

of an area such as the poverty level--an important factor from the viewpoint of poverty reduction--, several proxies that represent the development level of an area were added by the SAPROF team. In addition, LGED officials confirmed that growth centers will be given priority over rural markets in accordance with national policy. Third, the two sets of criteria were presented to the stakeholders in the Second Stakeholders Meetings²⁶ to obtain feedback. Finally, considering the feedback obtained and the data available, the two sets of criteria were finalized.

The finalized eligibility criteria are presented in Table 5-16. The proposed growth centers and rural markets must qualify under all of the eligibility criteria in order to be considered for development prioritization. The first criterion is set in expectation that road connection will multiply the effects of investment on growth centers and rural markets. The second criterion is included so that inactive growth centers and rural markets are not selected.

Table 5-16 Eligibility criteria for growth centers and rural markets

Eligibility criteria
1) Already connected or planned to be connected to a paved road
2) The growth center/rural market is open periodically, at least once a week

The finalized prioritization criteria are presented in Table 5-17. The scoring schemes are also given in the table. All growth centers and rural markets which qualify under the eligibility criteria are given a score reflecting each of the criteria. Subsequently, growth centers and rural markets are ranked according to their total scores.

However, before executing the ranking, growth centers and rural markets are put into separate groups according to Criterion 1. This ensures that the national policy to develop all growth centers is followed. All proposed growth centers that qualify under the eligibility criteria are given priority over rural markets. Thus growth centers and rural markets are ranked separately.

Apart from the above-mentioned national policy, three basic principles are followed in the prioritization criteria. They are: 1) give priority to growth centers and rural markets in underdeveloped areas; 2) give priority to growth centers and rural markets with higher economic potential; and, 3) give priority to growth centers and rural markets which are more likely to be maintained properly. The first principle is followed because the project aims to reduce poverty and the disparities between the poor and the rich. The second principle is followed to enhance the economic effects of the project investment. The third principle is followed so that positive effects may be sustained. In prioritizing the proposed growth centers and rural markets, an even weight of 40% is given to the first two principles and 20% to the third principle. As stated earlier, the principles, criteria, and weighting scheme were proposed by the SAPROF team and decided through discussions with LGED and stakeholder meetings²⁷.

criterion, was excluded from consideration, as data for rural markets were not available.

²⁶ See Annex 4.

²⁷ See Annexes 3 and 4 for the details of the stakeholder meetings.

Table 5-17 Prioritization criteria for growth centers and rural markets

Prioritization criteria	Weighting Scheme
A. National Policy	
1) Category given to the market; i.e. growth center or rural market	NA
B1. Level of development	40%
2) Income level: GDP per capita of the District where the growth center/rural market is located (Data source: Bangladesh Bureau of Statistics, 2000)	(20%)
3) Poverty: The Headcount Index; i.e. the proportion of the population counted as poor in the Upazila where the growth center/rural market is located (Data source: Bangladesh Bureau of Statistics, 2005)	(10%)
4) Education: average years of schooling of adult household members in the Upazila where the growth center/rural market is located (Data source: Bangladesh Bureau of Statistics, 2005)	(10%)
B2. Economic potential	40%
5) Hat day buyers per day (Data source: LGED, 2008)	(5%)
6) Hat day sellers per day (Data source: LGED, 2008)	(5%)
7) Number of permanent shops (Data source: LGED, 2008)	(10%)
8) Lease value per year (Data source: LGED, 2008)	(20%)
B3. Sustainability of operation and maintenance	20%
9) Existence and status of MMC (Data source: LGED, 2008)	(20%)
Total	100%

Scoring schemes

2): All Districts in the Project area are ranked according to GDP per capita, and each District is given a score ranging from 1 for the highest quartile to 4 for the lowest quartile.

3) and 4): All Upazilas in the Project area are ranked according to severity of poverty or level of education, and each Upazila is given a score ranging from 1 for the wealthiest or the most educated quartile to 4 for the poorest or the least educated quartile.

5) to 8): All proposed growth centers/rural markets which qualify for selection under the eligibility criteria are ranked from highest to lowest in terms of numeric value, and each growth center/rural market is given a score ranging from 1 for the lowest quartile to 4 for the highest quartile.

9): Each growth center/rural market that qualifies under the eligibility criteria is given a score of 1 if MMC is non-existent, 2 if MMC is dormant, and 4 if MMC is active.

For all criteria: If data is not available, a score of 2 is given.

For the first principle (B1 in Table 5-17), three criteria are listed. These criteria were selected, as they best reflect the level of development among the available proxies. Criterion 2 mainly reflects the economic aspect of development, and Criteria 3 and 4 its social aspect. Both the economic and the social aspects are given the same weight.

For the second principle (B2 in Table 5-17), four criteria are listed. These criteria best represent the economic potentials of growth centers and rural markets among the available data. Criteria 5, 6, and 7 are proxies of the number of the market users, and Criterion 8 represents the trade volume. Both groups are given the same weight.

For the third principle (B3 in Table 5-17), the existence and status of the MMC are considered (Criterion 9). Existence of an active MMC is likely to enhance the sustainability of the operation and maintenance of the growth center or the rural market.

In addition, additional preconditions for subproject implementation may be later specified, which shall dictate the approval of subprojects at the project implementation stage. An example set of preconditions are presented in Table 5-18.

Table 5-18 Preconditions for growth center and rural market subproject implementation

Eligibility criteria	
1)	Completion of a development plan for upgrading
2)	Approval of the development plan by stakeholders
3)	Opening or confirmation of existence of a bank account of MMC
4)	Letter from MMC Chairperson stating that s/he will be responsible for proper management of the facilities to be developed, and that s/he will ensure that the MMC's bank account will be properly managed with audits conducted by a third party

d) Ranking of growth centers and rural markets

The growth centers and rural markets on the list of proposed subprojects were prioritized according to the two sets of criteria explained above. Of the 62 growth centers, four did not meet the eligibility criteria. Of the 72 rural markets, 10 did not meet the eligibility criteria. Therefore, 58 growth centers and 58 rural markets were ranked using the prioritization criteria. For rural markets, however, in order to distribute the project investment more evenly across the Project area, the rural markets located in the Upazilas that did not have any growth centers to be upgraded under SWBRDP were prioritized over other markets. The ranking results for growth centers and rural markets are given in Table 5-19 and 5-20 respectively.

Table 5-19 Ranking result of growth centers

Rank	District	Upazila	Name of growth center	Upgrading	WMS
1	Madaripur	Shib Char	Shibchar		1
2	Rajbari	Baliakandi	Sonapur	1	
3	Madaripur	Shib Char	Madbarerchar	1	
4	Bhola	Lalmohan	Gazaria	1	
5	Faridpur	Sadarpur	Chadda Rashi	1	
6	Bhola	Tazumuddin	Hat Sashiganj	1	
7	Madaripur	Madaripur Sadar	Mostofapur		1
8	Shariatpur	Shariatpur Sadar	Burirhat	1	1
9	Pirojpur	Bhandaria	Bhandaria	1	1
10	Madaripur	Madaripur Sadar	Chillarchar	1	
11	Shariatpur	Damoudya	Sedhalkura	1	
12	Bagerhat	Kachua	Badhal		1
13	Satkhira	Tala	Pathkelghata	1	
14	Pirojpur	Nazirpur	Sreeramkathi	1	
15	Faridpur	Alfadanga	Gopalpur	1	
16	Bhola	Manpura	Hazir hat	1	
17	Patuakhali	Bauphal	Kalaia	1	1
18	Khulna	Paikgachha	Kopilmoni		1
19	Shariatpur	Zanjira	Janjira	1	1
20	Faridpur	Alfadanga	Alfadanga	1	
21	Bhola	Burhanuddin	Moazzem hat	1	

Table 5-19 Ranking result of growth centers (continued)

Rank	District	Upazila	Name of growth center	Upgrading	WMS
22	Khulna	Dumuria	Dumuria	1	
23	Khulna	Paikgachha	Garuikhali	1	
24	Pirojpur	Kawkhali	Kawkhali	1	
25	Faridpur	Faridpur Sadar	Khalil Mondal	1	1
26	Satkhira	Kalaroa	Sonabaria	1	1
27	Rajbari	Pangsha	Machpara	1	
28	Bagerhat	Chitalmari	Chitalmari	1	
29	Rajbari	Rajbari Sadar	Kutir Hat	1	
30	Bagerhat	Kachua	Gajalia	1	
31	Khulna	Phultala	Phultala GC		1
32	Barisal	Banaripara	Choumohani	1	1
33	Patuakhali	Galachipa	Badura	1	1
34	Barisal	Barisal Sadar	Shahiber hat	1	
35	Khulna	Terokhada	Katinga	1	
36	Gopalganj	Kotalipara	Dharabashail	1	1
37	Patuakhali	Patuakhali Sadar	Katachia	1	1
38	Bhola	Bhola Sadar	Majhir hat	1	
39	Jhalakati	Kanthalia	Amua	1	
40	Jhalakati	Jhalakati Sadar	Shivgonj	1	
41	Satkhira	Assasuni	Bardal	1	1
42	Pirojpur	Mathbaria	Sapleza GC	1	1
43	Satkhira	Satkhira Sadar	Bhetkhali	1	
44	Bagerhat	Morrelganj	Polar hat		1
45	Patuakhali	Kalapara	Lalua	1	
46	Jhalakati	Jhalakati Sadar	Birmohal		1
47	Barguna	Betagi	Bodnykhali hat	1	
48	Faridpur	Madukhali	Borogopaldi	1	
49	Bagerhat	Rampal	Gilatala	1	
50	Faridpur	Char Bhadrasan	Moulavir Char	1	
51	Patuakhali	Dumki	Murdia	1	
52	Khulna	Dighalia	Pother bazar	1	
53	Barguna	Amtali	Gazipur	1	1
54	Satkhira	Kaliganj	Kushlia	1	
55	Barisal	Agailjhara	Begdhar hat GC	1	
56	Jhalakati	Nalchity	Nalchity K.M. hat GC	1	1
57	Jhalakati	Rajapur	Putiakhali	1	
58	Barguna	Barguna Sadar	Phuljhuri hat	1	1

Table 5-20 Ranking result of rural markets

No	Rank ¹	District	Upazila	Name of growth center	Upgrading
1	59	Faridpur	Bhanga	Pukuria bazar	1
2	60	Shariatpur	Bhedarganj	Kartikpur bazar	1
3	61	Pirojpur	Swarupkath	Miar hat bazar	1
4	62	Shariatpur	Naria	Chakdha bazar	1
5	63	Barisal	Hizla	Akotar hat	1
6	64	Barisal	Gaumadi	Mahilera bazar	1
7	65	Faridpur	Nagarkanda	Puradia bazar	1
8	66	Madaripur	Kalkini	Miar hat	1
9	67	Barisal	Bakerganj	Koloshkati bazar	1
10	68	Shariatpur	Gosairhat	Shayka bazar	1
11	69	Gopalganj	Muksudpur	Molladi bazar	1

Table 5-20 Ranking result of rural markets (continued)

No	Rank ¹	District	Upazila	Name of growth center	Upgrading
12	70	Madaripur	Rajoir	Kalibari hat	1
13	71	Faridpur	Boalmari	Teljuri bazar	1
14	72	Bagerhat	Bagerhat Sadar	Chulkati bazar	1
15	73	Patuakhali	Mirzaganj	Mirjagonj Dargar Sharif	1
16	74	Barisal	Mehendiganj	Mejokazir char hat	1
17	75	Bhola	Char Fasson	Bojlur bazar	1
18	76	Bhola	Daulat Khan	Miear hat	1
19	77	Khulna	Koyra	Vander pole hat	1
20	78	Barisal	Babuganj	Post Office hat	1
21	79	Pirojpur	Pirojpur Sadar	Sikdar Mollik bazar	1
22	80	Khulna	Batiaghata	Sukdara bazar	1
23	81	Satkhira	Shyamnagar	Sirajpur Hat	1
24	82	Barguna	Bamna	Sonakhali	1
25	83	Shariatpur	Zanjira	Lowkhola bazar	1
26	84	Faridpur	Faridpur Sadar	Mominkhar hat	1
27	85	Faridpur	Sadarpur	Monikota bazar	1
28	86	Shariatpur	Shariatpur Sadar	Arigcon bazar	1
29	87	Shariatpur	Damoudya	Moderhat bazar	1
30	88	Satkhira	Kalaroa	Shorokathi bazar	1
31	89	Rajbari	Rajbari Sadar	Bashantopur bazar	1
32	90	Bhola	Manpura	Bhuyar hat	1
33	91	Bagerhat	Chitalmari	Boro Baria bazar	1
34	92	Bagerhat	Rampal	Foyla hat	1
35	93	Bagerhat	Bagerhat Sadar	Depara bazar	1
36	94	Bagerhat	Morrelganj	Foolhata hat	1
37	95	Satkhira	Satkhira Sadar	Baikari bazar	1
38	96	Bhola	Bhola Sadar	Maller hat	1
39	97	Rajbari	Pangsha	Sarsha bazar	1
40	98	Khulna	Dumuria	Sharafpur bazar	1
41	99	Satkhira	Kaliganj	Tarali bazar	1
42	100	Pirojpur	Nazirpur	Shekmatia bazar	1
43	101	Bhola	Lalmohan	Muguria bazar	1
44	102	Jhalakati	Rajapur	Charakhali bazar	1
45	103	Jhalakati	Nalchity	Taltala bazar	1
46	104	Khulna	Terokhada	Mokampur bazar	1
47	105	Khulna	Dighalia	Gazir hat bazar	1
48	106	Pirojpur	Bhandaria	Ikree bazar	1
49	107	Gopalganj	Kotalipara	Bujurgikona bazar	1
50	108	Satkhira	Assasuni	Kadakati hat	1
51	109	Barguna	Amtali	Lowpara hat	1
52	110	Madaripur	Shib Char	Bajitpur Shekpur hat	1
53	111	Faridpur	Faridpur Sadar	Duldi bazar	1
54	112	Faridpur	Alfadanga	Jhatigram bazar	1
55	113	Bagerhat	Kachua	Talleshar bazar	1
56	114	Faridpur	Sadarpur	Chandpur bazar	1
57	115	Bagerhat	Bagerhat Sadar	C&B bazar	1
58	116	Khulna	Dumuria	Thukra bazar	1

Note: 1) Number is continued from growth center.

(4) Subprojects to be developed

The list of growth centers and the list of rural markets to be developed are given in Table 5-21 and Table 5-22, respectively. A total of 58 growth centers²⁸ and 18 rural markets will be developed. A total of 22 WMS's, nine cyclone-resistant multipurpose market sheds, and 54 ghats will be developed. The growth centers where cyclone-resistant multipurpose market sheds will be established and the growth centers and the rural markets where ghats will be installed will be decided during project implementation.

Table 5-21 List of growth centers to be developed

No	Division/ Greater District	District	Upazila	Name of growth center	Rank	Upgrading	WMS	Cyclone- resistant shed	Ghat
1	Barisal	Barisal	Agailjhara	Begdhar hat GC	55	1			
2	Barisal	Barisal	Banaripara	Choumohani	32	1	1		
3	Barisal	Barisal	Barisal Sadar	Shahiber hat	34	1			
4	Barisal	Bhola	Bhola Sadar	Majhir hat	38	1			
5	Barisal	Bhola	Burhanuddin	Moazzem hat	21	1			
6	Barisal	Bhola	Lalmohan	Gazaria	4	1			
7	Barisal	Bhola	Manpura	Hazir hat	16	1			
8	Barisal	Bhola	Tazumuddin	Hat Sashiganj	6	1			
9	Barisal	Jhalakati	Jhalakati Sadar	Shivgonj	40	1			
10	Barisal	Jhalakati	Jhalakati Sadar	Birmohal	46		1		
11	Barisal	Jhalakati	Kanthalia	Amua	39	1			
12	Barisal	Jhalakati	Nalchity	Nalchity K.M. hat GC	56	1	1		
13	Barisal	Jhalakati	Rajapur	Putiakhali	57	1			
14	Barisal	Pirojpur	Bhandaria	Bhandaria	9	1	1		
15	Barisal	Pirojpur	Kawkhali	Kawkhali	24	1			
16	Barisal	Pirojpur	Mathbaria	Sapleza GC	42	1	1		
17	Barisal	Pirojpur	Nazirpur	Sreeramkathi	14	1			
18	Barisal	Barguna	Amtali	Gazipur	53	1	1		
19	Barisal	Barguna	Barguna Sadar	Phuljhuri hat	58	1	1		
20	Barisal	Barguna	Betagi	Bodnykhali hat	47	1			
21	Barisal	Patuakhali	Bauphal	Kalaia	17	1	1		
22	Barisal	Patuakhali	Dumki	Murdia	51	1			
23	Barisal	Patuakhali	Galachipa	Badura	33	1	1		
24	Barisal	Patuakhali	Kalapara	Lalua	45	1			
25	Barisal	Patuakhali	Patuakhali Sadar	Katachia	37	1	1		
26	Faridpur	Faridpur	Alfadanga	Gopalpur	15	1			
27	Faridpur	Faridpur	Alfadanga	Alfadanga	20	1			
28	Faridpur	Faridpur	Char Bhadrasan	Moulavir Char	50	1			
29	Faridpur	Faridpur	Faridpur Sadar	Khalil Mondal	25	1	1		
30	Faridpur	Faridpur	Madukhali	Borogopaldi	48	1			
31	Faridpur	Faridpur	Sadarpur	Chadda Rashi	5	1			
32	Faridpur	Gopalganj	Kotalipara	Dharabashail	36	1	1		
33	Faridpur	Madaripur	Madaripur Sadar	Mostofapur	7		1		
34	Faridpur	Madaripur	Madaripur Sadar	Chillarchar	10	1			
35	Faridpur	Madaripur	Shib Char	Shibchar	1		1		
36	Faridpur	Madaripur	Shib Char	Madbarerchar	3	1			

²⁸ In some growth centers, upgrading will not be implemented but a WMS will be established.

Table 5-21 List of growth centers to be developed (continued)

No	Division/ Greater District	District	Upazila	Name of growth center	Rank	Upgrading	WMS	Cyclone- resistant shed	Chat
37	Faridpur	Rajbari	Baliakandi	Sonapur	2	1			
38	Faridpur	Rajbari	Pangsha	Machpara	27	1			
39	Faridpur	Rajbari	Rajbari Sadar	Kutir Hat	29	1			
40	Faridpur	Shariatpur	Damoudya	Sedhalkura	11	1			
41	Faridpur	Shariatpur	Shariatpur Sadar	Burirhat	8	1	1		
42	Faridpur	Shariatpur	Zanjira	Janjira	19	1	1		
43	Khulna	Bagerhat	Chitalmari	Chitalmari	28	1			
44	Khulna	Bagerhat	Kachua	Badhal	12		1		
45	Khulna	Bagerhat	Kachua	Gajalia	30	1			
46	Khulna	Bagerhat	Morrelganj	Polar hat	44		1		
47	Khulna	Bagerhat	Rampal	Gilatala	49	1			
48	Khulna	Khulna	Dumuria	Dumuria	22	1			
49	Khulna	Khulna	Dighalia	Pother bazar	52	1			
50	Khulna	Khulna	Paikgachha	Kopilmoni	18		1		
51	Khulna	Khulna	Paikgachha	Garuikhali	23	1			
52	Khulna	Khulna	Phultala	Phultala GC	31		1		
53	Khulna	Khulna	Terokhada	Katinga	35	1			
54	Khulna	Satkhira	Assasuni	Bardal	41	1	1		
55	Khulna	Satkhira	Kalaroa	Sonabaria	26	1	1		
56	Khulna	Satkhira	Kaliganj	Kushlia	54	1			
57	Khulna	Satkhira	Satkhira Sadar	Bhetkhali	43	1			
58	Khulna	Satkhira	Tala	Pathkelghata	13	1			
Total					58	51	22	9	41

Table 5-22 List of rural markets to be developed

No	Division/ Greater District	District	Upazila	Name of rural market	Rank	Upgrading	Chat
1	Barisal	Barisal	Bakerganj	Koloshkati bazar	67	1	
2	Barisal	Barisal	Gaumadi	Mahilera bazar	64	1	
3	Barisal	Barisal	Hizla	Akotar hat	63	1	
4	Barisal	Barisal	Mehendiganj	Mejokazir char hat	74	1	
5	Barisal	Bhola	Char Fasson	Bojlur bazar	75	1	
6	Barisal	Bhola	Daulat Khan	Miear hat	76	1	
7	Barisal	Pirojpur	Swarupkath	Miar hat bazar	61	1	
8	Barisal	Patuakhali	Mirzaganj	Mirjagonj Dargar Sharif	73	1	
9	Faridpur	Faridpur	Bhanga	Pukuria bazar	59	1	
10	Faridpur	Faridpur	Boalmari	Teljuri bazar	71	1	

Table 5-22 List of rural markets to be developed (continued)

No	Division/ Greater District	District	Upazila	Name of rural market	Rank	Upgrading	Ghat
11	Faridpur	Faridpur	Nagarkanda	Puradia bazar	65	1	
12	Faridpur	Gopalganj	Muksudpur	Molladi bazar	69	1	
13	Faridpur	Madaripur	Kalkini	Miar hat	66	1	
14	Faridpur	Madaripur	Rajoir	Kalibari hat	70	1	
15	Faridpur	Shariatpur	Bhedarganj	Kartikpur bazar	60	1	
16	Faridpur	Shariatpur	Gosairhat	Shayka bazar	68	1	
17	Faridpur	Shariatpur	Naria	Chakdha bazar	62	1	
18	Khulna	Bagerhat	Bagerhat Sadar	Chulkati bazar	72	1	
Total						18	13

5.3.4 Poverty reduction interventions

The improvement of road and market conditions in rural areas will contribute significantly to the improvement of rural income and poverty reduction in the Project area. The Project will delegate tree-planting and caretaking activities and the maintenance of Village roads to LCS's. As described in Section 2.5, LCS is a system that directly employs disadvantaged rural people for unskilled or semi-skilled development works. Thus, it is envisaged that the employment of workers through LCS will create new employment opportunities and directly contribute to poverty reduction, especially among disadvantaged and destitute women in the Project area.

Tree-planting and caretaking and maintenance of Village roads shall be contracted out exclusively to female LCS members in accordance with the *"Tree plantation and conservation, Forest Resource Distribution Program and Implementation Manual"* (LGED, 2003), *"LCS Management Guidelines"* (LGED, 2004a), and *"The Guidelines for Rural Roads and Culvert Maintenance Program"* (LGD, 2008). Contracts shall be signed by an Upazila Engineer and the Chairperson and the Secretary of an LCS group. The contract enables LCS members to obtain fair wages. Once female LCS members are selected, the Project will provide them with training to impart knowledge and skills necessary for the maintenance of roads, tree-planting and caretaking of trees, and other relevant topics. To improve their livelihood after completion of the work, saving will be encouraged among LCS members during the contract period. The details of the proposed subcomponents are given below.

(1) Tree-planting and caretaking by Labor Contracting Societies

The main objectives of this subcomponent are to protect the embankment slopes of Upazila roads and Union roads to be upgraded by the Project from erosion, to produce timber and horticultural products, and to maintain vegetation cover. Tree-planting and caretaking will be undertaken through the LCS scheme, which enables destitute women living in the vicinity of concerned roads to secure

employment opportunities.

Vegetation cover is to be provided to 759 km of Upazila and Union roads, based on the discussions with LGED²⁹. This will require 759,000 seedlings in total. The recommended species of seedlings include 1) timber species, e.g. mahogany and shishu, 2) fruits species, e.g. jackfruit, coconut, mango, and blackberry, and 3) herbal species, e.g. arjun, hortoki and neem. Seedlings 1.5 m in height will be planted at 2.0 m intervals in single rows on Upazila roads and Union roads to be upgraded by the Project. In order to protect these seedlings, pigeon peas will also be planted at 50 cm interval. These seedlings and seeds are to be purchased from government nurseries in the vicinity of construction sites.

The task of tree-planting shall be awarded exclusively to female LCS members on short-term contracts of approximately two or three months. Groups consisting of around 10 female LCS members each are to be charged with planting trees on 1.5 km of roads during the rainy season, between June and September. It is estimated that around 5,063 women will be employed for this task. Of these women, about 1,400 qualified LCS members will be awarded contracts for an additional two years for caretaking of planted trees. Two caretakers per kilometer of roads will be responsible for this task. In addition to caretaking of trees, they are to carry out maintenance work of road shoulders and slopes.

According to the tree planting manuals issued by LGED, LCS caretakers are also stakeholders who are to receive the benefits arising from planted trees and their fruit. However, in practice, this arrangement is not always followed. To secure these benefits for LCS members the Project will monitor implementation of this component. To promote proper understanding of the profit sharing arrangements and LCS caretakers' rights by local elites such as UP Chairpersons, Upazila Nirbahi Officers (UNOs), and land owners, and by LCS members, *training and orientation programs are to be organized by the Project.*

The LCS members responsible for tree-planting will receive training in the planting and caretaking of trees, awareness raising, gender issues, group formation, and saving and credit. Necessary tools and equipment such as spades, scythes, iron bars, buckets, baskets, umbrellas, and aprons are to be provided by the Project. Since the accumulation of savings have proved to be effective for improving the livelihoods of LCS members, the Project will also encourage them to save tk. 36 from their tk. 90 wages in their individual bank accounts.

For ensuring the quality of LCS works, LGED Upazila Sub-Assistant Engineers, LGED Work Assistants, LGED Community Organizers, and Project Sociologists will be engaged in the monitoring and supervision of tree-planting and caretaking activities.

(2) Maintenance of Village roads by Labor Contracting Societies

Under the Project, maintenance of 1,400 km of village roads will be carried out through the LCS scheme to enhance the accessibility and durability of the roads. In particular, increases in

²⁹ The total Upazila roads and Union roads to be upgraded by the Project will be 949 km, and 80% out of which will be the target of tree planting.

non-motorized transportation such as vans and rickshaws are expected to improve local residents' access to essential services and institutions.

In accordance with the relevant LCS guidelines, female LCS members will be employed for five years to undertake the maintenance of Village roads. One LCS group will be composed of 10-15 members, and each LCS member will be assigned 1 km of a road. Thus, this subcomponent will create employment for 1,400 poor women during the project period.

LCS members will be provided with training and necessary tools and equipment before commencement of the work. Saving activities are to be incorporated into this subcomponent to enable LCS members to carry out economic activities with the savings accumulated after completion of LCS works.

5.3.5 Capacity development of stakeholders

The Project will seek to improve infrastructure operation and maintenance (O&M) and the sustainability of rural infrastructure investment by strengthening the capacities of the following stakeholders: 1) LGED officials; 2) contractors and construction workers; 3) Upazila Chairpersons³⁰; UNOs and UP Chairpersons; 4) growth center/rural market stakeholders; 5) women shopkeepers and physically challenged shopkeepers; and 6) LCS members.

The subcomponents for the capacity development of stakeholders will be carried out through training, workshops and meetings. As trainers and facilitators, the following organizations will be responsible for planning and undertaking subcomponents: 1) LGED officials and project consultants; 2) local NGOs; and 3) external training institutions such as the Bangladesh Academy Rural Development (BARD) and overseas institutions. The demarcation of responsibilities among them is shown in Table 5-23.

Local project consultants specializing in such fields as training coordination, institution building, and sociology will be responsible for overall management of subcomponents, including the selection of local NGOs and the development of selected training modules. There are a number of capable LGED officials, such as the staff members of the LGED Training Unit, who have experience working as trainers. Thus, the Project should mobilize such human resources as much as possible.

Training modules will be required as guides for the trainers. If relevant modules have already been developed by LGED's projects, they should be examined and adapted by the training coordinator to meet the Project objectives. If they are not available, new modules will need to be created. The guidelines related to participatory planning for growth center development, development of WMS's, and LCS works also need to be examined and incorporated into the training contents when necessary.

³⁰ The provision for a directly elected chairperson at the Upazila level was abolished in 1991. However, Upazila elections will be held in December 2008. If the Upazila Chairpersons are elected without incident, the Project should involve them in its capacity development programs.

Table 5-23 Overview of subcomponents and demarcation of responsibilities of trainers/facilitators

Subcomponents (training, workshops, meetings)	Planned trainee days		Trainers / Facilitators		
	(days)	(%)	LGED officials/ project consultants	Local NGOs	External training institutions
1. LGED and relevant government officials	22,736	24.9%			
1.1 Project kick-off meeting	539	0.6%	X		
1.2 Training of trainers (TOT)	960	1.1%	X		
1.3 Training on administration, technical and financial	468	0.5%	X		
1.4 Training on social and environmental issues	444	0.5%	X		
1.5 Special foundation training (LGED officials only)	19,200	21.1%			X
1.6 Overseas training	1,125	1.2%			X
2. Contractors and construction workers	1,500	1.6%			
2.1 Training on contracts, technical and financial management	750	0.8%	X		
2.2 Skill training of masons and construction workers	750	0.8%	X		
3. Upazila Chairpersons, UNO and UP Chairpersons	1,050	1.2%			
3.1 Project orientation meeting	1,050	1.2%	X		
4. Growth center / rural market stakeholders	7,804	8.6%			
4.1 Sensitization workshop	1,452	1.6%	X		
4.2 Orientation meeting on participatory planning of growth centers /rural markets	1,320	1.4%	X		
4.3 Training on land ownership in growth center / rural markets and the leasing system	1,452	1.6%	X		
4.4 Training on proper operation and maintenance of growth centers / rural markets	1,452	1.6%	X		
4.5 Training on gender and environmental issues	2,128	2.3%		X	
5. Women and physically challenged shopkeepers	1,320	1.4%			
5.1 Orientation meeting on WMS	480	0.5%	X		
5.2 Training on shop management and skill development	480	0.5%		X	
5.3 Training on gender and environmental issues	240	0.3%		X	
5.4 Training on functions of MMC and of Banik Samity	120	0.1%		X	
6. LCS members	56,665	62.2%			
6.1 Training on skill development for maintenance of Village	4,560	5.0%	X		
6.2 Training on tree-planting and caretaking	14,145	15.5%	X		
6.3 Training on social and gender awareness	8,760	9.6%		X	
6.4 Training on group formation and management	5,840	6.4%		X	
6.5 Training on health and hygiene	5,840	6.4%		X	
6.6 Training on saving and credit management	2,920	3.2%		X	
6.7 Training on skill development for income generation activities	14,600	16.0%		X	
7. Local NGO trainers / facilitators	60	0.1%			
7.1 Orientation and TOT	60	0.1%		X	
Total planned trainee-days	91,135		29,822	40,988	20,325
(%)		100%	32.7%	45.0%	22.3%

Source: SAPROF team

Both the selected LGED officials and the above local consultants will be involved in preparing and conducting capacity development programs for LGED and relevant government officials, contractors, Upazila Chairpersons, UNO and UP Chairpersons, and growth center/rural market stakeholders. In addition, some training courses for women shopkeepers, physically challenged shopkeepers, and LCS members will be carried out by them. The LGED officials and project consultants will organize 13 different types of programs during the project period. A total of 29,822 trainee-days will be reserved for these programs, accounting for 32% of the total trainee-days available for the capacity development component of the Project.

Because local NGOs have a comparative advantage in social mobilization, awareness-raising, and *training of project beneficiaries*, the qualified local NGOs will be awarded contracts for these purposes. More specifically, six local NGOs will be selected to carry out 10 different training courses for women shopkeepers, physically challenged shopkeepers, and LCS members. A total of 40,988 trainee-days will be reserved for these training courses, which accounts for 45% of the total planned trainee-days of the Project.

One out of the six NGOs will be responsible for the development of training modules, provision of training of trainers (TOT) to the other five local NGOs, coordination between local NGOs and the Project, and the compilation of training reports to be submitted by the five local NGOs. If qualified local NGOs are not available in the Project area, qualified local consultants should be sought.

The special foundation training and overseas training of LGED officials will be contracted out to external training institutions. The former is to be carried out by BARD, which is a specialized national institution for training, research, and action-research related to rural development. The latter will be undertaken by the selected overseas training institutions. A total of 19,200 trainee-days and 1,125 trainee-days will be reserved for the special foundation training and overseas training, respectively. Each training accounts for 22.1% and 1.2% of the total trainee-days in the Project.

(1) LGED and relevant government officials

The Project will provide various types of training and workshops to LGED and relevant government officials who will be involved in the Project activities at the Central, District, and Upazila levels. The programs for LGED and relevant government officials are mainly composed of two categories: 1) in-country training, workshops, and meetings to be conducted by LGED itself, and 2) overseas training by overseas training institutions. Special foundation training by BARD is only for LGED officials. A total of 22,736 trainee-days will be reserved for these programs, accounting for about one fourth of the total trainee-days of capacity development programs. An overview of each of the program categories is given below.

Project kick-off meeting

This will be organized once at LGED headquarters and six times in the different Districts of the Project area at the initial stage of project implementation and will be aimed at disseminating basic information on the Project. The agenda of the kick-off meeting includes the scope of the Project, objectives, institutional arrangements, procedures, plans of activities, and budgets. This kick-off

meeting will contribute to improving the understanding of concerned LGED and relevant government officials of the Project, enhancing their sense of ownership, and raising their commitment to implementation of the Project.

Training of Trainers (TOT)

This is designed to upgrade the capacities of LGED and relevant government officials who will be trainers under the Project. This three-day training will cover the basics of TOT and give focus to the topics that trainers are expected to teach to their trainees. The TOT will help to ensure that disparities in the quality of training among trainers will be kept to a minimum.

Training on project administration, technical and financial management

This two-day training is aimed at imparting practical knowledge and skills on project administration and technical and financial management to LGED and relevant government officials working in the Project. The intended participants of this training are Executive Engineers, Assistant Engineers, Junior Assistant Engineers, Upazila Engineers, Assistant Upazila Engineers, and Accountants. Field engineers to be employed by the Project will also be required to participate in this training. This will serve as a basis for the effective and efficient implementation and management of the Project.

Training on social and environmental issues of the Project

This course is intended to provide LGED and relevant government officials with knowledge on the social and environmental issues and prospective impacts to be generated by the interventions of the Project. It will also impart knowledge and practical skills on participatory planning, environmental monitoring approaches, facilitation skills, and consultation skills adopted by other similar LGED projects such as LDCP, RDP-24 and RDP-25.

Special foundation training³¹

The special foundation training is designed for newly-recruited Junior Assistant Engineers and Assistant Upazila Engineers, which are positions of equal rank introduced in FY 2008/09, to acquire basic knowledge and skills as civil service engineers. The former will be assigned to work at the District level, under the supervision of Assistant Engineers, while the latter will be placed at the LGED Upazila offices with the responsibility of assisting Upazila Engineers in selecting schemes and supervising implementation and maintenance of works. It is envisaged that the capacity development of Junior Assistant Engineers and Assistant Upazila Engineers will help ensure the smooth implementation of the Project and the sustainability of its effects. Of 481 Junior Assistant Engineers and Assistant Upazila Engineers who will be recruited between FY 2008/09 to FY 2009/2010, 280 of them will be trained by the Project. Those who will be assigned to the Project area should be selected first as trainees. Since the foundation training is a standardized training, the Project should follow the prevailing practice and contract out this training to BARD through the LGED Training Unit at headquarters.

³¹ Foundation training is a mandatory training for the newly recruited civil service officers and is carried out by Bangladesh Public Administration Training Center and BARD as per the standardized modules set by the National Training Council. In the case of newly recruited LGED officials, BARD has organized a two-month Special Foundation Training. The training mainly covers government policies, development resources, public administration and development economics, which are required for civil service officers or engineers.

Overseas training

The overseas training is designed to assist LGED and relevant government officials to enhance practical knowledge and skills of advanced techniques and methods and new concepts and approaches in engineering and rural development related to the Project. Five training courses, each with 15 trainees, will be carried out for two weeks from the second year of the Project. Based on research of available training courses and past experiences of LGED projects, the host countries for the overseas training will be selected from the following countries: Thailand, India, Philippines, Malaysia, Vietnam and Japan. Brief descriptions of proposed training courses are shown below.

- **Rural infrastructure and community participation:** This course aims to improve practical knowledge of community participation in rural infrastructure projects and strategies for its promotion. It will help SWBRDP in seeking community participation, particularly in the process of planning, development, and maintenance of growth centers/rural markets to meet local needs and priorities. It will provide case studies and lessons learned from the projects implemented in host training countries.
- **Maintenance and management system of rural infrastructure:** This course aims to improve attendants' technical knowledge and skills in planning, design, construction, maintenance, and management of rural infrastructure. It is expected to enhance LGED's capacity in conducting maintenance works effectively and efficiently. It will provide opportunities for them to study examples of rural infrastructure maintenance projects implemented in host training countries and to compare their own practices or approaches to them.
- **Effect monitoring and evaluation of rural infrastructure:** This course aims to equip attendants with knowledge and skills for effective monitoring and evaluation, result-based approaches in project and program evaluation, indicators and measurement tools, and techniques for evaluation.
- **Road safety management:** This course aims to impart knowledge of road traffic issues and safety measures to attendants. This training will provide case studies and lessons learned from past experiences of host training countries to help attendants address the emerging issues of road safety management.
- **Quality control and assurance of rural infrastructure:** This training will enhance managerial and technical skills of attendants regarding quality control and assurance of rural infrastructure development. It will focus on overall quality control issues of rural infrastructure, up-to-date knowledge of quality standards, new methods for testing quality control, and practical application of locally available construction materials. The training will provide opportunities for attendants to study examples and lessons learned in host training countries.

There are several benefits to overseas training that could not be obtained through in-country training in Bangladesh. First, overseas training can impart knowledge to participants about the latest technologies and knowledge for addressing new, complex issues that are unavailable in the home country. Second, participants can learn from relevant experiences and examples of the host training countries, including both successful and unsuccessful ones. The proposed training courses are expected to provide such opportunities through a combination of classroom lectures and study visits. Third, overseas training can provide opportunities for LGED and relevant government officials to broaden their perspectives.

Finally, it can motivate LGED and relevant government officials to engage actively in the implementation and management of the Project³².

Within LGED, those who have already participated in overseas training have shared the knowledge, skills, and lessons they learned with other staff members at feedback seminars and meetings. The Project should also organize such sessions immediately after overseas training and encourage LGED and relevant government officials to put what they learned into practice.

(2) Contractors and construction workers

Training on contract management and technical and financial management

This course aims to upgrade knowledge of contract management and the technical and financial management of awarded contractors. The two-day training will cover topics such as contract documents, analysis of rates, specifications of works, construction planning, management techniques, quality control testing in laboratories, bills of quantity, and invoicing and payment procedures. It will enable awarded contractors to ensure the smooth implementation of high-quality civil works within a given period of the Project. During the training, brochures on HIV/AIDS, made by National AIDS and STD Program (NASP) and NGOs, will be distributed and explained in an effort to counter the risk of the spread of HIV as described in Subsection 9.2.4 (3). The number of planned trainee-days will be 750, which accounts for 0.8% of the total trainee-days of the Project.

Skill training of masons and construction workers

This course aims to upgrade skills of masons and construction workers of awarded contractors. The two-day training will cover topics such as earthwork and compaction techniques, handling of bricks and metal rods, preparation of concrete, and other road and bridge construction skills. It will enable awarded contractors to ensure the smooth implementation of high-quality civil works within a given period of the Project. During the training, brochures on HIV/AIDS will be distributed in an effort to counter the risk of HIV dissemination. The number of planned trainee-days will be 750 in total for all participating masons and construction workers, which accounts for 0.8% of the total trainee-days of the Project.

(3) Upazila Chairpersons, UNOs and UP Chairpersons

Project orientation meeting

This meeting will be held in the Project area in the first and the second year of project implementation and is aimed at enabling Upazila Chairpersons, UNOs and UP Chairpersons to understand the outline of the Project. The topics of the one-day meeting cover the scope of the Project, objectives, institutional arrangements, procedures, plans of activities, budgets, and roles of stakeholders. It will help to reinforce the linkage between key stakeholders of local government institutions and the Project and to raise their commitment to supporting the smooth implementation of the Project. A total of 1,050 trainee-days are to be reserved for this meeting, accounting for 1.2 % of the total trainee-days of the Project.

³² This final benefit is critically important for promoting the productivity of LGED officials. A study has found that LGED often rewarded outstanding performances by providing training opportunities in foreign countries and that this “is perhaps working as one of the greatest incentives among the staff” (Japan-Bangladesh Joint Evaluation, 2006: 44).

Training on local government institutions and UP office management proposed in the F/S is not recommended to be included in the Project. As mentioned earlier, this is mainly because such training will overlap with interventions by LGSP, a national project for strengthening the capacity of UPs by allocating extended block grants and providing a comprehensive package of training for UP Chairpersons and UP Members. LGD, the implementing agency for LGSP, suggests that the SWBRDP should avoid any duplication of UP-related activities in the Project area.

(4) Growth center and rural market stakeholders

The capacity development of growth center and rural market stakeholders will be one of the focus areas of the Project. For proper planning, operation, and maintenance of growth centers and rural markets, it is indispensable to involve various stakeholders of concerned markets in activities at the early stage of the Project in order to strengthen their capacities. The number of trainee-days of this subcomponent will be 7804, accounting for 8.6% of the total planned number of trainee days of the capacity development component.

Sensitization workshop

This workshop aims to raise awareness, and enhance understanding, of the Project among various stakeholders of growth centers and rural markets. It is also expected to help reinforce the linkage among stakeholders and enhance the sense of ownership and knowledge of their responsibilities for the proper O&M of markets. The stakeholders include Upazila Chairpersons, UNOs, UP Chairpersons, Assistant Commissioners (land), market lessees, MMC Members, representatives of Banik Samitys, and representatives of permanent shopkeepers. The workshop will focus on the scope of the Project, objectives, institutional arrangements, procedures of market development, and participation of beneficiaries in O&M.

Orientation meeting on participatory planning of growth centers/rural markets

This meeting will focus on disseminating information on participatory planning for growth center and rural market development to the stakeholders listed above after the growth centers/rural markets have been selected for development. The meeting agenda will include criteria for prioritization of growth centers and rural markets, participatory processes at various stages of the scheme cycle, O&M, and roles and responsibilities of stakeholders. This will serve as a basis for coordinating the views of stakeholders with opposing interests in the process of planning for growth center and rural market development.

Training on land ownership in growth centers/rural markets and the leasing system

This training is designed for MMC Members, MMC Chairpersons, representatives of Banik Samitys, representatives of permanent shopkeepers, and lessees to learn the leasing system of growth centers and rural markets, including the roles and responsibilities of stakeholders. A unique feature of this training is that UNOs and Assistant Commissioners (land) will be invited as resource persons. The former are responsible for leasing markets, while the latter are responsible for collecting revenues at the Upazila level. Particularly, it is important to involve UNOs to promote their commitment and to ensure that 15-25% of total lease income is allocated to the maintenance of concerned markets. This

training is expected to enable market stakeholders to recognize the disparity between the existing rules and regulations and prevailing practices and to encourage them to fulfill their duties.

Training on proper operation and maintenance of growth centers/rural markets

This training is intended to impart knowledge and skills of O&M issues of growth centers and rural markets, the roles and responsibilities of stakeholders, planning, monitoring, and reporting activities to the following participants: MMC Members, representatives from Banik Samity, representatives of permanent shopkeepers, and lessees. During the training, an action plan for the O&M of each growth center or rural market will be prepared by the participants. The action plan will serve as a road map for promoting proper O&M of markets by specifying what will be done by when, who will do it, and how it will be done. It will also help LGED officials and project consultants in monitoring the progress of activities of the concerned growth centers and rural markets.

Training on gender and environmental issues

The objective of this training is to help market stakeholders, e.g., MMC Members, representatives from Banik Samitys, and representatives from permanent shopkeepers, to understand the gender and environmental issues of concerned growth centers and rural markets and take necessary actions. The two-day training will focus on proper hygiene practices and proper waste management, and promotion of women's economic activities in the market areas.

(5) Women shopkeepers of WMS

Orientation meeting on WMS

An orientation meeting on the WMS will be held by the LGED officials and project consultants for one day in the growth centers that requested the construction of WMS's to LGED. The meeting is basically designed for women who are interested in conducting business in the WMS and other stakeholders, such as MMC Members and Banik Samity members, to understand the WMS scheme. If shop allotments for physically challenged people need to be provided, they also will be invited to attend the orientation meeting. The meeting will cover such topics as the background and objectives of WMS construction, procedures of selecting women and physically challenged shopkeepers, selection criteria of shopkeepers, contract agreements, rent values, and other relevant issues.

Training on shop management and skill development

The three-day training aims to enable the selected women shopkeepers and the physically challenged shopkeepers to acquire knowledge and skills of shop management. The contents of training will include business planning, business management, account booking, customer dealing, and sales promotion. During the training, women who have previous business experience in WMS's will be invited as resource persons and asked to share their success stories and challenges with participants. In addition, a field visit to a nearby WMS will be included in the training program to give participants a clearer picture of the business activities in the WMS.

Training on gender and environmental issues

The two-day training is designed to provide knowledge to women and physically challenged

shopkeepers on basic concepts of gender and environment and related issues in growth centers. This course will help raise the self-confidence and self-sustainability of participants, particularly women shopkeepers, to start businesses in WMS's in conservative communities where women have limited access to economic activities in public spaces.

Training on functions of MMC and Banik Samity

The one-day training will provide information on the functions of MMC and Banik Samitys to women and physically challenged shopkeepers. Selected MMC Members and members of Banik Samitys will be invited to conduct one of the training sessions, which is expected to help strengthen the linkage and coordination between participants and these stakeholders.

(6) LCS members

The Project will provide training to a large number of LCS members to be recruited. The number of trainee-days reserved for this purpose will be 56,665 days, accounting for 62.2% of the total trainee-days of the capacity development component of the Project.

Training on skill development on maintenance of Village roads

The training will be conducted by LGED officials and project consultants for two days as soon as LCS members are appointed to specific maintenance works. It aims to equip LCS members with knowledge and skills for the maintenance of embankment slopes and shoulders, and cleaning of cross-drainage structures. The contents of training includes the definition of maintenance, the importance of maintenance, technical aspects of maintenance, quality control, distribution of work, maintenance of tools and equipment, supervision and monitoring, payment procedures, and opening of bank accounts.

Training on tree-planting and caretaking

The two-day training is designed for LCS members who are charged with tree-planting and caretaking. It covers topics such as the importance of tree-planting and caretaking, tree-seedling species, technical aspects of tree-planting and caretaking, the profit-sharing system of planted trees, supervision and monitoring, quality control, distribution of work, maintenance of tools and equipment, payment procedures, and opening a bank account.

Training on social and gender awareness

This will impart basic knowledge of gender and social issues to LCS members who are responsible for maintenance work of Village roads or caretaking of trees. It will cover the definition of gender, gender roles and needs, social and economic structures, gender issues of the Project, and the value of self-reliance and self-confidence. The benefits of this three-day training are expected to extend outside the work of LCS members, who are usually disadvantaged or destitute women in rural areas.

Training on group formation and management

This aims to enable LCS members who will engage in maintenance work of Village roads or caretaking of trees to acquire knowledge and skills of group formation, including its merits and possible applications to their lives outside of LCS activities. More specifically, the contents of training will include: the need for group formation, group formation strategies, group cohesiveness, holding

meetings, decision making, and conflict resolution. This two-day training is expected to help LCS members undertake LCS works in groups and start other group activities in their communities after completion of LCS works.

Training on health and hygiene

The training will be provided to LCS members who will be involved in maintenance work of Village roads or caretaking of trees. It will last two days and cover topics such as the importance of maintaining hygienic environments for good health, methods of hygiene maintenance, waterborne diseases, preventive measures, and primary treatment.

Training on saving and credit management

This one-day training is designed to enable LCS members who will undertake maintenance work of Village roads or caretaking of trees to understand the basics of saving schemes applied by many LGED projects. It will focus on topics such as the importance of savings, group savings and individual savings, opening bank accounts, and effective utilization of savings. The LCS members are expected to accumulate savings by using the acquired knowledge and skills during and after the implementation of the Project.

Training on skill development for income generation

The promotion of income generation activities for LCS members is not included as a component of the Project. However, the Project will organize a five-day training on skill development for income generation to improve the sustainability of their livelihood after completion of the LCS works. The training will cover topics such as the importance of and need for income generation activities, planning for income generation activities, investment budgets, account keeping, dealing with customers, and sales promotion. It will include the demonstration of selected activities such as livestock husbandry.

5.3.6 Consultancy services

A team of consultants will form a Technical Assistance (TA) Team to provide advisory and technical support to Project Implementation Office (PIO) and LGED revenue staff with regard to implementation of the project. The team, comprised of international and national consultants and support staff extensive experience in rural infrastructure development projects, will provide support at LGED headquarters, the LGED Circle Office in Faridpur, and the 14 District Offices. The Team will facilitate Project activities, which will include the development of work plans, design and monitoring and evaluation of construction works and capacity development activities, identification of problems and solutions, coordination, review of progress, and reporting to LGED, JICA and other relevant agencies. Implementation arrangements with the consultant team are described in Section 5.4.

5.3.7 Other components

(1) Procurement of vehicles and equipment

Construction equipment: Construction equipment consist of 28 vibrator rollers (two for each District)

of two different capacities (10-12 ton and 7-9 ton), 90 level machines (one for each Upazila), and 14 sets of laboratory equipment (one for each District Office of LGED). The contractors who are awarded the subprojects will rent road rollers from LGED.

Vehicles: Four 4-wheel cars for LGED and the TA Team, 14 4-wheel pickup trucks for the 14 Districts to conduct supervision, monitoring, and transport of construction materials for lab tests, and 123 motor cycles for PIOs (10), Project offices in Faridpur (9), District Offices (14), and Upazila offices (90) will be provided. This will enable the day-to-day monitoring and supervision activities of subprojects to be conducted conveniently and ensure that the quality of construction is maintained.

Office equipment and furniture: These include computers with uninterruptible power systems (UPS's), printers, photocopiers, and laptop computers to facilitate day-to-day office functions. This will facilitate operations at the Project Director's office at LGED Headquarters, PIO office, Project District offices as well as Upazila LGED offices.

Detailed cost estimates of construction equipment, vehicles, and office equipment and furniture are shown in Table 6-7.

(2) Land acquisition

Detailed procedures and estimated costs of land acquisition are described in Annex 22. It is estimated that 17.1 ha of land will need to be acquired for Project implementation.

(3) Project implementation staff

The Project will employ the set of staff members shown in Table 5-24. The project staff team comprises of 240 staff, of which 131 are professional staff, and 109 are support staff. The professional staff members consist of one Project director, one Deputy Project Director, two Executive Engineers, 19 Assistant Engineers, 16 Socio-Economists/Sociologists/Organizers, and 92 Sub-Assistant Engineers. They will be posted at the Project Headquarters in Dhaka, the Design and Monitoring Office, the LGED Office in Faridpur, the Quality Assurance Office at LGED District Offices, and LGED Upazila offices. Detailed cost estimates are shown in Table 6-11.

(4) Office operation costs

These include the costs related to the procurement of stationery, computer accessories, fuel for vehicles and motorcycles³³, office cleaning services, photocopies, advertisement for tender invitations, entertainment, utility bills (water, electricity, gas, etc.), printing, publication, and other necessary items. Detailed cost estimates are shown in Table 6-12.

³³ Fuel costs for road rollers are to be borne by contractors.

Table 5-24 Project Implementation Office staff

Name of the Post	Pay Scale/Consolidated Pay (Tk)	No.	PM
Total		240	14,400
Sub-total of A, B, C, and D		240	14,400
A. Project Implementation Office, LGED Headquarters, Dhaka		38	2,280
Project Director	15000-19800/26000 (GOB staff)	1	60
Executive Engineer	13750-19250/23875 (GOB staff)	2	120
Assistant Engineer	11000-17650/19750 (GOB staff)	4	240
Socio-economist	6800-13090/12400 (GOB staff)	1	60
Accounts Officer	5100-10360/9680 (GOB staff)	1	60
Administrative Officer	5100-10360/9680 (GOB staff)	1	60
Accountant	4100-8820/8080 (GOB staff)	2	120
Accountant Assistant	3300-6940/6690 (GOB staff)	2	120
Office Assistant	3000-5920/6120 (GOB staff)	1	60
Steno	3000-5920/6120 (GOB staff)	1	60
Cleaner	2400-4310/5170 (GOB staff)	1	60
Sub-Assistant Engineer	9680 (Project staff)	4	240
Computer Operator	8080 (Project staff)	4	240
Driver	6120 (Project staff)	6	360
Messenger/MLSS	5170 (Project staff)	6	360
Photocopier Operator	5170 (Project staff)	1	60
B. Design and Monitoring Office, LGED Circle Office Faridpur		16	960
Executive Engineer	13750-19250/21500 (GOB staff)	1	60
Assistant Engineer	12400 (Project staff)	1	60
Sociologist	12400 (Project staff)	1	60
Surveyor	9680 (Project staff)	3	180
Estimator Cum Draftsman	9680 (Project staff)	3	180
Computer Operator	8080 (Project staff)	2	120
Accounts Assistant	6640 (Project staff)	1	60
Driver	6120 (Project staff)	2	120
Messenger/MLSS	5170 (Project staff)	2	120
C. Quality Assurance Office, LGED 14 District Offices		98	5,880
Assistant Engineer	12400 (Project staff)	14	840
Stakeholders Organizer	12400 (Project staff)	14	840
Computer Operator	8080 (Project staff)	14	840
Work Assistant	6640 (Project staff)	28	1,680
Account Assistant	6640 (Project staff)	14	840
Operator/Driver:Constn Eqpm	6120 (Project staff)	14	840
D. LGED Upazila Office		88	5,280
Sub-Assistant Engineer	9680 (Project staff)	88	5,280

(5) Survey and investigation

The survey and investigation budget is to be used for subsoil investigation of bridge sites. Investigations should examine four to six bore-holes at each site, costing tk. 4,000 to tk. 6,000 per hole. Although the LGED material testing laboratory is capable of conducting small-scale investigations, large-scale investigations should be conducted by private firms. The cost estimates for subsoil investigation will be applicable in both these cases. In addition to the investigations, road surveys, effects monitoring, impact studies, and other social and environmental research/studies can be financed from this budget. Detailed cost estimates are shown in Table 6-13.

(6) Maintenance of vehicle and equipment

Maintenance costs for vehicles and other office equipment such as computers, construction equipment--including rollers, furniture, photocopier machines, fax machines, electrical facilities--, etc. are estimated under this heading. The costs include the purchase of spare parts as necessary. Detailed cost estimates are shown in Table 6-14.

(7) Development of the office facilities

Office facilities in 13 project Districts (excepting Khulna) are to be constructed on the premises of the existing LGED offices. Existing LGED buildings will be extended horizontally and vertically, and facilities such as dormitories, staff quarters for new Assistant Engineers, garages, and inspection rooms/guest houses will be constructed. On average, facilities equal to 500 m² of floor space per LGED office will be developed. Detailed cost estimates are shown in Table 6-15.

(8) Taxes and duties

Taxes and duties will cover payments of income tax, value-added tax, custom duties, etc. expected to be incurred for the procurement of goods, equipment, and services.

(9) Contingencies

Two percent of physical contingencies is included to finance costs for any emergency and unforeseen events such as the inevitable revision of civil works. With the recent instability of economic conditions in mind, 3% of compound price escalation is incorporated in the budget.

5.4 Institutional arrangement

5.4.1 Project Implementation Arrangements

(1) Executive Agency

The executing agency of the Project is LGED. The principal function of LGED as the executing agency will be to deliver administrative, technical, and infrastructure development services to stakeholders in the rural areas.

(2) Project Implementation Office (PIO)

An organizational diagram of the actors to be involved in the implementation of the Project is shown in Figure 5-22. LGED will establish a PIO within the LGED Headquarters. It will be operated by the PIO staff members shown in Table 5-24 and assisted by the TA Team, comprised of international and national consultants. The PIO will continue to function for the entire duration of the Project and will be headed by the Project Director, who will work within the existing hierarchy of LGED. To strengthen the PIO, the following branches should be established:

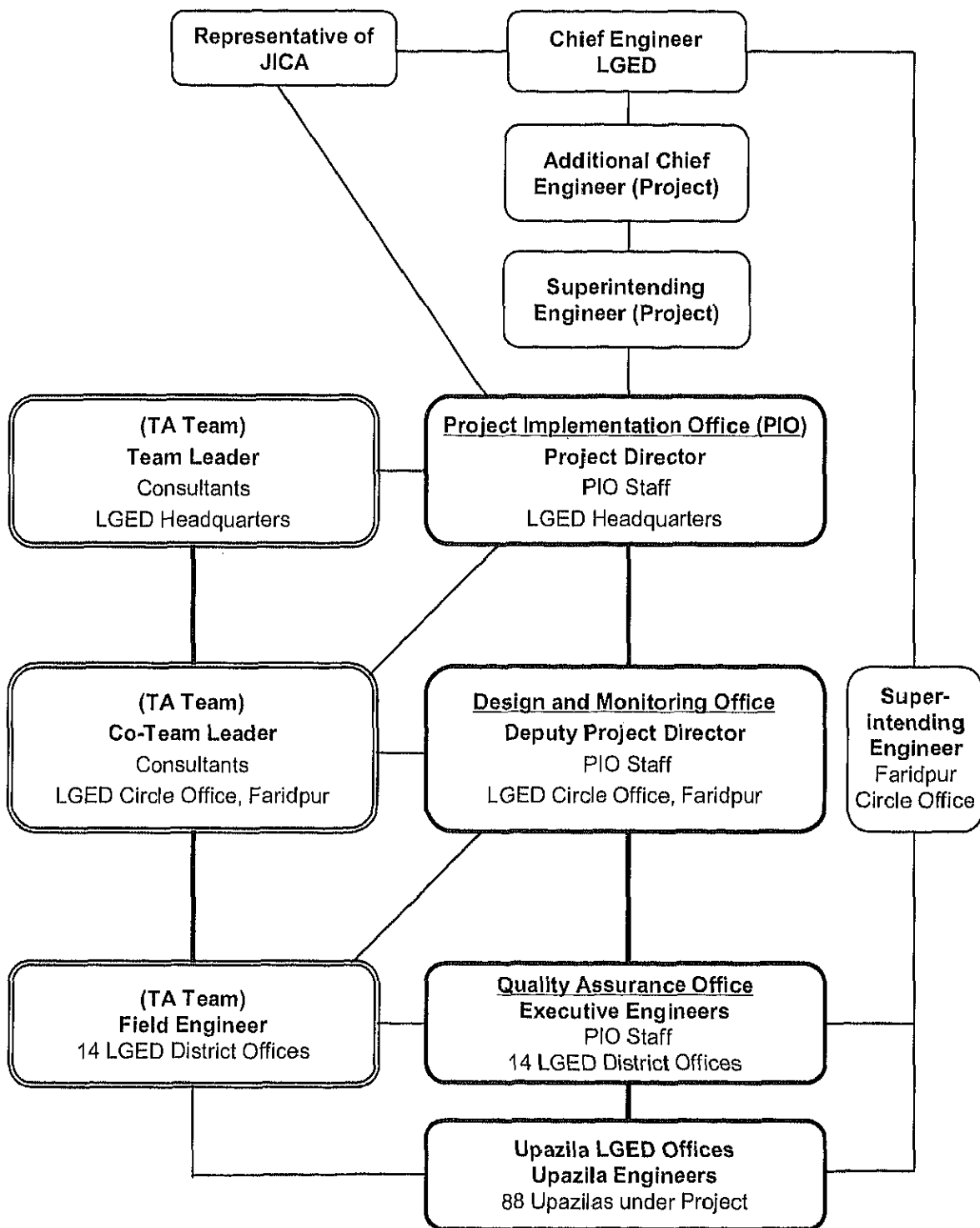


Figure 5-22 Project Implementation Arrangement

- 1) **Headquarters-level Technical Assistance Team**, to be located with PIO at LGED headquarters in Dhaka. It will consist of the Team Leader and five other consultants. The Team Leader and two consultants will be international expatriates. The others will be national

specialists.

- 2) **Design and Monitoring Office**, to be located with the LGED Circle Office in Faridpur. The office will be composed of PIO staff members and the TA Team. The PIO staff will include the Executive Engineer (Monitoring) who will be the Deputy Project Director of the PIO, Assistant Engineer (Quality Control), and Sociologist hired directly by PIO as consultants. The TA Team will consist of seven local consultants including Co-Team Leader of the TA Team.
- 3) **Quality Assurance Office**, to be located inside each of the 14 LGED District Offices in the Project area. The PIO staff will include the Assistant Engineer and Stakeholders Organizer employed directly by LGED for each District. The TA Team will be comprised of Field Engineers assigned to work in each of the Quality Assurance Offices.

The PIO will perform the following duties and responsibilities for the implementation of the Project:

- Planning of Project implementation in cooperation with JICA;
- Coordination of Project implementation activities;
- Review of detailed engineering design work;
- Facilitation of stakeholder participation and LCS management;
- Oversight of the preparation and processing of tender documents;
- Monitoring of the progress of Project implementation, management of implementation schedules, and execution of measures required to eliminate bottlenecks;
- Coordination of activities of the District and Upazila offices within the Project area, the Design and Monitoring Office, Quality Assurance Offices, the TA Team, and NGOs;
- Provision of guidance and support to LGED District offices for the day-to-day implementation and supervision of subprojects;
- Oversight of Project accounts and timely submission of disbursement requests to JICA;
- Maintenance of liaisons with JICA and the Ministry of Local Government, Rural Development and Cooperatives (MLGRD&C); and
- Reporting of progress to the Chief Engineer, LGED, and JICA.

The Design and Monitoring Office will assist the LGED offices at Districts and Upazilas with matters related to implementation of the Project, preparation of subproject implementation plans and designs with the stakeholders, and monitoring of subproject construction works.

The Quality Assurance Office will assist the implementation, monitor construction activities, and ensure the quality of construction works. It will provide technical advice to the Design and Monitoring Office during the detailed design of each subproject in close coordination with the LGED District and Upazila offices and stakeholders.

The TA Team will provide support with regard to: 1) assisting development of the capacity of Project staff to plan and design subprojects; 2) progress and effect-monitoring and evaluation of Project activities; 3) promotion of stakeholders' participation; 4) establishment of local institutions; and 4) ensuring that a focus on poverty reduction is maintained in implementation and that short-term and long-term employment opportunities are continuously provided. The team will assist PIOs to ensure that:

- 1) Subproject designs are prepared in consultation with local stakeholders through meetings at subproject sites, and that the stakeholders have agreed with the designs to be adopted;
- 2) Adequate monitoring and quality control systems are incorporated into the project implementation process; and
- 3) Sustainable technical, institutional, and financial mechanisms for maintenance of infrastructure are established.

(3) District and Upazila LGED Offices

District LGED offices within the Project area will be responsible for preparing individual subproject implementation plans in consultation with the stakeholders, coordinating with NGOs, and carrying out investigations and surveys and creating designs with support from the Design and Monitoring Office. District LGED offices will also supervise construction activities and expenditures and conduct monitoring activities with support from Quality Assurance Offices. The Executive Engineer, supported by the Senior Assistant Engineer and Assistant Engineer at each District office, will ensure the application of proper engineering designs and acceptable standards of construction works. Sociologists at the District office will be responsible for supporting Community Organizers at the Upazila offices in strengthening stakeholders' participation and LCS management.

Upazila LGED offices will be responsible for the implementation of subprojects through the participation of local stakeholders. The Upazila Engineer of each Upazila office will report to the Executive Engineer at the LGED District office with regard to subproject implementation. S/he will act as the LGED representative to local stakeholders in all matters related to the implementation of subprojects, management of the construction process, and supervision of construction works. Two Sub-Assistant engineers, one drafter, one surveyor, and four work assistants will support the engineer. The Community Organizer at the Upazila office will assist the Upazila Engineer in coordinating with local NGOs and managing the work of NGO facilitators.

A specialized series of training programs will be conducted to ensure that the Executive Engineers, Senior Assistant Engineers, and Assistant Engineers at the LGED District offices and the Upazila Engineers and Assistant Upazila Engineers at the Upazila offices are familiar with and follow the implementation requirements of the Project. Training will be organized on rural infrastructure management--i.e., operation and maintenance of growth centers and rural markets and road maintenance--for the District Sociologists, Upazila Community Organizers, local NGOs, and NGO facilitators at the Upazila levels to provide them with the skills they will need to support stakeholders and LCS members.

(4) Local NGOs

Local NGOs are suitable for conducting assignments primarily for strengthening stakeholders' participation and LCS management. They will work on behalf of, speak for, and represent the local stakeholders when necessary in obtaining services from LGED. They will also represent landless people and destitute women in forming LCSs. NGOs providing the facilitators are expected to take the initiative in ensuring that their facilitators understand and abide by the objectives and strategies of the Project.

Although the local NGOs are important partners in achieving Project objectives, their implementation capacity is generally insufficient. For example, many NGOs are not capable of executing activities in a manner that fulfills contractual obligations. Thus, it is recommended that LGED carefully select NGOs with adequate technical skills and organizational capacity and provide them with capacity development training as necessary.

CHAPTER 6 Cost estimate and procurement

6.1 Project costs

6.1.1 Basic assumptions for cost estimates

The estimations of project costs are based on the assumptions listed below.

For Components 1 and 2

- The cost of construction work is calculated separately for Greater Faridpur, Barisal Division, and Greater Khulna. For cost estimation of construction work in Greater Faridpur, Barisal Division, and Greater Khulna, the “Schedule of rates” (“Schedule”) for Faridpur Division, Barisal Division, and Khulna Division published by LGED in May 2008, are used to establish unit costs. The tables used as reference are shown in Annex 18.
- The calculation only includes the cost of new banking materials required for upgrading existing Upazila and Union roads, rather than considering the cost required for the construction of new roads.
- Vegetation cover will be provided on side-slopes and soft shoulders of roads.
- Culverts will be constructed at gaps equal to or less than 6 m, while RCC bridges will be built where the gaps are between 6 m and 200 m. Where gaps exceed 200 m, ghats will be constructed instead of bridges or culverts.
- Traffic signs will be installed near schools, hospitals, and growth centers and rural markets.
- 15 guard posts per kilometer will be installed on curved road sections. A total of eight guard posts will be built to the front, back, right, and left of each approach road to an RCC bridge.
- One bus bay per kilometer will be constructed, with one side of the road extended.
- Physical contingencies are calculated at 2 % of the base cost total.
- Price escalation is calculated at 3 % compound of the base cost total (see Section 6.2.1).
- Fees for consultancy services related to surveys, designs, tender documents, selection of contractors, and supervision of construction are included in the base cost.
- The costs are divided into those payable in foreign currency (Japanese yen) and those payable in local currency (taka). The exchange rates as of September 30, 2008 (US\$1 = 105.93 yen; US\$1 = tk. 68.65; and tk.1 = 1.543 yen or 1 yen = tk. 0.6481) are used for calculation.
- The costs payable in foreign currency are: 1) consultancy fees, overhead, and direct costs for international consultants, 2) costs for overseas procurement of vehicles and construction equipment, and 3) costs for overseas training.
- The costs payable in local currency are: 1) costs for civil works, 2) consultancy fees, overhead, and direct costs for national consultants; 3) costs for in-country procurement and maintenance of equipment and material, 4) costs for Project staff training, 5) duties and taxes, and 6) costs for land acquisition.

6.1.2 Price escalation

To hedge the risks associated with the recent price escalations and the worldwide economic slowdown triggered by financial sector crises of the US, Europe, Asia, and other regions, a price contingency is included in the cost estimates. To determine the magnitude of the price hike in the Project area, market prices of major road construction materials are used as reference in Barguna and Bhola Divisions. As shown in Table 6-1, these prices are compared with the prices cited in the “Schedule” for Faridpur published by LGED in May 2008. Although the recent price hike was accounted for in the Schedule, prices continued to increase after its publication.

Table 6-1 Comparison for construction material prices

Schedule of Rate May 2008, LGED				Prices in Sep. 2008	
SL. No.	Description	Unit	May 2008 (tk.)	Sep. 2008 (tk.)	Increase from May 2008
123	Brick (1st class)	pcs	4.2	4.1	-2%
132	Stone chips (20mm down grade)	m ³	2,427.0	3,001.4	24%
142	Sand (FM - 2.5)	m ³	650.0	882.8	36%
144	Cement	bag	340.0	377.5	11%
172	MS. Deformed (60 grade)	kg	65.0	72.0	11%
Total/weighted average			3,486.2	4,337.8	24%

Note: Two samples are observed for brick, cement and MS. deformed (60 grade) in Barguna and Bhola Districts, and one sample is observed for stone chips and sand in Bhola District.

In the Project area, on average, prices as of September 2008 are 24 % higher than the prices cited in the Schedule of rates. Since the prices in the Schedule were collected around March 2008, the change must have occurred in the period between March and September 2008. However, this rapid price hike was followed by the worldwide economic slowdown, which should have negatively affected the trend of increasing prices. Therefore, predictions of price escalations should be associated with a large range of prediction errors that should be absorbed by the amount budgeted as the price escalation. With respect to these circumstances, 3 % of compound price escalation rate is applied to the cost estimates for the Project. If cost fluctuations cannot be absorbed by the contingency, the number of road and / or market subprojects can be increased or decreased based on the ranking results presented in Chapter 5 to adjust the total project costs.

6.1.3 Summary of project costs

The summary of project costs is shown in Table 6-2. The total cost of the Project is tk. 9,100 million, which is equivalent to 14,041 million Japanese yen (JPY). Costs are classified into A) portion eligible for JICA loan, which can be financed both by JICA and GOB, and B) portion ineligible for JICA loan, which should be financed by GOB.

In terms of budget size, the largest component is “Component 1: Upgrading of Upazila roads” which accounts for 53 % of the total budget. The second largest are “Component 3: Upgrading of Growth

Chapter 6 Cost estimate and procurement

centers and rural markets” and “Component 5: Poverty reduction interventions” with 4 % of the total followed by “Component 2: Upgrading of Union roads” with 3 % of the total. Although the budget allocation to “Component 6: Capacity development” is relatively small (1 %), the component’s training plans are extensive, as shown in Table 6-3.

For project management, 5 % is allocated to “V. Project operation and recurrent costs” to finance the costs of Project Implementation Office (PIO) staff remuneration, operation of offices, etc. To ensure the quality of project outputs and to increase the project implementation capacity of the Project, 5 % of the budget is secured for “Consultancy services.” To manage economic and other uncertainties 9 % of the total cost is allocated to physical contingency and price escalation combined.

Table 6-2 Summary of project costs

Item	Local currency			Foreign currency			% to total
	(million tk.)			(tk.1 = yen 1.543) (million yen)			
	FC	LC	Total	FC	LC	Total	
TOTAL PROJECT COST (A+B)	325	8,775	9,100	501	13,540	14,041	100%
A. PORTION ELIGIBLE FOR JICA LOAN	325	6,977	7,302	501	10,766	11,267	80%
I. Procurement and construction	117	6,170	6,286	180	9,520	9,699	69%
Component 1: Upgrading of Upazila roads		4,837	4,837		7,464	7,464	53%
Component 2: Upgrading of Union roads		293	293		451	451	3%
Component 3: Upgrading of GC an RM		328	328		505	505	4%
Component 4: Procurement of vehicles and equip.	114	110	224	175	169	345	2%
Price escalation (foreign 0.5% and local 3%)	1	491	492	1	758	758	5%
Physical contingency (2%)	2	111	114	4	172	175	1%
II. Procurement of services	208	808	1,016	321	1,246	1,567	11%
Component 5: Poverty reduction interventions		397	397		613	613	4%
Component 6: Capacity development	32	55	87	49	85	134	1%
Consultancy services	169	271	441	261	419	680	5%
Price escalation (foreign 0.5% and local 3%)	3	70	73	5	107	112	1%
Physical contingency (2%)	4	14	18	6	22	29	0%
B. PORTION NON-ELIGIBLE FOR JICA LOAN	1,798	1,798		2,775	2,775		20%
III. Project component	1,073	1,073		1,656	1,656		12%
Component 6: Capacity development		19	19		30	30	0%
Component 7: Upgrading of Upazila roads		1,054	1,054		1,626	1,626	12%
IV. Land acquisition		31	31		48	48	0%
V. Project operation and recurrent costs		484	484		747	747	5%
VI. Taxes and duties		90	90		139	139	1%
VII. Price escalation and contingency		120	120		185	185	1%

As shown in Table 6-3, the costliest investment is the pavement of earthen and HBB portions of Upazila roads in Component 1, consuming 42.6 % of the total budget. Construction of bridges and culverts on Upazila roads also requires a significant proportion of the budget (10.0 %). The budget allocated to road safety measures is relatively small (0.6 %), but this subcomponent is included as a direct countermeasure against the recent increase in traffic accidents in rural areas.

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Table 6-3 Detailed summary of project costs

Item	Quantity	FC (mill. tk)	LC (mill. tk)	Total (mill. tk)	%	
TOTAL PROJECT COST (A+B)		324.6	8,775.4	9,100.0	100.0%	
A. PORTION ELIGIBLE FOR JICA LOAN		324.6	6,977.9	7,302.5	80.2%	
I. Procurement and construction		116.5	6,169.5	6,286.0	69.1%	
Component 1: Upgrading of Upazila roads			4,837.3	4,837.3	53.2%	
1.1 Pavement		723 km	3,880.1	3,880.1	42.6%	
1.1.1 Pavement of earthen roads		481 km	2,715.3	2,715.3	29.8%	
1.1.2 Pavement of HBB/BFS roads		242 km	1,164.9	1,164.9	12.8%	
1.2 Bridges, culverts, and ghats		2,730 m	906.1	906.1	10.0%	
1.2.1 Construction of bridges		2,424 m	808.0	808.0	8.9%	
1.2.2 Construction of culverts		306 m	92.6	92.6	1.0%	
1.2.3 Construction of ghats (boat landing stage)		2 nos	5.4	5.4	0.1%	
1.3 Road safety measures			51.2	51.2	0.6%	
1.3.1 Construction of bus bays		723 nos	31.9	31.9	0.4%	
1.3.2 Installation of guard posts		11,649 nos	13.3	13.3	0.1%	
1.3.3 Installation of sign boards		1,123 nos	6.0	6.0	0.1%	
Component 2: Upgrading of Union roads			292.6	292.6	3.2%	
2.1 Pavement		69 km	292.1	292.1	3.2%	
2.1.1 Pavement of earthen roads		50 km	220.8	220.8	2.4%	
2.1.2 Pavement of HBB/BFS roads		18 km	71.2	71.2	0.8%	
2.2 Bridges and culverts		2 m	0.5	0.5	0.0%	
2.2.1 Construction of bridges		m				
2.2.2 Construction of culverts		2 m	0.5	0.5	0.0%	
Component 3: Upgrading of growth centers and rural markets			327.5	327.5	3.6%	
3.1 Improvement of growth centers			266.3	266.3	2.9%	
3.1.1 Upgrading of growth center facilities		51 nos	153.0	153.0	1.7%	
3.1.2 Establishment of women's market section		22 nos	13.2	13.2	0.1%	
3.1.3 Establishment of cyclone resistant market shed		9 nos	18.9	18.9	0.2%	
3.1.4 Establishment of ghats		41 nos	81.2	81.2	0.9%	
3.2 Improvement of rural markets			61.2	61.2	0.7%	
3.2.1 Upgrading of rural market facilities		18 nos	36.0	36.0	0.4%	
3.2.2 Establishment of ghats (boat landing stage)		13 nos	25.2	25.2	0.3%	
Component 4: Procurement of vehicles and equipment			113.7	109.8	2.5%	
4.0.1 Vehicles			18.5	21.5	0.4%	
4.0.2 Construction equipment			95.2	75.9	1.9%	
4.0.3 Office equipment and furniture				12.4	0.1%	
Price escalation (foreign 0.5% and local 3%)			0.6	491.0	491.5	5.4%
Physical contingency (2%)			2.3	111.3	113.6	1.2%
II. Procurement of services			208.1	808.4	1,016.5	11.2%
Component 5: Poverty reduction interventions (LCS mobilization)			397.6	397.6	4.4%	
5.0.1 Tree planting and caretaking by LCS		759 km	157.7	157.7	1.7%	
5.0.2 Maintenance of village roads by LCS		1,400 km	239.9	239.9	2.6%	
Component 6: Capacity development			31.8	55.4	87.1	1.0%
6.1 Special foundation training by BARD			17.5	17.5	0.2%	
6.1.1 LGED officials		19,200 TDs	17.5	17.5	0.2%	
6.2 Overseas training (training by overseas institutions)			31.8	5.3	37.0	0.4%
6.2.1 LGED and relevant government officials		1,125 TDs	31.8	5.3	37.0	0.4%
6.3 Training by NGOs			32.7	32.7	0.4%	
6.3.1 Growth center/rural market stakeholders		2,128 TDs	1.5	1.5	0.0%	
6.3.2 Women and physically challenged shopkeepers		840 TDs	0.8	0.8	0.0%	
6.3.3 LCS members		37,960 TDs	14.4	14.4	0.2%	
6.3.4 Local NGO trainers / facilitators		60 TDs	0.1	0.1	0.0%	
6.3.5 Fees, overheads, and other charges			15.9	15.9	0.2%	
Consultancy services			169.1	271.4	440.5	4.8%
Consultancy services and support staff		1,260 PM	169.1	271.4	440.5	4.8%
Price escalation (foreign 0.5% and local 3%)			3.2	69.5	72.7	0.8%
Physical contingency (2%)			4.0	14.5	18.5	0.2%

Table 6-3 Detailed summary of project costs (continued)

Item	Quantity	FC (mill. tk)	LC (mill. tk)	Total (mill. tk)	%
B. PORTION NON-ELIGIBLE FOR JICA LOAN			1,797.5	1,797.5	19.8%
III. Project component			1,073.2	1,073.2	11.8%
Component 6: Capacity development			19.2	19.2	0.2%
6.4 In-country training, workshops, and meetings conducted by LGED			19.2	19.2	0.2%
6.4.1 LGED and relevant government officials	2,411 TDs		2.2	2.2	0.0%
6.4.2 Contractors and construction workers	1,500 TDs		1.6	1.6	0.0%
6.4.3 Upazila and UP Chairpersons, and UNO	1,050 TDs		1.1	1.1	0.0%
6.4.4 Growth center/rural market stakeholders	5,676 TDs		5.8	5.8	0.1%
6.4.5 Women and physically challenged shopkeepers	480 TDs		0.4	0.4	0.0%
6.4.6 LCS members	18,705 TDs		8.0	8.0	0.1%
Component 7: Upgrading of Upazila roads			1,054.1	1,054.1	11.6%
1.1 Pavement	158 km		810.6	810.6	8.9%
1.1.1 Pavement of earthen roads	98 km		524.3	524.3	5.8%
1.1.2 Pavement of HBB/BFS roads	60 km		286.3	286.3	3.1%
1.2 Bridges, culverts, and ghats	705 m		232.1	232.1	2.6%
1.2.1 Construction of bridges	596 m		199.0	199.0	2.2%
1.2.2 Construction of culverts	109 m		33.1	33.1	0.4%
1.2.3 Construction of ghats (boat landing stage)	nos				
1.3 Road safety measures			11.4	11.4	0.1%
1.3.1 Construction of bus bays	158 nos		7.1	7.1	0.1%
1.3.2 Installation of guard posts	2,611 nos		3.0	3.0	0.0%
1.3.3 Installation of sign boards	239 nos		1.3	1.3	0.0%
IV. Land acquisition	17.1 ha		30.8	30.8	0.3%
V. Project operation and recurrent costs			483.6	483.6	5.3%
(a) Project implementation office staff	14,400 PM		187.5	187.5	2.1%
(b) Office operation cost			184.2	184.2	2.0%
(c) Survey and investigation			3.3	3.3	0.0%
(d) Maintenance of vehicle and equipment			9.0	9.0	0.1%
(e) Development of office facilities	13 nos		99.6	99.6	1.1%
VI. Taxes and duties			90.0	90.0	1.0%
VII. Price escalation and contingency			119.9	119.9	1.3%
(a) Price escalation (foreign 0.5% and local 3%) of III and IV			97.8	97.8	1.1%
(b) Physical contingency (2%) of III and IV			22.1	22.1	0.2%

Since the Project aims to achieve poverty reduction, the direct transfer of money (4.4 % of the budget) to the rural poor will be realized through “Component 5: Poverty reduction interventions.” Within this component, 759 km of roadside tree-planting and caretaking work and 1,400 km of village road maintenance work will be contracted out to Labor Contracting Societies (LCS’s).

6.1.4 Costs of components

(1) Component 1 and 7 Upazila road upgrading

District-wise budget allocations under Component 1 and 7 are shown in Table 6-4. Under Component 1 88 Upazila roads are to be upgraded whereas 18 are to be upgraded in Component 7. Detailed construction costs for each of the Upazila roads selected for upgrading are shown in Annex 18. In Component 1 the largest amount (tk. 706 million) is allocated to Barisal Division, where a large portion of the budget will finance the cost of bridge construction (tk. 282 million). The same is true for Madaripur Division, where bridge construction will consume almost half of the construction cost (tk. 480 million).

Table 6-4 Component 1 and Component 7 Upazila Road upgrading cost summary by District

Loan/GOB financing Division/Greater District District UPAZILA	Pavement subcomponent (million tk.)			Bridge and culvert subcomponent (million tk.)				Safety measures subcomponent (million tk.)				Total (mill. tk.)
	Earthen road a	HBB/ BFS b	Sub- total c=a+b	Bridge d	Culvert e	Ghats f	Sub-total g=d+e+f	Bus bay h	Guard post i	Sign board j	Sub- total k=h+i+j	
Grand total	3,239.6	1,451.2	4,690.8	1,007.0	125.7	5.4	1,138.1	39.0	16.3	7.2	62.5	5,891.4
Component 1: Upgrading of Upazila roads (Upazila road upgrading to be financed by loan)												
Total	2,715.3	1,164.9	3,880.1	808.0	92.6	5.4	906.1	31.9	13.3	6.0	51.2	4,837.3
Barisal Division	1,081.5	480.5	1,562.1	294.6	59.8		354.4	13.5	5.6	2.2	21.2	1,937.7
Barguna	73.1	80.3	153.4		1.8		1.8	1.5	0.5	0.2	2.1	157.4
Barisal	270.1	132.9	403.0	282.2	15.4		297.6	3.5	1.8	0.5	5.8	706.4
Bhola	230.4		230.4		5.8		5.8	1.7	0.7	0.3	2.7	238.9
Jhalakati	102.9	113.4	216.2		20.0		20.0	2.0	0.7	0.3	3.1	239.3
Patuakhali	227.8	54.1	282.0	3.3	3.9		7.3	2.3	0.9	0.4	3.6	292.9
Pirojpur	177.3	99.8	277.1	9.0	12.9		21.9	2.4	0.9	0.5	3.8	302.8
Greater Faridpur	803.4	214.6	1,018.1	413.8	19.3	5.4	438.5	7.9	3.7	1.8	13.4	1,469.9
Faridpur	229.0	123.6	352.6	57.0	1.2		58.2	2.7	1.1	0.6	4.5	415.3
Gopalganj	157.6	28.5	186.0	55.6	1.5		57.1	1.5	0.7	0.4	2.5	245.7
Madaripur	184.8	32.4	217.3	251.2	9.1		260.2	1.7	0.9	0.2	2.9	480.4
Rajbari	154.4	9.1	163.5	36.0			36.0	1.2	0.6	0.3	2.1	201.5
Shariatpur	77.6	21.1	98.7	14.0	7.5	5.4	27.0	0.8	0.4	0.2	1.4	127.0
Greater Khulna	830.3	469.7	1,300.0	99.7	13.5		113.2	10.5	4.1	2.0	16.6	1,429.7
Bagerhat	244.9	95.2	340.1	8.3	4.4		12.7	2.9	1.1	0.6	4.6	357.4
Khulna	342.5	186.9	529.4	63.1	3.2		66.3	3.7	1.4	0.7	5.8	601.5
Satkhira	242.9	187.6	430.5	28.2	5.9		34.1	3.9	1.5	0.8	6.1	470.8
Component 7 Upgrading of Upazila roads (Upazila road upgrading to be financed by GOB budget)												
Total	524.3	286.3	810.6	199.0	33.1		232.1	7.1	3.0	1.3	11.4	1,054.1
Barisal Division	269.8	173.2	442.9	108.4	33.1		141.5	4.0	1.6	0.6	6.2	590.6
Barisal	35.1	34.8	69.9					0.7	0.2	0.0	0.9	70.8
Jhalakati	44.2	109.9	154.1	44.6	9.1		53.7	1.6	0.6	0.2	2.4	210.2
Patuakhali	86.7	6.0	92.7	3.3	5.9		9.3	0.7	0.3	0.2	1.2	103.1
Pirojpur	103.7	22.5	126.2	60.5	18.0		78.5	1.0	0.5	0.2	1.7	206.4
Greater Faridpur	186.3	30.5	216.8	90.6			90.6	1.7	0.8	0.4	2.9	310.3
Faridpur	42.5	17.9	60.4					0.5	0.2	0.1	0.8	61.2
Gopalganj	35.4	7.9	43.4	13.0			13.0	0.3	0.2	0.1	0.6	57.0
Rajbari	65.6	4.7	70.3	46.6			46.6	0.5	0.3	0.1	0.9	117.8
Shariatpur	42.7		42.7	31.0			31.0	0.3	0.2	0.1	0.6	74.3
Greater Khulna	68.3	82.7	151.0					1.4	0.5	0.3	2.2	153.2
Khulna	68.3	82.7	151.0					1.4	0.5	0.3	2.2	153.2

(2) Component 2 Union road upgrading

A total of tk. 292 million is allocated to Component 2 for Union road upgrading. District-wise budget allocations under Component 2 are shown in Table 6-5. 19 Union roads, whose detailed costs for upgrading are presented in Annex 18, are to be upgraded. Due to budget constraints, Union roads belonging to a limited number of Upazilas and Divisions will be upgraded.

Table 6-5 Component 2 Union Road upgrading cost summary by District

Division/ Greater District/ District/ Upazila	Pavement subcomponent (million tk.)			Bridges and culvert subcomponent (million tk.)			Total cost (mill. tk.)
	Earthen road	HBB/BFS	Upgrade total	Bridge	Culvert	Total	
	a	b	c=a+b	d	e	f=d+e	
Project area total	220.8	71.2	292.1		0.5	0.5	292.6
Barisal Division	126.5	27.0	153.5		0.4	0.4	153.9
Bhola	78.0		78.0		0.4	0.4	78.3
Jhalakati	13.4	0.4	13.8				13.8
Patuakhali	35.1	26.6	61.7				61.7
Greater Faridpur	82.7	38.2	120.9				120.9
Faridpur	18.2	9.4	27.6				27.6
Gopalganj	8.6		8.6				8.6
Madaripur	15.0		15.0				15.0
Rajbari	34.7	7.7	42.4				42.4
Shariatpur	6.2	21.2	27.4				27.4
Greater Khulna	11.6	6.0	17.6		0.1	0.1	17.7
Satkhira	11.6	6.0	17.6		0.1	0.1	17.7

(3) Component 3 Growth center and rural market upgrading

A total of tk. 327.5 million is allocated to Component 3. District-wise budget allocations under Component 3 are shown in Table 6-6. Most of the budget (tk. 266.3 million) is allocated to growth center development. A budget of tk. 18.9 million is reserved for the construction of nine cyclone resistant market sheds in nine growth centers, which will be selected from the growth centers from nine Districts of Barisal Division and Greater Khulna. Faridpur District will receive the largest budget (tk. 37.2 million), followed by Bhola District (tk. 28.8 million).

The unit costs of market facility development are shown in Table 6-6. To estimate the costs of growth center and rural market development, the unit costs for growth center upgrading (3 million tk.), establishment of WMS's (0.6 million tk.), establishment of ghats (2 million tk.), establishment of cyclone resistant market sheds (2.1 million tk.), and rural market upgrading (2 million tk.) are determined based on information obtained from LGED. The cost calculation for the establishment of ghats is based on the assumption that 70% of the growth centers and rural markets will require ghats.

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Table 6-6 Component 3 Growth center and rural market upgrading cost summary by District

Division/ Greater District District	Growth Center								Rural market					Total cost (mill. tk.)	
	Quantity (unit)				Development cost (million tk.)				Quantity (unit)		Development cost (million tk.)				
	Growth center upgrading	Establishment of women's section	Establishment of ghat	Cyclone resistant market shed	Growth Center upgrade	Establishment of women's section	Establishment of ghat	Cyclone resistant market shed	Sub-total cost	Rural market upgrading	Establishment of ghat	Upgrading of market	Establishment of ghat		Sub-total cost
Unit cost (million tk.)	3.0	0.6	2.0	2.1						2.0	2.0				
TOTAL	51	22	41	9	153.0	13.2	81.2	18.9	266.3	18	13	36.0	25.2	61.2	327.5
9 Costal districts				9				18.9	18.9						18.9
Sub-total	51	22	41		153.0	13.2	81.2		247.4	18	13	36.0	25.2	61.2	308.6
Barisal Division	24	10	18		72.0	6.0	35.0		113.0	8	6	16.0	11.2	27.2	140.2
Barguna	3	2	2		9.0	1.2	4.2		14.4						14.4
Barisal	3	1	2		9.0	0.6	4.2		13.8	4	3	8.0	5.6	13.6	27.4
Bhola	5		4		15.0		7.0		22.0	2	1	4.0	2.8	6.8	28.8
Jhalakati	4	2	4		12.0	1.2	7.0		20.2						20.2
Patuakhali	5	3	4		15.0	1.8	7.0		23.8	1	1	2.0	1.4	3.4	27.2
Pirojpur	4	2	3		12.0	1.2	5.6		18.8	1	1	2.0	1.4	3.4	22.2
Greater Faridpur	15	6	12		45.0	3.6	23.8		72.4	9	6	18.0	12.6	30.6	103.0
Faridpur	6	1	4		18.0	0.6	8.4		27.0	3	2	6.0	4.2	10.2	37.2
Gopalganj	1	1	1		3.0	0.6	1.4		5.0	1	1	2.0	1.4	3.4	8.4
Madaripur	2	2	3		6.0	1.2	5.6		12.8	2	1	4.0	2.8	6.8	19.6
Rajbari	3		2		9.0		4.2		13.2						13.2
Shariatpur	3	2	2		9.0	1.2	4.2		14.4	3	2	6.0	4.2	10.2	24.6
Greater Khulna	12	6	11		36.0	3.6	22.4		62.0	1	1	2.0	1.4	3.4	65.4
Bagerhat	3	2	4		9.0	1.2	7.0		17.2	1	1	2.0	1.4	3.4	20.6
Khulna	4	2	4		12.0	1.2	8.4		21.6						21.6
Satkhira	5	2	4		15.0	1.2	7.0		23.2						23.2

(4) Component 4 Procurement of vehicles and construction and office equipment

Costs for Component 4, the numbers of vehicles, and construction and office equipment distributed to each project office are shown in Table 6-7. The total amount of this component, excluding custom duties, taxes, and value added tax, is tk. 223.5 million. Custom duties and taxes are budgeted separately (Table 6-3). This component consists of a foreign currency portion of tk. 113.7 million and a local currency portion of tk. 109.8 million.

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Table 6-7 Component 4 Cost of vehicles and construction and office equipment

Items	Quantity	Unit cost		Total Amount without CD and VAT (^{'000 tk.})	Regist-ration Cost (^{'000 tk.})	CD and VAT value (^{'000 tk.})	Total amount with CD and VAT (^{'000 tk.})
		CIF value	With CD and VAT				
		a	b				
Total (A to C)				223,505	3,560	43,951	271,016
Foreign currency portion (A1+B2)				113,700			
Local currency portion (A2+B2+C1)				109,805			
A. Vehicle							
A1. Foreign currency							
1) 4-wheel drive (LGED & consultant firm)	4 nos	1,650	6,188	6,600	260	18,150	25,010
2) 4-wheel double cabin pick-up truck	14 nos	850	1,488	11,900	840	8,925	21,665
A2. Local currency							
3) Motor cycle	123 nos	175	189	21,525	2,460	1,722	25,707
B. Construction equipment							
B1. Foreign currency							
1) Vibrator roller 10-12 ton (Double drum)	14 nos	3,800	4,123	53,200		4,522	57,722
2) Vibrator roller 7-9 ton (Double drum)	14 nos	3,000	3,255	42,000		3,570	45,570
B2. Local currency							
3) Total station (Level machine)	90 nos	750	810	67,500		5,400	72,900
4) Laboratory equipment (Accessories)	14 nos	600	648	8,400		672	9,072
C. Office Equipment							
C1. Local currency							
1) Computer and UPS	104 nos	60	65	6,240		499	6,739
2) Printer	104 nos	30	32	3,120		250	3,370
3) Photocopier	17 nos	160	173	2,720		218	2,938
4) Laptop computer	2 nos	150	162	300		24	324

Numbers of vehicles, and construction and office equipment distributed to project offices

Items	Location				Total quantity (nos)
	Project Implementation Office (LGED Headquarters)	Design and Monitoring Office (LGED Faridpur Circle Office)	Quality Assurance office (14 LGED District Offices)	Upazila LGED Offices (90 LGED Upazila Offices ¹⁾)	
A. Vehicle					
A1. Foreign currency					
1) 4-wheel drive (LGED & consultant firm)	2	2			4
2) 4-wheel double cabin pick-up truck			14		14
A2. Local currency					
3) Motor cycle	10	9	14	90	123
B. Construction equipment					
B1. Foreign currency					
1) Vibrator roller 10-12 ton (Double drum)			14		14
2) Vibrator roller 7-9 ton (Double drum)			14		14
B2. Local currency					
3) Total station (Level machine)				90	90
4) Laboratory equipment (Accessories)			14		14
C. Office Equipment					
C1. Local currency					
1) Computer and UPS			14	90	104
2) Printer			14	90	104
3) Photocopier	2	1	14		17
4) Laptop computer	1	1			2

Note: 1) In the Project area there are 90 LGED Upazila Offices within which 88 LGED Upazila Offices will implement subprojects under SWBRDP.

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Table 6-8 Component 6 Capacity development cost summary

Item	Unit	Trainee- days	Unit Cost (tk.)	Total (‘000 tk.)
I. TOTAL (II and III)		91,135		106,298
II. PORTION ELIGIBLE FOR JICA LOAN		61,313		87,145
1. BARD		19,200		17,472
a. Capacity development of LGED officials		19,200		17,472
a-5 Special foundation training course	Trainee-days	19,200	910	17,472
2. External training institutions		1,125		37,013
a. Capacity development of LGED and relevant government officials		1,125		37,013
a-6 Overseas training	Trainee-days	1,125		37,013
i Rural infrastructure and community participation	Trainee-days	225	32,900	7,403
ii Maintenance and management system of rural	Trainee-days	225	32,900	7,403
iii Effect monitoring and evaluation	Trainee-days	225	32,900	7,403
iv Road safety management	Trainee-days	225	32,900	7,403
v Quality control / assurance	Trainee-days	225	32,900	7,403
3. NGOs		40,988		32,661
Sub-total of d. to g.		40,988		16,743
d. Capacity development of GC/RM stakeholders	Trainee-days	2,128		1,492
d-5 Training on gender and environmental issues	Trainee-days	2,128	701	1,492
c. Capacity development of women shopkeepers of WMS, physically challenged shopkeepers		840		812
e-2 Training on shop management and skill development	Trainee-days	480	925	444
e-3 Training on gender and environmental issues	Trainee-days	240	938	225
e-4 Training on functions of MMC and Banik Samity	Trainee-days	120	1,188	143
f. Capacity development of LCS members		37,960		14,375
f-3 Training on social and gender awareness	Trainee-days	8,760	371	3,250
f-4 Training on group formation and management	Trainee-days	5,840	396	2,313
f-5 Training on health and hygiene	Trainee-days	5,840	396	2,313
f-6 Training on saving and credit management	Trainee-days	2,920	471	1,375
f-7 Training on skill development for income generation	Trainee-days	14,600	351	5,125
g. Capacity development of local NGO trainers / facilitators		60		64
g-1 Orientation and TOT for NGO trainers / facilitators	Trainee-days	60	1,068	64
Sub-total of (1) to (5)				15,918
(1) Development of training modules				98
Development of modules for training 1-8	no	8	7,000	56
Development of modules for training 9 (6 items)	no	6	7,000	42
(2) Reporting				39
Quarterly reports	no	12	3,000	36
Final report	no	1	3,000	3
(3) Remuneration for NGO coordinator and NGO trainers / facilitators				10,005
1 NGO coordinator	mm	39	35,000	1,365
12 NGO trainers / facilitators	mm	432	20,000	8,640
(4) Overhead charge (20% of Sub-total)				3,349
(5) Income Tax and VAT(14.5% of Sub-total)				2,428

Table 6-8 Component 6 Capacity development cost summary (continued)

Item	Unit	Trainee-days	Unit Cost (tk.)	Total ('000 tk.)
III. PORTION NON-ELIGIBLE FOR JICA LOAN		29,822		19,153
4. LGED (LGED officials, Project consultants)		29,822		19,153
a. Capacity development of LGED and relevant government officials		2,411		2,246
a-1 Project kickoff meeting	Trainee-days	539	1,389	749
a-2 Trainers of Training (TOT)	Trainee-days	960	715	686
a-3 Training on project administration, technical and financial management	Trainee-days	468	889	416
a-4 Training on social and environmental issues of the project	Trainee-days	444	890	395
b. Capacity development of contractors and construction workers		1,500		1,563
b-1 Training on contract management, technical and financial management	Trainee-days	750	1,042	782
b-2 Skill training of masons and construction workers	Trainee-days	750	1,042	782
c. Capacity development of Upazila Chairpersons, UNO and UP Chairpersons		1,050		1,118
c-1 Project orientation meeting	Trainee-days	1,050	1,065	1,118
d. Capacity development of growth center/rural market stakeholders		5,676		5,820
d-1 Sensitization workshop on development and maintenance of growth center / rural market	Trainee-days	1,452	992	1,440
d-2 Orientation meeting on participatory planning of growth center/rural market	Trainee-days	1,320	1,061	1,401
d-3 Training on land ownership in growth center/rural market, leasing system, rules and regulations of leasing out	Trainee-days	1,452	1,026	1,490
d-4 Training on proper operation and maintenance of growth center/rural market and resource mobilization	Trainee-days	1,452	1,026	1,490
e. Capacity development of women shopkeepers of WMS, physically challenged shopkeepers		480		448
e-1 Orientation meeting on women market section	Trainee-days	480	933	448
f. Capacity development of LCS members		18,705		7,957
f-1 Training on skill development on maintenance of Village	Trainee-days	4,560	439	2,002
f-2 Training on tree plantation and care-taking	Trainee-days	14,145	421	5,955

(5) Component 5: Poverty reduction interventions

Per kilometer unit costs for tree-planting and caretaking and the maintenance of village roads are shown in Annex 18. Costs of tree-planting and caretaking are calculated by multiplying 80% of the total Upazila and Union roads to be upgraded (759 km) by the unit cost of tk. 207,700/km. The Project will also conduct village road maintenance, whose budget is estimated by multiplying the unit cost of tk. 171,350/km by 1,400 km of village roads to be maintained.

(6) Component 6: Capacity development

The types of training courses, their costs, and organizations charged with their implementation are presented in Table 6-8. Training courses organized by LGED are not eligible for financing by JICA

loans. Training courses contracted out to other institutions can be financed by JICA loans. The Bangladesh Academy of Rural Development (BARD) will conduct the foundation training of LGED staff with a budget of tk. 17.5 million. NGOs will develop training materials and train local stakeholders. For such activities involving NGOs, a budget of tk. 32.7 million is allocated.

(7) Consultancy services

The budget allocations for consultancy services (tk. 440.5 million) under Component 1 are shown in Table 6-3. They consist of costs for consultant and support staff remunerations and reimbursable expenses.

(8) Land acquisition

The estimated purchase cost for land acquisition is presented in Table 6-9. The total estimated cost is tk. 30.8 million, consisting of tk. 15.0 million in Barisal Division, tk. 5.4 million in Greater Faridpur, and tk. 10.4 million in Greater Khulna.

Table 6-9 Cost for land acquisition

Division	Cost per hectare (million tk.)	Area to be acquired (ha)	Inflation Rate (%)	Estimated Cost (million tk.)
Total		17.14		30.79
Barisal Division	1.54	7.10	137.5	15.03
Greater Faridpur	0.73	5.14	143.6	5.39
Greater Khulna	1.54	4.90	137.5	10.37

(9) Project Implementation Office staff

Costs for PIO staff are shown in Table 6-10. A total of tk. 187.5 million is allocated to the employment of 240 staff members over the course of five years (60 months). Tk. 132.3 million is allocated to the salaries of staff members, whereas tk. 55.3 million is allocated to their benefits and allowances.

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Table 6-10 Costs for Project Implementation Office staff for five years

Name of the Post	Pay Scale/Consolidated Pay (Tk)	No.	PM	Monthly payment Tk	Total for 60 PM Tk (‘000)
Total		240	14,400		187,540
Sub-total of A, B, C, and D		240	14,400		132,250
A. Project Implementation Office, LGED Headquarters, Dhaka		38	2,280		22,519
Project Director	15000-19800/26000 (GOB staff)	1	60	26,000	1,560
Executive Engineer	13750-19250/23875 (GOB staff)	2	120	23,875	2,865
Assistant Engineer	11000-17650/19750 (GOB staff)	4	240	19,750	4,740
Socio-economist	6800-13090/12400 (GOB staff)	1	60	12,400	744
Accounts Officer	5100-10360/9680 (GOB staff)	1	60	9,680	581
Administrative Officer	5100-10360/9680 (GOB staff)	1	60	9,680	581
Accountant	4100-8820/8080 (GOB staff)	2	120	8,080	970
Accountant Assistant	3300-6940/6690 (GOB staff)	2	120	6,640	797
Office Assistant	3000-5920/6120 (GOB staff)	1	60	6,120	367
Steno	3000-5920/6120 (GOB staff)	1	60	6,120	367
Cleaner	2400-4310/5170 (GOB staff)	1	60	5,170	310
Sub-Assistant Engineer	9680 (Project staff)	4	240	9,680	2,323
Computer Operator	8080 (Project staff)	4	240	8,080	1,939
Driver	6120 (Project staff)	6	360	6,120	2,203
Messenger/MLSS	5170 (Project staff)	6	360	5,170	1,861
Photocopier Operator	5170 (Project staff)	1	60	5,170	310
B. Design and Monitoring Office, LGED Circle Office Faridpur		16	960		9,128
Executive Engineer	13750-19250/21500 (GOB staff)	1	60	23,875	1,433
Assistant Engineer	12400 (Project staff)	1	60	12,400	744
Sociologist	12400 (Project staff)	1	60	12,400	744
Surveyor	9680 (Project staff)	3	180	9,680	1,742
Estimator Cum Draftsman	9680 (Project staff)	3	180	9,680	1,742
Computer Operator	8080 (Project staff)	2	120	8,080	970
Accounts Assistant	6640 (Project staff)	1	60	6,640	398
Driver	6120 (Project staff)	2	120	6,120	734
Messenger/MLSS	5170 (Project staff)	2	120	5,170	620
C. Quality Assurance Office, LGED District Offices 14		98	5,880		49,493
Assistant Engineer	12400 (Project staff)	14	840	12,400	10,416
Stakeholders Organizer	12400 (Project staff)	14	840	12,400	10,416
Computer Operator	8080 (Project staff)	14	840	8,080	6,787
Work Assistant	6640 (Project staff)	28	1,680	6,640	11,155
Account Assistant	6640 (Project staff)	14	840	6,640	5,578
Operator/Driver:Constn Eqpm	6120 (Project staff)	14	840	6,120	5,141
D. LGED Upazila Office		88	5,280		51,110
Sub-Assistant Engineer	9680 (Project staff)	88	5,280	9,680	51,110
Sub-total of E, F, G, H, and I					55,290
E. Festival Allowance (24% of the sub-total)					31,740
F. Service Benefit for Incremental Staff (13% of the sub-total)					17,192
G. Deputation Allowance for GOB Staff (20% of the basic pay)					1,889
H. Gratuity for Project Staff (two months of basic pay/year)					1,664
I. House Rent for GOB Staff					2,806

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Table 6-11 Office operation cost

Items	Quantity 1	Quantity 2	Quantity 3	Unit cost	Cost (mill. tk)
Total					184.2
A. Fuel cost for vehicles to be purchased					56.7
4-WD	4 4-WDs	500 litres/month	60 month	90 tk/litre	10.8
Pickup	14 pickups	500 litres/month	60 month	55 tk/litre	23.1
Motorcycle	123 units	34 litres/month	60 month	90 tk/litre	22.8
B. Office operation cost (communication, office supplies, utilities, etc.)					127.5
PIO at LGED HQs	1 office	60 months		250,000 tk/month	15.0
Faridpur Office	1 office	60 months		125,000 tk/month	7.5
District offices in Barisal Division					45.0
Barguna	1 office	60 months		125,000 tk/month	7.5
Barisal	1 office	60 months		125,000 tk/month	7.5
Bhola	1 office	60 months		125,000 tk/month	7.5
Jhalakati	1 office	60 months		125,000 tk/month	7.5
Patuakhali	1 office	60 months		125,000 tk/month	7.5
Pirojpur	1 office	60 months		125,000 tk/month	7.5
District offices in Greater Faridpur					37.5
Faridpur	1 office	60 months		125,000 tk/month	7.5
Gopalganj	1 office	60 months		125,000 tk/month	7.5
Madaripur	1 office	60 months		125,000 tk/month	7.5
Rajbari	1 office	60 months		125,000 tk/month	7.5
Shariatpur	1 office	60 months		125,000 tk/month	7.5
District offices in Greater Khulna					22.5
Bagerhat	1 office	60 months		125,000 tk/month	7.5
Khulna	1 office	60 months		125,000 tk/month	7.5
Satkhira	1 office	60 months		125,000 tk/month	7.5

(10) Office operation costs

The total costs for office operation at tk. 184.2 million, which includes tk. 56.7 million of fuel costs and tk. 127.5 million of communication, office supplies, utilities, etc., are shown in Table 6-11. This budget is vital to effective implementation of the Project and will enable the Project to conduct its day-to-day activities smoothly.

(11) Surveys and investigations

The survey and investigation budget, with a total of tk. 3.3 million, is shown in Table 6-12.

Table 6-12 Survey and investigation cost

Estimate number of bridges requiring subsoil investigation	Bore-holes required Per bridge	Total	Cost per bore-hole (Tk)	Total cost (Tk)
131	5	655	5,000	3,275,000

(12) Maintenance of vehicles and equipment

The details of this budget, amounting to tk. 9.0 million, are shown in Table 6-13. Tk. 2.0 million, tk.

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6.2 million, and tk. 0.8 million are budgeted for maintenance of construction equipment, maintenance of vehicles, and maintenance of office equipment, respectively.

Table 6-13 Maintenance of vehicle and equipment

Items	Quantity (units)	Monthly cost (tk.)	No. of months	Total (‘000 tk.)
Total				9,010
A. Construction Equipment				2,016
1. Vibrator roller 10-12 ton (Double drum)	14	16,800	60	1,008
2. Vibrator roller 7-9 ton (Double drum)	14	16,800	60	1,008
B. Vehicle				6,242
1. 4-wheel jeep (LGED & consultant firm)	4	10,000	60	600
2. 4-wheel double cabin pick-up (Lab. facility)	14	35,000	60	2,100
3. Motor Cycle	123	59,040	60	3,542
C. Office Equipment				752
1. Computer & UPS	104	5,690	60	341
2. Printer	104	5,690	60	341
3. Photocopier	17	930	60	56
4. Computer, UPS, printer, photocopier, accessories, etc.	4	220	60	13

Table 6-14 Development of office facilities

LGED District office	Item	Building	Quantity	Unit cost	Cost (mill. tk)
Grand total					99.60
Barisal Division					42.00
Barguna	Office extension (25m x 20m)	1 unit	500 m ²	14,000 tk/m ²	7.00
Barisal	Office extension (25m x 20m)	1 unit	500 m ²	14,000 tk/m ²	7.00
Bhola	Office extension (25m x 20m)	1 unit	500 m ²	14,000 tk/m ²	7.00
Jhalakati	Office extension (25m x 20m)	1 unit	500 m ²	14,000 tk/m ²	7.00
Patuakhali	Office extension (25m x 20m)	1 unit	500 m ²	14,000 tk/m ²	7.00
Pirojpur	Office extension (25m x 20m)	1 unit	500 m ²	14,000 tk/m ²	7.00
Greater Faridpur					43.60
Faridpur	Staff quarters (20m x 10m)	3 units	600 m ²	26,000 tk/m ²	15.60
Gopalganj	Office extension (25m x 20m)	1 unit	500 m ²	14,000 tk/m ²	7.00
Madaripur	Office extension (25m x 20m)	1 unit	500 m ²	14,000 tk/m ²	7.00
Rajbari	Office extension (25m x 20m)	1 unit	500 m ²	14,000 tk/m ²	7.00
Shariatpur	Office extension (25m x 20m)	1 unit	500 m ²	14,000 tk/m ²	7.00
Greater Khulna					14.00
Bagerhat	Office extension (25m x 20m)	1 unit	500 m ²	14,000 tk/m ²	7.00
Khulna	No office improvement				
Satkhira	Office extension (25m x 20m)	1 unit	500 m ²	14,000 tk/m ²	7.00

(13) Development of office facilities

Table 6-14 shows the location, contents, and costs for office facility development. The total cost of the development of office facilities is tk. 99.6 million. For 12 District Offices of LGED in the 12 Project districts, 500 m² of office floor/space will be added to the existing offices. In the Faridpur District office, three units of staff quarters will be constructed to accommodate PIO staff assigned to the Design and Monitoring Office in Faridpur.

6.2 Procurement method

(1) Objectives of procurement

Adherence to the Procedures is mandatory for all public Procuring Entities when they conduct procurement using public funds in order to ensure their compliance with the Regulations. The GOB regulates the procurement of goods, works, and services for achieving the objectives of:

- Optimizing efficiency in procurement
- Promoting competition among tenders for the procurement of goods, works, or services in the public sector
- Providing equitable treatment to tenders
- Promoting fairness in the procurement process
- Contributing to improvement of the country's business climate
- Introducing transparent regulations and universal application to all procurement activities in the public sector

(2) Method of procurement

- Open tendering method
- Restricted tendering method
- Direct procurement method
- Two-stage tendering method
- Request for quotations method

(3) National Competitive Bidding and International Competitive Bidding

Procurement of Works:

- International Competitive Bidding (ICB): Civil works contracts estimated to cost more than the amount equivalent to US\$ 2.0 million per contract may be procured using ICB.
- National Competitive Bidding (NCB): Civil works contracts estimated to cost less than the amount equivalent to US\$ 2.0 million per contract may be procured using NCB.

Procurement of Goods: Generally, goods will be procured using ICB for large packages, followed by NCB and national shopping for contracts of lesser value.

- ICB: Goods and equipment contracts estimated to cost the amount equivalent to US\$ 300,000 or more per contract will be procured using ICB. This includes large value computer

networking.

- NCB: Goods and equipment contracts estimated to cost less than the amount equivalent to US\$ 300,000 per contract may be procured using NCB. This includes office equipment and vehicles, etc.

ICB: When, in the absence of domestic capacity, effective competition cannot be obtained unless special efforts are made to attract international competition, procurement shall be preceded by prequalification of renderers and complemented with the following provisions:

- Technical specifications shall, to the extent compatible with national requirements, be based on international standards or standards widely used in international trade.
- *General and special conditions established in the contracts shall be of a kind generally used in international trade.*

(4) Packaging method

Project components should be organized into small packages to allow a large number of bidders to participate. NCB will be applied to all packages for construction. The construction packages will be organized as follows.

- The construction cost of each Road Package shall be less than 3 km and tk. 25 million.
- The construction of one bridge shall constitute a Bridge Package.
- Construction of culverts shall be included in Road Packages.
- Installation of safety measures shall be included in Road Packages.
- The construction of ghats at the gaps larger than 200 m shall be included in Road Packages.
- The construction of one growth center / rural market shall constitute one Market Package.

(5) Procurement methods and packaging

Following the conditions of ICB and NCB and the principle proposed for packaging, the recommended packaging of this Project's components is summarized in Table 6-15. The purchase of vehicles and construction equipment, and consultancy services will follow the ICB method, whereas all construction works under Component 1: Upazila road upgrading, Component 2: Union road upgrading, Component 3: Upgrading of growth centers and rural markets, procurement of construction equipment, office equipment and furniture, and training by NGOs, survey and investigation, and development of office facilities will follow the NCB method.

Table 6-15 Procurement and packaging methods

Item	Procurement method	Packaging
A. ELIGIBLE PORTION BY JICA LOAN		
I. Procurement and construction		
Component 1: Upgrading of Upazila roads		
1.1 Pavement (including culverts and ghats)	Local bidding	3 km/Road Package
1.2 Bridges (for gaps wider than 6 m)	Local bidding	1 bridge/Bridge Package
1.3 Road safety measures	Local bidding	1 road/Road Package
Component 2: Upgrading of Union roads		
2.1 Pavement (including culverts)	Local bidding	3 km/Road Package
2.2 Bridges (for gaps wider than 6 m)	Local bidding	1 bridge/Bridge Package
Component 3: Upgrading of GC and RM		
3.1 Improvement of growth centers	Local bidding	1 GC/Market Package
3.2 Improvement of rural markets	Local bidding	1 RM/Market Package
Component 4: Procurement of vehicles and equip.		
4.0.1 Vehicles	International bidding	1 package
4.0.2 Construction equipment	International and local bidding	1 package
4.0.3 Office equipment and furniture	Local bidding	1 package
II. Procurement of services		
Component 5: Poverty reduction interventions		
5.0.1-1 Tree planting by LCS	Direct procurement	5 km/package
5.0.1-2 Tree caretaking by LCS	Direct procurement	2 km/package
5.0.2 Maintenance of village roads by LCS	Direct procurement	5 to 10 km/package
Component 6: Capacity development		
6.1 Special foundation training by BARD	Direct procurement	1 package
6.2 Overseas training	Direct procurement	1 training/package
6.3 Training by NGOs	Local bidding	1 training/package
Component 7: Consultancy services		
7.0.1 Consultancy services and support staff	International bidding	1 package
B. NON ELIGIBLE PORTION BY JICA LOAN		
III. Project component		
Component 6: Capacity development		
6.4 In-country training, etc. conducted by LGED	N.A.	
Component 7: Upgrading of Upazila roads		
7.1 Pavement (including culverts and ghats)	Local bidding	3 km/Road Package
7.2 Bridges (for gaps wider than 6 m)	Local bidding	1 bridge/Bridge Package
7.3 Road safety measures	Local bidding	1 road/Road Package
IV. Land acquisition		
V. Project operation and recurrent costs		
(a) Project implementation office staff	N.A.	
(b) Office operation cost	Request for quotation	
(c) Survey and investigation	Local bidding	1 survey/package
(d) Maintenance of vehicle and equipment	Request for quotation	
(e) Development of office facilities	Local bidding	1 office/package

Tree-planting and caretaking and village road maintenance will follow the direct procurement method to engage LCSs. Special foundation training and overseas training will also follow direct procurement

method to engage BARD and other overseas training institutions. Procurement necessary for PIO to carry out the operation and maintenance of vehicles and equipment will follow the request of quotation method.

6.3 Implementation schedule

The proposed implementation schedule of contract packages and project implementation schedule are indicated in Table 6-16 and Table 6-17. The Project will start at the beginning of FY 2009/10, i.e., July 2009. The Project appraisal, loan negotiations, establishment of a loan agreement, and development of project preparation documents should be completed before the date of Project commencement. The procurement of consultancy services should be started early enough to prevent delays in implementation. Since it may take more than six months to complete the selection of a consulting firm or a consortium of consulting firms, the process should start well in advance of the date of commencement. Other contract packages of civil works and services should be procured and supervised as efficiently as possible to prevent delays in project implementation, and save the overall cost of investment.

During the first fiscal year, the major activities of the Project will be the preparation and establishment of the PIO and its branches in Faridpur and other Districts, selection and survey of subprojects, local consultations, and finalization of the selection of Upazila roads for upgrading. During the second and third fiscal years, commencement and implementation of construction work will reach their peak period, and by the end of third year, most of the tenders and civil work contracts of Upazila and Union roads should be completed. The fourth year is for supervision, and monitoring and evaluation of construction work, and the last year is reserved for implementation of delayed works caused by unforeseen events.

Regarding the poverty reduction intervention and capacity development components, their peak period should be from the second to fourth years of the Project. During the first year, NGOs and consultants will be selected and engaged for preparation work. The second to fourth years will be the peak activity period for the capacity development components.

6.4 Financing plan and annual cost schedule

Table 6-18 presents the proposed financing plan and annual cost schedule estimated based on the implementation schedule of contract packages shown in Table 6-16. The annual costs for the first, second, third, fourth, and fifth years are distributed at 4 %, 34 %, 37 %, 18%, and 7 % of the total project cost, respectively.

The portion eligible for JICA loan will be used for investment activities, and follows the trend of the implementation schedule of contract packages. The major part of the portion ineligible for JICA loan consists of recurrent costs which are stable and constant throughout the project years.

Table 6-16 Implementation schedule of contract packages

Item	FY 2009/10 (packages)			FY 2010/11 (packages)			FY 2011/12 (packages)			FY 2012/13 (packages)			FY 2013/14 (packages)			Total (packages)		
	FC	LC	Total	FC	LC	Total	FC	LC	Total	FC	LC	Total	FC	LC	Total			
TOTAL PACKAGES (% to the total)	4	17	20	1	290	291	1	301	302	1	161	162	1	56	57	824	832	100%
			2%			35%			36%			19%			7%			
I. Procurement and construction	2	1	3		200	200		211	211		86	86		25	25	8	523	525
Component 1: Upgrading of Upazila roads																		
Road Package					96	96		96	96		36	36		12	12		241	241
Bridge Package					40	40		40	40		15	15		5	5		100	100
Component 2: Upgrading of Union roads																		
Road Package								11	11								22	22
Bridge Package																		
Component 3: Upgrading of GCs and RMs																		
Market Package (growth centers)					23	23		23	23		9	9		3	3		58	58
Market Package (rural markets)					7	7		7	7		3	3		1	1		18	18
Component 4: Procurement of vehicles and equipment	2	1	3															
Component 7: Upgrading of Upazila roads																		
Road Package					21	21		21	21		8	8		3	3		53	53
Bridge Package					12	12		12	12		5	5		2	2		30	30
II. Procurement of services	2	16	17	1	90	91	1	90	91	1	75	76	1	31	32	6	301	307
Component 5: Poverty reduction interventions																		
Tree planting and caretaking by LCS		8	8		45	45		45	45		38	38		15	15		151	151
Maintenance of village roads by LCS		7	7		42	42		42	42		35	35		14	14		140	140
Component 6: Capacity development																		
Training by LGED, NGOs, etc.	1	1	2	1	2	3	1	2	3	1	2	3	1	2	3	5	10	15
Consultancy services																		
Consulting service	1		1													1	1	1

Table 6-17 Project implementation schedule

Items	Contract packages	2009				2010				2011				2012				2013				2014			
		FY 08/09 Q1	FY 08/09 Q2	FY 08/09 Q3	FY 08/09 Q4	FY 2009/10 Q1	FY 2009/10 Q2	FY 2009/10 Q3	FY 2009/10 Q4	FY 2010/11 Q1	FY 2010/11 Q2	FY 2010/11 Q3	FY 2010/11 Q4	FY 2011/12 Q1	FY 2011/12 Q2	FY 2011/12 Q3	FY 2011/12 Q4	FY 2012/13 Q1	FY 2012/13 Q2	FY 2012/13 Q3	FY 2012/13 Q4	FY 2013/14 Q1	FY 2013/14 Q2	FY 2013/14 Q3	FY 2013/14 Q4
Construction Season.																									
Preliminary activities																									
Appraisal mission																									
Exchange of note																									
Loan agreement																									
Preparation of detailed project plan																									
GOB approval																									
I. Procurement and construction																									
Component 1 and 7: Upgrading of Upazila roads																									
Selection of roads																									
Survey and design																									
Tendering																									
Pavement works (including culverts, etc.)																									
Bridges																									
294																									
130																									
Batch 1 (169 packages) Batch 2 (169 packages) Batch 3 (64 packages) Batch 4 (19 packages)																									
Component 2: Upgrading of Union roads																									
Selection of roads																									
Survey and design																									
Tendering																									
Pavement works (including culverts, etc.)																									
Bridges																									
22																									
Batch 1 (11 packages) Batch 2 (11 packages)																									
Component 3: Upgrading of GCs and RMs																									
Selection of GCs and markets																									
Survey and design																									
Tendering																									
Construction of GCs																									
Construction of RMs																									
58																									
18																									
Batch 1 (30 packages) Batch 2 (30 packages) Batch 3 (12 packages) Batch 4 (4 packages)																									
Component 4: Procurement of vehicles and equipment																									
3																									
Batch 1 (3 packages)																									
II. Procurement of services																									
Component 5: Poverty reduction interventions																									
Tree planting and caretaking by LCS																									
Maintenance of village roads by LCS																									
151																									
140																									
Batch 1 (15 packages) Batch 2 (87 packages) Batch 3 (87 packages) Batch 4 (73 packages) Batch 5 (29 packages)																									
Component 6: Capacity development																									
Tendering																									
Training by LGED, NGOs, etc.																									
15																									
Batch 1 (2 packages) Batch 2 (3 packages) Batch 3 (3 packages) Batch 4 (3 packages) Batch 5 (3 packages)																									
Consultancy services																									
Selection of firm																									
Purchase committee approval																									
Consulting service																									
1																									
1 package																									
IV. Land acquisition																									
V. Project operation																									
832																									
Total																									

Table 6-18 Financing plan and annual cost schedule

Item	FY 2009/10 (million tk.)			FY 2010/11 (million tk.)			FY 2011/12 (million tk.)			FY 2012/13 (million tk.)			FY 2013/14 (million tk.)			Total (million tk.)		
	FC	LC	Total	FC	LC	Total	FC	LC	Total	FC	LC	Total	FC	LC	Total	FC	LC	Total
TOTAL PROJECT COST (A+B) (% to the total)	148	250	398	44	3,022	3,065	44	3,299	3,343	44	1,588	1,632	44	617	661	325	8,775	9,100
			4%			34%			37%			18%			7%			100%
A. PORTION ELIGIBLE FOR JICA LOAN	148	189	337	44	2,437	2,480	44	2,671	2,715	44	1,248	1,292	44	433	477	325	6,977	7,302
I. Procurement and construction	117	115	232	2,233	2,233		2,462	2,462		1,055	1,055		305	305		117	6,170	6,286
Component 1: Upgrading of Upazila roads				1,935	1,935		1,935	1,935		726	726		242	242		4,837	4,837	
1.1 Pavement				1,552	1,552		1,552	1,552		582	582		194	194		3,880	3,880	
1.2 Bridges, culverts, and ghats				362	362		362	362		136	136		45	45		906	906	
1.3 Road safety measures				20	20		20	20		8	8		3	3		51	51	
Component 2: Upgrading of Union roads							146	146		146	146					293	293	
2.1 Pavement							146	146		146	146					292	292	
2.2 Bridges and culverts							0	0		0	0					1	1	
Component 3: Upgrading of GCs and RMs				131	131		131	131		49	49		16	16		328	328	
3.1 Improvement of growth centers				107	107		107	107		40	40		13	13		266	266	
3.2 Improvement of rural markets				24	24		24	24		9	9		3	3		61	61	
Component 4: Procurement of vehicles and equipment	114	110	224													114	110	224
Price escalation (foreign 0.5% and local 3%)	1	3	4	126	126		205	205		116	116		41	41		1	491	492
Physical contingency (2%)	2	2	4	41	41		44	44		18	18		5	5		2	111	114
II. Procurement of services	32	73	105	44	204	247	44	209	253	44	193	237	44	128	173	208	808	1,016
Component 5: Pov. reduction interventions	20	20	20	119	119		119	119		99	99		40	40		397	397	
Component 6: Capacity development	4	7	10	7	12	19	7	12	19	7	12	19	7	12	19	32	55	87
6.1 Special foundation training by BARD	2	2	2	4	4		4	4		4	4		4	4		17	17	
6.2 Overseas training	4	1	4	7	1	8	7	1	8	7	1	8	7	1	8	32	5	37
6.3 Training by NGOs	4	4	4	7	7		7	7		7	7		7	7		33	33	
Consultancy services	27	43	70	36	57	93	36	57	93	36	57	93	36	57	93	169	271	441
Price escalation (foreign 0.5% and local 3%)	0	2	2	0	11	12	1	17	18	1	21	22	1	17	18	3	70	73
Physical contingency (2%)	1	1	2	1	4	5	1	4	5	1	3	4	1	2	3	4	14	18
B. PORTION NON-ELIGIBLE FOR JICA LOAN	61	61	61	585	585		628	628		340	340		184	184		1,798	1,798	
III. Project component	2	2	2	426	426		426	426		162	162		57	57		1,073	1,073	
Component 6: Capacity development	2	2	2	4	4		4	4		4	4		4	4		19	19	
Component 7: Upgrading of Upazila roads				422	422		422	422		158	158		53	53		1,054	1,054	
7.1 Pavement				324	324		324	324		122	122		41	41		811	811	
7.2 Bridges, culverts, and ghats				93	93		93	93		35	35		12	12		232	232	
7.3 Road safety measures				5	5		5	5		2	2		1	1		11	11	
IV. Land acquisition	2	2	2	9	9		9	9		9	9		2	2		31	31	
V. Project operation and recurrent costs	48	48	48	97	97		121	121		121	121		97	97		484	484	
VI. Taxes and duties	9	9	9	18	18		23	23		23	23		18	18		90	90	
VII. Price escalation and contingency	0	0	0	35	35		49	49		25	25		10	10		120	120	
(a) Price escalation (foreign 0.5% and local 3%)	0	0	0	26	26		40	40		22	22		9	9		98	98	
(b) Physical contingency (2%)	0	0	0	9	9		9	9		3	3		1	1		22	22	

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7.1 Expected benefits

The impacts generated by similar projects, which are illustrated in Section 4.1 and Annexes 9 through 12, suggest that numerous benefits will result from the implementation of SWBRDP. Some of the more obvious benefits are outlined in Table 7-1.

Table 7-1 Expected benefits of SWBRDP

Sector / Issue	Main direct beneficiaries	Description of expected benefits
Rural transport	<ul style="list-style-type: none"> • Transport operators • Passengers / commuters 	<ul style="list-style-type: none"> • Reduction of travel and transport costs • Reduction in time required for travel and transport • Improved access to markets, schools, hospitals, UPCs, and other facilities • Improved access to employment opportunities
Local industry	<ul style="list-style-type: none"> • Farmers • Fishers 	<ul style="list-style-type: none"> • Improved access to inputs and markets • Improved access to information on production technology and markets • Reduction of post-harvest losses and spoilage • Expansion / introduction of existing / new industry
Real estate	<ul style="list-style-type: none"> • Land owners 	<ul style="list-style-type: none"> • Increase in price of land
Trade	<ul style="list-style-type: none"> • Producers • Traders • Consumers • Government 	<ul style="list-style-type: none"> • Reduction in spoilage of perishable goods • Increase in sellers and buyers • Increase in the number of shops, and goods and services available • Expansion of the catchment area • Increase in trading volume • Increase in market lease revenue
Employment	<ul style="list-style-type: none"> • Local residents • Destitute people 	<ul style="list-style-type: none"> • Increase in employment in construction work • Increase in work specifically targeting the poor • Increase in opportunities to earn cash
Gender	<ul style="list-style-type: none"> • Female shopkeepers / traders • Rural women in general 	<ul style="list-style-type: none"> • Increase in opportunities to trade • Increase in trade and income at markets • Safer and easier access to markets, schools, hospitals and other facilities • Increase in opportunities to engage in activities outside of their homes • Increased employment opportunities

The improvement of rural roads will reduce the time and costs required to travel and transport goods. Access to employment opportunities and facilities such as markets, schools, hospitals, and Union Parishad Complexes (UPCs) will become easier for those who live in areas where roads are newly paved. Those engaged in existing local industries, such as agriculture and fisheries, will benefit from improved access to inputs and markets, reduction of post-harvest losses and spoilage, and improved access to information on production technology and markets through the improved road network and through the development of growth centers and rural markets.

The improved infrastructure is likely to draw additional investments, which in turn will expand

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existing industries and attract new ones. This will have a positive effect on employment. Furthermore, improvement in road communication will encourage NGOs and microfinance institutions to expand their activities for financing various income generating activities of rural households, which ultimately will result in occupational diversification in addition to increased income. In tandem with the increase in investment, land prices will increase along the developed roads and near developed markets.

The improvement of growth centers and rural markets will reduce the spoilage of perishable goods. This will consequently improve the income of the vendors, attract more sellers, buyers, shops, and service providers, and increase the trading volume. This in turn is expected to increase the market lease revenue. Such benefits are multiplied by the simultaneous development of rural roads used to access the growth centers and rural markets.

The civil work implemented by the project will increase employment opportunities for rural people. Many of the rural poor in particular will acquire opportunities to enhance their livelihood through the poverty reduction interventions of the Project. Moreover, the improvement of rural roads will allow them to search for employment opportunities outside of their locality, which will reduce seasonal unemployment and underemployment.

The upgrading of rural roads and markets will have a positive impact on women. Paved roads will improve the mobility of women, as safer transport means will become available. Improved market facilities will make growth centers and rural markets cleaner and safer for women to visit. In addition, the development of Women's Market Sections (WMS's) will enhance business opportunities for women.

The Project's impact on poverty is expected to be substantial. Improving the condition of rural roads and markets has long been recognized in Bangladesh as an effective way to improve rural income and reduce poverty. As the Project focuses on rural areas where the incidence of poverty is high, the project investment will inevitably benefit the poor. The improvement of roads provides the poor with easier access to a broad range of socio-economic opportunities. Lower transport costs and travel time enable the rural poor to travel to find work and attend schools, training centers, and health care centers. The reduction in transport costs will decrease the prices of goods and services.

More importantly, the improvement of markets will provide a better and a more healthy environment for poor market vendors. The use of labor-intensive methods for construction work will create significant employment through the implementation of subprojects. Much of the maintenance work will be delegated to the landless and the disadvantaged women, particularly through the use of Labor Contracting Societies (LCS's). New employment opportunities are expected to be created in transport operation, vehicle repairs and service, and other small businesses.

7.2 Economic evaluation

(1) Key assumptions

The results of the economic analysis of Upazila roads, Union roads, and growth centers proposed for development by the Project, conducted by the SAPROF team, are presented below. The following are the results of the economic analysis of the Project. Annex 19 shows details of the methods and the assumptions applied and the results obtained for individual subprojects. Here are the key assumptions.

- 1) The project life is set at 20 years.
- 2) Price contingency, and taxes and duties are excluded from the costs.
- 3) The cost stream is based on the project costs and project implementation schedule presented in Chapter 6.
- 4) Subprojects of road development are assumed to be completed in two years, 50 % in the first year and the remainder in the second year.
- 5) For incremental operation and maintenance costs, it is assumed that the developed roads will receive routine maintenance every year and periodic resealing every five years. The routine maintenance and periodic resealing costs are estimated to be tk. 50,000 and tk. 500,000 per maintenance, respectively.
- 6) Only the sections of roads to be upgraded from earthen, HBB, and BFS are considered to calculate the stream of costs and benefits.
- 7) Subprojects of growth center development are assumed to be completed in one year.
- 8) For growth centers, the annual operation and maintenance costs are assumed to be 4 % of the capital costs, and other annual miscellaneous costs are assumed to be 2 % of the capital costs.
- 9) A standard conversion factor of 0.8 is used to adjust the local content of costs and goods assumed to be not being traded.
- 10) The benefit of road development is the reduction in Vehicle Operation Costs (VOCs) of motorized and non-motorized vehicles.
- 11) An increase in traffic equivalent to 60 % of the pre-development traffic is assumed after road development. In addition, an 8 % yearly increase in the traffic volume is assumed. However, a factor of 0.6 is applied to the newly-generated traffic to eliminate overestimation since the newly-generated traffic will most likely include traffic diverted from other roads.
- 12) It is assumed that only 40 % and 70 % of the benefit is accrued by the existing traffic in the first and the second year after completion of road development. From the third year onwards, 100 % of the benefit is assumed to be accrued. For the newly-generated traffic, 60 % of the benefit is assumed to be realized in the third year after development completion, and 100 % from the fourth year onwards.
- 13) The benefit of growth center development is the difference in spoilage of perishable goods in the market before and after development.
- 14) It is assumed that spoilage will be eliminated for peak hat-days after development, while no change is assumed for off-peak hat days. In addition, an annual increase in trading volume is assumed to be 5 %. The benefits will be accrued from the second year onward.

(2) EIRR of Upazila roads and Union roads

The Economic Internal Rate of Return (EIRR) was calculated for all roads proposed in the F/S for development. The EIRR of the Upazila roads and Union roads selected for development ranges from 16 % to 47 % and 40 % to 44 %, respectively. The average EIRR is 32 % for Upazila roads and 41 % for Union roads indicating the high economic viability of the selected subprojects.

(3) EIRR of growth centers

The EIRR of the growth centers selected for upgrading ranges from 26 % to 77 %. The average EIRR is 57 %, indicating the high economic viability of the proposed subprojects.

(4) Economic evaluation of the Project

The overall economic rate of return of the Project is estimated at 25 % for the base case. The viability of the Project has been calculated for the following variations of the base case: 1) costs plus 20 %, 2) benefits minus 20 %, and 3) combination of both cases. The results are presented in Table 7-2. None of the scenarios generate an EIRR below 12%, which is the assumed opportunity cost of capital in Bangladesh. Therefore, it can be said that the Project is economically viable.

Table 7-2 EIRR of the Project

Scenario	EIRR
Base Case	25%
1) Costs plus 20%	22%
2) Benefits minus 20%	22%
3) Combination of both cases	19%

CHAPTER 8 Monitoring and evaluation

8.1 Operation and effect indicators

The logical framework¹ for SWBRDP is proposed as indicated in Table 8-1. The objectively verifiable indicators in the logical framework will be used to monitor the progress and effects of SWBRDP. The output-level indicators are operation indicators, while the project purpose-level indicators are effect indicators.

The proposed operation indicators are as follows.

- 1-1 Length (km) of Upazila roads paved
- 1-2 Length (m) of bridges and culverts constructed on Upazila roads
- 1-3 Length (km) of Union roads paved
- 1-4 Length (m) of bridges and culverts constructed on Union roads
- 1-5 Number of ghats developed
- 2-1 Number of growth centers upgraded
- 2-2 Number of rural markets upgraded
- 2-3 Number of Women's Market Sections (WMS's) developed
- 2-4 Number of ghats developed
- 3-1 Number of people employed for Labor Contracting Society (LCS) tree-planting and caretaking
- 3-2 Number of people employed for LCS village road maintenance
- 4-1 Number of training sessions held for stakeholders
- 4-2 Number of stakeholders trained
- 5-1 Number of training sessions conducted for LGED officials
- 5-2 Number of LGED officials trained

Here are the proposed effect indicators².

- 1-1 Volume of traffic on developed roads (by transportation mode)
- 1-2 Number of pedestrians on developed roads (by sex)
- 1-3 Per km travel time on developed roads
- 1-4 Roadside employment along developed roads
- 1-5 Increase in visits to / by health services by / to households along developed roads
- 2-1 Number of hat day sellers
- 2-2 Number of permanent shops in developed markets
- 2-3 Number of temporary shops in developed markets
- 2-4 Market revenue of developed markets

The logical framework and indicators should be reviewed and determined at the beginning of the Project and periodically thereon and may be modified, whenever necessary, with the concurrence of the Project funding bodies.

¹ LGED employs the logical framework approach in its projects to monitor project progress and impacts.

² Data should be collected for each road or market.

Table 8-1 Logical framework of SWBRDP

	Narrative summary	Objectively verifiable indicators	Means of verification	Important assumptions
Overall Goal	Poverty reduced and social gap narrowed in the 14 South-Western Districts of Bangladesh	<ul style="list-style-type: none"> Reduction in incidence of poverty by XX % Increase in household income by XX % Improvement in literacy rate by XX % Improvement in infant mortality rate by XX % 	<ul style="list-style-type: none"> National statistics Post-completion evaluation report 	
Project Purpose	Economic opportunities and accessibility to social services of the rural poor enhanced, and progress made in recovery from natural disaster damage	<ul style="list-style-type: none"> Increase in traffic volume by XX % (by transportation mode) Increase in number of pedestrians by XX % (by sex) Decrease in per km travel time by XX % Increase in roadside employment by XX % Increase in visit to/by health service by XX % Increase in hat day sellers by XX % Increase in number of permanent shops in markets by XX % Increase in number of temporary shops in markets by XX % Increase in market revenue by XX % 	<ul style="list-style-type: none"> Benefit monitoring and evaluation reports; (mid-term and termination) Project completion report 	<ul style="list-style-type: none"> Government line departments and UPs maintain / improve quality and quantity of service provision to citizens Government budget continues to be allocated to maintenance Markets properly maintained by MMCs Political situation remains stable Poverty-focused programs continue Macro-economic stability maintained No major natural calamities
Outputs	<p>1. Rural communication network enhanced through improvement of physical structure of Upazila and Union roads</p> <p>2. Rural trade and agricultural activities enhanced through upgrading of physical facilities of growth centers and rural markets</p> <p>3. Short- and long-term employment opportunities created for the rural poor through development and maintenance of rural infrastructure</p> <p>4. Capacity of stakeholders enhanced in planning, maintenance and operation of rural infrastructure through training</p> <p>5. Capacity of LGED officials enhanced in project planning and management through training</p>	<ul style="list-style-type: none"> 749 km of Upazila roads paved 2,805 m of bridges and culverts constructed on Upazila roads 65 km of Union roads paved 17 m of bridges and culverts constructed on Union roads 2 ghats developed 51 growth centers upgraded 18 rural markets upgraded 22 WMS's developed 54 ghats developed 4,350 people employed in LCS tree-planting and caretaking 1,400 people employed in LCS village road maintenance 68,399 trainee days completed 22,736 trainee days completed 	<ul style="list-style-type: none"> Progress monitoring reports Progress monitoring reports Progress monitoring reports Progress monitoring reports Progress monitoring reports 	<ul style="list-style-type: none"> Government budget continues to be allocated to maintenance Sufficient funds allocated to market maintenance; MMCs fulfill their responsibility for market maintenance Political situation remains stable No major natural calamities Inflation is within expected range Timely procurement of consultants Timely release of funds Timely approval of project

8.2 Monitoring arrangement

8.2.1 Progress monitoring

The progress of the Project will be monitored according to GOB rules and the requirements of JICA. The Annual Development Program Review Format will be compiled on a monthly basis and submitted to Local Government Division (LGD). Next, the Project Monitoring Form will be submitted to the Implementation, Monitoring, and Evaluation Division of the Ministry of Planning on a quarterly basis. Then, the Quarterly Report will be submitted to JICA. It will include information on the physical progress of civil works and the status of training components, with progress measured against the operation indicators. Finally, the Project Completion Report will be compiled and submitted to JICA at project termination.

8.2.2 Effect monitoring and evaluation

Effect monitoring and evaluation will basically follow the LGED guidelines (LGED, 1999) and the methodology employed in RDP-25. In the first year of project implementation, a baseline survey will be conducted prior to the initiation of infrastructure development. The logical framework will be refined, and the effect monitoring and evaluation methodology will be finalized. A mid-term assessment and a terminal assessment will be conducted halfway through and towards the end of the project implementation period, respectively, to evaluate the effects of infrastructure developed.

To evaluate the impacts of the Project more precisely, a survey of control roads and markets is recommended in addition to the survey of roads and markets under the Project, following the methodology employed in RDP-25³. Furthermore, in order to evaluate the Project's impacts on poverty and social development, household surveys along the Project and the control roads are proposed.

The data to be collected include the following. Data related to the effect indicators listed earlier and indicators that represent the impact of the Project are proposed.

(1) Roads

- Traffic count by mode of transportation, e.g., rickshaw, van, and bus on hat days and non-hat days
- Pedestrian count on hat days and non-hat days
- Transport charge by transportation mode for cargo and passengers
- Journey length and time
- Vehicle Operation Costs⁴
- Information on number of shops, industries and other roadside establishments, with information on employment

³ See LGED and GTZ (2006).

⁴ This is done using a structured questionnaire. It covers the costs involved and the revenue derived in operating the vehicle in question. Details are given in Section 4.1.3 of the F/S and LGED (1999).

- Roadside land value

(2) Growth centers / rural markets

- Number of hat day sellers
- Number of permanent shops
- Number of temporary shops
- Annual lease value
- Quality Deterioration Savings⁵

(3) Households

- Information on household members (occupation status, etc.)
- Availability of facilities and services (water supply, sanitation, electricity, etc.)
- Land holding
- Agriculture / aquaculture production, including production costs and values
- Mode and cost of transportation of agricultural / aquacultural products;
- Labor wage rates
- Food sufficiency and consumption
- Household income and expenditure
- Visit to / by health services
- Household assets in terms of structures, livestock, and equipment

⁵ This involves survey of maximum unit price, and total sales quantity and revenue of selected perishable goods. Details are given in Section 4.1.3 of the F/S and LGED (1999).

CHAPTER 9 Environmental and social considerations

9.1 Legal and institutional framework

9.1.1 Legal framework related to environmental and social considerations

(1) Environmental assessment

In Bangladesh, the Environment Conservation Act 1995 and the relevant rules and guidelines constitute the legal framework for environmental assessment. The Act presents guiding principles to ensure appropriate environmental assessment, and the Environment Conservation Rules 1997 provides the detailed procedures and requirements. All development projects shall obtain Environmental Clearance Certificates (ECCs) in accordance with the Act and the Rules. The Rules classify development projects into four categories, i.e., Green, Orange-A, Orange-B and Red, and stipulate requirements to obtain ECC for each category (Table 9-1). The flowcharts describing the procedures for the Orange-B and Red categories are presented in Annex 20.

Table 9-1 Requirements by environmental categories

Category	Requirements
Green	General information, no objection certificate (NOC) from local authority, etc.
Orange-A	General information, NOC, layout plan, waste discharge arrangement, etc.
Orange-B	Initial Environmental Examination (IEE), Environmental Management Plan (EMP), NOC, etc.
Red	Environmental Impact Assessment (EIA), EMP, NOC, etc.

Source: Environmental Conservation Rules (1997)

If a project consists of multiple subprojects, a project proponent needs to obtain an ECC for each subproject in accordance with the Environment Conservation Rules 1997. Thus, for SWBRDP, LGED needs to obtain an ECC for each subproject prior to their commencement.

(2) Land acquisition

The Acquisition and Requisition of Immovable Property Ordinance 1982 (hereinafter “Ordinance 1982”) is the legal instrument for the acquisition of private land for public use. The Acquisition and Requisition of Immovable Property Rules 1982 and the Executive Directives (“Manual 1997”) present detailed procedures for land acquisition. Land acquisition below 50 *bigha* (approximately 6.7 hectares) is handled by the Deputy Commissioner, while that of over 50 *bigha* is under jurisdiction of the Ministry of Land. With regard to rural infrastructure projects executed by LGED, land acquisition over 50 *bigha* is generally not expected.

9.1.2 Institutional framework related to environmental and social considerations

(1) Environmental Unit of LGED

The Environmental Unit, headed by an Executive Engineer, was established in 2003 under the Integrated Water Resource Management Unit (IWRMU). The major function of the Unit is to handle environmental and social issues related to all LGED's activities. It reviews the Initial Environmental Examination (IEE) and Environmental Impact Assessment (EIA) of respective projects and evaluates the adverse impacts of proposed and completed subprojects.

The Environmental Unit also elaborated the "Environmental Assessment Guidelines for LGED Projects" in 2008. The guidelines indicate potential impacts of rural infrastructure projects, and standard formats for IEE and EIA.

(2) Department of Environment

The Department of Environment (DOE) within the Ministry of Environment and Forest is the agency responsible for the enforcement of the Environment Conservation Act 1995 and the Environment Conservation Rules 1997. In accordance with the Act and Rules, the ECC, required for implementing development projects, is issued by DOE.

(3) Deputy Commissioner

Under the Ordinance 1982, the Deputy Commissioner (DC) is entrusted to acquire private land below 50 bigha for project executing agencies such as LGED. Upon receiving a request from an executing agency, the DC takes necessary procedures to acquire private land. The DC makes the decision to acquire land, assesses values of land and other properties to be acquired, and pays compensations to affected persons.

9.2 Environmental and social impacts

9.2.1 Project description

The Project area covers a total of 14 Districts situated in Greater Faridpur, Barisal Division, and Greater Khulna. The characteristics of the Project area are described in Chapter 3. Physical infrastructure components of the Project are to upgrade 881 km of existing Upazila roads and 69 km of existing Union roads, including five bridges over 100 m, and 58 growth centers and 18 rural markets. The upgrading of Upazila and Union roads involves bituminous pavement of unpaved sections, road widening as per Road Design Standards 2005 (RDS/2005), minor realignment, construction of bridges and ghats, and installation of culverts and other facilities. With regard to growth centers and rural markets, major components are access and internal road rehabilitation, improvement of drainage facilities, construction of modern sheds, installation of sanitary latrines and tubewells, and construction of garbage pits.

9.2.2 Environmental category

JBIC Environmental Guidelines for Confirmation of Environmental and Social Considerations

The Project was classified as Category B according to the JBIC Environmental Guidelines for Confirmation of Environmental and Social Considerations 2002 (“JBIC Environmental Guidelines”). This means that the proposed subprojects are expected to have certain adverse impacts, though the impacts are not expected to be significant.

Bangladesh Environmental Conservation Rules 1997

As per Environmental Conservation Rules 1997, the upgrading of Upazila and Union roads falls into the Orange-B category, for which IEE is required. In addition, construction of a bridge over 100 meters is classified into the Red category where EIA is compulsory. Upgrading of growth centers and rural markets may belong to the Orange-B category, since the installation of public toilets is classified as Orange-B.

Table 9-2 Main check items of the environmental checklist for SWBRDP

Category	Environmental Item	Main check items
Permits and explanation	Environmental Clearance Certificate (ECC)	<ul style="list-style-type: none"> Necessary procedures to obtain ECC Progress of the required legal procedures
	Information disclosure to, and consultations with, the public	<ul style="list-style-type: none"> Adequacy of public consultations Status of information disclosure
Mitigation measures	Air quality	<ul style="list-style-type: none"> Compliance with the national standards
	Water quality	<ul style="list-style-type: none"> Water quality degradation caused by soil erosion Effluent water from markets
	Wastes	<ul style="list-style-type: none"> Cleaning of construction sites Waste collection and disposal system
	Noise and vibration	<ul style="list-style-type: none"> Compliance with the national standards
	Protected areas	<ul style="list-style-type: none"> Possibility of affecting protected areas
	Ecosystem	<ul style="list-style-type: none"> Impacts on wildlife and vegetation
	Hydrology	<ul style="list-style-type: none"> Alteration of surface and ground water flows Adequacy of the capacity of drainage facilities
	Topography and geology	<ul style="list-style-type: none"> Possibility of significant alteration of topography
Social Environment	Resettlement	<ul style="list-style-type: none"> Possibility of resettlement
	Land acquisition	<ul style="list-style-type: none"> Possibility of land acquisition Prior explanation and proper compensation Attention to the vulnerable groups
	Living and livelihood	<ul style="list-style-type: none"> Possibility of adverse impacts on local livelihoods Prior explanation and proper compensation
	Heritage	<ul style="list-style-type: none"> Existence/nonexistence of culturally important sites
	Landscape	<ul style="list-style-type: none"> Possibility of adverse impacts on local landscape
	Ethnic minorities and indigenous peoples	<ul style="list-style-type: none"> Attention to ethnic minorities and indigenous peoples
Others	Impacts during construction	<ul style="list-style-type: none"> Adequacy of mitigation measures Health and safety education to construction workers
	Monitoring	<ul style="list-style-type: none"> Efficiency and effectiveness of monitoring system

Source: SAPROF team

9.2.3 Environmental checklist

An environmental checklist for the Project was developed in consultation with the Project Director and

DOE. The checklist is based largely on checklists attached to the JBIC Environmental Guidelines, but some modifications were made to adapt them to the characteristics of the Project. Insights gained through IEE also provided important feedbacks for refining the checklist. The key check items are summarized in Table 9-2. The full environmental checklist is attached as Annex 21. A brief description of the current status at the SAPROF phase and points to be noted are also added to the checklist for convenience during the subsequent phases.

9.2.4 Initial environmental examination

(1) Methodology

A literature survey and a field investigation were conducted to identify potential environmental and social impacts and their significance. Relevant documents prepared by LGED and donors, including environmental assessment reports of past rural infrastructure projects, were examined to estimate the environmental implications of the Project. The field investigation was undertaken on sample roads and in markets. The sample roads and markets were selected based on the priority ranking of subprojects, natural characteristics of nearby areas, and consultations with District Executive Engineers. Roads and markets improved under past similar projects were also investigated, since lessons derived from the past experiences would provide valuable insights for the Project. The surveyed sample subprojects are summarized in Table 9-3.

Table 9-3 Number of sample subprojects

Division	District	Number of sample subproject		
		Upazila road	Union road	Growth center
Barisal	Barisal	3	-	2
	Patuakhali	2	1	2
	Pirojpur	3	-	2
Greater Faridpur	Faridpur	5	-	5
	Madaripur	1	1	2
	Shariatpur	3	-	2
Greater Khulna	Bagerhat	2	-	2
	Khulna	4	-	2
Total		23	2	19

The field survey on the sample subprojects was carried out by the SAPROF team and LGED engineers at the Upazila and District levels. During the field survey, a number of interviews with local stakeholders, including road and market users, farmers, land owners, and other local residents, were conducted to hear their perceptions on rural infrastructure projects.

(2) Potential impacts caused by upgrading of Upazila and Union roads

a) Overall impact

Table 9-4 demonstrates the overall rating of potential impacts of road upgrading based on the results of the literature and field survey.

Certain adverse impacts associated with the road upgrading are anticipated, though the impacts are not

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expected to be significant. Major adverse impacts identified are soil erosion caused by construction works and acquisition of roadside land. However, the Project will also bring positive effects such as improved drainage systems, increased accessibility to markets and public facilities, reduced soil erosion of road embankments, and creation of local employment. The potential impacts of road improvement are summarized in the following sections.

Table 9-4 Overall rating of potential adverse impacts of road improvement

Impacts	Overall rating of impacts			
	Construction phase		Operation phase	
	Positive	Negative	Positive	Negative
Air quality/dust	Nil	Low	Nil	Nil
Water quality	Nil	Low	Low	Nil
Soil erosion	Nil	Medium	Medium	Nil
Noise/vibration	Nil	Low	Nil	Nil
Wastes	Nil	Low	Nil	Nil
Protected areas	Nil	Nil	Nil	Nil
Ecosystem	Nil	Low	Nil	Low
Regional hydrology/drainage	Nil	Low	Medium	Nil
Topography and geology	Nil	Low	Nil	Nil
Living and livelihood	Nil	Low	Medium	Low
Heritage	Nil	Low	Nil	Low
Landscape	Nil	Nil	Nil	Nil
Ethnic minorities/indigenous peoples	Nil	Low	Nil	Nil
Resettlement	Nil	Nil	Nil	Nil
Land acquisition	Nil	Medium	Nil	Medium
Safety/health	Nil	Low	Nil	Low

Note: Medium, Low, and Nil indicate medium impacts, low impacts, and no or negligible impacts are expected, respectively.

b) Air quality/dust

During the construction phase, negligible amounts of air pollutants will be emitted from heavy machinery and construction vehicles. Local residents in the vicinity of the work sites will be temporarily disturbed by limited dust pollution. The overall adverse impacts are, however, expected to remain low, since the works are unlikely to be large-scale.

In terms of air pollution from motor vehicles at the operational phase, there is no risk of pollution, since the current traffic volume of motor vehicles on Upazila and Union roads is too small to cause air pollution. The volume of vehicles on most roads is less than 100 passenger car units per day, and even the most trafficked roads have only 600 per day. In addition, industrial areas, which may cause cumulative effects, are not identified in the vicinity of planned roads. It can therefore be concluded that road improvement will not cause air pollution. The air quality also will not exceed the Bangladesh ambient air quality standards provided in Schedule 2 of Environmental Conservation Rules 1997.

c) Water quality

Road rehabilitation works, such as earthmoving works associated with road surface grading and embankment rehabilitation, may cause soil runoff, which will eventually cause water quality degradation of roadside water bodies such as rivers and canals. Some negative impacts will be

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expected if the works are carried out during the rainy season. Construction materials such as bituminous material and other petro-chemicals may also cause water pollution if the chemicals spill out.

d) Soil erosion

Rehabilitation works involving clearing, excavating and other earthmoving activities may cause soil erosion. The impacts are, in particular, expected to be significant if the works are carried out during the rainy season. The soil texture will also affect the stability of embankments.

The field survey revealed that most unimproved roads are suffering from soil erosion and runoff. The erosion and runoff are particularly severe at the road sections along water bodies. However, the planned road rehabilitation works aim to address erosion and runoff problems by the compaction of embankment soils, re-vegetation of embankments, and installation of proper drainage facilities. Comparative investigations between improved sections of roads and the unimproved sections proved that the planned improvement works have preventive effects on soil erosion. Thus, the overall impacts of the rehabilitation works on soil erosion are considered positive.

e) Noise/vibration

Noise and vibration caused by heavy machinery and construction vehicles may temporarily disturb nearby residents, though the impacts are limited. At the operation phase, no significant noise and vibration are anticipated, since the traffic volume of motor vehicles on the Upazila roads are expected to be small.

f) Wastes

Road improvement works may generate a certain amount of wastes such as unused construction materials. The wastes may negatively affect the surrounding environment if they are left at the construction sites.

g) Protected areas

Protected areas in Bangladesh include eight National Parks, seven Wildlife Sanctuaries, one Game Reserve and five other conservation sites. The sites are designated by the Bangladesh Wildlife (Preservation) Order 1973 and managed by the Forest Department. In the Project area, there are two wildlife sanctuaries, i.e., the Char Kukri-Mukri Wildlife Sanctuary in Bhola District, and the Sundarban Wildlife Sanctuary in Bagerhat, Khulna and Satkhira District. However, no subprojects are planned within these protected areas. It is therefore concluded that the Project will not negatively affect the protected areas.

h) Ecosystem

The removal of trees and other vegetation are inevitable in road widening and embankment rehabilitation works, since many existing trees and grasses are situated on the paths of planned road alignments. The scale of vegetation clearance, however, will be minor, as no new roads are planned to be constructed by the Project. The possibility that primeval forests or valuable ecosystems are situated adjacent to the candidate roads is very low, because all of them are existing alignments.

i) Regional hydrology/drainage

Temporary interruption of natural drainage and flood passage is anticipated during the construction phase. Storage of soils, sand, and construction materials may impede natural drainage. This typically occurs if the rehabilitation works are undertaken during the rainy season. Increases in embankment heights of currently submersible roads may also affect regional hydrology.

The field survey confirmed that some drainage facilities of existing roads are not currently functioning well because they are inadequate in number and capacity. The drainage congestion problems also cause embankment erosion or soil runoff due to the increased pressure of flood water on the embankments. However, the planned civil works are expected to contribute to the improvement of the drainage problems by providing additional cross drainage capacities. The impacts on regional hydrology are, therefore, considered overall positive.

j) Topography and geology

Certain alterations to the topography of the Project area and land are expected due to road realignments, embankment widening, development of borrow pits, and other rehabilitation works. However, the Project will not cause major alterations to the topography, since no large-scale civil works are planned. In addition, the Project area is an overall flat land where significant landslides are not expected.

k) Living and livelihoods

Road improvement will not cause significant adverse impacts on local living and livelihoods. However, workers for ferry and boat transportation and other ferry-related workers, including shopkeepers at ghats, may be adversely affected where new bridge construction is planned. For instance, on the Arial Khan River of Madaripur District where a new bridge is planned to be constructed, both engine ferries and manual boats now operate for river crossing. Such workers will lose their income as a consequence of bridge construction. Fish and shrimp culture ponds, which are very common in the Project area, may be disturbed to some extent during the construction phase.

The improvement works will create temporary job opportunities for local people at the construction phase. Furthermore, improved roads will increase the accessibility of local goods and people to the nearby markets and bigger towns and cities. This will in turn provide long-term income-generating opportunities.

l) Heritage

There are a number of heritages and cultural sites in the Project area, but no such sites were found to be situated within any subproject road alignments. However, it is possible that religiously and culturally important sites such as mosques, Hindu temples, and graveyards become affected by the road improvement works.

m) Landscape

Road improvement works will not have adverse impacts on landscape, since the works will not

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involve new road construction and will not be large-scale.

n) Ethnic minorities and indigenous peoples

There are a few indigenous groups in the Project area: the Munda in Khulna and Satkhira Districts and the Rakhain or Marma in Patuakhali District. Inhabitants belonging to these groups have not been identified in the vicinity of subproject sites at the SAPROF phase, but there remains a certain possibility that the Project will disturb their lives and cultures.

o) Resettlement

Involuntary resettlement will not be required for the Project. If involuntary resettlement found to be unavoidable, the subproject will be considered unqualified and will be dropped from the candidate list.

p) Land acquisition

Road improvement will inevitably require some amount of land acquisition. In particular, road widening and realignment and construction of bridge approach roads will require the acquisition of land. During field investigations, several portions of sample roads were found to require road widening or realignment, which would eventually involve acquisition of private land. Although the area of land to be acquired is expected to be small, impacts of land loss for vulnerable people including small hold farmers, female-headed households, and the rural poor could be significant.

q) Safety/health

Road safety problems at work sites could be significant unless proper measures, such as signs or guards on the sites, are properly undertaken. The field survey revealed that there are one or more sharp curves, which may cause traffic accidents, in the respective sample roads. There is also the risk that infectious diseases such as HIV/AIDS could spread as a result of the inflow of construction workers.

(3) Mitigation measures for road subprojects

Necessary measures to mitigate the above potential impacts are described in Table 9-5.

Table 9-5 Mitigation measures for road upgrading

Impacts	Mitigation measures
Air quality/ dust	<ul style="list-style-type: none">• Water should be sprayed on the construction site to minimize the effects of dust.• Implementation schedules of the works should be distributed in advance to nearby residents.
Water quality	<ul style="list-style-type: none">• Measures described in the "soil erosion" section should be taken properly.• Chemicals shall be treated carefully to prevent spilling.
Soil erosion	<ul style="list-style-type: none">• The implementation of earthworks shall be restricted to the dry season.• Vegetation clearance should be minimized at the construction phase.• Soils for embankments should be properly tested and compacted to ensure stability.• It is critical to ensure proper compaction of embankment soils along with grass turfing and protective tree-planting on batter slopes. In particular, road embankments adjacent to water bodies such as rivers and canals need to be properly compacted and covered by grass and trees.

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Table 9-5 Mitigation measures for road upgrading (continued)

Impacts	Mitigation measures
Noise/ vibration	<ul style="list-style-type: none"> • Construction works shall be restricted to daytime hours so as to avoid/mitigate the disturbance of local lives. • Implementation schedules of the works should be notified in advance to nearby residents.
Wastes	<ul style="list-style-type: none"> • LGED should request and supervise contractors to clean up all construction wastes and unused materials after completion of rehabilitation works.
Ecosystem	<ul style="list-style-type: none"> • When determining detail road designs and specifications, efforts should be made to conserve as many trees and other vegetations as possible. • Existence/nonexistence of valuable ecosystems shall be confirmed prior to the detailed design phase. • Re-vegetation and replanting will be necessary if rehabilitation works involve extensive vegetation clearance.
Regional hydrology/ drainage	<ul style="list-style-type: none"> • Earthworks shall be restricted to the dry season. • Storage areas for soils and other construction materials should be carefully selected to avoid disturbance of natural drainage. • Installation of a sufficient number of functional culverts and other drainage facilities is vital. Culverts, bridges and other structures should be carefully designed to ensure sufficient cross drainage capacity.
Topography and geology	<ul style="list-style-type: none"> • Earthworks shall be restricted to the dry season. • Embankment soils should be properly compacted and covered by vegetations.
Living and livelihood	<ul style="list-style-type: none"> • If large-scale bridge construction is planned where ferry services operate, the plan of bridge construction should be explained well in advance to ferry-related workers so that they have enough time to find new income generating means. • Civil works should be designed to minimize the disturbance of fish ponds.
Heritage	<ul style="list-style-type: none"> • Important cultural sites shall be identified before the detailed design phase, and protection measures need to be incorporated into the detailed design. The measures should focus on avoiding disturbance of cultural and religious customs. • Hours for construction works shall be decided to avoid any disturbance. • LGED shall obtain agreements from local residents prior to the construction works.
Ethnic minorities / indigenous peoples	<ul style="list-style-type: none"> • Existence/nonexistence of residences of indigenous peoples shall be confirmed before the detailed design phase. • If the residences are identified, agreements from them should be obtained prior to the commencement of civil works.
Land acquisition	<ul style="list-style-type: none"> • Prior to road improvement works, it is critical to gather information on the physical and social characteristics of the lands adjacent to target roads through field surveys and local consultations. Then, detailed designs and specifications need to be determined on the basis of the survey results. Priority should be given to the avoidance and minimization of land acquisition. • If land acquisition is unavoidable, LGED needs to hold consultations with affected persons, and obtain their respective agreements on land acquisition. The land acquisition process shall be conducted in line with the Ordinance 1982. • Reasonable compensation shall be paid to the project affected persons (PAPs). Buildings, crops, trees and other assets shall also be properly compensated for. The amount of compensation shall be determined based on the replacement values.
Safety / Health	<ul style="list-style-type: none"> • Prior to the commencement of rehabilitation works, potential safety hazards should be explained to construction workers. • Warning signs and guards to prevent traffic accidents need to be placed well in advance of construction sites. • Warning signs, mirrors, and other safety facilities should be installed at sharp curves. • Construction workers should be provided with basic information on infectious diseases including HIV/AIDS. This is particularly important where construction workers are brought in from other areas.

(4) Environmental and social issues regarding market improvement

a) Overall impacts

Rehabilitation works of growth centers and rural markets will ameliorate current problems such as poor drainage, lack of proper sanitation, and mismanagement of solid waste. Thus, environmental and social impacts of market upgrading are expected to be overall positive, and the only possible adverse impact pertains to land acquisition. Key issues regarding market upgrading are summarized below.

b) Poor drainage condition

The field survey revealed that there were no or few effective drainage systems in the sample growth centers that were not yet upgraded. Even in the upgraded growth centers under RDP-24 and -25, some drains did not function well because of congestion caused by dumped garbage. It is therefore crucial not only to construct or rehabilitate drainage facilities but also to establish an effective maintenance system. In addition, the installation of internal road-cum-drains, i.e., depressed internal roads that have a drainage function, should be considered. This type of drain would not induce garbage dumping, while deep roadside drains frequently become congested by dumped garbage.

c) Lack of proper sanitation

Lack of proper sanitation has the potential to cause ground and surface water pollution. Unimproved growth centers investigated during the field survey either lacked sanitary latrines or had a few latrines in poor condition. Installation of the required number of sanitary latrines with septic tanks and/or soak wells will be necessary to keep markets clean and sanitary and to prevent degradation of nearby water bodies. Maintenance of sanitary latrines is also a critical issue. During the field survey, not a few latrines in growth centers upgraded under RDP-24 and -25 were found to be in unhygienic conditions due to the lack of proper maintenance. Market Management Committees (MMCs) should, therefore, ensure proper maintenance of the latrines.

d) Mismanagement of solid waste

Few of the growth centers investigated during the field survey have garbage bins or waste disposal sites. Wastes are often dumped into nearby water bodies and internal drains and cause water quality degradation and congestion problems. It is therefore necessary to install garbage bins or waste disposal sites in growth centers and rural markets. Over 90 % of solid wastes generated in the markets are organic wastes such as slaughter and vegetable wastes according to MMC Members. Hence recycling wastes by composting them for use as organic fertilizers can be an effective option for solid waste management.

e) Land acquisition

Upgrading of some growth centers and rural markets may require small-scale land acquisition for the construction of sheds and other physical infrastructure improvement. The same mitigation measures to be undertaken for road upgrading should be undertaken properly.

f) Safety of drinking water

Lack of safe water supply facilities can have severe implications on human health. The field survey

revealed that most growth centers had water supply facilities, but the numbers were inadequate, and some of them were inoperative. Adequate numbers of tubewells and other water facilities should be installed in the markets. Water quality inspection of tubewells is also recommended.

9.2.5 Environmental management plan

The Environmental Management Plan (EMP) is a crucial tool to ensure that the Project is implemented in an environmentally and socially sound manner. The Environmental Assessment Guidelines for LGED Projects presents the standard format of EMP, which covers all the required aspects for rural infrastructure projects. DOE also confirmed the appropriateness of the format. EMP for SWBRDP therefore needs to be formulated in line with the guidelines. The structure of EMP is presented below.

- 1) Identification of significant adverse environmental impacts
- 2) Mitigation measures, including responsibility, schedule, and budget
- 3) Environmental monitoring plan
- 4) Institutional strengthening and training program
- 5) Public involvement
- 6) Cost estimates
- 7) Implementation schedule and reporting procedures

9.3 Land acquisition and resettlement

Land acquisition and resettlement are two of the major adverse impacts associated with rural infrastructure development. Moreover, land acquisition and resettlement, which require time consuming legal procedures, often cause delay in project implementation. This section, therefore, focuses on land acquisition and resettlement issues to mitigate their adverse impacts and contribute to the smooth implementation of the Project. Detail information is presented in Annex 22.

9.3.1 Possibility of land acquisition and resettlement

Possibility of involuntary resettlement

No involuntary resettlement is expected for the Project, since one of the eligibility criteria for road selection is “no resettlement is required.” If some Upazila and Union roads cannot satisfy this criterion, these roads shall be excluded from the subproject list of the Project. This basic principle was confirmed by the Project Director of LGED.

Possibility of land acquisition

There is a possibility that land acquisition will be required for the following cases: 1) widening of roads to meet RDS/2005; 2) realignment of roads to ease curve radii; 3) increase in the embankment height of roads; 4) construction of approach roads for large-scale bridges; and 5) development of growth centers and rural markets.

9.3.2 Estimate of the scale of land acquisition

The precise area of land to be acquired in the Project cannot be estimated at the SAPROF phase. This is because sizeable areas to be acquired are considered public lands (*khash* lands), and some lands will be acquired through voluntary donations. In addition, detailed road designs have not been determined yet. The study therefore makes a rough estimate of the area to be acquired using available data, i.e., the areas acquired in similar projects in the past. Actual figures from RDP-24 and -25 are used as reference, as SWBRDP is similar to these projects in terms of the target Districts. Table 9-6 indicates the areas of land actually acquired for RDP-24 and -25.

Table 9-6 Land acquisition of the past similar projects

Project	Area of the acquired land (ha)	Total length of upgraded road (km)	Acquired Land per kilometer (ha)
RDP-24	14	638	0.022
RDP-25	22.75	1226	0.019

Source: Interviews with Project Implementation Office of RDP-24 and RDP-25

The areas of land to be acquired in Greater Faridpur are estimated based on the figure of RDP-24. Similarly, the figure of RDP-25 is employed to estimate the areas to be acquired in Barisal Division and Greater Khulna. A total of 17.14 ha are estimated to be acquired for the Project.

9.3.3 Points to consider for land acquisition

(1) Voluntary donation

In Bangladesh, donation of land is widely practiced when small pieces of land are required for public use. This is particularly common in Upazila and Union road projects, which will require strips of roadside land. The reason why affected persons often donate their land, rather than request compensations, is that they expect rises in property values as a result of road improvement. Local stakeholder interviews proved that many local people, including farmers and shopkeepers, were willing to contribute their land for road improvement projects. Many of them answered that the land donation would bring long-term benefits such as increase in land value and improved accessibility to other areas, though people who were unfavorable to land donation were also identified.

As long as it is considered voluntary, the donation of land is considered acceptable. It is, however, necessary to clarify what conditions should be satisfied for the donation to be justified, since donations could become compulsory or involuntary and cause social conflicts. When land is donated for rural infrastructure projects, the following points at the very least need to be confirmed.

- Donations of land shall be voluntary. If land owners decline to donate the land, any form of political pressure on the owners to donate their land shall be prohibited.
- Voluntary donation shall not affect the living standards of the land owners. For instance, if an owner donates sizable parts of his/her land, such donation shall be deemed to negatively affect the owner's living standards.

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- Donations from vulnerable people shall be prohibited. Vulnerable groups include female-headed households, small-hold farmers, the rural poor, and those who have limited sources of income.

The above points need to be confirmed through careful consultations with land owners. It is crucial to verify their actual perceptions on the donation. If some donations are found to not comply with the above criteria, land acquisition procedures in accordance with the Ordinance 1982 shall be undertaken, and reasonable compensations shall be paid.

(2) Amount of compensation

Interviews with Land Acquisition Officers of sample Districts revealed that the majority of complaints related to land acquisition are those on underestimated land values. The DC decides the value of land to be acquired based on the average price of land transactions of the past 12 months in the vicinity. 150% of the value is fixed as the amount of compensation. However, the amount of compensation is frequently lower than the market price, because the average price of land identified by the DC does not properly reflect the replacement values. Although land to be acquired for road upgrading projects is roadside land whose value is typically higher than other plots of land, value estimations often include the prices of land situated far away from road alignments, because of lack of sufficient information on transactions of roadside land. It is therefore recommended to conduct additional surveys on the market values of land and to adjust the amounts of compensation based on the survey results.

(3) Improvement of payment system to reduce burdens of PAPs

Project Affected Persons (PAPs) who want to claim compensations are required to collect a number of official documents, such as certified copies of land registration records, to prove their titles. This is a time-consuming and burdensome process for PAPs. They incur transaction costs such as transportation costs and application fees for the documents. In addition, it is difficult for some PAPs to understand complex legal procedures and to complete the procedures successfully. LGED, therefore, in cooperation with DC officers, should provide technical assistance to PAPs to reduce such burdens.

The following measures should be considered to reduce the burdens of PAPs.

- Information on required documents and formats should be properly provided to PAPs. An exemplary information provision system is the information counter at the Faridpur DC office. It displays a list of required documents and provides necessary advice to PAPs.
- The use of on-site procedures should be considered. In Pirojpur, Faridpur and Khulna, for example, some procedures, such as issuing notification letters and making payment of compensations, are sometimes conducted at the residences of PAPs.

9.4 Environmental monitoring mechanism

The JBIC Environmental Guidelines emphasizes post-funding monitoring activities. Environmental monitoring comprises of: 1) verifying compliance with the mitigation measures proposed in IEE or EIA; 2) checking the effectiveness and adequacy of the proposed mitigation measures; 3) taking additional measures if the proposed measures are found to be inadequate; and 4) taking necessary

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measures if unexpected problems emerge.

(1) Monitoring items

Key environmental impacts to be monitored in the Project are identified based on the potential impacts discussed in Section 9.2. Table 9-7 shows the monitoring items for the Project.

Table 9-7 Environmental monitoring items for Upazila and Union road improvement

Phase	Key impact	Monitoring item
Pre-construction	Environmental clearance	<ul style="list-style-type: none"> • Verify compliance with the conditions attached to the ECC by DOE
Construction	Air quality/dust	<ul style="list-style-type: none"> • Confirm whether measures to minimize dust such as spraying water are properly undertaken
	Water quality	<ul style="list-style-type: none"> • Check whether earthworks are undertaken in the dry season
	Soil erosion	<ul style="list-style-type: none"> • Check whether earthworks are undertaken in the dry season • Check whether soil protection measures, e.g., such as soil compaction and minimization of vegetation clearance, are properly undertaken
	Noise/vibration	<ul style="list-style-type: none"> • Check whether construction works are conducted during daytime hours • Check whether local residents are informed of the schedule of works
	Wastes	<ul style="list-style-type: none"> • Check whether construction sites are cleaned by contractors
	Ecosystem	<ul style="list-style-type: none"> • Check whether subprojects cause large-scale vegetation clearance • Check whether conservation measures are properly undertaken
	Regional hydrology/ drainage	<ul style="list-style-type: none"> • Check whether earthworks are undertaken in the dry season • Check whether construction materials are properly stored to avoid disturbance of local hydrology • Check whether the capacity of drainage facilities is adequate
	Living and livelihoods	<ul style="list-style-type: none"> • Check whether there are people who may lose income sources, such as workers on ferries and shopkeepers near ghats • Check whether such people are informed well in advance
	Land acquisition	<ul style="list-style-type: none"> • Check whether the land acquisition procedure is properly undertaken, focusing on consent of PAPs, proper compensation, and attention to vulnerable persons • Confirm the perceptions of PAPs on the Project
	Safety/health	<ul style="list-style-type: none"> • Check whether potential safety hazards and health issues are explained to construction workers
Operation and maintenance	Soil erosion	<ul style="list-style-type: none"> • Check the conditions of embankment to evaluate adequacy of soil protection measures
	Regional hydrology/ drainage	<ul style="list-style-type: none"> • Check whether regional hydrology is disturbed by the subproject • Check whether the capacity of drainage facilities is adequate
	Living and livelihoods	<ul style="list-style-type: none"> • Confirm the perceptions of PAPs on the Project
	Land acquisition	<ul style="list-style-type: none"> • Confirm the perceptions of PAPs on the Project • Check whether affected persons have any complaints
	Safety/health	<ul style="list-style-type: none"> • Check whether safety measures such as the installation of a sufficient number of warning signs are undertaken • Confirm the perceptions of local residents

(2) Monitoring mechanism

a) Institutional arrangement

The F/S prepared by LGED proposes to utilize the Environmental Unit for the environmental monitoring of the Project. The Unit is expected to oversee broad environmental and social issues related to LGED's activities. However, given the current limitations of human resources and

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institutional capacity, it seems difficult for the Environmental Unit to play a substantial role in the environmental monitoring of individual projects. It consists of only four personnel, i.e., one Executive Engineer, one Assistant Engineer in charge of environmental issues, one Assistant Engineer responsible for safeguard issues, and one data entry operator. According to the Executive Engineer, the Environmental Unit currently serves as a liaison office to DOE and other relevant organizations rather than committing to individual projects.

Apart from the Environmental Unit, few staff members within LGED have sufficient capacity to handle environmental and social considerations. Thus SWBRDP will not be able to rely on LGED's in-house capability in terms of environmental monitoring. Therefore, the Project Implementation Office (PIO) of SWBRDP should establish an internal section for environmental monitoring.

Table 9-8 Responsibilities of relevant entities at each project stage

Responsibility	Pre Construc- tion	Construc- tion	Operation
Project Implementation Office (PIO)			
[Assistant engineer in charge of the environmental monitoring]			
• Overall supervision of environmental monitoring	√	√	√
• Supervise EC in elaborating an environmental monitoring plan	√		
• Supervise and assist EC in conducting activities for environmental monitoring		√	√
[Environmental consultant (EC)]			
• Elaborate an environmental monitoring plan, including monitoring items and field survey schedules	√	√	√
• Perform quarterly environmental monitoring activities for the Project, including field surveys and interviews with local residents		√	√
• Analyze local complaints transferred from UE via XEN and make recommendations on how to address them		√	√
• Elaborate quarterly environmental monitoring reports that describe the problems identified and recommend solutions		√	√
District Executive Engineer (XEN)			
• Supervise and assist UE in supervising contractors		√	√
• Assist PIO (in particular EC) in conducting environmental monitoring activities, especially in conducting sample field survey		√	√
• Receive complaints transferred from UE and send it to PIO		√	√
Upazila Engineer (UE)			
• Supervise contractors to ensure that mitigation measures proposed in IEE or EIA are properly undertaken		√	√
• Assist PIO (in particular EC) and XEN in conducting environmental monitoring activities, especially in conducting sample field survey		√	√
• Receive complaints from local residents about environmental and social issues regarding the Project and send them to XEN		√	√

A consultant with expertise in environmental and social considerations should be assigned to this section. An assistant engineer of PIO should also be placed to supervise the overall activities of the environmental consultant. District-level and Upazila-level engineers are to assist the consultant in conducting the field survey. Upazila Engineers should also be responsible for the supervision of

contractors to ensure compliance with IEE or EIA. Complaints from local residents should also be received by Upazila Engineers and transferred to PIO via District Executive Engineers. Responsibilities of relevant entities at respective project phases are indicated in Table 9-8.

b) Monitoring activities

Environmental monitoring activities largely consist of two parts, which are to conduct field surveys for sample subprojects and to process complaints from local residents. The sample field survey will provide direct information necessary to monitor the environmental effects of Project implementation. The survey should be carried out quarterly so as to cover seasonal changes in ecological conditions. The environmental consultant will visit subproject sites to monitor compliance with IEE or EIA, adequacy of mitigation measures, and environmental and social impacts. If any non-compliance, inadequate mitigation measures and unforeseen impacts are observed in the field survey, the consultant shall report to the Assistant Engineer of PIO and recommend how to address the problems.

Complaints from local residents can be considered valuable feedback to the Project and will complement the information acquired through the sample field survey. A system for receiving and processing complaints from local residents is expected to contribute to the identification of problems that cannot be captured by the sample survey. The complaints will be received at Upazila level and shall be transferred to the environmental consultant of PIO via District Executive Engineers. When complaints are received, the consultant is to analyze them and make recommendations on how to address them.

Approximately three weeks should be allocated to the sample field survey and one week to reporting and complaint processing. A total of one month is assigned to the consultant for each quarter, and at least four man-months per year will be necessary for the environmental monitoring.

9.5 Conclusions and recommendations

The IEE at the SAPROF phase revealed that the Project will not cause significant adverse impacts, though certain adverse impacts are anticipated. The major potential adverse impacts include: 1) soil erosion caused by construction works; 2) disturbance of regional hydrology; 3) permanent acquisition of private land; and 4) loss of income sources of ferry-related workers. These impacts can, however, be effectively addressed by the mitigation measures proposed in Subsection 9.2.4.

LGED needs to take necessary procedures in accordance with the Environmental Conservation Rules 1997. In preparing the application for ECC, the mitigation measures proposed in Subsection 9.2.4, points to be noted regarding land acquisition in Subsection 9.3.3, and the monitoring mechanism proposed in Section 9.4 should be incorporated. In addition, it should be noted that construction of a bridge over 100 meters will fall into the Red category, for which EIA is mandatory. LGED therefore should pay due attention to bridge construction and complete necessary procedures to avoid any delays.

CHAPTER 10 Conclusions

The proposed project objectives to be achieved in the Project area are increased economic opportunities for the rural poor, improvement of their accessibility to social services, and promotion of recovery from damage by natural disasters. The study establishes linkages between the objectives and the measures to be implemented by the Project to achieve the objectives. The Project will improve Upazila and Union roads, and facilities of growth centers and rural markets. It will also provide employment opportunities for the rural poor, and capacity development services to various stakeholders concerning rural infrastructure development. The study finds that the stakeholders attribute social and economic impacts and poverty alleviation effects to the improvement of rural road network and market facility. The study also recognizes that capacity development of the stakeholders such as LGED officials, local government officials, contractors, members of MMC and LCSs, shopkeepers, and leaseholders is necessary to secure benefits derived from infrastructure development.

The team verifies the rationales of selecting 14 Districts out of 21 Districts originally proposed by LGED. Reduction in the number of target Districts was necessary because of limited availability of financial resources. Fourteen Districts are selected as the Project area on the grounds of high poverty level, slow progress of rural road development, absence of major rural infrastructure development projects supported by development partners, and being prone to cyclones and floods. The economy in the Project area highly depends on agriculture. The area is also home to the majority of export-oriented shrimp farms in the country, and the area's economic potential of the primary industry is assumed to be high. Since Upazila and Union roads and growth centers in the Project area are less developed than the national average, a large public investment is necessary to enhance the rural economy.

Examination of institutions for rural infrastructure development shows that the policy framework, legal and administrative instruments, and financial means are well established as bases for the implementation of the Project. The national-level policies advocate the following concepts: community participation; use of local resources; application of labor-intensive techniques; establishment of maintenance systems; and capacity development of stakeholders with planning, implementation, and monitoring of the rural infrastructure development. The team concurs with the adoption of these concepts in guiding project activities in order to enhance social and economic impacts of the Project. The concept of "social engineering" advocated by LGED clearly reflects its emphasis on the roles of rural institutions in achieving poverty reduction through investment in rural infrastructure. The team believes that capacity development of the institutions/stakeholders enhances impacts of such investments.

LGED as the major implementation agency of the Project has the capacity to manage more than 50 projects financed by GOB and development partners. The study reveals that LGED's public service delivery is well organized and consistent with the sector policy defined in the Rural Road Master Plan. LGED coordinates well the selection of various projects, their components, target areas, and sources of financing. In this regard, the team agrees with LGED's decision to shift the Union Parishad Complex (UPC) component from this project to the ongoing government-financed UPC construction project. Although LGED is considered a well-functioning organization, it has room for improvement in such

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areas as timely implementation, adequate level of quality control, and supervision of subprojects. Since the Project will have to handle more than 800 procurement/contract packages, efficient management of contracts and contractors is a key to implement the Project in a timely and effective manner. Thus, capacity development should be implemented for LGED officials, contractors, and construction workers in the areas of contract management, supervision, and monitoring of construction work and techniques.

The main stakeholder in the public sector is LGED whereas user committees and beneficially groups are the local institutions interacting with LGED systems. The activity and capacity levels of such stakeholder groups vary widely, and thus it is important to identify and target vital stakeholder groups. The necessity of capacity development of the stakeholders is highlighted in the survey results. At the same time, capacity of trainers and facilitators, LGED officials and project consultants, local NGOs, external training institutions should be strengthened as well.

According to the ranking and cost estimate conducted by the team, it is proposed that the Project upgrades 88 Upazila roads with 723 km of alignment to be paved, 19 Union roads with 69 km of alignment to be paved, 58 growth centers, and 18 rural markets in the Project area. In addition, 18 Upazila roads proposed to be upgraded by GOB funding. The total cost of the Project is estimated to tk. 9,100 million, which is equivalent to 14,041 million Japanese yen. Upgrading of Upazila roads, Union roads, and growth centers and rural markets account for 53%, 3%, and 4% of the total budget, respectively. Poverty reduction interventions promote the direct transfer of money (4% of the budget) to the rural poor through establishment and maintenance of 759 km of roadside tree-plantation, and 1,400 km of village road maintenance work by LCS's. For capacity development, approximately 1% of the total budget is allocated for more than 91,000 trainee-days. Cyclone-resistant multipurpose market sheds, and retaining walls, vegetation cover, and concrete revetments on slopes of Upazila and Union roads will be introduced as mitigation measures against cyclones and floods.

The team recommends allocating approximately 5% of the total budget for consultancy services to assist LGED in implementing the Project in a timely and effective manner. The consultants should help LGED scrutinize the contractors during selection, supervise their work, and mitigate delays and problems. Major recurrent costs vital to smooth project implementation are as follows: land acquisition cost of tk. 30.8 million for purchase of approximately 17.1 ha of private land; PIO staff cost of tk. 187.5 million for the employment of 240 PIO staff members; office operation cost of tk. 236.0 million; and cost of tk. 99.6 million secured for the improvement of 13 District Office facilities of LGED.

The team recommends that the Project commence in July 2009. The Project appraisal, loan negotiations, establishment of a loan agreement, and development of project preparation documents should be completed before this date. The procurement of consultancy services should be started ahead of the date of commencement to prevent delays in project implementation. Based on the proposed contract packaging schedule, the annual requirement of funds for the first, second, third, fourth, and fifth years is distributed at 4%, 34%, 37%, 18%, and 7% of the total project cost, respectively.

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The impacts of rural infrastructure development are significant. With regard to roads, the survey results indicate such signs of improvement as decrease in the costs and time required for travel, increase in the number of transport operators, and increase in land value and the number of shops along roads. For growth center development, the survey results also show impacts such as increases in trading volume, market lease revenue, number of shops and buyers, and presence of women in trading. The WMS was identified as a particularly effective measure to encourage women to visit the growth center. The economic analysis of Upazila and Union roads and growth centers shows the significant economic returns of the investments. The average EIRR is 32% for Upazila roads, 41% for Union roads, and 57% for growth centers. The overall economic rate of return of the project is estimated at 25%. None of the EIRR is below 12%, which is the assumed opportunity cost of capital in Bangladesh. Therefore, it is fair to conclude that the Project is economically viable.

The progress of the Project should be monitored according to GOB rules and the requirements of the donor. The annual and quarterly progress reports with information on the physical progress of civil works and status of training components should be submitted to both GOB and the donor agency. At project termination, the Project Completion Report will be compiled and submitted to the donor.

Effective monitoring and evaluation should follow the LGED guidelines and the methodology employed in other projects. A baseline survey, a mid-term assessment, and a terminal assessment will be conducted to evaluate the effects of infrastructure development. A survey of control roads and markets, and household surveys should also be implemented for precise analysis of impacts on poverty and social development. Since results of effective monitoring and evaluation will benefit both GOB and development partners in designing an effective rural development project, technical assistance costs incurred in monitoring and evaluation should be financed by grant money provided by development partners.

The Initial Environmental Examination conducted during the SAPROF indicates that, if appropriate mitigation measures are taken, no significant adverse environmental and social impacts are to be anticipated during project implementation. Negative environmental and social impacts such as soil erosion caused by construction works, disturbance of regional hydrology, economic loss of the rural poor caused by acquisition of private land, and loss of income sources of ferry-related workers need to be effectively addressed by the mitigation measures proposed in this report.

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