

**PRELIMINARY STUDY REPORT
ON
THE PROJECT FOR CONSTRUCTION
OF
SINDHULI ROAD (SECTION III)
IN
NEPAL**

NOVEMBER 2007

JAPAN INTERNATIONAL COOPERATION AGENCY

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PREFACE

In response to a request from the Government of Nepal, the Government of Japan decided to conduct a preliminary study on the Project for Construction of Sindhuli Road (Section III) and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent to Nepal a study team from February 12 to March 17, 2007. The team held discussions with the officials concerned of the Government of Nepal, and conducted a field study at the study area.

After the team returned to Japan, further studies were made. Then a mission was sent to Nepal from July 5 to July 12, 2007 in order to discuss a supporting plan for the project, and as this result, the present report was finalized.

I hope that this report will contribute to the promotion of the project and to the enhancement of friendly relations between our two countries.

I wish to express my sincere appreciation to the officials concerned of the Government of Nepal for their close cooperation extended to the teams.

November, 2007

Kazuo Nakagawa
Director General
Grant Aid Management Department
Japan International Cooperation Agency

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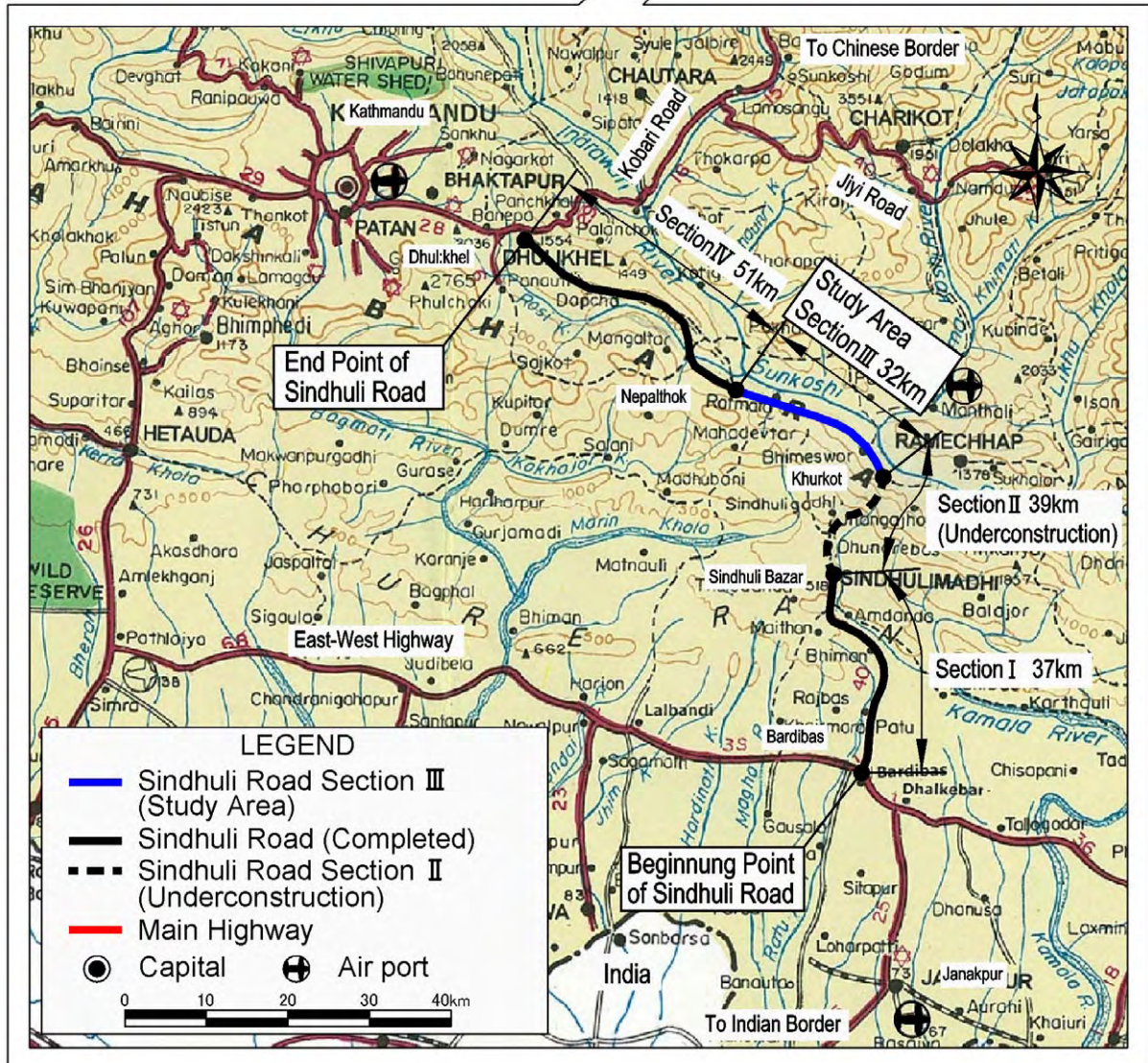
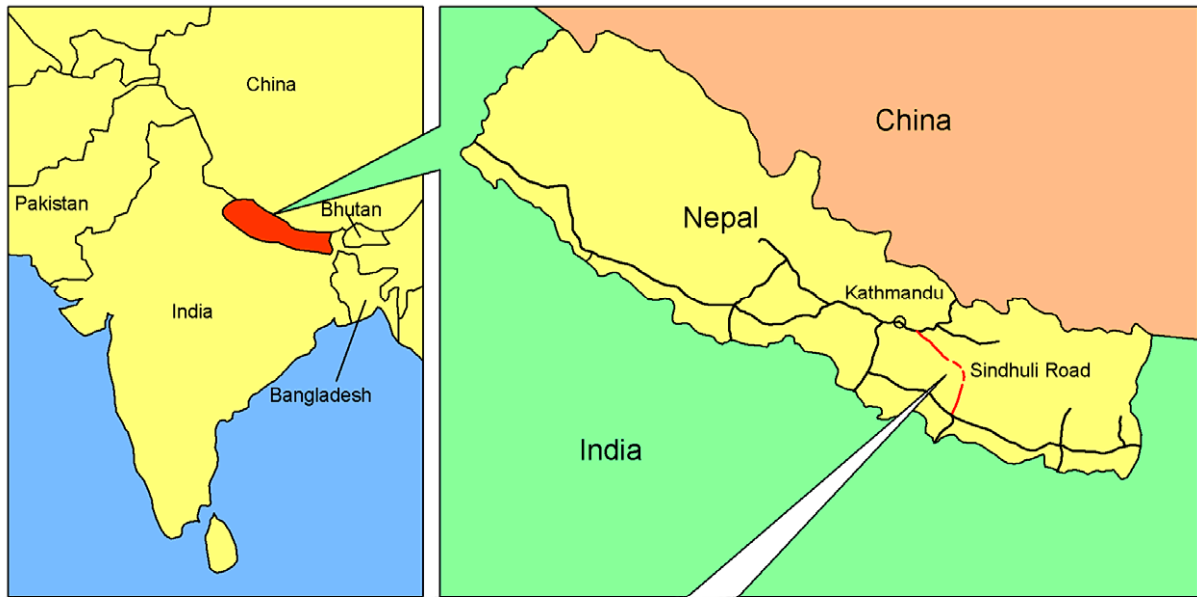
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ABBREVIATION

ADB	Asian Development Bank
B/D	Basic Design
CBO	Community-Based Organization
D/D	Detail Design
DDC	District Development Committee
DHM	Department of Hydrology and Meteorology
DoLIDAR	Department of Local Infrastructure and Agricultural Roads
DOR	Department of Roads
DMS	Detailed Measurement Survey
DRSP	District Roads Support Program
EIA	Environmental Impact Assessment
GDP	Gross Domestic Product
ILO	International Labour Organization
JICA	Japan International Cooperation Agency
LRN	Local Road Network
MCT	the Main Central Thrust
MBT	the Main Boundary Thrust
M/D	Minutes of Discussion
MEST	Ministry of Environment, Science and Technology
MFSC	Ministry of Forests and Soil Conservation
MFT	the Main Frontal Thrust
MOPPW	Ministry of Physical Planning and Works
MVDC	Municipality and Village Development Committees
PWD	Public Works Department
RBGs	Road Building Groups
RBN	Road Board Nepal
RTO	Road Transport Organization
SDC	Swiss Agency for Development and Cooperation
SHM	Stake Holder's Meeting
SRN	Strategic Road Network
VDC	Village Development Committee
YCL	Young Communist League

CHAPTER 1 BACKGROUND OF THE PROJECT

1.1 Background of the Project

Nepal is roughly divided into three areas, the northern mountain area, the central hill area and the Terai plain. Particularly, the Terai plain spreading out from east to west along the Indian border is the main agricultural area of Nepal. However, there is no road directly connecting to the National Capital Kathmandu with the Eastern Terai but more than 200km detour passing through the Mugling road has to be made. This is one of serious problems in the national road network. The Government of Nepal (GON), therefore, requested to the Government of Japan (GOJ) for Grant Aid for the Project for Construction of Sindhuli Road to connect to Kathmandu with the Eastern Terai.

GOJ carried out the feasible study from 1986 to 1988 and confirmed the validity of the Project. Resulting from the aftercare study carried out from 1992 to 1993, the Project for Construction of Sindhuli Road (Section I) as Japan's Grant Aid was started in 1995. Implementation of Sindhuli Road Construction between Bardibus (Terai side) and Dhulikhel (Kathmandu side), over 160km length, is divided into four sections. Sections I and IV were already completed and inaugurated. Section II is under construction now.

Construction of Section III (the Project) was requested by GON in March, 2003 and accepted by GOJ in December, 2003. The full scale environmental impact assessment of the Project (EIA) is necessary according to environmental laws of Nepal. The Project, moreover, is classified "Category A" in accordance with JICA's Guidelines for Environmental and Social Considerations because of about 100 house resettlements and also large scale earth work. The EIA was carried out by GON with support and guidance from Japanese and Nepalese consultants for the project formation. Ministry of Environment, Science and Technology (MEST) approved the EIA in May, 2006 and confirmed as follows:

- (1) A stakeholder meeting was held and inhabitants agreed the road construction.
- (2) Major impacts resulting from the project implementation were considered.

In October, 2007, results of the EIA were examined by JICA Advisory Council of Environmental and Social Considerations (the Council). The Council advised the following points to be considered for future studies.

- (1) To hold meetings with inhabitants for their understanding:
 - Numbers of meetings
 - Places of meetings
 - Methods for explaining to women, no literacy people
- (2) To carry out appropriate resettlements and compensation:
 - Examination of procedure and concept for resettlements
 - Determination of compensation in cases of landless farmers

- (3) To prepare an environmental and social management plan with appropriate aim standards.
- (4) To establish an Environment Management Unit (EMU) for monitoring the environmental and social management plan:
 - Technical advices
 - Secure budgeting

Considering the Council's advices, project implementation scale and environment impacts, further studies should be carried out carefully. Hence, this preliminary study, as one of the further studies, is to decide optimum road alignments for promoting agreements of project implementation and resettlement with inhabitants according to the JICA guidelines.

1.2 Contents of the Study

1.2.1 Objective of the Study

The Project (Section III) was requested by GON in March, 2001 and accepted by GOJ in December, 2003. However, the full scale EIA in the project area is required in accordance with environmental laws of Nepal due to the resettlements of 100 houses and large scale construction. Besides, the Project is classified "Category A" according to JICA's Guidelines for Environmental and Social Considerations. The EIA, therefore, was concluded through the project formation studies by consulting with GOJ. Then, GON had approved the EIA in May, 2006. The Council examined the EIA results in October, 2007. The main points in the Council's advices were: methodology of meetings with inhabitant, concept of compensation, and monitoring system of environment management plan. Taking the construction scale and environment impacts of the Project into consideration, further studies shall be conducted carefully. The objective of this study is to aim determination of road alignments by promoting fundamental agreements of inhabitants who are affected from the project implementation and resettlements.

1.2.2 Contents of the Study

Preparations in Japan

Outline of the Project was reviewed based on related information. Explanation materials and reports for the Council were examined. Then, alternative road alignments were proposed based on 1/1,000 scaled topographic maps and a preliminary plan of horizontal road alignments prepared by Nepalese consultants as part of the project formation study supporting the Sindhuli Road EIA in 2005.

First Site Survey in Nepal

Field investigation was carried out after explanation of the inception report and discussion of the project situation and study methodology. To mitigate not voluntary resettlements and to use the existing roads effectively, a preliminary road alignment plan (Draft) was decided with changes at three

parts of the original plan based on additional topographic survey results (Sta.15+400 – Sta.16+500, Sta.18+600 – Sta.20+900 and Sta.24+100 – Sta.25+300). The Study Team explained themes, major points concerned, and recommendations from the Council to GON officials and added advices for conducting Stakeholder meeting and Simple Survey. A schedule for further investigations was also explained and the Nepal side agreed it.

First Analyses in Japan

Based on the preliminary road alignment plan (Draft) decided through the first site survey, road design was done according to the design criteria for Sindhuli Road Construction (other Sections). Examining reports of stakeholder meetings at four places and Simple Survey prepared by the Nepal side, it was judged that a basic agreement could be formulated. Nevertheless, the stakeholder meeting in Khurkot was judged that no agreement was made because of obstruction by local residents except the inhabitants directly affected.

Second Site Survey in Nepal

Based on explanation materials for the second site survey, the following subjects were confirmed through a series of discussions:

- Three stakeholder meeting except Khurkot were properly done.
- Consensus of habitants resulted from the Simple Survey
- As follow up for local people in Khurkot, the political party coalition will prepare dialog with them, opinions of local people in areas from the beginning point of Section III up to 800m will be collected, and another meeting in Khalte Chainpur will be held.
- The road alignments will be reviewed and adjusted by B/D Study.
- Department of Roads (DOR) explained concept of compensation for habitants and the Study Team pointed out compensation for landless farmers who may lose their livelihood

Second Study in Japan

The stakeholder meeting was done on August 8, 2007 but the dialog with the local people in Khurkot has not yet been held by the political party coalition.

Report to the Council in Japan

It was scheduled on November 26, 2007.

1.3 Members of the Study team

Name	Job Title	Site survey in Nepal		Occupation
		1st survey	2nd survey	
Mr. KITO Koichi	Team Leader	Feb 22 – Mar 1	Jul 7 – Jul 12	Team Director, Transportation & Electric Power Team, Project Management Group I, Grant Aid management Department, JICA
Mr. KOYANAGI Yoshimoto	Project Coordinator	Feb 22 – Mar 1	Jul 5 – Jul 12	Senior Project Administration Officer, Transportation & Electric Power Team, Project Management Group I, Grant Aid management Department, JICA
Mr. HIRAOKA Kazuyuki	Chief Consultant Road Planner I	Feb 12– Mar 17	Jul 7 – Jul 12	Katahira & Engineers International
Mr. TAMAKI Takakazu	Road Planner II	Feb 12– Mar 17		Katahira & Engineers International
Mr. SASAKA Tsuyoshi	Environmental & Social Consideration Analyst	Feb 12– Mar 17	Jul 7 – Jul 12	Katahira & Engineers International
Mr. SHRESTHA Robinson	Road Designer & Coordinator	Feb 12– Mar 17		Katahira & Engineers International

1.4 Site Survey Schedule

The first site survey

No. of Day	Date	JICA	Consultant	
		Mr. KITO, Mr. KOYANAGI	Mr. HIRAOKA, Mr. TAMAKI Mr. SASAKA, Mr. S. Robinson	
1	11-Feb-07 Sun.		NRT(16:00)→BKK(21:00) JL703	
2	12-Feb-07 Mon		BKK(10:45)→KTM(13:00)TG320 Meeting with JICA and EOJ	
3	13-Feb-07 Tue		Courtesy Call and Discussion with DOR (Explanation on I/R)	
4	14-Feb-07 Wed		Kathmandu→Bhakunde Besi	
5 ~ 10	15-Feb-07 Thu 20-Feb-07 Tue		Site Survey: Nepalthok –Mulkot	
11	21-Feb-07 Wed		NRT(9:45)→BKK(14:45) TG643	Site Survey: Nepalthok –Mulkot
12	22-Feb-07 Thu		BKK(10:45)→KTM.(13:00) TG319 Meeting with JICA and EOJ	Site Survey: Nepalthok –Mulkot
13	23-Feb-07 Fri		KTM→Mulkhot→Nepalthok	Nepalthok→Mulkot→Khalte Chainpur Khalte Chainpur→ Mulkot →Nepalthok
14	24-Feb-07 Sat		Bhakunde Besi→KTM	
15	25-Feb-07 Sun		Courtesy call on DOR, & MOPPW. Discussion with DOR	
16	26-Feb-07 Mon	Discussion with DOR		
17	27-Feb-07 Tue	Discussion with DOR on the M/D		
18	28-Feb-07 Wed	Signing on the M/D Report to JICA		
19	01-Mar-07 Thu	Report to Embassy of Japan KTM.(14:05)→BKK(18 :30)TG320 BKK(23:40) → TG642	Report to Embassy of Japan Analyses on field data	
20	02-Mar-07 Fri	→NRT(07:30) TG642	Kathmandu → Manthali	
21 ~ 24	03-Mar-07 Sat 04-Mar-07 Sun		Site Survey: Khulkot – Khalte Chainpur	
25	5-Mar-07 Mon		Site Survey: Khulkot – Khalte Chainpur Site inspection of Section II Manthali→KTM	
26 ~ 32	6-Mar-07 Tue ~ 14-Mar-07 Wed		Data Collection and Analyses	
33	14-Mar-07 Thu		Report to DOR Report to JICA	
34	16-Mar-07 Fri		Report Embassy of Japan	
35	17-Mar-07 Sat		KTM.(14:05)→BKK(18 :30)TG320 BKK(22:30) → JL718	
36	18-Mar-07 Sun		→NRT(06:15) JL718	

The second site survey

No. of Day	Date	JICA & Consultants	JICA
		Mr. KITO (JICA), Mr. HIRAOKA & Mr. SASAKA (KEI)	Mr. KOYANAGI
1	4-Jul-07 Wed.		NRT(16:00)→BKK(21:00) JL703
2	5-Jul-07 Thu		BKK(10:45)→KTM(13:00)TG320 Meeting with JICA
3	6-Jul-07 Fri	NRT(9:45)→BKK(14:45) TG643	Site inspection: Sindhuli Road Sections I & II
4	7-Jul-07 Sat	BKK(10:45)→KTM.(13:00) TG319	Site inspection: Sindhuli Road Sections I & II
5	8-Jul-07 Sun	Meeting with JICA and EOJ Courtesy Call and Meeting with DOR	
6	9-Jul-07 Mon	Discussion with DOR	
7	10-Jul-07 Tue	Discussion with DOR on the M/D	
8	11-Jul-07 Wed	Signing on the M/D Report to JICA and EOJ	
9	12-Jul-07 Thu	KTM.(14:05)→BKK(18 :30)TG320 BKK(22:30) → JL718	
10	13-Jul-07 Fri	→NRT(06:15) JL718	

1.5 Outline of Study Results

1.5.1 Road Alignments

(1) Road Geometric Structure Standards

To design road alignments, the Road Geometric Structure Standards for Sindhuli Road Sections II and IV are applied to the Project. These Standards are the same as the Nepal Road Standards (1988) shown in the following tables (yellow cells show values adopted). However, the lowest Standards for highways are applied to Sindhuli Road.

- Design speed (km/h): 20km/h is adopted in a curve as exception.

Road Standards	Level	Rolling	Mountainous	Steep
Highways	120	80	50	40
Feeder roads	100	60	40	30
District roads	60	40	30	25

- Minimum curve radius 30m is for design speed 30km/h: 15km/h or 10km/h is adopted in a curve or hear pin curve, respectively as exception.

Road Standards	Max. average	Maximum	Max. length in excess of max. avg.
Highways	5%	8%	150m
Feeder roads	7%	10%	120m
District roads	7%	12%	100

There are other standards of Design Standards for Feeder Roads (1995) and Construction Guideline for Low Cost Feeder Roads: however these Standards are not strictly applied to constructions in landslide areas.

(2) Design Concepts

Investigation and design concepts are agreed as follows:

- Road alignment for natural disaster resistant

Considering the flood disaster on Sindhuli Road section IV in 2002, road alignments should not be along main river stream.

- Risk reduction of traffic accidents

Considering mitigation of traffic safety, local community separation, and access to farm lands for habitants, a bypass plan should be chosen.

- Mitigation of resettlements

Resettlements shall be minimized by using the pilot road (also called RTO road) constructed by DOR as road alignments for the project road.

- Redaction of earth work (environment friendly)

In reference to the designs and construction methods of Sindhuli Road Sections II and IV, and Jiri Road (a pioneer project considering environment friendly by the Swiss Aid), minimization of slope protections shall be considered.

(3) Alternative road alignments

According the said above Road Geometric Structure Standards and Design Concepts, the site investigation was done and the road alignments (draft) were decided based on results of additional topographic mapping at three parts changed from the original plan. The bypass plans along the existing roads are proposed instead of the original plan in 2005 passing through housing areas. As submitted, DOR appraised the road alignments (draft) and conducted SHM and DMS based on that. The road alignments will be reviewed by B/D study since an opinion to agree the original plan was cited in the SHM. This consideration was agreed with both DOR and the Study Team and described it in the M/D.

CHAPTER 2 ENVIRONMENTAL AND SOCIAL CONSIDERATION

2.1 Background of the Study

(1) Result of the EIA study for the Sindhuli Road Project (Section III)

The Sindhuli Road Construction Project, which connects the eastern Terai Plain and Kathmandu, consists of the four section. The construction of Section III will be the final section to be implemented for the Project. Since the full scale EIA study was required for the Section III of the Sindhuli Road according to the Nepalese environmental legislation, DOR of Ministry of Physical Planning and Works, the Proponent of the Project, conducted the EIA, which was approved by the Ministry of Environment Science and Technology (MoEST), the Nepalese Government, in May 2006.

After the approval of the EIA, JICA confirmed the following points on it.

1. The stakeholder meeting, which JICA Environmental and Social Considerations Guidelines (JICA ESC Guidelines) requires, was conducted to ascertain that the to-be-affected people are generally in favor of the road construction at Section III.
2. The main impacts to be caused by the concerned Project are described in the EIA report.

The EIA summarized in its conclusion the main benefits and mitigation measures to be taken as the Table below, and listed the two steps of action to be taken after the EIA.

Table 2.1-1 Conclusions of the EIA by DOR of Ministry of Physical Planning and Works, Nepal

Main Benefits	Mitigation Measures
<ul style="list-style-type: none"> • The opening of the entire Banepa - Sindhuli - Bardibas Road • The connection of the shortest path between the eastern Nepal and the Kathmandu valley (shortened by 163km in comparison with the existing route) • The connection of the Central Development Region of Nepal and the Kathmandu valley with all-weather road 	<ul style="list-style-type: none"> • Mitigation for forest decrease • Compensation for land, property and agricultural production • Relocation of social and public facilities • Relocation of irrigation facilities • Conservation measures and monitoring on the above impacts

Table 2.1-2 Necessary steps of action listed by the EIA

1	Update of the EIA after determination of the center line of the proposed road alignment In the updated EIA, the potential (negative) impacts should be evaluated qualitatively and the resettlement plan be prepared together with the compensation plan for the land and property acquisition.
2	In order for the environmental monitoring plan to be effective, the Environmental Management Unit (EMU) should be organized in the organizational scheme of the project implementation. This recommendation stands on the reflection that environmental monitoring plans had not shown effectiveness in foregoing projects in Nepal.

(2) Advice from the JICA Advisory Council of Environmental and Social Considerations

Since the Sindhuli Road Construction Project (Section III) is categorized as an A-category project according to JICA ESC Guidelines, the Nepalese EIA report was consulted by JICA Advisory Council of Environmental and Social Considerations on October 23rd in 2006. After its consultation, the Council prepared the final advisory documents on November 21st in 2006, giving 23 recommendations as follows.

Table 2.1-3 Categories of recommendations by JICA Advisory Council of ESC

Examination of alternatives	1	Method of assessment (evaluation of impacts)	18, 23
Impacts on natural environment	3, 4	Impacts on social environment resettlement community gender gaps or disparities method of public participation Religious & cultural facilities	5, 11, 12, 13 6, 14 7, 8 9, 10 20
Impact assessment for the connection of the entire Sindhuli Road	7	Mitigation	2, 15, 16, 19, 20
Environmental management plan	17, 21	Monitoring	22

2.2 Scope of Impacts to be caused by the Construction Works

(1) The Proposed Plan and the Alternative of Road Alignment

The following points were carefully examined for the road alignment.

- ① The road alignment should avoid houses, physical structures and croplands as far as possible.
- ② The road alignment should keep away from the Sunkoshi River as far as possible.
- ③ The study will conduct additional topographic survey for the section where significant change of alignment is planned in comparison with the survey result in 'JICA project formation study for assisting EIA of Sindhuli Road Project, 2005'. (Actually, 69 ha of additional survey were performed.)
- ④ The alignment will follow the existing pilot road (RTO road) as far as possible.
- ⑤ The study will confirm the basic intention of PAPs as far as possible.
- ⑥ The horizontal and vertical alignment will be examined to reduce slope work with reference to the dimensions of road design in the other sections of Sindhuli Road Project.
- ⑦ The opinion of geological experts will be referred.

The proposed alignment was explained to DOR of the Nepal Government with the pros and cons of alternatives, A and B plans, for several sub-sections.

(2) Outlines of Resettlement Necessity by the Proposed and Alternative Alignments

According to the EIA that the Nepal Government conducted based on a tentative road alignment, there existed 260 houses within ROW stretching 25m on both sides from the center line of the alignment. The EIA reported that around 155 houses among these were to be relocated since they were within 30 m of the corridor of impacts (COI) of road construction or 15 m on both sides of the center line. Compared with it, the A plan (the proposed plan) of alignment by the Preliminary Study may possibly reduce the number to around 60 houses, which is about one third of the EIA alignment, and the B plan may require approximately the same or slightly smaller number of relocated houses as the EIA alignment.

However, the project area stands on intermountain hillside where agriculture and stock raising are the main industry and where very limited lands are available for farming between rapid flow river and mountainous slope. Since lands usable for farming are cultivated almost to the limit, a land is very precious property for the local people. Therefore, people in some cases even requested resettlement of houses rather than farm land acquisition in the stakeholder meetings held in the Preliminary Study.

The Study recommended the A alignment plan as optimal from the view points of technical aspect, disaster resistance and minimum impact on houses, physical structures and croplands, which DOR accepted in principle. However, the both sides, DOR and JICA, agreed that the final alignment will be decided in the Basic Design Study reconsidering the people's requests.

2.3 Resettlement Policy of Environmental and Social Considerations

(1) International Direction (Guideline of Organization for Assistance)

Environmental and social guidelines in the Nepalese road sector have been prepared under assistance of the World Bank. The Bank Policy emphasizes the need to minimize involuntary resettlement in development projects and gives the direction that the proponent should prepare a resettlement action plan to ensure that the pre-project living standards of affected persons are restored (and where possible improved) at no cost to themselves.

Specifically, the following impacts are considered to be addressed.

- Loss of land and other privately-owned assets
- Adverse impacts on subsistence, livelihood or income generation capacity
- Collective adverse impacts on groups (e.g. loss of community resources and assets)

In order to avoid such negative impacts as above, the below measures are recommended to strengthen the effectiveness of mitigation.

- Ongoing community consultation to incorporate people's views, concerns and suggestions, particularly those of vulnerable groups into implementation procedures of a project

- Developing an institutional framework as an integral part of a project for appropriate social impact management mechanism and arrangements to ensure that compensation, resettlement and rehabilitation are carried out timely and effectively.

(2) Advice of the JICA Advisory Council for Environmental and Social Considerations

The JICA Advisory Council expressed the following views in its advice on important considerations for social impacts such as resettlement and land acquisition.

- Careful considerations should be taken for hearing the voices of the socially weak (low-income persons, illiterate persons, women, people of designated castes, etc.). Sufficient precautions should be taken to give information to and hear opinions from them, and properly record the opportunity of stakeholder meetings and home visits. (Article 9)
- Further survey should be necessary for opinions of the absentee landowners living outside the project area and the rights of the tenant farmers. (Article 12)
- Considering heads of households are usually men, the proponent should secure the opportunity with special considerations to hear opinions from, and give information and explanation on the project to women. (Article 11)
- To prevent social disharmony of local communities, the Project should collaborate with existing social groups within the communities. (Article 6)
- For compensation measures to assure living standards equal to those before the project (culturally, socially and economically), the Project should reflect the facts on living conditions, which became evident in the stakeholders meetings, into the resettlement plan. (Article 13)
- Since such people without land as tenant farmers might lose means of production by land acquisition of the project, the proponent should consider additional mitigation measures for them such as occupational training as well as cash compensation. (Article 5)
- Considerations should be taken to prevent the increased gaps or disparities between two genders to be possibly caused by the project. (Article 8)
- The Project should take effort in protecting religious and cultural facilities according to the degree of importance by the standard of Nepal. (Article 20)

(3) Policy of Nepal Government

The policy of the Nepal Government is mostly similar to that of the WB since they have collaborated with the Bank in preparing the guidelines for environmental and social considerations. However, there are different stand points in individual items because of the constraints of the Nepalese legislation and customary approach. They are shown below specifically.

- DOR will carefully and positively consider opinions of PAPs, especially the people of the socially weak groups, which is in accordance with the policies of JICA advisory council and the WB. (Answer 9 to Advice of JICA Advisory Council)
- DOR will incorporate these matters on land-lord's opinion and rights of tenant farmers through the simple survey. (Answer 12 to Advice of JICA Advisory Council)
- As per the Nepalese Regulation once a land compensation paper procedure is completed a total

amount of valuated money should be paid to the land owner. However, we shall give our every attention to handle such case with maximum care to keep them (house owner as man and wife) balanced or satisfied. At least one witness (preferably husband and wife) will be present at time of receive of compensation. (Answer 11 to Advice of JICA Advisory Council)

- DOR will be going to propose mitigation measures on social disharmonies through simple survey and stakeholder meetings. (Answer 6 to Advice of JICA Advisory Council)
- (In principle, the Nepalese government has customarily preferred cash compensation to the provision of resettlement site.) Public opinion in resettlement issues will be considered through stakeholder meetings. (Answer 13 to Advice of JICA Advisory Council)
- Tenant will receive 50 % and land-lord will receive 50 % of compensation amount for the land (if the tenant farmer has the legal contract for tenancy with the land-lord). Government of Nepal can decide as special case for those who loose whole means of production. Further, the Project will conduct skill-training program for interested affected families as among mitigation measures. (Answer 5 to Advice of JICA Advisory Council)
- DOR understand the laws of Nepal have given equal rights to both sex. However, they will consider this matter in facilitation of women participation to the stakeholder meetings. (Answer 8 to Advice of JICA Advisory Council)
- DOR will give careful considerations on preservation of religious and cultural facilities. (Answer 20 to Advice of JICA Advisory Council)

2.4 Environmental and Social Considerations for Social Consensus

(1) Stakeholders Meetings

During the Preliminary Study, stakeholder meetings were held at 4 places by DOR with the schedule below.

① Gajulidaha Chautara	May 9, 2007
② Ratmata Chautara	May 10, 2007
③ Ghumaune Chainpur Chautara	May 11, 2007
④ Khurkot Chautara	May 12, 2007

DOR employed the approach that put considerations on careful previous notification, meeting schedule, socially weak people friendly method (explanation material in Nepalese language, assurance of voices from women and minority groups, and focus group discussions, acceptance of written opinions, etc.) , following advices of JICA Advisory Council.

Basically, people agreed in implementation of the Project except Khurkot Chautara Meeting, where the issues related to Section II of Sindhuli Road was raised by the participants and failing to discuss about Section III. To confirm the local people opinions at Khurkot Area, additional meetings were held as follows.

- ⑤ Khalte Chainpur, Stakeholder Meetings August 8, 2007
- ⑥ Khurkot (Bhimeswar), Interaction Meetings with Local People through the All Parties Alliance October 4, 2007

In Khalte Chainpur, the meetings proceeded as the meetings of (1) to (4), and participants showed the basic agreement with the Project. In Bhimeswar, 50 people gathered in the meeting including the representatives of the All Parties Alliance, the local administration and 35 local residents. They made the decision that the village would support for the Project.

At the Stakeholder Meetings held during the Preliminary Study, people showed general agreement with the Project positively with key reserved points as follows;

- 1) They expressed support for the Project with the condition that the compensation for resettlement and land acquisition should be done by the market price of the property.
- 2) They also requested that representatives of VDC should be allowed to attend the compensation fixation committee that will decide the contents of compensation.
- 3) Some parties of people also requested the provision of job opportunity during the construction work, utilization of existing pilot road for alignment to minimize land loss, and preservation of traditional cultural assets.

(2) Simple Survey

Simple Survey was also conducted by DOR for directly affected PAPs living within ROW of the planned road from May 29 to June 6, 2007. The total target of survey was 398 households who live in ROW or have property or lands. Among them, the answer was given from 271 households, 68 %. Among those who answered, the PAPs who showed their agreement with the Project reached 269 persons, 99.3 %, and 89.7% of them showed their cooperation with property acquisition if necessary. Compared with the total households concerned, the agreement reached 67.6% and 61.1 % of people respectively.

2.5 Recommendations to the Nepal Government

(1) Recommendations from the Environmental and Social Aspects in the Preliminary Study

In the preliminary study, the JICA study team made recommendations on the following points from the environmental and social aspects.

- ① Made recommendations of environmental and social considerations and a complementary environmental study to update the EIA, with a tabulated list, clarifying 'Summary of Recommendations from the Council', 'Points to be examined further', 'Method of Further Study' and 'Notes'. See the file, 'Points of Revision of EIA'.
- ② Made a proposal for the simple survey format. See the files, 'Format of Simple Survey'

and 'Format of Simple Survey without property Q'.

- ③ Made an advice on the method and procedure for the stakeholder meetings and the simple survey held and conducted by the Nepalese Side. See the file, 'Notes for Meetings & Survey'.
- ④ Made a questionnaire requesting clarification about the unclear descriptions in the reports of the simple survey and the stakeholder meetings, which were held at four locations between May 9th and 12th in 2007. See the file, 'Sindhuli SS&SM Check'.
- ⑤ Made a recommendation on the procedure for the reconfirmation of the community's consensus, explanation to the people and verification of their true intention, at Bhimeswar through the All Parties Alliance. See the file, 'For Interaction Meeting at Bhimeswar'.

(2) Recommendations of the Environmental and Social Considerations in the coming stage of the Project

1) Effectiveness of Impact Mitigation Measures and Monitoring

'Environmental Mitigation Measures' and 'Monitoring Plan' in the EIA report of the Sindhuli Road Project (Section III) well covered diverse aspects of impacts. However, there remain many unclear aspects in how to implement them. We consider that this is because the organization external to the Project, outside the DOR and the Project Team, were assumed to be the implementing organizations for mitigation and monitoring measures. Execution of measures should be planned not from the view point of 'expected to do so' but from that of 'committed to do so'. To realize it, the Project is to clarify the range that can be carried out within the Project Team or DOR, the organization in charge of the Project, and to restructure the mitigation and monitoring plans.

This assignment is supposed to be in accordance with the Article 17, 'sorting out essential mitigation measures', and Article 21, 'EMP to propose the detailed scales of measures taken and methods to implement the plan' in the Advice from JICA Advisory Council.

2) Viewpoints on Resettlement Measures

In the area of the Project site, people clear land for cultivation and live on slopes, alluvial cones and old flood plains among mountains, valleys or rapid flow rivers. Since the lands available for farming are cultivated almost to the limit, it is difficult to suppose someone purchasing a new land easily. Not a few residents there actually prefer giving up houses to losing lands for crop in regard of road alignment. In such a way, the lands for means of production are limited.

On the other hand, it is assumed in the Project that the compensation for resettlement and land acquisition will be carried out with cash compensation in principle. This is because of the following reasons. First, the way of compensation has basically been cash compensation in the cases of the Nepalese Government projects including the road sector. Second, it was the case in the Sindhuli Road

Project at other sections, too. Third, people living there also want cash compensation for lands at the market price so that they can buy a new land in the neighborhood if relocation is required.

Considering that the purpose of compensation for resettlement is to secure at least the pre-project living standards of the affected, it is recommended that the compensation plan should be formulated from the viewpoint that the living standards of PAPs prior to the project implementation should be at least maintained.

3) Organizational Strengthening for Environmental Management by DOR

DOR has been developing environmental management and considerations manuals with the assistance of the WB and others as the activity to strengthen its environmental management since the late 1990s. In DOR, Geo-Environment Unit (GEU) has been in charge of environmental and social considerations (ESC). The unit is planning to set up the Environmental Management Unit (EMU) to implement the environmental management plan (EMP) planned by the EIA for the Sindhuli Road Project, Section III.

Observing the present situation, it seems that ESC activities, such as studies, meetings operation, information management, heavily depend on the private firm. Also observed is insufficient collaboration, information sharing and communication between GEU and the project operation division. Therefore, in setting up EMU it should be essential to clarify and secure the competency, staff, role and budget for the office to be able to operate in a stable manner.

2.6 Agreement for the stages ahead

In the Preliminary Study, DOR and JICA agreed on the preconditions to proceed to the next stages as follows.

Within the period of the Basic Design Study, DOR should conduct a complementary environmental study to update the EIA with the advice from JICA ESC Advisory Council and make a report on the updated EIA. Before the start of the Detailed Design Study, DOR as the proponent of the Project should complete agreements with the people, directly affected by relocation and land acquisition for the Project, on the details of compensation. Before the start of the project implementation (construction work), DOR should complete the payment of compensation and resettlement.

CHAPTER 3 RECOMMENDATION TO BASIC DESIGN STUDY

3.1 The Concept of Basic Design Study

It shall be confirmed the land acquisition for the Project to be carried-out in accordance with JICA's Guidelines for Environmental and Social Consideration. Taking account of the present conditions of Nepal, the site conditions and road management / maintenance, the basic design study shall be implemented. At the Second Field Survey, the road drawings of plan, road alignment, longitudinal section and cross sections were handed over to DOR on 11th July, 2007. At the Basic Design Stage, the discussion with Nepal side will be carried-out on these drawings. In these drawings, the road alignments were modified and designed with the additional survey to the topographic survey drawings which was made by the local consultant under the JICA's Sindhuli Road EIA Support Project Formation Study (2005) in order to enhance the implementation of Nepal's EIA. The Road Cross Section Design, Slope Protection and Bridges (Cause way) were not included in the Preliminary Study but included in the Basic Design Study.

Stake Holder Meetings were carried-out at Preliminary Study time, it was confirmed that basic consensus have been reached among the Stake Holders living in roadside of the Project. At Basic Design Stage, taking account of the road alignments and compensation plan requested by the Stake Holders, the road alignment will be fixed and the compensation will be finalized. The Basic Design Study Team will request DOR to be held the Stake Holders Meeting and monitor the progress in order to feed back such result.

Furthermore, during the Basic Design Study, DOR will carry-out the Complementary Environmental Examination to up-date the EIA (Environmental Impact Assessment). The Complementary Environmental Examination shall include the followings;

- Resettlement Action Plan
- Cultural Assets
- The fauna and flora
- Ecosystem
- Objects to be Preserved
- Preservation Plan
- Mitigation Measure
- Environmental Management Plan
- Investigation of effectiveness of Monitoring

The Basic Design Study Team shall support the Complementary Environmental Examination and making up-dated Report as the output of the Complementary Environmental Examination.

3.2 Scope of the Basic Design Study

The study area is Sindhuli Road Section 3 (Khulkot – Nepalthok: 32km) include 3 alternative road alignments as well.

And the scope of construction planning and estimation shall include the area of 3.9km which has not yet been executed under Section 2 in addition to section 3 (total about 36km).

3.3 Characteristics of the Project for Construction of Sindhuli Road

The significant characteristics of the Project for Construction of Sindhuli Road are that scale and a period. It began from “Feasibility Study in 1986 - 1988”, “After Care Study in 1992 – 1993”, “EIA Support Project Formation Study in 2005” and “Section 3 Complementary Study in 2006” were followed. And the Grant Aid Projects have been carried-out at Section 1, Section 4 and Section 2 since 1995. Now, Section 1 and Section 4 were completed and Section 2 is in progress.

A lot of technical data, materials are accumulated in 21 years up to date. It must be utilized effectively in future study.

We would say that Nepal is in the political chaos though there are no more physical conflict between Maoist and military force. So, the study on construction planning and estimation are requested to be done carefully, especially on the procurement of the material and construction equipment.

3.4 Study on the Environment and Social Consideration

The following study (action) shall be taken.

- 1) Confirming PAPs’ (Project Affected Person) intentions and DOR’s opinion, the road alignment shall be reviewed.
- 2) The finalized detail of compensation and reaching of PAP’s consent must be confirmed and that confirmation is the critical condition to execute the Detail Design stage.
- 3) It is noted the Project area is land-short area, and it is required that careful planning to be made for supporting the people to sustain the living standard after the resettlement and it is monitored.
- 4) The proper opportunity of Stake Holders Meeting for the progress on the above 1 to 3 shall be secured.
- 5) Taking care for the effectiveness of Environment Management Plan on the mitigation measure and monitoring, the Complementary Environmental Examination shall be conducted.

3.5 Locally Contracted Works

Normal topographic survey contracted locally for the road design including alternative route area was completed at EIA Study and this Preliminary Study. So it may not be necessary to conduct additional topographic survey contracted locally.

It is recommended about the works a) traffic volume survey, b) topographic survey·geological investigation which may be contracted locally as follows;

a) traffic volume survey

Traffic Volume Survey shall be conducted to forecast traffic volume (induced and diverted) after completion of the Project and the forecasted figure may be utilized for designing the paving and so on for the Project.

Taking account of the circumstances of the Project (present site condition, progress of Section 2, ADB planned bridge at Khurkot etc.), the surveyed Vehicle classification shall be subject of the discussion with DOR. The vehicle classification of registration in Nepal is Sedan car, Bus, Minibus, Truck/Tanker, Tractor, Motorcycle, Tricycle and others. It is recommended that 12 hours (6:00am – 6:00pm) Traffic Volume Survey is carried-out on 2 weekdays at the five locations shown on Figure 3.5-1.

The cost of Traffic Volume Survey is one million Japanese Yen (100,000 x 2 days x 5 location) at rough estimate.

The Axle load Survey may not be necessary because less overloaded vehicle is observed due to steep terrain.

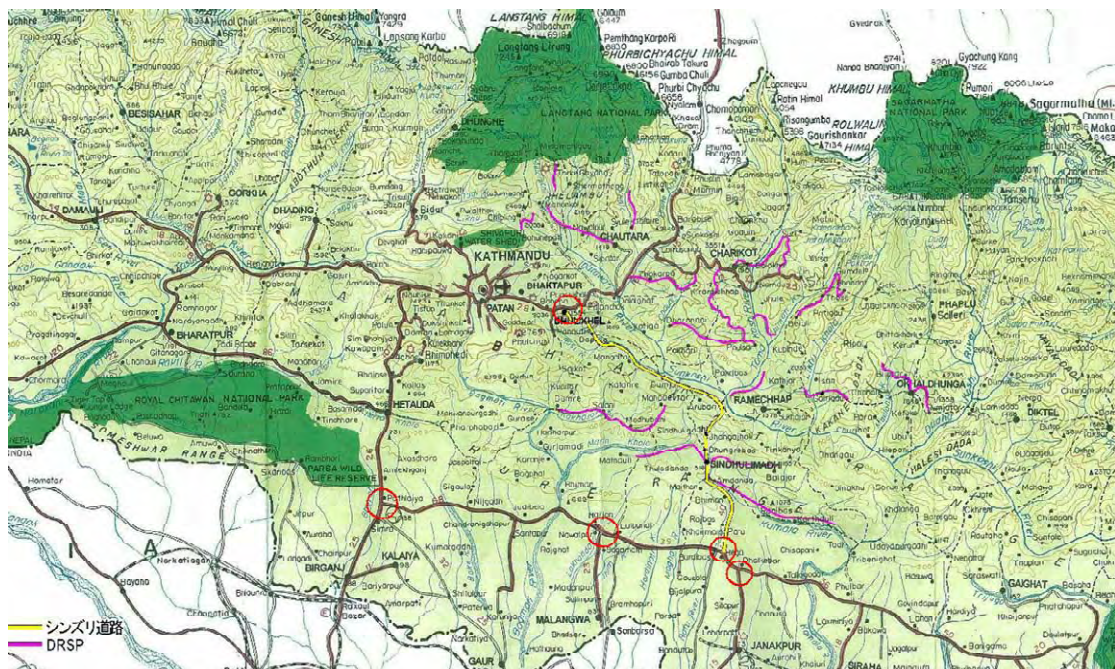


Figure 3.5-1 Proposed locations for Traffic Volume Survey (○)

b) topographic survey · geological investigation

The geological deformations influenced on the road are divided into three types by land slide, slope failure and debris flow. The definition of the above 3 technical terms is deemed to be un-established in English.

Land slide means the slow downward movement of mass of rock and/or earth by slope plane and the moved mass is not disturbed greatly. It is remarkable characteristics to continue to move and it is easy to find particular geographical shape which shows past the land slide on the slope. The scale of the land slide is big and movement is slow, these are the characteristics of Land slide.

Slope failure means slope (mountain slope) collapse which is small in scale and rapid in movement. In other words, slope failure is the phenomenon of the surface part.

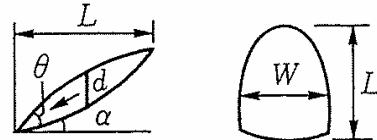
Land slide and Slope failure are divided by slope angle. Land slide happens at average slope of 14 – 19 degree and within the range of 8 – 25 degree. But slope failure happens at average 46 degree and within the range of about 30 – 60 degree.

The scale of land slide and slope failure are shown in Table 3-5-1.

Table 3.5-1 Average Scale of Land Slide and Slope Failure

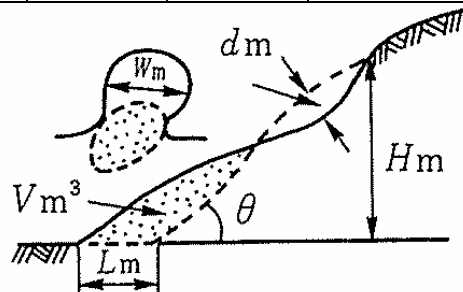
Average Scale of Land Slide

Tertiary (Oligocene)	W(m)	L(m)	$\theta(^{\circ})$	D(m)	A(ha)	$\alpha(^{\circ})$
Average	202	334	14	18.3	9.3	13
Accumulative 50% Value	90	190	11	12.5	2.5	12
Paleozoic	W(m)	L(m)	$\theta(^{\circ})$	D(m)	A(ha)	$\alpha(^{\circ})$
Average	182	357	19	18.6	7.4	19
Accumulative 50% Value	120	230	17	16	2.3	17.5



Average Scale of Slope Failure

Unit	H(m)	W(m)	L(m)	θ (度)	d(m)	γ (m^2)	L/H
Average	19.4	17.1	12.8	46.1	2.1	684	0.71
Min. ~ Max.	4 ~ 115	2 ~ 200	0.5 ~ 85	20 ~ 81	0.3 ~ 15	7 ~ 20000	0.08 ~ 2.61



In Japan, 3 nos. of boring investigation is conducted usually at one Cross section of the Road likely to happen land-sliding. Taking account of the local condition, the execution of boring investigation is not easy, not economical and time consuming due to the following conditions.

It is difficult to procure the demountable type boring machine which is possible to carry up to high

slope position manually.

Setting of boring rig is very difficult on the mountain slope.

Supply of water for boring is not easy because boring location is high above from river.

There are high possibility of circular water leaking from bore hole in crushed sediment rock layer or crushed metamorphic rock layer

It may be calculated about J.Yen 1,000,000 (=20,000/m x 20m x 3 holes) for the boring cost for **1 section of the Road**.

As mentioned at 3-3, the aerial photograph were taken in 1986 and 1992 – 6. Now, the satellite image (Quick Birds) is available. We have topographical survey drawings and geographical maps.

It is recommended to assign the specialist to read geographical and topographical data instead of boring investigation. The cost also may be calculated roughly J.Yen2,000,000 (=1,500,000 for data + 500,000 for specialist).

It is easy to say there are more than 2 land slide areas in the Project area.

Investigation steps for Land slide by data reading is shown in Table 3-5-2.

Table 3.5-2 Investigation steps for Land slide

Step	Work
1.	Data collection of Topographic Map, Geological Map, Aerial Photograph, Satellite Image
2.	Making Base Map to superpose Geological Map on Topographic Map
3.	Identification and supposition of Land slide area and Slope failure Area
4.	Identify Secular change with reading of Aerial Photograph and Satellite Image. Conduct Site Survey
5.	Making Report Geological Investigation

It is ideal to carry out boring investigation together with data reading. So many technical data has been accumulated since 1986 for the Project, they shall be utilized effectively.

In addition, existing data in past, latest GIS (Geographical Information System) and Image Processing technology shall be applied for making topographic an geological base map for road alignment design and construction planning.

The following data has been confirmed to be available.

- Topographical Map (scale 1/25,000) prepared by Nepal Survey Department in 1995.
- Geologic Map (scale 1/125,000) prepared by Nepal Survey Department in 1984.
- Aerial Photograph (scale 1/15,000) prepared by Nepal Survey Department in 1992.
- Quick Bird satellite image (61 cm resolution) provided by Digital Globe in 2003-2007.

As for Slope Failure above-defined, it is recommended that experienced engineer shall survey the site and set up proper slope using with past construction records (as built drawings) of Section 4 and 2.

Pitting shall be made about 1 location in 2km, and sample materials for Geological Investigation shall be taken. The following laboratory test shall be made.

- Specific Gravity : 50 ea.
- Moisture content : 50 ea.
- Sieve analysis : 50 ea.
- Liquid and Plasticity limits : 50 ea.
- CBR Test : 20 ea.

3.6 Construction Planning and Estimation

Special attention on the followings shall be paid during the planning and estimation.

Construction procedure

There are three option to start the work of Section 3; one is to start work from Section 4 side, one is to start work from Section 2 side, and to start work from both sides.

The options shall be examined and calculated carefully because construction cost and period are affected by transportation distance based on the options of Construction procedure.

Blasting

Since there is no more physical conflict after conclusion of cease-fire agreement between GON and Maoist, blasting and explosives may be used for rock excavation for the Project. Contacted with related governmental authorities to control explosives usage, the issues on the explosives such as application of usage, duration to approve, supplier, transportation and storage shall be confirmed and taken into the planning and estimation.

Regulation on Exhaust Gas

In Nepal, the regulation on exhaust gas (emission control) same as Euro 1 is in force. Substantially, it is impossible to import second hand constructional equipment, and there are not enough equipment in the market. It is requested that careful investigation on the procurement source, cost and period to be carried out.

Water Quality Examination

It is recommended to examine whether water quality of Sunkoshi River and other sources is suitable for construction.

Gravel Pit (Source of Aggregates)

The Gravel Pit (Source of Aggregates) shall be specified during B/D study and Royalty, Payer and Recipient to be confirmed in writing for improving the precision of estimation.

Spoil Area

It is ideal that Cut volume and Fill volume is balanced, but cut volume is over fill volume in mountain road construction. The Spoil Area shall be required and specified during B/D study. Planning (Location, Quantity etc.) of the Spoil Bank is important and it is recommended to reach consent of PAPs on the Spoil Areas.

Safety Fence

It is recommended to study to install the Safety Measures for traffic accident prevention especially its type (Block, Wire and Rail etc.).

Safety measures during construction period

Taking account of limited width of the road, just after construction of temporary roads, un-authorized vehicles may enter and emerge mixed traffic to make site safety harmful. In terms of preventive safety, Keep out sign and measures including watchmen to forbid the un-authorized vehicle, person and livestock to enter the construction areas shall be planned and its cost to be estimated.

Site Office and Quarters

Taking account of un-sable social condition, materialization of 24 hours gate control, night time lighting and hard fence for Site Office and Quarters is recommended.