

Detailed Project Report of Burhi Gandak-Noon-Baya-Ganga Link Project

Section-1 CHECK LIST

Name of the project	Burhi Gandak-Noon-Baya-Ganga Link Project
Location:	
(a) State	Bihar
(b) Districts	Samastipur, Begusarai and Khagaria
Category of the project:	
(a) Irrigation or Multipurpose	Multipurpose
(b) Storage or diversion	Diversion

S.No	Item	Reference
1	2	3
	Planning	
1.	Has the Master plan for overall development of the river basin been prepared and stages of basin development discussed briefly?	No
2.	Have the alternative proposals been studied and their merits and demerits discussed?	No
3.	Does the scheme fit in the overall development of the river basin and its priority in the overall development of the basin discussed?	Yes
4.	Are there any features which are not likely to fit in the overall development of the basin?	No
	Have the other departments concerned with the development been informed.	Yes

5.	Is the present scheme proposed to be executed in stages? If so, are its various stages of execution and development discussed in the report?	No Project will be executed simultaneously.
6.	Are the effects of the scheme on the riparian rights existing upstream and downstream projects, etc. discussed?	No, there is no existing projects in upstream and downstream of the river Burhi Gandak .
	Interstate and International Aspects	
7.	Are there any International/Interstate issues involved? If so, have these issues been identified and present status of agreement indicated specially in respect of	No
	(a) Sharing of water	N.A.
	(b) Sharing of cost	N.A.
	(c) Sharing of benefits	
	(d)Acceptance of the submergence by the upstream state(s)	N.A.
	(e)Compensation of land coming under submergence	N.A.
	(f) Settlement of oustees	N.A.
	(g) Any other	Nil
	Surveys	
8.	Have the detailed topographical surveys been carried out for the following items and maps prepared as per prescribed scales?	Yes
	(a) River surveys	Yes
	(b) Reservoir surveys	Yes
	(c) Head-works surveys (barrage, weirs, etc., and auxiliary components)	Yes
	(d) Plant site and colonies	Yes
	(e) Canals	Yes
	(f) Major canal structures	Yes
	(g) Power house, switch-yard, surge shafts, tailrace	N.A.
	(h) Tunnels, adits, penstocks, etc.	N.A.

	(i) Surveys(detailed and sample) of areas of the command for OFD and drainage works	Yes
	(j) soil surveys	Yes
	(k) Surveys for soil conservation	Yes
	(m) Any other surveys i.e. Archaeological, Right of way, communication, etc.	Yes
	Geology	
9.	Have the geological surveys for the following items been carried out and report on geology appended?	Yes
	(a) Regional Geology	Yes
	(b) Reservoir	N.A.
	(c) Head works and energy dissipation area	Yes
	(d) Power house and appurtenances	N.A.
	(e) Intake and regulators	N.A.
	(f) Major canal structures	Yes
	(g) Tunnel(s), Penstock hill, etc.	N.A.
	(h) Communication routes	Yes
10.	(a) Has the Seismicity of the region been studied and co-efficient of vertical/horizontal acceleration for the various structures discussed?	Yes
	(b) Has the approval of the Standing Committee for recommending design of seismic co-efficient for River Valley Project been obtained?	The site specific seismic study is being referred to NCSDP.
	Foundation Investigations	
11.	Have the detailed foundation investigations (including in-situ tests and laboratory tests) for the following structures been carried out and detailed report(s) appended?	
	(a) Masonry/concrete dam/barrage/weir etc.	Yes
	(b) Canal	Yes
12.	Are there any special features affecting the designs?	No

	Material Surveys	
13.	Have the surveys and laboratory tests for following construction materials been carried out and report(s) appended?	
	(a) Soils for impervious, semi-pervious and pervious zones of barrage.	Yes
	(b) Sand	Yes
	(c) Rock and aggregate	Yes
	(d) Bricks and tiles	N.A.
	(e) Pozzolona	N.A.
	(f) Cement	Yes
	(g) Steel	Yes
	(h) Other scarce materials:	No
	(i) Any other	Nil
14.	Have the sources for each of the above material been identified and need etc. indicated?	Yes
15.	Have the proposals for procurement of scarce materials been indicated?	N.A.
	Hydrological and Meteorological Investigations	
16.	Have the hydrological and meteorological investigations been carried out and status of data discussed in report?	Yes
(a)	Rainfall	Yes
(b)	Gauge	Yes
(c)	Discharge	Yes
(d)	Sediment	Yes
(e)	Water quality	Yes
(f)	Evaporation and whether the above data has been appended?	N.A.
	Hydrology	
17.	Is the hydrology dealt with in details in a separate volume?	Yes
(a)	Have the brief details been included in this report?	Yes

(b)	Is an index map and bar chart showing location of various hydrometric, climatic and rainfall stations and the data availability at those stations been attached?	Yes
(c)	Are brief notes about quality, consistency, processing and gap filling of the data included?	N.A.
18.	Have hydrological studies been carried out for the following:	
(a)	to establish the availability of water for the benefits envisaged.	Yes
(b)	to determine design flood for the various structures (Spillway, weir, barrage, etc.)	Yes
19.	Have the analysis for the water flows, evaporation and command area rainfall been discussed?	N.A.
20.	Have the studies regarding reservoir sedimentation been carried out and revised Elevation-Area Capacity curves been used in the simulation studies?	N.A.
21.	Have the other requirements such as low flow augmentation, water quality control, etc. been included in the project report and incorporated in the simulation studies?	N.A.
22 (a)	Design of major Civil Engineering Components have been finalized taking Seismicity of the region into consideration	Yes
(b)	Have the details of the simulation studies and conclusions arrived from the various alternatives explaining the factors and assumptions been included and discussed?	Yes
(c)	Have the number of failures for different aspects been indicated?	N.A.
23.	Have the likely desirable and undesirable changes in the hydrologic regime due to the project been brought out in the report?	Yes
24.	Is the criteria adopted for selection of the construction in the hydrologic regime due to the project been brought out in the report?	Yes

25.	Is the basis for fixing up the storages discussed?	N.A.
26.	Have the flood routing studies been carried out?	N.A.
27.	Have the back water studies been carried out?	Yes
	Land acquisition and resettlement of oustees	
28.	Have the type and quantum of land proposed to be acquired in the submergence area project area, area coming under canal and distribution system, area required for rehabilitation of the oustees been detailed?	Yes
29.	Is the basis for provision for land acquisition indicated?	Yes
30.	Have the rehabilitation measures, amenities and facilities to be provided to the oustees been discussed specially for the oustees from the upstream state?	N.A.
31.	Are the basis of land acquisition of the submerged area upon FRL/MWL etc. discussed?	N.A.
	Design	
32.	Has the final location of the head works and appurtenances, in preference to the other sites investigated, been discussed?	Yes
33.	Has the layout of the project area viz., location of head works, workshop, sheds, offices, colonies, etc. been finalized and discussed?	Yes
34.	Has the layout of the various major components of the headworks been discussed in the light of site feature, geology, and foundation characteristics, etc.	Yes
35.	Have the designs been prepared for the following components and appended?	Yes
(a)	Earth or rock fill dam, masonry or concrete dam, spillway, barrage, weir, etc. and appurtenances.	Yes

(b)	Energy dissipation arrangements	Yes
(c)	Opening through dam-galleries, head regulators, penstocks, other outlets, sluices, etc.	N.A.
(d)	Regulators	Yes
(e)	Canal	Yes
(f)	Canal structures	Yes
(g)	Power House, tunnels, surge shaft	N.A.
(h)	Instrumentation	N.A.
36.	Have the assumptions made in the design of above components of the project been indicated and basis of assumption discussed?	Yes
37.	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, the same will be taken up at the execution stage of the project.
38.	Has the final alignment of canal(s) and branch canal(s) been discussed in the light of various alignments studied?	Yes
(a)	Does the canal design provide for meeting requirements of rush irrigation?	Yes
(b)	Have any intermediate storages and tail tanks been considered to reduce the canal capacities?	N.A.
39.	Is the canal and distribution system being lined and if so what is the minimum capacity of the channel proposed to be lined?	Canal is fully lined.
40.	Is the location of canal structures on main and branch canals fixed after detailed surveys of the final alignments?	Yes

41.	Are the regulation arrangements of the off-taking channel both near and away from the cross regulators discussed?	Yes
42.	Are sufficient escapes including terminal escapes provided on the main/branch canal distributaries/minors?	Yes
43.	Have the basis for adopting water way for the cross drainage works been discussed?	Yes
44.	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
45.	Has any model studies for major canal structure(s) been carried out and if so, are the results discussed and incorporated in the design?	No
	Irrigation and Command Area Development	
46.	Have the conveyance and field irrigation efficiencies for paddy and upland crops during Kharif, rabi, etc. been indicated, discussed and justified?	Yes
47.	Have the weekly/fortnightly Crop water requirements at the canal head been worked out?	Yes
48.	Are there any proposals for introducing Warabundi and if so have these proposals been discussed in the report and sample calculations for a typical distributary /minor/ sub-minor furnished?	No
49.	Has the present position of irrigation in the command through existing canals, tanks, lift schemes, wells, etc. been brought out in the report?	Yes
50.	Are the particulars for minor irrigation projects existing/proposed in command been indicated?	N.A.

51.	Are there potential areas, indicating the potential where ground water is available? If so, has the quality of the ground water been indicated?	N.A.
52.	Has the quantum of available ground water been assessed indicating the basis for conjunctive use with surface water discussed?	No
53.	Have the semi-detailed soil surveys been carried out for the entire command and soil and land irrigability classifications brought out in the report?	No
54.	Is the method used for determining the crop water requirements discussed?	Yes
55.	Has the pre-project cropping pattern and justification for the proposed cropping pattern been furnished?	Yes
56.	Are the areas and percentages of the CCA that will be irrigated during kharif, rabi, two seasonal, summer and perennial been indicated?	Yes
57.	Is justification furnished for irrigating perennials and summer crops from the reservoir?	N.A.
58.	Have the monthly reservoir operation studies carried out at least for 20 years and summary on annual basis attached?	Yes
59.	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?	Yes
60.	Have the existing locations of the (Trial cum Demonstration Farm) inputs centres, (seeds, fertilizers and insecticides) in the command been indicated and proposal to strengthen the same discussed?	No
61.	Have the arrangements for financing the OFD works and proposals for strengthening the same been discussed?	No

62.	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?	No
63.	Has the yearwise phasing of irrigation development as a result of the project been discussed?	No
64.	Is the existing communication system within command area sufficient to meet the requirement after full development of irrigation? If not, have the new proposals been planned and discussed?	Yes
65.	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?	Yes
	Flood Control and Drainage	
66.	Have the various flood control components of the multipurpose project been indicated?	Yes
67.	Have the damage areas been identified and flood intensities worked out at each of the damage centre(s) which gets affected?	Yes
68.	Have the following aspects been discussed?	
	(a) Flood cushion in the reservoir	N.A.
	(b) Maximum moderated flood out flows over the spillway etc. and its frequency	Yes
	(c) Safe carrying capacities of the channel below in the dam existing and after construction of flood embankment, channel improvement, river diversion, etc.	Yes
	(d) Synchronized moderated peak floods due to release (s) from the Dam upstream and an intercepted catchment upto the damage centres	Yes
	(e) Average annual expenditure incurred on flood relief works	Yes

	(f) Area and population affected/likely to be affected before/after the project	Yes
	(g) Estimated saving in annual loss of life, property, cattle, crops, etc. (evaluated in terms of money) due to flood control.	Yes
69.	Have the following aspects of drainage been discussed?	No
	(a) Surface and sub-surface drainage problems of the command area with details of studies on sub soil water table.	
	(b) Maximum intensity of 1,2 & 3 day rainfall	
	(c) Deficiencies in farm drains	
	(d) Deficiencies in existing natural drains	
	(e) Proposal for improvement of drainage / water logging of the area with criteria	
	(f) 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.	
	Navigation	
70.	Is the present scheme for remodeling of the existing facilities and /or extension of the Navigable reach or New proposals?	N.A.
71.	Is the existing inland transport system being fully utilized? If not, have the bottlenecks in its full utilization been identified and discussed?	N.A.
72.	Have the traffic surveys been carried out and discussed in respect of present and projected:	
	(a) Goods traffic	N.A.
	(b) Passenger traffic	N.A.
	(c) Existing traffic in the area and its comparison with the other modes of transportation	N.A.

	Is the extent of modification required in the existing system discussed and justified?	N.A.
73	Have the main goods that are being carried and / or proposed to be carried been indicated?	N.A.
74.	Are the canal sections and canal structures designed from Navigation considerations or irrigation considerations?	No
75.	Have the proposals to develop the new scheme and phases of development in the different reaches been discussed?	N.A.
76.	If the area is being served by inland water transport, have the following been discussed:	NA.
	(a) The existing toll rates and registration fees, for the crafts(size wise)	N.A.
	(b) Proposals for revision of tollage rates and fees, if any	N.A.
	(c) Concurrence of the competent authorities for revision of rates and fees.	N.A.
	(d) Proposal to subsidize the tariff, tollage, craft registration fee, passenger fare, etc. to attract traffic.	N.A.
77.	Has the State Inland Water Authority been consulted while finalizing the scheme and its view point discussed?	N.A.
78.	Has economic justification and viability of the Navigation component of the multipurpose project been discussed?	N.A.
	Power	
79.	Have the following points been discussed?	
	(a) Availability of the power generating capacity in the region from different sources	N.A.
	(b) Total energy available and peak capacity of the system	N.A.
	(c) Integrated operation of the system and present status of utilization	N.A.

	(d) Surpluses and shortfalls in the system	N.A.
	(e) Future plans of power development from different sources in the State/region.	N.A.
	(f) Fitment of the scheme in planning of power development of the State/region	N.A.
	(g) Energy generated from the project, firm power; seasonal power and total power	N.A.
	(h) Proposal for transmission connecting to the existing system/grid	N.A.
	(i) Cost of generation per kwh installed and per kwh generated as compared to the different hydro-electric projects and difference sources in the State/region to justify the power component of the project.	N.A.
	Construction Programme and Plant & Manpower Planning	
80.	Are the major components of work proposed to be done departmentally or through contractor	Through contractor
81.	Have the various alternative for construction programme been studied and proper justification furnished for the final programme adopted?	Yes
82.	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
83.	Have the yea wise quantities of the following materials of construction been worked out for various components of the project:	
	(a) Excavation	Yes
	(b) Earthwork in filling-impervious, semi-pervious and pervious	Yes
	(c) Rockfill- dam, toe, rip rap, etc.	N.A.

	(d) Stone for masonry	N.A.
	(e) Coarse aggregate for concrete	Yes
	(f) Sand – filter, masonry, concrete	Yes
	(g) Gravel – filter	Yes
	(h) Steel of various sizes and type – reinforcement	Yes
	(i) Cement normal, quick/slow setting with or without pozzolana	Yes
	(j) Lime –surkhi-pozzolana	Yes
	(k) Scarce material – special steel	No
	(m) Other material – fuel, electricity, explosive, etc.	Yes
84.	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
85.	Have the labour intensive items of the various major components of the project been identified and the quantities of such items worked out?	Yes
	Foreign Exchange	
86.	Have the details of the plant and machinery, spares, instruments, scarce materials to be imported worked out and item wise justified?	N.A.
87.	Has the phasing of imports and source(s) of imports been discussed item wise?	N.A.
88.	Are the imports to be affected under foreign grants/credits or internal resources of the country?	N.A.
	Financial Resources	
89.	(a) Has the concurrence of the Finance Department been obtained?	No
	(b) Whether the scheme has already been started? If so, is the present stage of	No

	construction indicated?	
90.	Is the scheme included in the Plan? If not, what is the present position regarding its inclusion in the plan?	No
91.	Have the year wise requirement of funds been indicated?	Yes
92.	Is the scheme covered under State sector or Central sector?	State sector
93.	Is the scheme covered under any foreign assistance/aid agreement?	No
	Estimate	
94.	Is the separate volume of estimate attached as appendix?	Yes
95.	Is the year to which the rates adopted in the estimate indicated?	Yes
96.	Have the analysis of rates for various major items of work for the major components of the project been furnished, with basis for analysis?	Yes
97.	Are the provisions for the following items made on the basis of sample survey and sub-estimates:	
	(a) Distributaries, minor and sub-minors	Yes
	(b) Water courses	Yes
	(c) Drainage	Yes
	Revenues	
98.	Are the bases for the following sources of revenues furnished?	
	(a) Betterment levy and proposal for its recovery	No revenue from betterment levy considered.
	(b) Irrigation cess	Yes
	(c) Flood protection cess	No

	(d) Crop wise water rates	No revenue from crop wise water rates considered.
	(e) Sale of water for village water supply	No
	(f) Miscellaneous	Nil
99.	Have these rates been compared with the existing rates at the other projects in the State region?	Yes
100.	In case the rates are being enhanced, has the concurrence of the concerned department been obtained?	N.A.
101.	Have the organizational set up for the collection of revenue been indicated?	No
	B.C. Ratio	
102.	Are the allocated costs for the following components of the multipurpose project worked out and basis furnished?	
	(a) Irrigation	Yes
	(b) Power	No
	(c) Flood Control	Yes
	(d) Navigation	N.A.
	(e) Water supply	N.A.
	(f) Any other	Nil
103.	Have the various departments/State agreed to the sharing of the above allocated cost?	N.A.
104.	Have the crop wise benefits been worked out for irrigated and un irrigated crops being grown before project in consultation with the agriculture department and statement furnished?	Yes
105.	Have the crop wise benefits been worked out for the proposed cropping pattern after the introduction of irrigation in consultation with the agriculture department and statement furnished?	Yes

106.	Is the B.C. ratio of Irrigation Projects acceptable or otherwise justified?	Yes
107.	Is the B.C. ratio for Flood Control Projects acceptable or otherwise justified?	Yes
108.	Have the following financial return statements been furnished keeping in view the phasing of development:	
	(a) Irrigation	Yes
	(b) Power	N.A.
	Are the benefits other than considered in the B.C. ratio and financial return statement been identified?	No
	Ecological aspect	
109.	(a) Is the area likely to have any of the following environmental and ecological problems due to the altered surface water pattern and preventive measures discussed?	
	(i) Excessive sedimentation of the reservoir	No
	(ii) Water logging	No
	(iii) Increase in salinity of the ground water	No
	(iv) Groundwater recharge	Yes
	(v) Health hazard, water borne diseases, industrial pollution, etc.	No
	(vi) Submergence of important minerals	Nil
	(vii) Submergence of monuments	Nil
	(viii) Fish culture and aquatic life	No
	(ix) Plant life – forests	No
	(x) Life of migratory birds	
	(xi) National Park and sanctuaries	No
	(xii) Seismicity due to filling of reservoir	No
	(xiii) Any other	No
	(b) Has the concurrence of the Environmental Appraisal Committee been	No

	obtained?	
	Colonies and Buildings	
110.	Has the planning of the colony/building been done keeping in view the ultimate use for optimum utilization of the investment?	Yes
111.	Has the estimate of the extent of higher cost involved been made and details discussed?	Yes
112.	Are the permanent buildings being constructed required for maintenance for the project only?	Yes
113.	Can the buildings other than required for maintenance of the project being constructed to put to some other use after the completion of the project by the department or any other agencies?	Yes
114.	Have the interested agencies been consulted in planning of the buildings to suit their requirements later on?	No
115.	Have the proposals for disposal of temporary buildings been discussed?	No
	Public participation and Cooperation	
116.	Are the possibilities of these been discussed in:	
	(a) Planning	No
	(b) Construction	No
	(c) Improved agricultural practices	No
	(d) Any other	No
	Soil Conservation	
117.	Is the need for soil conservation measures in the catchment of the project discussed?	Yes

