EXECUTIVE SUMMARY

Long distance inter-basin transfer of water from water surplus basins to water deficit basins has been mooted in our country in order to reduce the imbalance in the water availability between various regions. A National Perspective Plan (NPP) was formulated in the year 1980 by the Union Ministry of Irrigation (now Ministry of Water Resources) and the Central Water Commission identifying a number of inter-basin water transfer links in respect of both Peninsular rivers and Himalayan rivers of the country. The Peninsular Rivers Development and the Himalayan Rivers Development components put together were expected to create an additional irrigation potential of 35 million hectares besides hydropower potential and other benefits.

The interlinking of Mahanadi - Godavari - Krishna - Pennar – Cauvery is one of the four parts of the Peninsular Rivers Development Component of the NPP. Amongst the Peninsular rivers, the Mahanadi and the Godavari have sizeable surpluses after meeting the existing and projected requirements within the basins. It is, therefore, proposed to divert the surplus waters of the Mahanadi and the Godavari to the water-short river basins viz., the Krishna, the Pennar and the Cauvery. Three water transfer links have been proposed connecting Godavari to Krishna, which form part of the interlinking. They are: (i) Inchampalli - Nagarjunasagar, (ii) Inchampalli - Pulichintala and (iii) Polavaram - Vijayawada. This report deals with the feasibility of the third link, i.e., diversion of a part of the surplus waters of Godavari from the proposed Polavaram reservoir to the Prakasam barrage on river Krishna through the Godavari (Polavaram) - Krishna (Vijayawada) link canal.

The National Water Development Agency (NWDA) has been carrying out water balance and other studies on a scientific and realistic basis for optimum utilisation of water resources for preparation of feasibility reports and thus to give concrete shape to the proposals of National Perspective Plan.

The objective of preparation of the feasibility report is mainly to facilitate firming up of the proposals and for discussions among the concerned States to arrive at broad agreements on the quantum of diversions and utilisations of water, sharing of cost and benefits, etc. This report has been prepared keeping in view the various comments offered by the governments of Andhra Pradesh, Madhya Pradesh and Karnataka on the Toposheet study and Pre- feasibility study of the Godavari (Polavaram) - Krishna (Vijayawada) link project.

The Godavari Water Disputes Tribunal (GWDT) award stipulates, among other provisions, transfer of 2265 Mm3 (80 TMC) of water from Godavari at Polavaram to Krishna above Prakasam barrage at Vijayawada, thereby displacing the discharges from Nagarjunasagar project for Krishna delta, and thus enabling the use of the above quantity for projects upstream of Nagarjunasagar. However, considering the possible full development of irrigation in the basin and projected in-basin uses for domestic and industrial requirements up to 2025 AD and also considering the proposed transfer of 6500 Mm3 from Mahanadi to Godavari through the Mahanadi (Manibhadra) - Godavari (Dowlaiswaram) link, it has been assessed by NWDA by simulation studies, that it is possible to transfer an additional quantity of 1236 Mm3 through the proposed Polavaram - Vijayawada link canal from Godavari to Krishna. An equal quantity of water can be made available for possible use in the water-short upper regions of Krishna basin by way of substitution.

Polavaram project has been formulated by the Government of Andhra Pradesh for the Utilisation of Godavari waters for irrigation and other benefits by creating a reservoir and canal systems at Polavaram about 42 km upstream of the existing Godavari barrage at Dowlaiswaram near Rajamundry. The Polavaram project will also cater to the transfer of 2265 Mm3 of Godavari waters to Krishna as agreed to by the States concerned and reflected in the GWDT award. A detailed project report on Polavaram project has been prepared by the Government of Andhra Pradesh. The project proposals include the construction of an earth-cum-rockfill dam across Godavari at Polavaram for creation of a reservoir of 2130 Mm3 live storage capacity; a Left Main Canal with a capacity of 250 cumec for providing irrigation to a CCA of 174978 ha and supplying 664 Mm3 to Steel Plant and other industries of Visakhapatnam; and a Right Main Canal with a capacity of 453 cumec for providing irrigation to a CCA of 139740 ha besides transferring 2265 Mm3 of Godavari waters to Krishna. The project also includes hydropower component for generation of 60 MW of firm power with an installed capacity of 720 MW.

The Polavaram - Vijayawada link canal now proposed by NWDA and detailed in this feasibility report will be incorporated in the Polavaram project of Andhra Pradesh. The link canal will replace the Right Main Canal of the Polavaram project. In fact the alignment of the link canal has been proposed to be the same as that of the Right Main Canal as proposed by the State Government.

The Godavari (Polavaram) - Krishna (Vijayawada) link canal takes off from the right bank of Godavari at the proposed Polavaram reservoir. The canal, after traversing 174 km, falls into river Budameru (which drains into Kolleru lake) at a point upstream of Velagaleru regulator. From the regulator, the canal water is let into the existing Budameru Diversion Channel, which after traversing 12 km, joins river Krishna at about 8 km upstream of the existing Prakasam barrage at Vijayawada. Diversion of 5325 Mm3 of water is envisaged through the canal. This will cater to: (i) transfer of 2265 Mm3 to the Krishna delta as committed under the GWDT award, (ii) en route irrigation requirement of 1402 Mm3, (iii) en route domestic and industrial requirements of 162 Mm3 and (iv) transmission losses of 260 Mm3. The remaining 1236 Mm3 of water will also be utilised for stabilising the existing ayacut under Krishna delta. With the quantity of 1402 Mm3 of water available for en route irrigation, an area of 139740 ha (CCA) will be benefited with 150% intensity of irrigation. The entire canal and the command areas lie in the State of Andhra Pradesh.

The total length of the link canal from Polavaram to Budameru will be 174 km. The canal will pass through West Godavari and Krishna districts of Andhra Pradesh. The design discharge at the head of the canal is 405.12 cumec. The canal will be of trapezoidal section and will be lined throughout its length. The bed width will be 68.5 m and full supply depth will be 4.9 m. The bed slope will be 1 in 20000. The link canal is proposed to be operated throughout the year.

The total cost of the Polavaram - Vijayawada link project including cost of command area development, but excluding the apportioned cost of head works i.e., Polavaram dam and appurtenant works, is estimated to be Rs. 148391 lakh at 1994-95 price level. The net value of annual benefits from irrigation in the en route command due to the project works out to Rs. 20110 lakh against the annual cost of Rs. 16462.74 lakh. Thus the B.C. ratio works out to 1.22.