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UPSC Mains 2016 GS I

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

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

<https://wrapexams.com/upsc/mains/gs-1/2016/>

Q1 · 12 marks

Early Buddhist Stupa-art, while depicting folk motifs and narratives, successfully expounds Buddhist ideals. Elucidate.

GS I · 2016 · Indian Heritage and Culture

Revision summary

Bharhut, Sanchi, and Amaravati wrap the relic stupa in folk figures and daily scenes.

Jataka and donor narratives teach giving, compassion, and renunciation in story form.

Aniconic signs such as footprints, wheel, and bodhi tree carry the **Buddha** without a human idol.

Circumambulation turns looking into practice.

Folk motif is the medium of the ideal, not a dilution of it.

Flow diagram

Folk yaksha lotus animal -> Stupa railing torana

Jataka donor stories -> Stupa railing torana

Stupa railing torana -> Dana karuna dhamma

Aniconic wheel throne tree -> Dana karuna dhamma

Conclusion

- Elucidate with named sites and named Jatakas, not with a general claim that Buddhist art is simple.
- **Stress that success lies in translation:** local motif and narrative become vehicles of Buddhist ethics, not rivals to them.

Early stupa-art used folk guardians, animals, and Jataka drama to teach dana, compassion, and non-self. The ideals are expounded because the carvings convert familiar forms into a walk around the relic, not because they abandon the popular world.

Open WRAP page — <https://wrapexams.com/upsc/mains-answers/gs-1/2016/early-buddhist-stupa-art-while-depicting-folk-motifs-and-narratives-successfully-expounds-buddhist-ideals-elucidate/>

Q2 · 12 marks

Krishnadeva Raya, the king of Vijayanagar, was not only an accomplished scholar himself but was also a great patron of learning and literature. Discuss.

GS I · 2016 · Indian Heritage and Culture

Revision summary

He ruled Vijayanagara from 1509 to 1529 and wrote the Telugu Amuktamalyada as Andhra Bhoja.

Sanskrit court drama and shastra sat beside that Telugu kavya.

Allasani Peddana and the Ashtadiggajas made the capital a Telugu literary peak.

Kannada, Tamil, and temple mathas also took grants.

War treasure and a multi-lingual empire made patronage a tool of kingship.

Flow diagram

Krishnadeva Raya -> Amuktamalyada Sanskrit plays
Krishnadeva Raya -> Ashtadiggajas Peddana
Krishnadeva Raya -> Telugu Kannada Tamil mathas
Amuktamalyada Sanskrit plays -> Scholar-patron court
Ashtadiggajas Peddana -> Scholar-patron court
Telugu Kannada Tamil mathas -> Scholar-patron court

Conclusion

- Discuss both the king's own Telugu-Sanskrit output and the Ashtadiggaja system, with Peddana as the named proof.
- Treat learning as part of Vijayanagara kingship, funded by agrarian and war surplus, not as a side-light to battles.

Krishnadeva Raya was a scholar-king who wrote Amuktamalyada and a patron who gathered the Ashtadiggajas and temple learned men. Vijayanagara's fame in letters rests on that double role, which turned conquest into a court of many languages.

Open WRAP page — <https://wrapexams.com/upsc/mains-answers/gs-1/2016/krishnadeva-raya-the-king-of-vijayanagar-was-not-only-an-accomplished-scholar-himself-but-was-a-also-a-great-patron-of-learning-and-literature-discuss/>

Q3 · 12 marks

Explain how the uprising of 1857 constitutes an important watershed in the evolution of British policies towards colonial India.

GS I · 2016 · The Freedom Struggle

Revision summary

The 1858 Act and the Queen's Proclamation ended Company sovereignty and set Crown-viceroy rule.

The army was recast by region, class mix, and British control of guns.

Princes were preserved as allies; lapse annexation was no longer the default.

Official policy promised religious non-interference while tightening security.

Small council seats for Indians sat beside deeper distrust of the educated public.

Flow diagram

Uprising 1857 -> Crown Act 1858
Uprising 1857 -> Army recruitment mix
Uprising 1857 -> Princes as breakwaters
Crown Act 1858 -> New Raj policy
Army recruitment mix -> New Raj policy
Princes as breakwaters -> New Raj policy

Conclusion

- Treat 1857 as a watershed in structure (Crown, army, princes), not as the birth of the nation-state.
- **Show continuity too:** economic drain and British supremacy remained; what changed was how the Raj insured itself.

1857 forced London to replace Company rule with Crown command, a re-engineered army, allied princes, and a cautious religious pose. Later nationalist politics grew inside that post-Mutiny Raj, which is why the uprising is a true watershed of colonial policy.

Open WRAP page — <https://wrapexams.com/upsc/mains-answers/gs-1/2016/explain-how-the-uprising-of-1857-constitutes-an-important-watershed-in-the-evolution-of-british-policies-towards-colonial-india/>

Q4 · 12 marks

Discuss the role of women in the freedom struggle especially during the Gandhian phase.

GS I · 2016 · The Freedom Struggle

Revision summary

1857 and Swadeshi already had women leaders, but **Gandhi** scaled participation through khadi, boycott, and salt.

Sarojini Naidu, Kamaladevi, and Kasturba stand for a much larger picketing public in the 1930s.

Quit India produced Aruna Asaf Ali, Usha Mehta, and Matangini Hazra when the male centre was arrested.

Peasant and town women both entered the campaigns.

Leadership titles still lagged behind this mass role.

Flow diagram

Gandhian satyagraha -> Khadi picket salt

Gandhian satyagraha -> Quit India underground

Khadi picket salt -> Mass women in streets jails

Quit India underground -> Mass women in streets jails

Male high command -> Limits on office

Conclusion

- Give named leaders and unnamed mass work in the same answer, and keep the stress on the Gandhian campaigns as asked.
- Do not collapse the INA's Rani of Jhansi Regiment into this question except as a later, non-Gandhian contrast if space remains.

In the Gandhian phase women moved from exceptional heroines to a mass of satyagrahis who spun, picketed salt and cloth, and led when men were in jail. That widened the nation, even though formal power inside the Congress still lagged behind their sacrifice.

Open WRAP page — <https://wrapexams.com/upsc/mains-answers/gs-1/2016/discuss-the-role-of-women-in-the-freedom-struggle-especially-during-the-gandhian-phase/>

Q5 · 12 marks

Highlight the differences in the approach of Subhash Chandra Bose and Mahatma Gandhi in the struggle for freedom.

GS I · 2016 · The Freedom Struggle

Revision summary

Gandhi made ahimsa and constructive village work the method of swaraj.

Bose built the Forward Bloc and the INA and allied with the Axis to attack British power.

- **Wartime choice is the sharpest split:** moral refusal versus using Britain's enemy.

Gandhi's social base was rural satyagraha; Bose's was army, youth, and a provisional government.

Both wanted the Raj to end; they disagreed on the cost and the kind of state that should follow.

Flow diagram

Gandhi -> Satyagraha khadi village
Bose -> Forward Bloc INA Azad Hind
Satyagraha khadi village -> Independence
Forward Bloc INA Azad Hind -> Independence
World War II -> Gandhi
World War II -> Bose

Conclusion

- Highlight differences of means and wartime alliance first, then social vision, so the answer does not become a score-sheet of patriotism.
- **Note overlap:** both mobilised beyond the old Moderate petition, and INA trials later fed the same nationalist public that **Gandhi** had already awakened.

Gandhi sought freedom through non-violent mass suffering and village reconstruction; Bose sought it through organised force and a wartime strike at the Raj. The two approaches divided the road, not the destination of an independent India.

Open WRAP page — <https://wrapexams.com/upsc/mains-answers/gs-1/2016/highlight-the-differences-in-the-approach-of-subhash-chandra-bose-and-mahatma-gandhi-in-the-struggle-for-freedom/>

Q6 · 12 marks

Has the formation of linguistic states strengthened the cause of Indian unity?

GS I · 2016 · Post-independence Consolidation

Revision summary

Andhra 1953 and the 1956 Act made language the main basis of the state map.

Mother-tongue government reduced the sense of internal colonialism in the south and elsewhere.

Regional parties mostly chose to rule states rather than leave India.

Border, river, and nativist conflicts continue and need minority and Centre-state tools.

On balance, linguistic states have been a method of unity, not a rehearsal for partition.

Flow diagram

Language identity -> States Reorganisation 1956
States Reorganisation 1956 -> Unity through recognition
States Reorganisation 1956 -> Border river sons-of-soil
Border river sons-of-soil -> Federal bargaining
Unity through recognition -> Indian Union
Federal bargaining -> Indian Union

Conclusion

- **Answer yes, with conditions:** language states strengthened unity by recognising diversity, provided the Centre holds defence, currency, and a common market, and provided minorities are not crushed in the name of the state language.
- Point to accommodation, not to a myth that 1956 ended all regionalism.

Linguistic states have strengthened Indian unity by giving democracy a mother tongue and by pulling regional pride inside the Union. They have not abolished rivalry, but they replaced many exit threats with bargaining inside the Constitution.

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Q7 · 12 marks

The anti-colonial struggles in West Africa were led by the new elite of Western -educated Africans. Examine.

GS I · 2016 · History of the World

Revision summary

Lawyers, teachers, and journalists chaired West African nationalist parties after 1945.

Nkrumah, Azikiwe, Senghor, and Houphouët-Boigny are the elite type, with different mass tactics.

Cocoa farmers, strikes, and 1948 Accra unrest show a wider social engine.

Chiefs could block or bargain, so tradition was not outside the story.

Elite leadership is accurate for the helm, not for the whole ship.

Flow diagram

Western-educated elite -> Parties press constitutions

Farmers unions veterans -> Mass pressure

Parties press constitutions -> Independence

Mass pressure -> Independence

Chiefs emirs -> Independence

Conclusion

- **Examine means:** elite leadership plus mass pressure, with Nkrumah as the type who was both scholarship boy and crowd politician.
- Compare British and French West Africa so the answer is not only the Gold Coast.

Western-educated Africans led West African anti-colonial politics in party, press, and constitution. The struggles themselves were wider: farmers, workers, veterans, and chiefs pushed, funded, and sometimes resisted that elite, which is why the statement must be examined, not swallowed whole.

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Q8 · 12 marks

To what extent globalisation has influenced the core of cultural diversity in India? Explain.

GS I · 2016 · Globalisation and Indian Society

Revision summary

Post-1991 markets, English work, and digital media have changed urban dress, food, and leisure.

Regional languages, ritual calendars, and caste marriage still structure most lives.

- **Change is uneven:** strong in IT cities, weaker in the agrarian interior, now spreading by phone.

Global tools also revive local culture, so the effect is hybrid, not only flattening.

The core is influenced in degree, not replaced in kind.

Flow diagram

Globalisation 1991 media migration -> Brands English youth taste

Globalisation 1991 media migration -> Family caste language faith

Brands English youth taste -> Hybrid public culture

Family caste language faith -> Hybrid public culture

Hybrid public culture -> Diversity bent not erased

Conclusion

- Answer "to a significant but not total extent," and split core (kinship, language, ritual) from periphery (dress, leisure, brands).
- Use 1991 and **digital India** as accelerators, not as the origin of all cultural mixing, which is older than satellite TV.

Globalisation has coloured the surface of Indian cultural life and has pressed on the family and the city, yet it has not dissolved the many languages, faiths, and marriage rules that make diversity. The extent is large in consumption and limited, though not zero, at the core.

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Q9 · 12 marks

"An essential condition to eradicate poverty is to liberate the poor from the process of deprivation." Substantiate this statement with suitable examples.

GS I · 2016 · Women, Population and Urbanisation

Revision summary

Poverty lasts because exclusion from land, papers, health, and voice repeats every year.

Rural landless, displaced Adivasis, and undocumented slum tenants show the process in concrete lives.

Gendered care work passes deprivation to the next generation.

MGNREGA, NFSA, FRA, RTE, and SHGs try to break links of that chain.

Income support without rights leaves the process standing.

Flow diagram

Deprivation process -> No land papers wage
Deprivation process -> Hunger illness no school
No land papers wage -> Persistent poverty
Hunger illness no school -> Persistent poverty
Rights assets voice -> Liberation from trap

Conclusion

- **Substantiate with a chain:** asset, wage, nutrition, school, papers, voice-and name one rural and one urban example.
- Stress that charity or a one-time subsidy does not end poverty if the process of exclusion stays intact.

Eradicating poverty means stopping the machine of deprivation, not only topping up income for a season. Land, work rights, food, school, identity papers, and panchayat voice are the locks to open, as Indian programmes show when they are actually delivered.

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Q10 · 12 marks

Why are the tribals in India referred to as 'the Scheduled Tribes'? Indicate the major provisions enshrined in the Constitution of India for their upliftment.

GS I · 2016 · Indian Society and Diversity

Revision summary

- **ST is a constitutional status:** communities notified under **Article 342** and defined in **Article 366(25)**.

The schedule exists so isolation and land vulnerability can be answered by law, not by charity alone.

Articles 15(4), 16(4), 46, and **335** frame education, jobs, and protection from exploitation.

The Fifth and Sixth Schedules and **Article 275** fund and structure tribal-area government.

Reserved seats and the ST commission give political and watchdog voice.

Flow diagram

President Art 342 -> ST list

ST list -> Arts 15 16 330 332 335

ST list -> Fifth Sixth Schedules Art 244

ST list -> Art 46 275 339

Arts 15 16 330 332 335 -> Upliftment safeguards

Fifth Sixth Schedules Art 244 -> Upliftment safeguards

Art 46 275 339 -> Upliftment safeguards

Conclusion

- Answer the name from **Articles 342 and 366**, then list protection, reservation, schedules, finance, and political seats as one package.
- **Keep examples short:** a **Fifth Schedule** state versus a **Sixth Schedule** council, so the map of upliftment is clear.

Tribals are Scheduled Tribes because the Constitution schedules them under **Article 342** for targeted justice. Upliftment is written as special care in equality clauses, scheduled-area government, Union grants, service claims, and reserved legislatures, which still need honest delivery on the ground.

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Q11 · 12 marks

With a brief background of quality of urban life in India, introduce the objectives and strategy of the 'Smart City Programme.'"

GS I · 2016 · Indian Heritage and Culture

Revision summary

Indian urban life is marked by slums, intermittent water, congestion, pollution, and weak municipal finance.

The Smart City Mission of 2015 sought core infrastructure, liveability, a cleaner environment, and smart solutions in about 100 cities.

Strategy combined area-based retrofit, redevelopment, or greenfield work with pan-city ICT services.

An SPV and convergence with AMRUT, housing, and sanitation missions were the delivery tools.

A showcase pocket does not by itself fix city-wide drains and buses, so execution remains the test.

Introduction

Indian cities create a large share of national income, yet daily life for many residents is crowded, polluted, and poorly served. The Smart City Mission, launched in 2015, tried to raise that quality of life through selected area projects and city-wide services rather than through one giant new capital.

Body**Quality of urban life in India**

- **Census 2011** put more than 370 million people in urban areas, and later estimates show the share still rising, so pressure on housing, water, and transport is structural, not a short boom.
- A large part of the urban poor lives in slums and informal settlements with insecure tenure, shared toilets, and weak solid-waste collection, which is the opposite of a liveable city.
- Piped water is intermittent in many municipal wards; groundwater and tankers fill the gap, while untreated sewage still reaches rivers and lakes.
- Congestion, mixed traffic, and weak public transport raise travel time and air pollution, which the CPCB's National Air Quality Index often flags in Delhi, Kanpur, and other towns.
- Municipal finances are thin; property tax and user charges do not match the cost of roads, drains, and street lights, so service quality stays low even when a city looks busy.
- Floods after short rain, heat islands, and loss of lakes show that urban ecology is part of the quality-of-life crisis, not a side issue.

Objectives of the Smart City Programme

- The Mission aimed to promote cities that provide core infrastructure, a decent quality of life, a clean and sustainable environment, and the application of 'smart' solutions.
- Core infrastructure in the official list included adequate water, assured electricity, sanitation and solid-waste systems, efficient urban mobility, affordable housing, IT connectivity, good governance including e-governance, sustainable environment, safety, health, and education.

- The programme was not meant to rebuild every Indian town at once; it selected about 100 cities through a challenge so that models could be copied.
- Citizen consultation was written into the proposal stage, so the objective was also more responsive local government, not only sensors and cameras.
- **Inclusive cities were named as a goal:** housing and services were to reach the poor, not only a business district.

Strategy of the programme

- **Area-based development was the first pillar:** retrofitting a chosen pocket, redevelopment of a worn inner area, or a greenfield township, so visible change could be shown in a few square kilometres.
- **Pan-city solutions were the second pillar:** one or two ICT-based services such as intelligent traffic, a city command centre, or better metering that cover the whole municipal area.
- Special Purpose Vehicles, usually with the municipal corporation and the state as shareholders, were to plan, bid, and run projects with a mix of central grant, state share, municipal funds, and private capital.
- Convergence with AMRUT, Housing for All, **Swachh Bharat**, and **Digital India** was the intended finance and works strategy, so a smart city was a stack of missions, not a stand-alone gadget plan.
- Competitive selection among cities was meant to push states to prepare plans rather than wait for a uniform central template.

Limits that the answer should note

- A small area-based island can raise land values without fixing city-wide drains or buses.
- SPV capacity, land, and municipal politics have slowed several projects, so the strategy is only as strong as local execution.

Way forward for the answer

- Paint urban life as congestion, slums, water, and pollution first, then name 100-city selection, area-based plus pan-city work, and the SPV as the Smart City method.

Flow diagram

Poor urban services slums pollution -> Smart City Mission 2015
 Smart City Mission 2015 -> Core infrastructure liveability
 Smart City Mission 2015 -> Area based retrofit redevelopment greenfield
 Smart City Mission 2015 -> Pan city ICT solutions
 Area based retrofit redevelopment greenfield -> SPV plus mission convergence
 Pan city ICT solutions -> SPV plus mission convergence

Conclusion

Urban India still offers uneven water, housing, mobility, and air, even as it drives growth. The Smart City Programme set out to lift core services and liveability in about 100 cities through area projects, pan-city digital tools, and an SPV, with other urban missions meant to fill the rest of the map.

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Q12 · 12 marks

What is the basis of regionalism? Is it that unequal distribution of benefits of development on regional basis eventually promotes regionalism? Substantiate your answer.

GS I · 2016 · Social Empowerment, Communalism and Secularism

Revision summary

Regionalism is a claim for power or resources in the name of a language, culture, or territory.

Language reorganisation, tribe, and distance from the capital are independent bases.

Skewed irrigation, industry, and jobs have clearly fuelled Telangana, Vidarbha, and mineral hinterland demands.

Prosperous regions can also turn regional to protect migrants or the tax base.

Unequal development promotes regionalism but does not exhaust its causes.

Introduction

Regionalism is the political claim that a language, culture, or territory deserves more power, resources, or even a separate state. In India it rests on several bases at once. Unequal fruits of development often sharpen it, but they are not the only root.

Body

What regionalism rests on

- Language and script are the oldest modern bases, from the Andhra movement and the **States Reorganisation Commission (1955)** to later hill and tribal identity claims.
- Shared history, caste clusters, and cultural memory, as in Tamil or Maratha pride, give a people a name before any budget figure is cited.
- **Geography and administrative distance matter:** a hill, a plateau, or a river basin that is ruled from a far capital feels like a region even when income is not the first slogan.
- Ethnic and tribal identity, as among Gorkhas, Nagas, Bodos, and some Jharkhand groups, mixes land, custom, and fear of demographic change.
- Political entrepreneurs and parties convert these feelings into a demand for a state, an autonomous council, or a larger share of river water and jobs.

Unequal development as a promoter

- Yes, in many cases the sense that roads, industry, irrigation, and government jobs stayed in one belt while another remained a hinterland is what turned identity into a durable movement.
- Telangana's long complaint against coastal Andhra over irrigation, employment, and Hyderabad's gains is a clear development-plus-identity case that ended in a new state in 2014.
- Vidarbha in Maharashtra, Bundelkhand in Uttar Pradesh-Madhya Pradesh, and parts of north Karnataka use drought, farmer distress, and thin industry as the regional argument.
- Jharkhand and Chhattisgarh were demanded as mineral-rich interiors that did not see matching human development under Bihar and Madhya Pradesh.
- Gorkhaland and some hill demands mix culture with the charge that plains-centred states neglect Darjeeling or the western Himalaya in schools and jobs.
- Green Revolution Punjab-Haryana versus rain-fed eastern and central India shows that national growth can itself create regional jealousy if public investment is spatially biased.

Why development is not the whole basis

- Linguistic states after 1956 reduced some unrest even where income gaps remained, which shows that recognition of language can calm regionalism without equal GDSP.
- Some rich regions also show regionalism, as when a prosperous belt wants to keep its tax base or opposes migrants, which is identity and resource-protection, not only poverty.
- Sons-of-the-soil politics in Mumbai or Assam is as much about culture and demography as about factory jobs.
- Centre-state finance fights and **Article 3** politics can manufacture a regional story even when the data gap is modest.

A balanced substantiation

- **Unequal regional benefits are a powerful fuel:** they give a grievance that can be counted in canals, colleges, and per capita income.
- The spark is still often language, tribe, or historical region; development failure makes that spark a fire.
- The Indian answer has been federal redesign, **Finance Commission** transfers, and special category or backward-region grants, not a denial of the feeling.

Way forward for the answer

- List language, culture, geography, and ethnicity first, then show with Telangana, Vidarbha, and mineral hinterlands that skewed development promotes regionalism without being its only cause.

Flow diagram

Language culture ethnicity geography -> Regionalism

Unequal canals jobs industry -> Regionalism

Regionalism -> Statehood autonomy resource share

Federal redesign Finance Commission -> Containment not erasure

Conclusion

Regionalism in India is based on language, culture, territory, and ethnicity. Unequal distribution of development benefits on a regional map does promote it, as Telangana and several hinterland movements show, but identity and political organisation can sustain regionalism even where the income gap is not the whole story.

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Q13 · 12 marks

Discuss the concept of air mass and explain its role in macro-climatic changes.

GS I · 2016 · World's Physical Geography

Revision summary

An air mass is a vast body of air with fairly even temperature and humidity from a uniform source region.

Types combine maritime or continental with tropical, polar, arctic, or equatorial labels.

Moving air masses are modified and meet at fronts, which produce large-scale cloud and rain.

India's monsoon is a seasonal swap of dry continental and moist oceanic air.

Western disturbances, heat waves, cold waves, and cyclones are also air-mass phenomena at the macro scale.

Introduction

An air mass is a huge body of air that stays long enough over a uniform source region to take on that region's temperature and moisture. When it moves, it carries those properties over continents and oceans and so shapes monsoon bursts, heat waves, cold waves, and storm tracks at the macro scale.

Body

Concept of an air mass

- An air mass is typically thousands of kilometres across and some kilometres deep, with relatively uniform temperature and humidity in the horizontal, unlike a local sea breeze.
- It forms over a source region that is large, fairly flat, and stagnant, such as a subtropical ocean, a desert, a polar ice field, or a continental interior.
- **Classification uses moisture and temperature:** maritime (m) or continental (c), and tropical (T), polar (P), arctic (A), or equatorial (E).
- Common types are mT (warm moist), cT (hot dry), mP (cool moist), cP (cold dry), and mE (very moist equatorial).
- **As an air mass leaves its source it is modified:** a cP air mass crossing a warm sea can pick up moisture; an mT air mass crossing a continent can dry and heat.
- The boundary between two unlike air masses is a front; lifting along a front produces cloud and rain at a scale far larger than a single thunderstorm cell.

Role in macro-climatic changes

- **Seasonal replacement of air masses is a main engine of climate belts:** in India, moist monsoon mT-equatorial air from the Indian Ocean replaces hot cT air of the pre-monsoon plains, which is a macro shift from dry heat to a wet season.
- Retreat of the monsoon is the return of drier continental air and the southward shift of the monsoon trough, again an air-mass change, not a local shower ending.
- Western disturbances are eastward-moving extra-tropical systems in which mid-latitude air masses and fronts bring winter rain and snow to north-west India, which can alter rabi moisture at a regional scale.
- Heat waves over north and central India are often linked to a persistent hot, dry continental air mass and a stalled ridge, which raises maximum temperatures for days.

- Cold waves follow incursions of cold continental air from the north-west after a western disturbance, dropping night temperatures across the northern plains.
- Tropical cyclones in the Bay of Bengal and the Arabian Sea feed on very moist maritime air; a change in sea-surface temperature and in the overlying air mass can raise or cut cyclone frequency in a season.
- El Niño and other ocean-atmosphere couplings change the location and moisture of tropical air masses, which is one path from global oscillation to Indian drought or flood years.
- Polar and arctic air-mass shifts in the higher latitudes, including a wavier jet stream, are linked in recent decades to unusual cold or heat in mid-latitudes, which is macro-climatic even if the Indian monsoon has its own drivers.
- Urban and land-use change can modify air near the ground, but true air-mass climate remains a planetary and seasonal process.

Way forward for the answer

- Define source region, m/c and T/P types, modification, and fronts, then tie Indian monsoon, western disturbances, heat and cold waves, and cyclones to air-mass replacement.

Flow diagram

Source region ocean desert ice -> Air mass mT cT mP cP

Air mass mT cT mP cP -> Movement and modification

Movement and modification -> Fronts and lifting

Fronts and lifting -> Monsoon heat cold cyclone climate

Conclusion

An air mass is a large, fairly uniform body of air born over a source region and classified by moisture and temperature. Macro-climatic change is largely the advance, retreat, and clash of such masses, which in India appears as monsoon onset and withdrawal, western disturbances, heat and cold waves, and cyclone seasons.

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Q14 · 12 marks

"The Himalayas are highly prone to landslides." Discuss the causes and suggest suitable measures of mitigation.

GS I · 2016 · Geophysical Phenomena

Revision summary

Himalayan landslides follow young thrusts, steep slopes, weak debris, monsoon rain, and earthquakes.

Road cuts, blasting, hydropower, and deforestation add human load to a naturally unstable belt.

Kedarnath-type events show rain plus debris can destroy valleys in hours.

Mitigation needs GSI-NDMA mapping, engineered roads, vegetation, and rainfall-based warning.

Relocation and tourist limits are needed where the slope cannot be made safe.

Introduction

The Himalaya is a young, steep, and still-rising mountain belt on an active plate edge. Heavy rain, earthquakes, weak rocks, and roads cut into slopes make landslides a regular hazard from Jammu and Kashmir through Uttarakhand and Himachal to the North-East.

Body**Why the Himalayas are so prone**

- The range is geologically young; the Indian plate still pushes under Eurasia, so rocks are crushed, folded, and cut by thrusts such as the Main Boundary Thrust and the Main Central Thrust.
- Slopes are steep, valleys are deep, and gravity is always ready to pull debris once a trigger comes.
- Many slopes are made of fractured sedimentary and metamorphic rocks, old landslide debris, and glacial till that lose strength when wet.
- The monsoon and cloudbursts deliver intense rain in a short time, raising pore-water pressure and turning soil into a flow, as seen in [Kedarnath \(2013\)](#) and later hill disasters.
- The belt is seismic; shaking from Himalayan earthquakes loosens slopes and can start slides during or after the event.
- Rivers undercut toes of slopes, and glacial lake outburst floods can strip valleys in hours.

Human causes that raise the risk

- Hill roads, often cut without proper benches, drains, or disposal of spoil, remove the toe of the slope and load the downhill side.
- Hydropower tunnels, blasting, and unplanned construction on old slide fans put buildings on unsafe ground.
- Deforestation, road-edge grazing, and slope farming without terraces reduce root strength and increase runoff.
- Encroachment on floodways and debris fans, plus tourism load in pilgrimage towns, puts more people in the path of the next slide.

Mitigation measures

- Map landslide hazard at large scale through the Geological Survey of India, state disaster authorities, and NDMA guidelines, and ban construction on very high-hazard slopes.
- Design hill roads with controlled blasting, retaining walls, catch drains, and safe dumping of muck, not a vertical cut and a heap on the riverbank.
- **Use bio-engineering:** grass, shrubs, and trees on cuts, plus check dams and contour drains to slow water.
- Early warning from rainfall thresholds, slope instruments, and community watch in monsoon weeks, linked to NDMA and state control rooms.
- Catchment treatment, restricted hydropower in fragile belts, and honest environmental clearance that treats landslide as a design input, not a footnote.
- Relocate chronic slide villages where repair is cheaper than risk; insure and train local masons in safer hill building.
- Keep pilgrimage and tourist numbers within the carrying capacity of towns such as those on the Char Dham routes.
- After a slide, drain the scarp, remove hanging blocks, and do not rebuild on the same debris without geotechnical sign-off.

Way forward for the answer

- Join plate tectonics, rain, and earthquakes with roads and hydropower, then list mapping, better cuts, bio-engineering, and early warning as mitigation.

Flow diagram

Young thrusts steep weak rock -> Landslide
Monsoon cloudburst earthquake -> Landslide
Roads dams deforestation -> Landslide
Mapping bio-engineering warning -> Lower loss

Conclusion

The Himalayas are landslide-prone because they are steep, fractured, wet in the monsoon, and seismically alive. Human cuts and loads make the hazard worse. Mitigation is hazard mapping, safer roads, slope drainage and vegetation, early warning, and keeping people off the worst fans.

Open WRAP page — <https://wrapexams.com/upsc/mains-answers/gs-1/2016/the-himalayas-are-highly-prone-to-landslides-discuss-the-causes-and-suggest-suitable-measures-of-mitigation/>

Q15 · 12 marks

The effective management of land and water resources will drastically reduce the human miseries. Explain.

GS I · 2016 · Natural Resources and Industries

Revision summary

Rural misery in India is closely tied to lost soil and badly timed water.

Terraces, watersheds, and healthy commons keep land productive.

Tanks, recharge, efficient irrigation, and floodplain rules turn the same monsoon into safety.

Land and water must be managed as one ridge-to-valley unit.

Upkeep and fair sharing matter; unused tanks and unfair dams recreate hardship.

Flow diagram

Soil conserved on slope -> Rain stored in tank aquifer

Rain stored in tank aquifer -> Food fodder drinking water

Food fodder drinking water -> Less drought flood migration

Greedy pumping silted tanks -> Misery returns

Conclusion

- Treat every dry and flood-prone block as a land-water project with farmers as co-managers, and measure success by soil moisture, drinking-water days, and fewer distress migrants.

Effective land and water management holds soil, stores rain, and shares river and groundwater with some fairness. That combination cuts crop failure, flood loss, disease, and distress migration more directly than most later welfare payments.

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Q16 · 12 marks

South China Sea has assumed great geopolitical significance in the present context. Comment.

GS I · 2016 · World's Physical Geography

Revision summary

The South China Sea sits on the main sea road between the Indian and Pacific Oceans.

Trade, oil and gas hopes, and fisheries give it economic and food value.

Overlapping island claims and reclaimed airstrips make it a military geography.

UNCLOS and the 2016 award clash with China's dash-line claim.

US, ASEAN, and India's Act East all treat open lanes there as a live strategic interest.

Introduction

The South China Sea is a semi-enclosed sea between South-East Asia and southern China. It has become a geopolitical hinge because world trade, energy, island claims, and naval power all meet there, and because no single legal settlement has stuck.

Body

Location and the trade artery

- The sea links the Indian Ocean to the Pacific through the Strait of Malacca and nearby passages, so a large share of world seaborne trade, including East Asian energy imports, must pass its approaches.
- For Japan, South Korea, China, and ASEAN exporters, a blocked or unsafe South China Sea would raise freight cost and strategic risk at once.
- India cares because its Act East trade, energy shipments, and the security of sea lanes from the Andaman Sea eastward sit on the same map.

Energy, fish, and resources

- The basin is believed to hold oil and gas, though estimates vary; even a modest field matters when several claimants need energy.
- Fisheries feed millions in Vietnam, the Philippines, Indonesia, and southern China; militia boats and banned fishing turn protein into a security issue.
- Seabed minerals and future blue-economy plans add a long-term resource layer to the dispute.

Islands, reefs, and military geography

- The Paracels, Spratlys, Scarborough Shoal, and many reefs are claimed in overlapping ways by China, Vietnam, the Philippines, Malaysia, Brunei, and Taiwan.
- Reclamation and airstrips turn rocks into outposts; whoever sits on them can watch and, in a crisis, harass shipping and aircraft.
- China's nine-dash (later ten-dash) line claim covers most of the sea and collides with exclusive economic zones drawn from ASEAN coasts under UNCLOS.

Law, great powers, and regional order

- UNCLOS gives coastal states EEZs; the 2016 arbitral award in the Philippines-China case rejected historic rights inside the nine-dash line, which Beijing refused to accept.

- The United States and partners run freedom-of-navigation operations to deny the idea that the sea is a Chinese lake.
- ASEAN is split between claimants and states closer to China's economy, so a binding Code of Conduct has been slow.
- Japan, Australia, and extra-regional navies treat the sea as a test of whether rules or force will order the Indo-Pacific.
- For India the issue is not a land border but the principle of open lanes, UNCLOS, and partnerships with Vietnam and other ASEAN states.

Why the 'present context' is sharp

- After 2010, more patrols, more reclamation, and more great-power rivalry have made incidents likely even without a planned war.
- Any clash would hit insurance, oil prices, and Asian supply chains within days.

Way forward for the answer

- Rank Malacca trade, energy and fish, militarised reefs, UNCLOS versus the dash line, and US-China-ASEAN-India stakes as the comment.

Flow diagram

Malacca trade energy lanes -> Geopolitical weight
Oil gas fish reefs -> Geopolitical weight
Nine dash vs UNCLOS EEZ -> Geopolitical weight
China ASEAN US partners India -> Geopolitical weight

Conclusion

The South China Sea matters because it is a world trade and energy corridor, a disputed resource bowl, and a naval chessboard. Overlapping island claims and the clash between UNCLOS and expansive historic lines have turned a regional sea into a test of Indo-Pacific order.

Open WRAP page — <https://wrapexams.com/upsc/mains-answers/gs-1/2016/south-china-sea-has-assumed-great-geopolitical-significance-in-the-present-context-comment/>

Q17 · 12 marks

Major cities of India are becoming vulnerable to flood conditions. Discuss.

GS I · 2016 · Geophysical Phenomena

Revision summary

Metros flood after short, intense rain because drains and storage have not kept up.

Mumbai 2005, Srinagar 2014, and Chennai 2015 showed coastal, river, and marsh failures.

Filled lakes, paved catchments, and garbage in nallas manufacture the flood.

Climate change and sea level add a further load on coasts.

Mitigation is wetland revival, drain capacity, zoning, and ward-level warning.

Introduction

Indian metros now flood after a few hours of hard rain, not only after a river in spate. **Mumbai (2005)**, **Srinagar (2014)**, **Chennai (2015)**, and later bouts in Bengaluru, Hyderabad, and Delhi show that the city itself has become a floodplain of concrete and blocked drains.

Body

Hydro-climatic pressure

- **Many large cities sit on coasts, deltas, or river terraces:** Mumbai, Chennai, Kolkata, Kochi, and parts of Surat are exposed to the sea, the tide, and cyclone rain.
- Monsoon bursts and cloudbursts now often dump a large share of monthly rain in a day, which older storm drains were not sized to carry.
- Climate change raises the chance of extreme rain and, on the coast, of higher sea levels and storm surge that hold river water back.
- Himalayan and foothill cities such as Srinagar and parts of Guwahati face river floods plus slope debris that chokes channels.

Urban form that creates the flood

- Lakes, tanks, wetlands, and floodplains have been filled for housing and IT parks; Chennai's Pallikaranai marsh and Bengaluru's tank chain are textbook losses of storage.
- Natural drains (nullahs, nallas) are narrowed, covered, or used as sewer lines, so peak flow has nowhere to go.
- Paved catchments and high-rise plots raise runoff coefficient; rain that once soaked laterite or alluvium now hits the road in minutes.
- Solid waste and construction debris sit in drains; a blocked grill turns a 50 mm shower into a street river.
- Informal housing on riverbanks and nalla edges puts the poorest in the deepest water and also squeezes the channel.

Governance and infrastructure gaps

- Storm water and sewage are mixed in many wards, so a flood is also a health event.
- Municipal maps of micro-drains are incomplete; pumping stations fail when power or maintenance fails, as Mumbai's Mithi story after 2005 showed.
- Upstream dams and barrages, if operated without city warning, can worsen a downstream urban flood.

- Insurance, early warning, and last-mile alerts still miss slum pockets even when the IMD issues a red warning.

Why 'major cities' in particular

- High population density means the same water depth harms more lives and more GDP in a few hours.
- Underground metros, flyovers, and basements add new traps for water that old towns did not have.
- Peri-urban sprawl beyond municipal limits grows faster than drainage plans, so the flood starts in the suburb and enters the core.

What discussion should recommend

- Restore tanks and wetlands as infrastructure, desilt and widen primary drains, and separate storm water from sewage.
- Enforce floodplain and tank-bed zoning; stop regularisation of marsh fill.
- Design roads as temporary channels with safe ponding parks, and keep pumping and power backup for the lowest wards.
- Link IMD nowcasts to ward-level sirens and to the urban poor, not only to television.

Way forward for the answer

- Argue that vulnerability is extreme rain plus a sealed, encroached city, illustrated by Mumbai, Chennai, Srinagar, and Bengaluru.

Flow diagram

Extreme monsoon rain -> Urban flood
Paving wetland fill -> Urban flood
Choked mixed drains -> Urban flood
Coast river siting climate -> Urban flood
Restore tanks desilt warn -> Lower vulnerability

Conclusion

Major Indian cities are flood-vulnerable because extreme rain now hits a paved, encroached, and poorly drained urban basin. Wetland loss, choked nalas, mixed sewage, and coastal or river siting turn a monsoon burst into a metropolitan disaster.

Open WRAP page — <https://wrapexams.com/upsc/mains-answers/gs-1/2016/major-cities-of-india-are-becoming-vulnerable-to-flood-conditions-discuss/>

Q18 · 12 marks

Present an account of the Indus Water Treaty and examine its ecological, economic and political implications in the context of changing bilateral relations.

GS I · 2016 · World's Physical Geography

Revision summary

- **The 1960 Indus Waters Treaty split six rivers:** Ravi-Beas-Sutlej to India, Indus-Jhelum-Chenab to Pakistan with limited Indian uses.

A **Permanent Commission** and Neutral Expert or arbitration handle disputes.

Ecology now includes glacier change, sediment, and delta stress the Treaty barely names.

Economies of Pakistani irrigation and Indian eastern-river commands plus J&K hydro rest on the bargain.

Wars did not kill the Treaty, but terror politics and storage fights have made every project a diplomatic event.

Introduction

The Indus Waters Treaty, signed in 1960 with the World Bank as a broker, divided the Indus system between India and Pakistan. It has outlived wars, yet climate stress, storage politics, and a harder bilateral climate now test every clause.

Body

Account of the Treaty

- The Indus, Jhelum, Chenab, Ravi, Beas, and Sutlej form a shared basin born in Tibet and the Himalaya and draining largely through Pakistan to the Arabian Sea.
- After Partition, canal headworks and fields were split; the 1948 stoppage of water to Pakistani canals showed that a legal regime was urgent.
- The Treaty allocates the three eastern rivers (Ravi, Beas, Sutlej) to India for unrestricted use, and the three western rivers (Indus, Jhelum, Chenab) to Pakistan, with India allowed limited non-consumptive uses such as run-of-river hydropower, navigation, and specified irrigation.
- A **Permanent Indus Commission** meets, shares data, and tries to settle questions; differences can go to a Neutral Expert and disputes to a Court of Arbitration, with the World Bank in a procedural role.
- India built the Bhakra-Nangal, Pong, and Ranjit Sagar storages on the eastern rivers; Pakistan built Tarbela and Mangla on the western system, aided by replacement works funded after 1960.

Ecological implications

- Dividing a basin by river rather than by integrated environmental flow can starve some eastern-river stretches in India once diversions are complete, and it can ignore the delta's needs in Sindh.
- Glacier retreat, monsoon swings, and extra sediment change the volume the Treaty assumed in the 1950s, so both sides face floods and lean-season stress the text did not design for.
- Hydropower and storage on western rivers raise questions of fish, sediment, and downstream timing even when the design is run-of-river.
- Climate adaptation would need joint catchment care; hostility makes that ecology the first casualty.

Economic implications

- For Pakistan, the western rivers are the backbone of irrigation in Punjab and Sindh; any perceived cut is an existential farm and food issue.
- For India, the eastern rivers water Punjab, Haryana, and Rajasthan, while limited western-river hydropower is important for Jammu and Kashmir's electricity and flood moderation.
- Projects such as Baglihar and Kishanganga showed that design details (pondage, spillways, diversions) have large rupee and megawatt effects and therefore become legal fights.
- A Treaty that still delivers water on time is cheaper than a water war; a Treaty that is frozen can delay Indian storage and Pakistani certainty alike.

Political implications in a changing relationship

- The Treaty survived 1965, 1971, and Kargil, which made it a rare piece of functional bilateralism.
- After terror attacks and a general freeze in talks, New Delhi has spoken of reviewing or using its full Treaty rights, which Islamabad reads as coercive hydrology.
- Neutral Expert and arbitration tracks have themselves become political when one party resists a forum.
- Third-party World Bank involvement is a political cushion and also a reminder that the basin is not a purely bilateral quiet pond.
- Any collapse would hurt farmers first and would draw in China as an upstream Indus state, widening the geopolitics.

Way forward for the answer

- Narrate 1960 allocation and dispute machinery, then judge ecology (climate and delta), economy (irrigation and hydro), and politics (resilience versus weaponisation) together.

Flow diagram

IWT 1960 World Bank -> Eastern rivers India
IWT 1960 World Bank -> Western rivers Pakistan
Eastern rivers India -> Irrigation hydro data
Western rivers Pakistan -> Irrigation hydro data
Climate storage politics -> Strain on Treaty

Conclusion

The Indus Waters Treaty gave India the eastern rivers and Pakistan the western rivers, with a commission and third-party dispute path. It still underwrites farm economies, but ecological change and a colder relationship strain a 1960 bargain that assumed more trust and a more stable climate than the basin now has.

Open WRAP page — <https://wrapexams.com/upsc/mains-answers/gs-1/2016/present-an-account-of-the-indus-water-treaty-and-examine-its-ecological-economic-and-political-implications-in-the-context-of-changing-bilateral-relations/>

Q19 · 12 marks

Enumerate the problems and prospects of inland water transport in India.

GS I · 2016 · World's Physical Geography

Revision summary

India's rivers could carry bulk cheaply but lack year-round depth and modern terminals.

Silt, seasonal flow, low bridges, and poor rail-road links are the core problems.

NW-1 on the Ganga, NW-2 on the Brahmaputra, and NW-3 in Kerala are the main prospects.

Jal Marg Vikas and Bangladesh protocol routes can open the eastern hinterland.

Prospects hold only if dredging, bridge height, and multimodal cargo are maintained together.

Introduction

India has thousands of kilometres of rivers, canals, and creeks, yet inland waterways still carry only a thin slice of freight. The problems are depth, silt, seasonal flow, and weak last-mile links. The prospect is cheap, lower-carbon bulk movement if those gaps are closed.

Body

Problems of inland water transport

- Many rivers are seasonal; in the lean months draft is too shallow for a loaded barge, so operators cannot promise a year-round schedule.
- Silt from the Himalaya and from eroded catchments fills channels faster than dredgers can work, especially on the Ganga and Brahmaputra.
- Barrages, low bridges, and unplanned cables create air-draft and lock problems; a national waterway is not navigable if one span is too low.
- Night navigation aids, jetties, and terminals are few, so turnaround is slow compared with a railway siding.
- **Multimodal links are weak:** a barge that cannot meet a rail rake or a road truck at a modern terminal loses the cost advantage.
- Private fleet, trained crew, and cheap insurance are still thin; banks see inland shipping as a risky, monsoon-stopped business.
- Inter-state coordination, environmental clearance for dredging, and fishing or riverine community rights slow projects.
- Competition from rail freight corridors and highways, plus under-priced road diesel externalities, makes water look slower even when it is cheaper per tonne-kilometre on paper.
- North-East and delta creeks face security, border, and shifting-channel problems that plains canals do not.

Prospects if the system is built

- National Waterway-1 (Haldia-Allahabad/Prayagraj on the Ganga) can move coal, fly ash, foodgrain, and containers if least available depth is held and Varanasi-Sahibganj-Haldia terminals work.
- NW-2 on the Brahmaputra can cut the cost of reaching Assam if Bangladesh protocol routes stay open and dredging is honest.

- NW-3 in Kerala's west-coast canal, and later Goa and Maharashtra creeks, suit fertiliser, fuel, and local cargo where the sea is close.
- The Jal Marg Vikas Project and the Inland Waterways Authority of India give a policy spine that did not exist when only a few states ran ferries.
- Lower fuel use per tonne and less road congestion are real gains for coal to power plants and for construction material into cities.
- River tourism and passenger ferries, as in Kerala and on stretches of the Ganga, can subsidise some terminal overheads if safety is enforced.
- Protocol routes with Bangladesh turn the North-East from a dead end into a water-linked market.
- If freight corridors feed riverside terminals, inland water becomes the third leg of a logistics triangle, not a museum of steamers.

Conditions for the prospect to materialise

- Maintain depth as a public good, like a rail track, not as a one-time launch event.
- Fix bridge heights and locks in the same plan as dredging.
- Give barge operators a stable tariff and a working multimodal law so cargo books a river leg by default for bulk.

Way forward for the answer

- List silt, seasonality, structures, terminals, and multimodal gaps as problems; list NW-1 to NW-3, Jal Marg Vikas, Bangladesh protocols, and bulk cargo as prospects.

Flow diagram

Silt seasonal draft low bridges -> Low IWT share

Terminals multimodal fleet -> Low IWT share

NW1 NW2 NW3 Jal Marg -> Cheaper bulk freight

Bangladesh protocol -> Cheaper bulk freight

Conclusion

Inland water transport in India is held back by shallow seasonal channels, silt, low bridges, and weak terminals. The prospect is substantial for bulk and North-East cargo if National Waterways keep depth, join rail and road, and treat the river as a working track rather than a ceremony.

Open WRAP page — <https://wrapexams.com/upsc/mains-answers/gs-1/2016/enumerate-the-problems-and-prospects-of-inland-water-transport-in-india/>

Q20 · 12 marks

In what way micro-watershed development projects help in water conservation in drought-prone and semi-arid regions of India?

GS I · 2016 · World's Physical Geography

Revision summary

A micro-watershed is a small catchment managed ridge to valley.

Trenches, bunds, farm ponds, and check dams turn a short rain into soil moisture and well recharge.

The method fits Deccan hard rock and Rajasthan semi-arid belts that lack large rivers.

Village rules against ridge grazing and over-pumping decide whether the water stays.

Structures without upkeep silt up and do not abolish a true rain failure.

Introduction

Drought-prone and semi-arid belts, from the Deccan trap to Rajasthan, Bundelkhand, and parts of Telangana and Karnataka, get rain in a few violent spells. A micro-watershed treats a small catchment so that rain is slowed, spread, and sunk instead of running off as a flash flood and a dry well.

Body

What a micro-watershed is

- A watershed is the land that drains to a common point; a micro-watershed is a small unit, often a few hundred to a couple of thousand hectares, that a village can actually manage.
- **The method is ridge to valley:** treat the top first so that lower bunds are not buried by untreated runoff.
- In semi-arid India the aim is not a large reservoir so much as soil moisture, a recharged dug well, and a longer green period for crops and grass.

How the works conserve water

- Contour trenches, bunds, and graded bunds on the ridge intercept sheet flow, raise infiltration, and cut gully start.
- Vegetative filters, grassed waterways, and tree lines increase roughness so water stays on the land extra hours.
- Farm ponds and sunken pits store a part of the shower for protective irrigation at flowering, which is often the difference between a crop and a failure.
- Check dams, gabions, and nala bunds in the drainage line slow the stream, drop silt, and push water sideways into the aquifer.
- Repair of tanks and khadins, as in Rajasthan, uses traditional storage that fits sandy and rocky catchments.
- In-situ moisture practices-broad-bed furrow, mulching, and compartmental bunding-keep the rain in the root zone even without a big structure.
- Reduced runoff also means less soil loss, so the sponge of the field improves year after year, which is water conservation as land conservation.

Why this fits drought-prone and semi-arid regions

- These regions cannot count on glacier rivers; they must live on local rain.

- Hard rock Deccan and granite belts have limited aquifers; recharge through many small structures beats one deep bore that goes dry.
- Success stories from Ralegan Siddhi, Hiware Bazar, and many IWDP/IWMP blocks show wells rising and tanker visits falling when the village stops free grazing on the ridge and maintains the bunds.
- Livestock get more fodder from treated commons, which reduces distress sale in a drought year.

Limits and conditions

- A check dam without ridge treatment silts up; the project then looks like construction, not conservation.
- Upstream pumping can steal the recharged water if wells are not socially regulated.
- Very low rainfall years still fail; micro-watersheds reduce the frequency of misery, they do not abolish drought.
- Women's groups and landless users must share tank and well water, or the project only helps the larger farmer at the valley bottom.

Way forward for the answer

- Define the small catchment, list trench-bund-pond-check dam as the water path, and tie it to Deccan and Rajasthan drought belts with the warning about silt and equity.

Flow diagram

Ridge trenches bunds trees -> Slower runoff more infiltration
Slower runoff more infiltration -> Valley ponds check dams
Valley ponds check dams -> Soil moisture recharged wells
Soil moisture recharged wells -> Less drought tanker dependence

Conclusion

Micro-watershed projects conserve water in dry India by catching rain on the ridge, storing it in soil, ponds, and nalas, and feeding wells from the same shower that used to leave as a flood. They work when the village maintains the chain and shares the recharge, not when a single dam is dumped in the valley.

Open WRAP page — <https://wrapexams.com/upsc/mains-answers/gs-1/2016/in-what-way-micro-watershed-development-projects-help-in-water-conservation-in-drought-prone-and-semi-arid-regions-of-india/>

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

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