Q 1. Do you think river interlinking is the most suitable way forward for water management in India? Critically examine.

Approach:

As the directive here is critically examine, it is necessary to cover various angles and arrive at a fair judgment. In the introduction explain what is river interlinking or National River Linking programme. In the main body part give both sides views regarding river water interlinking. Adding a way forward with supplementary techniques to address the issue is necessary.

Introduction:

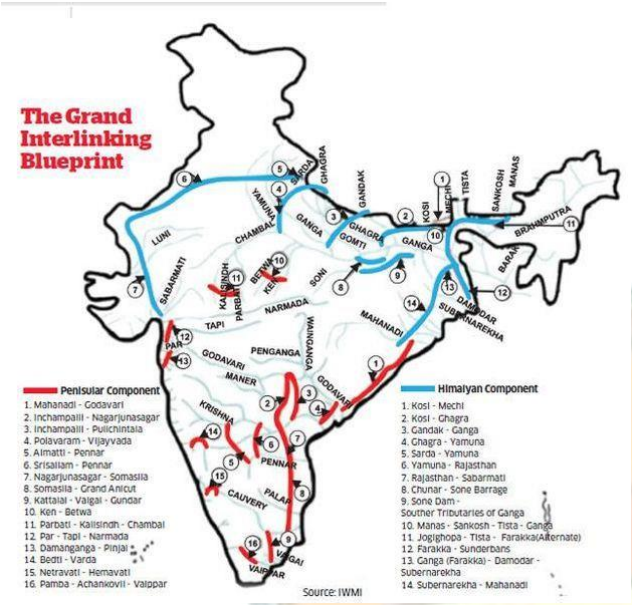
The river interlinking, envisages the transfer of water from water 'surplus' basins where there is flooding, to water 'deficit' basins where there is drought/scarcity, through inter-basin water transfer projects.

Body:

The National River Interlinking Project (NRLP) is such a project. NRLP will comprise of 30 links to connect 37 rivers across the nation through a network of nearly 3000 storage dams to form a gigantic South Asian Water Grid. It includes two components, Himalayan Rivers Development Component and Southern Water Grid.

Pros of river interlinking for water management in India:

- Hydropower generation: This project envisages the building of many dams and reservoirs. For instance, NRLP can generate about 34000 MW of electricity if the whole project is executed.
- Round the year water availability: River interlinking will help in dry weather flow augmentation. That is when there is a dry season, surplus water stored in the reservoirs can be released. This will enable a minimum amount of water flow in the rivers.
- Irrigation benefits: River interlinking project will provide irrigation facilities in water-deficient places. For instance, Indian agriculture is primarily monsoon-dependent. This leads to problems in agricultural output when the monsoons behave unexpectedly. This can be solved when irrigation facilities improve.
- River interlinking project will also help commercially because of the betterment of the inland waterways transport system. For instance, as shown in Map 1, it will help to have intricate network of rivers across India where NRLP will implement river interlinking. Thereby it will increase transportation capacity.
- Moreover, the rural areas will have an alternate source of income in the form of fish farming, etc. It will also augment the defence and security of the country through the additional waterline defence.



Map 1: National River Interlinking Programme

Cons of River Interlinking Programme:

- Ecological issues: One of the major concerns is that rivers change their course in 70–100 years and thus once they are linked, future change of course could create huge practical problems for the project.
- Aqua life: A number of leading environmentalists are of the opinion that the project could be an ecological disaster. There would be a decrease in downstream flows resulting in reduction of fresh water inflows into the seas seriously jeopardizing aquatic life.
- Deforestation: Creation of canals would need large areas of land resulting in large scale deforestation in certain areas.
- Areas getting submerged: Possibility of new dams comes with the threat of large otherwise habitable or reserved land getting submerged under water or surface water. Fertile deltas will be under threat, with coastal erosion expected to threaten the land and livelihoods of local economies that support 160 million people.
- Displacement of people: As large strips of land might have to be converted to canals, a considerable population living in these areas must need to be rehabilitated to new areas.
- Dirtying of clean water: As the rivers interlink, rivers with dirty water will get connected to rivers with clean water, hence dirtying the clean water.
- Disrupting of ecological flow for instance, on implementation of NRLP, water discharge in 23 out of 29 rivers will reduce considerably, they say. The Ganga will see a 24% decrease in flow. Its tributaries Gandak (-68%) and Ghaghara (-55%) will be the worst affected.
- While the Brahmaputra will see only a 6% loss, its tributaries will see massive flow reductions: Manas (-73%), Sankosh (-72%) and Raidhak (-53%). Changes in water flow and trapping of silt in reservoirs will see a dip in the sediment deposited by rivers.

This raises questions about India's Rs. 11 lakh crore ($165 billion) plan to transfer water from "surplus" to "deficit" basins. However, Australia's failure of Snowy River Scheme where Australia ended up destroying-the river's wetland habitat in its lower reaches is cited by the conservationist as a North star to not to give green signal to this project. Due to these reasons river interlinking can't be the only solution to address the water management issue. Following alternative methods also needs to implemented.

Alternatives for water management in India:

- Local solutions (like better irrigation practice) and watershed management, should be focused on. For instance, Artificial glaciers in the regions of Ladakh can be one such example. It resulted in significant increase in agricultural production, thereby increasing income of the locals.
- Farm ponds, filled during rainy season, can effectively act supplementary to tubewells and canals, leading to lesser stress on both govt and farmer. For instance, Maharashtra's Jalyukt Shivar is such a scheme.
- The Bundelkhand region of central India is the hotspot of water scarcity. Bundelkhand. Project Bhujal specifically aimed in rejuvenating the watershed and it created a storage capacity of 100 million liters of water. After this intervention the cropping intensity increased up to 30% and there was a significant increase the ground water recorded up to 2 to 5 meters.
- The government should alternatively consider the National Waterways Project (NWP) which "eliminates" friction between states over the sharing of river waters since it uses only the excess flood water that goes into the sea unutilized.

Conclusion:

With a bird's eye view it seems river interlinking has the potential to address the water stress issue of India. However, it is necessary to look at this issue on the basis of necessity and feasibility of river-interlinking. Most suitably it should be seen on case to case basis, with adequate emphasis on easing out federal issues. Besides as a supplementary measure we can incorporate traditional water harvesting and water management techniques which will help India to have a water security.

2. Comment on India's recent achievements on the front of border infrastructure expansion. What benefits would accrue with such expansion? Examine.

Approach - It expects students to write about recent border infrastructure expansion and how it will be beneficial in border security management in coming days.

Introduction

India shares its border with seven different countries. Most of these borders are man-made and do not follow any natural barrier. India's vast coastline and island territories also make it open to attacks and infiltration. In addition, political instability, cultural radicalism and patronage of mafia and terrorism in the few neighbouring countries make border management an important aspect to guard India's sovereignty.

Body

India's recent achievements on the front of border infrastructure:

- Bridge construction: Defence Minister Rajnath Singh inaugurated 44 major bridges at strategic locations along the western, northern and north-eastern borders. This included eight major bridges in Ladakh and Arunachal Pradesh each, along with 28 other bridges located across different border sectors.
- Tunnel construction: Atal Tunnel in Rohtang, which is the highest altitude tunnel in the world and has strategic significance. The tunnel was constructed using drill and blast NATM (New Austria Tunnelling Method) techniques. 10 new such tunnel construction has been planned.
- Infrastructure Development along the LAC: India is close to completing a major upgrade of border roads, including a strategic military-use road that connects an airfield at Daulat Beg Oldie in the northern tip of the western sector with the villages of Shyok and Darbuk toward the south.
- Frontier highways: Roads spread across Jammu & Kashmir, Ladakh, Himachal Pradesh, Uttarakhand, Arunachal Pradesh and Sikkim — BRO has reportedly completed 40 roads and 12 more roads will be completed by March 2021. For example Chardham project.
- Comprehensive Integrated Border Management System: The CIBMS is a robust and integrated system that is capable of addressing the gaps in the present system of border security by seamlessly integrating human resources, weapons, and high-tech surveillance equipment.
- The Border Area Development Programme (BADP): Under BADP, for projects in areas of States/UTs inhabited along the Indo-China border i.e. Arunachal Pradesh, Himachal Pradesh, Ladakh, Sikkim and Uttarakhand. The fund is distributed to the Border States and Union Territories (UTs) depending on various criteria such as the length of the international border and population.

Benefits of border infrastructure projects:

- Bridges will facilitate faster movement of heavy civil and military traffic in the border areas, provide connectivity to the border population and aid in the

faster deployment of troops when needed in sectors of strategic importance. For example project Sampark of BRO.

- DS-DBO road greatly facilitates the lateral movement of Indian forces along the western sector, reducing travel time by 40%.
- The tunnels are being built in areas where road traffic is disrupted every year for up to six months due to heavy snowfall during the winter months. The opening of the tunnels will enable the rapid movement of troops throughout the year, even in winter months.
- CIBMS has three components which are using a number of different devices for surveillance, efficient and dedicated communication network and data storage for a composite picture. Sensors like Thermal Imager, Unattended Ground Sensor (UGS), Fibre Optical Sensors, Radar, Sonar, satellite imagery are used in CIBMS.
- Under BADP the projects for developing strategically important villages and towns in border areas will be given priority. Construction of roads, bridges, primary schools, health infrastructure, playfields, irrigation works, etc. will be undertaken within 10 km of the border.

Way forward :

- Improving the functionality and efficiency of BRO: with Manageable Workload, Greater Financial Autonomy, Delinking Pay and Allowances, Higher Incentives and changes in the organisation structure in order to meet the deadlines.
- Leveraging technology: Integrated command and communication centres, scaling up of CIBMS, use of AI and moving a step closer to smart border management as recommended by Madhukar Gupta committee.
- Cross-border cooperation (CBC): The core principle of cross-border cooperation (CBC) is the information sharing and collaborative approach between neighbouring countries for border security threats like human trafficking arms smuggling, terrorist threats, etc.

Conclusion

Work on critical border infrastructure such as roads and bridges has gone up by nearly 75 per cent across seven states and union territories sharing borders with China and Pakistan in the last two years, defence ministry data has showed. The creation of infrastructure would help integrate these areas with the hinterland, create a positive perception of care by the country and encourage people to stay on in the border areas leading to safe and secure borders.

3. What is the 'Blue Flag' certification of beaches? Explain. Why was it in news recently? Discuss.

Approach:

Students are expected to write about the 'blue flag' certification in first part and discuss its recent significance in Indian context.

Introduction:

Blue Flag is awarded by the Denmark-based non-profit Foundation, Foundation for Environmental Education (FEE). The award is given to the safest, cleanest, and environment-friendly beaches of the world. Recently India became the first country in the world to receive the Blue Flag Certification for 8 beaches in a single attempt. This is a global recognition of India's conservation and sustainable development efforts

Body:

Blue Flag Certification:

- The 'Blue Flag' is a certification that can be obtained by a beach, marina, or sustainable boating tourism operator, and serves as an eco-label.
- It is awarded annually to beaches and marinas in FEE member countries. Blue Flag beaches are considered the cleanest beaches of the world.
- The Blue Flag programme was started in France in 1985. It promotes sustainable development in freshwater and marine areas through four main criteria those are Water quality, Environmental management, Environmental education, Safety.
- Forty-seven countries currently participate in the program, and more than 4000 beaches, marinas, and boats have this certification worldwide.

Recently, India is the first country in "Asia-Pacific" region which has achieved this feat in just about 2 years' time whereas Japan, South Korea and UAE are the only other Asian nations who have been conferred with a couple of Blue Flag beaches, however, in a time frame of about 5 to 6 years.

However according to the new notification, few activities and facilities would be permitted in the CRZ in order to meet the requirements of Blue Flag certification.

- Minimum distance: 50 meters from the High Tide Line (HTL) area was under imposition for development on the beach as per the earlier CRZ guidelines which is now changed to 10 meters from the High Tide Line.
- Infrastructure development permitted on Beaches: India has permitted certain types of development on beaches focusing on the criteria of blue flag certification such as Portable toilet blocks, change rooms and shower panels, Solid waste management plant, Solar power plant, Purified drinking water facility, Beach access pathways, Outdoor play / fitness equipment, CCTV surveillance and control room, First aid station, environment information

boards and other signages, Other associated facilities or infrastructure, as per requirements of Blue Flag Certification.

- New initiatives by Government: To take this project forward India has launched its own eco-label BEAMS (Beach Environment & Aesthetics Management Services) under ICZM (Integrated Coastal Zone Management) project which is an attempt to achieve sustainability.

Although Blue Flag is the most popular eco-award, however there are certain issues which are harmful for the environment

- High levels of human influence: The beaches are not characterized for their naturalness; instead they show high levels of human influence and artificialization. There are lot of services for the humans, but no real management for the conservation of the naturalness of the beach.
- Detrimental to beach ecosystem: The concession of Blue Flag award is strictly focused on services offered to the users of the beach, they do not take in account of environmental and ecological issues related to the behaviour of beaches as fragile systems. Ultimately it will cause damage the fragile species of beach ecosystem.

Conclusion:

India has now entered the bloc of 50 "BLUE FLAG" nations. The central government is planning to take this journey forward to 100 such beaches in the country in the next five years. As the ocean hosts the world's largest connected ecosystem and provide an increasing amount of energy, food, materials to the society, development of beaches in line with the sustainable development goals will ensure healthy and productive marine environment.

4. What is the National Infrastructure Pipeline (NIP)? What are its intended benefits? Examine.

Approach:

It expects student to write about – in first part write about what is National Infrastructure Pipeline – in second part write different intended benefits of National Infrastructure Pipeline – in the end write few challenges before it.

Introduction:

Recently, the Government has released a report of the task force on National Infrastructure Pipeline for 2019-2025. To augment infrastructure and create jobs in the country, the government task force on National Infrastructure Pipeline (NIP), which in its report projected total investment of Rs 111 lakh crore in infra projects over five years. It said that 18 per cent of the targeted investment is expected to be made in the road sector.

Body:

National Infrastructure Pipeline (NIP):

- NIP is a first-of-its-kind initiative to provide world-class infrastructure across the country and improve the quality of life for all citizens.
- It will improve project preparation, attract investments (both domestic & foreign) into infrastructure, and will be crucial for attaining the target of becoming a $5 trillion economy by FY 2024.
- Covers both economic and social infrastructure projects.
- During the fiscals 2020 to 2025, sectors such as Energy (24%), Roads (19%), Urban (16%), and Railways (13%) amount to around 70% of the projected capital expenditure in infrastructure in India.
- It has outlined plans to invest more than ₹102 lakh crore on infrastructure projects by 2024-25, with the Centre, States and the private sector to share the capital expenditure in a 39:39:22 formulas.

There are following intended benefits of NIP:

- It is estimated that India would need to spend $4.5 trillion on infrastructure by 2030 to sustain its growth rate. The endeavour of the National Infrastructure Pipeline (NIP), is to make this happen in an efficient manner.
- Well-planned NIP will enable more infrastructure projects, grow businesses, create jobs, improve ease of living, and provide equitable access to infrastructure for all, making growth more inclusive.
- Well-developed infrastructure enhances level of economic activity, creates additional fiscal space by improving revenue base of the government, and ensures quality of expenditure focused on productive areas.
- National Infrastructure Pipeline will ensure that infrastructure projects are adequately prepared and launched. It will provide better view of project supply, provides time to be better prepared for project bidding, reduces aggressive bids/

failure in project delivery, ensures enhanced access to sources of finance as a result of increased investor confidence.

- It will strengthen agricultural and rural infrastructure. Irrigation and rural infrastructure projects would account for 7.7 lakh crore each.
- It will further increase the connectivity in India, especially in rural areas. Road projects will account for Rs. 19.63 lakh crore while another Rs. 13.68 lakh crore would be for railway projects.
- There is a lack of private investment due to ongoing NPA crisis and lack of credit creation in the economy. So the government needs to invest from its own resources to give a push to the economy

However, following challenges needs to addressed:

- Credit availability is the biggest challenge in the backdrop of the NPA crisis. Envisaged Private sector participation in capital expenditure (22%) may largely suffer due to this.
- State governments' financial commitment may not be realised because of fiscal concerns. Presently, more than 20 states already have a debt-GSDP ratio of above 25 per cent.
- Land acquisition is a big challenge for the completion of infrastructure projects.

Conclusion:

Availability of quality infrastructure is a prerequisite to achieve broad-based and inclusive growth on a sustainable basis. If the concerns regarding fiscal availability are addressed properly, National Infrastructure Pipeline would be a massive exercise to realise the vision of becoming a 5 trillion $ economy by 2024.

5. Examine the significance of rural infrastructure schemes for the economy.

Approach:

It expects student to write about – in first part write about significance of rural infrastructure schemes for the economy – in second part write about different rural infrastructure schemes (you can also write first and second part as one) – in third part write challenges before it – in end write few way forwards.

Introduction:

Infrastructure plays a critical role in the economic development of any country. Presently 65% of India's population resides in its rural areas. If we talk about rural infrastructure in the country, then it is crucial for agriculture, agro-industries and poverty alleviation in the rural areas.

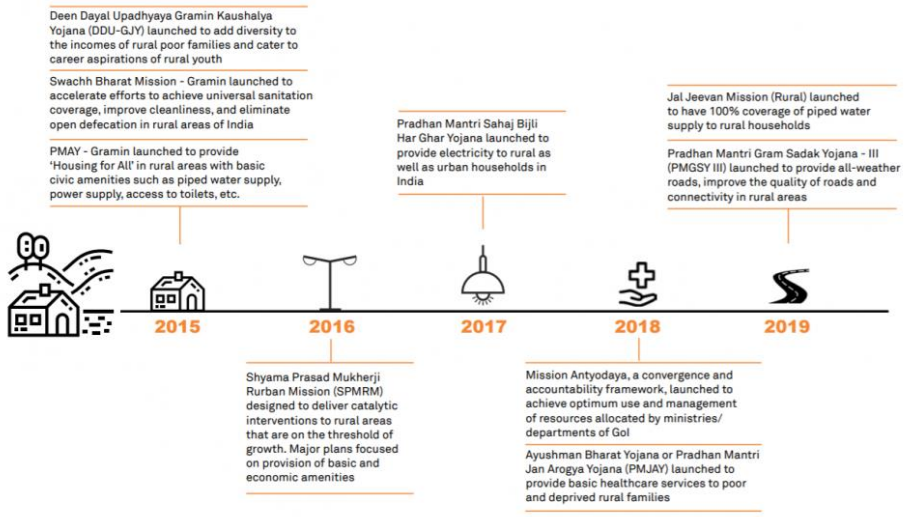
Body:

Significance of rural infrastructure schemes for the economy:

- Basically, rural infrastructure has the potential to provide basic amenities to people that can improve their quality of life. To give an example, development of rural infrastructure can lead to improved access to market centres for the rural producers, better availability of inputs and raw materials at reduced prices and improved mobility.
- Rural road infrastructure scheme: It provides mobility and connectivity to people living in rural areas. It also provides the much needed boost to agricultural activities by making available water, seeds and other raw materials to the farmers. By improving connectivity, rural roads also enhance employment opportunities for the rural people in non-agriculture sector, thereby, increasing livelihood opportunities. Rural roads also ensure that the rural areas are served with better public services and all the benefits offered by the state reach the far-flung areas easily. They can even provide access to education and health services.
- Rural electrification infrastructure scheme: It basically caters well to the requirements of agriculture and other activities including irrigation pumpsets, small and medium industries, khadi and village industries, cold storage chains, healthcare and education
- Rural water supply scheme: It can lead to sustainability of systems and sources and tackle the problem of water quality, thereby, increasing good health of people.
- Rural housing infrastructure scheme: It has the potential to improve living standard of the people.
- Overall and as per various studies, development of rural power, irrigation, water, sanitation and road infrastructure can increase productivity, savings, income and tourism and result in better jobs and health of rural people.

Keeping all the above factors in mind, the government of India (GoI) has initiated critical schemes for the upliftment of rural infrastructure. Such as:

- Pradhan Mantri Awas Yojana (PMAY - Gramin): Providing Housing for All by 2022. PMAY-G aims to provide pucca (permanent) houses and other basic civic amenities such as piped drinking water, power supply and Liquefied Petroleum Gas (LPG) connection in convergence.
- Pradhan Mantri Gram Sadak Yojana (PMGSY): Improving rural connectivity, by providing all-weather roads to connect eligible habitations in rural areas. As on December 31, 2019, road length worth Rs. 2.9 lakh crore had been sanctioned and expenditure of Rs. 2.17 lakh crore incurred.
- Jal Jeevan Mission (JJM): Providing Functional Household Tap Connection (FHTC) to every rural household i.e., Har Ghar Nal Se Jal by 2024.



There have been several factors that have posed a challenge to development:

- Land availability: There is a continuous tussle for land for agriculture, agro-based industries, and housing in the rural areas, which is a severe constraint to meet the housing demands of the rural population. This implies that the vision of 'Housing for All' will require acquisition/ supply of large land parcels on a regular basis.
- Inadequate financing: Inadequate access to formal sources of finance for the rural population has been an issue in the rural housing sector. Lack of proper documentation/ steady source of income for rural population has been a hindrance in securing formal finance.
- Legal constraints: There is a barrier for major players in real estate in tapping the vast land potential in rural areas reinforced by poor enforcement of laws against encroachment of public lands. There is an absence of clear titles to private lands causing an artificial scarcity of land in rural areas. Another major issue is the absence of large-scale digitisation of land records and easy access to such records for checking land-holding titles.
- Poor condition of rural road network: India has one of the largest and densest rural road networks around the world. However, 2.7 million kilometres of rural road network is in poor condition. At present, most of the rural roads are not all-weather roads and lack connectivity to remote areas.

Several reforms that are identified as imperative in the development of Rural infrastructure are as follows:

- Boosting rural affordable housing to ensure 'Housing for All by 2022': However, for the affordable housing initiative to succeed there needs to be efficient land usage and easy access to finance and innovative financing mechanism. For that the government is setting up an affordable housing fund in the National Housing Bank (NHB) that can be funded from the priority sector lending shortfall.
- Improving condition of roads under PMGSY: All roads to be covered by five-year maintenance contracts, to be entered into along with the construction contract with the same contractor in accordance with standard bidding document (SBD). Policy Framework for road maintenance by National Rural Infrastructure Development Agency in collaboration with the International Labour Organization (ILO) to be implemented on a state level. Ensuring greater fund availability, acknowledging feedback from the Meri Sadak App and Improving last-mile connectivity in rural areas.
- Improving coverage of basic civic amenities: By increasing accountability of GPs by decentralising service delivery model, improving the capacity of local government to undertake and implement quality infrastructure projects in the rural areas. And Creating awareness among the rural population regarding user charges/ fees for quality services/ amenities.
- Improving supply of drinking water: By bringing structural changes in the regulatory environment, a shift is needed in the institutional framework of the Central Water Commission (CWC) and the Central Groundwater Board (CGWB) to make water management more holistic and multidisciplinary. Restructuring and unifying the CWC and CGWB to form a new National Water Commission (NWC). A model law on water resource regulatory mechanisms can also be drafted and implemented on state level.

Conclusion:

Rural infrastructure can give impetus to overall growth and special need of Atmanirbhar Bharat can be fulfilled by bringing 69% of Indian population together with good infrastructure connectivity of all sorts.