FOREWORD

Based on revised mandate of National Water Development Agency (NWDA), preparation of Detailed Project Reports (DPRs) of intra-state water transfer link proposals as proposed by the States/UTs was taken up by NWDA.

The Govt. of Maharashtra submitted 20 proposals of intra-state links for assessing their feasibility by NWDA. River linking in water short Vidarbha region comprising three links viz. (i) Kanhan–Wardha, (ii) Wainganga-Nalganga-Purna-Tapi and (iii) Indravati-Wardha & Wardha-Penganga-Purna (Tapi) was one such proposal. These link proposals have been reviewed by NWDA in light of identified deficit areas, length of conveyance system and total lift involved and finally arrived at this comprehensive proposal “Wainganga (Gosikhurd) – Nalganga (Purna Tapi)” to divert water from the ongoing Gosikhurd Project on Wainganga river to serve the water stressed areas in Wainganga and Wardha sub-basins of Godavari basin and Purna Tapi sub-basin of Tapi basin in Vidarbha region. Most of the demands proposed by the State through the above three links have been taken care of in this proposal.

The Wainganga (Gosikhurd) – Nalganga (Purna Tapi) link project envisages to divert 1772 Mm$^3$ of water of Wainganga river from Gosikhurd to the deficit areas lying towards west of Vidarbha region in Maharashtra. The 427km long link canal on its way will feed 40 storages/tanks before outfalling into existing Nalganga reservoir on Nalganga river, a tributary of Purna Tapi river in Tapi basin for extending irrigation to a command area of 371277 ha with an annual utilisation of 1286 Mm$^3$ of water besides providing 32 Mm$^3$ towards domestic water supply and 397 Mm$^3$ for industrial water supply in the region.

The DPR of the Project has been prepared as per the “Guidelines for Preparation of Detailed Project Report of Irrigation and Multipurpose Projects of Ministry of Water Resources (2010)”. The DPR contains the details of various surveys and investigations such as topographical surveys, geotechnical and construction material surveys, geological investigations, solar power potential studies, archaeological surveys etc.

The co-operation and assistance received from the Water Resources Department of the Government of Maharashtra in various stages of
preparation of the DPR is thankfully acknowledged. My thanks are due to Central Water Commission (CWC), Central Soil & Material Research Station (CSMRS), Geological Survey of India (GSI), Archaeological Survey of India (ASI), Gujarat Energy, Research and Management Institute (GERMI) who were closely associated with various aspects of the investigations and studies of the DPR and provided necessary expert advice and technical assistance.

I compliment the concerned officers of NWDA, especially the Chief Engineer (HQ), the Chief Engineer (South), Hyderabad, the Superintending Engineer, Investigation Circle, Hyderabad and their team in Investigation Division, Nagpur with the able support from other Divisions at Chennai, Hyderabad and Bengaluru for their sincerity, devotion and hard work in completing this challenging task in the assigned time period.

It is hoped that the Govt. of Maharashtra as the Project proponent would pursue for the requisite statutory clearances and the Link Project will be taken up for implementation in the right earnest.

November, 2018
New Delhi

(M.K. Srinivas)
Director General, NWDA
PREFACE

Water is a precious natural resource and its development, conservation and use therefore, play a vital role in the country’s development planning. The water resources in the country are, however, limited. The rainfall in the country is mostly confined to monsoon season and is unevenly distributed with respect to both space and time. As a result, some parts of the country are affected by droughts whereas at the same time other parts are affected by floods. Within a State also, some areas are endowed with abundant water while other regions are gripped in acute water shortage. Vidarbha region in Maharashtra is one such water short region in the country. Water is further going to become a scarce resource in the near future due to continuous increase in population coupled with consequent increase in demand for water for various uses owing to progressive improvement in the living standards. So, it is imperative that the monsoon flood waters should be conserved in various storages and utilized for meeting various demands throughout the year through inter-basin, inter-state as well as intra-state link projects.

Vidarbha is the eastern region of Maharashtra State made up of Nagpur and Amravati divisions. 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 and ground water for cultivation.

Govt. of Maharashtra furnished 20 nos. of intra-state link proposals to NWDA to assess their feasibility. River linking in water short Vidarbha region comprising three links viz. (i) Kanhan–Wardha, (ii) Wainganga-Nalganga-Purna-Tapi and (iii) Indravati-Wardha & Wardha-Penganga-Purna (Tapi) was one such proposal. On review of these proposals, NWDA came up with “Wainganga (Gosikhurd) – Nalganga (Purna Tapi) link project”, a comprehensive proposal fulfilling almost all the objectives envisaged in the above three links.
Govt. of Maharashtra communicated to NWDA in April, 2015 to prepare the DPR of the Wainganga – Nalganga link project for diversion of 1912 Mm³ of water annually @ 75% dependability. Meanwhile, Water Availability study at Gosikhurd dam site has been reassessed by the Water Resources Department, Govt. of Maharashtra during November, 2016 and sent to CWC for further examination/vetting. CWC after examination finalized the surplus yield series at Gosikhurd during May, 2017. Duly considering the gross yield series as arrived by CWC, stipulated flows from MP, water needs in the catchment and computation of regeneration as per the TAC guidelines of NWDA, NWDA assessed the annual divertible quantum of water from Gosikhurd as 1772 Mm³ at 75% success rate through simulation, instead of 1912 Mm³.

The Wainganga (Gosikhurd) – Nalganga (Purna Tapi) link canal is proposed to take off from the right flank of the existing Gosikhurd reservoir on Wainganga river and traverses for about 426.54 km before outfalling into existing Nalganga reservoir on Nalganga river. In view of the limitation of Gosikhurd reservoir in meeting the rabi demands of the link project and lack of scope for creation of supplementary storage upstream of Gosikhurd, the envisaged diversion through the link project is planned only during the monsoon period. In order to store the link water during monsoon and subsequent utilisation in rabi season, about 40 enroute tanks/storages have been identified to be fed from the link canal. Out of these, in order to ensure effective functioning of the whole link system, two existing major projects viz., Lower Wardha and Katepurna are proposed to be integrated as balancing reservoirs, while 31 are newly proposed tanks, six involve raising of existing tanks to accommodate the link waters and one existing project- Bembla is used without any structural change. The proposed command area under the link project is 371277 ha with an annual utilisation of 1286 Mm³ of water. Besides, it is envisaged to provide 32 Mm³ towards domestic water supply in the command benefitting about 11.33 lakh people and 397 Mm³ for industrial water supply in the region. Thus, this project will immensely contribute to the prosperity of the Vidarbha.

The estimated cost of the project is Rs. 53752 crore (2017-18 price level) and Benefit Cost Ratio & Internal Rate of Return (IRR) work out to 1.74 & 9.50% respectively.
The Project Report has been prepared in four volumes as detailed below.

Volume – I  Main Report
Volume – II  Annexures
Volume – III  Appendices
Volume – IV  Drawings

The officers of Water Resources Department, Government of Maharashtra provided continuous support at each stage in the evolution of the link proposal as well as in preparation of the DPR through exchange of views and data. Their contribution in this regard is thankfully acknowledged.

Director General, NWDA continuously monitored the progress of Detailed Project Report of Wainganga – Nalganga link project and provided valuable guidance and advice which helped in timely completion of the DPR. His contribution in this regard is gratefully acknowledged. I sincerely acknowledge the role of Chief Engineer (HQ), NWDA, Director (Technical), NWDA, Superintending Engineer–I, NWDA and their team for their painstaking efforts in timely completion of the DPR.

I would also like to place on record my sincere thanks to officials working under Chief Engineer (South), NWDA, Superintending Engineer, Investigation Circle, Hyderabad, and Executive Engineers of Investigation Divisions, Nagpur & Chennai and their teams for their meticulous planning and untiring efforts due to which the DPR could be completed within the stipulated time. Thanks are also due to Shri R. Ramaraj, Ex. Executive Engineer, Investigation Division, NWDA, Chennai who has been associated in this task and contributed significantly in preparation of various chapters especially ‘Designs’ and ‘Cost-Benefit analysis’.

6 November, 2018
Hyderabad

(R.K. Jain)
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