UPSC Mains 2020 GS III

Year-wise PYQ pack · WRAP model answers with canonical links

Official UPSC stems in exam order. Each live answer sits on one WRAP URL; this PDF is the year pack, not a second copy of the article. Open the link under a question for the full page.

https://wrapexams.com/upsc/mains/gs-3/2020/

Q1 · 10 marks

Explain intra-generational and inter-generational issues of equity from the perspective of inclusive growth and sustainable development.

GS III · 2020 · Inclusive Growth

Revision summary

Intra-generational equity is fairness among people alive now; it is the core of inclusive growth.

Inter-generational equity is fairness toward the unborn; it is the core of sustainable development.

Jobless or unequal booms fail the first test even when GDP rises.

Aquifer mining, carbon lock-in, and weak environmental clearance fail the second.

Policy must raise present capability without running down the ecological and fiscal stock.

Introduction

Inclusive growth asks who shares today's income. Sustainable development asks whether tomorrow's people still have forests, aquifers, and a liveable climate. Intra-generational equity is fairness among those alive now. Inter-generational equity is fairness between present and future. The two must travel together; growth that lifts a few today by exhausting the commons fails both tests.

Body

Intra-generational equity and inclusive growth

- Intra-generational equity is the claim of the poor, women, Adivasis, persons with disability, and lagging districts to **jobs, assets, public services, and voice** in the same generation.
- Inclusive growth is not only a high GDP rate. It is growth whose **employment elasticity**, **real wages**, and **access to health, education, and credit** reach those groups.
- India's live issues are a large informal workforce, regional divergence, and asset inequality. Schemes such as **MGNREGA**, **NFSA**, **Ayushman Bharat**, **JAM**, and **DBT** are intra-generational tools when they actually reach the last household.
- If a boom is capital-deep and job-thin, the generation is growing on paper while a majority is excluded - that is an intra-generational failure even with a rising headline.

Inter-generational equity and sustainable development

• Inter-generational equity, in the **Brundtland** sense, is meeting present needs without stripping the resource base of those not yet born.

• Climate stock, groundwater, soil carbon, biodiversity, and fiscal debt are the ledgers the next cohort inherits. Mining a aquifer for this year's paddy, or locking in coal without a transition, taxes the future.

• **SDGs**, the **Paris** temperature goal, and India's **NDCs** are inter-generational promises. They constrain how inclusive growth may use energy and land.

• Weak **EIA** practice, untreated rivers, and stubble-plus-smog in the north-west are present consumption that the next urban child pays as disease.

How the two perspectives lock

• A coal plant may hire local labour (intra-generational gain) and dump a century of carbon and ash (inter-generational loss). A solar park with land consent and local jobs can serve both.

• **Green growth** is inclusive only if the poor are not asked to bear conservation without livelihood, and the rich are not allowed to pollute first and compensate never.

• Public investment in **human capital and ecological restoration** is the rare outlay that raises both present capability and future stock.

Flow diagram

Inclusive growth -> Intra-generational equity

Sustainable development -> Inter-generational equity

Intra-generational equity -> Jobs services voice now

Inter-generational equity -> Climate water soil later

Jobs services voice now -> Both required

Climate water soil later -> Both required

Conclusion

Intra-generational equity is inclusive sharing of today's growth. Inter-generational equity is leaving water, climate, and fiscal room for those after us. Sustainable development is the rule that one must not be bought by sacrificing the other.

Open WRAP page — https://wrapexams.com/upsc/mains-answers/gs-3/2020/explain-intra-generational-and-inter-generational-issues-of-equity-from-the-perspective-of-inclusive-growth-and-sustainable-development/

Q2 · 10 marks

Define potential GDP and explain its determinants. What are the factors that have been inhibiting India from realizing its potential GDP?

GS III · 2020 · Indian Economy

Revision summary

Potential GDP is sustainable full-capacity output, not the latest quarterly print.

Determinants are labour, capital stock, TFP, infrastructure, and macro stability.

India wastes potential through low female participation, logistics gaps, and factor-market frictions.

Bank and corporate stress, weak learning, and informality hold productivity down.

Demand shocks open an output gap; scarring can also lower the ceiling itself.

Introduction

Potential GDP is the highest level of real output an economy can sustain without sparking accelerating inflation, given its labour, capital, and technology. It is a supply-side ceiling, not last quarter's print. India often runs below that ceiling because of idle workers, thin capital, and frictions that keep productivity stuck.

Body

Meaning

- **Potential GDP** (or potential output) is a trend path set by productive capacity. The **output gap** is actual GDP minus potential: negative in a slump, positive when the economy overheats.
- It is estimated, not observed - filters, production functions, and survey slack. Policy still needs the idea: stimulus that only fills a gap is not the same as reform that raises the ceiling.

Determinants

- **Labour:** working-age population, participation (especially women), skills, and health. A demographic bulge raises potential only if people work and are productive.
- **Capital stock:** machines, structures, infrastructure, and housing. Investment as **gross fixed capital formation** is how the ceiling moves.
- **Total factor productivity:** organisation, technology, cities, and institutions that let the same labour and capital yield more.
- **Land and natural capital**, energy reliability, and the **financial system's** ability to allocate saving to investment.
- Openness to ideas and competition, and a stable **macro regime** (inflation, fiscal, external) so firms invest for the long run.

What inhibits India from realising it

- **Low female labour-force participation** and still-weak job creation in manufacturing waste the demographic gift.
- **Infrastructure and logistics gaps**, power quality, and delayed projects raise the capital cost of every extra unit of output.
- **Factor-market frictions:** land acquisition, labour dualism, and stalled factor reforms keep resources in low-productivity uses.

- **Balance-sheet stress** in banks and corporates (the twin-balance-sheet years) and later NBFC stress cut credit to new capital.
- **Human capital:** learning poverty, health, and nutrition cap TFP even when diplomas multiply.
- **Regulatory and judicial delay**, policy uncertainty, and a large informal sector with thin productivity.
- **Agriculture's** disguised unemployment and water-energy distortions lock labour below its potential product.
- Demand slumps (including the **2019-20 slowdown** and then **COVID**) can leave actual GDP far below an unchanged potential, and scarring can then pull potential itself down.

Flow diagram

Potential GDP -> Labour skills participation

Potential GDP -> Capital infrastructure

Potential GDP -> TFP institutions

Frictions NPAs informality -> Negative output gap

Potential GDP -> Negative output gap

Conclusion

- **Potential GDP is capacity:** labour, capital, and productivity without inflationary strain. India under-realises it when women and youth stay under-employed, capital formation is weak, banks are clogged, and institutions slow the reallocation of land and labour. Raising the ceiling is reform plus investment, not only a rate cut.

Open WRAP page — https://wrapexams.com/upsc/mains-answers/gs-3/2020/define-potential-gdp-and-explain-its-determinants-what-are-the-factors-that-have-been-inhibiting-india-from-realizing-its-potential-gdp/

Q3 · 10 marks

What are the main constraints in transport and marketing of agricultural produce in India?

GS III · 2020 · Indian Economy

Revision summary

Village roads and a thin cold-chain waste perishable produce before it is sold.

Small loads and truck dependence keep agri freight costly.

APMC concentration, weak assaying, and poor price information squeeze the seller.

Distress harvest sales and thin warehouse-receipt credit force low prices.

MSP procurement is not a marketing system for most crops and States.

Introduction

Indian farms can grow a surplus and still lose it between the field and the plate. Transport is slow, broken, and costly. Marketing is layered, poorly informed, and often tied to a local mandi. Together they tax the farmer twice: a lower farm-gate price and higher wastage.

Body

Transport constraints

- **First-mile roads** from village to market remain seasonal in many blocks; **PMGSY** helped but last-mile trucks and carts still bruise perishables.
- **A thin** cold-chain**:** pack-houses, reefer trucks, and ripening chambers are scarce outside a few corridors, so horticulture and milk lose value in heat.
- **Rail and water** take a small share of agri-freight; dependence on diesel trucks raises cost and time. Dedicated freight capacity for food is still catching up.
- Fragmented loads from small holdings make full-truck economics hard without aggregation by **FPOs**, cooperatives, or a village collection centre.
- Check-posts may have fallen under GST, but **weighbridges, local cess habits, and poor warehousing at stations** still delay cargo.

Marketing constraints

- **APMC** mandis in many States still concentrate sale: limited buyers, commission agents, and weak price discovery for the small seller.
- **Information asymmetry:** MSP headlines do not equal a local buyer; **e-NAM** connectivity is uneven, and quality assaying is thin.
- **Standards, grading, and sorting** are weak, so the farmer cannot claim a premium and the processor cannot trust a lot.
- **Credit and distress sale** after harvest flood the mandi; warehouse-receipt finance (**WDRA**, e-NWR) has not become the default.
- Private trade, contract farming, and direct retail exist, but **legal uncertainty** and political risk around farm laws (the 2020 ordinances were already a live fight) deter long offtake contracts.
- Export and interstate movement hit **SPS barriers, logistics, and sudden stock limits**, which make marketing risky even when the crop is good.

Why it matters

• High **post-harvest loss** and a large **retail-farm gate wedge** are the same constraint seen from two ends.

• Public grain procurement works for wheat and paddy in a few States; it is not a national marketing system for oilseeds, pulses, or vegetables.

Flow diagram

Farm gate -> Roads cold-chain rail

Farm gate -> Mandi info grading

Roads cold-chain rail -> Loss and high cost

Mandi info grading -> Loss and high cost

FPO e-NAM WDRA -> Better price

Conclusion

Agri transport is constrained by roads, cold-chain, and unconsolidated loads. Agri marketing is constrained by mandi bottlenecks, poor grading, thin finance, and shaky contract certainty. Aggregation, cold logistics, and open, informed sale are the remedies, not only a higher MSP poster.

Open WRAP page — https://wrapexams.com/upsc/mains-answers/gs-3/2020/what-are-the-main-constraints-in-transport-and-marketing-of-agricultural-produce-in-india/

Q4 · 10 marks

What are the challenges and opportunities of food processing sector in the country? How can income of the farmers be substantially increased by encouraging food processing?

GS III · 2020 · Crops, Irrigation and Marketing

Revision summary

India grows plenty but processes little, so glut and waste sit beside packaged-food demand.

Opportunities are jobs, exports, and seasonal smoothing through parks and PLI-type support.

Challenges are cold-chain, FSSAI capacity, MSME credit, and weak farm-plant links.

Farmer income rises when offtake contracts, grading, and FPO ownership capture processing margins.

A plant that buys cheap imports does not transform the local farmer.

Introduction

Food processing turns a raw crop into a stored, branded, or ingredient product. India has the farm surplus and the young consumers for a large industry. It still processes a small share of what it grows. The opportunity is value addition and less wastage. The challenge is capital, cold-chain, standards, and a farm that is not linked to the plant.

Body

Opportunities

- A large raw-material base in cereals, milk, poultry, spices, and horticulture, plus a rising domestic market for packaged food.
- **Export** of marine, buffalo meat, spices, rice, and processed snacks where quality holds.
- **Job creation** near production clusters - more labour-intensive than many heavy industries - and a pull for **women's** factory and SHG processing.
- **PMKSY (MoFPI)**, **mega food parks**, **Operation Greens**, and **PLI for food processing** (announced around this period) try to cluster plants with common infrastructure.
- **Processing can flatten seasonality:** tomato paste, milk powder, and frozen peas turn a glut into a later sale.

Challenges

- Low processing intensity versus peers; most fruit and vegetable still moves as wet, unpackaged produce.
- **Cold-chain and power**, small lot sizes, and weak **FSSAI** compliance among micro units.
- Access to **credit and working capital**, especially for MSMEs; seasonality of cash.
- Tax, logistics, and until recently **APMC** friction in buying directly from farmers.
- Brand and retail concentration; farmers rarely own the processed margin.
- Quality, pesticide residue, and traceability block some export lines.

How processing can raise farmer income

- A **processor offtake contract** with an FPO gives a known quantity, grade, and price, which is more than a glut-day mandi.

• **Grade-based procurement** pays for solids in milk, oil content, or colour in chilli - a quality dividend the fresh mandi often will not pay.

• **Less wastage** of perishables is a direct income gain: the tomato that becomes puree is not a roadside dump.

• **Primary processing at village level** (cleaning, drying, milling, SHG pickles) keeps a first margin in the village.

• Farmers as **shareholders in FPOs or cooperatives** (Amul-type dairy, some sugar and poultry) capture processing profit, not only a raw price.

• Linked **cluster infrastructure** - pack-house plus plant - is what **mega food parks** were meant to be; they work only when the catchment actually supplies the plant.

Caution

• Processing raises farmer income only if the plant buys local raw material at a transparent price. Imported concentrate and a tax arbitrage do not.

Flow diagram

Crop -> Process pack brand

Process pack brand -> Less waste

Process pack brand -> Value added

FPO contract contract -> Farmer income

Value added -> Farmer income

Less waste -> Farmer income

Conclusion

Food processing is India's chance to cut waste, export more, and pay farmers for grade and season. It fails when cold-chain, credit, and farm-plant contracts are missing. Substantial farm income needs FPOs, offtake, and a share in the processed rupee, not a factory far from the field.

Open WRAP page — https://wrapexams.com/upsc/mains-answers/gs-3/2020/what-are-the-challenges-and-opportunities-of-food-processing-sector-in-the-country-how-can-income-of-the-farmers-be-substantially-increased-by-encouraging-food-processing/

Q5 · 10 marks

What do you understand by nanotechnology and how is it helping in health sector?

GS III · 2020 · Indian Economy

Revision summary

Nanotechnology designs matter at 1-100 nanometres, where surfaces and optics change.

Health uses include targeted drug carriers, imaging agents, and antimicrobial coatings.

Lateral-flow tests and liposomal chemotherapies are working examples.

Lipid nanoparticles enabled mRNA COVID vaccines in 2020.

Toxicity, cost, and hype require regulation, not blanket enthusiasm.

Introduction

Nanotechnology is the design and use of materials and devices at the scale of roughly 1-100 nanometres, where surface chemistry and quantum behaviour differ from bulk matter. In health it is a set of tools for seeing, delivering, and killing at the scale of cells and proteins - not a single drug and not a magic powder.

Body

What it is

• A **nanometre** is one-billionth of a metre. At that size, gold, carbon, lipids, and polymers can be shaped as particles, tubes, shells, and films with new optical, catalytic, or barrier properties.

• **It sits across physics, chemistry, biology, and engineering: nanomedicine** is the health slice.

• India funds it through **Nano Mission** (DST) and related DBT/ICMR work, with the usual need for toxicity and ethics review.

Help in the health sector

• **Drug delivery:** liposomes and polymeric nanoparticles carry chemo or amphotericin to a target tissue, which can cut systemic toxicity (Doxil-type liposomal doxorubicin is the classic class).

• **Diagnostics and imaging:** gold nanoparticles and quantum dots improve assays and contrast; **lateral-flow** tests use gold conjugates - the same family as many rapid antigen strips.

• **Antimicrobials:** silver nanoparticles in coatings and some dressings; nano-enabled surfaces in hospitals. Stewardship still matters; nano is not a licence to skip hygiene.

• **Vaccines and biologics:** lipid nanoparticles became the delivery chassis for **mRNA COVID vaccines** in 2020 - a global health use of nano-formulation, even if India's first COVID shots were other platforms.

• **Implants and tissue:** nano-textured surfaces for better osseointegration; scaffolds for regenerative work still largely in trial.

• **Theranostics:** particles that both image and treat, especially in oncology research.

Cautions

• **ADME and toxicity** of persistent nanoparticles are not fully known; regulation must treat them as new entities, not as tiny versions of bulk powder.

- Cost and cold-chain for advanced nano-drugs can exclude public-hospital patients unless procurement is deliberate.
- Hype in cosmetics and 'nano-Ayurveda' claims should not be confused with peer-reviewed nanomedicine.

Flow diagram

Nanoscale 1-100 nm -> Drug delivery

Nanoscale 1-100 nm -> Diagnostics tests

Nanoscale 1-100 nm -> Lipid nanoparticle vaccines

Drug delivery -> Health sector

Diagnostics tests -> Health sector

Lipid nanoparticle vaccines -> Health sector

Conclusion

Nanotechnology is engineering at the billionth-of-a-metre scale. In health it already helps targeted drugs, rapid tests, coatings, and - globally in 2020 - lipid-nanoparticle vaccines. It helps as regulated medicine, not as a slogan on a bottle.

Open WRAP page — https://wrapexams.com/upsc/mains-answers/gs-3/2020/what-do-you-understand-by-nanotechnology-and-how-is-it-helping-in-health-sector/

Q6 · 10 marks

How is science interwoven deeply with our lives? What are the striking changes in agriculture triggered off by the science-based technologies?

GS III · 2020 · Crops, Irrigation and Marketing

Revision summary

Everyday life runs on applied science in energy, health, and digital public goods.

Agriculture's striking shift was HYV seed, fertiliser, and irrigation - the Green Revolution.

Pumps, Bt cotton, drip, Soil Health Cards, and satellite advisories are later layers.

The same technologies created groundwater and chemical stress in some belts.

The next task is science for climate-smart, less wasteful farming, not a rejection of labs.

Introduction

Science is no longer a lab visit. It sits in the grid, the phone, the vaccine, the weather warning, and the seed. Agriculture is the oldest Indian livelihood that those science-based technologies have most visibly rewritten - yield, water, chemicals, and now data.

Body

Science interwoven with lives

- **Energy and materials:** electricity, steel, cement, and fertiliser are applied thermodynamics and chemistry in daily shelter and food.
- **Health:** germ theory, antibiotics, vaccines, imaging, and now molecular diagnostics decide whether a fever is a death sentence.
- **Information:** satellites, fibre, and semiconductors run UPI, Aadhaar rails, and cyclone alerts that ordinary households use without naming Maxwell.
- **Risk:** IMD forecasts, seismic codes, and food standards are science as a public good, not a hobby.
- **The COVID year made the weave obvious:** sequencing, oxygen plants, and digital epidemiology were civic infrastructure.

Striking changes in agriculture

- **Green Revolution biology: HYV** wheat and rice, fertiliser-responsive plant architecture, and irrigation turned north-western plains into a grain bowl (**Swaminathan**, **Borlaug**, ICAR system).
- **Mechanisation and energy:** tractors, pumpsets, and later solar pumps changed labour and groundwater at once.
- **Plant protection and nutrition:** synthetic pesticides, herbicides, and soil-test based fertiliser; **Soil Health Card** tries to make the chemistry site-specific.
- **Biotechnology: Bt cotton** is the large Indian GM field crop; tissue culture and marker-assisted breeding spread in horticulture and rice.
- **Water technologies:** drip and sprinkler (**PMKSY-PDMC**), laser levelling, and canal lining are engineering answers to flood irrigation.
- **Information agriculture: INSAT/IRS** for crop and drought watch, **mKisan**, agro-met advisories, and the beginnings of precision and drone spraying.

• **Post-harvest science:** storage chemistry, food irradiation in niches, and cold-chain physics that decide whether horticulture pays.

The other side of the weave

• The same science locked some regions into **water-guzzling rice-wheat**, pesticide treadmills, and nutrient imbalance. Technology is not automatically wisdom.

• Climate-smart varieties, biologicals, and better extension are the next science layer, not a return to a pre-scientific farm.

Flow diagram

Science in daily life -> Health energy data

Science in daily life -> Agriculture

Agriculture -> HYV irrigation chemicals irrigation chemicals

Agriculture -> Bt cotton biotech

Agriculture -> Drip satellites advisories

Conclusion

Science is woven through power, medicine, data, and risk management in ordinary Indian life. In agriculture it delivered HYV seed, pumps, biotech cotton, micro-irrigation, and satellite advice - a yield revolution that now needs a sustainability revolution from the same scientific method.

Open WRAP page — https://wrapexams.com/upsc/mains-answers/gs-3/2020/how-is-science-interwoven-deeply-with-our-lives-what-are-the-striking-changes-in-agriculture-triggered-off-by-the-science-based-technologies/

Q7 · 10 marks

How does the draft Environment Impact Assessment (EIA) Notification, 2020 differ from the existing EIA Notification, 2006?

GS III · 2020 · Environment and Conservation

Revision summary

EIA 2006 is the notified prior environmental clearance system under the EP Act.

Draft EIA 2020 proposed post-facto clearance, shorter and narrower public hearings, and more exemptions.

It also sketched more central discretion and lighter post-clearance watch.

The 2020 text was a draft for comments, not a replacement gazette.

Naming 2020 as enacted EIA law is a factual error.

Introduction

EIA in India is a subordinate notification under the Environment (Protection) Act, 1986. The **EIA Notification, 2006** is still the notified procedure for prior environmental clearance. The **draft EIA Notification, 2020** was a MoEFCC proposal put out for comment. It was not brought into force as a final gazette replacing 2006. Any comparison is draft versus living law, not old Act versus new Act.

Body

What EIA 2006 actually is

• **It is the** notified **regime:** screening, scoping, public consultation, and appraisal, with **Category A** (MoEFCC and EAC) and **Category B** (SEIAA and SEAC).

• **Prior environmental clearance** is required before a listed project is built or expanded, subject to the schedule.

• **Public hearing** is a defined step for many Category A and B1 projects, with a notice window and a role for the local affected public, not only for files in Delhi.

• Post-clearance **compliance** is supposed to be monitored; violation is not meant to be a parallel easy door.

How the 2020 draft proposed to differ

• **Post-facto (ex-post facto) clearance:** the draft sketched a path to regularise projects that had already started without EC, with penalty. That is a break from the 2006 logic of prior clearance. Courts have since treated post-facto environmental clearance with deep suspicion; the draft's politics were exactly this dilution.

• **Public consultation thinned:** shorter hearing windows, more project types moved toward **B2** (no EIA, no hearing), and wider exemptions for 'strategic', border, and some linear or expansion cases. 2006 already had exemptions; the draft widened them.

• **Centralisation and discretion:** more items pulled toward the Centre; 'strategic' labelling could reduce disclosure.

• **Compliance self-reporting** and longer validity of clearances were proposed, which critics read as weaker watch after the stamp.

• **Modernisation and expansion** were to face lighter rungs than a new project, raising the risk of cumulative load without a fresh public test.

What did not happen

- The draft drew large public and scientific objection in 2020. **No final 2020 EIA notification replaced 2006.**
- Clearance practice in the years after still runs on **2006**, as amended from time to time, not on a 2020 statute-like code.
- Answer-writers who call 'EIA 2020' the law are describing a proposal as if it were notified. That is factually wrong.

Flow diagram

EP Act 1986 -> EIA Notification 2006 notified

Draft EIA 2020 -> Post-facto thinner hearings

Draft EIA 2020 -> Not brought into force

EIA Notification 2006 notified -> Living clearance law

Not brought into force -> EIA Notification 2006 notified

Conclusion

EIA 2006 is the notified prior-clearance and public-hearing system. Draft EIA 2020 proposed post-facto regularisation, thinner hearings, more exemptions, and lighter compliance. It remained a draft. Until a new final notification is gazetted, 2006 is the law to name.

Open WRAP page — https://wrapexams.com/upsc/mains-answers/gs-3/2020/how-does-the-draft-environment-impact-assessment-eia-notification-2020-differ-from-the-existing-eia-notification-2006/

Q8 · 10 marks

What are the salient features of the Jal Shakti Abhiyan launched by the Government of India for water conservation and water security?

GS III · 2020 · Environment and Conservation

Revision summary

Jal Shakti Abhiyan is a 2019 mission-mode conservation campaign, not a new Act.

It sat under the new Ministry of Jal Shakti and targeted water-stressed districts.

- **Five pillars:** harvest, traditional tank revival, reuse-recharge, watersheds, afforestation.

It converges MGNREGA labour with district teams and Jal Shakti Kendras.

Jal Jeevan Mission taps are related policy, not the same instrument.

Introduction

Jal Shakti Abhiyan is a **time-bound, mission-mode water conservation campaign**, not a new water statute. Launched in 2019 after the Ministry of Jal Shakti was created, it pushed districts to harvest, recharge, and reuse water with existing schemes rather than wait for a single mega dam.

Body

Institutional frame

- The **Ministry of Jal Shakti** (2019) merged water resources with drinking water and sanitation so conservation and tap water sat in one political shop.
- The Abhiyan is a **campaign with central teams in districts**, using collectors, MGNREGA, and line departments, closer to a drive than to a standalone Act.
- First phase focused on **water-stressed districts** (initially on the order of 250-plus districts), especially in the pre-monsoon and monsoon window.

Five intervention pillars

- **Water conservation and rainwater harvesting:** check dams, rooftop harvest, farm ponds.
- **Renovation of traditional water bodies:** tanks, katas, ahars, temple tanks - repair rather than only new concrete.
- **Reuse and recharge:** treated wastewater where possible; **borewell recharge** and aquifer interventions.
- **Watershed development:** ridge-to-valley works already familiar from IWMP-type programmes.
- **Intensive afforestation:** catchment trees as a water, not only a forest, measure.

Water security extras

- **Jal Shakti Kendras** as district knowledge and coordination points.
- Convergence with **MGNREGA** labour, **Atal Bhujal Yojana** (groundwater, selected states), and later **Jal Jeevan Mission** household tap connections - related but distinct: JJM is piped drinking water, the Abhiyan is conservation behaviour and structures.
- Thrust on **block-level water budgeting** and public participation (catch the rain, not only a ministry press note).

Limits

- A campaign can build structures that fail without maintenance, groundwater regulation, and cropping change.
- It does not by itself repeal free power for pumps, which still mines aquifers in Punjab and elsewhere.

Flow diagram

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Jal Shakti Abhiyan 2019 -> Harvest and tanks
Jal Shakti Abhiyan 2019 -> Recharge reuse
Jal Shakti Abhiyan 2019 -> Watershed trees
Jal Shakti Abhiyan 2019 -> Stressed districts
Harvest and tanks -> Water security
Recharge reuse -> Water security
```

Conclusion

Jal Shakti Abhiyan's salient features are mission-mode district drives, five conservation pillars, stressed-district focus, and convergence with MGNREGA and the new Jal Shakti ministry. It is water security as campaign and recharge, not a replacement for pricing, cropping, and the 2006-era water laws.

Open WRAP page — https://wrapexams.com/upsc/mains-answers/gs-3/2020/what-are-the-salient-features-of-the-jal-shakti-abhiyan-launched-by-the-government-of-india-for-water-conservation-and-water-security/

Q9 · 10 marks

Discuss different types of cybercrimes and measures required to be taken to fight the menace.

GS III · 2020 · Cyber Security and Money Laundering

Revision summary

Cybercrime targets persons, money, computers, and critical infrastructure, often in mixed form.

Phishing, UPI fraud, ransomware, CSAM, and CII attacks are the live Indian set.

IT Act plus ordinary criminal law, CERT-In, NCIIPC, I4C, and RBI rules are the state toolkit.

Backups, MFA, platform duty, and forensic capacity are the practical layer.

Most retail cases are social engineering, so literacy is a security control.

Introduction

Cybercrime is offence in which a computer or a network is the target, the tool, or the scene of evidence. In India it rides cheap smartphones, UPI, and social media. Types differ; the fight has to mix criminal law, CERT-In, banks, and public habit - not only a new section in the IT Act.

Body

Types

- **Against persons:** phishing, SIM-swap, OTP fraud, sextortion, cyberstalking, morphing, and child sexual-abuse material online.
- **Against property and finance:** ransomware, business-email compromise, credit-card and UPI fraud, crypto-enabled laundering, and theft of intellectual property.
- **Against the State and infrastructure:** website defacement, DDoS, espionage, attacks on **CII** (power, finance, telecom), and information operations.
- **Against computers themselves:** malware, botnets, supply-chain compromise.
- **Intermediary-enabled harms:** fake news for riot, terror recruitment, and drug or arms markets on encrypted apps - crime that is social but cyber-delivered.

Legal and institutional measures

- **IT Act, 2000 (with 2008 amendments): unauthorised access, data theft, impersonation, child pornography provisions; IPC/BNS** for cheating, defamation, sexual offences that merely use a phone.
- **Indian Computer Emergency Response Team (CERT-In)** for incident response and directions; **NCIIPC** for designated critical information infrastructure.
- Police **cyber cells**, the **I4C** (Indian Cyber Crime Coordination Centre), and the national cybercrime reporting portal.
- **RBI** and NPCI rules for payment fraud, two-factor authentication, and bank liability frameworks.
- **International:** MLATs, Interpol, and cooperation even where India is cautious about the Budapest Convention's politics.

Technical and social measures

- **Hygiene:** updates, MFA, segmented networks, backups against ransomware, and no internet-facing SCADA.
- **Platform duty:** faster takedown of CSAM and fraud pages; KYC on wallets; audit of large intermediaries.
- **Literacy:** most retail crime is social engineering. School and bank campaigns matter more than a new firewall logo.
- **Capacity:** trained magistrates and forensic labs so Section 65B evidence actually convicts.
- **Supply chain:** trusted telecom gear and software bills of materials for government and CII.

Flow diagram

Types -> Person fraud abuse

Types -> Finance ransomware

Types -> State CII

IT Act CERT-In I4C -> Response

Hygiene literacy MFA -> Response

Conclusion

Cybercrime ranges from OTP theft to ransomware on a grid. Fighting it needs the IT Act and IPC together, CERT-In and I4C, payment-system rules, and a public that does not type an OTP to a stranger. Technology without investigation and literacy will not close the menace.

Open WRAP page — https://wrapexams.com/upsc/mains-answers/gs-3/2020/discuss-different-types-of-cybercrimes-and-measures-required-to-be-taken-to-fight-the-menace/

Q10 · 10 marks

For effective border area management, discuss the steps required to be taken to deny local support to militants and also suggest ways to manage favourable perception among locals.

GS III · 2020 · Border Security and Organised Crime

Revision summary

Militants need local silence, supplies, and a grievance story.

Deny support by hitting overground finance, tightening surveillance, and ending force abuse.

Surrender-plus-livelihood and fast cases against harbouring shrink the helper pool.

Favourable perception needs BADP roads and schools, civic action, and jobs for youth.

A fence without trust still leaks; a trusted village is part of the border.

Introduction

Militants on a border do not live only in a jungle. They need food, silence, SIM cards, and a story that the State is the stranger. Border area management is therefore development and trust as much as fencing. Deny the logistic base; earn the perception that the uniform protects the village.

Body

Deny local support to militants

- **Intelligence from the village**, not only from the post: police-army-BSF fusion cells that pay for quality information and protect informers.
- **Cut** finance and stores**:** fake currency, narcotics, cattle-smuggling, and overground workers who rent rooms. Enforcement must hit the crime that funds the gun.
- **Fence, floodlights, sensors, and CIBMS**-style surveillance so crossing is costly; pair with patrols that do not farm the village as an enemy.
- **Rehabilitation and surrender** policies with a real livelihood, so the militant's family is not trapped as a permanent logistics cell.
- **Speed of** criminal justice **for harbouring and arms:** delay is itself a recruitment poster.
- Stop **security-force predation** (illegal taxes, harassment at checkpoints). Abuse is the most efficient recruiting sergeant the militant has.

Favourable perception among locals

- **Border Area Development Programme (BADP):** roads, health, schools, sports, and drinking water that the post-independence map actually delivers.
- **Civic action** by **BSF, ITBP, Assam Rifles, and Army:** medical camps, veterinary camps, and school coaching without turning them into a PR-only drill.
- **Free movement for genuine life:** farming up to the zero line, cross-border kin where policy allows, and predictable opening of gates - security that still lets a livelihood exist.
- **Jobs and skills** for border youth (including recruitment transparency) so the pay of a militant courier is not the best wage in the hamlet.
- **Local language, religion, and jhum or grazing custom** respected in operations; women-led village committees for complaint against forces.

- **Media and rumour management:** prompt, factual account of an encounter so the militant narrative does not own the night.

One principle

- A sealed border with a hostile population leaks. A slightly porous livelihood border with a loyal population holds.

Flow diagram

Militants -> Local logistics

Crime finance cut -> Support denied

No harassment -> Support denied

BADP civic jobs -> Favourable perception

Favourable perception -> Support denied

Conclusion

To deny militants local support, choke money and harbouring, professionalise intelligence, and end checkpoint abuse. To win perception, deliver BADP services, civic action, jobs, and a dignified everyday movement of border people. The fence works when the village wants it to.

Open WRAP page — https://wrapexams.com/upsc/mains-answers/gs-3/2020/for-effective-border-area-management-discuss-the-steps-required-to-be-taken-to-deny-local-support-to-militants-and-also-suggest-ways-to-manage-favourable-perception-among-locals/

Q11 · 15 marks

Explain the meaning of investment in an economy in terms of capital formation. Discuss the factors to be considered while designing a concession agreement between a public entity and a private entity.

GS III · 2020 · Indian Economy

Revision summary

Investment in the national-accounts sense is capital formation, chiefly GFCF, not secondary share trading.

Net investment after depreciation raises the capital stock and potential output.

A PPP concession pulls private capital into a public-purpose asset for a defined term.

Design must allocate land, demand, and construction risk, and fix tariff, termination, and lender step-in.

Vague scope, delayed ROW, and endless renegotiation are how Indian PPPs destroy value.

Introduction

Investment, in national accounts, is not a stock-market purchase of existing shares. It is **capital formation**: spending that adds to the stock of machines, structures, intellectual products, and inventories used to produce future output. A PPP concession is a contract that tries to pull private capital into that stock when the public entity will not, or should not, carry every rupee and every risk.

Body

Investment as capital formation

- In the SNA sense, **gross capital formation** is gross fixed capital formation plus change in inventories and valuables. **GFCF** is the core: dwellings, other buildings, infrastructure, machinery, cultivated assets, and some IP products.
- **Gross** investment includes replacement of worn-out capital; **net** investment is gross minus depreciation. Growth of potential GDP tracks net addition to the stock, not a mere reshuffle of ownership.
- Household buying of a new house is investment; buying an old house is a transfer. Government building a highway is public GFCF; a firm's plant is private GFCF.
- Financial investment (bonds, secondary shares) finances capital formation when it funds new projects. It is not itself the machine.
- **India's growth debate is often a** GFCF-to-GDP **debate:** crowding-in private capex, public infrastructure, and avoiding a savings-investment gap that shows up as a current-account deficit.

Why PPPs enter the story

- The State wants an asset (road, port, airport, power, metro) now; the private entity brings capital, construction skill, and sometimes operations.
- **The** concession **is the legal device:** the public entity grants a right to build, operate, and earn for a term, then typically returns the asset (**BOT**, **DBFOT**, hybrid annuity, and related forms).

Factors in designing the concession agreement

• **Clear scope and output specs:** what is to be built, service levels, and how completion is certified. Vague scope is a variation-order machine.

• **Risk allocation:** construction, traffic/demand, land, environment, forex, inflation, and political change should sit with the party that can manage them. Dumping land risk on the concessionaire after the bid is how projects stall.

• **Revenue model:** user charges, shadow tolls, **VGF**, or **HAM** (hybrid annuity) - each changes bankability and the public's residual liability.

• **Land, permits, and utilities:** the public entity must timeline ROW and statutory clearances; the 2006 EIA process, forest, and railway crossings are not private magic.

• **Tariff and reset:** formula, independent regulation, and inflation index so neither party lives on annual political bargaining.

• **Termination, step-in, and lenders' rights:** banks will not fund a concession they cannot take over if the SPV fails.

• **Force majeure and change in law:** COVID-style shocks showed why these clauses need cash, not only recitals.

• **KPIs, independent engineer, and audits:** availability, safety, and maintenance, with liquidated damages that are enforceable.

• **Renegotiation rules:** Indian PPPs often reopen; the contract should say when a genuine change of circumstances is allowed, so renegotiation is not a prize for the aggressive bidder.

• **Transparency and conflict:** bid criteria, Swiss challenge caution, and no related-party O&M that strips the SPV.

• **Social and environmental covenants:** resettlement, local employment, and actual EMP - not a paper annex.

• **Exit and residual value:** handback condition of the asset, so the last five years are not a milking period.

Design failures to avoid

• Aggressive traffic forecasts, delayed land, and one-sided government termination have filled Indian arbitration dockets.

• Model Concession Agreements (Planning Commission / later **NITI** and sector MCA of **NHAI**, ports, airports) exist so each district does not invent a new imbalance.

Flow diagram

Investment -> Gross fixed capital formation

PPP concession concession -> Asset plus service

Risk allocation -> Bankable project

VGF HAM tolls -> Bankable project

Land permits KPIs -> Bankable project

Bankable project -> Gross fixed capital formation

Conclusion

Investment as capital formation is new productive stock, measured mainly as GFCF. A PPP concession should allocate risk to the party that can bear it, lock a bankable revenue model, timeline land and permits, and write termination and KPI clauses that lenders and users can both live with. A concession is a constitution for one asset, not a press note.

Open WRAP page — https://wrapexams.com/upsc/mains-answers/gs-3/2020/explain-the-meaning-of-investment-in-an-economy-in-terms-of-capital-formation-discuss-the-factors-to-be-considered-while-designing-a-concession-agreement-between-a-public-entity-and-a-private-entity/

Q12 · 15 marks

Explain the rationale behind the Goods and Services Tax (Compensation to States) Act of 2017. How has COVID-19 impacted the GST compensation fund and created new federal tensions?

GS III · 2020 · Government Budgeting

Revision summary

GST compensation was the political insurance for States that subsumed VAT and related taxes.

The 2017 Act promised a 14 per cent CAGR over a 2015-16 base for about five years, funded by cess.

COVID crashed GST and cess inflows, so the fund could not meet the formula from current cess.

The 2020 conflict was borrowing windows versus a Union Consolidated Fund bailout.

The 14 per cent figure was a time-bound statutory compact, not a permanent constitutional grant.

Introduction

GST asked States to give up origin-based taxes (VAT, entry tax, a slice of excise) for a destination-based dual GST. The **GST (Compensation to States) Act, 2017 was the political insurance: a time-bound, formula-based top-up so no State would lose revenue in the transition. COVID then smashed collections. The fight of 2020 was over who borrows when the compensation cess** no longer fills the promised gap - not over whether the 14 per cent figure had been secretly repealed.

Body

Rationale of the 2017 Act

• States feared a **permanent loss of fiscal autonomy** and of origin-tax buoyancy after subsuming VAT and related levies.

• The Act promised **compensation for five years** (broadly July 2017 to June 2022) if a State's GST revenue fell short of a **14 per cent compounded annual growth** over the **2015-16** tax base specified in the law.

• Funding was not meant to be a routine Union Budget grant. A **GST compensation cess** on specified luxury and sin goods (plus some others) was to flow into a **compensation fund** and then to States.

• **The design bought a** GST Council consensus**:** one tax, two levies, with a sunset insurance so reform was not a leap in the dark.

• **It also created a** moral-hazard and forecast problem**:** 14 per cent was a political ceiling-as-floor from a high pre-GST base year, generous in a slowdown even before COVID.

How COVID hit the compensation fund

• Lockdowns in 2020 crushed GST collections. Cess collections, tied to autos, coal, tobacco, and similar bases, also fell just when the **compensation gap** exploded.

• The fund therefore could not, in 2020-21, pay the full statutory formula from **in-year cess** the way a normal year might.

• **Two shortfalls got argued:** a **GST implementation/structural shortfall** versus a **COVID-period shortfall**. The Union's 2020 line was that the Act never made the Consolidated Fund of India a residual guarantor; it made the **cess** the source.

• **GST Council (around the 41st meeting, 2020)** offered States **borrowing options:** a special window to borrow the cess-shortfall amount, with later cess extension to repay, versus a larger borrow covering a wider gap. That was the operational 'impact' - delay, options, and interest, not a silent repeal of 14 per cent.

New federal tensions

• **States heard a** compact**:** we ceded tax handles; you make us whole at 14 per cent CAGR. They wanted the **Union to borrow** (cheaper G-Sec, no State fiscal-deficit stain) and on-lend or grant.

• **The Union heard a** statute**:** compensation is cess-funded; a pandemic is an Act of God not written as a Centre overdraft; States should share the extraordinary borrowing.

• **Finance Commissions, FRBM headroom, and market borrowings** of States became the battlefield. Opposition-ruled States turned it into a trust issue about cooperative federalism.

• Extending cess **beyond June 2022** to repay COVID-window loans was the later compromise logic: the insurance period ends, the debt tail remains.

• **The tension is structural:** GST centralised rate politics in the Council while leaving States fiscally hung on a **temporary formula**. COVID pulled the formula's funding assumption apart.

What the answer must not do

• Do not say the Centre 'abolished' compensation in 2020. The fight was **how to finance a cess shortfall**.

• Do not treat 14 per cent as a constitutional forever-right. It was a **five-year statutory assurance**.

Flow diagram

GST 2017 compact 2017 compact -> Compensation Act

Compensation Act -> 14 percent CAGR five years

Compensation Act -> Compensation cess fund

COVID collections crash collections crash -> Cess shortfall

Cess shortfall -> State borrowing options

Cess shortfall -> Federal tension

Conclusion

• **The 2017 Act was the price of GST:** a five-year, 14 per cent CAGR top-up funded by compensation cess so States would surrender VAT. COVID emptied that cess just as the gap peaked, and the 2020 quarrel was who borrows. Federal trust cracked because States thought they had a Union guarantee and the Union pointed at the cess clause.

Open WRAP page — https://wrapexams.com/upsc/mains-answers/gs-3/2020/explain-the-rationale-behind-the-goods-and-services-tax-compensation-to-states-act-of-2017-how-has-covid-19-impacted-the-gst-compensation-fund-and-created-new-federal-tensions/

Q13 · 15 marks

What are the major factors responsible for making rice-wheat system a success? In spite of this success how has this system become bane in India?

GS III · 2020 · Indian Economy

Revision summary

Rice-wheat worked because HYV seed, irrigation, fertiliser, MSP, and procurement aligned.

Punjab-Haryana-western UP became India's grain insurance.

The same incentives mined aquifers with paddy on a semi-arid plain.

Stubble burning, soil nutrient imbalance, and cereal-heavy public buying are the other costs.

Diversification needs price and offtake, not only a technical residue machine.

Introduction

The rice-wheat rotation on the Indo-Gangetic plains, especially Punjab, Haryana, and western Uttar Pradesh, is India's most famous food-security machine. It succeeded because seed, water, price, and procurement lined up. The same lineup became a bane when groundwater, soil, air, and fiscal cost could no longer hide in the yield chart.

Body

Factors that made it a success

- **Semi-dwarf HYV wheat and rice** that responded to fertiliser and irrigation, backed by **ICAR**, State universities, and a public seed chain.
- **Assured irrigation:** Bhakra and later canal commands, then a dense **tube-well** grid powered by cheap or free electricity.
- **Chemical package:** nitrogen-heavy fertiliser, pesticides, and later herbicides that fitted a mechanised calendar.
- **Price and offtake: MSP** plus **FCI / State agency procurement** turned paddy and wheat into quasi-cash crops with a government cheque.
- **Extension and machinery:** tractors, combines, and a rural engineering culture that could sow wheat after a late paddy harvest (including zero-till in some pockets).
- **Public research on the rotation itself:** short-duration rice so wheat still fitted the winter window.
- **Political economy:** surplus States became the granary of **PDS** and buffer stocks, which rewarded the rotation year after year.

How it became a bane in Green Revolution States

- **Groundwater collapse:** paddy is a water-guzzling crop on a semi-arid Punjab-Haryana landscape. Free power and a paddy MSP made mining the aquifer rational for the farmer and lethal for the next decade.
- **Soil fatigue:** rice-wheat-rice-wheat without enough organic matter, micronutrient deficit, zinc and manganese issues, and a **chemical treadmill**.
- **Residue and air:** combine-harvested paddy straw is hard to manage in the short window before wheat; **stubble burning** became a regional air-health crisis for Delhi-NCR as well as the fields.

• **Monoculture risk:** pest shifts, falling water tables, and climate extremes hit a system with little crop diversity.

• **Fiscal and nutritional distortion:** public money buys rice and wheat the country already stores, while oilseeds, pulses, and millets stay under-incentivised - a **C2+50 / MSP** debate that is also a cropping-pattern debate.

• **Labour and social:** migrant labour dependence, then COVID-year shocks; a generation locked to a procurement crop rather than horticulture or industry.

• **Ecological dead-ends:** uranium and other geogenic worries in some Punjab waters, canal-water quality, and loss of indigenous basmati niches to a procurement-grade grain.

Rebalancing without romantic yield-suicide

• Diversification toward **maize, pulses, oilseeds, horticulture**, with **procurement and processing** that actually show up, not only a pamphlet.

• **Direct seeding of rice**, shorter-duration varieties, **Happy Seeder / SMS** for residue, and **electricity/water pricing** that tells the truth about the aquifer.

• **PM-KUSUM** and solarisation must not become a new subsidy to pump the last of the water.

• **MSP plus open-ended paddy procurement** is the political core of the bane; technical fixes without a price signal will leak.

Flow diagram

HYV canal tube-well MSP -> Rice-wheat success

Rice-wheat success -> Groundwater soil air

Rice-wheat success -> Fiscal cereal lock-in

Groundwater soil air -> Bane in GR states

Fiscal cereal lock-in -> Bane in GR states

Diversify residue price -> Rebalance

Conclusion

Rice-wheat succeeded through HYV seed, irrigation, chemicals, MSP, and FCI offtake. In the old Green Revolution States it became a bane by mining groundwater, exhausting soils, burning straw, and locking farmers and the exchequer into two cereals. Success was food in the godown. The bane is water, air, and a future crop map that cannot stay paddy-wheat forever.

Open WRAP page — https://wrapexams.com/upsc/mains-answers/gs-3/2020/what-are-the-major-factors-responsible-for-making-rice-wheat-system-a-success-in-spite-of-this-success-how-has-this-system-become-bane-in-india/

Q14 · 15 marks

Suggest measures to improve water storage and irrigation system to make its judicious use under depleting scenario.

GS III · 2020 · Crops, Irrigation and Marketing

Revision summary

Depletion requires storage that recharges, not only more pumps.

Tanks, watersheds, and managed aquifer recharge are the distributed store.

Micro-irrigation, canal efficiency, and working water-user associations cut waste.

Cropping and electricity reform decide whether drip subsidies are real savings.

PMKSY, Atal Bhujal, MGNREGA, and Jal Shakti Abhiyan are the named instruments.

Introduction

Indian irrigation grew by capturing monsoon in canals and then by mining aquifers with pumps. Under a depleting scenario - falling water tables, silted tanks, climate-erratic rain - the task is to store more where it recharges, move water with less loss, and apply it as a crop need, not as a free flood. Judicious use is pricing, cropping, and engineering together.

Body

Store more, and store in the right place

- **Revive tanks, ponds, and traditional systems** (ahar-pyne, johads, temple tanks) through **MGNREGA** and **Jal Shakti Abhiyan**-type drives, with silt as a farm input, not a dump.
- **Watershed and check-dam** work on a ridge-to-valley plan so storage is a chain, not a single celebrity reservoir.
- **Underground storage:** managed aquifer recharge, percolation tanks, and **Atal Bhujal Yojana** community water-budgets in stressed blocks.
- **Reservoir operation:** carry-over storage, desiltation where economic, and conjunctive use so canals and wells are one system.
- Urban **rainwater harvesting** and treated-wastewater reuse for industry and horticulture, to take pressure off irrigation freshwater.

Irrigation hardware that wastes less

- **Canal lining and piped distribution** where seepage is loss, not recharge (lining is not always wise over a depleted aquifer that needs leakage).
- **Micro-irrigation:** drip and sprinkler under **PMKSY-Per Drop More Crop**, with actual electricity and agronomy, not only a subsidy for pipes that lie unused.
- **On-farm storage** (farm ponds) for horticulture, with safeguards against illegal groundwater fill.
- **Pressurised irrigation from canals** (as in some Gujarat and Maharashtrian commands) to cut field-to-field flooding.
- Repair of **last-mile outlets** and participatory irrigation (**PIM / WUAs**) so the tail-ender actually receives a turn.

Judicious use under depletion

- **Cropping pattern:** shift thirsty paddy and sugarcane off over-exploited blocks; millets, pulses, and oilseeds with procurement that is real.

• **Power and water pricing:** flat-free electricity is a pump subsidy to mine water. Solar pumps (**PM-KUSUM**) need **feed-in / grid** options so farmers sell power instead of pumping 24 hours.

• **Soil moisture and scheduling:** agro-met, sensors for large commands, and **Soil Health Cards** so irrigation is not a substitute for agronomy.

• **Legal and institutional:** groundwater acts that are enforced, community metering, and **CGWB** assessment as a binding planning input, not a PDF.

• **Inter-linking and large dams** are not the first answer in a depleting local aquifer; they move a problem unless command-area efficiency is already high.

What not to do

• More tube-wells as 'irrigation development' in dark zones.

• Storage that evaporates in shallow open pits in arid heat without a recharge purpose.

• Ignoring **command-area development** after a dam is built - India's old sin.

Flow diagram

Depleting water -> Tanks recharge aquifers

Depleting water -> Drip lined canals PIM

Depleting water -> Crop and power reform

Tanks recharge aquifers -> Judicious use

Drip lined canals PIM -> Judicious use

Crop and power reform -> Judicious use

Conclusion

Under depletion, store in tanks, watersheds, and aquifers; irrigate through micro-systems and honest canal tails; and use less by changing crops and pump incentives. PMKSY, Atal Bhujal, MGNREGA water works, and Jal Shakti campaigns are the toolkit. A new dam without demand management is not judicious use.

Open WRAP page — https://wrapexams.com/upsc/mains-answers/gs-3/2020/suggest-measures-to-improve-water-storage-and-irrigation-system-to-make-its-judicious-use-under-depleting-scenario/

Q15 · 15 marks

COVID-19 pandemic has caused unprecedented devastation worldwide. However, technological advancements are being availed readily to win over the crisis. Give an account of how technology was sought to aid management of the pandemic.

GS III · 2020 · Indian Economy

Revision summary

COVID management used molecular tests, sequencing, and clinical imaging to see the disease.

Aarogya Setu, GIS war rooms, and dashboards aided tracing and communication, with privacy and coverage gaps.

Telemedicine, oxygen logistics, and PPE/ventilator ramps were care-side technology.

Vaccine platforms and later CoWIN were the biomedical and digital scale-up.

Apps did not replace primary care, oxygen, or equitable access.

Introduction

COVID-19 was a virus plus a systems test. Technology did not invent oxygen or nurses. It did compress time: sequencing the pathogen, tracing contacts, moving lab results, targeting containment, and later delivering vaccines. India's 2020 management mixed old public health with new digital and biomedical tools - with real gains and real exclusion.

Body

Knowing the pathogen and the case

- **Genomic sequencing** (global GISAID; Indian labs under ICMR and later INSACOG) identified SARS-CoV-2 and tracked variants - a first-year science aid that older pandemics lacked at this speed.
- **RT-PCR, TrueNat, CBNAAT, and antigen RDTs** scaled testing; machines, reagents, and ICMR protocols were the bottleneck as much as 'AI'.
- **Tele-radiology and CT** in some hospitals helped clinical triage when RT-PCR lagged.

Finding, isolating, and informing

- **Aarogya Setu** Bluetooth/GPS contact tracing and later status checks: useful in dense formal settings, weaker for feature-phone India and for privacy critics.
- **ITIHAS / telecom analytics** and State war-room GIS for hotspot mapping.
- **ICMR and State dashboards**, media briefings, and SMS advisories - information technology as risk communication, sometimes also as confusion when data lagged.
- **Quarantine apps** and geo-fencing in some States: aid to administration, contested as surveillance.

Care, oxygen, and logistics

- Hospital **bed and oxygen dashboards** (painfully incomplete in the first wave, then a 2021 lesson) are technology as logistics, not as medicine.
- **Telemedicine** guidelines (2020) let follow-up and mild-case advice continue through lockdown.
- **eSanjeevani** and private tele-consults reduced crowding for non-COVID care in pockets.

• **Industry: ventilator and PPE** production ramps, 3D-printed parts, and CSIR-industry consortia - manufacturing technology under a public demand shock.

Vaccines, cold chain, and payments

• Platform science (inactivated, viral vector; globally also **mRNA with lipid nanoparticles**) plus Indian manufacturing (**Serum Institute**, Bharat Biotech) was the decisive biomedical technology.

• **CoWIN** (rolled out for vaccination) is digital public infrastructure for slots, certificates, and later a model of scale - still a 2021 peak, designed in the pandemic year.

• **UPI and DBT** kept transfers and rations moving when offices closed; **ONORC** used ePOS identity to feed migrants.

Limits and justice

• Digital tools **missed the undocumented and the smartphone-poor**. A QR code is not a primary health centre.

• Technology could not fix **oxygen plants not built**, contractual health staff, or crowded housing.

• **Over-claiming 'AI defeated COVID' insults epidemiology:** distance, masks, testing, and vaccination did the work; software was a multiplier.

What to lock in for national development

• Treat **genomic surveillance, oxygen telemetry, telemedicine, and open health data standards** as standing infrastructure, not a wartime gadget.

• Keep **privacy and exclusion audits** on health apps so the next outbreak does not trade rights for a dashboard.

Flow diagram

Virus -> PCR sequencing

Virus -> Aarogya Setu dashboards

Virus -> Telemedicine oxygen logistics

Virus -> Vaccines CoWIN

PCR sequencing -> Pandemic management

Telemedicine oxygen logistics -> Pandemic management

Vaccines CoWIN -> Pandemic management

Conclusion

Technology aided COVID management through tests, genomes, tracing apps, telemedicine, manufacturing ramps, digital payments, and vaccine platforms. It multiplied public health; it did not replace beds, oxygen, or trust. The lasting lesson is to keep those labs, cold chains, and inclusive digital rails ready before the next pathogen.

Open WRAP page — https://wrapexams.com/upsc/mains-answers/gs-3/2020/covid-19-pandemic-has-caused-unprecedented-devastation-worldwide-however-technological-advancements-are-being-availed-readily-to-win-over-the-crisis-give-an-account-of-how-technology-was-sought-to-aid-management-of-the/

Q16 · 15 marks

Describe the benefits of deriving electric energy from sunlight in contrast to the conventional energy generation. What are the initiatives offered by our Government for this purpose?

GS III · 2020 · Infrastructure

Revision summary

Solar PV has no plant fuel, low operational water, and modular scale versus coal thermal.

It cuts operating emissions and can generate near load on rooftops.

- **It is variable:** nights and clouds still need storage or conventional firm power.

JNNSM, SECI parks, KUSUM, rooftop schemes, and RPOs are the main domestic initiatives.

ISA is the international arm; 175 GW by 2022 was the target frame of that period.

Introduction

Solar electricity turns irradiance into current through photovoltaic cells or, less often in India, concentrated solar heat. Conventional generation here means mainly **coal thermal**, plus gas, large hydro, and nuclear. Solar's benefits are fuel-free kilowatt-hours and modular scale. Its limits are night, clouds, land, and a grid that still needs firm power. Policy since the National Solar Mission has tried to buy down that gap.

Body

Benefits versus conventional generation

- **No fuel cycle at the plant:** no coal rakes, no imported gas price spike, no mine-to-ash chain. Operating emissions at the panel are effectively zero (manufacturing and land still have a footprint).
- **Modular and quick:** a megawatt of solar can be added in months; a pit-head thermal plant is years of clearances and boilers.
- **Distributed option:** rooftop and agricultural pumps can generate at the load, cutting some T&D loss that conventional central stations pay.
- **Water:** PV uses little operational water compared with thermal cooling towers - material in stressed basins.
- **Energy security:** sunlight is domestic; coal is largely domestic too, but solar diversifies away from a single dirty stock and from imported thermal coal in some plants.
- **Health and climate:** displacing coal reduces local air pollution and CO2 per kWh, which is the public-health case, not only a climate pledge.

Honest contrast - what conventional still does better

- **Firm, dispatchable power:** coal, hydro, and nuclear follow load; solar is **variable**. Without storage, gas, hydro, or demand response, the grid still leans on conventional capacity after sunset.
- **Land and materials:** utility solar needs acres and imported cells/modules in many years; thermal is compact at the plant but huge if mines and ash ponds are counted.
- **Inertia and system stability:** synchronous machines help the grid; inverters need ancillary-market design.
- So the benefit is real on energy and emissions; it is not a complete substitute on reliability unless storage and transmission are built.

Government initiatives

• **Jawaharlal Nehru National Solar Mission (2010)** under NAPCC: the original reverse-auction, RPPO, and park architecture.

• **SECI** tenders, **solar parks**, and interstate transmission support that crashed tariffs through competition.

• **KUSUM:** solarise pumps, grid-connected agro-feeders, and farmer as producer - the rural initiative.

• **Rooftop solar** schemes (residential incentives, later phase changes), **CPSU** programmes, and **defence/railway** solarisation.

• **Renewable Purchase Obligations**, **waiver of ISTS charges** for solar/wind in specified windows, and **green energy corridors**.

• **International Solar Alliance** (co-founded by India): diplomacy and standardisation, not a domestic kWh.

• At the 2020 horizon, India was pursuing a **175 GW renewable** target by 2022 (100 GW solar in that package) and signalling a larger **450 GW** non-fossil path - targets, not already-installed facts.

• **Complementary: PLI for high-efficiency modules** (announced around this industrial-policy wave) to cut import dependence - name it as industry policy, not as a 2010 Mission clause.

To make the benefit stick

• Pair solar with **storage, flexible coal/hydro, and market reforms** (ramping, ancillary services).

• Do not count diesel-backup rooftop as a clean win.

Flow diagram

Sunlight -> PV electricity electricity

PV electricity -> No fuel low water modular

Coal thermal -> Firm power fuel ash

JNNSM SECI KUSUM RPO -> PV electricity

Storage transmission -> Grid-worthy solar

Conclusion

Solar electricity beats conventional thermal on fuel, water, modularity, and operating emissions. It loses on night-time firmness unless storage and the grid catch up. Government initiatives run from the National Solar Mission and SECI parks through KUSUM, rooftop programmes, RPOs, and the International Solar Alliance. The benefit is a cleaner kWh; the system still needs conventional or stored power when the sun is down.

Open WRAP page — https://wrapexams.com/upsc/mains-answers/gs-3/2020/describe-the-benefits-of-deriving-electric-energy-from-sunlight-in-contrast-to-the-conventional-energy-generation-what-are-the-initiatives-offered-by-our-government-for-this-purpose/

Q17 · 15 marks

What are the key features of the National Clean Air Programme (NCAP) initiated by the Government of India?

GS III · 2020 · Indian Economy

Revision summary

NCAP launched in 2019 as a national city-based clean-air programme.

The target is 20-30 per cent reduction in PM2.5 and PM10 by 2024 from 2017.

It covers non-attainment cities, expanded to 122, each with an action plan.

CPCB and State boards monitor; the Air Act remains the legal backbone.

WHO AQG 2021 guideline values are not NCAP's numerical target.

Introduction

The **National Clean Air Programme** was launched by MoEFCC in January **2019** as a national, time-bound, city-centred drive against particulate pollution. It is a **programme with targets and city plans**, not a new Clean Air Act, and not a transcription of **WHO Air Quality Guidelines 2021**. Those WHO numbers are a health benchmark. NCAP's own arithmetic was a **20-30 per cent cut in PM10 and PM2.5 by 2024** from a **2017** base in listed **non-attainment cities**.

Body

Key features

• **Target: 20-30 per cent reduction** in **PM2.5 and PM10** concentrations by **2024**, with **2017** as the baseline year - a percentage improvement, not a jump to WHO guideline values.

• **Geography:** started with **102 non-attainment cities** (cities that persistently missed National Ambient Air Quality Standards); the list was **expanded to 122 cities**. Answers should use the 122-city NCAP universe, not a WHO-city list.

• **City action plans:** each city to prepare and execute a plan (dust, transport, industry, waste burning, construction) under State boards, monitored through a national dashboard.

• **Institutional stack: MoEFCC** as sponsor, **CPCB** as coordinator, **SPCBs/PCCs** and municipal bodies as doers; later **PRANA** portal-type tracking of city progress.

• **Science backbone:** ambient monitoring expansion, source apportionment studies, and emission inventories so actions are not only odd-even theatre.

• **Sector menus** (indicative, city-specific): road dust, vehicular fleet and fuels, industrial stacks, brick kilns, biomass and municipal burning, and construction guidelines.

• **Collaboration:** IITs and institutes as technical partners; public awareness as a listed component.

• **Non-statutory character:** NCAP did not by itself create a new criminal offence. It sits beside the **Air Act, 1981**, NAAQS, and later the **CAQM** ordinance/Act for the NCR (end-2020 onward) which is a different, legally sharper NCR instrument.

What NCAP is not

• It is **not** 'India adopted WHO AQG 2021'. WHO 2021 annual PM2.5 guideline (5 µg/m³) is far stricter than Indian NAAQS and was not the NCAP 2024 target.

• It is **not** only a Delhi programme. Delhi is one non-attainment story; NCAP is a multi-city list.

- It is **not** a substitute for State industrial closure powers or for GRAP in the NCR.

Complementary 2019-20 air measures (distinct from NCAP features)

- **BS-VI** fuel and vehicles (2020), **SATAT** biogas, **FAME** for EVs, stubble-management machines, and **Ujjwala** LPG - these help air, but they are not themselves the NCAP document.
- Keep them as supporting context, not as NCAP's 'key features' list.

Limits

- A 20-30 per cent cut can leave a city still above NAAQS, let alone WHO.
- Municipal capacity, construction dust, and regional crop-fire are larger than a city plan PDF.
- Monitoring quality and independent evaluation decide whether 2024 is a real number.

Flow diagram

NCAP 2019 -> 20-30 percent PM by 2024

NCAP 2019 -> 122 non-attainment cities

NCAP 2019 -> City action plans

WHO AQG 2021 -> Not the NCAP target

20-30 percent PM by 2024 -> CPCB SPCB dashboard

Conclusion

NCAP's key features are a 2019 national programme, a 20-30 per cent PM cut by 2024 from 2017, 122 non-attainment cities, city action plans, and a CPCB-SPCB monitoring stack. It is India's city-PM campaign. It is not WHO 2021, and it is not a standalone clean-air statute.

Open WRAP page — https://wrapexams.com/upsc/mains-answers/gs-3/2020/what-are-the-key-features-of-the-national-clean-air-programme-ncap-initiated-by-the-government-of-india/

Q18 · 15 marks

Discuss the recent measures initiated in disaster management by the Government of India departing from the earlier reactive approach.

GS III · 2020 · Disaster Management

Revision summary

The DM Act, 2005 institutionalised prevention and preparedness beside relief.

NDMA, NDRF, SDMAs, and disaster funds are the standing architecture.

Cyclone warning and mass evacuation (Fani, Phailin versus 1999) show the new approach in lives saved.

CDRI (2019) and the PM's DRR agenda push resilient infrastructure, not only tents.

Zoning and building-code failure remain the reactive residue.

Introduction

- **For decades India treated disaster as relief:** a collector's tent after the flood, a finance ministry's ex-gratia. The shift, marked by the **Disaster Management Act, 2005**, is toward **prevention, mitigation, preparedness, and a professional response force**. Recent years added early warning, cyclone drills that actually evacuate, and infrastructure resilience - Sendai in administrative form, not only in a UN speech.

Body

From reactive to a legal-institutional cycle

- **DM Act, 2005** created **NDMA**, SDMAs, DDMAs, and a statutory policy-plan-guidelines chain. Relief is one phase; mitigation is supposed to be first.
- **National Disaster Management Plan** (2016, revised later) and hazard-specific **NDMA guidelines** (flood, cyclone, heat, landslide) try to make departments own risk before the event.
- **NDRF** (and SDRFs) are standing specialised responders, a break from ad-hoc army-only rescue as the default civil picture - the army still leads many ops, but the civil capacity exists.
- **Finance:** National and State Disaster Response Funds, plus a growing **mitigation fund** logic after the Fifteenth Finance Commission, so money is not only post-facto.

Recent measures that show the departure

- **Early warning:** IMD's cyclone track and coastal warning, INCOIS tsunami and ocean, CWC flood forecasts, and last-mile SMS/sirens. **Phailin (2013)**, **Fani (2019)**, **Amphan (2020)** deaths were far below the 1999 Odisha super-cyclone scale because evacuation and warning, not only relief camps, worked.
- **Heat-action plans** (Ahmedabad model spreading), urban flood SOPs, and **school/hospital** safety campaigns - slow, but mitigation-minded.
- **Coalition for Disaster Resilient Infrastructure (CDRI, 2019):** India-hosted international coalition so roads, power, and telecom are designed for shocks, not rebuilt after every cyclone.
- **Prime Minister's Ten-Point Agenda** on disaster risk reduction (after the Asian Ministerial Conference): international cooperation, risk mapping, women's leadership, and building codes as politics, not only engineers.
- **Aapda Mitra**, community volunteers, and civil-defence refresh - capacity in the village before the NDRF column arrives.

• **GIS, drones, and satellite** (ISRO Disaster Management Support) for maps in hours, which is preparedness technology.

• **COVID-19** as a biological disaster stretched the Act and showed the unfinished shift: health infrastructure is mitigation; one-time PPE airlift is still reactive. The honest lesson is mixed.

What remains reactive

• Encroached floodplains, unsafe hill construction, and relief politics after every urban flood show the old muscle memory.

• Early warning without **enforced zoning** is still a better forecast of a preventable ruin.

Recommendations that fit the new approach

• Make **building-code compliance** and **land-use** the real mitigation spend.

• Integrate **climate projections** into dam and city drainage design.

• Keep NDRF professional; do not let every event wait for a ministerial aerial survey to start work.

Flow diagram

```
Relief after event -> DM Act NDMA NDRF
DM Act NDMA NDRF -> Early warning evacuation
DM Act NDMA NDRF -> CDRI codes mitigation funds
Early warning evacuation -> Fewer deaths per cyclone
CDRI codes mitigation funds -> Fewer deaths per cyclone
```

Conclusion

India's departure from a purely reactive culture is the DM Act system, NDRF, early warning, cyclone evacuation success, mitigation finance, and CDRI. Relief still happens - it must - but the centre of gravity has moved toward risk reduction. The remaining gap is enforcement of land and codes, where the approach is still too often a cheque after the funeral.

Open WRAP page — https://wrapexams.com/upsc/mains-answers/gs-3/2020/discuss-the-recent-measures-initiated-in-disaster-management-by-the-government-of-india-departing-from-the-earlier-reactive-approach/

Q19 · 15 marks

What are the determinants of left-wing extremism in Eastern part of India? What strategy should Government of India, civil administration and security forces adopt to counter the threat in the affected areas?

GS III · 2020 · Security Forces and Agencies

Revision summary

Eastern LWE grows from forest-land dispossession, missing services, and Maoist organisation.

Tri-junction terrain and mineral rents add operational and financial ease.

The Union's job is fused intelligence, choking extortion, and aligned development spends.

Civil administration must deliver FRA, PESA, roads, and honest grievance.

Security forces should be intelligence-led and police-owned, then leave a civilian hold.

Introduction

Left-wing extremism in eastern and central India - the **Dandakaranya-Jharkhand-Odisha-Bihar** arc - is not only a police file. Its determinants are land, forest, dignity, and a State that arrived as a thana and a contractor. The response therefore cannot be only a CRPF camp. Government, civil administration, and security forces need one strategy with three trades.

Body

Determinants in eastern India

- **Agrarian and forest dispossession:** tenancy insecurity, delayed **FRA, 2006** titles, mining and dam displacement without consent, and contractors on jal-jungle-zameen.
- **Governance vacuum:** absent schools, health, roads, and a revenue officer who is not extractive. The Maoist filled the dispute-resolution gap.
- **Adivasi and Dalit exclusion:** social humiliation and unaccountable police, which made a radical class war story locally believable.
- **Terrain and borders of States:** tri-junction forests (Chhattisgarh-Odisha-Jharkhand, etc.) that let cadres slip across jurisdictions.
- **Resource curse politics:** minerals of Jharkhand, Odisha, and Bastar attract rents; some of that rent historically leaked to protection economies.
- **Ideology and organisation:** CPI (Maoist) cadre structure, extortion, and propaganda; youth without jobs as the recruitment pool.
- **External and criminal overlay:** arms, explosives, and occasional urban sympathiser networks - secondary to the rural political economy, not imaginary.

Strategy for the Government of India

- **Hold the** SAMADHAN **frame as operations-plus:** smart leadership, intelligence, and development, not a slogan-only acronym.
- **Financial choking** of extortion, and a political refusal to treat LWE as a permitted 'social movement' once it uses mines and IEDs.
- **Centres of excellence** for intelligence fusion; avoid purely kinetic body-count incentives.

• Coordinate **MHA, rural development, tribal affairs, and mines** so a road is not only a CRPF logistics spur but a clinic and a mandi.

Strategy for civil administration

• **Deliver FRA, PESA, and basic services** faster than the pamphlet. A title deed and a teacher beat a midnight speech.

• **Road, telecom, banking, and PDS** in vacated areas immediately, or the cadre returns as the only employer.

• **Grievance and prosecution of official abuse**; fake encounters and sexual violence are strategic defeats.

• **Surrender-cum-rehabilitation** that is real: skills, safety from revenge, and a place in the village.

• Local **panchayats and traditional councils** as the political centre, not a parallel Maoist janatana sarkar.

Strategy for security forces

• **CRPF, CoBRA, State armed police, and district police** as a grid: police must own the thana; CAPF should not be a permanent substitute government.

• **Small-team, intelligence-led** operations over large, predictable road-opening routines that invite IEDs.

• **IEDs and mine warfare** specialisation; protect locals from being used as human shields or forced porters.

• **Civic action** that is not a substitute for the collector, but is coordinated with him.

• Human-rights **SOPs**, women in units for search, and prosecution of force crime - legitimacy is a weapon.

Sequence

• Clear, hold, and then **civil hold**. Security without administration recreates the vacuum that was the original determinant.

Flow diagram

Land forest dignity vacuum -> LWE eastern belt eastern belt

MHA SAMADHAN fusion -> Clear

FRA PESA services -> Hold

Police CoBRA intel -> Clear

Clear -> Hold

Hold -> Cadre shrinks

Conclusion

Eastern LWE is determined by dispossession, absent government, and an organised Maoist military-political machine. The Centre should fuse intelligence, money-trail, and development. Collectors must deliver FRA, services, and clean grievance. Forces should be intelligence-led, police-first, and rights-bound. The gun opens space; only the civil State closes the war.

Open WRAP page — https://wrapexams.com/upsc/mains-answers/gs-3/2020/what-are-the-determinants-of-left-wing-extremism-in-eastern-part-of-india-what-strategy-should-government-of-india-civil-administration-and-security-forces-adopt-to-counter-the-threat-in-the-affected-areas/

Q20 · 15 marks

Analyse internal security threats and transborder crimes along Myanmar, Bangladesh and Pakistan borders including Line of Control (LoC). Also discuss the role played by various security forces in this regard.

GS III · 2020 · Border Security and Organised Crime

Revision summary

Myanmar border threats are insurgent sanctuary, arms, and golden-triangle drugs; Assam Rifles lead.

Bangladesh border threats are illegal migration, cattle, FICN, and trafficking; BSF leads.

Pakistan IB is BSF versus infiltration and narcotics; the LoC is an Army counter-infiltration war.

Crime and terror fuse through hawala, heroin, and fake notes.

One-border-one-force plus police investigation is the role map; ITBP is not the Pakistan force.

Introduction

India's land borders are not one problem. Myanmar is hills, ethnicity, and a golden triangle of drugs and insurgent camps. Bangladesh is riverine density, cattle, fake notes, and migration politics. Pakistan and the **LoC** are a militarised line with terrorism as statecraft plus narcotics and fakes. Transborder crime is the peacetime face of the same maps. Different forces hold different stretches because the threat is not uniform.

Body

Myanmar border

- **Threats:** northeast insurgent groups historically using **Sagaing / Chin** depth, arms, and now a messier Myanmar civil-war spillover; **drug trafficking** (heroin, meth/WY) along the golden triangle route; wildlife and timber crime; possible radical or criminal misuse of unfenced hills.
- **Crimes:** precursor chemicals, small arms, and informal trade that finances cadres.
- **Forces: Assam Rifles** as the lead border-guarding force in much of the northeast under MHA, with **Indian Army** in counter-insurgency grids; **Narcotics Control Bureau** and State police on the crime side; **Sashastra Seema Bal** is not the Myanmar force.

Bangladesh border

- **Threats:** illegal migration as a political-security issue, **cattle smuggling**, **fake Indian currency notes (FICN)** routing, arms and explosive remnants in older modules, and Islamist or criminal networks that have used the riverine border.
- **Crimes:** human trafficking, phensedyl-type smuggling in some years, and gold.
- **Forces: Border Security Force (BSF)** is the designated border-guarding force; **State police**, **NIA** in terror-linked cases, and **coastal security** where the Sundarbans meet the sea. Fencing, floodlights, and coordinated patrol with BGB are the method; rivers still leak.

Pakistan border and LoC

- **IB (Gujarat, Rajasthan, Punjab, J&K IB patches): BSF** versus Pakistan Rangers; threats of infiltration, drones (a later intensification), **narcotics** in Punjab, and FICN.

• **LoC in J&K: Indian Army** holds the line; ceasefire violations, infiltration of terrorists, and transborder support to groups in the Valley are the core internal-security threat, not ordinary cattle crime.

• **Crimes plus terror:** heroin, weapons, and communication - a fused threat.

• **Other agencies: ITBP** is China-facing, not Pakistan; do not mix the maps.

Cross-cutting internal security

• **Terrorism, radicalisation, and communal rumour** can ride any of these routes.

• **Cyber and hawala** sit behind the physical crossing.

• **CIBMS**, fencing, and riverine boats are technology; **BADP** and perception (as in Q10) decide local spotting.

Role of security forces - how to state it

• **Army:** LoC, counter-infiltration, and hinterland CI in J&K; aid to civil power when asked.

• **BSF:** Pakistan and Bangladesh borders; law-and-order aid; civic action.

• **Assam Rifles:** Myanmar border and northeast CI, with a unique dual character.

• **ITBP / SSB:** China and Nepal/Bhutan respectively - mention only to show the **one-border-one-force** doctrine, not as Myanmar/Pakistan leads.

• **CAPF and State police:** investigation, UAPA cases, and the crime end that soldiers should not own forever.

• **Coast Guard and Navy:** the maritime flank of Bangladesh and Gujarat, because crime is not only a land problem.

What works

• Intelligence fusion (**Multi-Agency Centre**), joint interrogation, and disrupting the **crime-terror continuum** rather than treating a heroin mule as only an NDPS file.

• **Diplomacy:** coordinated border management with Bangladesh has improved; Myanmar and Pakistan are harder political terrains.

Flow diagram

Myanmar -> Assam Rifles drugs insurgency

Bangladesh -> BSF migration FICN cattle

Pakistan LoC -> Army infiltration terror

Pakistan LoC -> BSF IB narcotics

Assam Rifles drugs insurgency -> Internal security

BSF migration FICN cattle -> Internal security

Army infiltration terror -> Internal security

Conclusion

Myanmar brings drugs and insurgent depth, Bangladesh brings migration-crime and FICN on a riverine fence, Pakistan and the LoC bring terrorism fused with narcotics. Assam Rifles, BSF, and the Army are the respective spines, with police and specialist agencies on the crime-terror chain. One force, one border, plus a village that reports, is the working doctrine.

Open WRAP page — https://wrapexams.com/upsc/mains-answers/gs-3/2020/analyse-internal-security-threats-and-transborder-crimes-along-myanmar-bangladesh-and-pakistan-borders-including-line-of-control-loc-also-disc

uss-the-role-played-by-various-security-forces-in-this-regard/

Compiled answer key

Last pages of this pack. Each question links to the WRAP model answer on wrapexams.com.

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Q1 **10 marks**	**Q2** **10 marks**	**Q3** **10 marks**	**Q4** **10 marks**
Q5 **10 marks**	**Q6** **10 marks**	**Q7** **10 marks**	**Q8** **10 marks**
Q9 **10 marks**	**Q10** **10 marks**	**Q11** **15 marks**	**Q12** **15 marks**
Q13 **15 marks**	**Q14** **15 marks**	**Q15** **15 marks**	**Q16** **15 marks**
Q17 **15 marks**	**Q18** **15 marks**	**Q19** **15 marks**	**Q20** **15 marks**

Question-wise key

Q1 · 10 marks Solution
Q2 · 10 marks Solution
Q3 · 10 marks Solution
Q4 · 10 marks Solution
Q5 · 10 marks Solution
Q6 · 10 marks Solution
Q7 · 10 marks Solution
Q8 · 10 marks Solution
Q9 · 10 marks Solution
Q10 · 10 marks Solution
Q11 · 15 marks Solution
Q12 · 15 marks Solution
Q13 · 15 marks Solution
Q14 · 15 marks Solution
Q15 · 15 marks Solution
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