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UPSC Mains 2016 GS III

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

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<https://wrapexams.com/upsc/mains/gs-3/2016/>

Q1 · 12 marks

How globalization has led to the reduction of employment in the formal sector of the Indian economy? Is increased informalization detrimental to the development of the country?

GS III · 2016 · Indian Economy

Revision summary

After 1991, trade opening, flexible staffing and capital-intensive technology cut regular factory hiring.

Services-led growth and a freeze on public recruitment added few mass formal jobs.

Informal work absorbed labour but kept wages, social security and productivity low.

A large informal sector also limits tax and social-insurance reach.

Development needs formalisation of growing firms, not permanent dualism.

Introduction

Globalization after 1991 opened trade, capital and technology. Formal factory jobs did not rise in step with output. Firms met global competition by cutting regular payroll, using contract labour, and shifting work to **unregistered units**. Informalization can absorb people in the short run. It is detrimental to development when it becomes the **main growth path**, because it weakens wages, social security and tax capacity.

Body

How globalization cut formal employment

- Import competition after tariff cuts forced many **small organised units** in textiles, engineering and consumer goods to close or to stay below the factory-act threshold.
- Export and multinational buyers demanded **flexible, low-cost labour**. Firms answered with contractors, trainees and home-based chains rather than permanent staff.
- **Capital-intensive technology** and imported machines raised output with fewer shop-floor workers, so organised manufacturing's job elasticity stayed low.
- Growth after 1991 was **services-led**. Information technology and finance created some formal posts, but most new urban work was in construction, retail, transport and domestic services that sit outside provident fund and Employees' State Insurance.

- Rigid **Industrial Disputes Act** exit rules and inspector raj made employers avoid crossing the worker-count that triggers standing orders, so units stayed small and informal by design.
- Public-sector **disinvestment and freeze on regular recruitment** shrunk a historic source of formal jobs, while contract staff filled the same desks.

Is increased informalization detrimental?

- Informal work gave a livelihood cushion when firms shed labour and organised industry did not hire. That is not the same as development.
- Informal workers lack **minimum wage enforcement, written contracts, maternity cover and old-age security**, so household risk stays high and human capital is under-invested.
- Informal firms have weak access to bank credit, technology and export standards, so **productivity** stays low and India misses the manufacturing-jobs ladder seen in East Asia.
- A large informal base shrinks **social-security contributions and income-tax** reach, which limits the State's ability to fund health, skills and infrastructure.
- **Some informalization is** statistical: own-account work and micro units that GST and **Pradhan Mantri Jan Dhan Yojana** may later formalise. That transition is useful; a permanent dual labour market is not.
- Development needs a shift from informal survival to **formal, productive jobs**, with contract labour used as a bridge, not as the destination.

Way

- Ease exit and compliance for genuine firms so they grow above the informal threshold, while enforcing **core labour standards** on contractors.
- Use **Make in India**, skill missions and MSME credit so global value chains hire in India with papers, not only through unregistered suppliers.

Flow diagram

Globalization -> Import competition
 Globalization -> Flexible contract labour
 Globalization -> Capital intensive tech
 Import competition -> Fewer formal jobs
 Flexible contract labour -> Fewer formal jobs
 Capital intensive tech -> Fewer formal jobs
 Fewer formal jobs -> Informalization
 Informalization -> Weak security and productivity

Conclusion

Globalization raised output and some skilled services jobs, but it also pushed employers to shed regular factory posts and to use informal chains. Informalization is a shock absorber, not a development strategy. India develops when global integration is paired with formal, productive employment.

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Q2 · 12 marks

Women empowerment in India needs gender budgeting. What are the requirements and status of gender budgeting in the Indian context?

GS III · 2016 · Government Budgeting

Revision summary

Gender budgeting tags and tracks public money so women actually benefit from general and specific schemes.

Requirements are sex-disaggregated data, a Gender Budget Statement, trained cells, outcome targets and audit.

India began a Union Gender Budget Statement in 2005-06; States have followed unevenly.

Part B allocations are often notional and beneficiary data remain weak.

Empowerment will follow when outcomes, not only rupee annexes, are audited.

Introduction

Gender budgeting is not a separate purse for women. It is a way of planning, spending and auditing the **Union and State budgets** so that policies close gaps in work, health, safety and assets. Women's empowerment needs this tool because a gender-blind budget can look large on paper and still miss girls' schools, maternity beds, childcare and land titles.

Body

Why empowerment needs gender budgeting

- Women face **unequal unpaid care, weaker asset rights and labour-market barriers**. Ordinary line ministries will not correct these unless money is tagged and tracked.
- Schemes for roads, power, skills and farming affect women differently; gender budgeting forces each department to ask **who benefits**.
- Legal rights (equal pay, maternity, protection from violence) stay hollow without **budgeted staff, shelters and courts**.
- **Empowerment is also** voice in fiscal choice: a Gender Budget Statement makes the claim visible to Parliament and the public.

Requirements

- **Sex-disaggregated data** on beneficiaries, wages, land, credit, health and crime, so allocations are not guesswork.
- A published **Gender Budget Statement** that splits spending into women-specific schemes (Part A) and pro-women shares of general schemes (Part B).
- **Gender cells** in ministries and States, with trained budget officers, not a one-time annex.
- **Outcome targets:** enrolment, institutional deliveries, women's labour-force participation, credit to women, and conviction in violence cases - not only rupee outlays.
- **Audit and mid-year correction** by the Comptroller and Auditor General and parliamentary committees so the statement is not a brochure.
- Coordination with **Beti Bachao Beti Padhao**, maternity schemes, **National Rural Livelihoods Mission** self-help groups, and the **Nirbhaya** fund so gender lines talk to each other.

Status in India

- India introduced a **Gender Budget Statement (Statement 20)** with the Union Budget **2005-06**, after a 2004-05 pilot in a few departments.
- The Ministry of Women and Child Development is the nodal ministry; many Union ministries now report Part A and Part B figures.
- Several States (Karnataka, Kerala, Gujarat, Rajasthan, Madhya Pradesh and others) adopted State gender budgets, with uneven depth.
- **Gaps remain:** Part B shares are often **notional**, data on actual women beneficiaries are thin, and large infrastructure votes are weakly gendered.
- Women's share of formal credit, land titles and regular public employment still lags, which shows that a statement is not yet a full **gender-responsive budget cycle**.
- Recent Union efforts (Sukanya Samridhi, maternity benefit, Ujjwala in 2016, stand-up loans for women) sit beside the statement but still need **outcome audit**.

Flow diagram

Women empowerment -> Gender budgeting
Gender budgeting -> Sex disaggregated data
Gender budgeting -> Gender Budget Statement
Gender budgeting -> Outcome targets
Gender budgeting -> Audit
Gender Budget Statement -> Union 2005-06
Outcome targets -> Real gap closure

Conclusion

Women's empowerment needs gender budgeting because money, not only law, decides whether rights reach the household. India has the statement, the nodal ministry and many State pilots. The next step is reliable sex-wise data, honest Part B shares, and audit of outcomes, not only of annexes.

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Q3 · 12 marks

Pradhan Mantri Jan Dhan Yojana (PMJDY) is necessary for bringing unbanked to the institutional finance fold. Do you agree with this for financial inclusion of the poor section of the Indian society? Give arguments to justify your opinion.

GS III · 2016 · Indian Economy

Revision summary

PMJDY (2014) gives a zero-balance account, RuPay card, overdraft and basic insurance to the unbanked.

It is necessary because Direct Benefit Transfer and later credit need a bank identity.

It helps the poor by cutting leakage and offering a cheaper alternative to informal lenders.

Dormant accounts and weak last-mile cash-out remain the main gaps.

Inclusion is complete only when the account is used and credit and insurance actually work.

Introduction

Pradhan Mantri Jan Dhan Yojana (PMJDY), launched on 28 August 2014, is the Union's mass drive for a bank account, a debit card, overdraft and basic insurance. For the poor, institutional finance begins with an **identity that a bank recognises**. PMJDY is necessary as that first door. It is not sufficient as the whole of financial inclusion.

Body

Why PMJDY is necessary

- Large numbers of poor households were **unbanked** despite earlier no-frills and Business Correspondent experiments; they saved in cash, gold or informal lenders.
- A **zero-balance account** with Aadhaar seeding lets wages, pensions and subsidies travel by **Direct Benefit Transfer**, cutting leakage to middlemen.
- The **RuPay debit card**, accident cover and life cover attached to the account give a thin safety net that a village moneylender does not.
- An **overdraft** on a functioning account is a first formal credit line, cheaper than usurious informal loans if the account is actually used.
- Banking correspondents and the **India Post Payments Bank** path (then taking shape) extend the fold to habitations without a brick branch.
- Without this rail, **Pradhan Mantri Mudra Yojana**, crop insurance premia, and later gas and wage transfers cannot reach the same household on one ledger.

Arguments that it serves the poor

- Inclusion is not only credit; it is **safe saving, payment and insurance**. PMJDY put those three on one product for people the commercial branch had ignored.
- Women's accounts and self-help group linkage improve **household bargaining** when transfers are paid to the woman.
- Formal accounts create a **footprint** that banks and microfinance can use for small loans, which is the opposite of perpetual informal debt.

Limits, not a reason to discard the scheme

- Many accounts stayed **dormant** after the enrolment camp; an unused ledger is not inclusion.
- Last-mile **cash-out, connectivity and BC viability** still fail in remote blocks.
- Overdraft and insurance claims need **literacy and grievance redress**; the poor can still be charged or denied.
- True inclusion also needs **affordable credit, pensions (Atal Pension Yojana) and insurance (PMJJBY, PMSBY)** that sit on the Jan Dhan rail.
- **So the right view is:** PMJDY is **necessary and largely well aimed**, provided the State treats usage, not only account-opening numbers, as success.

Flow diagram

Unbanked poor -> PMJDY account
PMJDY account -> DBT payments
PMJDY account -> RuPay overdraft
PMJDY account -> Basic insurance
DBT payments -> Institutional finance fold
RuPay overdraft -> Institutional finance fold
Basic insurance -> Institutional finance fold
Institutional finance fold -> Usage last mile credit

Conclusion

- **Yes:** PMJDY is necessary to bring the unbanked poor into institutional finance. An account, card and transfer rail are the floor. The scheme will include the poor in substance only when accounts are used, cash-out works, and credit and insurance actually pay out.

Open WRAP page — <https://wrapexams.com/upsc/mains-answers/gs-3/2016/pradhan-mantri-jan-dhan-yojana-pmjd-y-is-necessary-for-bringing-unbanked-to-the-institutional-finance-fold-do-you-agree-with-this-for-financial-inclusion-of-the-poor-section-of-the-indian-society-give-arguments-to-justify/>

Q4 · 12 marks

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.

GS III · 2016 · Indian Economy

Revision summary

Indian Smart Cities combine area-based works and pan-city ICT for water, mobility, housing and e-governance.

They are relevant because cities are congested, under-serviced and economically central.

If capital stays in 100 cities, rural-urban differences will widen.

PURA sought urban amenities in rural clusters through four connectivities.

The 2016 Rurban Mission is the present cluster vehicle for Smart Villages alongside city Missions.

Introduction

A **Smart City** in the Indian **Smart Cities Mission (2015)** is not only sensors and Wi-Fi. It is an urban area that uses data, area-based retrofitting, greenfield pockets and pan-city ICT to improve **water, mobility, housing, energy and governance**. India is urbanising fast. The Mission is relevant. If it stays a few city islands, **rural-urban differences** will widen unless **Smart Villages** - in the spirit of **PURA** and the **Shyama Prasad Mukherji Rurban Mission** - move in parallel.

Body

What Smart Cities are

- The Mission uses **area-based development** (retrofit, redevelopment, greenfield) plus **pan-city** solutions such as intelligent traffic, e-governance and energy meters.
- Core claims are 24x7 water, solid-waste systems, public transport, affordable housing, safety and citizen feedback - **liveability**, not only gadgets.
- Funding mixes Union grants, State and urban-local-body shares, and **public-private** projects, with a Special Purpose Vehicle to implement.

Relevance for urban development

- Indian cities face **congestion, polluted air, leaking pipes, slums and weak municipal finance**. A focused, competitive Mission can demonstrate better service standards.
- **Economic engines** sit in cities: jobs, colleges and hospitals. Smarter logistics and power raise productivity.
- E-governance and open data can cut discretion in building permits and property tax, which ordinary master plans failed to do.
- Relevance is real only if the poor in **notified and non-notified slums** get tenure, water and buses, not only a central business-district makeover.

Will it increase rural-urban differences?

- **Yes, if** public money, skilled staff and private capital concentrate in 100 Mission cities while villages keep leaking schools and seasonal power.

- Migration will then accelerate, and the rural non-farm job base will thin.
- **Not necessarily**, if city success is paired with **rurban clusters** that offer urban amenities without forcing every youth to the metro.
- **The risk is** selection: already-capable municipal corporations win the challenge; weaker towns and villages fall further behind.

Smart Villages: PURA and Rurban

- **Provision of Urban Amenities in Rural Areas (PURA)**, associated with A.P.J. Abdul Kalam, argued for physical, electronic, knowledge and economic connectivity so a village cluster has roads, telecom, skills and markets.
- The earlier PURA scheme under the Ministry of Rural Development had mixed, often weak, private-partner delivery; the idea remained sound.
- **Shyama Prasad Mukherji Rurban Mission (2016)** funds **Rurban clusters**: groups of villages with integrated planning for roads, water, sanitation, skill, agro-processing and digital services, aiming at **urban amenities with rural soul**.
- **Digital India**, **Gram Jyoti**, **Pradhan Mantri Gram Sadak Yojana** and e-NAM are the sectoral rails a Smart Village needs.
- Smart Villages reduce distress migration, support farm value chains, and make Smart Cities less overcrowded. The two Missions should be **complements**, not substitutes.

Flow diagram

Smart Cities Mission -> Urban liveability jobs
 Smart Cities Mission -> Risk of rural lag
 PURA connectivity -> Smart Villages
 Rurban Mission clusters -> Smart Villages
 Smart Villages -> Narrow rural-urban gap
 Urban liveability jobs -> Narrow rural-urban gap

Conclusion

Smart Cities are relevant as a liveability and governance push in a rapidly urban India. They will widen rural-urban gaps if they remain exclusive enclaves. PURA's connectivity idea and the Rurban Mission are the rural counterpart: urban-quality services in village clusters so development is not only a city story.

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Q5 · 12 marks

Justify the need for FDI for the development of the Indian economy. Why there is gap between MOUs signed and actual FDIs? Suggest remedial steps to be taken for increasing actual FDIs in India.

GS III · 2016 · Indian Economy

Revision summary

FDI supplies long-term capital, technology and export links that domestic savings alone cannot fully provide.

Make in India opened several sectors to attract that capital into factories and infrastructure.

MoUs are non-binding headlines and often double-counted, so they dwarf actual RBI-recorded inflows.

Land, clearances, tax uncertainty and weak contract enforcement explain the gap.

Remedies are policy stability, single windows, insolvency exit, aftercare and publishing actual inflows.

Introduction

Foreign direct investment (FDI) is long-term capital with technology, management and market access. India needs it to close a **savings-investment gap**, to build factories and infrastructure, and to join global value chains. **Memoranda of Understanding (MoUs)** at summits look large. Actual equity that is reserved with the **Reserve Bank** and the Department of Industrial Policy and Promotion is often much smaller. The gap is a policy and implementation problem, not a mystery of investor mood alone.

Body

Why India needs FDI

- Domestic savings and the **fiscal space** of the Union and States cannot fund all power, ports, urban metro, electronics and defence lines at the speed India needs.
- FDI brings **technology, quality standards and export discipline** that portfolio flows do not.
- Greenfield FDI creates **jobs and supplier clusters**; brownfield FDI can revive stressed assets if regulation is clean.
- A stable FDI base eases the **current-account** constraint compared with hot money.
- **Make in India (2014)** and liberalised caps in defence, railways, insurance and construction were aimed at this developmental role, not at trophy announcements.

Why MoUs exceed actual FDI

- An MoU is a **statement of intent**. It is not a legally binding investment, and it often double-counts the same project across events.
- **Land acquisition, environmental clearances and multi-State approvals** delay or kill projects after the handshake.
- **Contract enforcement** is slow; tax retrospective disputes (the Vodafone-type overhang) and inverted duty structures scare committed equity.
- **Infrastructure and logistics costs**, power quality, and exit through insolvency were still weak in 2016, so money stayed in holding companies or never arrived.

- **Some MoUs are** diplomatic theatre: large headline numbers for a visit, with no term-sheet on equity, debt and local partner.
- Restricted sectors, FDI caps, and **Press Note** conditions (sourcing, lock-in) further convert a signed paper into a smaller actual inflow.

Remedial steps

- Keep a **stable, prospective tax** regime and a predictable FDI policy circular; avoid retrospective shocks.
- Shorten **single-window** clearances, digitise land records, and use industrial parks with pre-cleared land rather than plot-by-plot fights.
- Strengthen **Insolvency and Bankruptcy** exit so capital is not trapped; honour contracts and arbitration awards.
- Match **Make in India** openings with skills, quality testing and **special economic** or national-investment-manufacturing-zone logistics.
- Report **actual equity inflows** beside MoUs in public dashboards so States compete on realisation, not on summit signatures.
- **Use Invest India and State investment boards for aftercare:** a plant that is stuck after the MoU needs a named officer, not another brochure.

Flow diagram

Need for FDI -> Capital technology jobs
 MoUs -> Gap
 Actual FDI -> Gap
 Gap -> Land tax contracts delays
 Land tax contracts delays -> Stable policy single window aftercare
 Stable policy single window aftercare -> Actual FDI

Conclusion

India needs FDI for capital, technology and export jobs. MoUs overstate that need's fulfilment because they are intent, not money. Actual FDI will rise when land, tax, contracts and exit are boringly predictable, and when public scorecards count rupees received, not papers signed.

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Q6 · 12 marks

Comment on the challenges for inclusive growth which include careless and useless manpower in the Indian context. Suggest measures to be taken for facing these challenges.

GS III · 2016 · Inclusive Growth

Revision summary

Careless manpower is employed but low-productivity labour, especially disguised farm unemployment and skill mismatch.

Useless manpower in this question means idle and unemployable people, including educated unemployed and excluded groups.

Both block inclusive growth because output does not draw in the many.

Measures are quality education, PMKVY-type skills, health, **Make in India** jobs, and productive farm value chains.

MGNREGA and Jan Dhan social security are floors while regular jobs are built.

Introduction

Inclusive growth means output that **the many can join**, not only a rise in average income. In the Indian debate, **careless manpower** is labour that is employed but wasted - mismatched, under-skilled, absent, or stuck in **disguised farm unemployment**. **Useless manpower**, in the examiner's harsh phrase, is the idle and the unemployable: youth without skills, the long-term unemployed, and those locked out by health, caste or gender. Both are a drag on inclusion.

Body

Challenges: careless manpower

- A large farm workforce produces a small share of **gross value added**; extra hands on a tiny plot add little output. That is careless use of people, not a lack of people.
- **Skill mismatch**: degrees without shop-floor, language or digital skills leave graduates in informal odd jobs.
- Public and private offices often run on **overstaffing in some cadres and vacancies in others**, with weak accountability, so paid time is poorly used.
- **Low female labour-force participation** wastes half the talent stock; safety, childcare and social norms keep capable women out of paid work.
- Poor **health and nutrition** cut stamina and attendance, so even employed workers produce below potential.

Challenges: useless (idle and unemployable) manpower

- Open unemployment among the educated, and **NEET-type** youth who are neither in education nor in work, turn the demographic dividend into a liability.
- Illiteracy, dropout after elementary school, and weak **vocational** pathways make many unemployable in modern firms.
- **Regional and social exclusion** (Scheduled Castes, Scheduled Tribes, minorities, persons with disability) leaves groups outside the growth process.

- Informal, unsafe work without **social security** can look like employment while still leaving households in poverty - inclusion in name only.

Measures

- Universal **quality schooling and mid-day meals**, then **Skill India / Pradhan Mantri Kaushal Vikas Yojana** linked to actual employer demand, not only certificates.
- **Make in India**, MSME credit (**MUDRA**, CGTMSE) and labour-intensive exports to absorb surplus farm labour in factories and logistics.
- **Farm-side**: irrigation, **e-NAM**, food processing and producer companies so rural labour is productive, not surplus on the same acre.
- **National Health Mission**, sanitation and nutrition (ICDS, later Mission Indradhanush-type drives) to make the workforce employable in body, not only on paper.
- Raise women's work through childcare, safe transport, and **NRLM** livelihoods; enforce maternity and equal-remuneration law.
- **Mahatma Gandhi National Rural Employment Guarantee** as a floor, plus **Jan Dhan-Aadhaar-mobile** social security, so idle distress does not become permanent exclusion.
- Apprenticeship, easier formal hiring, and regional industrial corridors so 'careless' public payrolls are trimmed and private jobs expand.

Flow diagram

Inclusive growth -> Careless underused labour
 Inclusive growth -> Idle unemployable labour
 Careless underused labour -> Skills jobs farm productivity
 Idle unemployable labour -> Skills jobs farm productivity
 Skills jobs farm productivity -> Health education
 Skills jobs farm productivity -> Factory and rural jobs
 Health education -> Inclusive growth
 Factory and rural jobs -> Inclusive growth

Conclusion

Inclusive growth fails when India either wastes people on low-productivity tasks or leaves them idle and unskilled. The answer is not a slogan against labour. It is health, schooling, demand-linked skills, and jobs in manufacturing, services and productive farming so manpower becomes an asset.

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Q7 · 12 marks

What is water-use efficiency? Describe the role of micro-irrigation in increasing the water-use efficiency.

GS III · 2016 · Crops, Irrigation and Marketing

Revision summary

Water-use efficiency is crop output or income per unit of water applied or consumed.

Surface irrigation loses much water to evaporation, seepage and percolation.

Drip and sprinkler put water in the root zone and allow fertigation, raising yield per drop and often cutting pump hours.

Limits are capital cost, clogging and the risk of expanding thirsty crops.

PMKSY (2015) and Per Drop More Crop subsidise micro-irrigation as the national programme.

Introduction

Water-use efficiency in farming is the useful crop output (or income) obtained per unit of water applied or consumed. Indian irrigation is still dominated by **flood and furrow** methods that lose water to evaporation, seepage and deep percolation. **Micro-irrigation** - drip and sprinkler - puts water (and often fertiliser) in the root zone. That is the practical route to **more crop per drop**.

Body

What water-use efficiency means

- Agronomic efficiency is **yield per cubic metre** of irrigation water; economic efficiency is **rupees of produce per unit of water**.
- Basin efficiency also counts **return flows** reused downstream; on-farm efficiency is what the farmer controls at the plot.
- India's challenge is **low on-farm efficiency** in rice-wheat and sugarcane belts, falling groundwater, and climate-unreliable monsoon.
- Efficiency is not only hardware. It needs **scheduling, crop choice, lining of canals, and pricing or community rules** that discourage waste.

Role of micro-irrigation

- **Drip irrigation** delivers water in drops to the root zone through emitters. It cuts evaporation and wetting of unproductive soil, and it suits horticulture, cotton, sugarcane and vegetables.
- **Sprinklers** spray water like rain. They suit cereals, pulses and fodder on undulating land where drip laterals are costly.
- Both methods raise **application efficiency** well above typical surface irrigation, so the same reservoir or tube-well serves more area or the same area with less pumping.
- **Fertigation** with drip places nutrients with water, raising fertiliser-use efficiency and cutting leaching into groundwater.
- Less waterlogging and soil crusting improve **root health and quality** of produce, which matters for export horticulture.
- Energy use per kilogram can fall because pumps run fewer hours, which also eases the **power-subsidy** burden of States.

- **Limits:** high **capital cost**, clogging in saline or dirty water, need for filters and farmer training, and weak results if farmers still grow water-guzzling crops on a larger command.

Policy support

- **Pradhan Mantri Krishi Sinchayee Yojana (PMKSY, 2015)** unifies irrigation efforts with the motto Har Khet Ko Pani and Per Drop More Crop.
- The **Per Drop More Crop** component subsidises micro-irrigation systems, often with State top-up, and links them to water-user groups.
- **National Mission for Sustainable Agriculture** and earlier **National Mission on Micro Irrigation** laid the subsidy path that PMKSY absorbed.
- Efficiency also needs **participatory irrigation management**, canal lining, and crop diversification away from paddy in severely over-exploited blocks.

Flow diagram

Irrigation water -> Flood furrow losses
Irrigation water -> Micro irrigation drip sprinkler
Micro irrigation drip sprinkler -> Higher water-use efficiency
Micro irrigation drip sprinkler -> Fertigation less pumping
PMKSY Per Drop More Crop -> Micro irrigation drip sprinkler
Higher water-use efficiency -> More crop per drop

Conclusion

Water-use efficiency is more yield and income from each unit of water. Drip and sprinkler raise that efficiency by cutting non-beneficial losses and enabling fertigation. PMKSY's Per Drop More Crop is the Union vehicle; it works when hardware comes with training, maintenance and sensible crop choice.

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Q8 · 12 marks

What is allelopathy? Discuss its role in major cropping systems of irrigated agriculture.

GS III · 2016 · Crops, Irrigation and Marketing

Revision summary

Allelopathy is the chemical effect of one plant on another through leachates, exudates or decaying residues.

In irrigated rice-wheat it can suppress weeds such as barnyard grass and also cause residue autotoxicity if straw is mismanaged.

Sorghum, sunflower, mustard and some mulches are used for weed suppression in irrigated field crops.

Sugarcane, cotton and canal-side agroforestry also show allelopathic effects on ratoons and adjoining wheat.

It supports, but does not replace, integrated weed and residue management.

Introduction

Allelopathy is the effect of one plant on another through **chemicals released** from leaves, roots, litter or decomposing residues. The effect may suppress weeds or neighbour crops, or, less often, stimulate them. In **irrigated agriculture**, where rice, wheat, sugarcane and cotton repeat on the same land, allelopathy is a tool for **weed management and residue use**, and a risk when residues or intercrops poison the next stand.

Body

What allelopathy is

- Plants release **allelochemicals** (phenolics, terpenoids, alkaloids, glucosinolates) by leaching, root exudation, volatilisation or decay.
- Unlike simple shading or nutrient theft, the pathway is **chemical**. Laboratory bioassays must be checked in the field, because irrigation water can dilute or move the compounds.
- **Autotoxicity** is a special case: a crop's own residues harm the next sowing of the same species, seen in some rice, lucerne and sugarcane systems.

Role in major irrigated systems

- **Rice-wheat on the Indo-Gangetic plains:** rice straw and wheat stubble contain phenolics. Poorly managed residues can delay the next crop's roots; well-timed incorporation or microbial breakdown can reduce that harm. Some rice cultivars show weed-suppressive allelopathy against **Echinochloa** (barnyard grass), which matters as herbicide resistance rises.
- **Weed control:** sunflower, sorghum, mustard, eucalyptus leaf mulch and some rice lines release compounds that suppress *Phalaris*, *Avena* and broad-leaf weeds. This can cut herbicide load in irrigated wheat and maize if density and timing are right.
- **Intercropping and trap systems:** mustard, sorghum or cowpea allelopathy can protect a main irrigated crop from weeds; the companion must be chosen so it does not also stunt the main crop.
- **Sugarcane and cotton:** residue and ratoon allelopathy, plus intercropped pulses or sunnhemp, can affect sprouting and early weed flush. Irrigation keeps soils moist, which can either speed breakdown of allelochemicals or spread them in the root zone.

- **Green manures and oilseed cakes:** mustard cake and some green-manure residues combine nutrient supply with suppression of soil-borne pests and weeds - a chemical-biological mix, not magic.
- **Agroforestry on canal commands:** poplar and eucalyptus belts can allelopathically affect adjoining wheat if leaf litter and roots are unmanaged; spacing and leaf removal are the farm response.

Practical caution

- Allelopathy is **not a full substitute** for water, nutrients and integrated weed management. It is one layer with crop rotation, stale seedbeds and judicious herbicides.
- Breeding **weed-suppressive cultivars** and using residue mulch under **conservation agriculture** are the scalable research paths for irrigated India.

Flow diagram

Donor plant -> Allelochemicals
Allelochemicals -> Weed suppression
Allelochemicals -> Crop injury autotoxicity
Rice wheat sugarcane cotton -> Allelochemicals
Weed suppression -> Lower herbicide load
Crop injury autotoxicity -> Residue timing rotation

Conclusion

Allelopathy is chemical interference among plants. In irrigated rice-wheat, sugarcane, cotton and intercrops it can suppress weeds and also injure the next crop if residues are mishandled. Used with rotation, mulch and cultivar choice, it is a low-cost support to water-and-chemical-intensive irrigated systems.

Open WRAP page — <https://wrapexams.com/upsc/mains-answers/gs-3/2016/what-is-allelopathy-discuss-its-role-in-major-cropping-systems-of-irrigated-agriculture/>

Q9 · 12 marks

Discuss the role of land reforms in agricultural development. Identify the factors that were responsible for the success of land reforms in India.

GS III · 2016 · Land Reforms

Revision summary

Land reforms assign secure rights to the tiller, which raises investment, credit and the social base of farming.

Abolition of intermediaries worked more widely than ceiling redistribution.

Tenancy security and consolidation support irrigation and technology use.

Success factors were political will, peasant organisation, usable records and complementary irrigation.

Failure came from benami evasion, concealed tenancy and slow courts.

Introduction

Land reforms change who owns, who tills, and how secure the plot is. Agricultural development needs **incentive to invest**, access to credit, and a farm size that can take irrigation and technology. Where India transferred rights to the tiller and recorded those rights, yields and rural peace improved. Where ceilings and tenancy laws stayed on paper, the same Green Revolution inputs favoured those who already held land.

Body

Role in agricultural development

- **Abolition of zamindari and other intermediaries** (1950s) gave the State a direct link with the cultivator, cut illegal cesses, and raised the tiller's claim on the harvest.
- **Tenancy reform** (security, fair rent, ownership to tenants) encourages the actual grower to level land, sink a well, and use fertiliser, because the gain is not seized by a landlord.
- **Ceiling laws** were meant to redistribute surplus to the landless, widening the base of owner-cultivators and cutting semi-feudal labour.
- **Consolidation of holdings** in some northern States reduced fragmentation, which helps irrigation channels, mechanisation and extension.
- **Updating records and joint titling** (including women) improve **bank credit and crop insurance**, which are now part of agricultural development, not only of justice.
- Secure rights also support **diversification and contract farming** because a buyer and a bank can see who controls the plot.
- Incomplete reform left **concealed tenancy**, so tenants still under-invest, which drags productivity even when seeds and canals exist.

Factors behind success in India

- **Political will and peasant organisation:** Kerala and West Bengal combined party mobilisation with tenancy and homestead reforms; implementation was not left only to the revenue clerk.
- **Accurate land records and a functioning revenue administration** allowed names to change on the record of rights; where records were colonial and corrupt, ceilings were evaded through benami and gifts.

- **Early, simple abolition of intermediaries** succeeded more widely than later ceiling redistribution, because identifying a zamindar was easier than measuring every surplus acre.
- **Social structure:** less extreme caste dominance and a larger class of owner-cultivators (parts of Punjab, Haryana, western Uttar Pradesh after consolidation) made technology adoption faster once rights were clear.
- **Complementary investment:** reform succeeded as development where it met **irrigation, research and markets**. Land to the tiller without water remained a poverty plot.
- **Judicial and loophole delay** (personal-cultivation claims, delayed notification of surplus) explains failure in many States: the letter of the law existed, possession did not change.
- **Women and Dalit homestead rights** remained the weakest success factor nationwide; agricultural development still under-uses women's secure title.

Balanced view

- Land reform is necessary for **inclusive agricultural development**, not a complete substitute for prices, logistics and water. India's mixed record is a record of **implementation politics**, not of a wrong idea.

Flow diagram

Land reforms -> Abolition of intermediaries
 Land reforms -> Tenancy security
 Land reforms -> Ceilings consolidation
 Abolition of intermediaries -> Incentive to invest
 Tenancy security -> Incentive to invest
 Ceilings consolidation -> Incentive to invest
 Political will records irrigation -> Land reforms
 Incentive to invest -> Agricultural development

Conclusion

Land reforms aid agricultural development by giving the tiller security, credit and a reason to invest. Success in India followed political will, usable records, early abolition of intermediaries, and pairing of rights with irrigation. Where ceilings were evaded and tenancy stayed concealed, technology raised output without transforming the agrarian structure.

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Q10 · 12 marks

Given the vulnerability of Indian agriculture to vagaries of nature, discuss the need for crop insurance and bring out the salient features of the Pradhan Mantri Fasal Bima Yojana (PMFBY).

GS III · 2016 · Crops, Irrigation and Marketing

Revision summary

Indian farming is exposed to monsoon failure, floods, hail and pests, so households and crop loans need a rule-based risk cover.

Ad hoc calamity relief is too slow and uneven to replace insurance.

PMFBY (kharif 2016) charges low farmer premiums with the balance shared by governments.

It uses area-yield assessment, with farm-level cover for specified local and post-harvest losses, including prevented sowing.

Technology and a claim timeline were meant to fix delays that plagued NAIS and MNAIS.

Introduction

Indian agriculture still depends on the **monsoon**, and on local floods, drought, hail and pests. A bad season wipes out seed, credit and household consumption. **Crop insurance** socialises that yield risk so the farmer can borrow and plant again. **Pradhan Mantri Fasal Bima Yojana (PMFBY)**, launched for **kharif 2016**, is the Union's redesigned, cheaper, area-based cover after the National Agricultural Insurance Scheme and the modified NAIS.

Body

Need for crop insurance

- **Rainfed farms** are a large share of area; delayed or failed monsoon cuts output with little irrigation buffer.
- Climate variability has raised **extreme rainfall, unseasonal showers at harvest, and pest outbreaks**, which ordinary savings cannot absorb.
- Formal **crop loans** need a risk cover; without insurance, default and distress sale of land or cattle follow a failed year.
- Calamity relief from the State is **ad hoc and delayed**. Insurance, if it pays on a measured yield shortfall, is a rule-based safety net.
- Small and marginal farmers cannot self-insure across plots and years. Pooling risk at **village or block** scale is the public answer.
- Earlier schemes suffered **high premium, delayed claims, narrow crop lists and basis risk**. That history is why a new product was required, not why insurance itself was unnecessary.

Salient features of PMFBY

- **Low farmer premium:** 2 per cent of sum insured for kharif food and oilseeds, 1.5 per cent for rabi food and oilseeds, and 5 per cent for annual commercial and horticultural crops; the rest is shared by Union and State.
- **No capping** of sum insured in the original design, so cover can match the scale of finance rather than a truncated older formula.

- **Area-yield approach** for widespread calamities, using notified areas (village panchayat as the unit where possible) and crop-cutting experiments; **localised calamities** (hail, landslide, inundation) and **post-harvest** losses for specified crops can be assessed at the farm or individual level.
- Cover from **pre-sowing to post-harvest** (including prevented sowing and mid-season adversity) for notified crops in notified areas.
- **Use of technology:** smartphones, remote sensing and online portal for faster yield data and claim processing, with a stated timeline for payout.
- **Compulsory** for loanee farmers in notified areas in the original 2016 design; optional for others; implemented by empanelled insurance companies with banks as the main enrolment channel.
- Aims at **higher enrolment, faster claims and less distortion** than NAIS/MNAIS, where premiums were high and delays common.

Cautions

- **Basis risk** remains if the panchayat yield is good and one farmer's plot is not.
- Success needs timely **crop-cutting**, State premium share, and awareness so non-loanee smallholders also enrol.

Flow diagram

Monsoon disaster risk -> Need for crop insurance
 Need for crop insurance -> PMFBY 2016
 PMFBY 2016 -> Low farmer premium
 PMFBY 2016 -> Area yield plus local calamity
 PMFBY 2016 -> Technology timely claims
 Technology timely claims -> Sow again with credit

Conclusion

Vulnerability to nature makes crop insurance a development tool, not a luxury. PMFBY cut the farmer's premium, widened the risk window, and promised technology-based, quicker claims. It will meet the need only if enrolment is real, experiments are honest, and payouts arrive before the next sowing.

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Q11 · 12 marks

Give an account of the current status and the targets to be achieved pertaining to renewable energy sources in the country. Discuss in brief the importance of National Programme on Light Emitting Diodes (LEDs).

GS III · 2016 · Infrastructure

Revision summary

Wind still leads installed renewables; solar is the fastest-growing slice after parks and auctions.

The headline target is 175 GW by 2022, led by 100 GW solar and 60 GW wind.

Paris-era INDC adds a 40 per cent non-fossil capacity share by 2030.

The National LED programme through EESL cuts peak demand, bills, and carbon.

Supply targets and efficient lighting succeed together only if the grid and product quality hold.

Introduction

India still runs a large share of its grid on coal, yet sunlight, wind, biomass, and small hydro are no longer side experiments. After the revised **Jawaharlal Nehru National Solar Mission** and the **175 gigawatt renewable target for 2022**, capacity and auctions have moved fast. The question asks for that status and those targets, and then for a short account of the **National Programme on Light Emitting Diodes (LEDs)**, which cuts demand even as new green supply is built.

Body

Current status

- **Wind** is still the largest renewable slice of installed capacity, concentrated in Tamil Nadu, Gujarat, Maharashtra, Rajasthan, and Karnataka, with a shift from feed-in tariffs toward competitive bidding.
- **Solar** has grown sharply since 2014-15 through solar parks, rooftop policy, and reverse auctions that brought tariffs down; deserts, canals, and rooftops are the three main sites.
- **Biomass, bagasse cogeneration, waste-to-energy, and small hydro** add smaller but useful megawatts, especially where a factory already has fuel or a hill stream can take a run-of-river plant.
- **Large hydro** is counted separately from the Ministry of New and Renewable Energy basket, yet it remains a major non-fossil source for the grid.
- **Manufacturing, storage, and transmission still lag generation announcements:** solar cells and modules are import-heavy, and renewable-rich States face **evacuation and must-run** disputes with distribution companies.

Targets to be achieved

- The Union target of **175 GW of renewable capacity by 2022 is the working number: 100 GW solar** (utility plus rooftop), **60 GW wind**, **10 GW bio-energy**, and **5 GW small hydro**.
- India's **Intended Nationally Determined Contribution** after **Paris (2015)** pledges that about **40 per cent of installed electric power capacity** will come from non-fossil sources by **2030**, and that emissions intensity of GDP will fall **33-35 per cent** from 2005 levels by 2030.

- The **International Solar Alliance**, announced at Paris and hosted by India, is a diplomatic target as well as a technology club for sun-rich countries.
- State renewable purchase obligations, green corridors, and ultra-mega solar parks are the instruments meant to turn the 175 GW figure into wires and meters, not only a speech.

Why the targets matter

- They reduce the coal import and air-pollution bill, and they hedge a future carbon constraint on exports and climate finance.
- They can create installation, operation, and small-manufacturing jobs if **Make in India** on cells, inverters, and towers actually happens.
- They fail if land, forest clearance, and unpaid discom dues stall plants, or if the grid cannot absorb daytime solar.

National Programme on LEDs

- The programme, delivered mainly through **Energy Efficiency Services Limited**, aggregates demand so households and urban local bodies buy **LED lamps and street lights** at a low price instead of incandescent or sodium lamps.
- **Unnat Jyoti by Affordable LEDs for All (UJALA)** puts efficient bulbs in homes; the **Street Lighting National Programme** replaces municipal lighting.
- **Importance is threefold: peak load falls**, so fewer peaking plants and less diesel; **household and municipal bills fall; carbon and local air pollution fall** for the same lumen.
- It is the cheapest "renewable" megawatt because a unit not consumed need not be generated. It also builds a domestic LED manufacturing and assembly chain.
- **Limits:** quality and warranty must be policed, or cheap failures will send users back to old lamps; street-light savings need honest metering by municipalities.

Flow diagram

Renewable status wind solar bio SHP -> 175 GW by 2022
 175 GW by 2022 -> 40 percent non-fossil by 2030
 National National LED programme UJALA street lights programme UJALA street lights ->
 Lower peak and bills
 175 GW by 2022 -> Green corridors auctions
 Lower peak and bills -> Green corridors auctions

Conclusion

India's renewable story in 2016 is a real rise in wind and solar against a still-coal grid, judged against the 175 **GW (2022)** and 40 per cent non-fossil (2030) marks. The LED programme is the demand-side twin of that supply push: cheaper light, lower peak, and less carbon. Targets will count only when evacuation, discom payments, and lamp quality keep up with auctions and bulb distribution.

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Q12 · 12 marks

Discuss India's achievements in the field of Space Science and Technology. How the application of this technology has helped India in its socio-economic development?

GS III · 2016 · Indian Economy

Revision summary

PSLV, growing GSLV capacity, INSAT/GSAT, and the IRS family are the core engineering achievements.

Chandrayaan-1, the Mars Orbiter Mission, and the IRNSS/NavIC constellation mark science and autonomy.

Development use is weather and disaster warning, crop and fishery advice, tele-education, and telemedicine.

Maps of water, forest, and cities improve planning if officials actually open them.

Space multiplies other public goods; it does not replace roads, credit, or local administration.

Introduction

Indian space work began as a development tool, not as a race for flags. From **Aryabhata (1975)** to a working **Polar Satellite Launch Vehicle**, an operational **Indian National Satellite** communication fleet, and the **Mars Orbiter Mission (2014)**, the Indian Space Research Organisation has built both **rockets and uses**. The second half of the question is the more important one for GS-III: how those uses raise income, safety, and public services.

Body

Achievements in science and technology

- **Launch vehicles:** SLV and ASLV were learning steps; **PSLV** became a reliable workhorse for polar and many foreign commercial satellites; **GSLV** with an indigenous cryogenic stage opened heavier geostationary lifts; **GSLV Mark III** is the next heavy-lift path.
- **Remote sensing:** the **Indian Remote Sensing** series, **Cartosat**, **Resourcesat**, and **Radar Imaging Satellite (RISAT)** give maps of crops, water, forests, and all-weather images.
- **Communication and meteorology:** **INSAT** and **GSAT** carry television, telecom, and weather payloads; a meteorological chain supports the India Meteorological Department.
- **Navigation:** the **Indian Regional Navigation Satellite System (NavIC / IRNSS)** reached a seven-satellite regional constellation in 2016, reducing dependence on foreign GPS for Indian users.
- **Science missions:** **Chandrayaan-1 (2008)** contributed to evidence of water molecules on the Moon; **Mars Orbiter Mission** entered Martian orbit in 2014 at a low cost and on the first attempt; astronomy payloads and forthcoming **Chandrayaan-2** keep the science line alive.
- **Human and reusable steps:** crew-module tests and a **Reusable Launch Vehicle** technology demonstrator show a longer ladder, not an already finished human-spaceflight programme.
- **Antrix** commercial launches and satellite services earn foreign exchange and prove reliability.

Socio-economic applications

- **Weather and disaster:** cyclone track, rainfall, and drought maps give early warning for the coast and for farmers; flood and landslide mapping supports the National Disaster Management Authority and State relief.

- **Agriculture and fisheries:** crop-acreage and production estimates, drought assessment, and **Potential Fishing Zone** advisories from ocean satellites raise the chance of a catch and a planned sowing.
- **Land and water:** groundwater prospect maps, watershed planning, forest-cover change, and wasteland mapping feed rural programmes and forest departments.
- **Communication and education:** INSAT and EDUSAT-type capacity carry tele-education, telemedicine to district hospitals, and rural Direct-to-Home and radio, which matter where fibre has not arrived.
- **Governance and inclusion:** unique identity and many e-governance links ride on communication satellites; village resource centres were an early ISRO-development experiment.
- **Infrastructure and cities:** high-resolution imagery helps road, rail, and urban planning and monitors mining and coastal erosion.
- **Security and navigation:** navigation and radar satellites support the armed forces and civilian aviation and shipping; they also help in search and rescue when coupled with beacons.
- **Industry:** a domestic vendor chain in electronics, composites, and software jobs sits around the centres at Bengaluru, Sriharikota, Thiruvananthapuram, and Ahmedabad.

Limits that still bind development gains

- Last-mile extension, language, and a working phone still decide whether a fishing advisory is used.
- Data must reach **panchayats, krishi vigyan kendras, and municipal engineers**, not only a national atlas.
- Space cannot replace roads, cold storage, or a solvent discom; it only targets and times those investments better.

Flow diagram

ISRO launch and satellites launch and satellites -> PSLV GSLV NavIC GSLV NavIC
 ISRO launch and satellites -> Weather farm fish telecom
 Weather farm fish telecom -> Early warning income public services
 Chandrayaan MOM -> ISRO launch and satellites
 Last-mile extension -> Early warning income public services

Conclusion

India's space record is a ladder of PSLV and GSLV, INSAT and IRS, Chandrayaan-1, Mangalyaan, and NavIC. Socio-economic value appears when those assets warn a cyclone coast, guide a fishing boat, map a watershed, teach a remote classroom, and time a disaster response. The achievement is real when the map and the message reach the farmer and the district officer, not only the control room.

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Q13 · 12 marks

Why is nanotechnology one of the key technologies of the 21st century? Describe the salient features of Indian Government's Mission on Nanoscience and Technology and the scope of its application in the development process of the country.

GS III · 2016 · Indian Economy

Revision summary

Nano-scale materials behave differently, so they sit at the centre of medicine, electronics, water, and energy.

India's Nano Mission (2007, DST) funds people, characterisation centres, basic science, and applications.

Development uses include filters, diagnostics, solar and battery materials, and industrial coatings.

Agriculture and food uses need caution on residue and unknown toxicity.

- **A key technology is also a key regulatory task:** worker safety and waste, not only patents.

Introduction

Nanotechnology works at a scale of about **one to one hundred nanometres**, where materials show new strength, electrical, and chemical behaviour. That is why it sits beside information technology and biotechnology as a **platform of this century: one set of tools can touch medicine, water, energy, textiles, and defence**. India answered with the **Mission on Nano Science and Technology (Nano Mission)** under the Department of Science and Technology from **2007**.

Body

Why it is a key technology of this century

- At nano scale, **surface area rises** and quantum effects appear, so a small mass can catalyse, sense, or carry a drug in ways bulk chemistry cannot.
- It converges **with biotech and information technology**: a lab-on-chip, a targeted cancer particle, or a better lithium electrode is often a nano device.
- **Economic stakes are large**: electronics, coatings, composites, and pharmaceuticals will embed nano parts whether India makes them or imports them.
- **Strategic stakes are real**: sensors, lightweight armour, and filtration matter for security and for disaster response.
- **Risks are also why it is "key"**: unknown toxicity, worker exposure, and waste mean a country that only consumes nano products will still face the harm without the skill to regulate.

Salient features of the Nano Mission

- Launched in **2007** as a successor to the Nano Science and Technology Initiative, with DST as the nodal department and a **Nano Mission Council** to steer it.
- **Human resources**: teaching programmes, fellowships, and chairs so India is not only a user of imported nano goods.
- **Infrastructure**: centres of excellence, shared characterisation facilities (electron microscopes, clean rooms) that a single university cannot buy alone.

- **Basic research** in nano science together with **application** projects in water, energy, health, and security.
- **Industry linkage** and public-private projects so laboratory particles become a filter, a coating, or a diagnostic, not only a paper.
- **International collaboration** and a regulatory conversation on standards and safety, still thinner than the research spend.
- The Twelfth Plan continued and enlarged the Mission so the 2007 start did not remain a one-Plan experiment.

Scope in India's development process

- **Health:** targeted drug delivery, better imaging, implants, and low-cost diagnostics for tuberculosis and other high-burden diseases if regulation and trials are honest.
- **Water:** nano-filtration and silver or other antimicrobial coatings for rural drinking water and for industrial effluent - high development value if sludge toxicity is managed.
- **Energy:** better solar cells, fuel-cell membranes, hydrogen storage, and battery electrodes that support the same renewable targets discussed elsewhere in this paper.
- **Agriculture:** slow-release nano-fertiliser and pesticide can cut dose; they also raise food-safety questions that **FSSAI** and environment rules must face before cheerleading.
- **Textiles and materials:** stain-resistant and stronger fibres for a large export industry; nano-composites for lighter vehicles and aircraft parts.
- **Environment:** sensors for air and water pollutants in cities.
- **Caution:** without **occupational safety, life-cycle tests, and labelling**, nano development can export risk to workers and rivers. Public laboratories and the Mission should fund toxicology as seriously as patents.

Flow diagram

Nanoscale platform -> New properties convergence strategy
 Nano Mission 2007 DST -> People and shared labs
 Nano Mission 2007 DST -> Water health energy materials
 Water health energy materials -> Development uses
 Toxicology regulation -> Development uses

Conclusion

Nanotechnology is a key twenty-first-century platform because one scale of matter now redesigns medicine, water, energy, and materials. **India's Nano Mission (2007)** built people, shared labs, and application projects under DST. Development gains will come in filters, diagnostics, and energy devices - and will last only if safety and Indian manufacturing rise with the papers.

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Q14 · 12 marks

Rehabilitation of human settlements is one of the important environmental impacts which always attracts controversy while planning major projects. Discuss the measures suggested for mitigation of this impact while proposing major developmental projects.

GS III · 2016 · Environment and Conservation

Revision summary

Moving human settlements is a core social-environmental impact of dams, mines, and urban projects.

Controversy grows when users of commons are left out and colonies lack water and work.

LARR 2013, SIA, consent, NRRP 2007, and EIA 2006 are the main legal mitigation tools.

Forest Rights and gram sabha consent matter on forest land.

Services and livelihoods must exist before displacement, with a budget inside the project cost.

Introduction

A dam, a mine, a highway, or an industrial park often needs land that is already a **village, a forest hamlet, or an urban slum**. Moving people is not a side effect; it is an **environmental and livelihood impact** because house, common land, temple, and job move together. Controversy follows when numbers are under-counted, consent is thin, and "resettlement" is a distant plot without water. Mitigation has to be designed **before** clearance, not as a riot-control afterthought.

Body

Why rehabilitation attracts controversy

- **Loss is** multidimensional: farmland, grazing, fishing, forest produce, and social networks, not only a roof.
- **Adivasi and Dalit** households are over-represented in submergence and mining belts; legal forest rights may be ignored if the count starts from a faulty revenue record.
- Promises of jobs and house plots are **delayed or diluted** once the reservoir fills or the plant is commissioned.
- Urban projects (metro, coastal road, riverfront) evict without calling it "displacement", which breeds the same conflict.
- Past scars - **Narmada**, large irrigation, and mining in central India - make every new Environmental Impact Assessment a trust test, not a form.

Measures suggested while proposing major projects

- **Avoid and minimise:** site the dam, alignment, or park to cut displacement; a slightly costlier alignment that saves a dense settlement is mitigation, not luxury.
- **Social Impact Assessment** under the **Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013**: public hearing, assessment of livelihoods, and a public **SIA report** before acquisition in the cases the Act covers.
- **Consent:** the 2013 Act requires consent of a **high share of affected families** for private and public-private projects (with listed exceptions). Using exceptions as the default recreates

controversy.

- **Compensation and R&R package:** land for land where possible, house in a **resettlement colony** with roads, drinking water, school, anganwadi, and electricity **before** displacement; annuity or jobs as written entitlements, not verbal hope.
- **National Rehabilitation and Resettlement Policy, 2007** already asked for a rehabilitation plan as part of the project; the 2013 Act gives that policy more teeth where it applies.
- **Environmental Impact Assessment Notification, 2006:** public consultation, management plan, and **Environmental Management Plan** that must include R&R monitoring, not only stack emissions.
- **Forest Rights Act, 2006** and gram sabha processes in forest land: no diversion on a false "uninhabited" certificate.
- **Independent monitoring:** a rehabilitation commissioner, third-party audit, and a grievance cell with a timeline; World Bank and Asian Development Bank safeguard language is useful even for domestic finance if it is actually followed.
- **Livelihood restoration:** skill, credit, and access to fisheries or share in irrigation from the same dam; a plot without a job is not rehabilitation.
- **Cultural and common property:** graveyards, temples, grazing, and burial grounds need replacement, or social conflict will outlast the civil work.
- **Staged displacement** tied to **staged construction:** no filling of a reservoir until the colony is live.
- **Urban equivalent:** in-situ upgradation or nearby rehousing with tenure, not a far peri-urban dump.

What project reports should show at proposal stage

- A **census of affected persons** including tenants, forest users, and women-headed houses.
- A **budget line** for R&R inside the project cost, not a leftover.
- A **timeline** aligned with the construction schedule, with a stop-work clause if R&R slips.

Flow diagram

Major project -> Displacement of settlements
 Displacement of settlements -> Controversy if undercounted
 Avoid minimise SIA LARR EIA -> Livelihood and live colony
 Displacement of settlements -> Avoid minimise SIA LARR EIA
 Forest Rights gram sabha -> Avoid minimise SIA LARR EIA

Conclusion

Rehabilitation is a central impact of major projects because it breaks homes and commons. Controversy is the symptom of under-counting and late, poor colonies. Mitigation is avoid-minimise-restore: honest SIA, LARR 2013 consent and packages, EIA public hearing, Forest Rights, live services before move, and livelihood, not only a tin roof. A project that cannot fund that package is not ready for clearance.

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Q15 · 12 marks

The frequency of urban floods due to high intensity rainfall is increasing over the years. Discussing the reasons for urban floods, highlight the mechanisms for preparedness to reduce the risk during such events.

GS III · 2016 · Environment and Conservation

Revision summary

Heavier rain bursts, sealed soil, lost lakes, and undersized, clogged drains explain more frequent urban floods.

Coastal tides and split civic agencies make outfall and response worse.

NDMA urban-flooding guidelines ask for drainage maps, early warning, and pre-monsoon works.

Preparedness is desilting, pumps, land-use rules, and a joint control room, not only boats.

Community alerts and protected wetlands cut loss more cheaply than post-flood compensation.

Introduction

Urban floods are not only a river leaving its bank. They are **streets that become channels** because rain cannot sink or drain. **Mumbai (2005)** and **Chennai (2015)** showed that a few hours of extreme rain can stop a metro economy. Frequency is rising because **heavier bursts**, **sealed ground**, and **blocked drains** now meet in the same hour. Preparedness is the set of actions **before** that hour.

Body

Reasons for urban floods

- **High-intensity rainfall:** climate change and urban heat can raise the chance of short, violent showers that exceed the design storm of old drains.
- **Concretisation:** parking lots, compounds, and flyovers cut infiltration; every millimetre becomes runoff.
- **Encroachment of lakes, wetlands, floodplains, and storm channels:** Chennai's wetlands and Mumbai's Mithi are textbook losses of natural storage.
- **Drains designed for a milder city:** sections are too small, too flat, or mixed with sewer; **solid waste** and construction debris silt the remaining capacity.
- **Unplanned growth** on low-lying reclaimed land without raising plinths or leaving waterways.
- **Tidal lock:** in coastal cities, rain at high tide cannot outfall to the sea.
- **Broken institutions:** storm water, sewer, roads, railways, and the development authority do not share one map; a metro wall or a gated layout can dam a ward.
- **Loss of tanks and palas** in peninsular cities that once buffered the monsoon.

Mechanisms for preparedness to reduce risk

- **Hazard and drainage mapping:** a ward-level map of low spots, outfalls, and encroachments, updated after each monsoon, as asked in the **NDMA Guidelines on Urban Flooding (2010)**.
- **Early warning:** India Meteorological Department nowcasts and Doppler radar, plus **mobile alerts** to ward officers and the public a few hours ahead.

- **Operation of pumps and gates:** pre-monsoon desilting, tested pumps at outfalls, and tidal-gate drills - not a first switch-on during the storm.
- **Land-use and building rules:** no construction on storm drains; compulsory **rainwater harvesting**, permeable parking, and **minimum recharge**; raised plinths in marked zones.
- **Restore storage:** protect remaining lakes and floodplains; **sponge** parks and detention basins in new layouts.
- **Solid-waste discipline** before the monsoon so plastic does not plug grates; fines that are actually collected.
- **Integrated command:** municipal commissioner, police, fire, power, and railways in one flood-control room with a common radio and a list of shelters.
- **Critical infrastructure:** hospitals, substations, and telecom on high ground or with backup power and sandbag drills.
- **Community preparedness:** resident welfare associations know the ward shelter, the boat or tractor owner, and the disabled neighbours; school mock drills.
- **Insurance and relief Standard Operating Procedures** so shopkeepers are not wiped out twice - once by water and once by delay.
- **After-action:** every major flood must change the drain drawing, not only the compensation list.

What "preparedness" is not

- It is not only NDRF boats after the water is chest-high.
- It is not a flyover that becomes a new dam.
- It is a **pre-monsoon calendar** with named officers and a published drain-cleaning audit.

Flow diagram

High-intensity rain -> Urban flood
 Concrete encroach silted drains -> Urban flood
 Maps nowcast desilt pumps -> Lower risk
 Protect wetlands sponge rules -> Lower risk
 One flood control room -> Lower risk

Conclusion

Urban floods rise because intense rain hits sealed, encroached, and poorly drained cities. Reasons are climatic and, even more, planning failure. Preparedness is NDMA-style mapping, nowcasts, desilting and pumps, lake protection, building rules, one command room, and community drills. Reduce risk in the dry months; rescue is what remains when those months were wasted.

Open WRAP page — <https://wrapexams.com/upsc/mains-answers/gs-3/2016/the-frequency-of-urban-floods-due-to-high-intensity-rainfall-is-increasing-over-the-years-discussing-the-reasons-for-urban-floods-highlight-the-mechanisms-for-preparedness-to-reduce-the-risk-during-such-events/>

Q16 · 12 marks

With reference to National Disaster Management Authority (NDMA) guidelines, discuss the measures to be adopted to mitigate the impact of recent incidents of cloudbursts in many places of Uttarakhand.

GS III · 2016 · Disaster Management

Revision summary

A cloudburst over a steep Uttarakhand catchment becomes a flash flood and landslide within minutes.

Damage explodes when hotels and yatris occupy river beds and old slide zones.

NDMA guidelines stress hazard mapping, construction control, and early warning.

Mitigation is Doppler and rain gauges, slope and muck discipline, pilgrimage caps, and pre-positioned NDRF/SDRF.

Rebuild above the flood line; do not restore the same unsafe shop.

Introduction

A **cloudburst** is a sudden, very heavy fall of rain over a small hill catchment - often more than **100 millimetres in an hour**. In Uttarakhand that water becomes a **flash flood** and a **debris flow** within minutes. The **Kedarnath disaster of 2013** and later local bursts showed what happens when rain, a glacial lake or moraine, and a built-up pilgrim town meet. **National Disaster Management Authority** guidelines on floods, landslides, and the hill States' own plans are the checklist for mitigation.

Body

The hazard in Uttarakhand

- Steep slopes, fractured rock, and thin soil mean rain does not stay; it scours **nalas** and roads.
- **Monsoon and westward disturbances** can stack moisture against the Himalaya.
- **River-bed construction**, hotels on floodplains, and hydropower debris narrow the channel the cloudburst will use.
- Pilgrim peaks (**Char Dham**) put tens of thousands on the same narrow road on the same week.
- Landslides block rivers and create **temporary lakes** that burst - a second flood after the rain.

NDMA-linked measures to mitigate impact

- **Land-use zoning:** NDMA landslide and flood guidance asks States to map **hazard zones** and to forbid or strictly limit buildings on river beds, steep cut slopes, and old slide scars. Uttarakhand must enforce this on municipal and forest land, not only print an atlas.
- **Regulation of construction and hydropower:** stable cut-and-fill, no dumping of muck into rivers, and catchment treatment; the 2013 review already named unregulated roads and projects as force multipliers.
- **Early warning:** Doppler weather radar coverage for the hills, dense **automatic rain gauges**, and **nowcast** to district magistrates and temple boards; community watch on **nala** colour and noise as a last local signal.
- **Glacial lake and moraine monitoring** in upper catchments so a burst is not a complete surprise.

- **Watershed and slope work:** afforestation with local species, check dams that are maintained, and drainage of road cuts - as in NDMA landslide documents.
- **Safe pilgrimage:** compulsory registration, daily caps, weather-linked closure of tracks, designated shelters above known flood lines, and **helipad and mule** alternatives when the road goes.
- **Building rules:** two-storey limits where slopes fail, no hotels on the Ganga and Mandakini floodway, and relocation of the most exposed shops over a published timetable.
- **Response structure:** **National Disaster Response Force** and **State Disaster Response Force** pre-positioned in monsoon; **Indian Air Force** helicopters on notice; local police and home guards trained for traffic holds, not only for rescue photographs.
- **Communication:** redundant wireless because mobile towers fall; satellite phones at SDM and major temples.
- **Public awareness:** simple hill-language messages - leave the nala, do not stand on bridges, keep a three-day kit in the yatra season.
- **Insurance, relief, and reconstruction** that does not rebuild the same hotel on the same sandbank (NDMA "build back safer").
- **Inter-State and centre-State:** IMD, **Central Water Commission** where rivers are gauged, and the State disaster authority must share one protocol; the **Disaster Management Act, 2005** already names that chain.

What mitigation cannot claim

- It cannot stop a cloudburst. It can stop a town from sitting in the path, and it can give two hours' warning and a drilled exit.

Flow diagram

Cloudburst -> Flash flood debris flow
 Floodplain hotels yatra crowd -> Flash flood debris flow
 NDMA landslide flood guidance landslide flood guidance -> Hazard zoning
 NDMA landslide flood guidance -> Radar gauges nowcast
 Hazard zoning -> Lower impact
 Radar gauges nowcast -> Lower impact
 Pilgrim caps shelters -> Lower impact

Conclusion

Uttarakhand cloudbursts become catastrophes when rain meets unsafe buildings and a packed yatra road. NDMA flood and landslide guidance points to hazard maps, construction control, rain and lake warning, slope care, capped pilgrimage, NDRF/SDRF, and safer rebuilding. Mitigate the path and the crowd; do not pretend the mountain rain will become gentle.

Open WRAP page — <https://wrapexams.com/upsc/mains-answers/gs-3/2016/with-reference-to-national-disaster-management-authority-ndma-guidelines-discuss-the-measures-to-be-adopted-to-mitigate-the-impact-of-recent-incidents-of-cloudbursts-in-many-places-of-uttarakhand/>

Q17 · 12 marks

The terms 'Hot Pursuit' and 'Surgical Strikes' are often used in connection with armed action against terrorist attacks. Discuss the strategic impact of such actions.

GS III · 2016 · Internal Security and Extremism

Revision summary

Hot pursuit is an immediate chase across a boundary; a surgical strike is a limited, precise hit on a camp.

India's Myanmar 2015 and LoC 2016 actions are the living examples in this debate.

Gains are deterrence, morale, and a signal to sponsors.

Risks are escalation, civilian harm, and a rebuilt sanctuary.

The tool works only with narrow aims, evidence, and follow-on diplomacy, not as a substitute for police and intelligence.

Introduction

Hot pursuit is a fast chase of attackers across a boundary before they melt into a safe haven. A **surgical strike** is a short, planned hit on a specific camp or launch pad, then a return, meant to be **limited and deniable or at least contained**. India used the first language after the **2015 Myanmar operation** against militants, and the second after the **September 2016 strikes across the Line of Control** following the **Uri** attack. The strategic question is what these acts do to **deterrence and to the next war**, not only to tonight's headline.

Body

What the terms mean in practice

- Hot pursuit stresses **immediacy and continuity** of the chase; it is borrowed from maritime law but used loosely on land.
- A **surgical strike stresses** precision, limited aims, and a political message: the State can reach the camp, not only absorb the blast.
- Both are **below a full conventional war** and are aimed at non-State groups that use another territory. In South Asia they still touch a **nuclear-armed** rival or a sensitive neighbour.

Strategic impact - gains

- **Deterrence by punishment:** a group and its handlers cannot assume that Indian soil is a free firing point. After Uri, the public and the force needed a visible reply; silence can also be read as weakness.
- **Initiative:** the security forces set time and place instead of only patrolling for the next fidayeen.
- **Domestic cohesion and morale** of troops who have taken casualties; that is a real strategic resource in a long counter-terror campaign.
- **Signalling to sponsors:** plausible deniability of camps becomes costlier if India is willing to cross a line on a narrow aim.
- **International narrative:** if evidence of the terror attack is shared, a limited strike can be framed as self-defence under **Article 51** of the UN Charter, rather than as aggression - though others will contest the facts.

Strategic impact - risks and limits

- **Escalation ladder:** the other State may reply on the Line of Control, in Kashmir, or with a larger conventional move. Nuclear overhang makes misreading deadly.
- **Sanctuary adaptation:** camps thin out, move deeper, or hide among civilians; one raid does not end the industry of terror.
- **Neighbour sovereignty:** hot pursuit into a friendly or fragile State (as in the Myanmar debate) can strain diplomacy even when that State also wants the militants gone.
- **Legal and reputational cost** if civilians die or if the operation cannot be distinguished from a raid on regular troops.
- **Tit-for-tat on Indian soil:** terror groups may seek a bigger spectacular to restore their brand after a strike.
- **Alliance and great-power reaction:** partners may privately approve and publicly urge restraint; that mixed signal must be planned for.

Using them as strategy, not as theatre

- Pair the strike with **diplomacy, FATF-type financial pressure, and intelligence** so the camp is not rebuilt in a month.
- Keep **aims narrow** and **communication controlled** so the other side has a ladder down.
- Strengthen **border and police** so the next module cannot be launched while the television debate still runs.
- Do not treat every local ambush as a case for crossing; **threshold and evidence** protect the tool from inflation.

Flow diagram

Terror attack -> Hot pursuit or surgical strike
 Hot pursuit or surgical strike -> Deterrence morale initiative
 Hot pursuit or surgical strike -> Escalation and sanctuary shift
 Diplomacy intelligence finance -> Deterrence morale initiative
 Escalation and sanctuary shift -> Nuclear and diplomatic cost

Conclusion

Hot pursuit and surgical strikes can restore deterrence, morale, and a measure of initiative after a terrorist attack. They also climb an escalation ladder beside a nuclear neighbour and can scatter rather than finish a group. Their strategic value holds when aims stay limited, law and evidence are prepared, and diplomacy and intelligence continue after the troops are home.

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Q18 · 12 marks

'Terrorism is emerging as a competitive industry over the last few decades.' Analyse the above statement.

GS III · 2016 · Border Security and Organised Crime

Revision summary

Terror groups compete like firms for fighters, funds, publicity, and land.

Tactics and brand names spread because spectacular violence is rewarded by media and by rival prestige.

Outbidding and franchises can raise killings even when one group is weakened.

The metaphor is incomplete because ideology, martyrdom, and State proxies are not ordinary profit-seeking.

Response must dry money and glamour and keep local policing strong, or a rival shop opens.

Introduction

An industry sells a product, fights rivals, raises capital, and brands itself. Over recent decades some terrorist groups have done the same: they **compete** for fighters, donations, publicity, and ground. The product is **fear and a political monopoly through violence**. The statement is therefore a sharp metaphor, not a joke. It helps explain **Al-Qaeda versus later franchises, ISIS's** bid for a "caliphate", and smaller modules that copy tactics to stay visible.

Body

What "competitive industry" captures

- **Demand:** grievances, sectarian fear, foreign wars, and local State failure create a pool of possible recruits and sympathetic money.
- **Supply of violence:** bombs, kidnappings, and spectacular attacks are the "output"; groups copy successful tactics the way firms copy a product.
- **Competition for recruits:** a young person in a conflict zone or online can choose among brands - global jihad, ethnic insurgency, or a local gang with a political flag.
- **Competition for funds:** diaspora donations, extortion, kidnapping for ransom, narcotics, antiquities, and State sponsors are contested revenue lines. A richer group buys better weapons and media.
- **Competition for media:** television and social platforms reward the most shocking image; groups stage attacks for the camera, not only for the battlefield.
- **Franchise and brand:** a local cell may take a global name to import prestige, as in "Al-Qaeda in..." or later ISIS provinces - a licensing model.
- **Barriers to entry are low** for a small module with a phone and homemade explosive, which is why the "industry" keeps attracting start-ups even when a large group is hit.

How rivalry among groups matters

- **Outbidding:** one group kills more civilians to prove it is more "serious" than a rival, which raises the death toll without a larger political aim.
- **Splintering:** competition produces factions; peace talks with one shop do not bind the next.
- **Territory as market share:** holding a town (as ISIS did in parts of Iraq and Syria) is both revenue (tax, oil) and advertisement.

- **Innovation:** encrypted chat, drone use, and lone-wolf instructions spread because groups watch each other.
- **India's experience:** competing tanzeems, insurgent factions in the North-East, and left-wing groups have long stolen each other's thunder and turf; the metaphor is not only Middle Eastern.

Where the metaphor fails

- Firms seek profit and usually fear bankruptcy. Many terrorist actors seek **martyrdom or apocalypse**, so ordinary cost-benefit does not always restrain them.
- The "customer" of terror is often not a buyer but a **coerced public**; the State is the main counter-player, not another firm in a free market.
- **State sponsors distort the market:** a group may be a proxy, not an independent company.

Implications for response

- Hit **money, media, and recruitment** together, or a rival shop will take the share of the group you just banned.
- Avoid measures that **advertise** the group; over-reaction can be free publicity.
- **De-glamourise** online and in prisons so the brand loses workers.
- Because entry is easy, **police and community** at home matter as much as a foreign raid.
- Regional **intelligence fusion** is needed when groups shop for the weakest border.

Flow diagram

Grievance and fear demand -> Terror market
 Terror market -> Compete for recruits money media
 Compete for recruits money media -> Outbidding franchises
 State sponsors -> Terror market
 Finance narrative police -> Shrink the market

Conclusion

Terrorism has become competitive in recruits, money, media, and territory, which is why the industry metaphor works. Rivalry drives outbidding and franchises. The metaphor fails where martyrdom and State proxies replace profit. Policy must crowd out the market - finance, narrative, and local policing - not only smash one famous firm.

Open WRAP page — <https://wrapexams.com/upsc/mains-answers/gs-3/2016/terrorism-is-emerging-as-a-competitive-industry-over-the-last-few-decades-analyse-the-above-statement/>

Q19 · 12 marks

Border management is a complex task due to difficult terrain and hostile relations with some countries. Elucidate the challenges and strategies for effective border management.

GS III · 2016 · Border Security and Organised Crime

Revision summary

Himalayan, desert, riverine, jungle, and coastal stretches each break a single fence model.

Pakistan and China add hostility; other borders add kinship, trade, and insurgent depth.

Specialised forces must share intelligence instead of working in silos.

Fencing, CIBMS-type sensors, ICPs, BADP roads, and coastal radar are the hardware.

Diplomacy and local livelihoods decide whether the hardware holds.

Introduction

India's land frontier runs through **ice, desert, river, jungle, and village fields**, and much of it faces **Pakistan and China**, where trust is thin. Other stretches face **Bangladesh, Nepal, Bhutan, and Myanmar**, where the problem is less tanks and more **people, cattle, and insurgents**. **Coastal and island** borders after **26/11** complete the map. Border management is therefore not one fence; it is a mix of **force, technology, livelihood, and talks**.

Body

Why the task is complex

- **Terrain:** the Himalaya and Karakoram deny roads and visibility; the Thar and Rann hide patrols in dust and salt; the Brahmaputra and Sundarbans shift channels; the North-East jungle and the Myanmar hills favour ambush and camps.
- **Unsettled lines:** **Line of Control**, **Actual Ground Position Line**, and **Line of Actual Control** are not full international boundaries in the ordinary sense; patrol face-offs are built in.
- **Hostile or difficult relations:** Pakistan-backed infiltration and artillery on the LoC; China's infrastructure and patrols on the LAC; occasional strain with others over fencing, rivers, or insurgents.
- **Porous socio-economic borders:** ethnic kin across Myanmar, Nepal, and Bangladesh; **informal trade**, cattle, and labour; **Rohingya and other mixed flows**.
- **Insurgency and organised crime:** Northeast groups, left-wing corridors near some internal-external edges, drugs from the Golden Triangle, fake currency, and wildlife.
- **Coast:** a long shoreline, creeks of Gujarat, and island chains that a small boat can use, as 26/11 showed.

Challenges in operations

- Manpower versus length; night and winter gaps.
- Local alienation if the force is only a search party and never a clinic or a road.
- Dual control among **Army, Border Security Force, Indo-Tibetan Border Police, Sashastra Seema Bal, Assam Rifles, Coast Guard**, and police - coordination failures are a challenge of their own.
- Village rights, grazing, and **border haats** versus a hard fence.
- Technology that fails in snow, rain, and no-power posts.

Strategies for effective management

- **Force specialisation:** BSF on Pakistan and Bangladesh borders, ITBP on the China frontier, SSB on Nepal and Bhutan, Assam Rifles on Myanmar, Army on the LoC and high LAC, Coast Guard and Navy at sea - with **joint doctrine and shared intelligence**.
- **Fencing, floodlighting, and roads** where terrain allows (India-Pakistan, parts of India-Bangladesh), plus **border outposts** with all-weather access under the **Border Area Development Programme**.
- **Technology:** sensors, cameras, **Comprehensive Integrated Border Management System** pilots, drones, and coastal radar chains; they **aid** the jawan, they do not replace him.
- **Integrated Check Posts** and authorised trade so legal commerce undercuts smuggling.
- **People-centric borders:** identity cards, regulated crossing, haats, and development in border blocks so the villager is an ally, not a courier.
- **Diplomacy:** coordinated patrols and hotlines with Bangladesh and Myanmar; boundary talks and confidence-building on the LAC; LoC ceasefire discipline with Pakistan even when terror continues.
- **Coastal security:** registration of boats, police stations on the coast, **National Committee on Strengthening Maritime and Coastal Security**, and fusion of Navy, Coast Guard, and coastal police.
- **Legal and customs** capacity against drugs and fake notes, not only a patrol count.
- **One data picture** for immigration, visa overstay, and watch lists at the Integrated Check Post.

Flow diagram

Terrain ice desert river jungle coast -> Complex border task
 Hostile LoC LAC plus porous edges -> Complex border task
 BSF ITBP SSB AR Army Coast Guard -> Effective management
 Fence sensors ICP BADP -> Effective management
 Hotlines coordinated patrols -> Effective management

Conclusion

Difficult terrain and hostile or sensitive neighbours make Indian border management a permanent joint task. Challenges are infiltration, crime, shifting rivers, and split forces. Effective strategy is the right force on the right stretch, fence and sensors where they work, roads and livelihoods in border blocks, coastal radar after 26/11, and talks that keep a channel open. A wall without a willing village and a shared intelligence room will leak.

Open WRAP page — <https://wrapexams.com/upsc/mains-answers/gs-3/2016/border-management-is-a-complex-task-due-to-difficult-terrain-and-hostile-relations-with-some-countries-elucidate-the-challenges-and-strategies-for-effective-border-management/>

Q20 · 12 marks

Use of internet and social media by non-state actors for subversive activities is a major security concern. How have these been misused in the recent past? Suggest effective guidelines to curb the above threat.

GS III · 2016 · Indian Economy

Revision summary

Terror groups and riot organisers use social media to recruit, instruct, raise funds, and spread rumour.

The 2012 North-East exodus rumours and ISIS-style online radicalisation are clear recent misuses.

Lawful blocking, UAPA, and IT Act intercept powers must stay narrow after the 66A judgment.

Platforms need log preservation and fast removal of unlawful content on a legal order.

Literacy, counter-speech, and financial tracking beat a long blanket internet shutdown.

Introduction

Phones and social platforms let a **non-State actor** - a terror group, a riot organiser, a hostile intelligence proxy, or a criminal gang - reach millions **without a radio station**. Recruitment, rumour, and live attack coordination now travel on the same apps as family chat. That is a major internal-security concern. The answer must name **how the tools were misused** and then offer **guidelines that target crime**, not the ordinary political speech the Supreme Court protected when it struck down **Section 66A** in 2015.

Body

How the tools are misused

- **Recruitment and radicalisation:** polished videos and private chat pull a youth from grievance to a module; **ISIS** and other groups industrialised this after 2014.
- **Instruction and operational security:** bomb-making notes, encryption, and dead-drop accounts replace a physical handler.
- **Rumour as a weapon:** fake images of violence can start a riot or a **flight of people**, as in the **2012 North-East exodus** rumours on SMS and social media.
- **Communal incitement:** forwarded clips, often old or foreign, timed for a procession or an election.
- **Fundraising:** online wallets, charities that are fronts, and publicity for kidnappings.
- **Live terror:** attackers on the move using phones for media and for handlers, as seen in several urban assaults worldwide and in Indian investigations after 26/11-era plots.
- **Cyber crime overlap:** phishing and malware to fund or to steal data from officials.
- **Separatist and insurgent propaganda** aimed at the diaspora and at local youth in Kashmir and the North-East.

Recent-past illustrations

- Global jihadist use of Twitter, YouTube, and Telegram-style channels for brand and for lone-wolf calls.

- Indian cases of modules busted with **Facebook and WhatsApp** trails; police often find the handler abroad.
- **Mass rumour** moving faster than a district's public-address system.
- Use of virtual private networks and foreign servers to sit outside easy summons.

Effective guidelines to curb the threat

- **Law with a narrow aim:** use **Unlawful Activities (Prevention) Act, Information Technology Act** blocking and interception powers (**sections 69 and 69A**), and ordinary IPC offences against incitement - with **judicial or high-level executive oversight** so the 66A-era vagueness does not return.
- **Intermediary rules:** time-bound removal of **unlawful content** on a lawful order; a local office and a compliance officer for large platforms; preservation of logs for investigation. Do not demand a general pre-censorship of all speech.
- **CERT-In, NTRO, and State cyber cells** that share indicators of compromise and of terror handles in hours, not months.
- **Open-source and undercover capability** in police, with language skills, instead of only a blocking request.
- **Financial trails:** freeze wallets and hawala that sit behind the page; involve the Financial Intelligence Unit.
- **Counter-speech:** official fact pages during a rumour spike; community voices that are trusted in that town, not only a Delhi press release.
- **Digital literacy** in schools and madrasas and through the police beat: how to spot a fake video, whom to call.
- **Crisis protocol:** when a riot clip spreads, **district magistrate, police, and platforms** on one call; targeted restriction if a court or statute allows, rather than a long, blanket shutdown that also blinds the honest citizen and the police.
- **International cooperation:** Budapest Convention-type mutual assistance, and requests to firms that store data abroad.
- **Prison and probation:** monitor known radicalisers' accounts; deradicalisation that is more than a locked SIM.
- **Protect encryption for the honest user** while using **targeted lawful intercept** on identified suspects - a mass backdoor is itself a security hole.

Flow diagram

Non-state actors -> Internet social media
 Internet social media -> Recruit rumour finance ops
 UAPA IT Act 69 69A -> Curb threat
 Intermediary takedown logs -> Curb threat
 Literacy counter-speech FIU -> Curb threat

Conclusion

Non-State actors have used the internet to recruit, to riot through rumour, to raise money, and to run operations. Indian rumour panics and global jihadist media are the recent proof. Guidelines that work are precise law, platform compliance, cyber fusion, money trails, counter-speech, and literacy - not a return to vague speech crimes or a permanent blackout. Curb the handler and the lie; keep the citizen online.

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WRAP Exams

Compiled answer key

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

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Q1 12 marks	Q2 12 marks	Q3 12 marks	Q4 12 marks
Q5 12 marks	Q6 12 marks	Q7 12 marks	Q8 12 marks
Q9 12 marks	Q10 12 marks	Q11 12 marks	Q12 12 marks
Q13 12 marks	Q14 12 marks	Q15 12 marks	Q16 12 marks
Q17 12 marks	Q18 12 marks	Q19 12 marks	Q20 12 marks

Question-wise key

Q1 · 12 marks Solution

Q2 · 12 marks Solution

Q3 · 12 marks Solution

Q4 · 12 marks Solution

Q5 · 12 marks Solution

Q6 · 12 marks Solution

Q7 · 12 marks Solution

Q8 · 12 marks Solution

Q9 · 12 marks Solution

Q10 · 12 marks Solution

Q11 · 12 marks Solution

Q12 · 12 marks Solution

Q13 · 12 marks Solution

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Q20 · 12 marks Solution

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