



**Government of Nepal  
Ministry of Physical Infrastructure and Transport  
Department of Road  
Geo-Environment and Social Unit  
Babarmahal, Kathmandu**

## **GESU Business Plan (2069/2070-2071/2072)**

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## ***Glossary***

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DDG	Deputy Director General, 2
DG	Director General, 2
DOR	Department of Roads, 1
EIA	Environment Impact Assessment, 2
ESMF	Environmental and Social Management Framework, 1
GESU	Geo-Environment and Social Unit, 1
GEU	Geo-Environment Unit, 1
GON	Government of Nepal, 5
HURDEC	Human Resource Development Centre, 4
IEA	Initial Environment Assessment, 4
IEE	Initial Environment Examination, 2
M&E	Monitoring and Evaluation, 5
MOFSC	Ministry of Forest and Soil Conservation, 4
MOSTE	Ministry of Science Technology and Environment, 4
NEA	Nepal Electricity Authority, 5
O&M	Organization and Management, 5
ODA	Overseas Development Assistance, 1
SIA	Social Impact Assessment, 2
TOR	Terms of Reference, 8
VCDP	Vulnerable Community Development Plan, 2

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Human Resource Development Centre (HURDEC) Pvt Ltd  
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# I. Introduction

## 1.1 Background and context

Department of Roads (DOR) established Environmental Management Unit under Planning Branch in the year 1988 to support the Arun Access Road for the proposed Arun-III Hydropower Project. The Department made it a permanent cell under Planning and Design Branch and renamed it as Geo-Environment Unit (GEU) in the year 1994. During 1994 to 1999 the unit was supported by Overseas Development Agency (ODA) and World Bank for Road Maintenance and Rehabilitation Projects. The British (ODA) support mainly focused on capacity building and strengthening of bio-engineering skills, whereas World Bank's support focused on environmental sector. In the year 2005 GEU's role was further strengthened and the unit was renamed Geo-Environment and Social Unit (GESU) to cover social aspects in road construction and maintenance. As road construction often produces adverse effects on the bio-physical, social, economic and cultural environments, the role of the GESU is very important not only in social analysis and ensuring stakeholders' participation in the planning and implementation process but also for improved efficiency, effectiveness and sustainability of the projects.

The GESU currently covers all road and bridges construction and maintenance projects implemented through World Bank, ADB and other development agency support. It is now in the process to bring all the DOR projects under its arm. The DOR has already mandated the GESU to implement provisions of the Environmental and Social Management Framework (ESMF) under all construction, especially, road and bridge works under DOR. Therefore it has become necessary to ensure expansion of the GESU to cover all projects irrespective of donor funding. Considering a number of projects ongoing and forthcoming new projects like BIMP it is expected to require significant resource layout over the next three years. In this context, the status and capacity of the GESU needs to be enhanced significantly to cope with the challenges. This business plan aims at enhancing the status of the GESU and capacitating it for the challenges. This business plan covers a period of three years. Specifically, the business plan consists of:

- The GESU's mission, role, proposed structure and approach
- Key issues facing the GESU and options
- The GESU's estimated workload and personnel required
- Activity plan for the next three years
- Operational plan for the fiscal year 2069/70

## 1.2 The GESU's mandate and scope of work

GESU's present mandate is to study and recommend geo-technical, environmental and social issues pertaining to roads and bridge building and compliance monitoring of projects under World Bank assistance in close coordination with its two important stakeholders, Ministry of Environment and Ministry of Forest and Soil Conservation. It now plans to expand its mandate *"to conduct the geo-environmental, social assessment and compliance monitoring of roads and bridges for construction under the departments of roads irrespective of donor assistance. At the same time, it is also mandated to develop land acquisition plan, resettlement action plan, vulnerable community development plan, and gender plan" for DOR projects.*

*The scope of work of GESU is listed as below;*

- conduct Initial Environment Examination (IEE), Environment Impact Assessment (EIA), Social Impact Assessment (SIA) of the road project and neighborhoods, Social and Environment Audit (SEA) of the road projects
- advise the DOR for land acquisition, compensation and resettlement(LCR) for different Road Projects under DoR
- conduct geo-technical investigations of the roads under SRN to identify the potential sites requiring early attention to prevent the road closures
- research and Development of Geo–Environment and Social Aspects of road construction and maintenance
- promote the use of appropriate and Environmentally sound techniques for the construction and maintenance of the roads
- provide Bio-engineering Assistance to DRO’s and Projects
- increase Environment and Social Awareness of road construction, maintenance and asset preservation among RDs and DROs staffs through **workshops and training**
- monitor Compliance of Environment Management Action Plans (CEMAP), Social Action Plans (CSAP), Social and Environmental Impact (CSEI) of road construction/ upgrading/ rehabilitation/maintenance
- collect and maintain Geo-Environment and Social related central level data base
- **prepare, review and update** documents such as policy/guidelines/manual on Geo - technical Investigations and Practices, Bio-engineering Practices, Environmental and Social Aspects of integrated road development and **disseminate** to the DOR agencies through trainings, seminars and workshops

A circular issued by the Director General on 2069-6-22 has clarified the role of GESU in the social and environmental assessment of all construction projects under the DOR and has specifically directed other units of the DOR to comply with the mandate of the GESU<sup>1</sup>, but this may take some time in the implementation process. Aside from SEA and SIA the GESU is required to chart out the vulnerable community development plan and gender plan, while it needs to conduct IEE and EIA under its environmental assessment mandate. The land acquisition and resettlement plan is formulated by a district level committee under the chairpersonship of the Chief District Officer and members comprising district development committee representative, District Land Revenue Officer/Chief, Project In-charge. Representatives from District Forest Office, Survey, and District Agriculture Development Office are invited guests in these committee meetings. GESU is mandated to monitor the land acquisition and resettlement plan and process.

### 1.3 Operational structure of GESU and its functional relationship with other Units of DOR and outside agencies

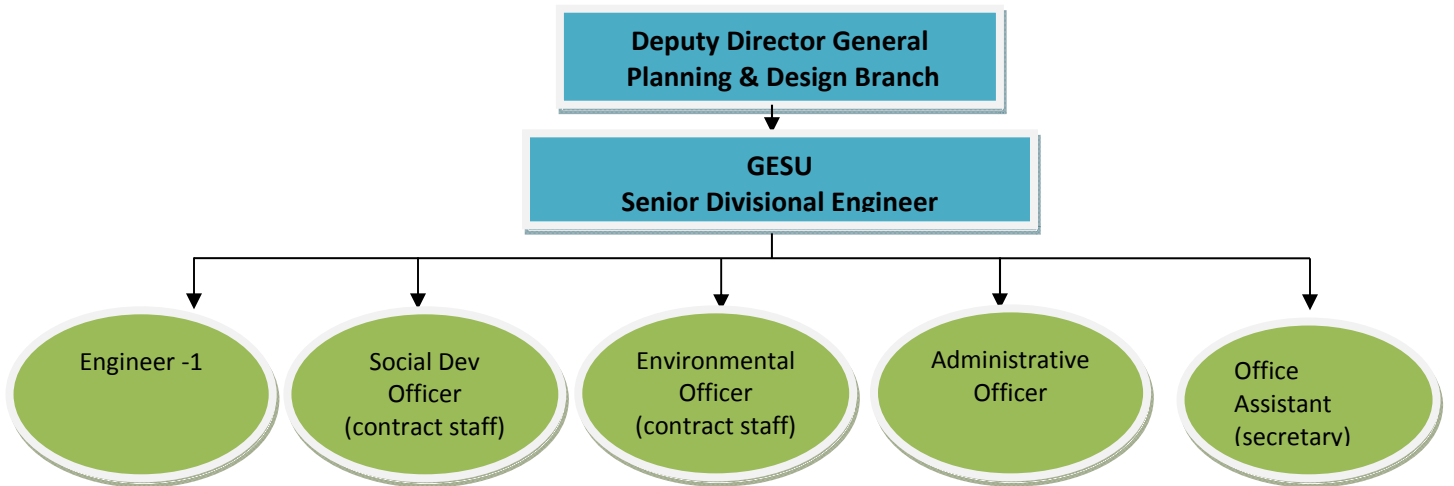
Geo-Environment and Social Unit headed by Senior Divisional Engineer (Unit Chief), under the direct supervision of Deputy Director General (DDG) -Planning and Design Branch, is assisted by only one Engineer. Besides, an Environmental officer, a Social officer, an administrative officer and an office assistant are working in this unit as professionals and assistants (Chart -1).

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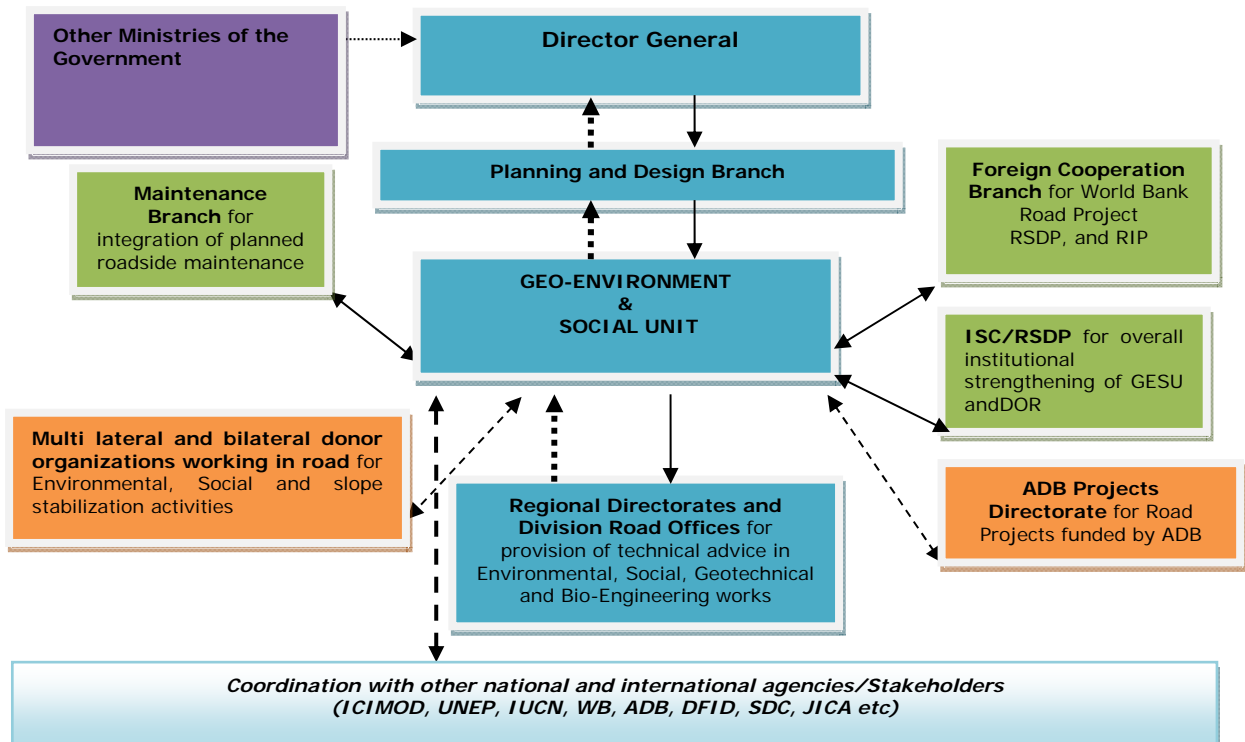
<sup>1</sup>A letter outlining these developments in DOR has been issued to the World Bank on May 3, 2012 and a follow up letter on May 8, 2012.

Chart -2 depicts the operational structure of GESU and its functional relationship with other units under DOR and outside. Although it has to work in close coordination with other Ministries of the government it cannot deal directly with these Ministries because of its lower status in the government authority chain. All Environmental Assessment files have to be approved by or moved through the Director General to the Ministry of Environment or the Ministry of Forest and Soil Conservation, which involves longer process in approval of contract documents.

**Chart -1: GESU Administrative Structure**



**Chart -2: GESU Functional Structure**



## II. Institutional and staffing issues /options facing the GESU

Some of the issues that are affecting the function and the performance of GESU are discussed below. Pertinent issues are clustered under institutional and staffing sections along with their causes. In addition, possible actions and activities to overcome these problems or issues are also discussed alongside.

### 2.1 Institutional

1. Currently, EIA reports are approved by the Ministry of Science, Technology and Environment (MOSTE) and in many cases with the approval of Ministry of Forest and Soil Conservation(MOFSC) which takes a long time, up to 6 months for approval causing unnecessary delays in the commencement of the contract. This is mainly because GESU cannot directly communicate with other Ministries, e.g. MOSTE and MOFSC because of its functional hierarchy in the government chain of command, and the files need to be sent to these ministries through the Director General of the DOR for approval and through Secretary of MOPIT to MOSTE. This is in fact tedious and time consuming.

The issue here is the inter-ministerial communication and one option out of this situation is the establishment of Ministerial level coordination committee jointly representing GESU of the DoR and Ministry of Environment. This coordination committee can act as one window system for EIA/IEE in all road and bridge projects.

2. Other entities of department do not consult GESU while preparing contract document and providing clearance for bill of quantity (BOQ). This is mainly because the authority of GESU is not clearly communicated with other entities of department, especially with BridgeProjects. Moreover, GESU lacks enough clout in the department because of its unit level status within the Planning Division.

Therefore the DDG needs to circulate a directive to all the entities to consult with GESU while preparing contract document and providing clearance for bill of quantity (BOQ) in the short run. In the long run GESU can be upgraded to Joint Secretary level division. The action needs to be initiated with the reformulation of GESU mandate in the O&M proposal which is presently in the process of approval.

3. Although there is a high workload in the GESU at the centre, the regional directorates cannot hire experts to conduct compliance monitoring. Because of shortage in the specialist staff at the centre many of the assessment and monitoring tasks are delayed.

The regional directorates, therefore, can be delegated authority to procure local experts for compliance monitoring. Alternative plan could be a provision for hiring individual experts under each project to be supervised by the core staff of GESU. In order for this to happen, the department should hire certain permanent core staff under GESU who will supervise the work of the outsourced specialists under each project. This practice is well established in the Nepal Electricity Authority and is functioning smoothly.



4. The practice of information dissemination is poor. Therefore, space needs to be created for activities of the unit in the department website.

## 2.2 Staffing

1. There is frequent turnover of GESU chief as well as the staff. Most of the staff are not interested to work in GESU due to lack of motivation as compared to other units of the department. Therefore, the unit is taken as a dumping site rather than an equally contributing part of the DOR as a whole. Those who are transferred to the unit take it as a transitory platform. This means that the function of GESU is undermined in the department.

In order for the unit to be attractive and well functioning with sufficient and qualified staff one option could be a separate incentive package for the staff of GESU, in line with the modality that Nepal Electricity Authority (NEA) has adopted. NEA provides two percent of the project cost as incentive to the staff of its Environmental Monitoring Unit, besides providing training and exposure visits to overseas countries. However, the proposed modality will be a major departure in the government incentive system, thus needs to be thought/worked. Another option could be to secondment of the GESU staff in the consultant's team as per their expertise. The payment to the GESU staff/experts could be as per the quotation of the consultant approved by the DOR.

2. There is a question on the quality of work of the of the GESU unit staff pertaining to skills required for conducting survey on environmental and social issues. The GESU does not have regular positions for regular experts on specialized fields such as geo-technology, environment and social analysis, forestry and biology. Lack of such expertise in the core staffing of GESU makes it very difficult to handle the workload smoothly.

Although most of the expertise can be outsourced as and when required, it is difficult to assure quality of their work in absence of in-house experts in relevant field. Even the present incentive system to out sourcing is inadequate and needs to be revised to attract qualified experts.

It is necessary to ensure one regular staff position for each of the five specialized fields: geo-technology, environment and social analysis, forestry and biology. Additionally, the workload concerning outsourcing/procurement of expert services will become very high in the future. This warrants a regular Procurement Specialist within the GESU. Finally, one M&E Specialist will also be required. The terms of reference of the experts will be developed once the business plan is approved and implemented by DOR.

Since the creation of new regular position is almost impossible within the existing government system, the option left is to ensure those regular positions for GESU in the proposed overall O&M restructuring plan<sup>2</sup> of the department. The rest of the experts can be built in the project cost itself in line with the NEA strategy. As discussed earlier, it would be less bureaucratic and more efficient to outsource experts instead of hiring a whole set of specialists by the GON.

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<sup>2</sup> Please refer to the O&M plan of DOR is under the process of approval.

3. Although monitoring and evaluation is on one of the major functions of GESU, it is neglected because of the absence of monitoring desk and logistics to support it. There is shortage of staff, especially an engineer to oversee the monitoring function of the unit. As such compliance monitoring suffers from both staff and logistic (office space, vehicle, materials) shortage.

This, of course points out to the need for re-assessing the staff and logistic requirements of the GESU and plan accordingly. The initiative needs to be taken from the director general level. There is shortage of office space to accommodate more staff and vehicle for field monitoring visits.

4. Moreover, there is no job description of the GESU staff. They have to delineate their functions out of the overall scope of the work of GESU on the one hand and create confusion and overlapping of responsibilities among the staff, on the other hand.

In order to function in a professional manner and achieve desired results by GESU, the job description of GESU staff needs to be clearly written. Additionally, the incentive system recommended by this report is based on the performance of staff which calls for clear understanding of job and required job outputs. The job descriptions of the current GESU staff are already approved by the department.

### III.The GESU's projected workload and staff requirement

The GESU's workload is divided into two main areas, i.e., the roads sector and the bridge sector. Based on the standard norms for road building and bridge works, person days required for total number of roads and bridges to be constructed (Table-1)in the coming three years has been calculated (Annex Table-1 and 2 respectively). Based on the person days calculation, human resource required under GESU has been calculated (Annex Table 3).

**Table 1: Length and no under construction and to be constructed in the coming three years**

	Roads				Bridge
Length	up to 20 km	20 - 50 km	51-100 km	above 100 km	
No	24	49	20	8	121

Table 2 reveal that there is a huge need for additional staff in the GESU even to complete the existing works. As per the table ten Environmentalist/Forestry Specialist/Ecologist and seven socio-economists and a number of other specialists are needed to complete the job requirement in the coming year in the roads sector. Similarly, five environmentalists and four socio-economists are necessary for the job requirements of under the bridge sector. The demand for human resource is increasing in the coming years, thus needs to be either procured under the GON permanent service regulations or outsourced on the contractual arrangement.

**Table 2: GESU projected human resource requirement in the roads and bridge sector (2069/2070- 2072/2073)**

S.N.	Experts/Support Staff	Roads Sector		Bridge Sector	
		No of experts / staff required of 3 yrs	No of experts/ staff required for 1 yr	No of experts / staff required of 3 yrs	No of experts/ staff required for 1 yr
1	Environmental/ Forestry Specialist/ Ecologist	30	10	16	5
2	Highway Engineer/Transport Engineer	19	6	10	3
3	Geologist/Geotechnical Engineer	18	6	7	2
4	Hydrologist	7	2	7	2
5	Social Expert-Socio-Economist	22	7	11	4
6	Legal expert	4	1		
	<b>Support staff</b>				
1	Technical assistance (Physico-chemicals)	13	4	8	3
2	Technical assistance (biological)	13	4	8	3
3	Technical assistance (Socio-economist)	15	5	8	3
4	Acc/Admin	10	3	6	2
5	Computer operator	13	4	9	3
6	Runner	18	6	11	4
7	Driver		1		1

Source: Calculated from annex table 1

Table 2 shows the calculation of the total person days required of each specialist under the GESU in order to fulfill its given mandate. The projection is only for the new and under construction roads and bridge projects. This means that there is still a huge workload on the maintenance of these facilities. Thus the number of Environmentalist/Forestry Specialist/Ecologist required is 10 and 5 in the first year under the roads and the bridge projects respectively. Similarly, the demand for socio-economist is also huge, i.e., 7 and 4 in the two sectors in the first year (Table 2). The requirements get much higher on the third year of operation of the plan.

## IV. GESU operational plan for the next three years

### 4.1 Proposed activities and calendar of operation

The following table depicts the major activities to be undertaken during the coming three years in order to enhance the functional capacity of GESU, those responsible for initiating the activities and approving authority. The plan encompasses regular activities which are also the core function of GESU and those activities which need to be undertaken to achieve the proposed mandate of GESU and for its smooth functioning.

Proposed activities			1 <sup>st</sup> year				2 <sup>nd</sup> year				3 <sup>rd</sup> year			
	Forwarding Unit	Approving authority	1	2	3	4	1	2	3	4	1	2	3	4
Directive to other departments of DOR to consult with GESU on matter relating to EA in the short run (already issued)	GESU	DG/DDG												
Introduction of new incentive system in the GESU <ul style="list-style-type: none"> <li>- Discussion at the DG and DDG level</li> <li>- Initiate file movement</li> <li>- Revision of O&amp;M which is currently in the process of approval</li> </ul>	GESU	MOSTE												
Delegate more authority to the RDs to outsource local specialist for EA and compliance monitoring in the short run <ul style="list-style-type: none"> <li>- Outsourcing of individual experts under each project</li> <li>- Hiring of permanent staff by GESU for supervision (geo-technology, environment and social analysis, forestry and biology)</li> <li>- DOR initiates the file movement up to the MOPPWTM Secretary level</li> <li>- Revision of O&amp;M which is currently in the process of approval</li> </ul>	GESU and Department	MOPIT												
Upgrading of GESU to divisional level <ul style="list-style-type: none"> <li>- GESU organizes meeting of DG and DDG for orientation on the proposed plan</li> <li>- DOR initiates the file movement up to the MOPIT Secretary level</li> <li>- Reformulation of GESU's mandate in the O&amp;M proposal which is currently in the process of approval.</li> </ul>	Department	MOPIT												
Create separate M&E desk in GESU <ul style="list-style-type: none"> <li>- Initiate the file movement to arrange for necessary logistics at the GESU (space, furniture, computer and equipment, vehicle, etc)</li> <li>- Hiring of regular monitoring staff with transport engineering, social and environmental background</li> <li>- Hiring of permanent procurement staff for outsourcing of specialists</li> <li>- Revision of O&amp;M which is currently in the process of approval</li> </ul>	GESU & department	MOPIT												
Prepare specific TOR of staff														
Regular training to GESU staff	GESU	DDG												

Formation of inter-Ministerial coordination committee for one window initiative - GESU organizes meeting of DG and DDG for orientation on the proposed plan - DOR initiates the file movement up to the MOPIT Secretary level - The Secretary of MOPIT calls a ministerial meeting of MOSTE and MOFSC	GESU/DOR	Cabinet																		
Update Acts/rules/guidelines	GESU	MOL																		
Revise reference manuals	GESU	MOL																		

## V Budget requirement and sources of fund

The current year budget requirement and the 2<sup>nd</sup> and 3<sup>rd</sup> years projections are provided in Table 3 based on GESU's regular activities and available budget. GESU has NRS 19,600 thousand budget for the current year and will require additional budget in the coming years for its regular activities.

In addition to its regular budget, it requires about NRS 30,800 thousand for the proposed capacity development activities in the first year and NRS 79,400 on the third year of capacity development (Table 4). This fund has to be arranged either from the government regular budget or from donor support. Of the total budget it is envisaged that about 50 percent will be borne by the DOR and the rest will be sought from different donors (Table 5). Some of the experts required to complete the job are hired by the GON on permanent basis while majority are hired under contract on project basis. It is envisaged that the human resource cost is inbuilt on the project cost, so that the burden of human resource cost will be shifted to the project budget instead of on the regular budget of the DOR. Donors support is also envisaged in the overall resource estimates of the GESU.

**Table 3: Available and projected budget for the GESU regular activities 2012/13 - 2014-15**

Budget in NRs 000.

S.N.	Activities	Fund/Sources	unit	Target	Budget for 2012/13 Year1	Target	Budget for 2013/14 Year 2	Target	Budget for 2014/15 Year 3
1	Outsourcing Environmental & Social experts	WB/RSDP	No	2	1900	2	1900	2	1900
		WB/BIMP	No	2	300	2	1900	2	1900
2	Consulting services for HIV-AIDS awareness activities	WB/RSDP	No	1	1800	1	600	1	0
3	Conducting geo tech investigations	WB/RSDP	No	3	1900		0		
		GoN	No			3	2000	3	2000
4	Hiring external monitors	WB/RSDP	No	2	500	4	1000	4	1000
5	Hiring consultant for Preparing GESU Business Plan	WB	no	1	200				
6	Conducting training	WB/RSDP	No	2	1600	3	2500		
		BIMP	No			2	1600	2	1600
		GoN	No			3	2000	3	2000
7	Publication of legal Guidelines and other environmental and social related documents	RSDP	No	1	100		0		0
		GoN	No			2	400	2	400
8	Procurement and Conducting EIA/IEE*	GoN	Pkg	23	10000	7	20000	15	20000
	Procurement and Conducting IEE	BIMP	%			60	6000	40	4000
9	Safeguard monitoring for all GON,WB,ADB,RIP roads and bridges	GoN	%	100	1000	100	1500	100	1500
		RSDP	%	100	300	100	500	100	
		BIMP	%			100	1200	100	1200
Total					19600		43100		37500

**Table 4: Projected Resource Requirement For GESU For Three Years**

in thousands Rs

S.N.	Activities Description	Year -1		Year-2		Year-3		Annual payments in NRS
		No	Budget	No	Budget	No	Budget	
<b>A</b>	<b>Human Resources</b>							
1	Environmental/ Forestry Specialist/ Ecologist (Team leader)		1100	10	12000	15	18000	1200
2	Social Expert – Socio/Economist	1	800	7	6300	11	9900	900
3	Geologist/Geotechnical Engineer			6	7200	8	9600	1200
4	Hydrologist			2	2400	4	4800	1200
5	Legal expert			1	900	1	900	900
6	Monitoring and Evaluation Specialist			1	1200	1	1200	1200
7	Procurement officer			1	900	1	900	900
8	Office Secretary	1	200	2	400	2	400	200
9	Drivers	2	300	3	600	3	600	200
10	Office Assistant	1	100	2	400	1	200	200
	<b>Sub Total</b>		<b>2500</b>		<b>32300</b>		<b>46500</b>	
<b>B</b>	<b>Logistics</b>							
1	Office space (400) sqft to be provided in DOR premises	400						
2	Vehicles			3	10000			
3	Furniture			LS	1000			
4	Computers/Laptops/UPS			10	1000			
5	Printers			3	100			
6	Photocopy machine			1	200			
7	Office running costs incl. stationary and other necessary materials	LS	500	LS	500	LS	500	
8	Vehicle running costs	LS	500	LS	1500	LS	1500	
	<b>Sub Total</b>		<b>1000</b>		<b>14300</b>		<b>2000</b>	
<b>C</b>	<b>Capacity Development</b>							

1	Participation in National and International seminars and conferences			LS	500	LS	500	
2	Training to GESU Staff			LS	200	LS	200	
3	Training to others	LS	1600	LS	2500	LS	2500	
	<b>Sub Total</b>		<b>1600</b>		<b>3200</b>		<b>3200</b>	
D	<b>Miscellaneous</b>							
	Projects EIA/IEE	15	23000	15	23000	15	23000	
	Monitoring	LS	200	LS	300	LS	300	
	Field visits	LS	200	LS	600	LS	600	
	Publications	LS	200	LS	200	LS	200	
	Geo technical investigations	LS	1900	LS	3000	LS	3000	
	Procurement works	LS	100	LS	500	LS	500	
	Data collection and Documentation	LS	100	LS	100	LS	100	
	<b>Sub Total</b>		<b>25700</b>		<b>27700</b>		<b>27700</b>	
	<b>Grand Total</b>		<b>30,800</b>		<b>77,500</b>		<b>79,400</b>	

**Table 5: Sources of Fund For Three Year**

in thousands Rs

S.N.	Activities Description	Year -1		Year-2		Year-3		Remarks
		GON/DOR	Other Partners	GON/DOR	Other Partners	GON/DOR	Other Partners	
1	Human Resources(hiring)	750	1750	16150	16150	23250	23250	
2	Logistics	500	500	5000	9300	1000	1000	
3	Capacity Development		1600	700	2500	700	2500	
4	Projects	23000	2700	26000	1700	26000	1700	
	<b>Total</b>	<b>24250</b>	<b>6550</b>	<b>47850</b>	<b>29650</b>	<b>50950</b>	<b>28450</b>	



**Annex Table1: GESU projected work load in the roads sector  
(2069/2070- 2072/2073)**

Type of experts required/Type of road	Person days required for Initial Environment Examination					Person days required for Environmental Impact Assessment					Total person days for IEE + EIA
	up to 20 km	20 - 50 km	50- 100 km	above 100 km	Total person days	up to 20 km	20 - 50 km	50- 100 km	above 100 km	Total person days	
<b>Environmental/ Forestry Specialist/ Ecologist</b>	456	1176	660	360	2652	816	2548	1400	720	5484	8136
<b>Highway /Transport Engineer</b>	264	784	440	240	1728	456	1519	900	520	3395	5123
<b>Geologist/Geotechnical Engineer</b>	216	637	340	200	1393	456	1519	900	520	3395	4788
<b>Hydrologist</b>	0	0	0	0	0	264	882	500	360	2006	2006
<b>Social Expert – Socio-Economist</b>	264	784	440	240	1728	600	1911	1100	600	4211	5939
<b>Legal expert</b>	0	0	0	0	0	168	490	240	120	1018	1018
<b>Support staff</b>											
<b>Technical (Physico-chemicals)</b>	168	539	320	184	1211	336	1029	600	328	2293	3504
<b>Technical assistance (biological)</b>	168	539	320	184	1211	336	1029	600	328	2293	3504
<b>Technical (Socio-economist)</b>	168	539	320	184	1211	432	1323	720	376	2851	4062
<b>Acc/Admin</b>	168	441	220	104	933	360	833	380	168	1741	2674
<b>Computer operator</b>	240	588	300	136	1264	480	1127	500	216	2323	3587
<b>Runner</b>	336	784	420	216	1756	480	1470	800	400	3150	4906

Based on the standard norms for road building provided in annex table -3

**Annex Table 2: GESU projected work load in the bridge sector  
(2069/2070- 2072/2073)**

S.N	Type of experts required/Type of road	Person days required		Total person days required
		Under construction (95)	New construction (26)	
	<b>Number of Bridges</b>			
1	Environmental/ Forestry Specialist/ Ecologist	3325	910	<b>4235</b>
	Highway Engineer/Transport Engineer	2185	598	<b>2783</b>
3	Geologist/Geotechnical Engineer	1520	416	<b>1936</b>
4	Hydrologist	1520	416	<b>1936</b>
5	Social Expert – Socio-Economist	2280	624	<b>2904</b>
6	Legal expert			
	<b>Support staff</b>			
1	Technical assistance (Physico-chemicals)	1615	442	<b>2057</b>
2	Technical assistance (biological)	1615	442	<b>2057</b>
3	Technical assistance (Socio-economist)	1615	442	<b>2057</b>
4	Acc/Admin	1235	338	<b>1573</b>
5	Computer operator	1900	520	<b>2420</b>
6	Runner	2280	624	<b>2904</b>

Based on the standard norms for bridge building provided in annex table -4

**Annex Table 3: Standard norms of roads construction**

S.N.	Experts	Unit	Initial environment assessment				Environmental impact assessment			
			Length of road up to 20 km	Length of road 20-50 km	Length of road 51-100 km	Length of road > 100 km	Length of road up to 20 km	Length of road 20-50 km	Length of road 51-100 km	Length of road > 100 km
1	Environmental/ Forestry Specialist/ Ecologist (Team leader)	P/D	19	24	33	45	34	52	70	90
2	Highway Engineer/Transport Engineer	P/D	11	16	22	30	19	31	45	65
3	Geologist/Geotechnical Engineer	P/D	9	13	17	25	19	31	45	65
4	Hydrologist	P/D					11	18	25	45
5	Social Expert – Socio-Economist	P/D	11	16	22	30	25	39	55	75
6	Legal expert	P/D	0	0	0	0	7	10	12	15
	Support staff									
1	Technical assistance (Physico-chemicals)	P/D	7	11	16	23	14	21	30	41
2	Technical assistance (biological)	P/D	7	11	16	23	14	21	30	41
3	Technical assistance (Socio-economist)	P/D	7	11	16	23	18	27	36	47
4	Acc/Admin	P/D	7	9	11	13	15	17	19	21
5	Computer operator	P/D	10	12	15	17	20	23	25	27
6	Runner	P/D	14	16	21	27	20	30	40	50

Source: DOR 2013

**Annex Table 4: Norms of bridge construction**

S.N.	Experts	Unit	Initial environment assessment	Environmental impact assessment	Brief environment assessment	Total
1	Environmental/ Forestry Specialist/ Ecologist (Team leader)	P/D	14	15	6	<b>35</b>
2	Highway Engineer/Transport/Bridge engineer	P/D	9	9	5	<b>23</b>
3	Geologist/Geotechnical Engineer	P/D	5	7	4	<b>16</b>
4	Hydrologist	P/D	5	7	4	<b>16</b>
5	Social Expert –Socio-Economist	P/D	9	9	6	<b>24</b>
6	Legal expert	P/D				<b>0</b>
	Support staff					<b>0</b>
1	Technical assistance (Physico-chemicals)	P/D	6	7	4	<b>17</b>
2	Technical assistance (biological)	P/D	6	7	4	<b>17</b>
3	Technical assistance (Socio-economist)	P/D	6	7	4	<b>17</b>
4	Acc/Admin	P/D	5	5	3	<b>13</b>
5	Computer operator	P/D	7	9	4	<b>20</b>
6	Runner	P/D	10	10	4	<b>24</b>

Source: DOR 2013