添付資料 1: 要請書

取扱注意

APPLICATION
FOR
JAPAN'S DEVELOPMENT STUDY PROGRAM

RAICHAK-KUKRAHATI BRIDGE OVER RIVER HUGLI INCLUDING APPROACH ROADS LINKING NH-41 AND NH-117 PRE-FEASIBILITY/ FEASIBILITY STUDY AND PREPARATION OF DETAIL PROJECT REPORT

JAPANESE ASSISTANCE

Government of West Bengal
India

配付先 国内部☐ 国際協力人材部☐
無償部☐ 社会開発部☑ JOCV☐
人間開発部☐ 地球環境部☐
農村開発部☐ 経済開発部☐
コピー 1 /

November 2004

APPLICATION FORM FOR JAPAN'S DEVELOPMENT STUDY PROGRAM

取扱注意

Date of entry : month *November* year *2004*

Applicant : the Government of *West Bengal*

1. Project digest

(1) Project Title *Raichak-Kukrahati bridge over river Hugli including approach roads linking NH-41 and NH-117 - Pre-feasibility/ Feasibility study and Preparation of Detail Project Report – Japanese assistance*

*Enter the project title in English (Spanish or French).

(2) Location

(province/county name): *West Bengal, India*

(city/town/village name): *Raichak in the district of South 24 Parganas on eastern bank and Kukrahati in the district of Purba Medinipur on Western bank*

from the metropolis: about *two & half* hours' ride/~~flight~~

(3) Implementing Agency

Name of the Agency: *Public Works (Roads) Department, Government of West Bengal*

*Enter the name of the implementing agency including such details as the name of the bureau or department.

Number of Staff of the Agency: *Provided in Annexure "A"* (on a category basis)

*Attach an organizational chart, and mark the department responsible for the study.

Budget allocated to the Agency: *Rupees twenty nine crore for plan works*

(4) Justification of the Project

*Provide detailed information of the project regarding the items below.

- Present conditions of the sector:

NH front: The existing NH-network in West Bengal comprises fifteen NH-segments totalling about 2,331 km of length; out of this about 1500 km length is under administrative control of NH wing of Public Works (Roads) Department. Under the ongoing development works (4/6 laning) included in NHDP & Port Connectivity Programs undertaken by the Central Government 771 km of NH is becoming part of high performance transportation grid as follows

Golden Quadrilateral Corridor (NHDP)	NH-2/NH-6/NH-60	329 km
East-West Corridor (NHDP)	NH-31/NH-31C	337 km
Port Connectivity Program	NH-41	53 km

NH-2/NH-6 on the southern part and NH-31/NH-31C on the north form part of well-connected Network Grid across the country. Coming from southern part of the country NH-60 on the western side of the Bhagirathi-Hugli system provides interchange-ability option between NH-6/NH-2/NH-34; a significant portion (about 57%) of the NH is less than 2-lane carriageway for improvement of which project preparation work has been taken up. Running from Kolkata to NH-31, NH-34 on the eastern bank of the Bhagirathi-Hugli system links northern and southern parts of the State. Under NH-34 Corridor Development Program, improvement work of about 370 km of NH-34 from Amdanga (31 kmp) to Raiganj (398 kmp) is in progress. A TA Study, sponsored by ADB, has recently been launched for Sub-regional Transport Connectivity Project the scope of which includes [a] for remaining part of NH-34 (i) providing Barasat Bypass at the south end for removal of Kolkata region

bottleneck, (ii) improvement of Raiganj (398 kmp) – Dalkhiola (junction with NH-31) section at the north end, (iii) capacity improvement of major bridges at Baharampur & Maldah over Bhagirathi & Mahananda respectively, and [6] improvement of NH-31A (Sevok to Gangtok ~ 92 km). Implementation of Second Vibekananda Tollway BOT Bridge Project (6 km long) is in progress and this integrated with Belgharia Expressway (7.5 km long) on the eastern bank, construction of which is almost complete, would link NH-34 to NH-2/ NH-6 system. Major portion of the newly annexed NH-117 connecting south Bengal to NH-6 via Vidyasagar Setu in Kolkata, is of less than 2-lane carriageway and is handicapped by bottleneck in the Kolkata region (Joka to Kolkata).

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Development & maintenance of National Highways is funded by the Ministry of Road Transport & Highways, Govern of India. For the portion under administrative control of NH wing, expenditure figures for 2003-04 was: Plan expenditure= Rs 7300 lakh, Non-Plan expenditure= Rs 2355 lakh

State Road front: Broadly, length of State Roads of different category are: SH ~ 2770 km, MDR ~ 5,830 km & ODR ~ 3670 km & VR ~ 2800 km – mostly of intermediate to single lane carriageway. Under NH-34 Corridor Development Program, two State Highways are being upgraded to NH-standard; one is Chakda (on NH-34) – Bongaon (Petrapole border) segment of SH-1 (length of about 40 km) and the other is Gajol (on NH-34) – Hilli (Bangladesh bordere) segment of SH-10 (length of about 110 km). Government of West Bengal has recently undertaken a feasibility study for developing a new road on the eastern bank to provide fast track connectivity between NH-117 and NH-34 bypassing the Kolkata city road area. The above Sub-regional Transport Connectivity study includes improvement of SHs from Hasimara to Pluntsholing (Bhutan border: 22 km long) and from Fulbari to Kakravita (Bangladesh border).

Expenditure incurred during 2003-04: Plan ~ 2900 lakh, Non Plan ~ 4000 lakh.

- Sectoral development policy of the national/local government:

Haldia Port along with its vast Industrial Belt is emerging as the major contributor to economic development of West Bengal in tandem with the Port of Kolkata. Since Diamond Harbour Road on eastern bank has been declared as NH-117, its development is on the cards. There is growing need of linking major road networks on either side of the Hugli to open up opportunities for regional development apart from tying North Bengal, North-Eastern States, Nepal, Bhutan and Bangladesh to Haldia Complex.

- Problems to be solved in the sector:

Removal of missing link between NH-Networks on either bank of the Hugli.

- Outline of the Project:

According to JETRO Report (Mar-2003) and subsequent suggestion of Pre-Fact Finding Mission of JBIC (Apr-2004), the project requires to consist in

1. Construction of 3.1km long bridge, including a high level Cable-Stayed section for shipping channel, over the Hugli
2. Construction/ development of Approach Road from Kukrahati to NH-41,
3. Construction/ development of Approach Road from Raichak to Sarisha on NH-117 (Diamond Harbour Road)

- Purpose (short-term objective) of the Project:

The project is intended to provide direct link between Haldia Port/ Haldia industrial complex and Kolkata and also to north Bengal & north-eastern States through NH-117/ NH-34 system.

- Goal (long-term objective) of the Project:

Government of West Bengal is contemplating to develop a new road on the eastern bank to provide a fast track connectivity between NH-117 and NH-34 avoiding the Kolkata city road area bottleneck. Haldia Port & industrial complex would then find economic transportation corridor to north

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Bengal & north-eastern States through the project infrastructure. Providing traffic interchange facility between NH-41/ NH-6/ NH60/ NH-2 system on west bank and NH-117/ NH-34 system on east bank, the project stands to strengthen network facilitating ubiquitous movement of traffic to the benefit of State economy

- Prospective beneficiaries:

(Population for which positive change are intended directly and indirectly by implementing the project, and gender disaggregated data, if available)

The project will benefit directly about 2/3 million people of both the banks of river Hugli and indirectly the people in the eastern part of the country and its adjacent states.

- the Project's priority in the National Development Plan / Public Investment Program:

Govt of West Bengal is very interested to implement the project but since it is in the preliminary stage and it is yet to be reflected in the budget.

(5) Desirable or Scheduled time of the commencement of the Project:

month *January*	year	*2006 for commencement of project preparation*
month *January*	year	*2010 for commencement of construction*

(6) Expected funding source and/or assistance (including external origin) for the Project:

*Describe the concrete policies for the realization of the project, and enter the prospects for realization and funding sources

For physical works	*:ODA loan assistance from JBIC through MOEA, Government of India and requisite counterpart funding from the State budget.*
For Project preparation works	*:JICA assistance on grant basis.*

(7) Other relevant Projects, if any.

As already noted above, Government of West Bengal is contemplating to develop a new road on the eastern bank to provide a fast track connectivity between NH-117 and NH-34 avoiding the Kolkata city road area bottleneck.

2. Terms of Reference of the proposed Study

*Please fill in (1) and (2) below, paying particular attention to the following items.
- In the case that a study was conducted in the same field in the past, describe the grounds for requesting this study, the present status of the previous project, and the situation regarding the technology transfer.
- Whether there are existing studies regarding this requested study or not.
- Coordination with other economic and technical cooperation from Japan

(1) Necessity/Justification of the Study:

According to JETRO (Mar-2003) Report the bridge requires to be about 3.1 km long including a high level Cable-Stayed section over the shipping channel. This is a huge bridge project over a very major and sensitive river to be sited between Haldia Dock and confluence of the mighty Rupnarayan involving plethora of complex elements. This is where a properly formed Project Preparation Report (through the stages of FSR/ PPR and DPR in line with IRC:SP-19 & SP-54) is a necessity to develop appropriate design and construction methodology capturing all related intricate points (through field surveys/ investigations/ model tests), implementation schedule, specifications, BOQ & cost estimate to produce cost effective solution weighing alternative options. Reliable cost estimate is a necessity for robust economic/ financial appraisals, to determine size of loan, to plan budgetary strategy to meet the short-term liability (counterpart funding plus cost of pre-construction activities) and long-term liability (repayment of loan).

Status of JETRO (Mar-2003) Study: The report was in fact a Pre-Feasibility Study, based on interpretation of collected data (often secondary), little field involvement (limited to only traffic volume count at two points) and reasoned assumptions, to look at different aspects of the project and so to examine apparent viability of the project. The included economic & engineering aspects (like traffic assignment & projection, line of crossing, span scheme, form of superstructure, construction material/

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technology, implementation schedule, etc) of such a huge & complex bridge project were not backed by standard traffic surveys (O-D survey, commodity survey etc), detailed engineering surveys (river/ alignment/ building surveys), sub-soil investigations, project specific detailed design under Indian Standards. Detailed study of alternative alignments/ alternative forms of superstructure towards optimisation in economical solution had not been undertaken. Estimate of divertible traffic did not consider the ongoing capacity up-gradations of NH-41/ NH-6 system; also traffic projection did not consider capacity constraint over time. As such the findings are broadly indicative.

(2) Necessity/Justification of the Japanese Technical Cooperation:

Since a grant assistance, free of tie obligations, is available for detailed project preparation.

(3) Objectives of the Study:

*Describe the objectives of the study in detail. Also, indicate who will benefit from the study in as much detail as possible, including gender disaggregated data and describe the beneficial effect in terms of quantity. Enter in a concise manner the goal expected to be achieved in the future by conducting the study.

*When the requested study is the only input scheme there is in the cooperation program, enter the same sentences given in the "Objective of the Cooperation Program" in the summary sheet. When more than one scheme is requested including this one, describe clearly the role of the requested study.

Main objective of the study is to find technical, economic and financial viability of the project and carrying out project preparation (DPR through FSR/PPR) backed by field surveys/ investigations as per IRC:SP-19/ SP-54 and model tests.

The Detailed Project Report would inter-alia include detailed design of bridge, highway design, design of pavement and overlay, cross drainage structures and grade separated structures, design of service roads, quantity of various items (BOQ), detailed good-for-construction drawings, detailed cost estimates, economic and financial viability analyses, environmental and social feasibility, social and environmental action plans, Operation & Maintenance manual, tender packaging and documents required for tendering the project including the related Project Management Contract for international/local competitive bidding.

The DPR consultant should ensure detailed project preparation incorporating quality audit and safety audit requirement in design and implementation.

(4) Area to be covered by the Study:

*Enter the name of the target area for the study and attach a rough map to the documents submitted. The attached map should be at a scale that clearly shows the project site. Mark the site in red

Broadly, the study area would cover the districts of Medinipur, 24-Parganas, Haora, Hugli and Kolkata. Attachments: Figure-1 (Road map of West Bengal) & Figure-2 (Project site).

(5) Scope of the Study:

*Enter in a concise manner using an itemized statement.

Outline scope of works for project preparation: Project preparation is required to consist of the following two stages according to the provisions of IRC:SP-19/ IRC:SP-54. DPR is to commence after FSR/ PPR is accepted by the government.

- ⇒ *STAGE-1: Pre-feasibility Study followed by Feasibility Study/ Preliminary Project Report (PPR)*
- ⇒ *STAGE-2: Detailed Project Report (DPR)*

STAGE-1 is considered to consist of two parts

- *Part-1: Pre-feasibility Study*
- *Part-2: Feasibility Study Report/ Preliminary Project Report (PPR)*

STAGE-1/ Part-1: Pre-feasibility Study: Reconnaissance survey, aided by mouza maps, requires to be undertaken to examine possible river-crossing options and selection of alternative crossing sites/ alignments on the basis of Decision Matrix for further study in FSR / PPR stage. Likely Decision Matrix parameters are length of bridge, nature of crossing, probable foundation depth, length of approach roads, firmness of banks, land use & land acquisition aspect of approach roads etc.

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STAGE-1/ Part-2: Feasibility Study Report/ Preliminary Project Report (PPR) comprises two components basically, namely,

- *Field survey/ investigation/ data collection*
- *Report*

Field survey/ investigation/ data collection component: Field surveys/ investigations included in this stage are -

- *Traffic Study~ Collection of data, classified volume count, O-D survey, axle-load survey.*
- *Highway Engineering Survey~ Road inventory/ condition survey, roughness survey, pavement deflection survey, sub-grade investigation, bridge/ culvert inventory, preliminary exploration of construction materials.*
- *Hydraulic Study~ Data collection, Hydraulic Model Study*
- *Survey/ Investigation~ Total Station river survey showing all features on plan for a length of 1km (along direction of flow) and nine cross-sections (up to 200 m from high bank on either shore) with three cross-sections following the alternative alignments and detailed topographical survey of the alternative approach road alignments identified during pre-feasibility study) connecting NH-41 & NH-117.*
- *Geo-technical Investigation~ Five bore-holes in river channel, including two in the deepest channel (shipping channel), to a depth of 50m from bed level and one bore-hole on either bank (in high embankment position) to depth of 30m from GL.*
- *Social/ Environmental study~ Data collection related to initial screening/ complete Environmental Study along the three alternative alignments, consultation with affected group (stakeholders) and government officials*
- *Collection of data related to socio-economic profile*

Report component: The Report component is required to include the following matters prepared on the basis of Field survey/ investigation/ data collection –

- *Preliminary design for horizontal/ vertical alignment*
- *Preliminary determination of span arrangement aided by Hydraulic Model Study*
- *Preliminary design of the bridge for each alternative alignment (identified in pre-feasibility study) along with alternative structural arrangements as necessary to achieve economical optimisation.*
- *Preliminary design for waterways*
- *Preliminary arrangement for ROB*
- *Preparation of GAD and other drawings based on preliminary design*
- *Preliminary construction plan (methodology & implementation schedule)*
- *Preliminary design of pavement for each alternative alignment (identified in pre-feasibility study)*
- *Preliminary arrangement for intersections*
- *Preliminary arrangement for toll plaza*
- *Drawings showing road alignment in plan & sections*
- *BOQ based on preliminary design for bridge & road works*
- *Social/ Environmental study~ Initial screening and complete Environmental Study along the three alternative alignments, Resettlement/ Rehabilitation Plan*
- *Preliminary cost estimate*
- *Traffic analysis~ Review/ tabulation of existing data, estimate for diverted traffic, projection.*
- *Socio-economic profile for immediate project area and the State of West Bengal*
- *Estimate of EIRR, NPV, FIRR*

STAGE-2 would consist in detailed engineering (DPR). It comprises two components basically, namely,

- *Field survey/ investigation/ model test*
- *Report*

Field survey/ investigation/ model test component: Field surveys/ investigations included in this stage are -

- *Traffic Study~ Intersection traffic*

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- *Field survey- Supplementary river-cross-sections, supplementary cross-sections for approach roads*
- *Aerodynamic Model study (Wind Tunnel)*
- *Dynamic Model study for seismic effect*
- *Geotechnical Investigation- For bridge at foundation locations, ROB/ CD structures, for high embankment etc*

Report component: The Report component is required to include the following matters prepared on the basis of Field survey/ investigation/ data collection –

- *Final design for horizontal & vertical alignment*
- *Final determination of span arrangement aided by Hydraulic Model Study*
- *Final design of bridge components*
- *Final design of CD structures*
- *Final arrangement for ROB*
- *Preparation of GAD and other drawings based on final design*
- *Final construction plan (methodology, Layout of construction / fabrication yard, Machinery & equipment, logistics and Implementation Schedule)*
- *Final design of pavement/ shoulder/ intersection*
- *Final design of road furniture/ landscaping/ toll plaza/ road side amenities etc including drawings*
- *Final drawings showing road alignment in plan & sections*
- *Environmental Management Action Plan including Rehabilitation/ Resettlement Plan and cost estimate thereof*
- *BOQ based on final design for bridge & road works*
- *Final cost estimate*
- *Socio-economic profile for immediate project area and the State of West Bengal*
- *EIRR, NPV, FIRR*
- *Operation & Maintenance manual*
- *Preparation of Contract packaging/ Tender Document for launching construction works & Project Management Contract*

(6) Study Schedule:

*Enter the time/period of the study.

Time frame of the study has been shown below. While the detailed project preparation work will be carried out by a Prime Consultant on JICA technical grant assistance, a Proof Consultant would be engaged, supported preferably on loan assistance, to assist State Government with acceptance/ approval of project preparation works.

SL	Item	Period	Length of time
1	Negotiation for Japanese grant program towards obtaining Project Preparation Assistance from JICA & preparation for engaging Proof Consultant	12/ 2004 – 12/2005	13 months
2	**Stage-1: Pre-Feasibility Study & Feasibility Study/ Preliminary Project Report (PPR)**		
2.1	Pre-Feasibility Study		
	Prime Consultant	1/ 2006 –2/2006	1 month
2.2	Feasibility Study		
	Prime Consultant	2/ 2006 – 1/ 2007	12 months
	Proof Consultant	8/ 2006 – 4/ 2007	9 months
3	Government approval	5/2007 – 6/ 2007	2 months
4	**Stage-2 : Detailed Project Report (including approval)**		
	Prime Consultant	7/ 2007 – 8/ 2008	14 months
	Proof Consultant	10/ 2007 – 10/ 2008	12 months
5	Loan negotiation/ Invitation & acceptance of Tender for launching construction works & Project Management Consultancy Service	11/ 2008 – 12/ 2009	14 months

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(7) **Expected Major Outputs of the Study:**

Major outputs of the study are finding Economic and Financial Appraisals, Environmental & Resettlement/Rehabilitation Reports & Action Plans, Detailed Designs, Specifications & Good-for-construction Drawings, Construction Methodology & Action Plan, preparation of Operation & Maintenance Manual, Tender packaging, preparation of Tender Documents for Works and Project Management Contracts.

(8) **Possibility to be implemented / Expected funding resources:**

- *For physical works:* *ODA loan assistance from JBIC through MOEA, Government of India and requisite counterpart funding from the State budget.*
- *For Project preparation works:* *JICA assistance on grant basis.*

(9) **Request of the Study to other donor agencies, if any:**

*Please pay particular attention to the following items:

- Whether you have requested the same study to other donors or not.
- Whether any other donor has already started a similar study in the target area or not.
- Presence/absence of cooperation results or plans by third-countries or international agencies for similar projects.
- In the case that a study was conducted in the same field in the past, describe the grounds for requesting this study, the present status of the previous project, and the situation regarding the technology transfer.
- Whether there are existing studies regarding this requested study or not. (Enter the time/period, content and concerned agencies of the existing studies)

There is no standing request to any other donor agency nor is there is there contemplation for such assistance other than this request.

(10) **Other relevant information**

*Enter relevant information other than that described above, if any.

Nothing in particular except noting that the project preparation work, DPR through PPR, is required to be conducted according to provisions of IRC:SP-19 & SP:54 and model tests as specified elsewhere.

3. Facilities and information for the Study

(1) **Assignment of counterpart personnel of the implementing agency for the Study:**
(number, academic background, etc.)

Shri S. P. Roy, Engineer-in Chief, PWD & PW(R)D, would form a dedicated core team of engineer-officers headed by Shri N. Pal, Chief Engineer (Planning & Quality Assurance) and Chief Engineer (Roads) to provide necessary help/ interaction for the study.

(2) **Available data, information, documents, maps, etc. related to the Study:**
(Please attach the list.)

Department would extend as and when necessary

(3) **Information on the security conditions in the Study Area:**

Satisfactory

4. Global Issues (Environment, Gender, Poverty, etc.)

(1) **Environmental components (such as pollution control, water supply, sewage, environmental management, forestry, biodiversity) of the Project, if any.**

The study area is mostly agricultural land; there is no forest, national park or sanctuary. It is not likely that environmental components of the project influence area would pose any acute problem. However, environmental study included in scope of project preparation would sort out the issue.

(2) **Anticipated environmental impacts (both natural and social) by the Project, if any.**

Environmental impacts on natural resources are likely to be minimal and are amenable to being replenished by suitable mitigation measures. The project might require acquisition of some land with structures, mostly temporary, which is to be addressed in the related R/R plan included in the scope of project preparation works.

(3) Women as main beneficiaries or not.

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It is anticipated that a significant proportion (estimated at 2/3 lakh) of women would be beneficiary.

(4) Project components which require special considerations for women (such as gender difference, women specific role, women's participation), if any.

Local women might participate in construction activity forming part of unskilled labour force.

(5) Anticipated impacts on women caused by the Project, if any.

It is likely to have beneficial effect on a part of women population.

(6) Poverty alleviation components of the Project, if any.

Local people of the anticipated project command area will participate in the construction activities in large numbers as unskilled labour.

(7) Any constraints against the low-income people caused by the Project.

Hopefully no constraints will be caused by the project

5. Undertakings of the Government of (the recipient country)

In order to facilitate the smooth and efficient conduct of the Study, the Government of (the recipient country) shall take necessary measures:

(1) to secure the safety of the Study Team,

(2) to permit the members of the Study Team to enter, leave and sojourn in (the recipient country) in connection with their assignment therein, and exempt them from foreign registration requirements and consular fees,

(3) to exempt the Study Team from taxes, duties and any other charges on equipment, machinery and other materials brought into and out of (the recipient country) for the conduct of the Study,

(4) to exempt the Study Team from income tax and charges of any kind imposed on or in connection with the implementation of the Study,

(5) to provide necessary facilities to the Study Team for remittance as well as utilization of the funds introduced in (the recipient country) from Japan in connection with the implementation of the Study,

(6) to secure permission for entry into private properties or restricted areas for the conduct of the Study,

(7) to secure permission for the Study Team to take all data, documents and necessary materials related to the Study out of (the recipient country) to Japan, and,

(8) to provide medical services as needed. Its expenses will be chargeable to members of the Study Team.

6. The Government of (the recipient country) shall bear claims, if any arise against member(s) of the Japanese Study Team resulting from, occurring in the course of or otherwise connected with the discharge of their duties in the implementation of the Study, except when such claims arise from gross negligence or wilful misconduct on the part of the member of the Study Team.

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7. (The implementing Agency) shall act as counterpart agency to the Japanese Study Team and also as coordinating body in relation with other governmental and non-governmental organizations concerned for the smooth implementation of the Study.

8. (The implementing Agency) will, as the executing agency of the project, take responsibilities that may arise from the products of the Study.

*In the case that Detail Design Study is requested.

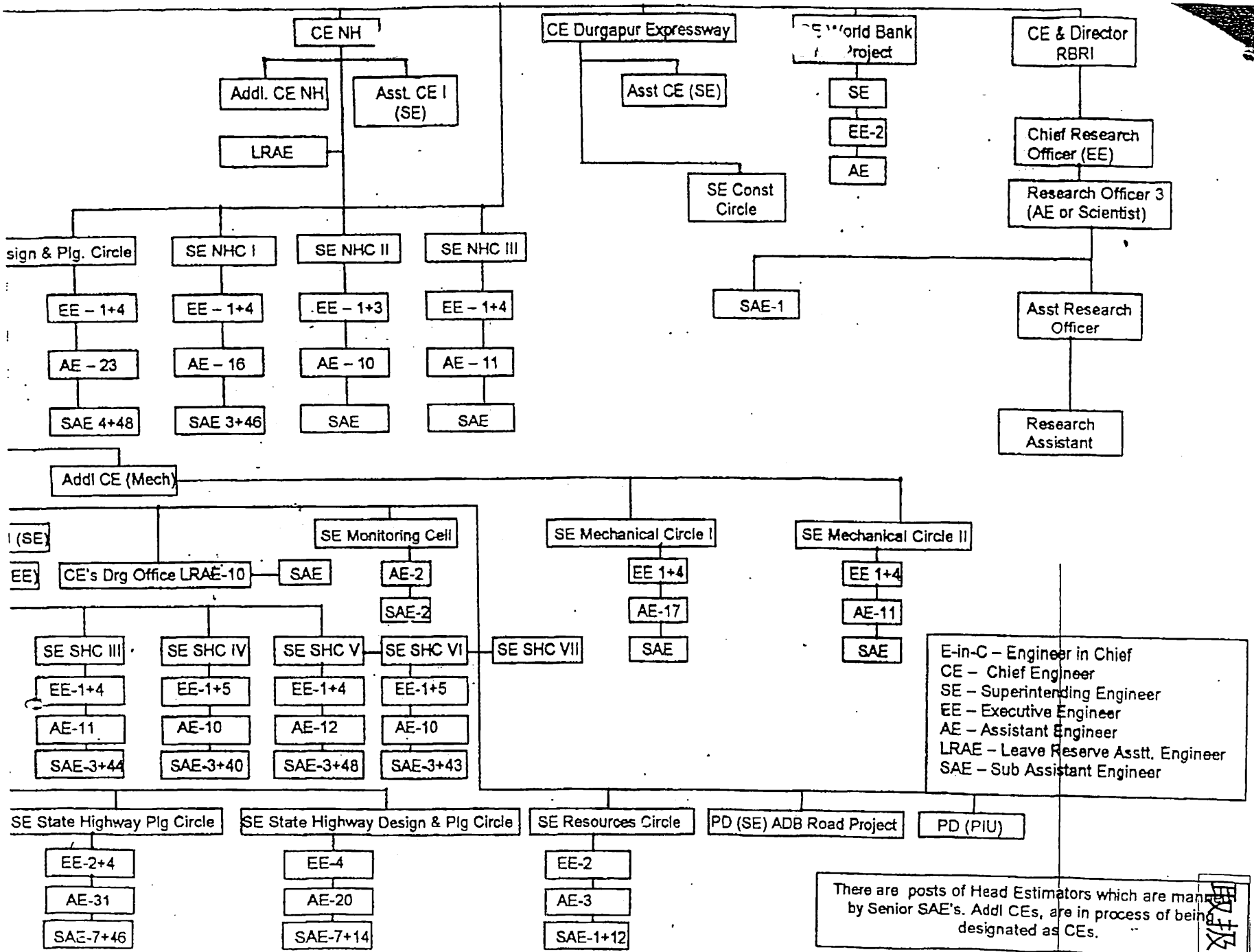
The Government of (the recipient country) assures that the matters referred to in this form will be ensured for the smooth conduct of the Development Study by the Japanese Study Team.

Signed: S. P. RAY

Title: Engineer-in-Chief & Ex-Officio Secretary P.W. & P.W. (Roads) Deptts. Govt. of West Bengal.

On behalf of the Government of West Bengal, India.

Date: 22. 11. 2004



ORGANISATION CHART : PUBLIC WORKS (ROADS) DIRECTORATE

West Bengal map showing the existing NHs & SHs
(Corrected upto 2004)

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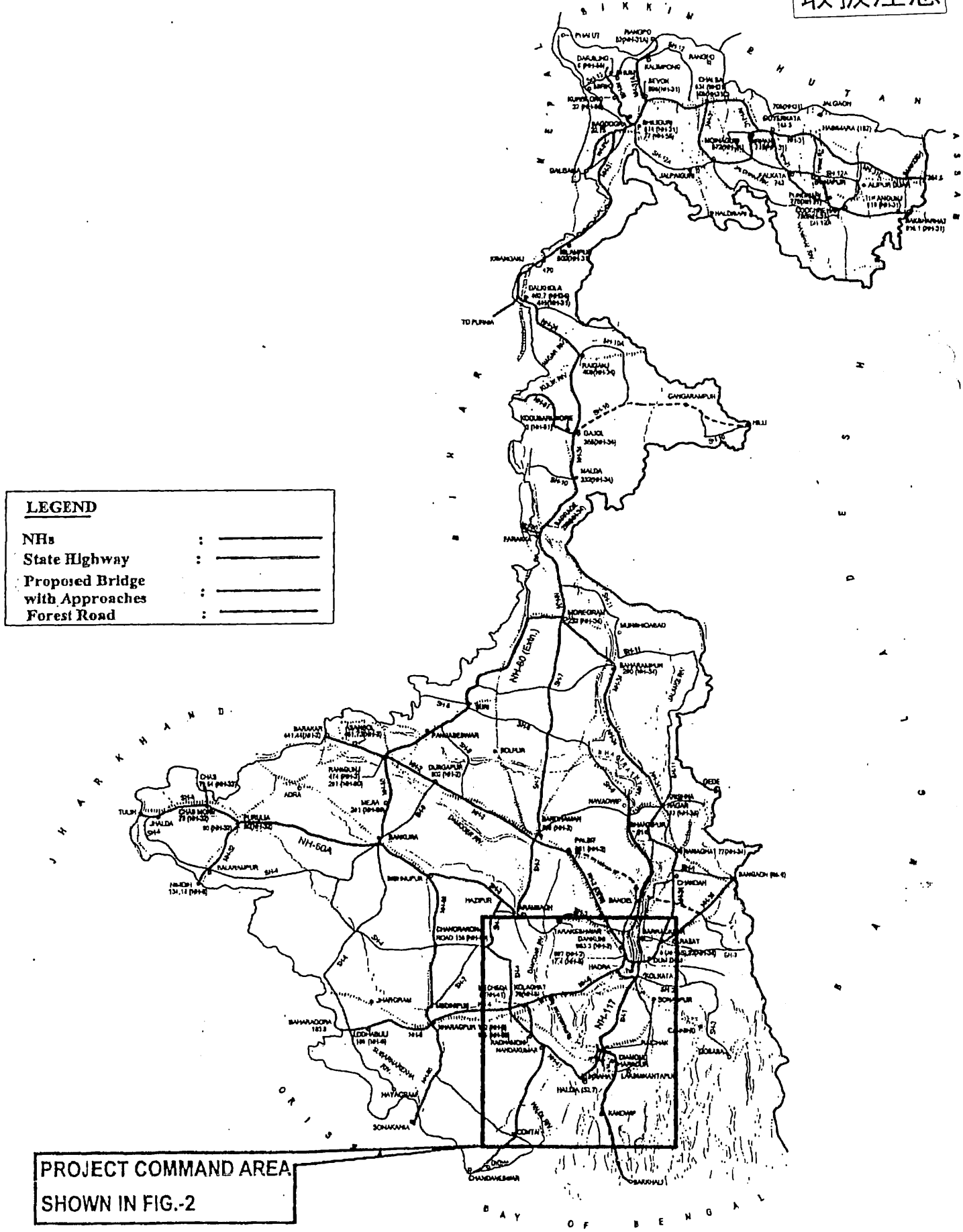

FIG.-1

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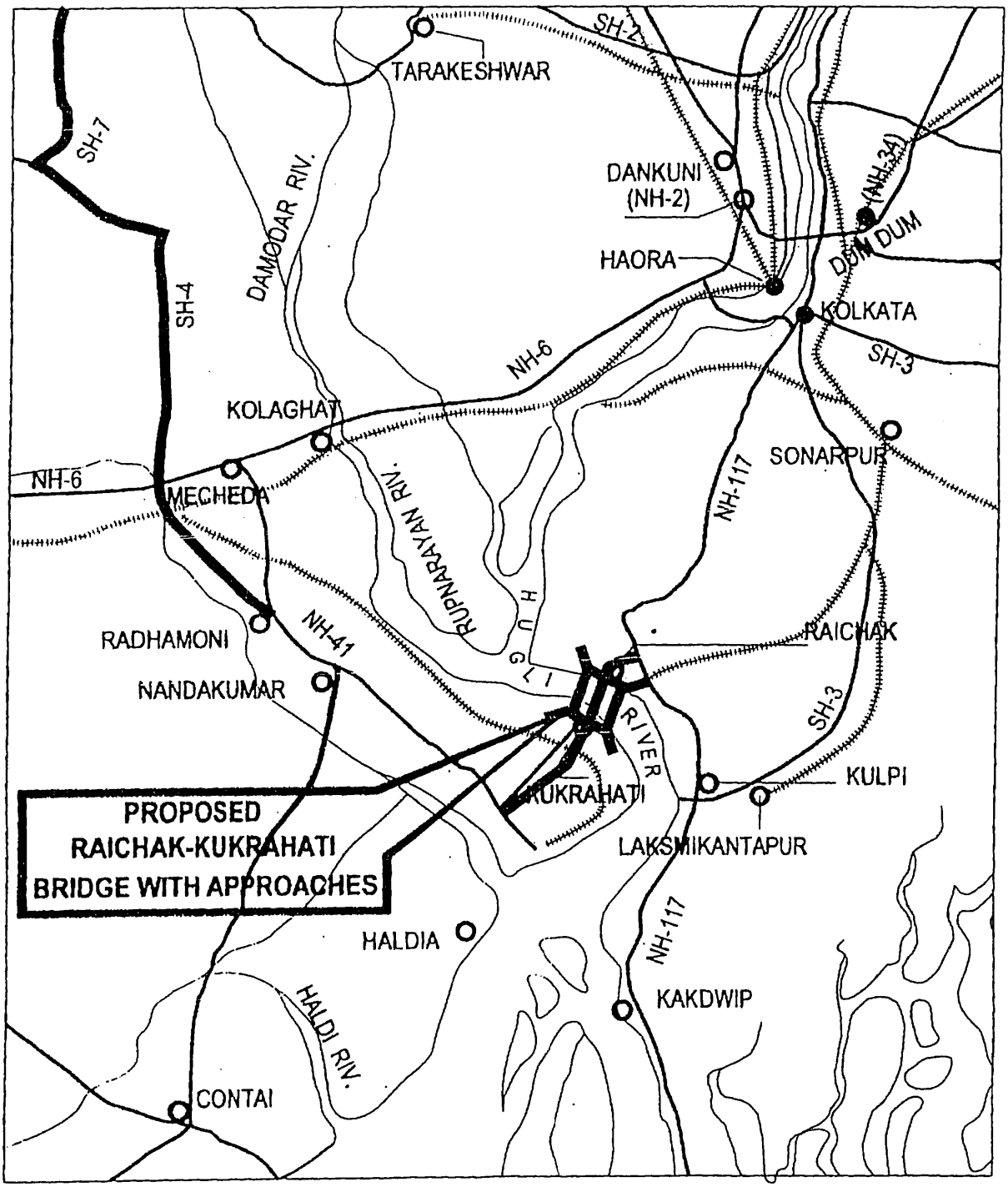
Proposed command area for the proposed Raichack - Kukrahati Bridge with Approaches over river Hugli



LEGEND

NHs	:	———
State Highway	:	———
Proposed Bridge with Approaches	:	———

FIG.-2

添付資料 2：Scope of Work (S/W)

SCOPE OF WORK

FOR

THE FEASIBILITY STUDY ON

THE CONSTRUCTION OF RAICHAK – KUKURAHATI BRIDGE IN INDIA

AGREED UPON BETWEEN

PUBLIC WORKS DEPARTMENT, GOVERNMENT OF WEST BENGAL, INDIA

MINISTRY OF SHIPPING, ROAD TRANSPORT AND HIGHWAYS,

AND

JAPAN INTERNATIONAL COOPERATION AGENCY

DELHI, INDIA

February 28, 2006

Dr. P.K. Agrawal
Principal Secretary,
P.W. Dept. & P.W. (Roads) Dept.
Government of West Bengal

Mr. Nobuhiro KOYAMA
Leader
Preparatory Study Team
Japan International Cooperation Agency

Mr. A. P. Bahadur
Chief Engineer
Ministry of Shipping, Road Transport and Highways

INTRODUCTION

In response to the request of the Government of India (hereinafter referred to as "GOI"), the Government of Japan (hereinafter referred as "GOJ") has decided to conduct the Feasibility Study on the Construction of Raichak – Kukurahati Bridge in India (hereinafter referred to as "the Study"), and exchanged Notes Verbal with GOI concerning the implementation of the Study.

Accordingly, the Japan International Cooperation Agency (hereinafter referred to as "JICA"), the official agency responsible for the implementation of the technical cooperation programme of GOJ will undertake the Study in close cooperation with the authorities concerned of GOI.

On the part of GOI, Public Works Department of the Government of West Bengal, (hereinafter referred to as "PWD") shall act as the counterpart agency to the Japanese study team and as the coordinating body in relation with other concerned organizations for the smooth implementation of the Study.

I. OBJECTIVES OF THE STUDY

The objectives of the Study are:

1. to conduct the feasibility study on the construction of Raichak – Kukurahati bridge over the River Hugli including its approach roads
2. to pursue technology transfer to the counterpart personnel during the course of the Study

II. STUDY AREA

The study shall focus on the southern part of West Bengal State, which would be directly influenced by the proposed bridge construction project, as shown in Attachment-I including viability of an alternative corridor between Haldia Port and North Bengal & North-Eastern States.

III. SCOPE OF THE STUDY

In order to achieve the objectives mentioned above, the Study shall cover the following items:

1. Preparatory Works
   1-1. Planning for Implementation of the Study
   1-2. Preparation of the Inception Report (IC/R)
2. Analyses of Existing Conditions

2-1. Analyses based on existing/available data, information and reports

(1) The country and West Bengal State

a) Socio-economic conditions and future development plans of the country as well as West Bengal State

b) Current conditions and future development plans of the transport sector of the country as well as West Bengal State

c) Hinterland of the Port of Haldia including neighboring countries

d) Environment protection laws and regulations including "Environment Impact Assessment (EIA)" and land acquisition

e) Policies, laws and regulations regarding resettlement

f) Other data and information related to the Study

(2) The Study Area

a) Natural, socio-economic and environmental conditions

b) Land use including environmentally sensitive areas

c) Current transport network and traffic of roads, railways and ports

d) Future transport development plan of roads, railways and ports

e) Traffic data on land transport, river crossing ferries and inland water/marine transport in the study area

f) Other data and information related to the Study

2-2. Analyses based on the investigations and surveys by the Study

a) Socio-economic survey in the study area including land use

b) Surveys of transport infrastructure, systems and service in the study area

c) Traffic survey in the study area

d) Engineering survey related to the proposed bridge construction including geotechnical investigation for bridge foundation and high embankment

e) Environmental survey related to the proposed bridge and road construction including possible land acquisition

f) Social survey related to the proposed bridge and road construction including possible impacts and mitigation measures of resettlement

3. Future Traffic Demand Forecast

3-1. Clarification of the current socio-economic framework of the study area

3-2. Clarification of the current traffic demand related to the study area including (a) generation & attraction, (b)distribution, (c)modal split, and (d)traffic assignment

3-3. Review of national, provincial and regional development plans related to the study area

3-4. Assumption of future socio-economic framework of the study area

3-5. Assumption of the future transport network related to the study area

3-6. Forecast of future traffic demand related to the study area

3-7. Clarification of the structure of future traffic demand using the Raichak - Kukurahati Bridge

The Study would estimate volume of diverted/generated traffic into the proposed crossing through O-D surveys and toll charge based on generalized cost concept

4. Study on alternative methods for crossing the River Hugli

4-1. Identification of the alternative methods for crossing the river (e.g. improvement of ferry system, construction of bridge, and 'without project' option) as well as criteria for selecting the best option

4-2. Surveys on alternative methods (based on the criteria mentioned in 4-1)

1) Socio-economic condition survey including land use
2) Natural condition survey from engineering view point (topographic, soil & geological, and hydrological & hydraulic surveys)
3) Study on possible environmental and social impacts

4-3. Assessment of alternatives and selection of best option

1) Improvement of ferry system
2) Construction of bridge
3) Zero option (without project)

4-4. Recommendation on the method for crossing the river

5. Feasibility Analysis of the Raichak – Kukurahati bridge project

5-1. Basic policy for the feasibility study on the bridge construction project

5-2. Development of bridge alternatives by location, design and alignment from cost effective and updated technology considerations and with guidelines of IRC: SP-19 & 54

5-3. Development of decision matrix for selection of the best alternative

5-4. Feasibility study on the selected best alternative

1) Demand forecasting
2) Designing (bridge section and approach road sections)

The design is to include design of components (including investigations such as Hydraulic Study, Wind Impact Study, Seismic Impact Study, etc.) and drawings including construction methodology and Bill of Quantity (BOQ). The design shall aim at utilizing indigenous materials, machinery etc. as much as possible and adopting relevant IRC Codes to select the most economical solution, supported by robust preliminary designs/drawings.

3) Costing (Investment and operation/maintenance)

Cost estimate will be based on BOQ and estimated unit rates.

4) Scheduling
5) Financial evaluation including finding FIRR and other parameters
6) Economic evaluation including finding EIRR and other parameters
7) Evaluation of environmental and social impacts including the costing of mitigation measures for possible impacts
8) Conclusion of the feasibility analysis

6. Overall Evaluation and Recommendations

6-1 Overall evaluation of the project

6-2 Recommendations for the project implementation

6-3 Recommendations for environmental and social considerations

6-4 Recommendations for land acquisition and rehabilitation/resettlement plan

IV. STUDY SCHEDULE

The study shall be carried out within sixteen months period in accordance with the attached tentative schedule as shown in APPENDIX 1.

V. STUDY IMPLEMENTATION MECHANISM

1. Steering Committee & Technical Committee

The Government of West Bengal will establish the Steering Committee to provide policy guidelines, and Technical Committee to provide technical advice for the Study and sort out technical problems, if any.

2. Advisory Committee

JICA will establish Advisory Committee to review and comment on results of the Study from time to time in Japan.

3. Collaboration between JICA Study Team and Counterpart Team of PWD

The Government of West Bengal will assign the counterpart personnel to work together with JICA Study Team on a daily basis.

4. Proof Consultant

The Government of West Bengal will engage a Proof Consultant to review the Study and make comments for improving results of the Study from time to time. The comments and recommendations suggested by the Proof Consultant shall be suitably integrated into the Study through the discussion with the JICA Study Team.

VI. REPORTS

JICA shall prepare and submit the following reports in English to the GOI and the

Government of West Bengal.

1. Inception Report,
   Thirty (30) copies, at the time of commencement of the Study

2. Progress Report 1
   Thirty (30) copies, within three and half (3.5) months after commencement of the Study

3. Interim Report
   Thirty (30) copies, within seven (7) months after commencement of the Study

4. Progress Report 2
   Thirty (30) copies, within ten and half (10.5) months after commencement of the Study

5. Draft Final Report
   Thirty (30) copies, within fourteen and half (14.5) months after commencement of the Study
   GOI and the Government of West Bengal will provide JICA with its written comments within one (1) month after the receipt of the Draft Final Report.

6. Final Reports
   Forty (40) copies and three (3) sets of CD-ROM within half (0.5) month after the receipt of the comments on the Draft Final Report

VII. UNDERTAKING OF JICA

For the implementation of the Study, JICA shall take the following measures;

1) to dispatch, as its own expense, the Japanese study team (hereinafter referred to as "the Study Team") and
2) to pursue technology transfer to the Indian counterpart personnel during the course of the Study.

VIII. UNDERTAKINGS OF GOI

1. To facilitate smooth implementation of the study, GOI shall take necessary measures:

(1) to provide security related information on as well as measures to ensure the safety of the Study Team

(2) to permit the members of the Study Team to enter, leave and sojourn in India for the duration of their assignment therein, and exempt them from foreign registration requirements and consular fees;

(3) to exempt the members of the Study Team from taxes, duties, fees and any other charges on equipment, machinery and other materials brought into and out of India for the implementation of the Study;

(4) to exempt the members of the Study Team (excluding Indian members) from income taxes and charges of any kind posed on or in connection with any emoluments or allowance paid to the members of the Study Team for their services in connection with the implementation of the Study;

(5) to provide necessary facilities to the Study Team for remittance as well as utilization of the funds introduced into India from Japan in connection with the Implementation of the Study;

(6) to secure permission for the Study Team to take all data and documents including photographs and maps related to the Study out of India to Japan, and

(7) To provide medical services as needed. Its expenses will be chargeable to members of the Study Team.

2. GOI shall bear claims, if any arises, against the members of the Study Team resulting from, occurring in the course of, or otherwise connected with, the discharge of their duties in the implementation of the Study, except when such claims arise from gross negligence or wilful misconduct on the part of the members of the Study Team.

3. PWD shall provide the Study Team with the followings, in cooperation with other organizations concerned:

(1) Security-related information on as well as measures to ensure the safety of the Study Team;

(2) Information on as well as support in obtaining medical service;

(3) Available data and information related to the Study, including aerial photographs and maps;

(4) Counterpart personnel;

(5) Suitable office in Kolkata

(6) Credentials or identification cards.

IX. OTHRES

JICA and PWD shall consult with each other in respect of any matter that may arise from or in connection with the Study.

APPENDIX 1

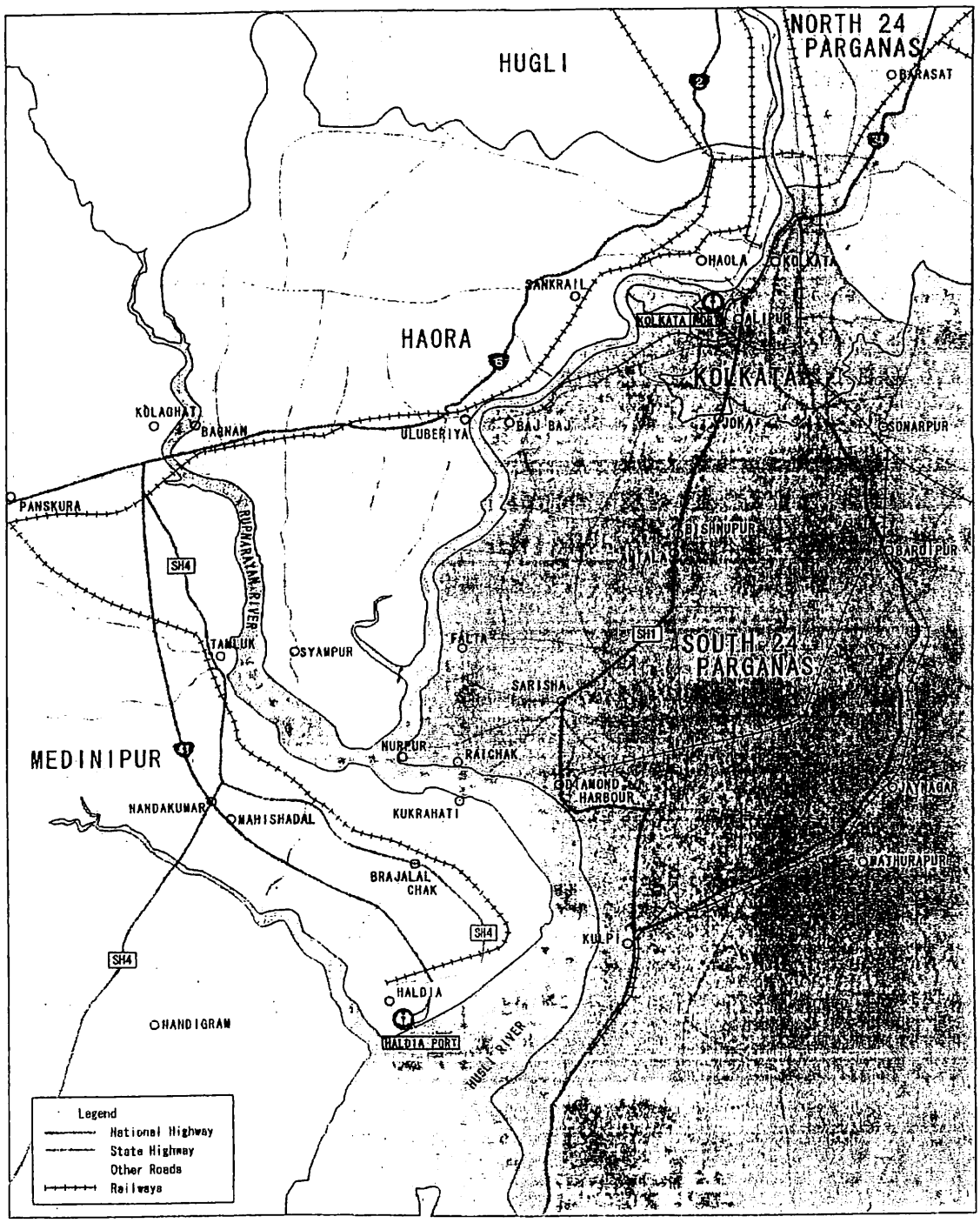
Tentative Schedule

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Work in India																	
Work in Japan																	
Report	▲ IC/R			▲ P/R1			▲ IT/R				▲ P/R2				▲ DF/R		▲ F/R

Legend

IC/R	Inception Report
P/R 1	Progress Report 1
IT/R	Interim Report
P/R 2	Progress Report 2
DF/R	Draft Final Report
F/R	Final Report

Attachment-1



添付資料 3：Minutes of Meeting (M/M)

MINUTES OF MEETING
OF
THE FEASIBILITY STUDY ON
THE CONSTRUCTION OF RAICHAK – KUKURAHATI BRIDGE IN INDIA

AGREED UPON BETWEEN
PUBLIC WORKS DEPARTMENT, GOVERNMENT OF WEST BENGAL, INDIA
MINISTRY OF SHIPPING, ROAD TRANSPORT AND HIGHWAYS
AND
JAPAN INTERNATIONAL COOPERATION AGENCY

DELHI, INDIA
February 28 , 2006

Dr. P.K. Agrawal
Principal Secretary,
P.W. Dept. & P.W. (Roads) Dept.
Government of West Bengal

Mr. Nobuhiro Koyama
Leader
Preparatory Study Team
Japan International Cooperation Agency

Mr. A. P. Bahadur
Chief Engineer
Ministry of Shipping, Road Transport
and Highways

In response to the request of the Government of India (hereinafter referred to as "GOI"), the Government of Japan (hereinafter referred to as "GOJ"), dispatched the preparatory study team headed by Mr. Nobuhiro Koyama (hereinafter referred to as "the Team"), from February 19 to March 3, 2006 through the Japan International Cooperation Agency (hereinafter referred to as "JICA"), to discuss the scope of work on the Feasibility Study on the Construction of Raichak – Kukurahati Bridge in India (hereinafter referred to as "the Study").

The Team conducted site survey and had a series of discussions with the authorities of the GOI including Ministry of Shipping, Road Transport and Highways (hereinafter referred to as "MSRTH") and Department of Economic Affairs (hereinafter referred to as "DEA") and the Government of West Bengal, (hereinafter referred to as "GOWB") from February 20 to February 28, 2006. The list of participants of the meeting is shown in Appendix 1.

Main points discussed between the Team and GOWB during the meeting of the scope of work are summarized below:

1. The Scope of Work (S/W) was agreed upon by both sides.

2. Study Title
   Both sides agreed to determine the title of the Study as "the Feasibility Study on the Construction of Raichak – Kukurahati Bridge in India".

3. Commencement of the Study
   The Indian side requested that the Study be commenced at the earliest possible time. The Team explained that procedure of selecting JICA Study Team would take around three months in accordance with the rules and regulations of JICA. The Team also stated that the Study would start in sometime in June 2006.

4. Study Schedule
   GOWB requested that the Study would be completed in time for applying the Japanese Yen Loan for the Year 2007. The Team took note of it and explained that the tentative schedule attached in S/W indicates the timely submission of the Draft Final Report for that purpose.

5. Steering Committee and Technical Committee

Both sides agreed that the Steering Committee and Technical Committee shall be set up for smooth implementation of the Study. The Indian side will inform the candidate members of the Steering and Technical committees to JICA before the commencement of the Study, hopefully by the end of April 2006. The Indian side will also convene stakeholder meetings to facilitate public participation.

6. Counterpart Personnel
GOWB will organize a counterpart team and assign the members of the team covering functions to be decided later for the effective and efficient collaboration between both sides.

7. Proof Consultant
GOWB informed that the Proof consultant would be engaged by the GOWB to review and make comments on the reports for improvement, and that the comments by the Proof consultant be suitably integrated into the Study. The Team responded that the JICA Study Team would make its best efforts for quality improvement of the Study through close collaboration with the GOWB.

8. Information Dissemination of the Study
Both sides agreed the importance of information dissemination of the Study for promoting participation and understanding of stakeholders. For this purpose, both sides shall cooperate together to organize seminars/workshops during the course of the Study. The Final Report of the Study will be made available to the authorities and organizations for the effective implementation of the project.

9. JICA Guideline for Environmental and Social Consideration
The Team explained the general concept and procedures of "the JICA Guideline for Environmental and Social Consideration". The Team stated that the guideline should be applied to the Study accordingly, and that the Indian side shall be responsible for conducting the environmental and social considerations in accordance with the guideline with the technical support of the JICA Study Team.

10. Undertaking of GOI
The Team requested the Indian side to provide the office space in Kolkata city for the JICA Study Team. The Indian side responded that GOWB would

make best efforts to provide the office space in Kolkata.

11. Effectuation of the Scope of Work

The Team explained the Indian side that the Scope of Work of the Study would become effective after the approval of JICA headquarters.

APPENDIX 1

List of attendants of the Indian side

Ministry of Finance Department of Economic Affairs

Ms. Sreyasi Chaudhuri	Under Secretary, Department of Economic Affairs

Ministry of Shipping, Road Transportation and Highways

Mr. A.P. Bahadur	Chief Engineer, Project Implementation Cell
Mr. R.K. Singh	Superintending Engineer (PIC)
Me. Naveen Kumar Chaurasia	Assistant Executive Engineer (PIC)

The Government of West Bengal

A.K. Deb	Chief Secretary
S.A. Ahmed, I.A.S	O.S.D. & Special Secretary to Chief Minister

Public Works Department, the Government of West Bengal

Dr. P.K. Agrawal	Principal Secretary, PWD
Mr. S.P. Roy	Engineer in- Chief / Ex-Officio Secretary
Mr. S.K Saha	Chief Engineer, Planning & Quality Assurance
Mr. Kashi Nath Das	Executive Engineer, Highway Survey Division III
Mr. Susmit Banerjee	Executive Engineer, Tamluk Highway Division

List of attendants of the Japanese side

The Preparatory Study Team, JICA

Mr. Nobuhiro Koyama	Leader
Mr. Akira Moriyama	Member
Mr. Isaya Higa	Member
Mr. Kuniaki Nishijima	Member
Mr. Shigeo Honzu	Member

JICA Indian Office

Mr. Tomoyuki Fujii	Resident Representative
Mr. Nobuaki Koguchi	Assistant Resident Representative

Embassy of JAPAN

Mr. Keiji Kamiyama	Counselor

添付資料 4：収集資料リスト

収集資料リスト

番号	収　集　資　料　名	頁数	刊 行 元	入手先
1	Catalogue of IRC Publications Available for sale	12	Indian Roads Congress	Inidan Roads Congress
2	Project Preparation Manual for Bridges (First printed April 2000, Reprinted Sep. 2003)	42	Indian Roads Congress	Inidan Roads Congress
3	Road Development Plan Vision : 2021	104	Ministry of Road Transport & Highways	Indian Roads Congress
4	Manual for Survey, Investigation and Preparation of Road Project	114	Indian Roads Congress	Indian Roads Congress
5	Five Year Plan 2002-2007 (Volume -I) Dimensions and Strategies	222	Planning Commission Gov. of India	Book Shop (in New Delhe) (E.D.Galgotia & Sons)
6	Five Year Plan 2002-2007 (Volume -II) Sectoral Policies and Programs	1207	Ditto	Ditto
7	Five Year Plan 2002-2007 (Volume -III) State Plans Trend, Concerns and Strategies	152	Ditto	Ditto
8	Geological and mineral Atlas of India (Sheet No. 29)	1	Geological Survey of India (Edition 1963)	Geological Survey of India
9	Public Relations Directory 2004 for West Bengal Government	254	I. & C. A. Department Govt. of West Bengal	I. & C. A. Department Govt. of West Bengal
10	Annual Hydraulic Survey Charts at Kukulahati Crossing 5 Nos. (Nov. 05, Nov. 03, Dec. 01, Nov. 99, Nov. 95)	5*	Kolkata Port Trust Marin Department	Kolkata Port Trust Hydraulic Study Department
11	Annual Hydraulic Survey Charts Eastern Gut Bar 5 Nos. (Dec. 05, Nov. 03, Nov. 01, Nov. 99, Nov. 95)	5*	Ditto	Ditto
12	River flow's Velocity Data and Bed Soil Sample data at Kukrahati region (30th May to 31st May 03)		Kolkata Port Trust Hydraulic Study Department	Ditto
13	Bed Soil Sample data Grain size distribution Chart	2*	Ditto	Ditto
14	Float Observation Data at Kukurahati Crossing (Carried out on: 29 th June 2003)	1*		Ditto
15	Water Level data (Daily Tidal Register Kept at Diamond Harbor Tidal Station (Jan.05-Dec. 05)	12*	Kolkata Port Trust	Ditto
16	Maximum, Mean High / Low water at Sagar	1*	Kolkata Port Trust	Ditto
17	Meteorological Data (Rain fall, Wind etc.) at Sagar	4*	Kolkata Port Trust	Ditto
18	MCC PTA India Brochure	1	MCC PTA India Co.	MCC PTA India Co.
19	Cross Section of Soil Profile (for MCC PTA factory at Haldia)	1*	S.K. Mitra & Associates	MCC PTA India Co.
20	Haldia Dock Brochure	18	Kolkata Port Trust Haldia Dock Complex	Kolkata Port Trust Haldia Dock Complex
21	List of Operating and Projects Under Implementing Unit in Falta Processing Zone (as on 1.12.99)	13*		Falta Special Economic Zone
22	Environmental Standards for Ambient Air, Automobiles, Fuels, Industries and Noise	105*	Central Pollution Control Board, Min. of Envir.&Forests	Central Pollution Control Board, Min. of Envir.&Forests
23	Map of State of West Bengal Showing NH & SH	A3	P.W.(Roads) Dept.	P.W.(Roads) Dept.
24	Map of West Begal & Sikkim (1:1,000,000)	A1	NATMO Dep. Sience & Technology	P.W.(Roads) Dept.
25	Distric Planning Map Series (1:250,000) Suth 24-Parganas West Bengal	A1	NATMO	P.W.(Roads) Dept.
26	Distric Planning Map Series (1:250,000) Haora West Bengal	A1	NATMO	P.W.(Roads) Dept.
27	Urban Landuse Calucutta City (1:25,000)	B1	NATMO (Revised Edition 1998)	P.W.(Roads) Dept.
28	Tentative remuneration of staff and hire charges (Figurewa as stated are indicative only)	1*	P.W.(Roads) Dept.	P.W.(Roads) Dept.
29	Soil exploration rate of schedule of rates of P.W.Directorate, GOWB.	12*	P.W.(Roads) Dept.	P.W.(Roads) Dept.
30	Map of West Begal (1:1,00,000)	1	TTK Healthcare Limited Publications Division	Book shop
31	Records of the Zoological Survey of India: Fish and Fisheries of Digha Coast of West Bengal, Zoological	87	Chatterjee, T.K., Ramakrishna, S. Talukdar	Zoological Survey of India
32	The Freshwater Fishes of India Handbook	475	Zoological Survey of India	Zoological Survey of India
33	Fauna of West Bengal Part1	443	Zoological Survey of India 1992	Zoological Survey of India
34	Fauna of West Bengal Part2	381	Zoological Survey of India 1992	Zoological Survey of India
35	Catalogue 2006 A list of Priced Publications	52	Zoological Survey of India	Zoological Survey of India
36	Decentralization in West Bengal: Origines, Functioning and Impact.	19	Bardhan, Pranab and Dillip Mookherjee, 2004.	Download from Internet
37	A Field Guide to Indian Mammals. Dorling Kindersley India Pvt. Limited in Association with Penguin Book	200	Menon, Vivek, 2003.	Dorling Kindersley Pvt Limited
38	Annual Report 2004-2005		World Wide Fund for Nature – India.	WWF-India East Bengal State Office
39	Manual for Survey, Investigation and Preparation of Road Project. Ministry of Road Transport and	114	Indian Road Congress, 2001.	Indian Roads Congress
40	Project Preparation Manual for Bridges. Ministry of Road Transport and Highways.	42	Indian Road Congress, 2000.	Indian Roads Congress
	c.f. *) Photocopy			

添付資料 5：事前評価表

事業事前評価表（開発調査）

作成日：　平成 18 年 3 月 20 日
担当グループ：社会開発部第 3 グループ
運輸交通第 1 チーム

1. 案件名

インド国 ライチャック・ククラハティ橋梁建設計画調査

2. 協力概要

(1) 事業の目的

西ベンガル州南部における効率的な物流網の構築のため、フグリー川下流のライチャック・ククラハティ渡河地点において、長大橋及び接続道路を建設する「ライチャック・ククラハティ橋梁建設事業」に関するフィージビリティー調査（含む環境社会配慮調査）を行うもの。

(2) 調査期間

2006 年 6 月～2007 年 9 月

(3) 総調査費用

約 3.0 億円

(4) 協力相手先機関

西ベンガル州政府　公共事業局

(5) 計画の対象（対象分野、対象規模等）

1) 対象分野：運輸交通（道路橋梁）
2) 対象地域：インド国 西ベンガル州南部
3) 技術移転の対象：西ベンガル州公共事業局（PWD）

3. 協力の必要性・位置付け

(1) 現状及び問題点

インド国西ベンガル州は、人口 8,000 万人を有し、水運の窓口となるハルディア港及びコルカタ港を擁していることから物資の集散地として商業・産業が盛んであり、東部インド経済の中心地として重要な位置を占めている。

同州の経済・産業動向については、石油化学等の工業地区としての発展が著しいハルディア港工業地区、大規模商業地である州都コルカタ（人口 1,100 万人）周辺における投資・企業活動の活況に支えられており、今後も内外含めた企業による製造工場誘致を通じた更なる産業振興、雇用創出効果が期待されている。

しかしながら、ハルディア港工業地区とコルカタ市を含んだ西ベンガル州南部の道路インフラは充分に整備されておらず、現在、ハルディア港工業地区とコルカタ市後背に広がる経済圏を直接結ぶ物流路線は無く、ハルディア港付近を起点とする国道 41 号線、国道 6 号線を迂回しなければならない。加えて、コルカタ市街の道路渋滞が激しいことから、日中は交通規制がなされており、コルカタ市経済圏とハルディア港を結ぶ物流ルートは距離のみならず、時間的コストにおいても制限を受けている。

このような状況のもと、インド政府は、効率性を欠いた道路ネットワークが、今後の西ベンガル州への新規企業進出への障害となり、同国の経済発展の鈍化要因となることを懸念し、 ハルディア地区とコルカタ市経済圏を最短距離で直結するフーグリー川橋梁（ライチャック・ククラハティ橋）建設について検討を進め、我が国に対してフィージビリティー調査実施に係る技術協力の支援を要請した。

(2) 相手国政府国家政策上の位置づけ

国家開発計画において、経済基盤整備としての運輸交通インフラ一般の整備拡充が重視され、幹線道路網の整備、既存施設の改善、物流サービスの質の向上が政策課題として挙げられている。

(3) 他国機関の関連事業との整合性

他ドナー（ADB）は、コルカタ市北部郊外にて、特に交通量が多い区間の渋滞緩和を目的としたバイパス道路の建設支援を検討中であり、本調査対象の橋梁建設事業と同様、東部インド及び周辺国における効率的な南北経済回廊が構築に寄与されることが期待されている。

(4) 我が国援助政策との関連、JICA 国別事業実施計画上の位置づけ

本件は、物流ボトルネックの解消を通じた市場経済条件の整備・産業振興に寄与するものであり、JICA「インド向け国別事業実施計画」の援助重点分野「経済改革・インフラ整備」に合致する。また、本重点分野における協力の基本的な姿勢とされる「資金協力との連携、計画策定段階における協力」等と整合が図られている。

4. 協力の枠組み

(1) 調査項目

〈フェーズ 1 調査〉

① 情報収集・分析
② 調査対象地域における現況把握・分析
③ 交通量調査・物流調査
④ 自然条件調査
⑤ 環境社会配慮調査
⑥ パブリックコンサルテーション開催支援
⑦ 社会経済フレームワークの設定
⑧ 西ベンガル州南部及び周辺地域の地域開発戦略の検討
⑨ 調査対象地域における交通量予測
⑩ 代替案の設定・最適渡河オプションの検討

〈フェーズ 2 調査〉

① ライチャック・ククラハティ橋梁建設事業に係るフィージビリティー分析
- 資材調査
- 概略設計
- 維持管理計画の策定
- 概算事業費の算出
- 経済・財務分析
- 事業実施計画

② 総合評価及び提言

(2) アウトプット（成果）

(a) 調査結果：ライチャック・ククラハティ橋梁建設計画の策定

(b) 技術移転：西ベンガル州政府公共事業局職員に下記分野の技術移転を図る。
交通・道路・河川・橋梁計画手法
橋梁・河川施設設計手法
環境配慮・住民移転計画策定手法

(3) インプット（投入）：以下の投入による調査の実施

(a) コンサルタント（各分野 1 名）

担当	担当
1) 総括	10) 橋梁設計（下部工）
2) 副総括/橋梁計画	11) 河川施設
3) 交通・道路計画/需要予測1	12) 施工計画/積算
4) 地域インフラ計画/地域振興戦略	13) 経済・財務分析
5) 河川計画	14) 交通量調査/需要予測 2
6) 自然条件（地形・地質）	15) 環境社会配慮（自然環境）
7) 自然条件（水理・水文）	16) 環境社会配慮（社会環境）
8) 道路設計	17) パブリックコンサルテーション
9) 橋梁設計（上部工）	

（b）その他

特になし

5. 協力終了後に達成が期待される目標

(1) 提案計画の活用目標

(a) 調査にて検討・策定される地域開発戦略が、インド国政府及び西ベンガル州政府が策定する開発計画・政策に反映される。

(b) 調査にて提案される事業（最適渡河手段）が、インド国政府またはドナー支援により事業実現化される。

(2) 活用による達成目標

西ベンガル州南部における物流ネットワーク効率化の促進

6. 外部要因

(1) 協力相手国内の事情

(a) 行政的要因：インド国の対外政策の変更、関連機関における調整の不備等

(b) 経済的要因：インド国の対外債務の増大

(c) 社会的要因：対象地区における治安の悪化、用地取得・住民移転プロセスの遅滞

(2) 関連プロジェクトの遅れ

特になし

7. 貧困・ジェンダー・環境等への配慮（注）

(1) 大規模な住民移転を含め、地元住民の生活や経済に大きな影響を与える可能性がある。よって、初期段階から住民参加を徹底するとともに、望ましくない影響の回避・緩和を実現させなければならない。また、プロジェクトの影響を受ける住民（Project Affected People: PAP）、貧困層や指定カースト等の社会的弱者が被る不便や損失も把握・考慮した上で本計画のフィージビリティーを検討する必要がある。

(2) 橋梁へのアプローチ道路の建設に関しては、環境影響評価（EIA）を作成し政府の承認を得る必要が生じる可能性がある。よって、本調査の中でも必要な手続き・情報について確認し、必要に応じてインド側を支援する必要がある。

(3) プロジェクト・サイトは、ガンジスカワイルカやバタグールガメなどの希少動物の生息域である。また、サイト周辺の水産資源は地元漁民の生活の糧となっている。よって、生態系への影響を回避・緩和する配慮が必要である。

(4) 対象地域では、女性の識字率が男性のそれを顕著に下回っており、ジェンダーによる不平等が予想される。よって、女性やその子供（特に母子家庭）が不当な損害を被らないよう、配慮する必要がある。

8. 過去の類似案件からの教訓の活用（注）

(1) 事業に係る用地取得手続きの遅延による建設事業工程への影響を回避するため、本調査の進捗に応じて、先方カウンターパート機関に事業実施に関するパブリックコンサルテーションの開催、情報公開の徹底を実施させる必要がある。

(2) 大規模な橋梁建設計画では、建設工事や供用に伴い大気汚染や水質汚濁、騒音等の公害が予想されるため、相手国の制度や基準を遵守するとともに、負の影響を回避もしくは最小化させるための現実的な手段の検討が必要である。また、建設中だけではなく、供用後のモニタリング制度についても検討するが望まれる。

9. 今後の評価計画

(1) 事後評価に用いる指標

(a) 活用の進捗度

本調査により策定された最適渡河方法が、インド政府またはドナーの支援により実現されたか。

(b) 活用による達成目標の指標

- ハルディア地区～コルカタ市～周辺地域における移動時間の短縮
- ハルディア地区～コルカタ市～周辺地域における物流コストの削減率
- 周辺国との貨物取引量の伸び率

(2) 上記（ａ）および（ｂ）を評価する方法および時期

・ フォローアップ調査によるモニタリング

（注）調査にあたっての配慮事項