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CLASS NOTES
WAINGANGA RIVER LINKING

AUTHORITY

- In the year 1980, the erstwhile Union Ministry of Irrigation & the Central Water Commission (CWC) formulated a National Perspective Plan (NPP) for Water Resources Development in the country which comprises two components: (i) Himalayan Rivers Development Component; and (ii) Peninsular Rivers Development Component.
- The National Water Development Agency (NWDA) was set up by the Government of India as an Autonomous Society under the then Ministry of Irrigation on 17th July, 1982 to study the feasibility of the proposals of inter linking of rivers under Peninsular Rivers Development Component of NPP and give concrete shape to these proposals.
- Subsequently in 1990, NWDA Society resolved to take up the studies of the Himalayan Rivers Development Component of NPP also.
- On 28th June, 2006, preparation of Detailed Project Reports (DPRs) of link projects under NPP & pre-feasibility / feasibility reports of Intra-State links as proposed by States were also included in the functions of NWDA.
- Accordingly, the then Ministry of Water Resources (MoWR) dated 30th November, 2006 has modified the functions of NWDA Society.
- NWDA requested all the State Governments to identify the intra-state link proposals in their States & send details to NWDA for taking up pre feasibility/feasibility studies.
- The functions of NWDA were further modified on 19th May, 2011 to undertake the work of preparation of DPRs of Intra-State links also which was published in the Gazette on 11th June, 2011.
- River linking in water short Vidarbha region comprising three links viz. (i) Kanhan–Wardha, (ii) Wainganga-Nalganga-Purna-Tapi and (iii) Indravati-Wardha & WardhaPenganga-Purna (Tapi) was one such proposal.
- These proposals have been reviewed by NWDA in light of deficit areas, length of conveyance system and total lift involved and finally arrived to a comprehensive proposal viz., "Wainganga (Gosikhurd) – Nalganga (Purna Tapi)" to divert water from the ongoing Gosikhurd Project on Wainganga river to serve the water stressed areas in Wainganga, Wardha and Tapi basins of Vidarbha region
- The proposed Wainganga (Gosikhurd) - Nalganga (Purna Tapi) link project as per DPR envisages diversion of 1772 Mm3 from the ongoing Gosikhurd (Indira Sagar) project (first National Project in the country) on Wainganga river in Pranhita sub-basin of Godavari basin for extending irrigation, domestic and industrial water supply benefits in six districts of Vidarbha region of Maharashtra State. viz. Nagpur, Wardha, Amravati, Yavatmal, Akola & Buldhana before out falling into Nalganga project on Nalganga river in Tapi basin.

VIDARBHA REGION

- Vidarbha is the eastern region of Maharashtra State made up of Nagpur and Amravati divisions. It comprises eleven districts: Amravati, Akola, Buldhana, Washim and Yeotmal in Amravati division while Nagpur, Wardha, Bhandara, Gondia, Chandrapur and Gadchiroli in Nagpur division.
- Vidarbha region is not so developed in irrigation in comparison to the rest of Maharashtra.
- Though, the region occupies 31.62% of the State's geographical area, the cultivable area is only 25.29% while the surface water resources constitute to only about 17.38% of the State.
- The irrigation backlog in Vidarbha region in relation to the State's average of 60.27% (2012) is about 11.85 lakh ha, out of which 9.97 lakh ha is in the Amravati division itself.
- Due to non-availability of canal irrigation facilities in the upland areas , the farmers depend mainly on rainfall & groundwater for irrigation.
- The link canal will bring additional areas under irrigation in the Vidarbha region to an extent of 371277 ha besides providing drinking and industrial water supply.
- The link canal envisages to serve the command areas lying in upper reaches through pumping and feeding storages/tanks, which could not possibly be served through conventional projects.
- The scheme will help in removing the backlog in irrigation development in Vidarbha region by meeting the demands of one of the most water short areas in the country lying in Akola, Buldhana and Amravati districts apart from other three districts of Nagpur, Wardha and Yavatmal.
- This link project will thus bring economic prosperity to the acute water short, drought-prone command area lying in the vicinity of the link project in the Vidarbha region.
- The link canal takes off from the right flank of the ongoing Gosikhurd dam and traverses for a length of about 427 km through Nagpur, Wardha, Amravati, Washim, Akola and Buldhana districts of Maharashtra.

- It is proposed to bring 371277 ha of CA under irrigation in these districts (except Washim) besides Yeotmal district.
- In view of limitation of storage capacity at Gosikhurd, the diversion through the link project is planned only during the monsoon period (July to September).
- In order to store the water received through link canal during monsoon and subsequent utilisation in rabi season, about 40 enroute storages/tanks are planned to be integrated for extending the benefits in the command from the link canal.
- In order to negotiate the topography and feed the enroute storages/tanks, pumping of water is proposed at 6 locations on the main canal involving a total lift of 155 m (static), with an annual energy requirement of 839 MU.
- Besides, another 12 MU of energy will be required to pump waters from link canal into about five enroute tanks/storages proposed on higher ground.
- Vidarbha region occupies 31.62% of area & holds 21.3% of population of Maharashtra.
- It borders the State of Madhya Pradesh to north, Chhattisgarh to east, Telangana to south and Marathwada & Khandesh regions of Maharashtra to the west.
- Situated in central India, Vidarbha has its own rich cultural and historical background distinct from rest of Maharashtra.
- The region is famous for growing oranges and cotton. It holds two-thirds of Maharashtra's mineral resources and about 58% of its forest resources.
- However, it is less economically prosperous compared to the rest of Maharashtra. The largest town in Vidarbha is Nagpur.
- The area of interest is a part of Vidarbha region in eastern Maharashtra covering Bhandara, Nagpur, Wardha, Amravati, Washim, Yeotmal, Akola and Buldhana districts.
- The Gosikhurd dam (Indira Sagar project) across Wainganga river in Godavari basin is located at latitude of 20^{o} 52' 15'' N and longitude of 79^{o} 37' 00'' E near Gosikhurd village in Pauni tehsil of Bhandara district.
- The Wainganga (Gosikhurd) – Nalganga (Purna Tapi) link canal takes off from the Gosikhurd reservoir near Rajoli village & traverses through Nagpur, Wardha, Amravati, Washim, Akola and Buldhana districts before outfalling into the right flank of Nalganga reservoir.
- The Nalganga is a medium irrigation project constructed across the river Nalganga, a left bank tributary of river Purna Tapi of Tapi basin.
- The project is located between latitude of 20^{o} 45' 00'' N to 20^{o} 53' 00'' N and longitude of 76^{o} 11' 00'' E to 76^{o} 20' 00'' E downstream of village Sanglad in Motala tehsil of Buldhana district.
- On its path, the link canal crosses a number of rivers such as Amb, Veena, Krishna nala, Bor, Panchadhara, Dham, Wardha, Vidarbha, Pinjar, Katepurna, Gyan Ganga and Vishwaganga through major cross drainage works.

CLIMATE

- The average rainfall of the State is about 1150 mm of which nearly 88% occurs during monsoon period from June to October. Rainfall in Maharashtra Differs from region to region.
- Thane, Raigad, Ratnagiri and Sindhudurg districts receive heavy rains of an average of 2000 mm annually.
- But the districts of Nasik, Pune, Ahmednagar, Dhule, Jalgaon, Satara, Sangli, Solapur and parts of Kolhapur get rainfall less than 500 mm annually.
- Rainfall particularly concentrates to the Konkan and Sahyadri Maharashtra.
- Central Maharashtra receives less rainfall.
- However, under the influence of the Bay of Bengal, eastern Vidarbha receives good rainfall in July, August & September.
- The Wainganga river after its confluence with the Wardha river is called the Pranhita river.
- The Pranhita is one of the northern tributaries of the river Godavari in its middle reaches.
- The Pranhita sub-basin lies between latitudes 180 - 48' N and 220 - 43' N and longitudes 780 - 03' E and 800 - 53' E.
- Wainganga rises at an altitude of about 640 m in Seoni district of Madhya Pradesh, flows east for a short distance and then south for a length of about 274 km in Seoni and Balaghat districts of Madhya Pradesh and then a distance of about 334 km in Maharashtra before the tributary Wardha joins it.
- Pranhita, flow for a further distance of 113 km along the boundary of Maharashtra & Telangana before joining the river Godavari.
- The catchment area of the full Pranhita (including Penganga & Wardha) is 109079 km2 while that of the truncated Pranhita sub-basin is 61094 km2 (only Wainganga/Pranhita catchment excluding Penganga and Wardha), which is 19.53% of the Godavari basin.
- The catchment area lies in the States of Madhya Pradesh (24566 km2), Chhattisgarh (271 km2), Maharashtra (30100 km2) and Telangana (6157 km2)
- The Pranhita sub-basin covers Balaghat, Chhindwara, Seoni, Betul and Mandla districts of Madhya Pradesh; Rajnandgaon & Kowardha districts of Chhattisgarh; Nagpur, Bhandara, Gondia, Chandrapur and Gadchiroli districts of Maharashtra; and Adilabad district of Telangana.
- The Pranhita sub-basin is in the shape of a top draining the slopes of Satpura, Gaikhuri, Ambagarh and Ballahi ranges.

- Most of the terrain of the Wainganga river up to its confluence with the Bagh river is mountainous and the remaining is flat.
- The entire catchment area of the Pranhita sub-basin is full of ridges, valleys and low hill rangeS.

LINKING APPROVED

- The project, with an estimated cost of ₹87,342.86 crore, will irrigate around 3.75 lakh hectares of land, significantly benefiting drought-prone areas such as Marathwada
- In a significant decision aimed at transforming agriculture in regions plagued by farmer suicides, the Maharashtra government has approved the ambitious Wainganga-Nalganga river linking project.
- The project plans to channel water from the Godavari basin into the Wainganga river project in Buldhana district. To achieve this, a total of 426.52 kilometers of connecting canals will be constructed.
- The districts of Nagpur, Wardha, Amravati, Yavatmal, Akola and Buldhana in Vidarbha will benefit from irrigation, drinking water and industrial water supply across 15 talukas.
- Additionally, 31 storage tanks will be built to facilitate water usage during the Rabi season.
- The National Water Development Agency presented the detailed project report in 2018 and the project has since received approval from the Central Water Commission. It has also been included in the Integrated State Water Plan during the State Water Council meeting.
- In another decision, the council of ministers approved the imposition of a Rs 50,000 fine for cutting a tree without permission.
- The violation will lead to the seizing of equipment and the confiscating of the vehicle used for transporting chopped wood.
- Accordingly, the Maharashtra Tree Felling Act 1964 will be amended.
- 972 blocks with total area of 745914 km2 in 188 districts in the country are covered under Drought Prone Area Programme (DPAP) (as on 1.4.2008) as per Department of Land records, Ministry of Rural Development.
- Out of this, 149 blocks admeasuring 194473 km2 in 25 districts lie in Maharashtra itself.
- The districts of Akola, Washim, Amravati, Buldhana, Chandrapur, Gadchiroli, Nagpur and Yavatmal in Vidarbha are placed in the list.
- About 48183 km2 of area in these districts is computed to be drought prone
- In all these six districts, the groundwater in general is good and suitable for drinking and irrigation purpose, however with localized issues.
- In Nagpur district, localized magnesium, nitrate and fluoride contamination and high salinity hazard is observed
- In Akola and Amravati districts, the groundwater is not suitable for drinking and irrigation purpose in the saline areas of the Purna Alluvium.
- In Buldhana and Wardha districts, localized nitrate contamination is observed.
- In Yavatmal district, high fluoride (>1.5 mg/l) contamination in parts of Kelapur, Maregaon and Wani talukas is observed

MAIN COMPONENT OF THE PROJECT

- Head works at existing Gosikhurd reservoir across Wainganga river for a peak discharge of 347.2 cumec.
- The Link canal of length 426.54 km from Gosikhurd reservoir to Nalganga reservoir, comprising of open canal, pipe lines & tunnels
- Canal falls at two locations at RDs 302.93 km (7 m) and 426.43 km (6 m) to dissipate the available excess head and reduce quantum of filling
- Seven tunnels
- Outfall structures & Head regulators for integration of existing reservoirs of Lower Wardha and Katepurna
- Raising of six existing storages to accommodate link waters
- Command area development of about 371277 ha in Nagpur, Wardha, Yavatmal, Amravati, Akola and Buldhana districts
- Canal top solar power generation arrangement at appropriate reaches along the link canal alignment
- Outfall structure at existing Nalganga reservoir on Nalganga river, a tributary of Purna Tapi

BENEFITS OF THE PROJECT

- The link canal will provide irrigation benefits to about 371277 ha of new command area utilising 1286 Mm3 of water
- The link canal will provide 32 Mm3 of water for drinking water supply & 397 Mm3 of water to a no. of industries in the vicinity of the link project.
- Since there will be a diversion of 1772 Mm3 of water through the proposed link canal during the three monsoon months of July to September, which constitute the prime flood season, it is likely that the intensity of flood will be mitigated / reduced to that extent in the downstream.

PHASES OF DEVELOPMENT

- The development of the project can be planned in the following stages:

1. First stage of development from Gosikhurd to Lower Wardha
2. Second stage of development from Lower Wardha to Katepurna
3. Third stage of development from Katepurna to Nalganga

- Integration of storages/tanks with the link canal is the prominent feature of this project.
- There is striking contrast between eastern and western parts of Vidarbha.
- High rainfall and abundant water resources on eastern parts & low rainfall & shortage of water resources in western parts is a regular phenomenon.
- The percentage of irrigation in Vidarbha is abysmally low in comparison with rest of Maharashtra and India as a whole.
- Farmers are mostly dependent on open wells, which usually fail during dry years.
- The usual practice among the farming community is to irrigate the fields through pumping of water which often leads to groundwater depletion.
- All these factors suggest that a water resources development project like Wainganga (Gosikhurd) - Nalganga (Purna Tapi) link project is essential so as to provide the necessary impetus to the irrigation development in the Vidarbha region.
- The link project will fit well in contributing to the overall development of the region, like a spoke in the wheel.
- The Wainganga –Nalganga link project is basically an intra-state link project of Maharashtra that envisages diversion of a part of waters available at ongoing Gosikhurd dam across Wainganga river, which is allocated by Godavari Water Disputes Tribunal (GWDT) to the State of Maharashtra.
- The project will provide impetus to all-round development of the region and reduce the socio-economic imbalance by enhancing agricultural production and employment opportunities.
- Hence, good cooperation and wholehearted participation is anticipated from the beneficiary areas.

EXPERIENCE OF INTERLINKING

PERIYAR PROJECT

- The project is the most notable endeavour of the 19th century in transbasin diversion.
- The project involves transfer of water from Periyar basin to Vaigai basin.
- A masonry gravity dam of 47.28 m high has been constructed across a gorge on west flowing Periyar river.
- A 1,740 m long tunnel with a discharging capacity of 40.75 cumec has been driven across the mountain barrier to convey the water eastwards to Vaigai basin.
- The project was commissioned in 1895 and provided irrigation to an area of 57,923 ha initially, which has since been extended to 81,069 ha.
- There is also a power station of 140 MW capacity.

PARAMBIKULAM-ALIYAR

- The project is a complex multi-basin, multi-purpose project of seven streams; five flowing towards the west and two towards the east, which have been dammed and their reservoirs interlinked by tunnels.
- The project envisages transfer of water from Chalakudy basin to Bharathapuzha and Cauvery basins.
- The water is ultimately delivered to drought prone areas in Coimbatore district of Tamil Nadu and the Chittur area of Palakkad District of Kerala.
- The command area for irrigation is presently about 1,62,000 ha.
- Besides, there is a total power generation capacity of 185 MW at four power houses.
- This project was built during the second and third five year plans

KURNOOL- CUDDAPAH CANAL

- A private company started this scheme during the Colonial period in 1863.
- The project envisages transfer of water from Krishna basin to Pennar basin.
- A 8.23 m high anicut was built at Sunkesula village on the river Tungabhadra upstream of Kurnool town in Andhra Pradesh.
- A 304 km long canal with a capacity of 84.9 cumec at its head extends from Krishna to Pennar basin and irrigates an area of 52,746 ha.
- The scheme was taken over by the British Govt. in 1882.

TELUGU GANGA PROJECT

- This project has been implemented primarily to meet the pressing need of water supply to Chennai metropolitan area.
- It brings Krishna water from Srisailam reservoir through an open canal, first to Somasila reservoir in Pennar valley.
- From Somasila, the water is taken through a 45 km canal to Kandaleru reservoir and from there to Poondi reservoir in Tamil Nadu through another 177 km long canal.