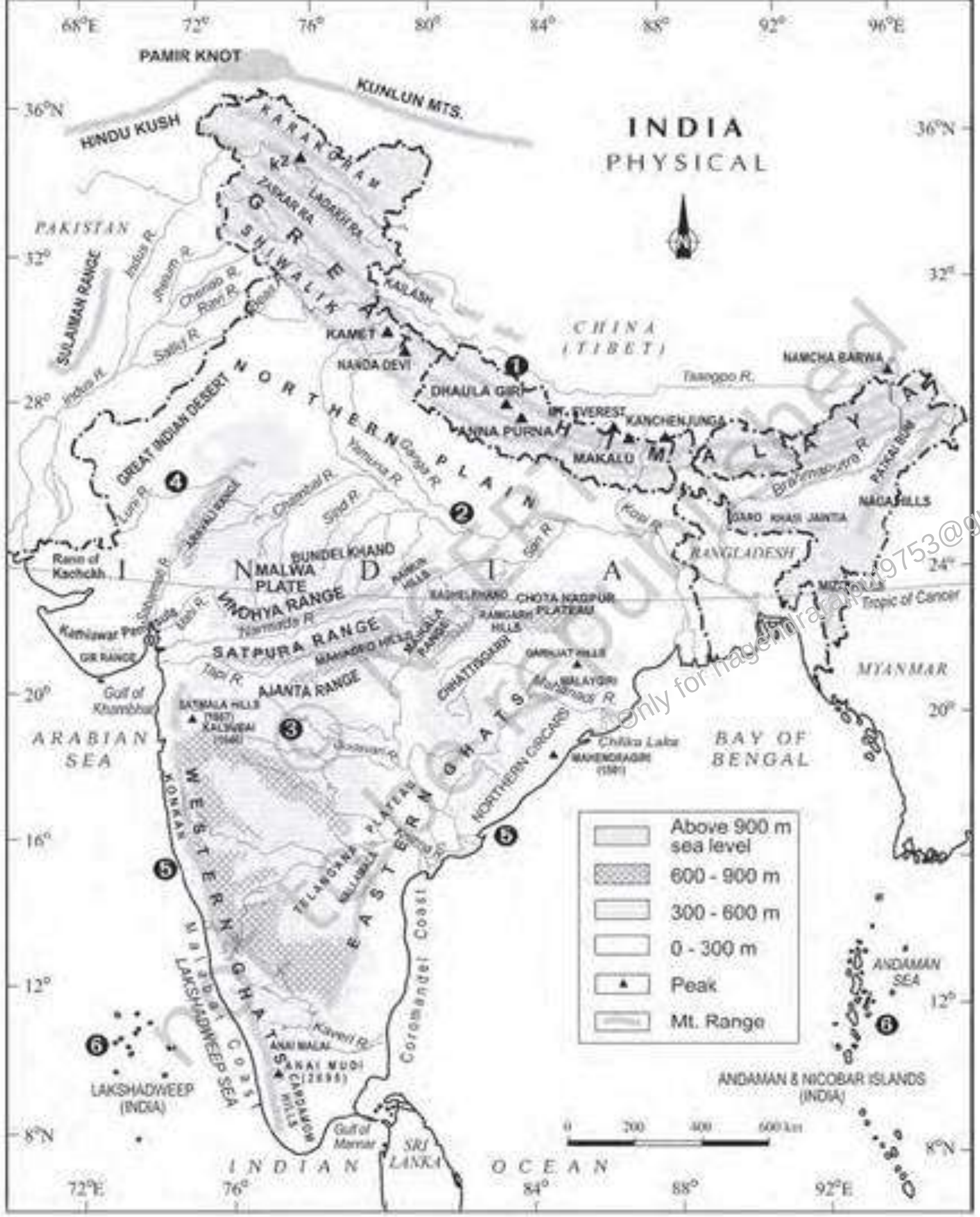
- Agate
- Andalusite
- Apatite
- Asbestos
- Ball Clay
- Barytes
- Calcite
- Chalk
- Clay (Others)
- Corundum
- Calcarious sand
- Diamond
- Diaspore
- Dolomite
- Dunite
- Felspar
- Fire Clay
- Felsite
- Flourite(Graded)
- Flourite (Concentrates)
- Gypsum
- Garnet (Abrasives)
- Garnet (Gem)
- Graphite run-on-mines (r.o.m.)
- Jasper
- Kaolin
- Kyanite
- Laterite
- Limestone
- Limestone Kankar
- Lime Shell
- Magnesite
- Mica(Crude)
- Ochre
- Pyrites
- Pyrophyllite
- Phosphorite
- Quartz
- impure quartz,
- Quartzite
- Fuchsite Quartzite
- Silica Sand
- Sand Others
- Salt (Rock)
- Salt (Evaporated)
- Shale
- Slate
- Steatite
- Sillimanite
- Vermiculite
- Wollastonite

Important minor minerals

1. boulder,
2. shingle,
3. lime shell, kankar and limestone used in kilns for manufacture of lime used as building material,
4. brick-earth,
5. bentonite,
6. slate and shale when used for building material,
7. marble,
8. stone used for making household utensils,
9. quartzite and sandstone when used for purposes of building or for making road metal and household utensils,
10. saltpetre
11. ordinary earth (used or filling or leveling purposes in construction or embankments, roads, railways, building).

Important minor minerals

12. Agate,
13. Barytes,
14. Calcite,
15. Chalk,
16. Corundum,
17. Diaspore,
18. Dolomite,
19. Dunite/Pyroxenite,
20. Felspar,
21. Gypsum,
22. Jasper,
23. Kaolin,
24. Laterite,
25. Sand (others),
26. Silica Sand,
27. Steatite or Talc or Soap stone.



Cotton Textiles

Jute and Silk Textiles

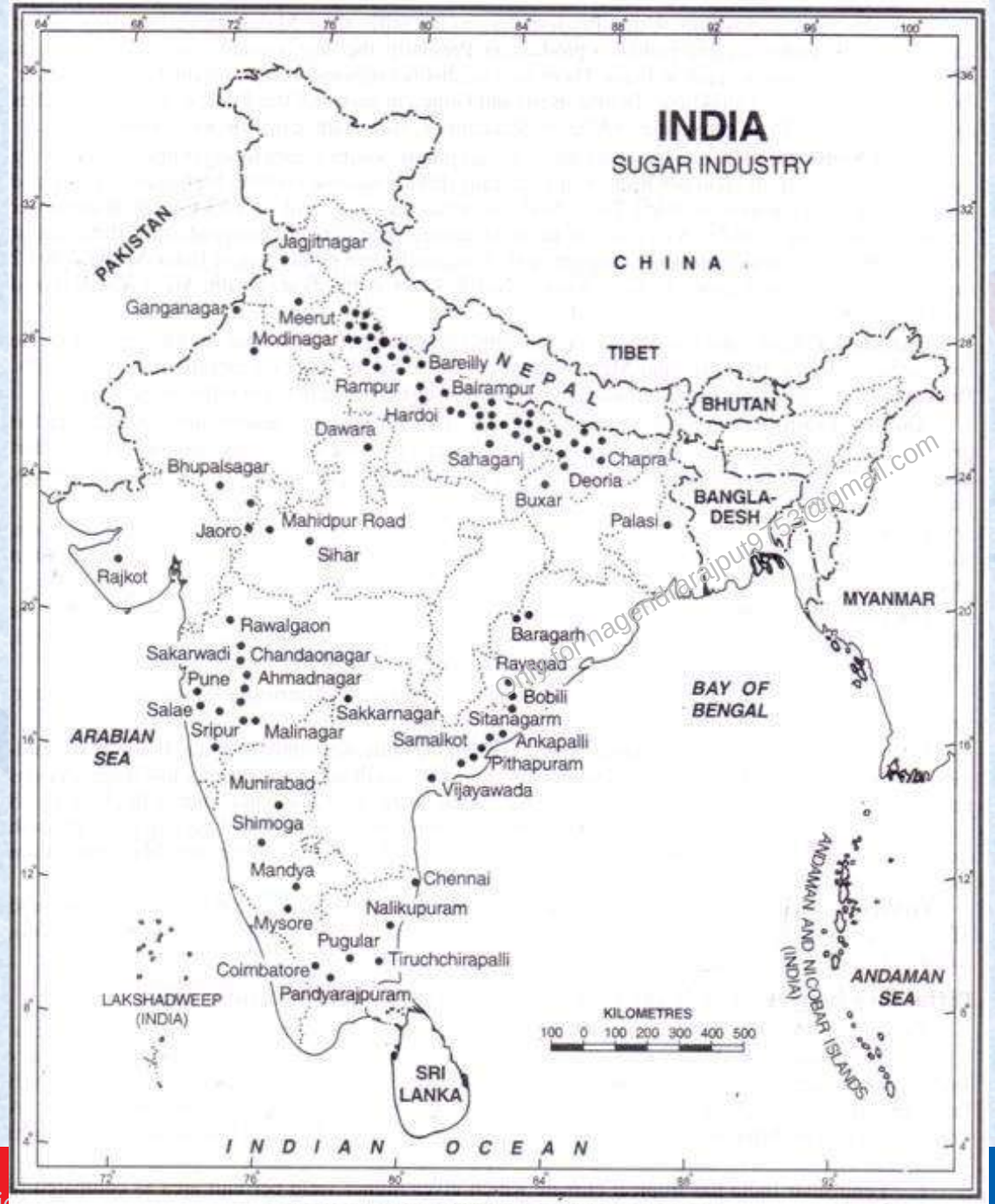


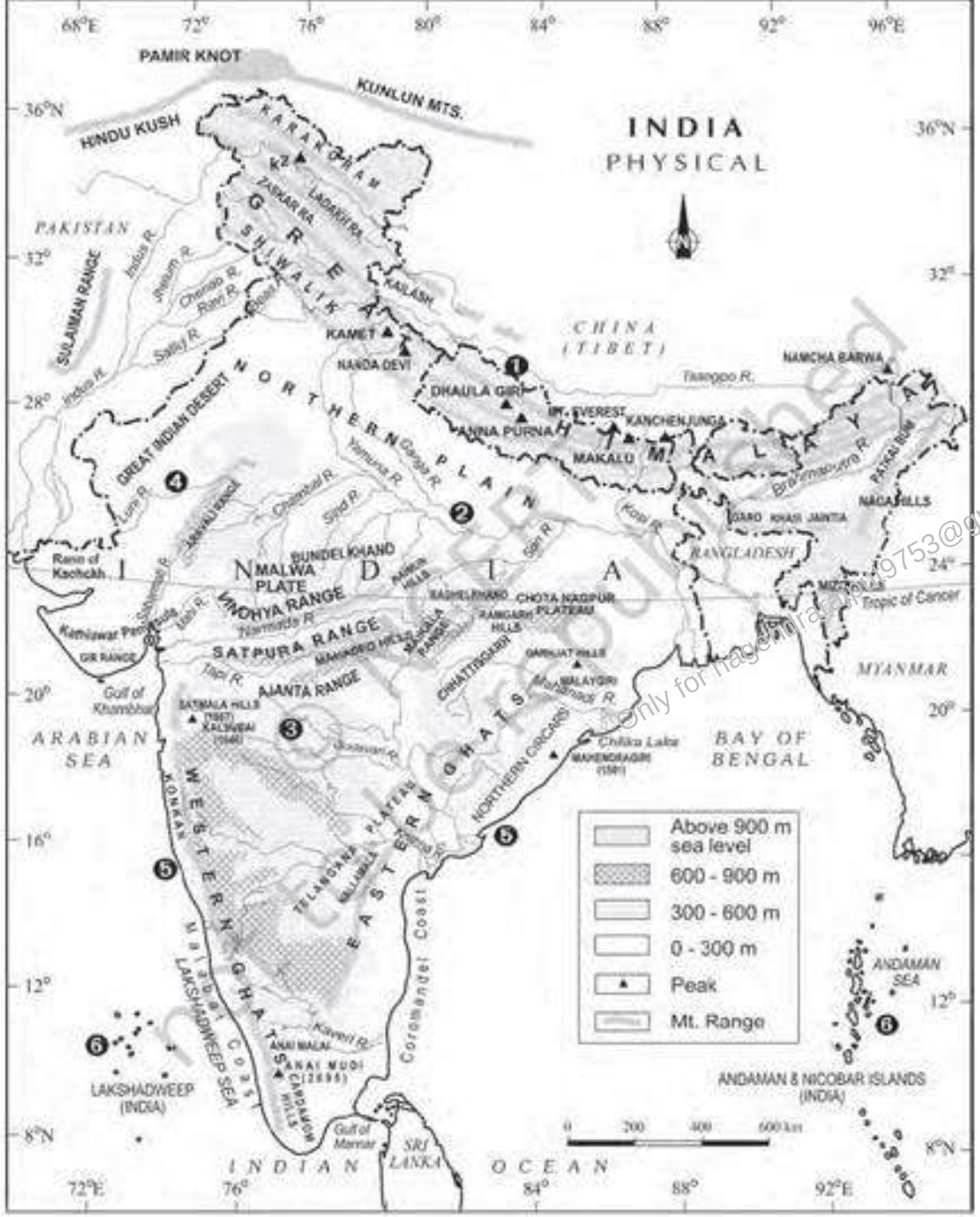
FIG. 27.17. India : Distribution of Sugar Industry

Metal Based Industries

DISTRIBUTION –

I&S Plant	Iron Ore	Coal	Lime & Mag	Water	Labour	Power
• Jamshedpur TISCO Jharkhand	Jharkhand Odisha	Jharia	Odisha	Subarnrekha	Bihar Odisha	Jharkhand
• Burnpur WB	Jharkhand	Raniganj	Odisha	Damodar	Bihar	Damodar Valley Corp.
• Durgapur WB Help of UK	Jharkhand	Raniganj	Odisha	Damodar	Bihar	DVC
• Bokaro (Jharkh.) USSR	Jharkhand	Bokaro	Odisha	Local reservoir	Bihar	DVC
• Rourkela (Odisha) Germany	Odisha	Bokaro	Odisha	Local Rivers	Odisha	Hirakud Project
• Bhilai (Chattisgarh) USSR	Chattisgarh	Godavari Valley + Chattisgarh	Maha. + MP	Local Stream	Chattis. garh	Thermal Power Plant

I&S Plant	Iron Ore	Coal	Lime & Mag	Water	Labour	Power
• Bhadravati (Karnataka) VISL	Karnataka	Godavari Valley AP, Ch.	Karnataka	Bhadra River + Tunga River	Local	Sharavathi Power Project
• Vizag (AP)	Chattisgarh	Godavari	Karnataka + Local			
• Vijaynagar Steel Plant (Kar.)	Karnataka	AP	Karnataka	Tungabh-adra	Local	Tungabhadra PP
• Salem (T Nadu)	Karnataka	Neyveli Coal	Karnataka	Cauvery	Local	Mettar PP

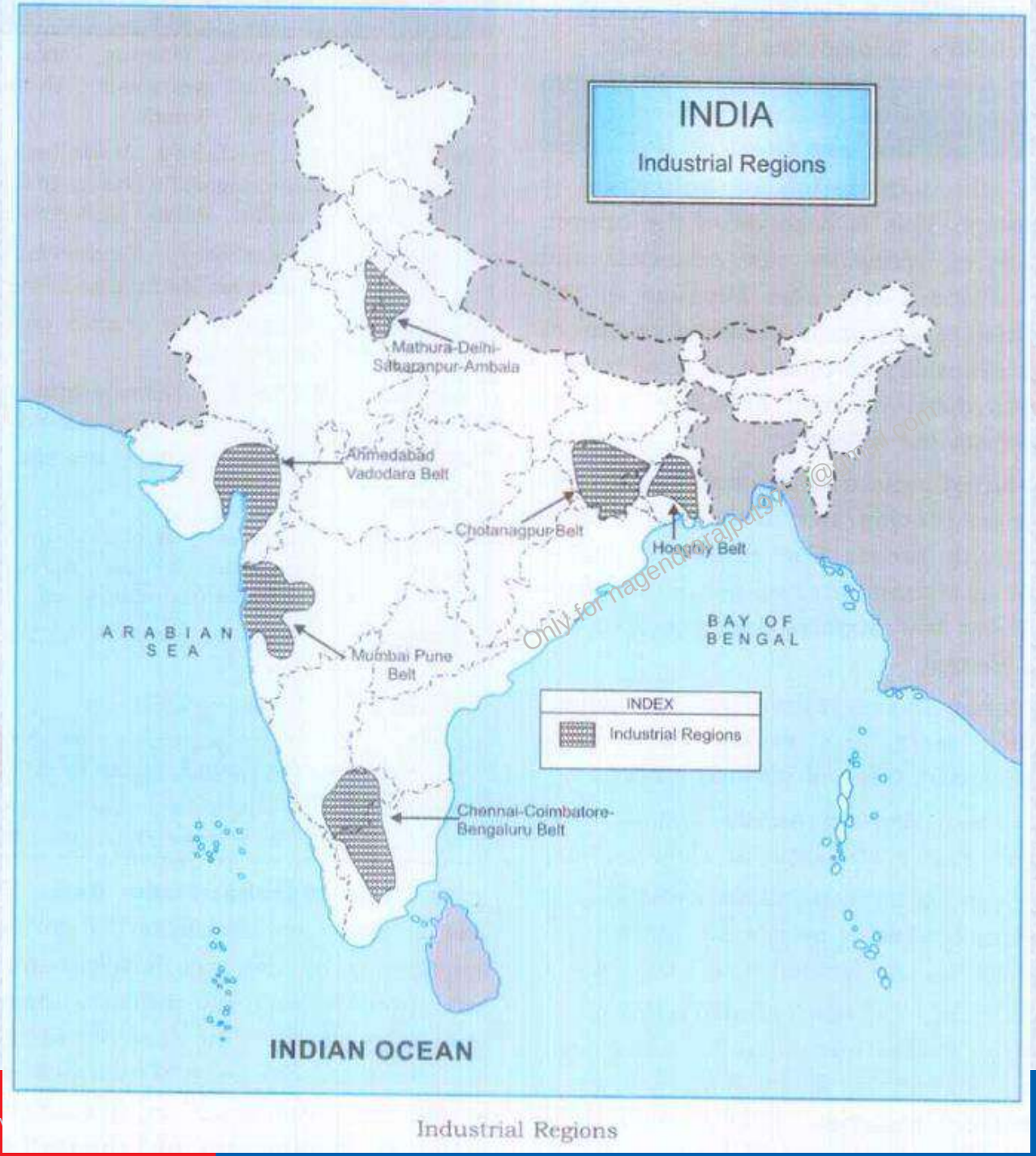


Major Industries in India

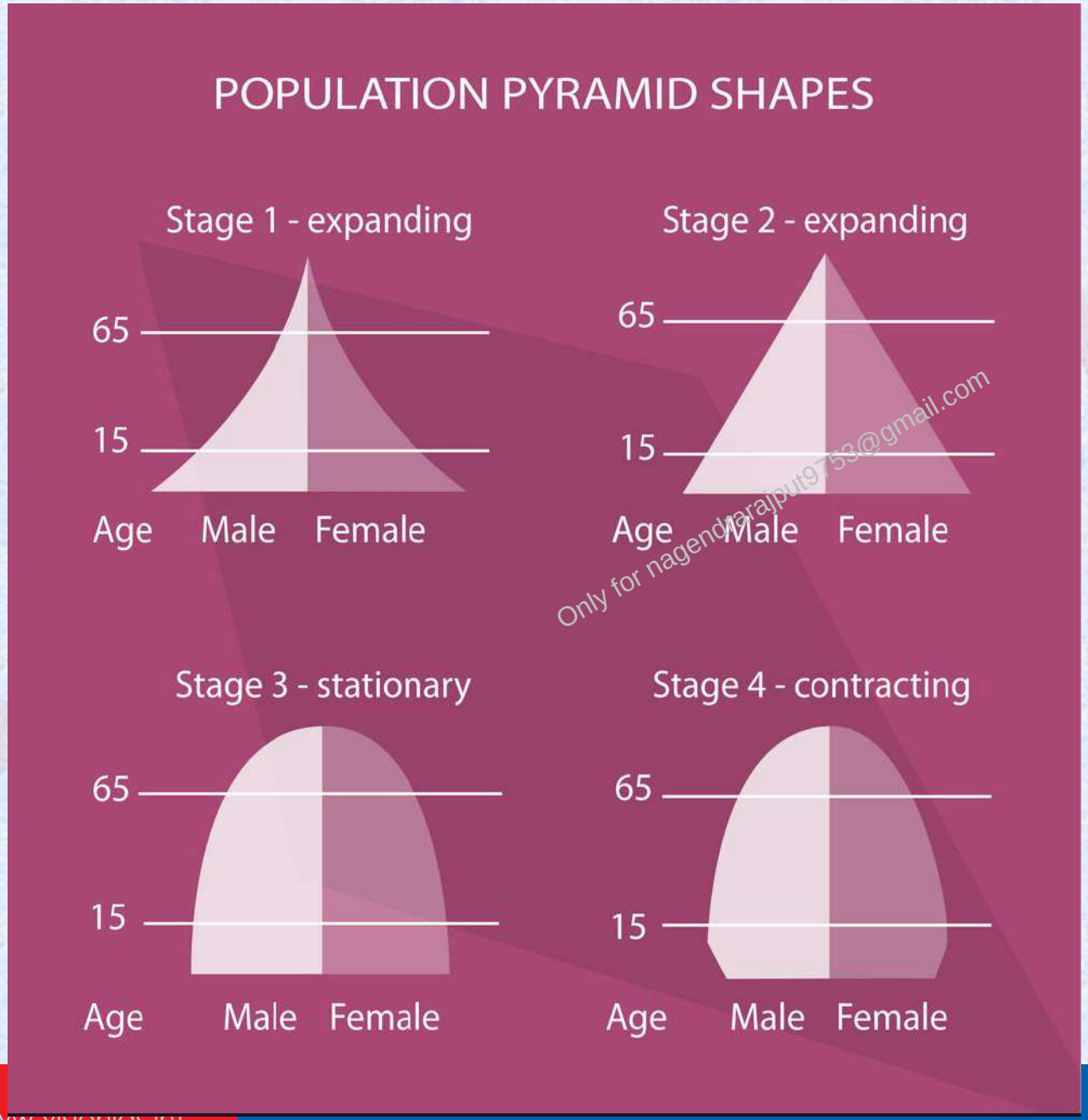
Industry	States and Main Centres of Production
1. Iron and Steel	1. **Tata Iron and Steel Company (TISCO)** — Jamshedpur, Jharkhand 2. **Bokaro Steel Plant** — Hazaribagh, Jharkhand. 3. **Durgapur Steel Plant** — Burdwan, West Bengal. 4. **Bhilai Iron and Steel Plant** — Durg, Chhattisgarh. 5. **Rourkela Steel Plant** — Sundargarh, Odisha. 6. **Indian Iron and Steel Company (IISCO)** — IISCO Plants are located at Burnpur, Hirapur and Kulti, near Asansol, West Bengal. 7. **Vishvesvaraya Iron and Steel Limited** — Shimoga, Karnataka. 8. **Vijayanagar Steel Plant** — Bellary, Karnataka. 9. **Vishakhapatnam Steel Plant** — Vishakhapatnam, Andhra Pradesh. 10. **Salem Steel Plant** — Salem, Tamil Nadu.
2. Heavy Engineering Industry **(A) Shipbuilding**	1. **Hindustan Shipyard Limited (HSL)** — Vishakhapatnam, Andhra Pradesh. 2. **The Cochin Shipyard** — Cochin, Kerala. 3. **The Garden Reach Workshop** — Kolkata, West Bengal. 4. **The Mazagaon Dock Limited (MDL)** — Mumbai, Maharashtra.
(B) Automobile	1. **Bus and Trucks** — Pune, Mumbai, Chennai, Kolkata, Jamshedpur, Lucknow, Uttarakhand. 2. **Jeeps** — Jabalpur (MP), Mumbai. 3. **Cars** — Gurgaon (Haryana), Kolkata, Chennai, Mumbai, Bengaluru, Sanand (Gujarat). 4. **Two and Three Wheelers** — Mumbai, Pune.

(C) Railway Locomotives	(i) **The Chittaranjan Locomotive Works** — West Bengal; (ii) **The Diesel Locomotive Works** — Varanasi (UP); (iii) **The Integral Coach Factory** — Perambur, Chennai; (iv) **The Rail Coach Factory** — Kapurthala, Punjab.
(D) Aircraft	(i) **The Hindustan Aeronautics Ltd. (HAL)** — Nasik, Koraput, Hyderabad, Kanpur, Lucknow, Bengaluru.
(E) Heavy Electrical	(i) **The Heavy Electrical Ltd.** — Bhopal, Madhya Pradesh; (ii) **The Bharat Heavy Electrical Ltd.** — Haridwar (UP), Ramchandrapuram (Telangana), Tiruchirapalli (Andhra Pradesh); (iii) **The Hindustan Cables Factory** — Jhansi (UP) and Rupnarainpur, West Bengal.
(F) Heavy Machines and Tools	(i) **The Hindustan Machine Tools (HMT)** — Bengaluru, Karnataka; (ii) **The Heavy Machine Tools Plant** — Ranchi, Jharkhand; (iii) **The Machine Tool Corporation of India** — Ajmer, Rajasthan; (iv) **The Praga Tools Ltd.,** — Secunderabad, Andhra Pradesh; (v) **The National Instruments Factory** — Kolkata, West Bengal.
3. Electronics	(i) **The Indian Telephone Industries (ITI)** — Bengaluru, Karnataka; (ii) **The Electronics Corporation of India Ltd. (ECIL)** — Hyderabad, Andhra Pradesh; (iii) **The Bharat Electronics Ltd. (BEL)** — Bengaluru, Karnataka.

4. Space Technology	1. **The Indian Space Research Organisation (ISRO),** — Bengaluru, Karnataka. 2. **Satellite Launching Station** — Sriharikota, Andhra Pradesh. 3. **National Remote Sensing Agency** — Hyderabad, AndhraPradesh. 4. **Chandrayaan-I** — India's First Scientific Mission to Moon.
5. Software Industry	Bengaluru and Hyderabad.
6. Entertainment	Mumbai, Kolkata, Chennai and Pune
7. Petrochemical Industry	1. **Herdillia Chemicals Ltd.** — Chennai, Tamil Nadu. 2. **National Organic Chemicals Industries Ltd.** — Mumbai, Maharashtra. 3. **Petrofils Cooperative Limited (PCL)** — Three plants located at Vadodara and Naldhari in Gujarat. 4. **Indian Petrochemical Corporation Ltd.** — Vadodara, Gujarat. 5. **The Bongaigaon Petrochemicals Ltd.** — Bongaigaon, Assam. 6. **The Reliance Industries:** Hazira, Gujarat. 7. **Haldia Petrochemicals Ltd.:** Haldia, West Bengal. 8. **The Indian Oil Corporation:** Three plants in Gujarat and Panipat.

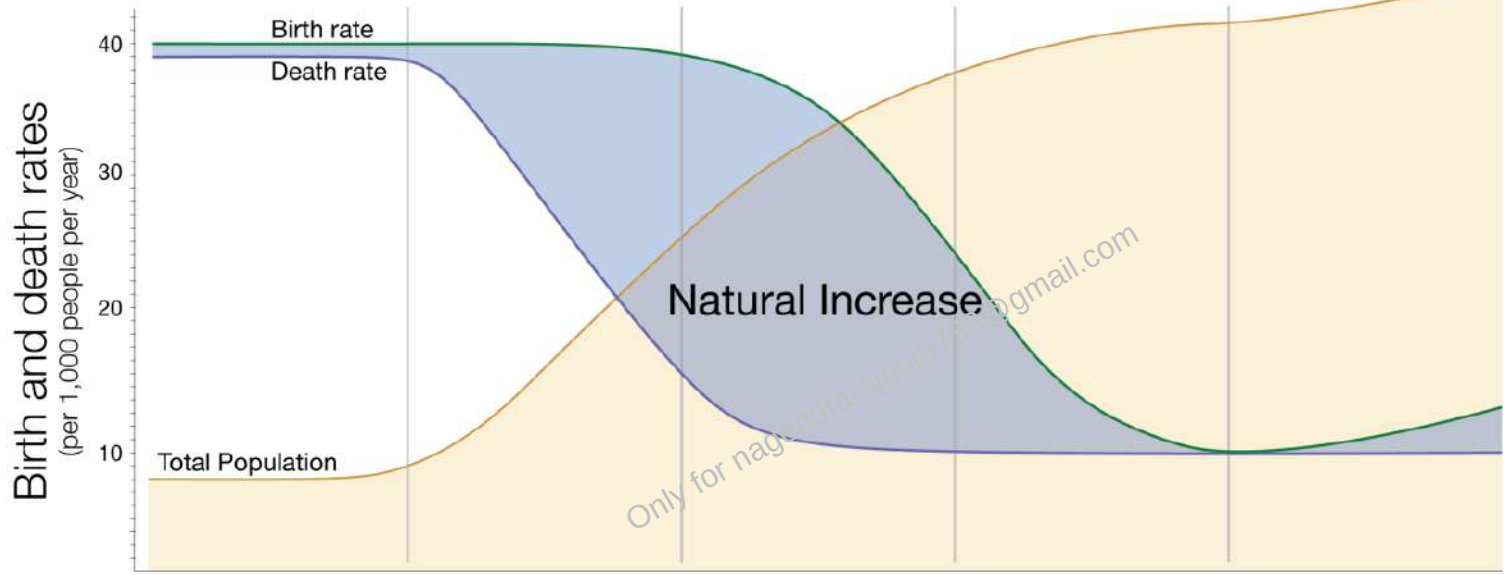


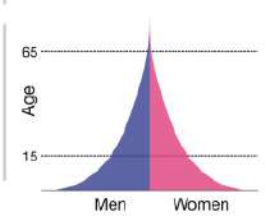
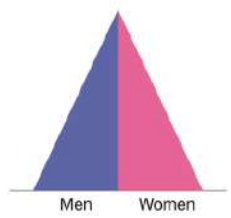
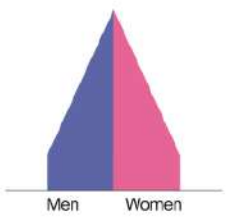
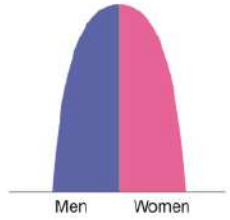
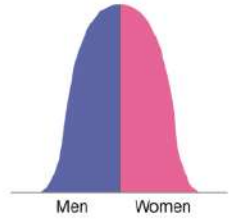
Industrial Regions



The demographic transition in 5 stages

Our World in Data



	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5
Birth rate	High	High	Falling	Low	Rising again
Death rate	High	Falls rapidly	Falls more slowly	Low	Low
Natural increase	Stable or slow increase	Very rapid increase	Increase slows down	Falling and then stable	Stable or slow increase
Population Pyramid					

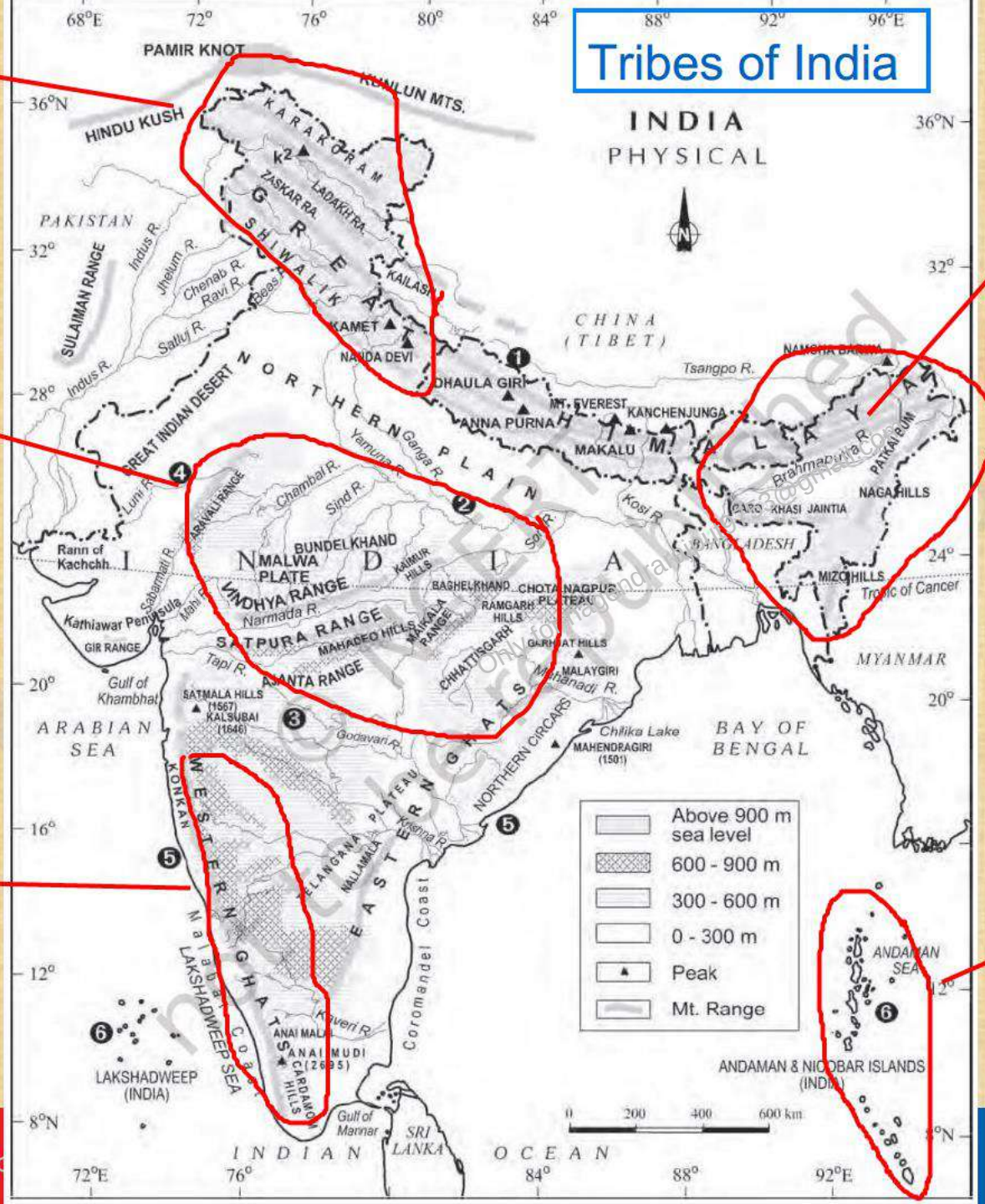
- Bakerwal
- Gaddis
- Tharu
- Changpa
- Bhotias

- Bhils
- Khonds
- Gond
- Asur
- Munda
- Meena
- Abhujmarya
- Bisonhornmarya

- Irulas
- Todas
- Puliyans
- Uralis
- Jenu kurubas
- Chenchu
- Soliga

- Garo
- Khasi
- Jaintia
- Dafla
- Miri
- Abor
- Mishmi
- Naga
- Mikir

- Andamanese
- Nicobarese
- Onge
- Jarawa
- Sentineles
- Shompen



Questions??

- Online query (For faster reply)
- Read and revise what is taught
- Read the reference material
- Mentoring sessions

If Dil Maange beyond MORE…

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