



## 50 INFRASTRUCTURE → MEANING & CHARACTERISTICS

**Definition:** Infrastructure (बुनियादी संरचना / अवसंरचना) is the set of basic facilities that help an economy to function & grow such as energy, irrigation, roads, railway & telecommunication.

**Infrastructure sector has following characteristics →**

1. Sometimes a **natural monopoly** e.g. Railways (and once upon a time even aviation and telecom sector in India).
2. **Sunk costs are high.** It's the investment that cannot be recovered even when the firm go out of business. e.g. If airport closed down, airstrip's asphalt will have little or no resale value because very bulky to dig-off and transport.
3. **'Output' is often Non-Tradable.** e.g. A road / bridge / airport constructed at one place cannot be 'transferred' to another place unlike a box of carrots.
4. Sometimes **intangible in nature** e.g. we can't touch spectrum or electricity.
5. Consumption is often **'Non-Rival'** in nature e.g. One person using a road or street light it doesn't make that product 'unavailable' for others (unlike a privately owned iphone.)
6. **Price Exclusion is often difficult.** A rural road or street light can't be 'denied' to a person who is not paying taxes or user-fees. (whereas if a person cannot afford iPhone then he is excluded from buying it.)
7. Usually **creates positive externality:** e.g. new railway station / airport → that much more business for taxi-walla & hotel owners in the surrounding area.

Category	Sectors granted 'infra' status by FinMin → Dept. of _____
Transport & Logistics: परिवहन और रसद	<ul style="list-style-type: none"> <li>- Roads and bridges, Ports, Shipyard, Inland Waterways, Airport, Railway, tunnels, bridges, Transport, Logistics Infrastructure.</li> <li>- <b>2019-Feb:</b> Commerce Ministry released 'Draft National Logistics Policy' But it's 'draft' so we need not lose sleep.</li> </ul>
Energy	Electricity, Oil, Gas
Water & Sanitation	Water supply & treatment, Sewage/Solid Waste Management, Irrigation
Communication	Telecommunication
Social & Commercial Infrastructure	<ul style="list-style-type: none"> <li>- Hospitals, Education Institutions, Sports Infrastructure, Tourism infrastructure -hotels, ropeways and cable cars etc.</li> <li>- Industrial Parks, food parks, textile parks, SEZ etc.</li> <li>- Cold storage, Soil-testing laboratories</li> <li>- Affordable Housing</li> </ul>

If a sector gets infrastructure 'status', then its entrepreneurs get following benefits (as and when notified):

1. Govt could give them tax benefits, lease public land at a token price, faster environment clearance, automatic FDI approval etc.
2. RBI could help them by relaxing the External Commercial Borrowing (ECB) norms, Debt restructuring (e.g. RBI's 5/25 rule), Changing PSL norms etc.
3. SEBI could relax norms for REITs/InvITs etc. funds to help them mobilize capital easily for the infrastructure sector.
4. IRDAI & PFRDA could oblige insurance and pension cos. to invest minimum X% in infrastructure companies etc.
5. They could get easier funding from World bank & other multilateral banks.



## 51 INFRASTRUCTURE → MINING (खनन)

[Yearbook] Ministry of Mines ( खान मंत्रालय) <list not exhaustive>

Dept / Statutory	N/A
<b>Attached / subordinate offices</b>	<ul style="list-style-type: none"> <li>– National Mineral Exploration Trust राष्ट्रीय खनिज अन्वेषण न्यास</li> <li>– Geological Survey of India भारतीय भूवैज्ञानिक सर्वेक्षण</li> <li>– Indian Bureau of Mines भारतीय खान ब्यूरो</li> </ul>
<b>PSU</b>	<ul style="list-style-type: none"> <li>– National Aluminium Company Limited (NALCO), Bhubaneswar;</li> <li>– Hindustan Copper Limited (HCL), Kolkata;</li> <li>– Mineral Exploration Corporation Limited (MECL), Nagpur.</li> </ul>
<b>Autonomous bodies / Trusts</b>	<ul style="list-style-type: none"> <li>– National Institute of Rock Mechanics</li> <li>– Kolar Gold Fields (<b>KGF</b>, Karnataka),</li> <li>– National Institute of Miners' Health (NIMH), Nagpur</li> <li>– Districts Mineral Foundations (DMF) in mining districts.</li> </ul>

By default the 'regulation of mines and mineral development', falls under Union List. But,

- **Minor minerals:** गौण खनिज = Their legislation, royalty, administrative work is delegated to the States' domain e.g. Mica, Marble, Granite, Agate, Chalk, Gypsum, Shale etc.
- **Major minerals:** प्रमुख खनिज = Any mineral that is not in Minor mineral list is called 'Major Mineral' → Union's domain e.g. atomic minerals, bauxite, iron, coal, petroleum, natural gas etc.

### 51.1 NATIONAL MINERAL POLICY (NMP) 2019

- **Boss?** Mining Ministry, to replace 2008's policy.
- **Target:** For non-fuel and non-coal minerals
- We'll allow transfer of mining leases from one company to another, help in their merger and acquisition (विलय और अधिग्रहण).
- We'll grant 'industry' status to mining. (so they become eligible for certain tax benefits / schemes meant for industry sector, if any.)
- We'll harmonize India's mining taxes & royalty rates to global benchmarks.
- R&D, manpower skilling, environmental conservation etc.
- We've already allowed 100% FDI in mineral exploration but we'll work for ease of doing biz, so that FDI actually comes ;-)

### 51.2 MINING → MMDR ACT 2015

Mines and Minerals Development and Regulation Act, (2015: खान और खनिज विकास और विनियमन अधिनियम) replaced the 1957's act for ease of doing biz.

- Mining Lease (= Concessions अनुज्ञा पत्र) will be granted **only through auction**. No discretionary allotment (विवेकाधीन आवंटन) to any company.
- Mining Lease shall be given for 50 years, then it'll be put up for auction (and not renewal unlike the earlier system).
- Establish a **National Mineral Exploration Trust** (राष्ट्रीय खनिज अन्वेषण ट्रस्ट). Mining companies required to pay them → it'll carry out exploration of minerals.



- Establish 'Not-for-Profit Trusts' \_\_\_\_\_ (DMF: जिला खनिज प्रतिष्ठान) in all districts where mining takes place. Mining company required to pay them ₹ ₹ → DMF to use it for the welfare of people in the district who are affected by the mining related operations. State govt to prescribe the administrative structure and guidelines of DMFs.
- Higher penalties and jail terms for illegal mining (अवैध खनन).

**MCQ. What is/are the purpose/purposes of 'District Mineral Foundations' in India?(Asked in UPSC-Pre-2016)**

1. Promoting mineral exploration activities in mineral-rich districts
2. Protecting the interests of the persons affected by mining operations
3. Authorizing State Governments to issue licences for mineral exploration

**Answer Codes:** (a) 1 and 2 only (b) 2 only (c) 1 and 3 only (d) 1, 2 and 3

### 51.3 MINING → COAL (कोयला)

Type	Note	Carbon %
<b>Peat</b>	Highest moisture content = smoke pollution. Most inferior in energy	40
<b>Lignite / Brown coal</b>	Important states: TN (Neyveli), Gujarat, Rajasthan	40-60
<b>Bituminous/ Black-Coal</b>	<ul style="list-style-type: none"> <li>• Upon heating, it releases a liquid called Bitumin.</li> <li>• Used to make coking coal, gas coal, steam coal.</li> <li>• Notable states: Chattisgarh, Jharkhand, WB, MP, Odisha</li> </ul>	60-80
<b>----- Hard Coal</b>	Burns with short blue flame, lowest moisture content, highest energy.	80-90

[Yearbook] Coal Ministry (कोयला मंत्रालय) consists of →

<b>Dept</b>	- N/A
<b>Attached / subordinate</b>	- Coal Controller's Organization
<b>PSU</b>	<ul style="list-style-type: none"> <li>- Coal India Ltd (CIL) &amp; its subsidiaries. HQ: Kolkata, Maharatna company, single largest coal producing company.</li> <li>- Neyveli Lignite Corporation, Tamil Nadu.</li> <li>- Singareni Collieries Company Limited: ----- Govt 51%: Union: 49%</li> </ul>
<b>Statutory</b>	- Coal Mines Provident Fund Organization

- **1973:** Coal Mines Nationalization Act → Coal India and other CPSEs took over private coal mining companies. They will dig coal, sell it to thermal power plants & other industries.
- **1993:** Private mining allowed for ONLY for captive use (अंकुशित उपयोग) i.e. industrialist wanting coal for his own steel, cement, aluminium etc. manufacturing processes → UPA-raj Captive Mining rights given to ministers' relatives → they sold rights to needy companies @higher price= SCAM, then 2014: SC cancelled coal block allocations.
- **2015:** Coal Mines Special Provision Act: It opens up commercial coal mining for both private and public entities, and thus ends monopoly of Coal India.



- **2017: SHAKTI Coal Policy: Boss?** Coal Ministry. Scheme for Harnessing and Allocating Koyala (Coal) Transparently in India (SHAKTI). Previously, which thermal power plant company will get how much coal from Coal India? → that depended on discretion of Government. Shakti Policy replaces that discretion with an online centralised bidding process. ~~Beyond that how it works in real life PhD = useless.~~

#### Apps?

1. **Coal Mitra App** by Power Ministry to help companies in buying / selling coal.
2. **UTTAM App** by coal ministry to monitor coal quality coming from a particular mine.

**MCQ. Consider the following statements relating to Coal India Limited : (Asked in UPSC-CDS-2019-i)**

1. It is designated as a 'Maha Ratna' company under the Ministry of Coal.
2. It is the single largest coal producing company in the world.
3. The Headquarters of Coal India Limited is located at Ranchi Jharkhand.

Answer Codes: a) 1 only b) 1 and 2 only c) 2 and 3 only d) 1, 2 and 3

#### **51.3.1 Coal Energy: Economic survey suggestions / observations:**

1. **Carbon Imperialism (कार्बन साम्राज्यवाद)** is a modern day type of imperialism wherein the 1st world nations are trying to enforce their views about energy-consumption upon the 3rd nations with hidden agenda to 1) To sell their nuclear fuel and technology. 2) To portray the third world in bad light for using coal power and thereby reducing their own culpability (दोषी/ दण्ड्यता) for global warming.
2. But for India **coal based electricity is a necessary evil** because 1) Wind and solar power are nondispatchable, meaning electricity can be generated only when there is fast wind blowing or there is appropriate sunshine 2) Land requirement for solar based powerplant is 10 times that of thermal power plant. 3) Bottlenecks in acquiring nuclear fuel and nuclear Technology 4) unemployment if we shut down coal mining & thermal plants. Further mains self study at [mrunal.org/2017/09/upsc-mains-answer-writing-gsm3-carbon-imperialism.html](http://mrunal.org/2017/09/upsc-mains-answer-writing-gsm3-carbon-imperialism.html)

#### **51.4 MINING → MISC. SCHEMES**

<b>Pradhan Mantri Khanij Kshetra Kalyan Yojana (2015)</b>	<ul style="list-style-type: none"> <li>- <b>Boss?</b> Mining Ministry.</li> <li>- It aims to use the <b>funds of the DMFs</b> to complement the ongoing union and state schemes in that area, related to like drinking water supply, health care, sanitation, education, skill development, women and child care etc.</li> </ul>
<b>Star Rating Of Mines, 2016</b>	Mining Ministry → Indian Bureau of Mines gives 0-5 Star to a mine depending on whether the mining company is working without adversely affecting the social, economic and environmental well-being of present and future generation.
<b>Illegal mining bad for environment &amp;</b>	<ul style="list-style-type: none"> <li>- <b>Mining Surveillance System (MSS):</b> satellite based system by Indian Bureau of Mines under Mining ministry.</li> </ul>



<b>Govt deprived of royalty so....</b>	<ul style="list-style-type: none"> <li>- <b>Khan Prahari App:</b> Ministry's app for reporting illegal coal mining.</li> <li>- Sidenote: _____ <b>App:</b> Election Commission of India's app to report violation of model code of conduct / expenditure.</li> </ul>
<b>TAMRA App/portal</b>	To do 'legal' mining, entrepreneur has to obtain approvals and participate in the mining block auctions → so, Mining ministry launched TAMRA App/portal (2017)

## 52 INFRA → ENERGY → ELECTRICITY (ऊर्जा → विद्युत)

**Introduction (Origin)** Electricity is a key element in modern day life. Right from running irrigation pumps to charging mobile phones, electricity is a prerequisite for agricultural growth and digital connectivity.

**(DATA)** In India's present electricity mix consists of:

Thermal Electricity (ऊष्मीय विद्युत: Coal > Gas > Oil)	~64%
Renewable: Hydroelectricity (जल-विद्युत)	13%
Renewable Energy (नवीकरणीय ऊर्जा) (Solar, Wind, Biomass etc. except hydro)	21%
Nuclear (नाभिकीय / परमाणुवीय)	~2%
Total	100%

**[Yearbook] Ministry of Power (विद्युत-ऊर्जा मंत्रालय)**

<b>Dept &amp; Attached</b>	N/A but they've filled the deficiency with truckload of other bodies & apps:
<b>Statutory Bodies</b>	<ul style="list-style-type: none"> <li>- Central Electricity Authority (CEA: केन्द्रीय विद्युत प्राधिकरण): prescribes the standards for construction of electrical plants, electric lines etc.</li> <li>- Central &amp; State Electricity Regulatory Commissions (विद्युत नियामक आयोग) for fixing the electricity tariff (prices).</li> <li>- Appellate Tribunal for Electricity (APTEL)</li> <li>- Central / State Transmission Utility</li> <li>- National / Regional / State Load Despatch Centre</li> <li>- Bureau of Energy Efficiency (BEE)</li> <li>- Damodar Valley Corporation (DVC)</li> <li>- Bhakra Beas Management Board (BBMB)</li> <li>- Joint Electricity Regulatory Commission (JERC) for GOA &amp; UTs</li> <li>- JERC for Manipur and Mizoram</li> </ul>
<b>Autonomous bodies</b>	<ul style="list-style-type: none"> <li>- Central Power Research Institute (CPRI)</li> <li>- National Power Training Institute (NPTI)</li> </ul>
<b>PSU</b>	<ul style="list-style-type: none"> <li>- National Thermal Power Corporation (NTPC)</li> <li>- National Hydroelectric Power Corporation (NHPC)</li> <li>- SJVN Ltd: Satluj Vidhyut (Gol 62%, _____ 27%, rest with FI/Public)</li> <li>- THDC India Limited: Tehri Hydro (Gol: 75%, _____ State:25%)</li> <li>- Rural Electrification Corporation (REC)- known for DD Gram Jyoti.</li> <li>- North Eastern Electric Power Corporation (NEEPCO)</li> <li>- Power Finance Corporation (PFC)</li> </ul>



	<ul style="list-style-type: none"> <li>- Power Grid Corporation of India (POWER GRID)</li> <li>- Power System Operation Corporation Limited (POSOCO)</li> <li>- EESL- Energy Efficiency Services Limited- joint venture of NTPC Limited, PFC, REC and POWERGRID- known for its subsidized UJALA LED bulbs</li> </ul>
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## 52.1 ELECTRICITY → ONE NATION-ONE GRID

- Initially, individual states' electricity grids (बिजली ग्रिड) were interconnected to form 5 regional grid regions namely Northern, Eastern, Western, North Eastern & Southern region. If a state had surplus electricity, it could sell ONLY to other states in that region.
- So, One Nation-One Grid concept aims to connect all 5 regional grids into one national grid so, electricity can be transferred from surplus region to deficient region.
- Here buying-selling of electricity is done through power exchanges like —Power Exchange of India (PXIL) and India Energy Exchange (IEX).
- **Boss?** Power ministry → Power Grid Corporation of India Limited.

### 52.1.1 Grid → Green Energy Corridor Project (हरित ऊर्जा गलियारा परियोजना)

- Boss? Same as above + loan support from Asian Development Bank.
- project will enable the flow of renewable energy into this National Grid Network. So that renewable energy rich States like Rajasthan (solar), Tamil Nadu (wind) can sell the electricity to other states.

## 52.2 ELECTRICITY → POWER MINISTRY'S APPS OVERDOZE / NUISANCE

- **Power Ministry's Garv & Garv-II apps** to monitor progress of how many villages electrified under DD Gram Jyoti Yojana.
- **Power Ministry's DEEP** portal to help DISCOM companies buy electricity from thermal plants through auction.
- **Power Ministry's Vidyut PRAVAH & MERIT app** & to let people know how much electricity is generated in India, vs. current price, demand & shortages, inter-state purchase of electricity etc.
- **Power Ministry's Urja Mitra App** to notify users about upcoming electricity outages.
- **Power Ministry's TARANG App** to monitor upcoming power projects & stalled projects.
- And lastly, Power Ministry → Central Electricity Authority (CEA) → **National Power Portal** (NPP) where above Apps' data can be displayed (वही सब दिखाना है तो इतनी एप्स क्यों बनाईं!???)

## 52.3 ELECTRICITY → INTEGRATED POWER DEVELOPMENT SCHEME (IPDS)

Originally Manmohan had Restructured Accelerated Power Development and Reforms Programme (RAPDRP), Modi repacked it as IPDS.

- एकीकृत बिजली विकास योजना. **Boss?** Ministry of Power (2014).
- Central Sector Scheme = 100% funded by Union.
- **Target?** To strengthen power infrastructure, especially in urban areas.





- **How?** All Electricity Distribution Companies (Discoms: बिजली वितरण कंपनियां) are given financial assistance for improving distribution network, installing ICT enabled smart meters for billing and collection. Install solar panels if not possible to join an area with grid.

## 52.4 ELECTRICITY: NPA SOLVE → UDAY (2015)

During UPA-raj, DISCOMs were suffering losses because:

1. Floods and cyclones, environmental activism by NGT/SC, scams in coal allocation → coal mining declined → Coal became expensive → Thermal electricity production became expensive.
2. Under the Electricity Act 2003 → Central Electricity Regulatory Commission regulate the price of Inter-State sale of electricity. While State Electricity Regulatory Commissions regulate the price of intra-state sale. The electricity price slabs are kept different for industrial use, household use and agriculture use. And to keep the farmers happy, agriculture electricity will be subjected to lower tariffs. Electricity thefts rampant but State Govts ignore it for vote bank politics.
3. While electricity production was become more expensive because of bullet1, but Electricity commissions will not increase the prices in a corresponding manner → DISCOM were making huge losses → Modi launches a scheme to help them called, 'Ujwal Discom Assurance Yojana' (UDAY).

**Boss?** Ministry of \_\_\_\_\_ (2014)

**Target?** Financial revival of DISCOMs via following method:

- Whatever was the debt of a DISCOM on 30/9/15: State government will take over 75% of the debt in a phased manner. [It is optional for States to do this.]
- To repay this debt, State govt. will mobilize ₹ issuing Ujwal bonds in the market. These bonds will be non-SLR in nature (So although it's a 'G-Sec' but if banks are buying them, it will be not counted in their SLR quota).

(if States do above thing) → Union will give them extra funding for Deendayal Upadhyaya Gram Jyoti Yojana (DDUGJY), Integrated Power Development Scheme (IPDS), and other such schemes of Ministry of Power and Ministry of New and Renewable Energy.

### 52.4.1 Electricity: NPA Solve → (proposed) Pariwartan (2018)

Power Asset Revival Through Warehousing and Rehabilitation (PARIWARTAN):

- Rural Electrification Corporation (REC) & other public sector entities will create an Asset Management Company (AMC) to take over the NPA-assets of power sector companies.
- Since it's at a proposal stage, so we need not lose much sleep over exact mechanism.

## 52.5 ELECTRICITY → \_\_\_\_\_ YOJANA (2015)

Originally Manmohan had Rajiv Gandhi Grameen Vidyutikaran Yojana (RGGVY), Modi restructured as DDUGJY.

- **Boss?** Ministry of \_\_\_\_\_ → Rural Electrification Corporation-REC (2015)
- Central Sector Scheme = 100% funded by Union.



- **Target?** 24×7 uninterrupted 'metered' electricity supply to each rural household by 2022, by doing following →
- Separate feeder lines (संभरक लाइन) for rural households vs agricultural use.
- Strengthen sub-transmission and distribution network to reduce power losses.
- Install electricity meters.

## 52.6 ELECTRICITY → PM SAHAJ GHAR BIJLI YOJANA ( \_ \_ \_ \_ \_ )

**Boss?** Ministry of Power → Rural Electrification Corporation-REC (2017)

**Target?**

- To give electricity connections to all remaining un-electrified households in rural and urban areas. (तो दिनदयाल में दे देना था ना!, अलग योजना क्यों बनाई!??)
- Provide 24\*7 power supply for all by 2019.

**How?**

- Based on SECC-2011 data, they'll identify beneficiaries, give them free electricity connection with meter.
- If a household in remote area → not possible to join with grid connected electricity lines → then solar cell, DC battery pack, LED lights will be given.

**Funding?**

- REC gives 75-90% of project cost as grants to DISCOMs (public and private), state electricity departments etc.
- Grant % depends on whether General / Sp.Cat state, and how much progress achieved.
- Central Sector Scheme = 100% funded by Union. (100% in the sense that State government is not required to contribute money, although for the remainder project cost-Discom etc. will borrow from Bank/NBFC.)

## 52.7 ELECTRICITY → USE 'LESS' → PERFORM, ACHIEVE AND TRADE (PAT)

2008: Environment Ministry's National Action Plan on Climate Change (NAPCC: जलवायु परिवर्तन पर राष्ट्रीय कार्य योजना ) One of its 8 components is National Mission for Enhanced Energy Efficiency (NMEEE: वर्धित ऊर्जा कार्यक्षमता का राष्ट्रीय नियोग ) → PAT.

**Boss?** Power Ministry → Bureau of Energy Efficiency (BEE).

- Under Perform Achieve and Trade (PAT: प्रदर्शन, हासिल और व्यापार करना) mechanism: 8 energy intensive industries are given 'quotas' viz. Thermal Power, Aluminium, Cement, Fertilizer, Iron-steel, Pulp-paper, Textiles and Chlor-alkali.
- They've to cut their energy consumption according to the quotas, else face penalties.
- Overachieving firm can obtain Energy Saving Certificates (ESCerts) from BEE's PATNET portal and sell it to the underachieving firm (similar to PSLC certificates). Central Electricity Regulatory Commission (a statutory body) regulates the prices & purchase procedure.

## 52.8 ELECTRICITY → USE 'LESS' → NATIONAL LED PROGRAMME

**Boss?** Power Ministry gives ₹ ₹ to Energy Efficiency Services Ltd (EESL) for:

- **Unnat Jeevan by Affordable LEDs and Appliances for All (UJALA)** for subsidized home Light-emitting Diode (LEDs) bulbs. Previously called DELP (Domestic Efficient Lighting





Program, renamed in 2015).

- **Street Lighting National Program:** whereas EESL replaces conventional halogen street bulbs with LED street bulbs, free of cost.

## 52.9 ELECTRICITY → USE 'LESS' → MISC. SCHEMES & TOPICS

<b>AJAY</b>	<b>Atal Jyoti Yojana (Ajay):</b> FREE Solar Street Light with LED in <ol style="list-style-type: none"> <li>1. Special category states</li> <li>2. 5 states - Assam, Bihar, Jharkhand, Odisha and Uttar Pradesh.</li> <li>3. NITI-ayog-walle Aspirational districts in other states</li> <li>4. Andaman Nicobar and Lakshadweep</li> </ol> <b>Funding:</b> MNRE 75% + 25% from MPLADS of given constituency.
<b>SAATHI</b>	<ul style="list-style-type: none"> <li>- Sustainable &amp; Accelerated Adoption of efficient Textile technologies to Help small Industries.</li> <li>- Ministry of Power and Ministry of Textiles give money to Energy Efficiency Services Limited (EESL) → give energy efficient instruments to small and medium Powerlooms to reduce their energy consumption.</li> </ul>
<b>Star Labelling</b>	To help the customer to use energy efficient appliances. <i>Refer BEE under Pillar #4</i>
<b>Smart Electricity Meters</b>	<ul style="list-style-type: none"> <li>- Ministry of Power → Energy Efficiency Services Ltd. (EESL) helps DISCOMs to install Smart Electricity Meters. <b>Benefit?</b> IT enabled monitoring, no need to manually visit the premise for billing, difficult to do power theft etc.</li> </ul>
<b>Methanol Economy Fund</b>	To use 'less' petrol & diesel in transport & electricity generators: <ul style="list-style-type: none"> <li>- Methanol is can be generated from bio waste. It is the simplest alcohol and does not emit particulate matter (PM) / Sulphur or nitrogen pollution.</li> <li>- 2017: Niti Aayog proposed to setup a Methanol Economy Fund to finance R&amp;D.</li> </ul>
<b>PM Ji-VAN</b>	<ul style="list-style-type: none"> <li>- 2003: Oil Companies to blend upto 10% of ethanol in Petrol, by 2022.</li> <li>- 2019: "Pradhan Mantri JI-VAN (Jaiv Indhan-Vatavaran Anukool fasal awashesh Nivaran) Yojana" for providing ₹ to second generation (2G) bioethanol projects through Viability Gap Funding (VGF).</li> <li>- <b>Boss?</b> Petroleum Ministry. 100% Union funded.</li> </ul>
<b>Energy Transition Index</b>	<ul style="list-style-type: none"> <li>- _____'s index to measure countries on how much CO<sub>2</sub> / pollution is generated while producing energy, And whether the country is serious about reducing it.</li> <li>- <b>Ranking 2019:</b> Sweden ranked #1, India #76 (last year #78 so slightly improved), Haiti #115 (bottomest).</li> </ul>

**Self Study:** Nuclear Power from ch5 of Ravi Agrahari's Sci-Tech book.

## 53 INFRA → ENERGY → RENEWABLE (नवीकरणीय ऊर्जा)

Government has set a target of installing \_\_\_\_\_ GW of renewable energy capacity by \_\_\_\_\_. This includes 100 GW solar + 60 GW wind + 10 GW biopower (biowaste to energy) + 5 GW small hydro-power.

### 53.1 ENERGY → RENEWABLE → [YEARBOOK] MNRE

Ministry of New and Renewable Energy नवीन एवं नवीकरणीय ऊर्जा मंत्रालय consists of:



<b>Dept/Attached/ Statutory</b>	N/A or nothing MCQ worthy.
<b>Autonomous bodies</b>	1. National Institute of Solar Energy (NISE)- Gurugram 2. National Institute of Wind Energy (NIWE)-Chennai 3. Sardar Swaran Singh National Institute of Renewable Energy (SSS NIRE) – Kapurthala
<b>PSU</b>	1. Indian Renewable Energy Development Agency (IREDA)- Delhi, MINI Ratna 2. Solar Energy Corporation of India (SECI)- Delhi

### 53.2 RENEWABLE → KUSUM (SOLAR FOR FARMER) 2019

**Boss?** Ministry of New and Renewable Energy. Kisan Urja Suraksha evam Utthaan Mahabhiyan (KUSUM) has components A, B, C but the gist of the matter is:

- Farmers are encouraged to install Solar pump tube wells for irrigation → less diesel consumption.
- Farmers, panchayats, cooperatives can install upto 2 MW renewable power plants in their barren / cultivable lands.
- Above people can sell the excess electricity to the DISCOMS. Its price will be decided by the respective State Electricity Regulatory Commissions (SERC).
- **Funding?** Union 30%+ State 30%+ Bank Loan 30% +10% by the farmer himself= 100% project cost.
- **Benefit?** consumption of Diesel & Thermal electricity will decline → 27 million CO<sub>2</sub> emission reduced / per year.

Renewable → Jawaharlal Nehru National Solar Mission

- 2008: Manmohan → National Action Plan on Climate Change (NAPCC) with 8 missions → 2009-10: J.N. National Solar Mission (राष्ट्रीय सौर मिशन). Target: add 20,000 MW solar power by 2022.
- Modi continued but raised target to 1 lakh MW (= 100 GW) by 2022.
- Out of that 40GW from 40 GW Rooftop solar panel and 60 GW through Large & Medium Scale Grid Connected Solar Power Projects.
- **Boss?** Ministry of New and Renewable Energy (MNRE)

Just like the Make In India project, this is not a 'scheme' but rather a collection of initiatives in various sectors such as

1. MNRE → SRISTI (Sustainable Rooftop Implementation for Solar Transfiguration of India) → subsidy for purchase of the solar panel and other equipments.
2. **Solar City initiative** (2012-17): 60 cities got ₹ 50 lakhs each, to replace minimum 10% thermal energy with solar.
3. Install rooftop solar panels in large government complexes/ buildings;
4. 'Building bye laws' are the construction norms set by the State Govt to ensure uniform & safe development of buildings. They'll be changed to require compulsory roof top solar in big private buildings.
5. Change land laws to help leasing farmer's land for solar projects; Use wastelands to setup solar parks



6. \_\_\_\_\_ i.e. residential and commercial customers generate their own electricity from rooftop solar power and sell excess of this solar electricity to DISCOM.
7. MNRE → NISE (National Institute of Solar Energy) → 90 days coaching skill development programme “Surya Mitra” to train youth for solar equipment installation / repair / maintenance.
8. “ARUN” Mobile app to help people install rooftop solar panels by themselves.
9. Issuing tax free solar bonds to finance such initiatives.
10. Amending Electricity Act for Renewable Purchase Obligation (RPO) & Renewable Generation Obligation (RGO);

### 53.3 RENEWABLE → RENEWABLE PURCHASE OBLIGATION (RPO)

**Applicable to?** Power distribution companies, large electricity consumers and captive power plants.

- They are obliged to buy min. “X” % of the electricity from renewable energy sources.
- This ensures solar, wind and other renewable power producers receive sufficient of consumers / market demand.
- This mechanism is called Renewable Purchase Obligations (RPOs: नवीकरणीय खरीद के दायित्व). Its prices are decided by CERC/SERC depending on whether its Interstate or intrastate sale.
- This “X%” quota is decided by the MNRE.
- First time setup in 2014 (11.50%, With internal bifurcation for solar and non solar),
- Quota raised over years. 2018: 17%, 2019: 17.5%.....2022: [=10.50% from solar + 10.50% from Non solar=21%]

**Related?** Renewable Generation Obligation (RGO: नवीकरणीय सृजन दायित्व): It requires coal based thermal plants to generate/procure “x%” of renewable energy.

**Conclusion?** Access to clean, reliable and affordable energy increases the ease of living, improves education and human development. Aforementioned schemes / initiatives / challenges are important in that regard / need to be addressed on priority basis.

## 54 INFRA → ENERGY → COOKING

### 54.1 COOKING → PRATYAKSH HANSTANTRIT LABH (PAHAL-2015)

~~Manmohan started pilot project in selected districts~~ → 2015: Modi rolled out all India level

- **Boss?** Ministry of Petroleum and Natural Gas. Central sector scheme = 100% funded by Union.
- Previously, LPG dealers would divert the subsidized LPG cylinders to restaurants → households would be deprived & forced to purchase LPG cylinder at a higher price in the black market.
- PAHAL-Direct Benefits Transfer For LPG (DBTL): Beneficiary buys 14.2 KG LPG cylinder at market price (e.g. ₹ 700), Petroleum ministry directly transfer subsidy amount (~₹ 200) in his bank account linked with his customer ID. Similarly 5kg LPG cylinder- then lower price, lower subsidy.



- A beneficiary is eligible to get subsidy on upto \_ \_ \_ \_ cylinders per year. (Although economic survey suggested it should be reduced because most household may not need more than 10 cylinders in real life.)
- **Who is not eligible?** Restaurants / commercial enterprises; A person with taxable income more than ₹ 10 lakh (and husband/wife of such person.)

## 54.2 COOKING → PRADHAN MANTRI UJJWALA YOJANA (PMUY)

- Ordinarily, a customer has to pay ~₹ 1000+ as refundable security deposit to get the LPG connection from Oil Marketing Company (OMC: Bharat Gas HP Gas etc.).
- Ujjwala Yojana gives Deposit-free LPG connections + rubber tube + pressure regulator to the women of Below Poverty Line (BPL: गरीबी रेखा के नीचे) families. (Although they have to pay money for the stove and cylinders to actually start cooking.)
- The BPL families are identified using SECC-2011 data. Later, the beneficiary list was expanded to cover the forest dwellers, people residing in Islands etc. whose name may not be in SECC-2011 data.
- **Boss?** \_ \_ \_ \_ \_ Ministry pays ₹ ₹ OMC. Central sector scheme = 100% funded by Union.
- **Benefit?** Less consumption of firewood and kerosene → less indoor pollution, health benefit to the women

## 54.3 COOKING → MISC.

<b>PM LPG Panchayat Scheme</b>	It's just a gathering of 100 LPG customers in an area, they'll discuss LPG benefits, women empowerment. Petroleum Ministry aims to organize 1 lakh such Panchayats across India by 31/3/2019.
<b>PM Urja Ganga</b>	2016: This project aims to lay down Natural Gas Grid Pipeline across 5 states, viz. UP, Bihar, Jharkhand, Odisha & W.Bengal. The supply of such Piped Natural Gas (PNG) can help homes, hotels, fertilizer companies & electricity companies → helps creating a gas based economy.
<b>DBT in PDS Kerosene (DBTK) 2016</b>	<ul style="list-style-type: none"> <li>- Boss &amp; principle is same as PAHAL-LPG. Kerosene is sold at market price → subsidy ₹ ₹ transferred to poor family's bank account. This discourages PDS shopkeeper from diverting subsidised kerosene to the rickshaw-wallas.</li> <li>- Govt. is trying to cover more poor families under the LPG and electricity schemes so in future they will not require subsidised kerosene for cooking and lightening purpose. Thus, India will become 'kerosene free'.</li> </ul>
<b>GOBARDhan (2018)</b>	<ul style="list-style-type: none"> <li>- It's a sub-component of Swachh Bharat mission (Gramin). Core Scheme = not 100% funded by Union.</li> <li>- <b>Boss?</b> Ministry of Drinking Water and Sanitation.</li> <li>- Galvanising Organic Bio-Agro-Resource dhan-(<b>GOBARDhan</b>) scheme helps farmers &amp; rural entrepreneurs to convert cattle dung &amp; other biowaste to biogas and organic manure.</li> <li>- Depending on the population of the gram panchayat, they will be given up to ₹ 20 Lakh to setup such project.</li> </ul>
<b>City Compost Scheme (2016)</b>	Ministry of Chemicals and Fertilizers pays subsidy to entrepreneurs to create compost (कूड़ा खाद) from city (municipal) waste → supply it to farmers at subsidized rate.



**Conclusion?** Energy is the prerequisite for development of any society. Energy improves the access to healthcare, education and overall well being. SDG Goal#7 requires India to provide affordable, reliable and modern energy services to all by 2030. Aforementioned Scheme/Policy/Challenge.....

## 55 INFRA → WATER (जल)

**Introduction:** Water is essential for survival and critical for agriculture & industrial growth. While India has more than 17% of the world's population, but barely 4% of world's water resources.

[Yearbook] Ministry of Water Resources, River Development And Ganga Rejuvenation जल संसाधन, नदी विकास एवं गंगा संरक्षण मंत्रालय consists of <list not exhaustive>

Dept	N/A
<b>Attached / subordinate offices</b>	<ul style="list-style-type: none"> <li>- Central Water Commission (केंद्रीय जल आयोग)</li> <li>- Ganga Flood Control Commission</li> <li>- Bansagar Control Board (Son River)</li> <li>- Central Water and Power Research Station</li> <li>- Central Soil and Materials Research Station</li> </ul>
<b>Statutory Bodies</b>	<ul style="list-style-type: none"> <li>- Betwa River Board, Brahmaputra Board under respective Acts.</li> <li>- Various water dispute tribunals (जल विवाद न्यायाधिकरण) under Inter-State Water Disputes Act, 1956               <ul style="list-style-type: none"> <li>- <u>Under _____, 1986 →</u></li> </ul> </li> <li>- National Ganga River Basin Authority (NGRBA)</li> <li>- Central Ground Water Authority (केंद्रीय भूजल प्राधिकरण)</li> </ul>
<b>PSU</b>	<ul style="list-style-type: none"> <li>- Water and Power Consultancy Services Ltd ( _ _ _ _ _ )</li> <li>- National Projects construction Corporation Ltd.</li> </ul>
<b>Autonomous Bodies</b>	<ul style="list-style-type: none"> <li>- National Institute of Hydrology</li> <li>- Krishna River Management Board</li> <li>- Godavari River Management Board</li> </ul>

**Related?** [Yearbook] Ministry of Drinking Water And Sanitation: पेयजल और स्वच्छता मंत्रालय → doesn't have any MCQ worth Organizations.

### 55.1 INFRA → WATER → NRDWP (2009)

National Rural Drinking Water Mission राष्ट्रीय ग्रामीण पेयजल मिशन

- **Boss?** Drinking Water Ministry. Centrally Sponsored Scheme → Core Scheme = NOT 100% funded by Union. (50:50)
- To provide every rural person with safe water for drinking, cooking & domestic needs.
- Additional focus on areas affected by Arsenic, Fluoride & chemical contamination; Encephalitis disease etc.



## 55.2 INFRA → WATER → JAL KRANTI ABHIYAN (2015)

- **Boss?** Water Resources Ministry.
- In every district, 2 villages facing acute water shortage (पानी की तीव्र कमी) are designated as 'Jal Gram' and efforts are made to turn them into 'water surplus' villages.
- This is not a separate scheme. ₹ ₹ is mobilized from others schemes like Pradhan Mantri Krishi Sinchayee Yojana, NRDWP, MNREGA etc. to create dugwells, watershed, artificial recharge tanks etc. water assets.

## 55.3 INFRA → WATER → NAMAMI GANGE YOJANA (2015)

- 1986: Ganga Action Plan by PM Rajiv Gandhi.
- 2009: Ganga was declared 'National River', & National Ganga River Basin Authority (NGRBA) setup under Environment Protection Act. Initially the authority was under the Environment Ministry but later transferred to the Water Resources Ministry.
- 2015: Modi repacked previous schemes / initiatives under 'Namami Gange'.
- **Boss?** Water Resources Ministry. Central Sector Scheme = 100% funded by union
- ₹ ₹ given to NGRBA to make Ganga pollution free in the next 5 years through Sewage / Effluent Treatment Plants (गंदा पानी साफ करने के संयंत्र), Information, Education & Communication (IEC: सूचना, शिक्षा और संचार) etc.

## 55.4 INFRA → WATER → MISC. SCHEMES

**Boss?** Water Resources ministry. Central Sector Schemes =100% funded by union (In the sense that states are not required to give money) + Additional loans from World Bank.

DRIP (2012)	<ul style="list-style-type: none"> <li>- Dam Rehabilitation and Improvement Program.</li> <li>- DHARMA webportal: to monitor safety of dams in India, minimize loss of life and property damage in case of dam overflow / disaster.</li> </ul>
National Hydrology Project (2016) जलविज्ञान	<ul style="list-style-type: none"> <li>- Objective? Remote Sensing (सुदूर संवेदन) for water resources, flood forecast etc.</li> </ul>
Atal Bhujal Yojana 2018	<ul style="list-style-type: none"> <li>- Funding: 50:50 by Union + World Bank.</li> <li>- This scheme is not meant for entire India but only in the selected areas of selected states facing extreme water shortages e.g. Rajasthan, UP, Madhya Pradesh, Gujarat etc.</li> <li>- Villagers formed into 'Water User Associations' → try to minimize water wastage, build water assets, IEC etc.</li> </ul>

+ Revise Pillar#4: Agro handout for Irrigation angle.

**Conclusion?** Water is a scarce natural resource. Water is fundamental to life, livelihood, food security and sustainable development. SDG Goal#6 requires India to provide Universal access to safe and affordable drinking water for all. Aforementioned policy / scheme / challenges are significant in this regard / need to be addressed on priority basis.





## 55.5 INFRA → SANITATION → SWACHH BHARAT MISSION (SBM: 2014)

2012: Manmohan launched Nirmal Bharat Abhiyan → 2/10/2014 Modi restructured as SBM  
**Boss?** Ministry of Drinking Water & Sanitation. Core Scheme = \_\_\_\_\_ funded by Union (60:40 | 90:10) + Corporates' CSR funding. **Target** \_\_\_\_\_ →

1. Open Defecation Free (ODF: खुले में शौच मुक्त) India. As of 2019-Jan: 27 States/ UT declared themselves ODF.
2. Eradicating manual scavenging (मानव मल-मूत्र को हटाने के लिये सफाई कर्मचारियों के नियोजन को खत्म करना)
3. improving Municipal Solid Waste Management (MSWM: नगरपालिका ठोस अपशिष्ट प्रबंधन)

### How?

1. ₹ ₹ given for building toilets in individual homes, community toilets and bathing house, Public toilets at bus station, schools, temporary construction sites
2. Additional ₹ ₹ given for solid waste management projects- trucks, garbage disposal units etc;
3. IEC, Awareness & behavioral changes through Swachhta Doots, Social Media, Campaigns, posters, advertisements
4. Research Development in sanitation.

### SBM has two components:

1. SBM-Rural implemented by Ministry of Drinking Water and Sanitation.
2. SBM-Urban implemented by Ministry of \_\_\_\_\_ .

### Why do we need SBM? Economic survey 2017 observed:

1. The lack of access to toilet facility → Girls reduce food & water intake to avoid going during day time → Malnutrition.
2. Open defecation → infections among pregnant women → MMR & IMR are high; intestinal infection (enteropathy: आंत्रविकृति) in children → Even if children given good food their body will not absorb the nutrients fully → poor brain development → educational outcomes :- (

Thus, SBM important for the human development in India. SDG Goal#6 requires India to achieve 100% ODF free status by 2030.

## 55.6 INFRA → SANITATION → SWACHHTA UDYAMI YOJANA (2014)

Ministry of Social Justice → ₹ to National Safai Karamcharis Finance and Development Corporation → Concessional loans to Safai Karamcharis/ Manual Scavengers for →

1. Building community toilets → they can charge user fees.
2. Buying Sanitation related Vehicles → Beneficiaries can take contracts from the Municipalities for garbage collection etc. to earn livelihood.

**Related Misc. schemes by above ministry:** Self Employment Scheme for Rehabilitation of Manual Scavengers (SRMS) which give skill and financial assistance to them.



## 56 INFRA → TRANSPORT → H<sub>2</sub>O → INLAND WATERWAYS

Inland Waterways Transport (IWT: अंतर्देशीय जलमार्ग परिवहन) has following benefits →

- ✓ Lower CO<sub>2</sub> emissions & fuel consumption in transporting per tonne of cargo than Rail / Road.
- ✓ IWT requires very little land acquisition(भूमि अधिग्रहण) than Rail / Road.
- ✓ IWT eases traffic congestion(यातायात जमाव/की भीड़) on Road/Rail networks.

### 56.1.1 Inland Waterways → IWAI

Inland Waterway Authority of India (IWAI: भारतीय अंतर्देशीय जलमार्ग प्राधिकरण) is a Statutory Body under Ministry of \_\_\_\_\_, responsible for the development, management, safety, survey of inland waterways. Its notable portals are:

1. **FOCAL** to connect cargo owners and shippers.
2. **LADIS** – Least Available Depth Information System so shippers can know whether it's safe to take their vessel further or not.

### 56.1.2 Inland Waterways → National Waterways (राष्ट्रीय जलमार्ग)

- 7th Sch → Union List → Parliament can make laws on inland waterways.
- National Waterways Act, 2016: 5 existing waterways and 100+ additional waterways declared as National Waterways. 5 existing waterways are:

National Waterway No.	Length (km)	State(s)
1: Ganga-Bhagirathi-Hooghly River System (Haldia - Allahabad)	1620	Uttar Pradesh, Bihar, Jharkhand, West Bengal
2: Brahmaputra River (Dhubri - Sadiya)	891	Assam
3: West Coast, Champakara and Udyogmandal Canals	205	Kerala
4: Krishna, Godavari and a few Canals	2890 (when finished)	Tamil Nadu, Andhra, Telanagana
5: Mahanadi delta rivers & canals	588	Odisha, West Bengal

Apart from this NW68: Mandovi (Goa), NW111 Zuari (Goa), NW97: Sundarbans and a few others are presently operational.

### 56.1.3 Inland Waterways → Jal Marg Vikas Project (2014)

NW-1 has low depth upstream of Farakka → difficult to take big vessels.

- Jal Marg Vikas project aims to develop infrastructure, navigational locks to make NW1 enable commercial navigation on Varanasi-Haldia stretch of river Ganga.
- Plus, provisions for Roll on-Roll off (Ro-Ro) ferries, Digital dashboard / portals for River Information System (RIS) and Vessel Traffic Management System (VTMS) etc.
- Central Sector Scheme (0% from States) + loans from World Bank (IBRD) + PPP.
- 2018-Nov: Modi inaugurated India's first multi-modal terminal (एकाधिक मॉडल टर्मिनल) @**Varanasi** & welcomed the cargo ship 'MV Rabindranath Tagore' coming from Kolkata.

**Side Note:** Same Varanasi also designated as India's first '**freight village (माल गांव)**' i.e. an area where national and international cargo operators carry out their activities.



## 57 INFRA → TRANSPORT → H<sub>2</sub>O → SHIPPING & PORTS

[Yearbook] Ministry of Shipping नौवहन मंत्रालय consists of

Dept,	N/A
<b>Statutory Bodies</b>	<ul style="list-style-type: none"> <li>– Inland Waterway Authority of India (IWAI: भारतीय अंतर्देशीय जलमार्ग प्राधिकरण)</li> <li>– Tariff Authority for Major Ports (TAMP) to decide the fees charged by Major ports.</li> </ul>
<b>Attached / subordinate offices</b>	<ul style="list-style-type: none"> <li>– Directorate General of Shipping, Mumbai नौवहन महानिदेशालय, मुंबई</li> <li>– DG Lighthouses and Lightships</li> <li>– Minor Ports Survey Organisation, लघु पत्तन सर्वेक्षण,</li> </ul>
<b>PSU</b>	<ul style="list-style-type: none"> <li>– Shipping Corporation of India, Mumbai</li> <li>– Cochin Shipyard Limited, Cochin</li> <li>– Central Inland Water Transport Corporation Limited</li> <li>– Dredging Corporation of India Limited</li> <li>– Hooghly Dock &amp; Port Engineers Limited</li> <li>– Ennore Port Limited</li> <li>– Sethusamundaram Corporation Limited</li> </ul>

Indian Ports Act, 1908: State Governments responsible for minor ports, Union Government is responsible for development of Major Ports.

### List of Major Ports in India: (A: Artificial, N: Natural harbor)

A/ N?	NAME of the Port	STATE
N	Jawahar Nehru, Nhava Shewa	MH (2)
N	Mumbai	
N	Kandala, Kutch. Tidal port (ज्वारीय बंदरगाह). Developed in the 50s because Karachi port lost in Partition. Kandla is also the first Exclusive Economic Zone (EEZ) in India and Asia (concept that is nowadays called 'SEZ')	Guj (1)
N	Mormugao. Tidal Port, @Zuvari estuary, iron-ore export	Goa (1)
A	New Mangalore. Deep water, all weather port.	Karnataka (1)
N	Cochin/Kochi. Willingdon island	Kerala(1)
<b>Total Major Ports (West Coast)</b>		6
N	Haldia   Kolkata. <b>Oldest major port</b> of India. <b>Problem?</b> It's a Riverine Port (नदी तटीय बंदरगाह) so Need constant dredging (निकर्षण) to remove silt & keep depth.	WB(1)
N	Vishakhapatnam & Eastern Naval command	AP(1)
A	Paradeep (Manmade lagoon)	Odisha(1)
N	Tuticorin	TN (3)
A	Chennai (all weather Port)	
A	Ennore (private, under companies Act)	
<b>Total Ports East Coast</b>		6

Additionally,

- 2010: Manmohan announced to setup Port Blair (Andaman Nicobar) as Major port.



- 2016: Modi announced to setup Sagar in west Bengal, Duggirajapatnam in Andhra Pradesh, Vadhavan in Maharashtra, Enayam in Tamil Nadu as major ports.

But, Govt Annual reports still continue to list only 12 major ports, given in above table so we need not lose sleep.

Related term? **Dry Ports (सूखे बंदरगाह)** = They are inland terminal, directly connected to a seaport by rail or road e.g. Patna@Bihar, Hazira@Guj. 20+ such dry ports under development (2018).

## 57.1 PORTS → CHALLENGES IN INDIA

1. While India made great success in metro rails and airport infra, But shipping infrastructure has been neglected. We suffer from ageing fleet, manpower shortage, we do not have world class ports. Third-generation large sized ships are unable to enter our ports so their goods are first offloaded in Srilanka, then sent to India in smaller ships.
2. Port congestion, delay in turnaround, takes lot of paperwork to load/unload cargo, customs clearance / inspection is slow, inadequate road and rail connectivity with the hinterland (आंतरिक इलाके).
3. Privately owned minor ports are more efficient, whereas major ports suffer from labour unions and politicization of the Board Of Directors.
4. Problems of land acquisition and environmental clearances while setting up new ports.
5. Desi Shipping companies buy / hire foreign ships at higher cost because domestic shipbuilding industry is underdeveloped. (Although shipping 'breaking' industry is well developed at Alang in Gujarat.)

## 57.2 INFRA → TRANSPORT → H<sub>2</sub>O → PORTS → SAGARMALA PROJECT

- 2003: PM Vajpayee proposed Project Sagarmala → Manmohan ignored → Modi revived (2015).
- Boss? \_\_\_\_\_ ministry. Central Sector Scheme = 0% funded by States. Although in practice it's Shipping Ministry → Sagarmala Development Company Limited (2016) → invest in Special Purpose Vehicles (SPVs) companies (in which State & private players may also have shareholding) → SPVs implement various projects under Sagarmala.
- Sagarmala aims to develop new major & minor ports, improve existing ports, encourage coastal shipping.
- \_\_\_\_\_ (CEZs) to create manufacturing & employment opportunities. Give them Hinterland connectivity through rail, road, inland water transport.
- Skill development, training for coastal community.

Misc. Topic: **Sethusamudram project (1997)** to create a shipping canal between Palk bay & Gulf of Manner to reduce time & fuel consumption. But case pending in SC-PIL that it'll hurt marine biodiversity & Ram Sethu's religious sentiments.



## 58 INFRA → TRANSPORT → ROAD (सड़क)

[Yearbook] Ministry of Road Transport & Highways सड़क परिवहन एवं राजमार्ग मंत्रालय →

<b>Dept /Attached</b>	N/A
<b>Statutory Bodies</b>	----- (NHAI) भारतीय राष्ट्रीय राजमार्ग प्राधिकरण
<b>PSU</b>	National Highways and Infrastructure Development Corporation

### 58.1 INFRA → TRANSPORT → ROAD → TYPES

Name	Responsibility of	Connects
National Highways	Union Government	State capitals, major cities, ports
State Highways	State Government	State Capital to District HQ
District Roads	Zila Parishad	District HQ to tehsil and Blocks
Village Roads	Gram Panchayat	Villages to neighboring towns
Expressway	PPP / SPV	Six to eight lane high class highways e.g. A'bad Vadodara Expressway made by SPV owned by NHAI+ IRB Infrastructure Developers.

- 3 organizations associated with highway construction: 1) National highways authority of India (NHAI), 2) State Public Works Department (PWD: लोक निर्माण विभाग), 3) Border roads Organization (BRO:सीमा सड़क संगठन under Defense Ministry)
- In terms of total road length (bigger to smaller): Other roads >> State highways >> National highways >> expressways

### 58.2 TRANSPORT (🚗) → PRADHAN MANTRI GRAM SADAK YOJANA (2000)

- **Boss?** ----- Ministry. Centrally Sponsored Scheme → Core Scheme = NOT 100% funded by Union. (General-60:40, Sp. Cat-90:10)
- 2000: PM Vajpayee launched to construct all-weather single (lane) roads for all unconnected rural habitations
  - upto min. 500 population (plains) by 2019
  - 250/> (Sp.Cat States, tribal districts and desert areas) by 2019
  - 100-249 population (if Naxal/LWE:Left Wing Extremism affected areas) by 2020
- PMGSY – II (2013 onwards): To upgrade / repair the previously constructed rural roads and to construct new roads.

### 58.3 TRANSPORT (🚗) → NHAI (1988)

भारतीय राष्ट्रीय राजमार्ग प्राधिकरण National Highways Authority of India is a statutory body under Road Ministry. It gets ₹ ₹ from →

- Road and Infrastructure cess on Petrol & Diesel → Central Road and Infrastructure Fund (setup in 2000, Non-Lapsable).
- External Assistance from World Bank, ADB, JBIC etc.; Market Borrowings by NHAI, Public Private Partnership(PPP).



#### 58.4 TRANSPORT (🚗) → NHDP (1998)

PM Vajpayee started National Highways Development Programme (NHDP) to build:

- Golden Quadrilateral (GQ: स्वर्णिम चतुर्भुज) connecting the four metro cities of Delhi, Mumbai, Chennai and Kolkata
- North-South corridor to connect Srinagar to Kanyakumari.
- East-West corridors to connect Silchar to Porbandar.

**Related terms:** Budget-2014: **Diamond quadrilateral** → to connect major metros through High Speed **Railways**.

#### 58.5 TRANSPORT (🚗) → BHARATMALA PARIYOJANA (2017)

- **Boss?** Ministry of Road Transport & Highways → NHAI. ₹ ₹ mobilized via Cess/PPP/SPV.
- It aims to upgrade & expand the highways that were built under the previous NHDP.
- It has 7 phases. Phase-1 aims to upgrade 24,800 kms of national highways by 2022.
- Special focus on connecting the coastal areas, economic corridors, and border regions (for easier troop movement against China-Pak & increase land based export-import with Nepal, Bhutan, Bangladesh and Myanmar).

#### 58.6 TRANSPORT (🚗) → E-TOLL COLLECTION VIA FASTAG (2017)

- From 2013 onwards Govt required vehicle manufactures to install Radio-frequency Identification (RFID) tags on windshields.
- 2017: NHAI launched 2 mobile apps **MyFASTag** and **FASTag Partner** to facilitate Electronic Toll Collection (इलेक्ट्रॉनिक पथकर/टोल संग्रह).
- Persons tops up ₹ ₹ in his mobile app → activates RFID tag in his car → when it passes through highway toll-booth, the money is automatically deducted = faster traffic movement.

#### 58.7 TRANSPORT (🚗) → NOWAIT@RAILWAY CROSSING: SETU BHARATAM

- **Boss?** Road Ministry. Central Sector Scheme = 100% funded by Union.
- Setu Bharatam aims to make all National Highways free of railway level crossings by constructing Railway Over Bridges (ROB)/Railway Under Bridges (RUB).
- Deadline: 2019. **Benefits?** 1) Less traffic condition & accidents in highways 2) Less employees required for manning the railway crossing signals.

#### 58.8 TRANSPORT (🚗) → BRIDGES

<b>IBMS</b>	Road Ministry developed an Indian Bridge Management System (IBMS) webportal to monitor 50,000+ bridges on National Highways of India. Such database can help 1) repair works 2) mega-sized trucks could be diverted to other routes to avoid structural damage to small bridges.
<b>Bogibeel Bridge</b>	The longest <b>Rail-cum-Road</b> Bridge of the India (4.94 km). Connects Assam and Arunachal over _____ river. 2018: Modi inaugurated.





<b>Dhola-Sadiya Bridge</b>	Longest road bridge of India (9.15kms) to connect Dhola in <b>Assam</b> to Sadiya in _____ over river <b>Lohit</b> , a tributary of River <b>Brahmaputra</b> . 2017: Modi inaugurated.
<b>Dhubri-Phulbari Bridge</b>	19.3 kms road bridge to connect Dhubri ( <b>Assam</b> ) and Phulbari (_____) over river <b>Brahmaputra</b> . 2019: Modi approved, will finish by 2026-27, then it'll become longest bridge.
<b>SARDP-NE</b>	Road Ministry → extra funds for roads in North East. Special Accelerated Road Development Programme (SARDP-NE)

**Conclusion?** Good connectivity is a fundamental requirement equitable industrial growth in all regions. SDG Goal #9 requires India to build resilient infrastructure including all weather roads connecting all villages. Aforementioned scheme / policy / challenges....

## 58.9 TRANSPORT → TRANSBORDER CONNECTIVITY

<b>Kaladan Multi-Modal</b>	<ul style="list-style-type: none"> <li>- To connect Haldia/Kolkata Port → Sittwe Port (Myanmar) → Kaladan River → Road transport to Mizoram.</li> <li>- in other words, this project aim to provide alternate connectivity between eastern ports of India to Mizoram via Myanmar.</li> </ul>
<b>IMT Trilateral</b>	India-Myanmar-Thailand Trilateral Highway
<b>INTC</b>	<ul style="list-style-type: none"> <li>- 2000: International North-South Transport Corridor (अंतर्राष्ट्रीय उत्तर-दक्षिण परिवहन गलियारा) proposed.</li> <li>- To connect India, Iran, Afghanistan, Armenia, Azerbaijan, Russia, Central Asia and Europe</li> <li>- With ship, rail, and road route for faster cargo transport.</li> </ul>
<b>Ashgabat agreement</b>	<ul style="list-style-type: none"> <li>- 2011: Ashgabat (@Turkmenistan) Agreement For multimodal goods transport between Central Asia and the Persian Gulf.</li> <li>- Signatories: Kazakhstan, Uzbekistan, Turkmenistan, Iran, Oman, Pakistan (2016), India (2018). This also creates synergy for INTC.</li> </ul>
<b>OBOR</b>	2013: China One Belt One Road (OBOR) initiative to connect Asia, Africa and Europe via 6 proposed corridors <ol style="list-style-type: none"> <li>1. New Eurasia Land Bridge Economic Corridor</li> <li>2. China-Mongolia-Russia economic corridor</li> <li>3. China-Central Asia-West Asia Economic Corridor</li> <li>4. China-Indochina Peninsula Economic Corridor</li> <li>5. Bangladesh, China, India, Myanmar Economic Corridor (BCIM)</li> <li>6. China-Pakistan Economic Corridor: It passes through Gilgit-Baltistan - a territory of India that is illegally occupied by Pakistan.</li> </ol> India has not officially joined, YET.
<b>Chabahar &amp; Gwadar</b>	<ul style="list-style-type: none"> <li>- Chabahar Port@Iran. India helped building it.</li> <li>- Gwadar Port@Pakistan. So obviously China helped building it.</li> </ul>

## 58.10 TRANSPORT (RAILWAY) → → [YEARBOOK]

Ministry of Railways रेलवे मंत्रालय consists of

<b>Dept</b>	N/A
<b>Zonal Headquarter</b>	Total 18



	<ul style="list-style-type: none"> <li>- Latest 18th Zone is: Southern Coast Railway - _____ (Andhra)</li> <li>- Metro Railway Zone = _____</li> </ul>
<b>Subordinate Offices</b>	<ul style="list-style-type: none"> <li>- Railway Recruitment Boards.</li> <li>- Railway Staff College, Vadodara, Guj</li> <li>- Indian Railway Engineering Institute, Pune.</li> </ul>
<b>Statutory Bodies</b>	Railway Board.
<b>PSU</b>	<ul style="list-style-type: none"> <li>- IRCON (Construction), IRFC (Finance), CONCOR (Container), IRCTC (Catering Tourism),</li> <li>- Konkan Railway Corporation Ltd., Mumbai Rail Vikas Corporation,</li> <li>- RITES (Technical and Economic Services), Rail-Tel (communication), Rail Vikas Nigam Ltd.</li> <li>- Dedicated Freight Corridor Corp. of India Ltd.,</li> <li>- Bharat Wagon and Engineering Co. Ltd., Burn Standard Coy. Ltd, Braithwaite and Company Ltd.</li> </ul>

- 1853: Mumbai to Thane (34kms). Governor General Dalhousie
- 1921: Acworth Committee recommends separation of rail budget from General budget; practice started from 1924-25, ended in 2017.

<b>Cross Subsidization</b> क्रॉस सहायिकीकरण	<ul style="list-style-type: none"> <li>- To keep rail travel cheap for the poor people, Railways keeps the passenger tickets lower than its input cost.</li> <li>- To compensate this loss, Railways keeps freight (goods transport) prices higher. This is called "Cross subsidization"</li> </ul>
<b>Operating Ratio</b>	<ul style="list-style-type: none"> <li>- It means Railways operating expenses divided by its operating revenues.</li> <li>- 2017: 98.4% (means only ₹ 1.6 rupees left out of every ₹ 100 revenue earned.) → 2018: 96.2%</li> <li>- Budget-2019: we'll try to improve it to 95%</li> </ul>

### 58.11 TRANSPORT (🚂) → MODERNIZATION

- Cross subsidization, poor operating ratio → sanitation, service quality & safety compromised. Railways ill-equipped to combat robberies, vandalism, stone-pelting.
- While truck transport-more pollution, expensive and slow than trains, yet more than 2/3rd cargo carried by trucks.
- Too many rail stoppages to appease the voters → speed slow.

<b>Project uni-gauge</b> Started in 90s	<ul style="list-style-type: none"> <li>- Track gauge is the spacing of the rails on a railway track. Broad [1,676 mm] &gt; Meter [1,000 mm] &gt; Narrow [762 mm, 610mm].</li> <li>- Project Unigauge to convert selected routes into broad gauge.</li> <li>- Presently, in terms of track length: Broad &gt; Meter &gt; Narrow.</li> </ul>
<b>Project Saksham 2018</b>	Skill / Training program for railway employees. Phase-II started in 2019.
<b>Mission Avataran</b>	(2016) To transform Indian Railways' speed, safety, profitability
<b>Yatri Mitra Sewa</b>	wheelchair cum porter services for PH passengers (2016)



<b>Tatkal Tickets</b>	for booking the tickets in hurry / emergency.
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### 58.11.1 Transport (🚂) → Modernization → Rail Development Authority

Interim Budget 2014 proposed setting a Rail Tariff Authority, but didnot materialize.

- 2017: Modi Government setup “Rail Development Authority (रेल विकास प्राधिकरण)” - non-Constitutional, non-statutory body via cabinet resolution.
- It's headed by a chairman + 3 members; 5 years term.
- Suggest Tariff (fares) determination, efficiency and performance standards, customer satisfaction, technological upgrades..
- Although it can only 'suggest' because under Railway Act, only the Railway Board can decide on the fares of rail services.

### 58.11.2 Transport (🚂) → Modernization → Green Initiatives by Railways

- Windmill/ solar panels at each rail station.
- **Green curtain:** boundary wall created around railway station, chowkidar to combat defecation and littering.
- **Biotoilets** with help DRDO: They contain anaerobic microbial bacteria to decompose and convert human excreta into water and gasses.
- **“Green corridors in Railways”** = on these routes all trains have bio-toilets to avoid direct discharge of human excreta on Railway tracks/station premises.
- 5% blending of biodiesel.

### 58.11.3 Transport (🚂) → Modernization → Electric Traction

- It means replacing diesel / coal powered engines with electric engines because they're more environmental friendly and energy efficient.
- Earlier, PM Modi & NITI Member Bibek Debroy raised doubts from strategic & economic angles that
  - it'll cost ~1 lakh crores, while our existing investment in diesel engines will go to waste
  - Difficult to accomplish in J&K & NE due to topography.
  - EU/China/Russia use electric trains for passengers and diesel for cargo transport.
- 2018-Sept: Still, forgetting above ANTI-arguments, Committee on Economic Affairs (CCEA) approved 100% Electric Traction by 31/3/2022.

### 58.11.4 Transport (🚂) → Modernization → Safety

- **Rashtriya Rail Sanraksha Kosh** (2017) created to finance the projects related to railway safety e.g. Train Collision Avoidance System.
- Int-Budget-2019 says “We've **removed all Unmanned railway crossing in January 2019.**”

## 58.12 TRANSPORT (🚂) → TYPES OF TRAINS

This table has very little utility in the UPSC, self-study for other exams:

<b>Red ribbon</b>	to spread AIDS awareness
<b>Rajdhani</b>	Connects Delhi with state capitals. Started in 1969
<b>Shatabdi</b>	Connects Metro cities with other cities. called “Shatabdi” because started in 1988 Nehru's centenary.
<b>Garib-rath 2006 (Lalu)</b>	AC trains for poor people- at cheaper cost. But seat space narrow, no food/bedding given. So it's called ‘No frills’.



<b>Duranto Express 2009 (Mamta)</b>	Duranto means 'restless' in Bengali. Long distance non-stop from source to destination. Speed as fast as Rajdhani and Shatabdi. Although now stops at more stations for voters appeasement so original objective is defeated.
<b>Mumbai Monorail 2014</b>	Monorail runs on a single rail. This rail may be located either above or beneath the railway cars. 2014: Started in Mumbai by Maharashtra State Govt.
<b>Mumbai-A'bad bullet train 2014 (Modi brainchild)</b>	<ul style="list-style-type: none"> <li>- Length: ~520 km; proposed speed ~320 kms.</li> <li>- Duration: 3-4 hours (currently 8 hours)</li> <li>- Project funded by JICA (Japanese International Cooperation Agency).</li> <li>- <b>Challenges?</b> Farmers protest against the land acquisition, Ticket price will have to be kept very high ELSE difficult to recover the cost.</li> <li>- <b>Benefit?</b> Even if the cost is not recovered, experience gained → later try 'Make in india' &amp; export bullet trains to third world.</li> </ul>
<b>Antyodaya Express 2016 (Suresh Prabhu)</b>	These trains have only general coaches and they're unreserved.
<b>Humsafar Express 2016</b>	Attempted to give a taste of 'luxury' to the common man. Fully AC coaches, more comfortable seats, LCD TV, laptop-mobile charging points, coffee/tea/soup vending machine, toilet's flush button has automatic perfume releaser.
<b>Tejas Express 2016</b>	Similar to above. Their new version even has Small TV behind every chair.
<b>Gatimaan Express 2016</b>	Semi-high speed train, maximum speed 160 kmph, runs on electricity.
<b>Vande Bharat Express 2019 (Piyush)</b>	<ul style="list-style-type: none"> <li>- Same as above, made by Integral Coach Factory in Chennai. Technical name '_____ '.</li> <li>- 2019-Feb: First train started on New Delhi -Kanpur-Allahabad-Varanasi route.</li> </ul>

### 58.13 TRANSPORT (🚆) → METRO RAIL

Metro Rail is a Mass Rapid Transport System (MRTS: सामूहिक द्रुत परिवहन प्रणाली) for daily commuters. It runs on electricity & usually confined within a given city.

- At present, India has operational metro rails at Delhi, Mumbai, Kolkata, Chennai etc.
- City Roads = very congested, slow, accident prone, air pollution. While metro rails provide relief in daily commuting.
- However, metro trains are not panacea for India because they are more capital and technology intensive than ordinary public bus or local railways. They require dedicated tracks, underground tunnels and bridges → problems in land acquisition and remodeling of existing urban road infrastructure.
- Since metro rails cater urban middle class commuters, so, fares can't be raised beyond a point for faster recovery. So it takes a very long time to recover investment.

#### 58.13.1 Transport (🚆) → Metro Rail → Metro Rail Policy 2017

**Boss?** Ministry of Housing and Urban Affairs.

- Considering aforementioned challenges, Metro train should be launched only after cost: benefit compared to launching more buses and ordinary trains.



- State Government will be responsible for Land acquisition(भूमि अधिग्रहण).
- Proposed Investment models for Metro rails: →
  - 50:50 joint venture(संयुक्त उद्यम/साहस) between Union & State OR
  - Public Private Partnership (लोक/सार्वजनिक निजी भागीदारी ) between State & private company; while Union gives them grants through Viability Gap Fund (व्यवहार्यता अवकाश निधी).

## 58.14 TRANSPORT (✈️) → AVIATION (उड़यन)

[Yearbook] Ministry of Civil Aviation नागर विमानन / नागरिक उड़यन मंत्रालय consists of:

<b>Dept</b>	N/A
<b>Attached offices</b>	Directorate General of Civil Aviation (DGCA: महा निर्देशक): registers civil aircrafts, gives license to pilots, supervises gliding clubs, implements Chicago Convention on International Civil Aviation.
<b>Statutory Bodies</b>	<ul style="list-style-type: none"> <li>– Airports Authority of India (AAI: भारतीय विमानपत्तन प्राधिकरण): Statutory body responsible for creating, upgrading, maintaining airports &amp; runways in India. It operates ~120+ airports in India- some directly, and some via PPP basis e.g. GMR group → Delhi and Mumbai airports, Adani group → A'bad, Lucknow etc.</li> <li>– Airports Economic Regulatory Authority</li> <li>– Rajiv Gandhi National Aviation University</li> <li>– Commission of Railway Safety (CRS) is under Administrative control of Aviation Ministry.</li> </ul>
<b>PSU</b>	<ul style="list-style-type: none"> <li>– Air India &amp; its subsidiaries</li> <li>– Hotel Corporation of India Ltd.</li> <li>– Pawan Hans (Helicopter) Limited</li> </ul>
<b>Autonomous bodies</b>	<ul style="list-style-type: none"> <li>– Bureau of Civil Aviation Security</li> <li>– Indira Gandhi Rashtriya Uran Akademi</li> </ul>

**Civil Aviation Policy 2016: Highlights →**

1. More airports and flights for North East & small towns to improve regional connectivity.
2. Making the air travel more affordable for middle class
3. Improving Airplanes' Maintenance, Repair and Overhaul (MRO) operations.

## 58.15 TRANSPORT (✈️) → CHEAP FLIGHTS TO SMALL TOWNS → \_ \_ \_ \_

- **Boss?** Civil Aviation ministry (2017). 0% funding from States.
- Earlier, Airlines avoided small towns, fearing that not enough passengers will come.
- So, under Ude Desh ka Aam Naagrik- Regional Connectivity Scheme (क्षेत्रीय संयोजकता/कनेक्टिविटी योजना), Govt. fixed ₹ 2,500 airfare per seat for one-hour travel on selected regional / small town routes.
- Airlines fly @this rate, small town passengers will come because it's affordable, and if airline making any losses on such route → covered by Union's Viability Gap Funding (VGF: ).
- Govt arranges VGF money by charging ~₹ 5000 levy per flight on airlines operating at major cities (E.g. Mumbai Bengaluru, A'bad-Delhi).

### 58.15.1 Transport (✈️) → Udan 3.0 (2018)

Civil Aviation Ministry invited the airline operators to bid for new regional routes connecting



- Additional tourist cities & North East cities.
- Seaplanes using Water Aerodromes (e.g. Statue of Unity-Sardar Sarovar Dam @Gujarat, Sabarmati RiverFront A'bad@Gujarat, Brahmaputra Riverfront Guwahati@Assam etc.)

### 58.16 TRANSPORT (✂️) → BUILD MORE AIRPORTS → NABH NIRMAN

- Budget 2018 announced 'NextGen Airports for Bharat' (= NABH) Nirman
- It aims to build 100 new airports in 15 years at the cost of ₹ 4 lakh crore (mostly through PPP investment.)
- It also aims to expand / upgrade existing airports.
- **Result?** Billion trips a year.

**Related Topic:** No Frills airports (बिना तामझाम के) → AAI develops No Frills airports at small towns / North East with only basic safety and security features. No fancy lounges with airconditioners, no aerobridges, no conveyor belts for luggage. It's just a single storey building without any posh facility → low operational costs.

#### 58.16.1 Transport (✂️) → Challenges to aviation sector

- **ATF-Taxes:** Airlines spend ~50% of the revenues on Aviation Turbine Fuel (ATF). India's ATF excise & VAT are among the highest in world = profitability hurt :-)
- **Predatory Pricing:** It means deliberately selling product below the cost price, to eliminate rival companies. AirDeccan, Spicejet etc. accused of this. It's bad for economy because in long term, either the firm will collapse or it'll establish monopoly by eliminating rivals.
- **Passenger Safety Compromised:** Due to higher operating costs, Indian Airlines not doing the regular service & maintenance of the aircraft.
- Govt. owned Air India is making losses, 2018: Union tried to sell its 76% shares to privatize Air India, but no one came to buy.

#### 58.16.2 Transport (✂️) → Drone Regulation (ड्रोन विनियमन) 1.0

- **Boss?** Civil Aviation ministry designed the rules effective from 31/12/2018.
- India's airspace classified into
  - Red Zone (flying not permitted),
  - Yellow Zone (controlled airspace),
  - Green Zone (automatic permission).
- Drone-User will have to do one-time-registration with Digital Sky Platform app
- Then for every flight, Drone user must ask permission from mobile app. Based on the zone & GPS location its system will automatically permit / deny.
- Any drone without a digital permit will not be able to takeoff. Thus, it has "no permission, no takeoff" (NPNT) mechanism.

## 59 INFRA → HOUSING FOR ALL BY 2022 (🏠)

- 1985: Indira Awas Yojana for rural areas gave money to poor families to build homes,
- 2008: Rajiv Rinn Yojana for urban areas gave home loan Interest subsidy to poor families.
- 2015-16: Modi restructured them into Pradhan Mantri Awas Yojana (PMAY). Core Scheme = NOT 100% funded by Union. PMAY has two components.





PMAY (Urban)	PMAY (Rural)
by Ministry of Housing and Urban Affairs	By Ministry of _____.
<p>It has four components:</p> <ol style="list-style-type: none"> <li>1. If person owns land: ₹ 1.50 lakh to build / renovate his house.</li> <li>2. If a builder is keeping 35% apartments' quota for EWS then he gets subsidy.</li> <li>3. Slum redevelopment</li> <li>4. <b>Credit-linked subsidy scheme (CLSS):</b> Depending on the annual income, the beneficiaries are classified into 3 groups: Economically Weaker Section (EWS), Low Income Groups (LIGs) and Middle Income Groups (MIGs: i.e. annual income upto ₹ 18 lakhs). These groups are given 3-4% interest subsidy on loan amounts upto ₹ "x" lakhs.</li> </ol>	<p>Beneficiaries are identified through SECC-2011 data, and verified by Gram Sabha. They're given money to build home.</p> <ul style="list-style-type: none"> <li>- ₹ 1.5 lakh (plains area),</li> <li>- ₹ 1.6 lakh (hilly states)</li> <li>- Additionally they can get ₹ 70,000 as bank loans</li> </ul> <p>Money transferred to beneficiary's bank account via AwaasSoft web platform.</p> <ul style="list-style-type: none"> <li>- Convergence with other schemes to provide electricity, LPG, drinking water &amp; toilet.</li> <li>- Also provides skill programs for rural masons.</li> </ul>

### 59.1.1 (🏠) → National Urban Housing Fund 2018

Boss? Ministry of Housing and Urban Affairs → (Autonomous body) Building Materials and Technology Promotion Council.

- They'll raise mobilize ₹ 60,000 crores in next 4 years to finance the PMAY (Urban).
- This money will be raised through 'extra Budgetary Resources' i.e. BMTPC itself borrowing from market / CPSEs / lenders without involvement of Govt. (so that Govt's fiscal deficit appears under control.)

**Conclusion?** A homeless family is more vulnerable to crime, disease & disasters. SDG Goal #11 requires India to provide safe and affordable housing to all by 2030. Aforementioned scheme / policy / challenges.....

## 60 INFRASTRUCTURE → URBAN (🏙️)

	2011	2030
<b>Urban population</b>	__ %	40% (and 50% by 2050)
<b>Contribution to GDP</b>	63%	75%

**Introduction (Data):** Urban areas support >30% of India's population and contribute to more than 60% of India's GDP. These figures are expected to grow to 40% and 75% respectively by 2030.

### 60.1 URBAN (🏙️) → CENSUS DEFINITIONS

Census-2011 definitions of urban area:

<b>Statutory towns</b>	municipality, corporation, cantonment board or notified town area committee, etc.
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<b>4000+</b>	
<b>Census towns 3800+</b>	<ul style="list-style-type: none"> <li>- Min 5k people; and</li> <li>- Min. population density: 400/sqkm</li> <li>- min.75% of males engaged in non-agro;</li> </ul>

Further,

Size / class of the area		Population Size
Urban	Class I	1,00,000 & above: further Metro city = 40 lakh/>, mega city = 1 cr />
	Class II	50,000 - 99,999
Semi-Urban	Class III	20,000 - 49,999
	Class IV	10,000 - 19,999
Rural** (if <75% male population in non-agro)	Class V	5,000 - 9,999
	Class VI	less than 5,000

## 60.2 URBAN (🏠) → [YEARBOOK] MOHUA

Ministry of Housing And Urban Affairs आवासन एवं शहरी कार्य मंत्रालय consists of →

<b>Dept</b>	NA
<b>Attached offices</b>	<ul style="list-style-type: none"> <li>- Central Public Works Department केन्द्रीय लोक निर्माण विभाग</li> <li>- National Buildings Organisation (NBO)राष्ट्रीय भवन निर्माण संगठन</li> </ul>
<b>Statutory</b>	<ul style="list-style-type: none"> <li>- Delhi Development Authority</li> <li>- Rajghat Samadhi Committee</li> <li>- Delhi Urban Arts Commission</li> <li>- National Capital Region Planning Board</li> </ul>
<b>Autonomous Bodies</b>	<ul style="list-style-type: none"> <li>- National Institute of Urban Affairs</li> <li>- Building Materials &amp; Technology Promotion Council (BMTPC)</li> <li>- Central Government Employees Welfare Housing Organisation (CGEWHO)</li> <li>- National Cooperative Housing Federation of India (NCHFI)</li> </ul>
<b>PSU</b>	<ul style="list-style-type: none"> <li>- Housing and Urban Development Corporation Ltd. (HUDCO)</li> <li>- Hindustan Prefab Limited (HPL)</li> <li>- National Buildings Construction Corporation Limited</li> </ul>
<b>Subordinate office</b>	<ul style="list-style-type: none"> <li>- Town &amp; Country Planning Organisation</li> <li>- Government of India Stationery Office</li> <li>- Department of Publication (responsible for printing Gazettes)</li> </ul>

**2015:** Modi govt launched Urban Rejuvenation Mission () with two components: 1) 500 AMRUT cities 2) 100 Smart cities.

## 60.3 URBAN (🏠) → AMRUT MISSION (2015) → 500 CITIES

2005: Manmohan launched Jawaharlal Nehru National Urban Renewal Mission (JNNURM).

→ 2015: Modi repacked as Atal Mission for Rejuvenation and Urban Transformation (AMRUT).

- **Boss?** Urban Development Ministry. Core Scheme = NOT 100% funded by Union.
- **Validity?** 2015 to 31/3/2020. It's a five year \_\_\_\_\_ scheme, covering 500 cities with population of 1 lakh />.
- Aims to improve basic infrastructure - public transport, water supply, sewerage, storm-water drains, green spaces and parks.



## 60.4 URBAN (🏠) → SMART CITIES MISSION (2015) → 100 CITIES

**Definition:** It is a city with smart physical, civic and economic infrastructure. It provide smart technology, utility & mobility to its residents through 0% bureaucratic hassles & 100% use of Information and Communications Technology (ICT). Although ICT/computerization itself is not the 'end goal' of a smart City. The end goal is to improve quality of life, ease of living, economic growth and sustainable development.

<b>Infra.</b>	Facilities in a Smart City
<b>Electricity</b>	Automated streetlights, Smart electricity grids, Rooftop Solar
<b>Water</b>	Heavy penalties for littering & water wastage. Facilities for rainwater harvesting, storm water drainage
<b>Transport</b>	<ul style="list-style-type: none"> <li>- Walking lanes, public cycle sharing, public transport within 10-15m waiting time.</li> <li>- Multimodal transport: Bus Rapid Transit System (BRTS), Waterways, railways (Metrorail, Monorail, Trams etc.)</li> <li>- Bypass, underpass, overbridges, smart traffic signals to prevent traffic congestion. ICT to send automated challans to traffic violators.</li> </ul>
<b>Housing</b>	100% housing to all with 24/7 water, electricity and Wi-Fi connectivity. School, Mall, Parks available within 400m of residential area.
<b>Education</b>	From nursery to college- all educational facilities will be available.
<b>Healthcare</b>	<ul style="list-style-type: none"> <li>- From Primary Health Care Centre to multispeciality hospital and even veterinary hospital for the pets will be available.</li> <li>- 108 ambulance with maximum 30 minutes of response time.</li> </ul>
<b>Communication</b>	Wifi @all houses. Apps and emergency helplines to connect with medical / fire / police.
<b>Economic</b>	Bank-ATM, Centres for Skill Development & Startup Incubation; Warehousing, Freight Terminals, Export Parks

### 60.4.1 Smart Cities → Selection process

- Cities prepare Smart city plan → send to state government → MoUD → final selection among total 100 slots with internal quotas assigned to each state/UT in proportion of their population and number of statutory towns.
- So, UP (13) > TN (12) > Maharashtra (10).....Union territories and special category states are given minimum 1 City each e.g. Srinagar(J&K), Arunachal (Pasighat), Kavaratti (Lakshadweep), Andaman-Nicobar-Islands (PortBlair).

**MCQ. Which one of the following cities was not included in the list of smart cities in India? (Asked in UPSC-CDS-2019-i)**

- a) Silvassa    b) Jorhat    c) Itanagar    d) Kavaratti

### 60.4.2 Smart Cities → funding and administration

**Boss?** Urban Development Ministry. Core Scheme = NOT 100% funded by Union.

<b>Contribution</b>	Total amount from 2015-20
<b>Union budget</b>	48k cr
<b>Union's National Investment &amp; Infra Fund (NIIF)</b>	2k cr
<b>State/UT</b>	50k cr
<b>Total (100 cities vs. 1l cr so each city gets ₹ 1,000 cr)</b>	1 lakh crore



To implement this project, every smart city is required to set up a Special Purpose Vehicle (SPV) company under the Companies Act: wherein

Co-contribution from the (State / UT) + its respective Urban Local Body (ULB)	x%
Any private company or financial intermediary (Bank / NBFC)	y%
Total shareholding 100% (but x% must be > greater than y%)	100%

#### 60.4.3 Smart Cities → Criticism / Challenges

1. India is a country of poor people and rural people. So, instead of spending ₹ 1000 crore x 100 big cities, it would have been better to spend ₹ 10 crores each on 10,000 towns and villages where people are struggling for basic amenities like water and electricity.
2. Excessive reliance on ICT in city administration makes us more vulnerable to hacking & cyber warfare. City will completely stop functioning if electricity gone during natural disasters / nuclear attacks.
3. Nothing will be free except the Wi-Fi because the SPV company will charge user-fees on everything from water, sanitation, education and healthcare.
4. Soul of the city & sense of the community will be lost. It will become an artificial jungle of concrete and internet cables where nobody has time for anybody except their electronic gadgets.

**Counter-argument?** Smart city will improve the quality of life & create economic opportunities. And looking at such best cities, even the voters in the small cities will become more assertive in demanding better quality of city administration from their municipal corporators → then even small towns will become more clean and comfortable to live.

#### 60.5 URBAN (🏠) → PRASAD & HRIDAY MISSION

Both are Central Sector Schemes: 100% funded by Union. Both aim to improve the city infrastructure & amenities with special focus on improving the tourism.

PRASAD (2014-15)	HRIDAY (2014-15)
Pilgrimage Rejuvenation and Spiritual Augmentation Drive.	National Heritage City Development and Augmentation Yojana
Ministry of Tourism, initially 12 cities but then list keeps getting expanded to 20+.	Ministry of Urban Development, 12 cities: Ajmer (Rajasthan), Amaravati (Andhra Pradesh), Amritsar (Punjab), Badami (Karnataka), Dwaraka (Gujarat), Gaya (Bihar), Kanchipuram (Tamil Nadu), Mathura (UP), Puri (Odisha), Varanasi (Uttar Pradesh), Velankanni (Tamil Nadu), Warangal (Telangana),

**Conclusion?** India is a fast urbanizing country and is witnessing a steady increase in migration from rural areas to urban centers. This poses stress on the already overburdened infrastructure of the cities. SDG Goal 11 requires India to work towards Sustainable cities and communities. Aforementioned scheme / policy / challenges.....



## 60.6 URBAN (🏠) → PH FRIENDLY → SUGAMYA BHARAT (2014)

- **Boss?** Ministry Social Justice and Empowerment → Divyangjan Dept.
- Ramps in public buildings / railways / airports; toilets for wheelchair users, Braille symbols and auditory signals in lifts, disabled-friendly websites etc. so that life becomes easier for the PH.
- Under Accessible India Campaign (Sugamya Bharat Abhiyaan), Divyangjan Dept hires auditors to check public buildings & websites → then respective organization required to do above things under the Persons with Disabilities Act (विकलांग व्यक्ति अधिनियम). Grants are given as & where required.
- + Awareness generation, IEC, mobile app etc.

## 61 INFRA → RURAL (🏡)

[Yearbook] Ministry of Rural Development ग्रामीण विकास मंत्रालय consists of →

<b>Dept</b>	<ul style="list-style-type: none"> <li>- Dept. of Rural Development.</li> <li>- Dept. of Land Resources (भूमि संसाधन).</li> </ul>
<b>Autonomous Bodies</b>	<ul style="list-style-type: none"> <li>- National Institute of Rural Development and Panchayati Raj-Hyderabad. राष्ट्रीय ग्रामीण विकास और पंचायती राज संस्थान</li> <li>- Council for Advancement of People's Action and Rural Technology (<b>CAPART</b>) chaired by the Union Minister for Rural Development to coordination with NGOs &amp; Government</li> </ul>
<b>PSU / Statutory /Attached</b>	NA or Not MCQ worthy.

There is also a Ministry of Panchayati Raj - but doesn't have any MCQ-worthy orgs.

### 61.1 RURAL (🏡) → SHYAMA PRASAD MUKHERJEE RURBAN MISSION

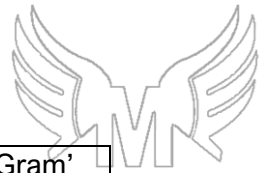
2004: President Dr. Kalam suggested PURA (Providing Urban Amenities in Rural Areas), but failed totakeoff because inter-ministerial miscoordination in UPA. → Modi repacked (2016)

- **Boss?** Rural Development Ministry. Core Scheme = NOT 100% funded by Union.
- 15-20 villages clusters are selected. They're given ₹ ₹ to improve Electricity, water, roads; centres for Agri Processing, Tourism, Skill development etc.

As a result, the economic opportunity and ease of living will improve in the rural areas itself → cities will face less migration and congestion (स्थानान्तरण और अतिप्रजन).

### 61.2 RURAL (🏡) → ADARSH GRAM YOJANAS

Saansad Adarsh Gram Yojana (SAANJHI)	Pradhan Mantri Adarsh Gram Yojana
----- Ministry (2014)	----- Ministry (2009: Manmohan launched → Modi continued)
Members of Parliament adopt village in their constituency (if nominated member then adopt anywhere) <ul style="list-style-type: none"> <li>- MP to give personal attention to develop these villages <b>through</b></li> </ul>	Govt to focus on villages with than 50% Scheduled Caste (SC) population <ul style="list-style-type: none"> <li>- Develop these villages <b>through better implementation of existing schemes.</b></li> </ul>



<p><b>better implementation of existing schemes.</b></p> <ul style="list-style-type: none"> <li>- MP to encourage the villagers to build library via donation, prepare village song, remember martyrs, celebrate girl child birth, plant trees etc.</li> </ul>	<ul style="list-style-type: none"> <li>- A village is declared 'Adarsh Gram' once it achieves minimum 3 targets from a long list of targets related to school enrollment, 100% adult literacy, 100% vaccination, 100% ODF-free, 0% child marriage, 0% drinking of desi-liquor in public places etc.</li> </ul>
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### 61.3 RURAL(🏠) → RASHTRIYA GRAM SWARAJ ABHIYAN (2018)

- Under Manmohan-era, the Panchayati Raj Ministry had following schemes:
  - a. Backward Region Grant Fund (BRGF) → Additional ₹ ₹ to backward areas to build schools, roads, streetlights etc.
  - b. Rajiv Gandhi Panchayat Shasaktikaran Abhiyan → ₹ ₹ for Panchayat Building renovation.
  - c. Rashtriya Gram Swaraj Yojana (RGSY) for training of PRI's elected representatives & civil servants.
- Since 14th Finance Commission provided huge grant in aid to the Panchayati Raj bodies, so Modi stops / suspends these schemes from 2015.
- 2018: Modi launches (restructured) Rashtriya Gram Swaraj Abhiyan with basically above features i.e. Panchayati Raj Institutions (PRIs) given ₹ ₹ to improve e-governance, repair / renovate panchayat building. PRI officials given training & exposure visits → capacity building → they become capable to achieve SDG goals.
- **Boss?** Panchayati Raj Ministry. Core Scheme = NOT 100% funded by Union. (Gen-60:40, Sp.Cat-90:10)

### 61.4 RURAL(🏠) → MPLADS (1993)

- Members of Parliament Local Area Development Scheme (सांसद स्थानीय क्षेत्र विकास योजना). Central Sector Scheme =100% funded by Union.
- Boss? Ministry of Statistics and Programme Implementation (MoSPI).
- Each MP can suggest development works worth ₹ 5 crore per year in his constituency. Rajya Sabha MP: any district in his State. Nominated MP can select any district in anywhere in India.
- If an area inhabited by SC → 15% fund quota for their development works, if ST → 7.5%.
- Max. 20 lakhs / year (out of his 5 cr quota) for PH welfare e.g. giving tricycles, artificial limbs, hearing aids etc.
- Further, if any MP wishes, he may also recommend works anywhere in India upto Max. 25 lakhs / year (out of his 5 cr quota) e.g. during natural disaster or to promote national unity.
- MPLADS Funds are non-lapsable in nature i.e. if not used this year, it is carried forward to the next year.

### 61.5 RURAL(🏠) → BORDER AREA DEVELOPMENT PROGRAMME (BADP).

सीमा क्षेत्र विकास कार्यक्रम





- **Boss?** Ministry of Home Affairs → Dept of Border Management. 100% funded by Union.
- BADP covers 17 states' people living within 50 kilometres of the International Border. Funding for roads, bridges, school, hospital etc.
- Eligible states are: Arunachal Pradesh, Assam, Bihar, Gujarat, Himachal Pradesh, Jammu Kashmir, Manipur, Meghalaya, Mizoram, Nagaland, Punjab, Rajasthan, Sikkim, Tripura, Uttar Pradesh, Uttarakhand, West Bengal.

**Sidenote:** Ministry of Home Affairs Departments of (i) Internal Security (ii) Department of States (iii) Department of Official Language (Raj Bhasha) (iv) Department of Home (Grih Vibhag) (v) Department of J&K (vi) Department of Border Management (Seema Prabandhan Vibhag)

**Conclusion?** SDG Goal #8 requires India to provide decent work and economic growth opportunities to all. Since majority of Indians reside in rural areas, the rural infrastructure development is the lynchpin factor in this regard. Aforementioned scheme / policy / challenge....

## 62 INFRASTRUCTURE → COMMUNICATION

### [Yearbook] Ministry of Communication (संचार मंत्रालय)

<b>Dept</b>	<ul style="list-style-type: none"> <li>– Dept. of Telecommunications (दूरसंचार विभाग)</li> <li>– Dept. of Posts (डाक विभाग)</li> </ul>
<b>Statutory Bodies</b>	<ul style="list-style-type: none"> <li>– ----- (TRAI: भारतीय दूरसंचार विनियामक प्राधिकरण)</li> <li>– Telecom Disputes Settlement and Appellate Tribunal (TDSAT: दूरसंचार विवाद समाधान एवं अपील अधिकरण)</li> </ul>
<b>PSU / PSB</b>	<ul style="list-style-type: none"> <li>– BSNL: Bharat Sanchar Nigam Limited</li> <li>– MTNL: Mahanagar Telephone Nigam Ltd for Delhi &amp; Mumbai.</li> <li>– BBNL: Bharat Broadband Network Ltd.</li> <li>– Telecommunications Consultants India (TCIL) Ltd</li> <li>– Indian Telephone Industries (ITI) Ltd</li> <li>– <b>India Post Payments Bank (IPPB) Ltd</b></li> </ul>
<b>Attached / subordinate</b>	<ul style="list-style-type: none"> <li>– Universal Service Obligation Fund</li> <li>– Telecommunication Engineering Center</li> </ul>
<b>Autonomous</b>	<ul style="list-style-type: none"> <li>– Centre for Development of Telematics (C-DOT)</li> </ul>

### 62.1 COMMUNICATION → DEPARTMENT OF POST

- 1766: Clive started
- 1854: Dalhousie- Post Office Act; 1st postal stamp, rates by weight & not by distance.
- 1884: Postal life insurance for its employees, after independence RPLI to cover rural people as well → 2017: Sampooran Bima Gram Yojana: select min. 1 village per district → sell min. 1 RPLI policy to every rural household in it.
- 2008: Project Arrow for modernization.
- 2013: Telegram stopped by India Post, due to onset of SMS & email.



- 2018: India Post Payments Bank starts operations.
- **Terms:** Philately = stamp collection hobby, numismatic = coin collection hobby.

## 62.2 COMMUNICATION → TELECOM (📞)

**Teledensity** = number of telephones per 100 population, is an indicator of telecom penetration in the country. Rural teledensity 70% (2017) → Target: 100% by 2020.

### 62.2.1 Telecom (📞) → 2G Spectrum Scam

To run telecom business, two things required → A) License, B) Access to Spectrum. Spectrum refers to the radio waves that are used by mobile phones to transmit data.

- **UPA-1:** we'll give license by "First Come First Serve Basis", and whoever gets the license, he will automatically get free 2G spectrum linked with his License.
- **Scam?** Certain shell companies who had no intention of actually running telecom business applied and got licence & free spectrum → they sold it to the needy companies at higher prices, thus, making windfall profit without doing any business at all. UPA's ally DMK party's A.Raja (Telecom Minister) & Kanimozhi were arrested → later acquitted (2017).

#### Present system:

- A) Company has to separately apply for Unified License (i.e. valid for both voice and data services) and
- B) Company has to separately buy Spectrum through Dept of Telecom's auctioning.

### 62.2.2 Telecom (📞) → Emergency Response Support System (ERSS)

- **Boss?** \_\_\_ Ministry. Launched pan-India in 2019-Feb. Although some states yet to roll it out.
- Victim dials \_\_\_ → Emergency Response Centre (आपातकालीन प्रतिक्रिया केंद्र) → redirect to police (100), fire (101), health (108), women's safety (1090) & other helplines.
- Alternatively, victim can use Panic Button on the phone by longpressing '5' or '9', or, '112 India' mobile app which also has a 'shout' button so registered volunteers close to the victim can come for immediate assistance before police/firemen arrive.

### 62.2.3 Communication → IT (💻) → [Yearbook] MEITY

Ministry of Electronics & IT इलेक्ट्रॉनिकी एवं सूचना प्रौद्योगिकी मंत्रालय consists of →

Dept	N/A
<b>Attached offices</b>	<ul style="list-style-type: none"> <li>- National Informatics Centre (NIC) राष्ट्रीय सूचना विज्ञान केंद्र</li> <li>- Standardisation, Testing and Quality Certification (STQC) Directorate मानकीकरण परीक्षण और गुणवत्ता प्रमाणन निदेशालय</li> </ul>
<b>Statutory Bodies</b>	<p><b><u>Under the Information Technology Act, 2000 →</u></b></p> <ul style="list-style-type: none"> <li>- Controller of Certifying Authorities (CCA) प्रमाणन प्राधिकरण नियंत्रक</li> <li>- Computer Emergency Response Team-India (CERT-In) भारतीय कंप्यूटर आपात प्रतिक्रिया दल</li> </ul> <p><b><u>Under the Aadhaar Act 2016 →</u></b></p>



	<ul style="list-style-type: none"> <li>----- (UIDAI) भारतीय विशिष्ट पहचान प्राधिकरण</li> </ul>
<b>PSU</b>	<ul style="list-style-type: none"> <li>National Informatics Centre Services Inc.(NICSI) (PSE under control of NIC) भारतीय सूचना विज्ञान केंद्र सेवा संस्थान</li> </ul>
<b>Autonomous Bodies (स्वायत्त निकाय)</b>	<ul style="list-style-type: none"> <li>Centre for Development of Advanced Computing (C-DAC) प्रगत संगणक विकास केंद्र</li> <li>Centre for Materials for Electronics Technology (C-MET) इलेक्ट्रॉनिक प्रौद्योगिकी सामग्री केंद्र</li> <li>Education &amp; Research in Computer Networking(ERNET)</li> <li>National Institute of Electronics and Information Technology (NIELIT - Formerly DOEACC Society)</li> <li>Society for Applied Microwave Electronics Engineering and Research (SAMEER)</li> <li>Software Technology Parks of India (STPI)</li> <li>National Internet Exchange of India(NIXI) - a meeting point for ISPs.</li> </ul>

### 62.3 COMMUNICATION → IT (💻) → DIGITAL INDIA PROGRAMME

- **1977:** National Informatics Centre (NIC) to develop websites, softwares, ICT services for government of India
- **2006:** Manmohan's National e-Governance Plan (NeGP)
- **2014:** Modi's Digital India Mission by restructuring above things:

**Boss?** Ministry of Electronics & IT. Central Sector Scheme = 100% Funded by Union.

#### Digital India program(डिजिटल इंडिया कार्यक्रम) 9 Pillars:

<b>1) Broadband Highways</b>	<ul style="list-style-type: none"> <li>----- <b>Project:</b> Connect all 2.50 lakh+ village Panchayats with broadband <b>National Optical Fibre Network (NOFN)</b>. <b>Nodal?</b> Communication Ministry's Department of Telecom (DoT).</li> <li><b>State Wide Area Network (SWAN)</b> to run State Government website &amp; e-governance services.</li> <li>----- <b>platform:</b> To provide Cloud Computing services <i>Benefit?</i> Cloud servers can store the file &amp; run the softwares/Apps → individual Govt. organizations needn't buy very powerful CPU/large hard disks etc.</li> <li><b>National Knowledge Network (NKN):</b> to provide highspeed internet (Gbps speed) to all universities,libraries, laboratories, healthcare, research &amp; agricultural institutions</li> </ul>
<b>2) Universal Access to Mobile Connectivity</b>	Telecom companies required to pay ₹ ₹ to DoT's Universal Service Obligation Fund (USOF: विश्वव्यापी सेवा कर्तव्य निधि) → new mobile towers in unconnected rural / remote / LWE (naxal) areas.
<b>3) Public Internet Access Programme</b>	<ul style="list-style-type: none"> <li>MEITY → <b>Setup Common Services Centre (CSC)</b> in all 2.50 lakh+ gram panchayat. So, even if a poorman doesn't own PC/mobile, he can use CSC to apply online for exams/schemes/certificates, check result, pay bills etc.</li> </ul>



(सार्वजनिक इंटरनेट एक्सेस कार्यक्रम)	<ul style="list-style-type: none"> <li>- Dept of Post will create similar facilities in all 1.50 lakh+ post offices.</li> </ul>
<b>4) e-Governance</b> <b>5) e-Kranti - Electronic Delivery of Services</b>	<p>Develop more apps, websites and portals to reduce to improve Govt's efficiency, reduce corruption. e.g.</p> <ul style="list-style-type: none"> <li>- FinMin → Dept of Expenditure Controller General of Accounts (CGA) → Public Financial Management System (<b>PFMS</b>) webportal to disbursement of scheme money.</li> <li>- Same CGA → <b>Bharatkosh</b> webportal for transactions related to govt's "Non-tax revenue receipts" e.g. selling Yojana / Kurukshetra magazines online.</li> <li>- Dept of Post → online tracking of speed post, online sale of postal stamps.</li> </ul> <p>Similarly, portals / apps for paying taxes, getting passport, registering a company, applying for admissions etc.</p>
<b>6) Information for All</b>	<ul style="list-style-type: none"> <li>- <b>MyGov.in</b>: to facilitate 2-way idea exchange between citizens and Government for good governance.</li> <li>- <b>Data.gov.In</b>: researchers can obtain datasets related to ministries, departments, Macroeconomic indicators etc.</li> <li>- <b>E-taal portal</b>: It tracks the statistics of govt-citizen transactions e.g. "x" number of RTI applications filed online by the people in "y" age group from "z" state.</li> <li>- IGNOU, Delhi University etc. given funding to put their courses / learning modules online.</li> <li>- <b>mKisan</b> app/portal for e-extension services to farmers.</li> </ul> <p>And so on....</p>
<b>7) Electronics Manufacturing</b>	<i>Ref: Pillar#4 → Mfg → National Policy on Electronics (NPE)</i>
<b>8) IT for Jobs</b>	<ul style="list-style-type: none"> <li>- IT companies given subsidies and tax benefits for setting up BPO/call centers in North East.</li> <li>- More computer courses for villagers and ITIs.</li> </ul>
<b>9) Early Harvest Programmes</b> <b>(शीघ्र परिणाम कार्यक्रम)</b>	<p>It focuses on the projects which are to be implemented within short timeline. e.g</p> <ul style="list-style-type: none"> <li>- Biometric attendance in govt organisations to check the absenteeism of employees, teachers and students</li> <li>- Women and Child Ministry → _____ portal to announce lost children so others may inform the authorities.</li> <li>- Labour Ministry → _____ portal to send complaint about child labour.</li> <li>- HRD Ministry → Convert all school books into ebooks.</li> <li>- IMD + NDMA → SMS based weather information and disaster alerts</li> <li>- MEITY → CERT-In → <b>Cyber Swachhta Kendra</b> webportal for free tools for removal of botnet / malware / ransomware such as Petya, WannaCry etc.</li> <li>- MEITY → <b>Digilocker</b>: It's similar to google drive to store files. citizen opens an online account linked with Aadhar</li> </ul>



	number. 1) He can store his important documents 2) Organizations can send electronic copies of documents (e.g. driving license, Voter ID, School certificates) directly into his lockers. 3) he can even sign documents using eSign facility.
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**MCQ. Which of the following is/are the aim/aims of "Digital India" Plan of the Government of India?(Asked in UPSC-Pre-2018)**

1. Formation of India's own Internet companies like China did.
2. Establish a policy framework to encourage overseas multinational corporations that collect Big Data to build their large data centres within our national geographical boundaries.
3. Connect many of our villages to the Internet and bring Wi-Fi to many of our schools, public places and major tourist centres.

**Answer Codes:** (a) 1 and 2 only (b) 3 only (c) 2 and 3 only (d) 1, 2 and 3

### 62.3.1 IT (🖥️) → National Digital Communications Policy (2018)

राष्ट्रीय डिजिटल संचार नीति replaces National Telecom Policy-2012.

**Boss?** Ministry of Communications → DoT

- **Target-2022:** 50mbps broadband to every citizen, 10 Gbps to all Gram Panchayats, jobs to 40 lakh people covering 8% GDP.
- **Bodies:**
  - DoT's Telecom Commission transformed into ' \_\_\_\_\_ (डिजिटल संचार आयोग)'.
  - (proposed) National Fibre Authority(राष्ट्रीय फाइबर प्राधिकरण): for creating broadband National Digital Grid.
- Focus on data privacy, digital security, 5G, Internet of Things (IOT), Machine to Machine Communication (M2M), etc.
- United Nations → specialized agency → International Telecommunication Union (ITU) → **ICT Development Index** → improve India's ranking. (presently below 100, have to get into top-50.)

**Related:** World Economic Forum's **Networked Readiness Index**. Although seems ranking not updated post-2016 so let's ignore.



### 62.3.2 IT (🖥️) → National Policy on Software Products - 2019

- **Boss?** MEITY **Target-2025:** 1000 startups, 35 lakh jobs, 10% of India's GDP.
- For this we will help the startup companies, setup Software Technology Parks , Research, Innovation, Training, Skill Upgradation, Linkages Between Industry-Academia, IPR Protection.
- Software Product Development Fund (SPDF: सॉफ्टवेयर उत्पाद विकास कोष) of ₹ 1000 cr → 'Fund of Funds' → give ₹ ₹ to Venture Capital Funds → they give it to software developers.

### 62.3.3 IT (🖥️/🔗) → Training (existing schemes)

Training Target	Scheme? [Central Sector Scheme = 100% Funded by Union.]
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 <b>Youth to get telecom sector jobs training</b>	<ul style="list-style-type: none"> <li>– Pandit Deen Dayal Upadhyay Sanchar Kaushal Vikas Pratisthan Scheme</li> <li>– <b>Boss?</b> Dept of Telecom (Communication Ministry).</li> </ul>
 <b>Villagers to get computer training</b>	<ul style="list-style-type: none"> <li>– Pradhan Mantri Gramin Digital Saksharta Abhiyan (PMGDISHA)</li> <li>– <b>Boss?</b> Ministry of Electronics &amp; IT</li> </ul>

Apart from above, many other skill development schemes also directly or indirectly involve Computer training, but that we will see in Pillar#6 handout.

**Conclusion:** SDG Goal #9 (infrastructure) requires India to provide Universal telephone and internet connectivity to all. Above scheme / policy helps in digital access, digital inclusion, digital empowerment and bridging the digital divide (डिजिटल विभाजन). Thus, it'll play an important role in transforming India into a knowledge-based economy and digitally empowered society.

## 62.4 COMMUNICATION (/) → REGULATORS

### 62.4.1 Comm → Regulators → TRAI

- 1999: Telecom Regulatory Authority of India (TRAI: भारतीय दूरसंचार नियामक प्राधिकरण), a statutory body under the Communications Ministry → further appeal to Telecom Dispute Settlement And Appellate Tribunal (TDSAT: दूरसंचार विवाद निपटान और अपीलीय न्यायाधिकरण).
- TRAI regulates the operators of telecom, internet, DTH/cableTV sector.

TRAI's notable initiatives for consumer interest are →

- **DND (Do Not Disturb)** registry → to prevent Telemarketing Calls/SMS.
- Strong directives to reduce **Call-drops** in mobile plans.
- **MySpeed** App to help customers to measure 3G/4G speed & share with TRAI.
- Directives for **Net Neutrality (नेट तटस्थता)** i.e. Internet Service Providers (ISPs) must treat all internet traffic equally without increasing/slowing down speed towards any website.
- DTH / Cable operators required to give customer the **freedom of choosing channels**, and fixed prices for services.

### 62.4.2 Comm → Regulators (Statutory) → Censor board

- Indian Cinematograph Act, 1952 → Central Board of Film Certification (CBFC: केंद्रीय फिल्म प्रमाणन बोर्ड) commonly known as 'Censor board', under Ministry of Information & Broadcasting.
- Types of movie certificates:
  - Unrestricted public exhibition (U)
  - Parental guidance for children <12 (U/A) e.g. "Jungle Book"
  - Adult (A)





- Viewing by specialized groups only (S) e.g. documentary movie about surgeries, meant to be shown to doctors only, because ordinary person may get disturbed by the blood & gore.

**Controversy?** Former chairman Pahlaj Nihalani would do excessive cuts in the movies to stop display of smoking-alcohol, Cuss words, Kiss scenes etc. leading to debate on 'social values vs artistic freedom of expression'.

#### 62.4.3 Comm → Regulators (Statutory) → Press Council of India

- 1978: Press Council Act → भारतीय प्रेस परिषद, a statutory body under Ministry of Information & Broadcasting.
- Readers can complaint against violation of press ethics (e.g. yellow journalism, paid news, hate news).
- Newspaper / Journalists can complaint if their freedom of press violated.
- Chairman + members from journalism field, (members from LS & RS), members sent by (UGC, Bar Council, Sahitya academy).

**Press Council of India doesn't cover TV-News channel and so we have →**

<b>News channels</b>	<ul style="list-style-type: none"> <li>- <b>News broadcaster association (NBA):</b> Non-statutory Self regulatory body set up by the news channels themselves (2008)</li> <li>- It punishes news-channels if they spread misinformation, hate news, harm privacy of women by showing rape victim name / face etc.</li> </ul>
<b>Entertainment channels</b>	<ul style="list-style-type: none"> <li>- <b>Broadcasting Content Complaints Council (BCCC):</b> Non-statutory Self regulatory body set up by non-news general entertainment channels themselves. (2011)</li> <li>- Punishes them for objectionable content.</li> </ul>
<b>Notable laws</b>	<ul style="list-style-type: none"> <li>- Prohibit advertising drugs for cancer, diabetes, abortion etc. Else complaint under <b>Drugs and Magic Remedies Act (औषधि और जादुई इलाज कानून), 1954</b></li> <li>- Prohibit indecent representation of women in Print Media, TV etc. else complaint under <b>Indecent Representation of Women (Prohibition) Act(महिलाओं के अश्लील निरूपण (निषेध) अधिनियम), 1986.</b></li> </ul>

#### 62.4.4 [Yearbook] Ministry of Information & Broadcasting

सूचना एवं प्रसारण मंत्रालय

Dept	N/A
<b>Attached offices</b>	<ol style="list-style-type: none"> <li>1. Press Information Bureau (PIB). पत्र सूचना कार्यालय</li> <li>2. Publications Division. प्रकाशन विभाग</li> <li>3. Office of the Registrar of Newspapers for India</li> <li>4. Directorate of Film Festivals, Photo Division, National Film Archives of India</li> <li>5. New Media Wing, Electronic Media Monitoring Centre</li> </ol>
<b>Statutory Bodies</b>	<ol style="list-style-type: none"> <li>1. _____ भारतीय प्रेस परिषद</li> <li>2. Central Board of Film Certification केन्द्रीय फिल्म प्रमाणन बोर्ड → Film Certification Appellate Tribunal</li> </ol>



	3. _____ : a) All India Radio b) Doordarshan
<b>PSU</b>	1. National Film Development Corporation Limited (NFDC) 2. Broadcast Engineering Consultants (India) Limited (BECIL)
<b>Autonomous Organizations</b>	1. Film and Television Institute of India (FTII), Pune 2. Satyajit Ray Film and Television Institute, Kolkata 3. Children's Film Society of India 4. Indian Institute of Mass Communication

## 63 INFRA → GSM3: INVESTMENT MODELS (निवेश के तरीके)

- **Origin:** Infrastructure projects require large amount of investment. Govt alone can't finance it due to fiscal deficit targets.
- Such projects also require the level of technical expertise, management skills and professionalism that may not be available in the traditional bureaucratic apparatus.
- Therefore, Infrastructure investment / development has to be done through:
  - PPP: BoT, BOOT
  - Non-PPP: such as EPC, Outsourcing (Contracting-Out)
  - Or a mixture of both using Hybrid Annuity Model

### 63.1 INFRA.DEV. → PPP (PUBLIC PRIVATE PARTNERSHIP)

- **Definition:** सार्वजनिक-निजी क्षेत्र की भागीदारी is a long-term contract between a public sector organization (Union/State/Local Body/PSU) and a private sector company
  - to build a public infrastructure (highway, ports etc.) or
  - to provide a public utility service (electricity, gas, water, transport, health etc.).
- In such PPP contract the ownership, risks & rewards are shared in some fashion. (Unlike privatization where it's completely transferred from public sector to private sector.)
- PPP can be
  - for a **Greenfield project** (ग्रीनफील्ड परियोजना) e.g. GMR group building fresh new airport in Hyderabad. OR
  - for a **Brownfield project** e.g. Private companies upgrading the existing airports at Delhi and Mumbai.
- PPP can be
  - Done by forming a Joint Venture (संयुक्त उद्यम 50:50) or Special Purpose Vehicle (SPV:विशेष उद्देश्य वाहन) company with equity from public and private sector. OR
  - Done by Govt granting 'Concession / lease / licence / permit' (अनुज्ञापत्र= a legal right) to private company (=Concessionaire) to design, develop, finance, construct, operate, maintain a greenfield / brownfield infrastructure asset.

### 63.2 INFRA.DEV. → PPP (GREENFIELD) MODELS

<list not exhaustive>

- Build-Operate-Transfer (BoT: निर्माण-संचालन-हस्तांतरण)
- Design-Build-Finance-Operate (DBFO: रचना-निर्माण-पूंजी लगाना-संचालन)



- Build-own-operate-transfer (BOOT: निर्माण-स्वामित्व-संचालन-हस्तांतरण)

	(BoT: Toll / Annuity)	DBFO / BOOT
<b>Who owns infrastructure?</b>	Private player but after time limit is over / his investment recovered, the ownership transferred to Govt.	
<b>Who is responsible for financing the project cost?</b>	Govt.	Private player responsible to arrange from his pocket / market.
<b>Who is the responsible for the building, operation and maintenance (O&amp;M)?</b>	निर्माण , संचालन और रखरखाव: Private player during the contact period, then government itself may start operating it (or outsource it to a third private company)	
<b>Who collects the toll / fees from users?</b>	<ul style="list-style-type: none"> <li>- If <b>BoT: Toll (पथकर) model</b> then Private player levies toll from users (e.g. highway)- but he'll face a risk- what if less traffic!</li> <li>- If <b>BoT: Annuity (वार्षिकी) model</b> then Govt pays private player fixed ₹ ₹ at regular period from its budget.</li> </ul>	Could be toll or annuity depending on project. E.g. Delhi-Mumbai highway - private players would love to have a Toll model, whereas in Nagaland Manipur highway they'd prefer annuity model due to less growth projection in traffic.
<b>Example(s)</b>	NHAI highways	Water pipeline contracts by Municipal corporations

Some alternatives to above: **Build Own Operate (BOO) / Build-develop-operate (BDO) / Design-construct-manage-finance (DCMF)**: In these models private player remains the owner in perpetuity (सदा के लिए मालिक).

### 63.2.1 Infra.Dev. → PPP (Brownfield)

- **Build - Lease - Transfer (BLT: निर्माण-ठेका-हस्तांतरण)**: Usually associated with brownfield projects (ब्राउनफील्ड परियोजनाएँ) e.g. Govt owned existing airport is leased to private player for operation → he renovates it → charges user fees → After the contact period is over / investment recovered then govt again assumes operational responsibilities (or gets another private player). Thus Govt remains the owner in perpetuity.
- **Toll-Operate and Transfer (TOT: टोल -संचालन-हस्तांतरण)**: Private player pays upfront fees (e.g. ₹ 9000 crore) to the government to obtain the 'right to collect toll' on an existing road (=brownfield) for a fixed period (e.g. 30 years). **Benefits?** →
  - **To Government**: we got a front money to finance schemes / build new roads; no need to pay salary of those toll-booth employees.
  - **To private player**: we will make profit depending on how much traffic comes.



### 63.3 INFRA.DEV. → NON-PPP

In these models, the private player is not given ownership of infrastructure or right to collect toll/user fee at any point of time. So, they're not PPP. Notable examples are

- **Engineering, Procurement and Construction (EPC:** अभियांत्रिकी, खरीद और निर्माण)
- **Outsourcing / Contracting out** (करार के द्वारा बाहरी व्यक्ति को काम देना ).

	PPP model (BoT: Toll)	Non PPP models e.g. EPC, outsourcing
<b>Who owns infrastructure?</b>	Private player owns until contract time expired/ his investment recovered.	Govt owns in perpetuity.
<b>Who is the responsible for the building, operation and maintenance?</b>	Private player	Private player
<b>Who collects the toll / user/fees?</b>	Private player	Govt pays the private player. Govt itself will collect user fees or arranging ₹ ₹ from budget.

### 63.4 HYBRID ANNUITY MODEL (HAM) = MIX OF PPP + NONPPP

2016: संकर वार्षिकी मॉडल Introduced for highway projects in India.

Suppose the cost to build a new highway is ₹ 100, then.

- ₹ 40: Govt pays in phased manner (as road construction progresses).
- ₹ 60: private player arranges from his pocket and / or market borrowing.
- Once the highway is finished, Govt (NHAI) starts collecting toll → pay the private player at regular interval (=annuity) till the private player recovers ₹ (60+some profit).

PPP model (BoT: Toll)	Non PPP model (EPC)	Hybrid Annuity
Govt. has to bear the burden = more fiscal deficit.		Private player bears higher burden of financing the project = less fiscal deficit for Govt.
BoT: Toll- Private player has the right to collect toll	Private player has no right to collect toll (But at the same time, he is also saved from the risk if sufficient traffic did not come!)	

**In Bharatmala Pariyojana, NHAI has decided that →**

Hybrid Annuity Model (HAM)	60%
BOT (Toll) Model	10%
Engineering, Procurement, Construction (EPC)	30%
Total projects under Bharatmala →	100%

### 63.5 INFRA.DEV → MISC. TOPICS

#### 63.5.1 Swiss Challenge (स्विस चुनौती / ललकार)

Without waiting for the government advertisement, suppose a private company (Mukesh Ambani) sends a suo-moto / unsolicited proposal to develop a railway station.

- Government puts it online so other private companies can challenge it.



- Ratan Tata challenges, “I can finish this project at 10% less price and / or 5 additional facilities in the same price etc.” → Mukesh Ambani is given opportunity to counter Ratan Tata’s proposal, then Government selects the best offer.
- 2015: While Govt of India was considering to allow Swiss challenge method for infrastructure development, but Vijay Kelkar committee on PPP reforms suggested not to do it.
- Because there is a scope for non-transparency / collusion: What if both Ratan Tata and Mukesh Ambani decide internally -“I will not challenge your projects in X cities and you will not challenge me in Y cities! And together we’ll milk the maximum money from govt!”

### 63.5.2 Viability Gap Funding (VGF: व्यवहार्यता अन्तर फंडिंग)

- Sometimes, the project is justifiable from social welfare / human development point of view but it’s not financially profitable or viable e.g. installing solar panels in remote villages.
- Then, Union Government / Multilateral Bank may provide grant (अनुदान: not Loan) in the form of Viability Gap Funding (VGF).

## 63.6 INFRASTRUCTURE FUNDS

<b>Global Infrastructure Facility (GIF: 2004)</b>	<ul style="list-style-type: none"> <li>- By _____ to help emerging economies and developing countries.</li> <li>- It provides ₹ ₹ &amp; advisory to design PPP contract.</li> </ul>
<b>National Investment Fund (NIF: 2005)</b>	During UPA raj, the ₹ ₹ from disinvestment were transferred in this fund to finance various schemes, projects, PSB recapitalization.
<b>India Infrastructure Project Development Fund (IIPDF: 2007)</b>	setup in Dept of Economic Affairs with ₹ 100 crores to help PPP projects.

### 63.6.1 National \_\_\_\_\_ Fund (NIIF: 2015)

- राष्ट्रीय निवेश और बुनियादी ढांचा कोष ₹ 40,000 crore. Out of that 49% from Dept of Economic Affairs (FinMin), remaining by domestic & foreign investors & financial intermediaries.
- SEBI registered NIIF as Category II Alternative Investment Funds.
- NIIF is ‘fund of funds’ → gives funding to other funds. E.g. 2017: India & UK set up Green Growth Equity Fund (GGEF) to finance green infrastructure projects in India. So, from Indian side NIIF invested money in GGEF.

**MCQ. With reference to ‘National Investment and Infrastructure Fund’, which of the following statements is/are correct?(Asked in UPSC-Pre-2017)**

1. It is an organ of NITI Aayog.
2. It has a corpus of Rs. 4,00,000 crore at present.

**Answer Code:** (a) 1 only      (b) 2 only      (c) Both 1 and 2      (d) Neither 1 nor 2

**MCQ. Which one of the following statements is not correct? [UPSC-CDS-2016-II]**



- (a) Creation of National Investment and Infrastructure Fund (NIIF) was announced in the Union Budget, 2015-16.
- (b) NIIF is a fund for enhancing infrastructure facility in the country.
- (c) NIIF and NIF (National Investment Fund) are the names of the same organization.
- (d) NIIF can finance more than one alternative investment fund.

**MCQ. The Global Infrastructure Facility is a/an(Asked in UPSC-Pre-2017)**

- (a) ASEAN initiative to upgrade infrastructure in Asia and financed by credit from the Asian Development Bank.
- (b) World Bank collaboration that facilitates the preparation and structuring of complex infrastructure Public-Private Partnerships (PPPs) to enable mobilization of private sector and institutional investor capital.
- (c) Collaboration among the major banks of the world working with the OECD and focused on expanding the set of infrastructure projects that have the potential to mobilize private investment.
- (d) UNCTAD funded initiative that seeks to finance and facilitate infrastructure development in the world.

### **63.7 PPP CHALLENGES**

**While the PPP-led infrastructure sector witnessed boom before the supreme crisis but afterwards facing following challenges:**

1. Environment groups / Civil society protest / PILs → land acquisition becoming difficult.
2. Fall in demand post subprime crisis → less cargo traffic in highways / seaport / airports etc. so those developers wanted extension of toll collection period / loan restructuring / extra money to finish remainder of projects but UPA's coal scam, 2G scam and subsequent 'policy paralysis' where ministers, IAS & public sector bankers avoided taking decisions on any file due to fear of media & courts → Time & cost overruns for the infra-developers → NPA problems.
3. Crisis in IL&FS & other NBFCs in the infrastructure finance sector.
4. In PPP projects the fees paid by the users may be higher than when the project was government operated. Excessive reliance on PPP may eventually result in exclusion of poor persons from infrastructure facilities.
5. Private players providing substandard services / construction material to keep bigger profit margin. **Solution?** Performance / service audit.
6. PPP not appropriate for small sized projects e.g. building a school.
7. In India, PPP model projects have confined mostly to airports and highways. In other sectors, the growth is either mostly private sector led (e.g. Telecom / ICT) or mostly public sector led (e.g. Railways & atomic energy) even though there is lot of scope for synergy.

#### **63.7.1 Infra → Conclusion**

- Infrastructure is a critical determinant of economic growth. It has a direct bearing on investment, manufacturing sector, logistics and productivity. Infrastructure is equally important for social sectors - be it education or health.
- Therefore SDG Goal #9 focuses on building resilient & sustainable infrastructure.





- In India, infrastructure gaps exist in most of the sectors- posing a serious threat to our economic growth and sustainable development. Therefore,
  - A. Aforementioned scheme / policy / initiative is important in that regard. OR
  - B. Aforementioned challenges need to be addressed on priority basis. OR
  - C. While the aforementioned XYZ PPP-investment model may not be the panacea in every case but it can surely help improving our infrastructure.

### 63.8 MAINS QUESTIONS IN PAST UPSC EXAMS

- GS1 Syllabus Topic: Urbanization: problems and remedies
- GS2 Syllabus Topic: Welfare Schemes (centre, states; performance, mechanisms)
- GS3 Syllabus Topic: Infrastructure (energy, ports, roads, airports, railways); Investment models

With growing energy needs should India keep on expanding its nuclear energy programme? Discuss the facts and fears associated with nuclear energy.	2018
Access to affordable, reliable, sustainable and modern energy is the sine qua non to achieve Sustainable Development Goals (SDGs). Comment on the progress made in India in this regard.	2018
Examine the developments of Airports in India through Joint Ventures under Public-Private Partnership (PPP) model. What are the challenges faced by the authorities in this regard.	2017
What are 'Smart Cities? Examine their relevance for urban development in India. Will it increase rural-urban differences? Give arguments for Smart Villages' in the light of PURA and RURBAN Mission. <b>(GSM3)</b>	2016
Smart cities in India cannot sustain without smart villages. Discuss this statement in the backdrop of rural urban integration. <b>(GSM1)</b>	2015
With a brief background of quality of urban life in India, introduce the objectives and strategy of the 'Smart City Programme'. <b>(GSM1)</b>	2016
The basis of providing urban amenities in rural areas (PURA) is rooted in establishing connectivity. Comment. <b>(GSM2)</b>	2013
National urban transport policy emphasizes on moving people instead of moving vehicles. Discuss critically the success of various strategies of the government in this regard.	2014
Explain how private public partnership agreements, in longer gestation infrastructure projects, can transfer unsuitable liabilities to the future. What arrangements need to be put in place to ensure that successive generations' capacities are not compromised?	2014
Adaptation of PPP model for infrastructure development of the country has not been free from criticism. Critically discuss the pros and cons of the model.	2013