

Detailed Project Report of Bedti–Varadalinkproject

Check List

I	GENERAL DATA	
1	Name of the project	Bedti–Varada link project
2	Location	Latitudes from 14 ⁰ 35' to 14 ⁰ 53' and Longitudes from 74 ⁰ 41' to 74 ⁰ 57'
a	State (s)	Karnataka
b	District (s)	Uttara Kannada, Raichur
c	Taluk (s)	1. Uttara Kannada(Sirsi, Yellapur) 2. Raichur(Manvi including Sirwar, Devadurga, Raichur)
d	Location of head works	Latitude (N) Longitude (E)
	Link-I	
	a) Pattanadahallaweir	14 ⁰ 40' 15'' 74 ⁰ 41' 18''
	b) Shalamalahallaweir	14 ⁰ 42' 26'' 74 ⁰ 48' 31''
	Link-II	
	c) Suremanebarrage	14 ⁰ 52' 53'' 74 ⁰ 47' 13''
e	Survey of India topo-sheets 1:50,000 Scale	48J/10,13,14
f	Earthquake zone	The project lies in Seismic Zone II as per the zoning map of India (IS 1893-2002,Part-I)
g	Complete address for correspondence along with pin code/e-mail	Superintending Engineer, National Water Development Agency, 1 st Floor, Mahatma Gandhi Markfed Bhavan, 5-2-68, Jambagh, Hyderabad. Telangana-500001. Ph: 040-24601209, 040-

		29804307 Email: sehyd-nwda@nic.in
3	Category of the project	
a	Irrigation or Multipurpose	Irrigation
b	Storage or diversion	Diversion
II	PLANNING	
4	Has the Master plan for overall development of the river basin been prepared and stages of basin development discussed?	This is a proposed link under Peninsular rivers development component of National Perspective Plan for interlinking of rivers formulated by Govt. of India. While planning the proposal, water requirement for all the uses in the catchments upto the proposed diversion sites in the ultimate stage of development are duly considered.
5	Have the alternative proposals (including set of smaller developments vis-à-vis a single large development) been studied and their merits and demerits discussed?	Yes. Discussed in Chapter-1: 'Introduction'.
6	Does the scheme fit in the overall development of the river basin and its priority in the overall development of the basin discussed?	Yes. As indicated vide item 4 above.
7	Have the other Departments concerned with the development been informed?	Yes.
8	Is the present scheme proposed to be executed in stages? If so, are its various stages of execution and development discussed in the report?	To be executed in single stage.
9	Are the effects of the scheme on the	Yes. The requirement of water

	riparian rights & existing upstream and downstream projects, etc. discussed?	for all the existing, ongoing, and future projects located in the catchment of Bedti basin upto the proposed diversion sites have been duly accounted for while arriving at the net inflow at weirs/ barrage.
10	Has the provision for municipal and industrial water supply been made?	The provision for domestic and industrial requirement up to 2050AD is made in the catchment of Bedti basin up to three diversion sites and is discussed under para 5.9 of Chapter 5. In Tungabhadra sub-basin, a part of diverted water is proposed to be used for domestic and industrial water supply in the command of Tungabhadra LBC.
III	INTERSTATE AND INTERNATIONAL ASPECTS	
11	Are there any International/Interstate issues involved? If so, have these issues been identified and present status of agreement or tribunal decision indicated specially in respect of this project.	No international issues are involved. However Interstate issues are discussed in Chapter-3 'Inter-state aspects'.
a	Sharing of water	Discussed in para 3.2 of Chapter-3.
b	Sharing of cost	Entire cost to be borne by Karnataka
c	Sharing of benefits (irrigation, flood control, power etc.)	As per the agreement to be executed among the riparian states in Krishna basin in accordance with KWDT Award.
d	Acceptance of the submergence by the upstream State (s)	Since the planned diversion is only from proposed weirs/barrage,

e	Acceptance by the upstream State(s) of compensation of land coming under submergence.	no submergence issue is involved. Also, the entire project area lies in Karnataka state.
f	Settlement of oustees	No habitations/people are affected.
IV	SURVEYS	
12	Have the detailed topographical surveys been carried out for the following items and maps prepared as per prescribed scales?	No. The present DPR has been prepared based on the survey of India toposheets and DEM data. However, the detailed surveys & investigations will be taken up at pre-construction stage.
	(a) River surveys	No. However, the carrying capacity of Varada river as part of CEIA will be assessed at pre-construction stage.
	(b) Reservoir surveys	Not required as no new reservoirs are proposed.
	(c) Head-works surveys (dam, dykes, barrages, weirs, etc., and auxiliary components)	Contour maps for weir and barrage diversion sites have been prepared using DEM.
	(d) Plant and Colonies sites	Covered in the contour plan for headworks.
	(e) Canals, branch canals and water distribution system	Using DEM data, contour maps for raising main, tunnels and canal alignment have been prepared. However, no branch canals or distributaries are involved as the command area under existing Tungabhadra LBC is being augmented.
	(f) Major canal structures	Since there are no major canal structures, surveys were not carried out.
	(g) Power-house, switch-yard, surge shafts, tailrace	No power generation component is proposed. Hence, is not required.

	(h) Tunnel(s), adits, penstocks, etc.	Based on toposheets and DEMdata, contour maps for the tunnel alignments are prepared.
	(i) Surveys (detailed and sample) of areas of the command for OFD and drainage works.	No surveys in the command area are required as the diversion is proposed for stabilization / augmentation of existing Tungabhadra LBC command.
	(j) Soil surveys	
	(k) Surveys for soil conservation	
	(l) Any other surveys a) Archaeological,	To be carried out at pre-construction stage.
	b) Mineral survey	To be carried out at pre-construction stage.
	c) Right of way survey	Since no proposed reservoir is involved, the survey may not be required.
	d) Communication survey	Communication systems has been identified and is discussed under para 4.2.4 of Chapter 4: 'Surveys & Investigations.
V	GEOLOGICAL INVESTIGATIONS	
13	Have the geological surveys for the following items been carried out and report on geology of the following appended?	No. The detailed investigations are proposed to be taken at pre-construction stage.
a	Region as whole	No, please refer para 4.3.1 of Chapter 4 of Volume I: Report.
b	Reservoir (Local geology)	Since no reservoir is involved, it is not required to be carried out.
c	Head works and energy dissipation area	To be carried out at pre-construction stage.
d	Power-house and appurtenances	Not applicable.
e	Intakes and regulators	To be carried out at pre-construction stage.
f	Major canal structures	Not involved.
g	Tunnel(s), Penstock(s), hill(s), etc.	In respect of tunnels, to be

		carried out at pre-construction stage. Penstocks etc. are not involved.
h	Communication routes	May not be required.
VI	SEISMIC INVESTIGATIONS	
14	Has the Seismicity of the region been studied and co-efficient of vertical/horizontal acceleration for the various structures discussed?	Site-specific seismic studies are required to be conducted at pre-construction stage.
15	Has the approval of the National Committee for recommending design of seismic coefficients for River Valley Projects (NCSDP) been obtained?	To be obtained at pre-construction stage.
16	Is there a possibility of liquefaction of foundations? If so whether liquefaction studies been carried out?	No. will be carried out at pre-construction stage as necessary.
VII	FOUNDATION INVESTIGATIONS	
17	Have the detailed foundation investigations (including in-situ tests and laboratory tests) for the following structures been carried out and detailed report(s) appended?	To be carried out at pre-construction stage.
a	Earth and rock fill dam/barrage/weir, etc.	No new dam is involved. For weirs & barrage, foundation investigations will be carried out at pre-construction stage.
b	Masonry/concrete dam/weir, etc.	
c	Barrage(s)/Weir(s)/headregulator(s), etc.	
d	Canal(s) & canal structures	Not involved.
e	Power-house(s), tunnel(s), transformer cavern(s), de-silting chamber(s), surge tank(s)/ shaft(s), intake(s) canal structures, etc.	No power generation component is proposed. Hence, not required. For the proposed tunnels in the link alignment, these will be conducted at pre-construction

		stage.
18	Are there any special features affecting the designs?	No.
VIII	CONSTRUCTION MATERIAL SURVEY	
19	Have the surveys and laboratory tests for the following construction materials been carried out and report(s) appended?	Laboratory tests for coarse and fine aggregate are proposed to be carried out at pre-construction stage.
a	Soils for impervious, semi-pervious and pervious zones of earth and rock-fill dam(s)	Not required.
b	Sand	No. Please refer Para 4.4 of Chapter 4 of Volume I-Report.
c	Rock and coarse aggregate	
d	Bricks and tiles	
e	Pozzolana	
f	Cement and limestone	No. Please refer Para 4.4 of Chapter 4 of Volume I-Report.
g	Steel	
h	Any other	
20	Have the sources for each of the above material been identified and need etc. indicated?	
21	Have the proposals for procurement of scarce materials been indicated?	No scarce materials are anticipated to be used in the project which may cause hindrance to the progress of construction of the project.
IX	HYDROLOGICAL AND METEOROLOGICAL INVESTIGATIONS	
22	(a) Have the hydrological and meteorological investigations been carried out and status of following data discussed in report?	Yes, the detailed discussion is made in Chapter 5: 'Hydrology and water assessment' of Volume-I Report.

i	Rainfall	Refer para 5.4.1 of Chapter 5
ii	Temperature	Refer para 5.4.3 of Chapter 5
iii	Sunshine	Refer para 5.4.3 of Chapter 5
iv	Gauge & Discharge	Refer para 5.4.4 of Chapter 5
v	Sediment	Refer para 5.4.5 of Chapter 5
vi	Water quality	Refer para 5.4.6 of Chapter 5
vii	Evaporation	Refer para 5.4.2 of Chapter 5
viii	Wind speed	Refer para 5.4.3 of Chapter 5
	(b) Has the above data been collected & appended?	Yes, collected & appended.
X	HYDROLOGY	
23	Is the hydrology dealt with in details in a separate volume? Have its brief details been included in this report?	No separate volume. Details are furnished in Chapter-5 of Volume-I: Report and relevant Annexures in Volume-II: Annexures.
24	Have an index map and bar chart showing locations of various hydro-metric, climatic and rainfall stations existing/ongoing/planned water resources projects and the data availability at those stations been attached?	Yes, index map of the link project and the basin maps of Bedti, Krishna and Tungabhadra are included in Volume-III: Drawings.
25	Have required detailed note about project specific hydro-meteorological data observatories been attached?	Yes, please refer Chapter-5 of Volume-I: Report.
26	Have required detail in case of Himalayan rivers, if project being planned in upper reaches, the satellite imageries of project catchment especially one during snowmelt period (March-May) and one during monsoon (June-September) period been attached?	Not applicable since the project pertains to Peninsular region.

27	Are detailed notes about quality, consistency, processing, and gap filling of the data included?	Yes, please refer Chapter-5 of Volume-I: Report.
28	Have hydrological studies been carried out for the following:	
a	To establish the availability of water for the benefits envisaged.	Yes, please refer Chapter-5 of Volume-I: Report.
b	To determine design flood for the various structures (Spillway, weir, barrage, etc.)	Yes, please refer Chapter-6: 'Design aspects' of Volume-I: Report.
c	Sediments storage	Since the diversion is only through weirs / barrage, without any storage, sedimentation study is not carried out.
d	Design flood for diversion during construction	No. As weirs / barrage are proposed to be constructed during the non-monsoon season.
e	Tail water rating curve	Not applicable.
f	Evaporation rates from reservoirs/concerned area	Since the headworks are weirs and barrage, no such studies are required to be carried out.
g	Command area rainfall	Yes. Please refer para 8.4.1 of Chapter-8: 'Irrigation planning and CAD' of Volume-I: Report.
29	Has the Ground water potential (existing use and additional availability) been indicated?	Yes. Please refer para 8.7.2 of Chapter-8 of Volume-I: Report.
30	Have the studies regarding reservoir sedimentation been carried out and revised Elevation-Area capacity curves been used in the simulation studies? (Working Table)?	Since only weirs and barrage with negligible storage is involved, sedimentation studies are not carried out.
31	Have the ecological requirements of water such as low flow augmentation	Domestic, industrial and ecological requirements are duly

	and water quality control etc. and water requirement for domestic, industrial use and power generation (thermal, hydel, nuclear) been considered and included in the Project Report and incorporated in the simulation studies?	considered. However, water are being proposed for diversion through the link project during the monsoon period only. Hence, no adverse effect on account of link diversion on downstream ecological needs is anticipated.
32	Have the details of the simulation studies (Working Table) and conclusions arrived from the various alternatives explaining the factors and assumptions been included and discussed?	Yes, simulation studies are carried out. The inflows at diversion sites have been verified for the proposed diversion through the link canal for a period of 47 years. The monthly abstracts of daily simulation are furnished in the relevant annexures of Chapter-5.
33	Have the number of failures for different aspects been indicated?	Yes. Indicated as above.
34	Have the likely desirable and undesirable changes in the hydrologic regime due to the project been brought out in the report?	No adverse effect on downstream hydrologic regime is anticipated, because the diversion is planned from weirs/barrage during monsoon period only.
35	Are the criteria adopted for selection of the construction diversion flood discussed?	Not applicable.
36	Has the basis for determining the storage capacity been discussed?	
37	Have integrated working tables (for more than one reservoir in the system) been prepared?	Yes. Carried out for Link-I which consists of 2 weirs.
38	Has carry over storage been prepared? If so, whether studies for most economic carry over storage	No, as the diversion structures are weirs and barrage only.

	been done?	
39	Have the flood routing studies been carried out?	Not applicable.
40	Have the back-water studies been carried out?	No reservoir is involved.
XI	LAND ACQUISITION AND RESETTLEMENT OF OUSTEES	
41	Have the type and quantum of land proposed to be acquired in the submerged area, project area, area coming under canal and distribution system, area required for rehabilitation of the oustees been detailed?	Yes, refer Chapter-10: 'EIA & EMP' & Chapter-11: 'Socio-economic aspects' of Volume-I: Report. This will be firmed up during the pre-construction stage.
42	Is the basis for provision for land compensation indicated?	Yes, refer Chapter-13: 'Cost Estimate' of Volume-I: Report.
43	Have the rehabilitation measures, amenities and facilities to be provided to the Project Affected Persons been discussed and whether their provisions included in the report? Are these in accordance with State's policy/project specific policy/draft national policy for rehabilitation and resettlement?	Since no reservoir is involved, the PAPs are not involved.
44	Are the basis of land acquisition of the submerged area upto FRL/MWL etc. discussed?	No reservoir is involved. Only land acquisition for canal, raising main, tunnel and weir up to FPL is required. This is discussed in Chapters- 10 & 11.
XII	DESIGNS	
45	Does the State have established a Central Design Organisation and State level multidisciplinary Advisory Committee and whether its	Designs of various components of the project have been carried out by NWDA.

	composition has been indicated in the report?	
46	Has the selection of final location of the head works and appurtenances, in preference to the other sites investigated, been discussed?	Yes. Refer Chapter-6 of Volume-I: Report.
47	Have the layout of the project viz., location of head works, workshop sheds, offices, colonies, etc. been finalized and discussed?	Yes. Locations of head works have been finalized.
48	Has the layout of the various major components of the head works been discussed in the light of site feature, geology, and foundation characteristics, etc.	No. If required, it will be taken at pre-construction stage.
49	Have the detailed designs been prepared for the following components and got vetted by CDO?	Designs of various components of the project have been carried out by NWDA.
a	Earth or rock fill dam, masonry or concrete dam, spillway, barrage, weir, etc. and appurtenances.	Yes. Designs of two weirs, one barrage and their appurtenances has been carried out by NWDA. Please refer Chapter- 6 of Volume-I: Report.
b	Energy dissipation arrangements, training wells, etc.	Yes. Design of energy dissipation arrangements has been carried out by NWDA. Refer Chapter- 6 of Volume-I: Report.
c	Openings through dam-galleries, head regulators, penstocks, other outlets, sluices, etc.	Not involved.
d	Regulators	Yes, refer Chapter-6 of Volume-I: Report.
e	Canal and water conductor system	
f	Canal structures	
g	Pump house, intake structures	

h	Power house, tunnels, surge shaft	No power generation component is involved. Three tunnels in the link alignment are proposed for which designs have been prepared. Refer Chapter-6 'Designs' of Volume-I: Report.
i	Instrumentation	Not required as no power generation component is involved.
j	Power evacuation arrangement	
k	Design of Hydro Mechanical equipments	
50	Have the salient features of the above components and the assumptions made in the design of above components of the project been indicated and basis of assumption discussed?	Yes. Refer Chapter-6 of Volume-I: Report
51	Have any model studies been carried out for location of the dam, spillway and other appurtenances checking the design profile of the spillway, energy dissipation arrangements, location of outlets/ regulators, etc?	No proposed dam is involved.
52	Has the final alignment of canal(s) and branch canal(s) been discussed in the light of various alignments studied?	Yes, discussed for canal under para 6.5.1 of Chapter- 6. There are no branch canals.
a.	Does the canal design provide for meeting requirements of rush irrigation?	Not applicable since the irrigation is proposed for augmenting the existing command of Tungabhadra LBC.
b.	Have any intermediate storages and tail tanks been considered to reduce the canal capacities?	No.
53	Are the canals and distribution	Yes. The canals and tunnels are

	system being lined and if so, what is the minimum capacity of the channel proposed to be lined?	proposed to be lined. 22.33 m ³ /s is the minimum capacity of canal and tunnel off taking from the Pattanadahalla weir.
54	Is the location of canal structures on main and branch canals fixed after detailed surveys of the final alignments?	No CD/CM works are proposed since the links are a combination of raising mains and tunnels with canals of only small lengths.
55	Are the regulation arrangements of the off-taking channel both near and away from the cross regulators discussed?	No cross regulators are proposed as the major portion of conveyance system is tunnel and raising main. However, the offtake channel for the Pattanadahalla weir is tunnel intake.
56	Are sufficient escapes including terminal escapes provided on the main/branch canal, distributaries/minors?	Major portion of the conveyance system is of tunnel and raising mains. Hence, no canal escapes are provided.
57	Have the basis for adopting water way for the cross-drainage works been discussed?	No. No CD works are proposed.
58	Have the proposals for rating the canal section by providing standing wave flumes, rating of the falls, broad crested weirs. V-notches etc. been discussed for the canal and distribution system?	No. Major portion of conveyance system is of raising main and tunnel only. No branch canal or distributaries are proposed. The link project envisages to serve existing command area under Tungabhadra LBC.
59	Have any model studies for major canal structure(s) been carried out and if so, are the results discussed and incorporated in the design?	No.

XIII IRRIGATION AND COMMAND AREA DEVELOPMENT		
60	Have the conveyance and field irrigation efficiencies for paddy and upland crops during kharif, rabi, etc. been indicated, discussed, and justified?	Yes, and incorporated in the GIR calculation. For major & medium projects, it is 65% and for minor projects, it is 80%.
61	Have the 10-daily/monthly crop water requirements at the canal head been worked out?	Yes, the monthly crop water requirements have been worked out and are presented at Chapter: 8. These will be met from the Tungabhadra reservoir.
62	Are there any proposals for introducing Warabandi and if so, have these proposals been discussed in the report and sample calculations for a typical distributary /minor/ sub-minor furnished?	Not proposed as the existing distributary system of the TLBC is proposed to be used.
63	Has the present position of irrigation in the command through existing canals, tanks, lift schemes, wells, etc. been brought out in the report?	Yes, discussed in Chapter- 8. The link envisages to serve existing command only.
64	Are the particulars of all irrigation projects (including minor schemes) existing/proposed in the command been indicated?	Yes, discussed in Chapter 8.
65	Are there potential areas, where ground water is available? If so, has the quantity & quality of the ground water been indicated?	Yes, please refer para 8.7.2.1 of Chapter-8 of Volume-I: Report.
66	Has the quantum of available ground water been assessed and plan for its conjunctive use with surface water been prepared and incorporated in the report?	Not as of now. The scope for conjunctive use shall be explored at a later stage.

67	Have the semi-detailed soil surveys been carried out for the entire command? If not the extent of area surveyed may be indicated.	As the proposed diverted water is used for irrigation under the existing TLBC command, no further soil surveys are contemplated in the target command area.
68	Have soil and land irrigability classifications brought out in the report?	Yes. Please refer para 8.3.1 of Chapter-8 of Volume-I: Report.
69	Is the method used for determining the crop water requirements discussed?	Yes. Please refer para 8.6 of Chapter-8 of Volume-I: Report.
70	Has the pre-project cropping pattern and the proposed cropping pattern along with justification been furnished?	Yes. Please refer Chapter: 8. The existing cropping pattern for the TLBC is considered for target command area also.
71	Has the proposed cropping pattern been certified by Centre/State Agricultural Authorities giving the Statement of having considered the soil characteristics and land irrigability characteristics of the command area in deciding the percentage of the command area falling under respective crops as suggested in DPR?	The proposed cropping pattern is devised duly taking into consideration the existing cropping pattern of Tungabhadra LBC command area. To be got certified from State Agricultural Department of Karnataka.
72	Whether drinking water needs of the population projected for the 25-30 years after construction of the project on enroute and that in the command of the project considered?	Yes.
73	Whether the proposed G.W. utilisation is certified by CGWB, and a statement furnished	No G.W. utilisation is planned in the proposal at this stage.
74	Are the areas and percentages of the	Yes. The proposed irrigation

	CCA that will be irrigated during kharif, rabi, two seasonal, summer and perennial been indicated?	is only during Kharif season and has been indicated under para 8.5.2 of Chapter: 8.
75	Is justification furnished for irrigating perennials and summer crops from the reservoir?	No, as perennials and summer crops are not proposed.
76	Have the monthly reservoir operation studies been carried out at least for 20 years and summary on annual basis attached?	No reservoir is involved.
77	Have the number of blocks selected for detailed surveys for On Farm Development (OFD) works including drainage and total area covered by such blocks been indicated?	Not applicable.
78	Have the existing locations of the Trial cum Demonstration Farm, input centres(seeds, fertilizer, and insecticides) in the command been indicated and proposal to strengthen the same discussed?	Not required.
79	Have the arrangements for financing the OFD works and proposals if any, for strengthening the same been discussed?	No.
80	Have the agencies responsible for execution of the OFD works been identified and simultaneous planning of execution of OFD works along with engineering works discussed?	Not needed as the proposed irrigation will be in the existing command.
81	Has the year-wise phasing of irrigation development as a result of the project been discussed?	Yes, is discussed in para 13.5 of Chapter 13.
82	Is the existing communication system telephone, wireless, and roads within	Yes, there are good network of roads and railways within

	command area sufficient to meet the requirement after full development of irrigation? If not, have the new proposals been planned and discussed?	the command area.
83	Is the adequacy of the marketing centres in the Command Area and new proposals to meet the requirements after full development of irrigation been discussed?	Adequate marketing centres are available in the command area.
84	Is there any stabilization of existing irrigation proposed?	Yes, as all the proposed diverted water will be used solely for this purpose.
XIV	FLOOD CONTROL AND DRAINAGE	
85	Have the various flood control components of the multipurpose project been indicated?	Not applicable. The head works involved are only weirs/barrage.
86	Have the damage areas in pre-project & post project situations been identified and flood intensities worked out at each of the damage centre(s) which gets affected?	Not applicable.
87	Have the following flood aspects been discussed?	Not applicable. The head works involved are weirs/barrage only.
a	Flood cushion in the reservoir	Not applicable.
b	Maximum moderated flood out flows over the spillway etc. and its frequency	Not applicable.
c	Existing and proposed safe carrying capacities of the channel below the dam after construction of flood embankment, channel improvement, river diversion, etc.	Not applicable.
d	Synchronized moderated peak floods due	Not applicable.

	to release(s) from the dam upstream and unintercepted catchment upto the damage centers	
e	Average annual expenditure incurred on flood relief works	Not applicable.
f	Area and population affected/likely to be affected before/after the project	Not applicable.
g	Estimated saving in annual loss of life, property, cattle, crops, etc. (evaluated in terms of money) due to flood control.	Not applicable.
88	Have the following drainage aspects of command area been discussed?	
a	Existing Surface and sub-surface drainage network and problems of the drainage congestion, water logging, alkalinity/salinity, if any.	Yes, it is discussed under para 8.8 of Chapter: 8.
b	Studies on sub soil water table (pre-monsoon, post-monsoon etc.)	No.
c	Maximum intensity of 1-, 2- & 3-day rainfall	No.
d	Deficiencies in farm drains	No.
e	Deficiencies in existing natural drains	No.
f	Proposal for improvement of drainage / water logging/alkalinity/salinity of the area along with justification thereof.	Yes, suitable provision has been made in the cost estimate.
g	Identification of the area in Command which will get benefited due to execution of drainage network and benefits thereof in terms of relief from crop damage, increased yields, etc.	No.
XV	NAVIGATION	
89	Is the present scheme for remodeling of the existing facilities and /or extension of	Navigation aspect is not planned in the project

	the navigable reach or establishing new navigable reach?	proposal.
90	Is the existing inland transport system being fully utilized? If not, have the bottlenecks in its full utilization been identified and discussed?	Not applicable.
91	Have the surveys for goods and passenger traffic been carried out and discussed?	
92	Is the extent of modification required in the existing system discussed and justified?	
93	Do design for the canal sections and structures take into account the navigation requirements?	
94	Have the proposals to develop the new scheme and phases of development in the different reaches been discussed?	
95	If the area is being served by inland water transport, have the following been discussed:	The project area is not being served by inland water transport.
a	The existing toll rates and registration fees, for the crafts (size wise)	Not applicable.
b	Proposals for revision of tollage rates and fees, if any	
c	Concurrence of the competent authorities for revision of rates and fees.	
d	Proposal to subsidize the tariff, tollage, craft registration fee, passenger fare, etc. to attract traffic.	
96	Has the State Inland Water Authority been consulted while finalizing the scheme and its viewpoint discussed?	Not applicable.
97	Has economic justification and viability	Not applicable.

	of the navigation component of the multipurpose project been discussed?	
XVI	POWER	
98	Have the following points been discussed?	
a	Availability of the power generating capacity in the State as well as in the region from different sources.	Yes, refer Chapter-9 of Volume-I: Report.
b	Total energy available and peaking capacity of the system in the State as well as in the region from different sources.	
c	Integrated operation of the system and present status of utilisation in the State as well as in the region.	
d	Surpluses and shortfalls in the system in the State as well as in the region.	
e	Future plans of power development from different sources in the State/region.	
f	Fitment of the scheme in planning of power development of the State/region.	
g	Energy generated from the project, firm power; seasonal power and total power.	
h	Proposal for transmission lines connecting to the existing system/grid	Not applicable.
i	Project cost per kwh installed and per kwh generated at bus bar as compared to the different hydro-electric, thermal generation and gas projects and different sources in the State as well as in the region to justify the power component of the project.	
j	Whether the proposed addition to the	

	transmission system has been shown on a geographical map. Whether options considered for the proposed addition have been discussed with statement of justification for the selected option after carrying out supporting studies covering load flow studies, short-circuit studies (three phase and single phase) and stability studies	
XVII	CONSTRUCTION PROGRAMME AND PLANT AND MANPOWER PLANNING	
99	Are the major components of work proposed to be done departmentally or through contractor?	Through contractor.
100	Have the various alternative construction programme been studied and proper justification furnished for the final programme adopted?	Yes, please refer Chapter-12 'Construction Programme, Manpower and Plant planning' of Volume: I Report.
101	Has the proposed construction programme been prepared and synchronized for timely completion of each of the major component of work including Command Area Development?	Yes, for all other major components. No command areadevelopment works are proposedas irrigation is proposed to be provided to existing Tungabhadra LBC command.
102	Have the year wise quantities of the following materials of construction been worked out for various components of the project?	
a	Excavation separately in – soft and hard strata	Total quantities of the required materials have been worked out. Please refer Chapter-12'Construction
b	Earthwork in filling-impervious, semi-pervious and pervious	

c	Rockfill- for dam, toe, riprap, etc.	Programme, Manpower and Plant planning' of Volume-I:Report.
d	Stone for masonry	
e	Coarse aggregate for concrete	
f	Sand – for filter, masonry/ concrete	
g	Gravel – for filter	
h	Steel of various sizes and type	
i	Cement- normal, quick/slow setting with or without pozzolana, special types	
j	Lime - surkhi-pozzolana	
k	Scarce material - special steel	
l	Other material -fuel, electricity, explosive, etc.	
103	Have the year wise quantities to be executed by machine/labour for each of the major component been worked out for each of the above material?	Yes.
104	Have the labour-intensive items of the various major components of the project been identified and the quantities of such items worked out?	No.
105	Have PERT chart or CPM diagrams for construction programme of various components been made and included in report? Has organization set up and frequency for project monitoring been indicated in the Report?	Yes. Bar Chart is prepared for construction programme and organization set up has been indicated. Please refer Chapter-12.
XVIII	FOREIGN EXCHANGE	
106	Have the details of the plant and machinery, spares, instruments and scarce materials to be imported worked out?	Not visualized as of now. Most of the requirements of plants and machinery, spares, equipments / instruments, etc would be procured indigenously.
107	Has the phasing of imports and source(s)	No.

	of imports been discussed item wise?	
108	Are the imports to be affected under foreign grants/credits or internal resources of the country?	Not applicable.
109	Is the scheme covered under State sector or Central sector?	Central sector.
XIX	FINANCIAL RESOURCES	
110	Has the concurrence of the State Finance Department been obtained?	No, after obtaining all clearances, DPR will be submitted to the Ministry of Jal Shakti / NITI Aayog for investment clearance.
111	Is the scheme included in the Five year/Annual plan? If not, what is the present position regarding its inclusion in the plan?	Not included. However, the proposal will be submitted for inclusion in the Five year/Annual plan by the State, as necessary.
112	Whether the scheme has already been started? If so, is the present stage of construction indicated?	Yet to be started.
113	Have the year wise requirement of funds been indicated?	Yes, please refer para 12.9 of Chapter-12 'Construction Programme, Manpower and Plant planning' of Volume-I: Report.
114	Is the scheme covered or proposed to be covered under any foreign assistance/aid agreement?	No.
XX	ESTIMATE	
115	Is the separate volume of estimate attached as appendix?	No. Included as part of Volume-II: Annexures.
116	Is the year to which the rates adopted in the estimate relate to indicated?	Yes, refer Chapter-13 of Volume-I: Report.
117	Have the analysis of rates for various	Yes, the rates are as per

	major items of work for the major components of the project been furnished and with basis of analysis described?	Schedule of rates of Govt. of Karnataka 2020-21.
118	Are the provisions for the following items made on the basis of sample survey and sub-estimates?	Not applicable because the diverted water is beingutilized in the existing command of TLBC. Only the provision for drainage is made on lumpsum basis.
a	Distributaries, minor and sub-minors	
b	Water courses	
c	Drainage	
d	CAD works	
XXI	REVENUES	
119	Are the basis for the following sources of revenues furnished?	
a	Betterment levy and proposal for its recovery	Not applicable.
b	Irrigation cess	Yes, Considered
c	Flood protection cess	Not applicable.
d	Crop wise water rates	Not applicable.
e	Sale of water for village/city/industrial/power /water supply	Yes, Domestic and industrial water priced and shown in revenues
120	Have these rates been compared with the existing rates at the other projects in the State region?	Not applicable.
121	In case the rates are being enhanced, has the concurrence of the concerned department(s) been obtained?	Not applicable.
122	Have the organizational set up for the collection of revenue been indicated?	No, existing set up of Govt. of Karnataka shalltake care of it.
XXII	B-C RATIO	
123	Are the allocated costs for the following components of the multipurpose project worked out and basis therein furnished?	Yes, worked out

	(a) Irrigation	Irrigation, water supply and industrial water requirement net benefits are worked out after arriving costs.
	(b) Power	
	(c) Flood Control	
	(d) Navigation	
	(e) Domestic water supply	
	(f) Industrial water supply	
124	Have the various departments of the State/Centre agreed to the sharing of the above allocated cost?	The stage has not arisen as of now.
125	Have the crop wise benefits been worked out for irrigated and unirrigated crops being grown before project in consultation with the agriculture department and Statement furnished?	Yes, please refer Chapter-13 of Volume-I: Report.
126	Have the crop wise benefits been worked out for proposed cropping pattern after the introduction of irrigation in consultation with the agriculture department and Statement furnished?	Yield rates per hectare has been taken from Karnataka Agricultureprice Commission.
127	Is the B.C. ratio of Irrigation Projects acceptable or otherwise justified?	B.C. ratio for Link-I, Link II separately and the Project as a whole is acceptable.
128	Is the B.C. ratio for Flood Control Projects acceptable or otherwise justified?	Not applicable.
129	Is the B.C. ratio for power component of the project acceptable or otherwise justified?	Not applicable.
130	Have the financial and economic return Statements been furnished keeping in view the phasing of development?	Yes, refer para 13.7 of Chapter-13.
131	Are the benefits other than those considered in the B.C. ratio and financial return Statement been identified?	No.

132	Is the benefit from Galper land, if proposed, based on lease rates admissible and Statement from concerned Central /State authorities furnished?	Not applicable.
133	Are the benefits from fisheries, horticulture, if proposed, based on lease rates admissible and Statement from concerned Central/State authorities furnished?	Benefits from fisheries and horticulture are not proposed.
XXIII	ECOLOGICAL ASPECTS	
134	(a) Is the area likely to have any of the following environmental and ecological problems due to the altered surface water pattern? If yes whether preventive measures have been discussed?	
i	Excessive sedimentation of the reservoir and the upper reaches of the river and its tributaries tailing into reservoir	Not likely as no reservoir is proposed.
ii	Water logging, salinity/alkalinity	Not likely.
iii	Quality of surface and ground water	Not likely.
iv	Groundwater recharge	No. In fact, on introduction of irrigation in the command area, groundwater table will improve in the adjoining areas along the link canal.
v	Health hazard-water borne diseases, industrial pollution, etc.	Not likely.
vi	Submergence of important minerals deposits	Not likely.
vii	Submergence of monuments/archeological sites	Not likely.
viii	Fish culture and aquatic life	No.
ix	Plant life (flora)	No.

x	Wildlife	No.
xi	Migratory birds	Not likely.
xii	National Park and sanctuaries	No.
xiii	Seismicity due to filling of reservoir	No reservoir is involved.
xiv	Likely change in the regime of the river	Not likely.
xv	Any other	No.
	(b) Have the environmental and forest clearance from MoE&F been obtained? If not, what is status thereof?	Govt. of Karnataka approached MoEF&CC for approval of TOR. However, MoE&F asked DPR level aspects of the proposal from GOK. Accordingly, DPR is prepared at the request of GOK.
XXIV	COLONIES AND BUILDINGS	
135	Has the planning of the colony/building been done keeping in view the ultimate use for optimum utilization of the investment?	Yes.
136	Has an estimate of the extent of higher cost involved been made and details discussed?	No. Provision made as % for buildings as per the DPR norms.
137	Are the permanent buildings being constructed required for maintenance of the project only?	Yes, provision is made as per the guidelines for preparation of DPR of irrigation & multipurpose projects-2010.
138	Can the buildings other than required for maintenance of the project being constructed be put to some other use after the completion of the project by the department or any other agencies?	Yes, can be used by Govt. departments or other project authorities.
139	Have the interested agencies been consulted in planning of the buildings to	No, will be taken up at pre-construction stage.

	suit their requirements later on?	
140	Have the proposals for disposal of temporary buildings been discussed?	Not discussed.
XXV	PUBLIC PARTICIPATION AND COOPERATION	
141	Are the possibilities of these been discussed in:	To some extent at the planning stage. These will be further dealt at the implementation stage of the project.
	(a) Planning	
	(b) Construction	
	(c) Improved agricultural practices	
142	Have public debates about utility of projects been held and the response thereof outlined in the Report?	During the CEIA studies, public hearings will be conducted.
XXVI	SOIL CONSERVATION	
143	Is the need for soil conservation measures in the catchment of the project discussed?	Yes, discussed in Chapter: 10.