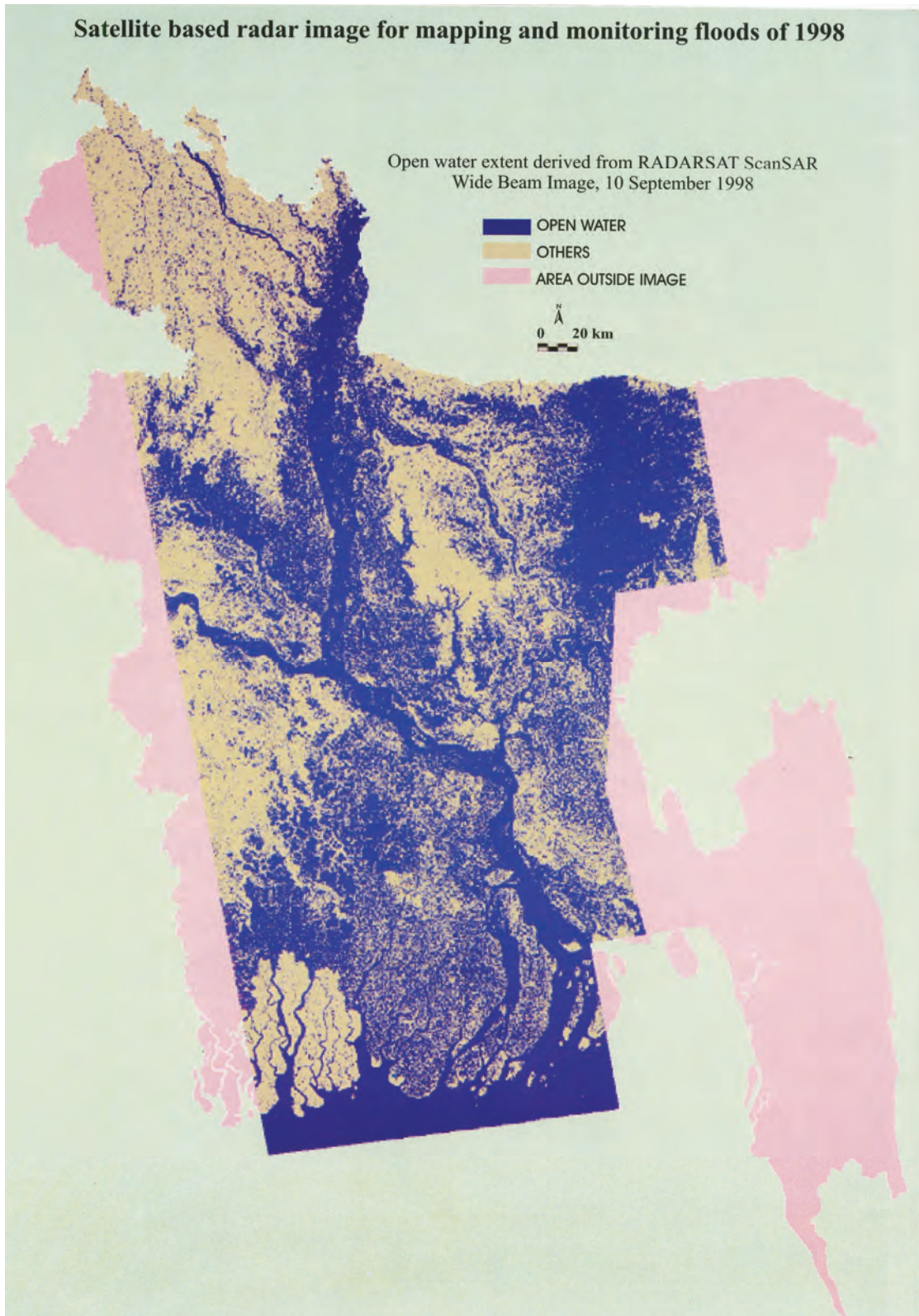
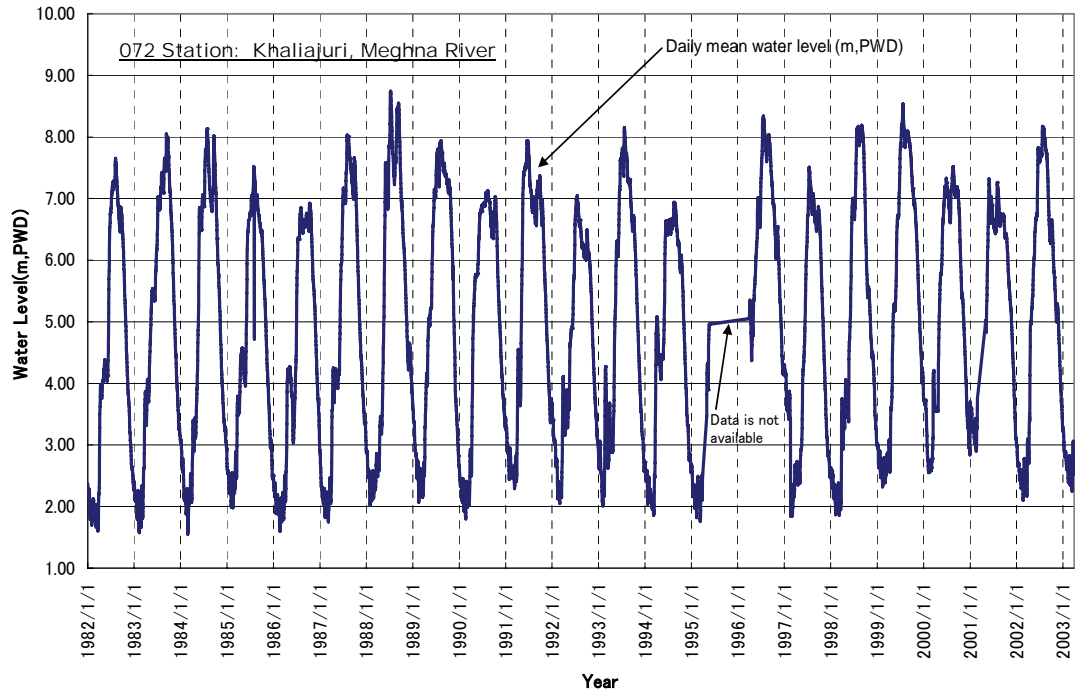


添付資料 2.1 : ハオール地域河川システム

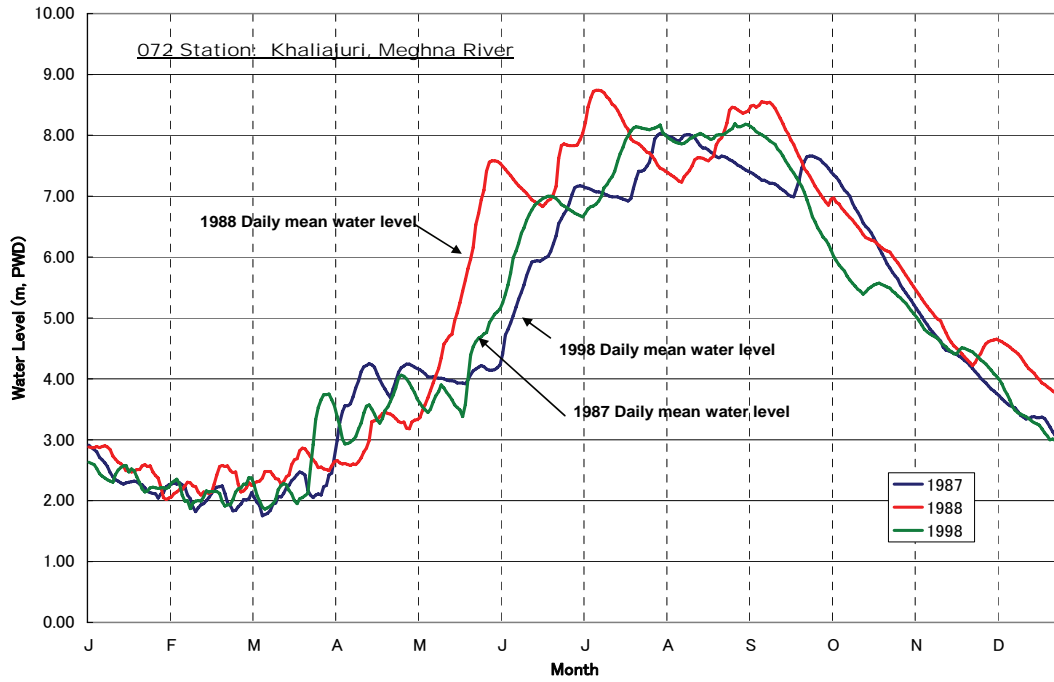
添付資料.2.2 「1998 年洪水時の浸水状況」



添付資料 2.3 : カリアジュリ地点における水位記録



カリアジュリ地点における主要洪水の水位ハイドログラフ



添付資料 2.4

2004年洪水被害調査結果 (LGED)

FLOOD DAMAGE ASSESMENT-2004 (Component wise) under LOCAL GOVERNMENT ENGINEERING DEPARTMENT

District : Sunamgonj.

Road
Date of Reporting :

Sl. No.	Name of Upazila	Name of Damaged Scheme	Type of Damage Scheme/Component(earth road/embankment/paved road/Bridge/culvert/GC/ghat/UP Bhanban/School building etc.	Under which Project it was Constructed/ Developed	Location of Damage for Road & Bridge/ Culvert(Ch. in km.)	Type of Damage (Full/ Partial)	Actual Damage Quantity (km/m/no)	Type of repair/ rehabilitation/ maintenance required	Estimated cost to repair/ rehabilitation/ maintenance (Tk in Lakh)	Remarks
1	2	3	4	5	6	7	8	9	10	11
1	Dharmapsha	Dharmapasha-Singhda road	CC road		0-500	Partial	200	Maint.	2.50	
			HBB		500-800	Partial		Maint.	2.50	Eroded
			HBB		800-1300	Full	500	Rehab.	13.00	With E/W
			Earthen Structure		1300-1850	Full	500	Rehab.	14.00	With E/W & Protc.
					1850-1890					
2	Dharmapsha	Dharmapasha-Maddhanagar rd	CC road		531-1083	Full	552	Rehab.	15.00	CC road fully damaged
			HBB & Protection		3661-4045	Full	384	Rehab.	15.00	in/c. wave protection
			HBB		4045-4615	Partial	570	Rehab.	8.00	
			HBB		4615-5500	Full	885	Rehab.	20.00	in/c. Partial protection
			BC		620-6752	Partial	552	Rehab.	35.00	Wave Protc. Reqr.
			HBB		8252-10252	Partial	2000	Maint.	8.50	
			Earther		10252-12752		250	Rehab.	51.25	Wave Protc.
3	Dharmapsha	Maddhanagar-Moheshkhola road	HBB		20-100	Full	980m	Partial	52.00	Both side Wave protc
			HBB		9250-9750	Partial	500	Partial	2.00	
			HBB		9750-11750	Full	200	Rehab.	25.00	
			Earthen		11750-12540	Partial	790		10.00	
			HBB		12540-13050	Full	510	Rehab.	8.75	
			HBB		13050-14140	Partial	1090	Maint.	3.00	
4	Dharmapsha	Dharmapasha-Golokpur road	CC road		0-2700	Partial	2700	Maint.	30.00	Wave protc
			Earthen		2700-5700		3000		15.00	
									330.50	

FLOOD DAMAGE ASSESMENT-2004 (Component wise) under LOCAL GOVERNMENT ENGINEERING DEPARTMENT

District : Sunamgonj.

Culvert
Date of Reporting :

Sl. No.	Name of Upazila	Name of Damaged Scheme	Type of Damage Scheme/Component(earth road/embankment/paved road/Bridge/culvert/GC/ghat/UP Bhanban/School building etc.	Under which Project it was Constructed/ Developed	Location of Damage for Road & Bridge/ Culvert(Ch. in km.)	Type of Damage (Full/ Partial)	Actual Damage Quantity (km/m/no)	Type of repair/ rehabilitation/ maintenance required	Estimated cost to repair/ rehabilitation/ maintenance (Tk in Lakh)	Remarks
1	2	3	4	5	6	7	8	9	10	11
1	Dharmapsha	Maddhanagar-Moheshkhola road	Culvert		3524	Full	4	Rehabilitation	6.00	
			Culvert		11110	Full	6	Rehabilitation	8.00	
2	Dharmapsha	Dharmapasha-Aktapara road	Bridge		5	Full	15m	Rehabilitation	15.00	
3	Dharmapsha	Dharmapsha Girls School-T&T rd			300-330		30m	Maint.	20.00	
									49.00	

FLOOD DAMAGE ASSESSMENT-2004 (Component wise) under LOCAL GOVERNMENT ENGINEERING DEPARTMENT.

Upazilla:-Nikli.District:-Kishoregonj.

Date of Reporting|-16-8-2004.

Sl No	Name of Upazilla	Name of Damaged Scheme	Type of Damage scheme/Component earth road)embankment Paved road /bridge/ Culvert/GC/ghat/Up bhaban/School building etc.	Under which Project it was Construced/ Developed	Location of damaged for Road & Bridge/ Culvert (Ch. in Km.)	Type of Damage Full/partial)	Actual Damage Quantity	Type of Repair/ rehabilitation/ maintenance (Taka in Lakh)	Estimated Cost to Repair/ rehabilitation/ maintenance (Taka in Lakh)	Remarks
1	2	3	4	5	6	7	8	9	10	11
1	Nikli	Nikli- Singpur Road	Paved road	ADP	00-1.50 Km	Full	1.50 Km	Rehabilitation	45.00	
			Earth road		1.67-3.8	Partial	2	Repair	1.50	
			Do		6.48-7.00	Partial	0.5	Repair	0.50	
			Wave Protection Wall	IFSP	2.55 - 2.6	do	0.04	do	1.00	
			Paved Road	Priority	7.00 - 9.23	do	1	do	1.00	
2		Nikli- (Ruder Pudda Bazar) Sarishapur Road.	Paved road	RDP-21	.25 -.5	Full	0.25	do	6.75	
			do	do	.819 - .914	Partial	1	maintenance	4.00	
			do	do	6.75 - 7.50	Partial	0.75	maintenance	3.00	
3		Nikli -Hospital Kargram Rd	Paved road	Priority	00 - 1.0	do	1	Repair	1.50	
4		Nikli -Bazar Mazlishpur Rd	do	do	00- .5	do	0.5	do	1.50	
5		Nikli-Hilochia Rd.	do	IFSP	00 -2.00	do	2	do	1.00	
			do	RDP-21	3.00 - 4.00	do	1	do	1.00	
6		Karpasha Up- Jalalpur Bazar Rd.	Earth Road	RIDP	00 - 3.00	Partial	2.5	Repair	1.00	
7		Shapmari Gurai Rd.	Earth road	RIDP	0 - 1.00	Full	1	Rehab.	1.00	
8		Attarbaria Primary School to ruder Pudda Bazar Rd.	do		0 - 2.00	Partial	2	Repair	2.00	
9		Nikli Bazar - chuntikali Rd.	do		0.00- 2.00	Partial	2	Repair	1.00	
10		Wave Protection wall at Chatircher.	Embankment	IFSP	.6 - .72	Full	0.12	Rehab.	15.00	
11		Wave Protection wall at Tenguria.	do	do	.530 -.551	do	0.021	do	3.00	
12		Majlishpur-Karpasha up Rd.	Paved	ADP	00 - 1.5	Partial	1.5	Repair	2.00	
						Sub-Total=			92.75	
1		Nikli- Singpur Road	Culvert		Ch.500m	Full	1No.4.66m	Rehab.	15.00	
2		Nikli-Hilochia Rd.	Culvert		Ch.5000m	Full	1No.4.66m	Rehab.	10.00	
						Sub-Total=			25.00	

Sl No	Name of Upazilla	Name of Damaged Scheme	Type of Damage scheme/Component earth road /embankment Paved road /bridge/ Culvert/GC/ghat/Up bhaban/School building etc.	Under which Project it was Constructed/ Developed	Location of damaged for Road & Bridge/ Culvert (Ch. in Km.)	Type of Damage Full/partial)	Actual Damage Quantity	Type of Repair/ rehabilitation/ maintenance (Taka in Lakh)	Estimated Cost to Repair/ rehabilitation/ maintenance (Taka in Lakh)	Remarks
1	2	3	4	5	6	7	8	9	10	11
1	Nikli	Dubi GPS	School Building	GEP		Partial		Repair	2.50	
2		Vatibaratia GPS	do	do		do		do	1.00	
3		Sulthan Pur GPS	do	do		do		do	2.50	
4		Singpur GPS	do	do		do		do	2.00	
5		Tenguria GPS	do	do		Partial		Repair	1.00	
6		Islampur GPS	do	IDB		Partial		Repair	1.00	
7		Aliapara	do	GEP		do		do	1.00	
8		Noapara	do	do		Full		Rehab.	10.00	
9		Uttar Dampara	do	PEDP		Partial		Repair	1.50	
10		Madda Dampara	do	GEP		Partial		Repair	1.00	
11		Dakkin Dampara	do	IDB		Partial		Repair	0.75	
12		Diruail	do			Full		Rehab.	10.00	
13		Barakanda	do			Partial		Repair	2.50	
14		Nansree	do	GEP		Partial		Repair	1.00	
15		Jalalpur	do	IDB		Partial		Repair	0.50	
16		Sharmul	do	PEDP		Partial		Repair	2.00	
17		Karpasha	do	GEP		Partial		Repair	1.00	
18		Majlishpur	do	PEDP		Partial		Repair	2.00	
19		Nikli Adarsha	do	GEP		Partial		Repair	1.00	
20		Shaitder	do	GEP		Partial		Repair	0.50	
21		Pasruki	do	GEP		Partial		Repair	0.50	
22		Kursha	do	GEP		Partial		Repair	1.00	
23		Ruderpudda	do	GEP		Partial		Repair	1.00	
24		Darisher	do	GEP		Partial		Repair	1.00	
25		Jaritala	do	GEP		Partial		Repair	1.00	
26		Sajanpur	do	GEP		Partial		Repair	0.50	
27		Attarbaria	do	GEP		Partial		Repair	1.00	
28		Habsherdia	do	IDB		Partial		Repair	1.00	
29		Uttar Jallahbad	do	GEP		Partial		Repair	1.50	
30		Dakkin Jallahbad	do	GEP		Partial		Repair	0.50	
31		Rasulpur	do	GEP		Partial		Repair	0.50	
						Sub-Total=			54.25	
32		Chatircher	do	GEP		Full		Rehab.	20.00	
33		Chetra	do	GEP		Partial		Repair	1.00	
34		Gurai	do	GEP		Partial		Repair	1.00	
35		Para Bajithpur	do	GEP		Partial		Repair	1.00	
36		Dalutpur	do	GEP		Partial		Repair	1.00	
37		Moherkona GPS	School Building	GEP		Partial		Repair	1.50	
38		Goradiga GPS	School Building	GEP		Full		Rehab.	20.00	

Nikli.

39	Purba Hati NGPS	School Building	RNGPEDP		Full	Rehab.	10.00	Page 3 of 3
40	Kamalpur NGPS	School Building	RNGPEDP		Partial	Repair	2.50	
41	Purba Singpur	School Building	RNGPEDP		Partial	Repair	1.50	
42	Paschim tenguria	School Building	RNGPEDP		Full	Rehab	10.00	
43	Purba Singpur	School Building	RNGPEDP		Partial	Repair	1.50	
44	Badarpur	School Building	RNGPEDP		Partial	Repair	2.50	
45	Singarpar Chaterkandi	School Building	RNGPEDP		Full	Rehab.	10.00	
46	Paschim Nikli	School Building	RNGPEDP		Partial	Repair	1.00	
47	Banamalipur	School Building	RNGPEDP		Partial	Repair	1.00	
48	Attabaria Pukurpar	School Building	RNGPEDP		Partial	Repair	0.50	
49	Dakkin Jaritala	School Building	RNGPEDP		Partial	Repair	1.50	
50	Dakkin Habshardia	School Building	RNGPEDP		Partial	Repair	1.00	
51	Paschim Gurai	School Building	RNGPEDP		Partial	Repair	2.00	
52	Madda Gurai	School Building	RNGPEDP		Partial	Repair	1.50	
53	Gurai Purbapara	School Building	RNGPEDP		Partial	Repair	1.50	
54	Dakkin Chatercher	School Building	RNGPEDP		Partial	Repair	1.00	
55	Paschim Kursha	School Building	RNGPEDP		Partial	Repair	1.00	
56	I No Kamalpur	School Building	RNGPEDP		Partial	Repair	2.50	
57	Purba Barakanda	School Building	RNGPEDP		Partial	Repair	1.50	
					Sub-Total=		99.50	
58	Madda Chatircher	School Building	RNGPEDP		Partial	Repair	2.50	
59	Naynbali Bill	Embankment	4th Fishery		Partial	Repair	1.00	
60	Trees on road	Nikli-Sarisapur road	Rdp-21	0-7.5	Full	Rehab	0.76	
					Sub-Total=		4.26	
					Total=		158.01	
					G.Total=		275.76	

FLOOD DAMAGE ASSESSMENT-2004 (Component Wise) under LOCAL GOVERNMENT ENGINEERING DEPARTMENT

District- Habiganj.

Date of reporting 12/08/2004

Sl. No.	Name of Upazila	Name of Damaged Scheme	Type of Damaged Scheme/Component (Earth road/embankment /paved road/bridge/culvert/GC/ghat/Up bhaban/ School building etc.	Under which Project it was Constructed/ Developed	Location of Damage for Road & bridge/ Culvert (Ch. In Km.)	Type of Damage (Full/partial)	Actual Damage Quantity (km/m/no)	Type of repair /rehabilitation/ maintenance required	Estimated Cost to repair/ rehabilitation/ maintenance (Taka in lakh)	Remarks
1	2	3	4	5	6	7	8	9	10	11
1	Lakhai	Lakhai Thana Head Quarter-Lakhai Bazar Rd.	Earth Road	G.C.C.R	6.5	Partial	6.5	Rehab.	16.85	
2		Lukra-Madna Rd.	HBB & Earth Road	G.C.C.R	12.2	Partial	12.2	Rehab.	53.98	
3		RHD Rd.-Madna Bazar Via Hospital & NoaGoun	BC & Earth Road	Sylhet Diviwion	5.1	Partial	5.1	Rehab.	3.56	
4		Badikara RHD Rd. to Faundauk Bazar Rd.	HBB & Earth Road	Agradikar	9.6	Partial	9.6	Rehab.	19.19	
5		Murakori UP Office to Zirunda Bazar Upto RHD	HBB & Earth Road	Agradikar	7	Partial	7	Rehab.	16.9	
6		Bamai DC Rd. to Bamai Bazar Rd.	Earth Road	A.D.P. U.Z.P.	1.8	Partial	1.8	Rehab.	2.95	
7		Rarishail Baleswari Rd.	Earth Road	A.D.P. U.Z.P.	2.65	Partial	2.65	Rehab.	1.9	
8		Lakshmipur-Murakori Rd	Earth Road	A.D.P. U.Z.P.	4.2		4.2	Rehab.	6.67	
9		Bulla DC Rd. to East Bulla Rd.	Earth Road	A.D.P. U.Z.P.	1	Partial	1	Rehab.	2	
10		RHD Rd. to Hossainpur	Earth Road	A.D.P. U.Z.P.	1.8	Partial	1.8	Rehab.	0.9	
11		Bulla RHD Rd.-East SinghaGram	HBB & Earth Road	Agradikar	1.5	Partial	1.5	Rehab.	3	
12		Badikara ZailKana Rd.	HBB & Earth Road	Agradikar	2.5	Partial	2.5	Rehab.	4	
13		Kaliadara RHD Rd. to Tegoria Kalauk Rd.	HBB & Earth Road	Agradikar	3	Full	3	Rehab.	10	
14		Bullah Bazar to Faundauk Rd. Via Singha Gram	HBB & Earth Road	Agradikar	9.45	Partial	9.45	Rehab.	18.9	
15		Karab Up Office to Beki Taka Via Nuton Bazar	HBB & Earth Road	Agradikar	7	Partial	7	Rehab.	8	
SubTotal=							75.3		168.8	

1	2	3	4	5	6	7	8	9	10	11
1	Lakhai	Lakhai Thana H.Q. Lakhai Bazar	C.C. Block & Toe Wall	Rural Rd. Cult. Maint. Project	1.5	Partial	1	Rehab.	5	
2		Lakhai Bazar to Lakhai U.P. Office Rd.	Wing Wall	U.Z.P.	0.8	Partial	2	Rehab.	4	
3		Murakari U.P. Office to	Wing Wall	Sylhet Division	3.05	Partial	2	Rehab.	6	

		Zirunda Bazar Up to RHD			4.45					
4		Lakshmipur- Morakari Rd	Toe Wall	U.Z.P.	3	Partial	1	Rehab.		2
5		Kaliadara RHD Rd. to Tegoria Kalauk Rd.	Bridge	M/O. Relief	2	Full	10	Construction		15

Sub Total=

32

1	2	3	4	5	6	7	8	9	10	11
1	Lakhai	Lakhai Bazar	G.C.	Zilla Parishad	-	Partial	100.00m	Rehab.		13.47
2		Madna Bazar	G.C.	Zilla Parishad	-	Partial	120.00m	Rehab.		13.47
3		Bulla Bazar	G.C.	Zilla Parishad	-	Partial	110.00m	Rehab.		13.47
4		Community Clinic	C.C	C.M.M.U	-	Partial	-	Rehab.		5

Sub Total=

45.41

1	2	3	4	5	6	7	8	9	10	11
1		Mohammedpur, G.P.S	Govt. Prymari School	M/O. Edn.	-	Partial	-	Maint.		2.61
2		Laksmipur, G.P.S	Govt. Prymari School	M/O. Edn.	-	Partial	-	Maint.		1.15
3		Barpurnee, G.P.S	Govt. Prymari School	M/O. Edn.	-	Partial	-	Maint.		1.15
4		Kamalpur, G.P.S	Govt. Prymari School	LGED	-	Partial	-	Maint.		1.03
5		Lahai No.1, G.P.S	Govt. Prymari School	M/O. Edn.	-	Partial	-	Maint.		0.5
6		Zirunda, G.P.S	Govt. Prymari School	M/O. Edn.	-	Partial	-	Maint.		2.15
7		Morakari, G.P.S	Govt. Prymari School	LGED	-	Partial	-	Maint.		0.5
8		Lamnauk, G.P.S	Govt. Prymari School	M/O. Edn.	-	Partial	-	Maint.		0.5
9		Mantail, G.P.S	Govt. Prymari School	M/O. Edn.	-	Partial	-	Maint.		0.5
10		Muriauk, G.P.S	Govt. Prymari School	M/O. Edn.	-	Partial	-	Maint.		0.5
11		Satauk, G.P.S	Govt. Prymari School	M/O. Edn.	-	Partial	-	Maint.		0.3
12		Rarisal, G.P.S	Govt. Prymari School	M/O. Edn.	-	Partial	-	Maint.		0.3
13		Gonipur, G.P.S	Govt. Prymari School	M/O. Edn.	-	Partial	-	Maint.		0.3
14		Bulla, G.P.S	Govt. Prymari School	M/O. Edn.	-	Partial	-	Maint.		0.3
15		Balakandi, G.P.S	Govt. Prymari School	M/O. Edn.	-	Partial	-	Maint.		0.5
16		Faridpur, G.P.S	Govt. Prymari School	M/O. Edn.	-	Partial	-	Maint.		0.6
17		Gopalpur, G.P.S	Govt. Prymari School	LGED	-	Partial	-	Maint.		0.5
1	2	3	4	5	6	7	8	9	10	11
18		Goakara, G.P.S	Govt. Prymari School	LGED	-	Partial	-	Maint.		0.6
19		Suneswar, G.P.S	Govt. Prymari School	LGED	-	Partial	-	Maint.		0.3
20		Hossainpur, G.P.S	Govt. Prymari School	M/O. Edn.	-	Partial	-	Maint.		0.3
21		Babanipur, G.P.S	Govt. Prymari School	M/O. Edn.	-	Partial	-	Maint.		0.6
22		Badikara, G.P.S	Govt. Prymari School	LGED	-	Partial	-	Maint.		0.3
23		Shibpur No-2, G.P.S	Govt. Prymari School	M/O. Edn.	-	Partial	-	Maint.		0.3
24		Bamai, G.P.S	Govt. Prymari School	M/O. Edn.	-	Partial	-	Maint.		0.3
25		Marugach, G.P.S	Govt. Prymari School	M/O. Edn.	-	Partial	-	Maint.		0.3
26		Karab, G.P.S	Govt. Prymari School	M/O. Edn.	-	Partial	-	Maint.		0.3
27		Bumarur, G.P.S	Govt. Prymari School	LGED	-	Partial	-	Maint.		0.6
28		Fulbaria, G.P.S	Govt. Prymari School	LGED	-	Partial	-	Maint.		0.6
29		Kataya, G.P.S	Govt. Prymari School	LGED	-	Partial	-	Maint.		0.3
30		Chikonpur Regd. Non	R.N. Govt. Pry. School	LGED	-	Partial	-	Maint.		0.6
31		R.N. Govt. Pry. School								
32		Patit Paban	R.N. Govt. Pry. School	LGED	-	Partial	-	Maint.		0.5
33		R.N. Govt. Pry. School								
34		East Badikara	R.N. Govt. Pry. School	LGED	-	Partial	-	Maint.		0.3

35		R.N. Govt. Pry. School								
36		Purnee Bari	R.N. Govt. Pry. School	LGED	-	Partial	-	Maint.	0.4	
37		R.N. Govt. Pry. School								
38		Chanpur	R.N. Govt. Pry. School	LGED	-	Partial	-	Maint.	0.3	
39		R.N. Govt. Pry. School								
40		Helar Kandi	R.N. Govt. Pry. School	LGED	-	Partial	-	Maint.	0.4	
41		R.N. Govt. Pry. School								
42		Chargawn	R.N. Govt. Pry. School	LGED	-	Partial	-	Maint.	0.2	
43		R.N. Govt. Pry. School								
44		East Singha Gram	R.N. Govt. Pry. School	LGED	-	Partial	-	Maint.	0.25	
45		R.N. Govt. Pry. School								
46		Hazi Alfu Miah	R.N. Govt. Pry. School	LGED	-	Partial	-	Maint.	0.2	
47		R.N. Govt. Pry. School								
48		Abdur Rahim Chy.	R.N. Govt. Pry. School	LGED	-	Partial	-	Maint.	0.2	
49		R.N. Govt. Pry. School								
50		Agapur	R.N. Govt. Pry. School	LGED	-	Partial	-	Maint.	0.3	
51		R.N. Govt. Pry. School								
52		Ali Hasan Chan Rahman	R.N. Govt. Pry. School	LGED	-	Partial	-	Maint.	0.4	
53		R.N. Govt. Pry. School								
54		South Karab Pita Buson	R.N. Govt. Pry. School	LGED	-	Partial	-	Maint.	0.25	
55		R.N. Govt. Pry. School								
56		Chowdhury Amaz Uddin	R.N. Govt. Pry. School	LGED	-	Partial	-	Maint.	0.3	
57		R.N. Govt. Pry. School								
58		Kashempur Forhad	R.N. Govt. Pry. School	LGED	-	Partial	-	Maint.	0.3	
		R.N. Govt. Pry. School								
1	2	3	4	5	6	7	8	9	10	11
59		West Karab	R.N. Govt. Pry. School	LGED	-	Partial	-	Maint.	0.5	
		R.N. Govt. Pry. School								
60		Fultail Kushuumbala	R.N. Govt. Pry. School	LGED	-	Partial	-	Maint.	0.5	
		R.N. Govt. Pry. School								
61		Muslim Yousuf	R.N. Govt. Pry. School	LGED	-	Partial	-	Maint.	0.5	
		R.N. Govt. Pry. School								

Sub Total=

24.59

Grand Total=

270.8

Sub Asstt. Engineer
LGED
Lakhai, Habiganj.

Upazila Engineer
LGED
Lakhai, Habiganj.

添付資料 2.6

ローカルコンサルタント一覧

会社名	住所
Development Design Consultants Ltd	23,New Eskaton Road Dhaka-1000 Tel:833619,405477,841323
Vitti Sthapati Brinda Ltd	House No.2, Road No.7, Dhanmondi, Dhaka Tel:869566
Bangladesh Consultants Ltd	34,Dhanmondi RA, Road No.16 Dhaka- 1209 Tel:813437,815018,815023
Engineering and Architectural Consultant	10,Dilkusha C/A Jiban Bina Tower Dhaka-1000 Tel:9556106, 9125303
Bkh Consulting Engineers	Road No.99,House No.1 Gulshan, Dhaka Tel:9121681
Engineers and Consultants Bangladesh Ltd	Road No.67,Road No.11/A Dhanmondi RA Dhaka-1209
Development Planner and Consultants	House No.37,Road No.4 Dhanmondi R/A Dhaka
SARM Associates Ltd	125A Motijiheel C/A Dhaka
Engineering Science Ltd	48,Bijoyagar Dhaka-1000 Tel:834562,835412
Associate Consulting Enginners Ltd	333,Segun Bagicha Dhaka Tel: 835941,9330694
Avanti Engineers and Associate Ltd	House No.80, Satmasjid Road Dhanmondi, Dhaka
Sheltech Consultants ltd	House No.59/B, Road No. 16 Dhanmondi R/A Dhaka-1209

出典 : LGED

添付資料 2.7

Design Criteria

Road Structure Manual の抜粋

Design Criteria

This chapter gives guidelines for design practice and performance. The guideline consists of the standard practice of design for road structures with relevant codes such as AASHTO, ASTM, ACI and BNBC.

In consideration to the stability and durability of structures and minimum construction problems, criteria are adopted with care. Criteria are applicable to two types of load bearing structures such as reinforced concrete and masonry structures without reinforcement.

Design criteria are adopted to conform with "Working Stress Method". Where repetitive loads are involved, primary attention should be focused on stress conditions at service load levels. So, "Working Stress Method" can be justifiably adopted for design of Road Structures.

Design criteria are defined for the following parameters of loaded members composed of specific materials :

1. Stress-strain relationship within elastic limit.
2. Ultimate/ yield strengths/stresses and their limits.
3. Allowable stresses for flexure, shear and normal.
4. Slenderness effect and effective length of axially loaded members.
5. Protection against corrosion.
6. Earth pressure co-efficients.
7. Strength parameters of different type of soil in consideration to effective and stable foundation structures.
8. Factor of Safety against external stability and settlement or deformations of the structures.

CHAPTER 7

Design Criteria

7.1 GENERAL

Once the Design parameters are established compatible to the spirit and purpose of the project (as covered in Chapter 6), designers are in a position to evaluate Design Criteria to be adopted for Analysis & Design of structures. Moreover, it stimulates the designers to impart proper judgments in any event in course of their work. It is true that in absence of field data/information, any case study, data/information on failure mode and failure data (if happened so) of structures built according to the practice of existing RSM, designers feels some prohibitory problem to be more close to the field conditions and environment. Design Criteria are mainly derived from the material properties of the structures, durability, stability and interaction of foundation structure and soil.

7.2 DESIGN CODE AND STANDARDS

All structures shall be designed in accordance with the following Codes and standards:

- A. AASHTO : American Association of state Highway and Transportation Officials, 15th Ed, 1992
- B. ASTM : American Society for Testing and Materials
- C. ACI : American Concrete Institute
- D. BNBC : Bangladesh National Building Code, 1993

7.3 UNIT WEIGHT

Unit weight of the materials are furnished in Chapter 8.

7.4 METHOD OF DESIGN

Structure should be designed in Working Stress method.

7.5 UNITS

All units are in SI unless otherwise specified.

7.6 ELASTIC CONSTANTS (STRENGTH PARAMETERS) OF MATERIALS

A. REINFORCING BAR AND WELDABLE ANGLES & PLATES

- Modulus of Elasticity : $E_s = 200000 \text{ N/mm}^2$
- Specified yield strength : $f_y = 275 \text{ N/mm}^2$
- Corresponding maximum strain: 0.35 percent
- Poisson's Ratio μ : 0.3

B. REINFORCED CONCRETE [NORMAL WEIGHT CONCRETE]

Concrete shall be constituted by (1) Normal weight coarse aggregate (2) Fine aggregate having F.M not less than 1.8 and (3) Portland Cement conforming to code.

- Modulus of Elasticity : $E_c = 4700\sqrt{f_c} \text{ N/mm}^2 \leq 22000 \text{ N/mm}^2$
- Specified compressive strength (28 days cylinder strength) for structural use of concrete : $f_c = 21 \text{ N/mm}^2$
- Corresponding to f_y , maximum strain in concrete in tension : 0.0035
- Poisson's ratio : $\mu = 0.2$

C. MASONRY WORK

A masonry unit is the assemblage of bricks of specified strength and shape properly bonded together with mortar. So, the strength of the masonry unit is the function of both the strength of the bricks and the strength of mortar joints. The strength of the mortar varies with the varying mixing ratio of cement, fine aggregate and water. Therefore the strength of the bricks alone does not absolutely represent the strength properties of masonry assemblage.

- 3 (three) wythes shall be considered for single unit of abutment structure i.e. one abutment and two wing walls.
- Modulus of elasticity of masonry : $E_m \leq 15000 \text{ N/mm}^2$
- Specified compressive strength of masonry at 28 day $f_m \leq 6.0 \text{ N/mm}^2$
- Poisson's ratio : $\mu = 0.2$

Note :

1. Reinforcing bars shall be deformed of Grade: 40
2. The straightening plates and angles shall be done by methods that will not produce fracture or other injury to the metal. Distorted members shall be straightened by mechanical means or as approved by the Engineer.
3. Degree of workability for concrete shall be medium.
4. In the saline zone, sulphate resistant cement shall be used, unless otherwise specified according to sulphate exposure.
5. Modulus of elasticity of masonry shall be determined by the secant method. The slope of the line connecting the points 0.05 f_m and 0.33 f_m on the stress-strain curve shall be taken as the modulus of elasticity of masonry.
6. Specified compressive strength: f_m shall be in accordance with the following:
 - a. Masonry Prism Testing : The compressive strength of masonry based on tests at 28 days in accordance with "standard Test Method for Compressive Strength of Masonry Prisms", (ASTM E447) for each set of prisms shall equal or exceed f_m . Verification by masonry prism testing shall meet the following:
 - Testing Prior to Construction : A set of five masonry prisms shall be built and tested in accordance with ASTM E447 prior to the start of construction. Materials used for prisms shall be same as used in the project. Prism shall be constructed under the observation of the Engineer or an approved agency.

Remarks :

Presumably it will not be possible to carryout the above mentioned tests neither prior to construction nor during construction. Fortunately no testing during construction shall be required when 50% of the allowable stresses are used in design. Accordingly allowable stresses will be furnished in the next clause.

7.7 ALLOWABLE STRESSES

A. REINFORCING BARS

- Flexural reinforcement : $f_s = 0.45f_y \leq 125 \text{ N/mm}^2$
- Design yield strength of shear reinforcement : $f_v \leq 275 \text{ N/mm}^2$
- Minimum area of shear reinforcement : $A_v = 0.35 \frac{b_w s}{f_y}$

Where, b_w = Web width

S = Spacing of shear reinforcement

f_y = yield strength

- At any section of a beam, where positive reinforcement is required by analysis, the ratio P provided shall be:

$$P_{\min} = \frac{1.38}{f_y}$$

- Bearing stress $\leq 0.4 f_y$

B. REINFORCED CONCRETE

1. Flexure

- Extreme fiber stress in compression : $f_c = 0.4 f_c$

2. Shear in Beams and footings:

- For members subjected to shear & flexure only : $v_c = 0.079\sqrt{f_c}$
- For member subjected to shear and axial compression : $v_c = 0.079\sqrt{f_c}$
- For members subjected to shear and axial tension :

$$V_c = 10.84 [(0.0068 + 0.004 (N/Ag)] \sqrt{f_c}$$

Where, N = Design axial load normal to cross-section occurring simultaneously with shear force 'V' to be taken as negative for tension.

- Maximum shear stress : $v_{\max} = 0.332\sqrt{f_c}$

Note: V_c represents shear force of concrete
 v_c represents shear stress in concrete

3. Shear Friction

Provisions for shear - friction are to be applied where it is appropriate to consider shear transfer across a given plane, such as an existing or potential crack, an interface between dissimilar materials, or an interface between two concrete cast at different times.

- Shear stress shall not exceed : $0.09 f_c$

4. Compressive (bearing) stress in axially loaded members $0.3\sqrt{f_c}$ (in case of piles extended from ground or columns etc.)

5. Shear capacity of slabs & footings in the vicinity of concentrated load as in the following cases:

- Beam action for the slab or footing, with a critical section extending in a plane across the entire width and located at a distance 'd' from the face of the concentrated load or reaction area:
- Two way action for the slab or footing, with a critical section perpendicular to the plane of the member and located so that its perimeter b_o is a minimum but not closer than $d/2$ to the perimeter of the concentrated load or reaction area:

Shear stress shall not exceed : $0.149\sqrt{f_c}$

6. Shear capacity of pile cap :

Shear stresses at the critical section of the pile cap where b_o is the perimeter of the critical section and d is the effective depth, shall not exceed:
 $0.332 \sqrt{f_c} b_o d$.

7. Maximum allowable driving stresses in pile materials for top driven precast concrete pile :
- a. $0.85 f_c$ (compression)
 - b. $0.70 f_y$ of steel reinforcement (tension)

C. MASONRY WORK

1. Flexure

- Compressive stress : $F_b = 0.167 f_m \leq 5 \text{ N/mm}^2$
- Tensile stresses without tensile reinforcement is dependent on the type of joints and mortars which are appended below:
 - a. Normal to Bed Joints : $F_{tB} = 0.1 \text{ N/mm}^2$ for mortar M_1 & M_2
 - b. Normal to Head Joint : $F_{tH} = 0.2 \text{ N/mm}^2$ for mortar M_1 & M_2

Where mortar M_1 represents the ratio, cement : sand = 1:3
and Mortar M_2 represents the ratio, cement : sand = 1:4

- Tensile stresses for mortar 1:5 & 1:6, value in a & b above should be reduced to 25%
2. Shear stress for flexure member when no reinforcement in use :
- $F_b = 0.0415\sqrt{f_m} \leq 0.125 \text{ N/mm}^2$

3. Bearing stress

- Unreinforced masonry walls and columns subjected to compression only,

$$\text{axial stress : } F_a = \frac{f_m}{10} [1 - (h'/4t)^3]$$

Where, h' = Effective height of wall or column & t = effective thickness of a wythe wall or column.

7.8 EFFECTIVE LENGTH FACTOR, 'K' FROM PILES EXTENDED FOR GROUND & COLUMN, ETC.

The effective length of a column (any member behaving like a column) KL, has been used in the equations for allowable compression stress in the members as stated above. K is the ratio of the effective length of an idealized pin-end column or piles in cap (pile cap free to translation or side sway) to the actual length of a member with various other end conditions. KL represents the length between inflection points of a buckled member. Restraint against rotation and translation of the member ends influences the position of the inflection points in a member. The theoretical value of 'K' for the idealized vertical members (pile or pile group restraint by pile cap) free to translate is given below:

- a. Theoretical value of K = 1
- b. Design value of K when ideal conditions are approximated : K = 1.2

7.9 PROTECTION AGAINST CORROSION

The following minimum concrete cover should be provided for reinforcement:

	<u>Minimum cover (mm)</u>
a. Concrete cast against and permanently exposed to earth	75
b. Concrete in 'a' above in Marine environment	100
c. Concrete exposed to earth or weather	
- Primary reinforcement	50
- Stirrups, ties and spirals	40

- d. Concrete deck slab in mild climates
 - Top reinforcement : 50
 - Bottom reinforcement : 25
- e. Concrete not exposed to weather or in contact with ground
 - Primary reinforcement : 40
 - Stirrups, ties and spirals : 25
- f. Precast Concrete piles or piles cast against and/or permanently exposed to earth : 50
- g. Concrete members in 'f' above in marine environment : 75

Note : In saline zone extra 25mm cover shall have to be provided in addition of the above concrete cover.

7.10 EARTH PRESSURE COEFFICIENT

It is evident that back fill parameter γ_s (unit wt. of soil) & ϕ (angle of internal friction) are needed for earth pressure computation. It is implicit that in at least a limited zone defined by abutment and wing/return wall a granular backfill will be used and earth pressure co-efficient shall be taken K_o , where K_o being an effective stress state at zero strain. This co-efficient in this case is appropriate providing a more conservative wall pressure.

$$K_o = 1 - \text{Sin } \phi$$

7.11 ULTIMATE FRICTION FACTORS FOR DISSIMILAR MATERIALS

The following table should be used for general guidance in selecting sliding friction factor between wall base and foundation soil.

<u>Interface Materials</u>	<u>Friction Factor, f (DIM)</u>
a. Mass concrete on clean sand to medium sand, silty medium to coarse sand, silty or clayey gravel.	0.45 to 0.55
b. Mass concrete on fine sand, silty or clayey fine to medium sand.	0.35 to 0.45
c. Mass concrete on fine sandy silt, nonplastic silt.	0.30 to 0.35

- d. Mass concrete on medium stiff and stiff clay and silty clay 0.3 to 0.35

- Note:
1. Masonry on foundation materials has the same friction factors.
 2. Additive resistance resulting from adhesion of the soil is neglected so that a more conservative value against the sliding is obtained.

7.12 FACTOR OF SAFETY (Wherever Applicable)

<u>Ultimate value</u>	<u>Factor of safety</u>
a. Ultimate bearing capacity of open (shallow) foundation.	3.0
b. Ultimate bearing capacity of deep foundation (pile bearing capacity - individual pile).	3.0
c. Ultimate bearing capacity of pile group.	2.5
d. Against overturning	2.0
e. Against sliding	1.5

7.13 SOIL CONDITION

Structures adjacent to the channel having stream flow and the sites experiencing fluctuation of water table, will be defined evidently in the sites of fine grained soil subjected to drained loading condition.

添付資料 2.8

本件無償事業要請と関連する他ドナー、NGO等の事業内容

世界銀行:

Rural Transport Improvement Project

1. 実施期間：2004-2009

2. 対象地域：ダッカ州 6 県、チッタゴン州 3 県、ラジシャヒ州 8 県、シレット州 4 県の計 21 県。うち、無償事業要請と重複するシレット州 2 県での世銀借款対象地域は以下の通り。

- ・ Sunamganj 県：県内全 10 ユパジラ中 9 ユパジラ (Dharmapasha ユパジラ、Joysree ユニオン[UN]を含む)
- ・ Habigonj 県：県内全ユパジラ (8 ユパジラ) (Lakhai ユパジラを含む)

3. 事業内容 (以下の表は無償事業要請と重複する 2 県での重複コンポーネントについてのみ) :¹

コンポーネント	内容 ²
道路整備	ユパジラ (郡) 道路(UZR)舗装 5 区間、総延長 84.60km
	ユニオン (行政村) 道路 (UR) 舗装 9 区間、総延長 45.14km
船着場整備	UZR や市場に直結する既存船着場の改善 5 ヶ所
農村市場(Growth Center)整備	既存市場(rural markets)のグレードアップ 20 ヶ所

4. 事業費：事業費総額 255 百万ドル。うち世銀借款対象額 190 百万ドル。

¹ 情報出所：LGED の無償事業担当者提供資料及び世銀ウェブサイト。

http://www-wds.worldbank.org/servlet/WDS_IBank_Servlet?pcont=details&eid=000012009_20030529124557

² 事業全体での事業規模は次の通り：UZR 整備総延長 1,100km、UR 整備総延長 500km、船着場改善 45 ヶ所、農村市場改善 150 箇所。

日本国際協力銀行（JBIC）：
東部バングラデシュ農村インフラ整備事業（EBRIDP）

1. 実施期間：2005-2008

2. 対象地域：バングラデシュ東部の9県（チッタゴン州5県、シレット州全4県）。うち、無償事業要請と重複するシレット州2県での円借款対象地域は以下の通り。

- ・ Sunamganj 県：県内全ウパジラ（10ウパジラ）（Joysree UNを含む）
- ・ Habigonj 県：県内全ウパジラ（8ウパジラ）（Lakhai UNを含む）

3. 事業内容（以下の表は無償事業要請と重複する2県での重複コンポーネントについてのみ）：³

コンポーネント	内容
道路整備	ウパジラ（郡）道路(UZR)舗装 18 区間 ⁴ 、総延長 197.77km うち潜水道路 4 区間、総延長 45.47km
	ユニオン（行政村）道路 7 区間、総延長 30.00km
船着場整備	UZR や市場に直結する既存船着場の改善 5 ヶ所
農村市場(Growth Center)整備	既存市場(rural markets)のグレードアップ 8 ヶ所

4. 事業費：

融資組織等	事業費（百万円）
JBIC	11,345
GOB、地方政府等	4,022
合計	15,367

³ 情報出所：LGED の円借款事業担当プロジェクトマネジャー提供資料。

⁴ 事業全体（9 県）での UZR 整備全区間は合計 104 区間(出所：JBIC 事前評価表)。事前評価表では他コンポーネントについての事業規模は示されていない。

http://www.jbic.go.jp/japanese/oec/before/2004/pdf/bangladesh_01.pdf

アジア開発銀行（ADB）：
Third Rural Infrastructure Project

1. 実施期間：1997-2005

2. 対象地域：バングラデシュ北部の 13 県（ラジシャヒ州北部 8 県、ダッカ州北部 5 県）。うち、無償事業要請（ハオール）と重複するダッカ州北部 2 県での対象地域は以下の通り。

- ・ Kishoreganj 県：県内全 12 ウパジラ中 4 ウパジラ（Nikli ウパジラを含む）。
- ・ Netrokona 県：県内 9 ウパジラ中 3 ウパジラ（Khaliajuri ウパジラを含む）。

3. 事業内容（以下の表は無償事業要請と重複する 2 県での重複コンポーネントについてのみ）：⁵

コンポーネント	内容
道路整備	ウパジラ（郡）道路(UZR)17 区間 ⁶ の舗装、総延長 21.98km。うち潜水道路 10 区間、総延長 10.38km
船着場整備	UZR や市場に直結する既存船着場の改善 15 ヶ所
農村市場(Growth Center)整備	既存市場(rural markets)のグレードアップ 10 ヶ所

4. 事業費：

融資組織等	事業費（百万ドル）
ADB 借款対象額	71.49
OECD/JBIC	52.84
IFAD	11.32
SIDA	7.20
GOB	35.76
地方政府	2.46
合計	181.07

5. 備考：本件事業は 99 年度円借款事業との協調融資であったが、円借款資金充当対象はダッカ州北部 5 県での一般ウパジラ道路舗装と LGED/RDEC(Rural Development Engineering Center)建設のみ(OECD/JBIC での本事業の名称は「北部農村インフラ整備事業」)。

⁵ 情報出所：JBIC ダッカ事務所及び LGED 提供資料。

⁶ 事業全体での UZR 整備は 123 区間、総延長 1,238km。

日本海外経済協力基金（OECF）：
北部農村インフラ整備事業

1. 実施期間：1999-2005

2. 対象地域：バングラデシュ北部の 5 県（ダッカ州北部 5 県）。うち、以下の地域が無償事業要請（ハオール）と重複する。

- ・ Kishoreganj 県
- ・ Netrokona 県

（ウパジラ名称等詳細は LGED から提供されなかった）

3. 事業内容（以下の表は無償事業要請と重複する 2 県での重複コンポーネントについてのみ）：⁷

コンポーネント	内容
道路整備	ウパジラ（郡）道路(UZR)舗装 （円借款が充当された道路区間の量及びについては ADB 事業と区分した情報が LGED から提供されなかった）

4. 事業費：

融資組織等	借款承諾額 ⁸ （百万円）
OECF	6,593

5. 備考：本件事業は ADB 3rd RIDP との協調融資。

⁷ 情報出所：LGED の円借款事業担当プロジェクトマネジャー提供資料、JBIC プレスリリース。

⁸ 事業費の詳細について、プレスリリースには記載されていない。また、JBIC での事前評価制度導入は 2001 年度承諾事業以降であり、99 年度承諾事業の本件について事前評価表は作成されていない。

DFID: Chars Livelihood Programme

1. 実施期間：2002-2010

2. 対象地域: ジャムナ川のチャール地域5県(Kurigram, Jamalpur, Gaibandha, Bogra, Sirajganj)。チャール地域の全166ユニオン、全25ウパジラを対象とする予定⁹。

3. 事業内容及び事業費¹⁰

コンポーネント	内容	金額 (£ mil.)
アウトプット1: 的を絞ったインフラ整備とサービス提供を通じたチャール居住者の脆弱性低減 (この項小計。以下同) 13.8	ユニオン強化	0.7
	ユニオン基金	3.4
	ウパジラ(郡)基金(25ウパジラ)	2.0
	極貧層保護(40万人)	4.0
	・通信事業: 通信中継機整備、ラジオ500ヶ提供等	0.3
	・運輸事業: R-2, R-3道路や船着場整備等	0.9
	・災害管理: かさ上げ(家、集落、市場、避難所等)	1.3
	・避難所、水・衛生: 避難所整備、建築材料改善調査等	0.6
	・環境管理システムの確立	0.3
	・Char Rural Development Academyセットアップ	0.3
アウトプット2: チャール居住貧困層の生計維持と経済への能動的参加 10.1	生計強化1	4.0
	生計強化2	1.0
	自営業サービス1	0.5
	自営業サービス2	0.6
	金融支援	3.4
	その他起業支援	0.6
アウトプット3: チャール居住貧困層の地域政治・国政への参加 8.8	社会動員	5.1
	村民フォーラム支援基金	0.3
	意識向上活動	0.4
	社会防衛能力向上	0.2
	調査研究	0.3
	競争入札研究基金	1.2
	調査提供基金	0.5
	モニタリング等	0.8
その他 3.0	予備費	2.1
	監査・評価	0.5
	プログラムマネジャー委託ポスト	0.4
小計		35.7
総計	(その他管理費等を含むDFID支援総額)	50.0

(約101億円) (£1=201円)

⁹ DFID Sep. 15, 2002, Annex 1 p.11 section 2.2.3.

¹⁰ 上掲表全体の出所は以下のDFIDウェブAnnex 1 p.39-40。アウトプット1のインフラ整備詳細情報出所はAnnex 2。

<http://www.dfid.gov.uk/pubs/files/chars-livelihoods-prog.pdf>

CARE (USAID) : 総合食糧安全保障事業(Integrated Food Security Program: IFSP)
 の一部としての洪水共生事業(FPP)

1. 実施期間 : 1999-2004

2. 対象地域 : コンポーネントごとに異なる (以下「3.」参照)。

3. 事業内容 :

名称	内容
ユニオンのインフラ整備事業 (BUILD: Building Union Infrastructure for Local Development)	全国規模でのインフラ整備 <ul style="list-style-type: none"> ・ 農村道路、路肩強化植林、カルバート、橋梁 ・ 農村市場 ・ Union Parishad Complex (ユニオン行政施設)
洪水共生事業 (FPP: Flood Proofing Project) (詳細は次項参照)	チャール及びハオール地域での洪水対策 <ul style="list-style-type: none"> ・ 構造物対策 : 土台かさあげ、避難所建設等 ・ 非構造物対策 : 保健・栄養、IGA
都市貧困層衛生改善事業 (SHAHAR: Supporting Household Activities for Hygiene, Assets and Revenue)	4 中核都市でのスラム住民対象の能力強化、保健・栄養関連活動、生活インフラ整備等。
災害管理事業 (DMP: Disaster Management Project)	災害関連研修 (ローカル NGO、ユニオン災害管理委員会、ユニオン行政メンバー等)

4. 事業費

2004 年度の同事業の予算は USD35,463,234 だった旨以下ウェブサイトに記載されているが、総事業費や FPP 等サブプロジェクトごとの事業費規模は記載されていない。

http://www.carebd.org/financial_info.html

CARE (USAID) : 洪水共生事業(Flood Proofing Project: FPP)

1. 実施期間 : 1999-2004
2. 対象地域 : チャール地域及びハオール地域の 944 村 (いずれにも属さないマイメンシン県での事業を含めた場合、1,033 村)
3. 事業内容 : ¹¹

①構造物洪水対策

活動内容	実績	活動内容	実績
土台かさ上げ	23,329 ヶ所	トイレ建設	7,817 ヶ所
ソサイティセンター建設	47 ヶ所	農村市場改善	48 ヶ所
多目的洪水避難シェルター建設	57 ヶ所	公共施設かさ上げ	402 ヶ所
井戸 (tube well) 改善/掘削	1,696 ヶ所	法面保護	121 ヶ所
RCC 擁壁	2 ヶ所	レンガ擁壁	多数

②非構造物洪水対策

活動内容	実績
ローカル事業グループ活動 : 性別、階層、年齢等さまざまな村民約 10 人から成るグループを結成し、研修受講後に各種活動に従事した (擁壁建設、マウンド造成、道路整備、教育活動等)。	1,033 村 (マイメンシン県を含む)
母親クラブ : 各村で約 20 人の母親から成るグループを結成し、母子保健、栄養、育児に関する研修を受講した。また、母親の行う野菜栽培、養魚等収入増加活動がグループを通じて支援された。	1,115 村の母親 18,900 名 (マイメンシン県を含む)
児童フォーラム : 8-12 歳の児童が洪水共生、健康、栄養等に関する研修を受講した。	児童 8,556 名
パイロットコンポーネント : ①地域密着型栄養プログラム : 食事指導、発育モニタリング、就学前保育、誕生・新生児体重の登録活動、母子保健、栄養不良児童の保健施設へのレファラル、地域健康教育、移動クリニック、母親学習セッション、健康・栄養サーベイランス船等。 ②子供主導の地域開発 : 8-14 歳の子供がソーシャルマッピングや問題分析を通じて地域開発のありかたを考える活動。地域内の各組織と連携し、児童婚の撤廃を提唱して成功した地域もあった。	(記載なし)

¹¹ 情報出所 : RCC 擁壁に関する情報は LGED 提供。レンガ擁壁が多数であることは CARE ダッカ事務所 Boeren 氏口頭情報。他情報は IFSP Final Evaluation Report (Jun. 2, 2004), p.16 と CARE ウェブサイト <http://www.careusa.org/careswork/projects/BGD058.asp>。

CARE (USAID) : 友愛事業(Strengthening Household Ability to Respond to Development Opportunities : SHOUHARDO[ベンガル語で“友愛”])

1. 実施期間 : 2004-2009

2. 対象地域 : チャール地域(Nilphamari, Lalmonirhat, Rangpur, Kurigram, Gaibandha, Bogra, Jamalpur, Tangail, Sirajganj, Sherpur, Pabna)、ハオール地域(Sunamganj, Habiganj, Kishoreganj, Netrokona)、南部沿岸部(Chittagong, Noakhali, Cox's Bazar).の計 18 県

3. 事業内容 : ¹²

本事業は 99-2004 年に実施された食料安全保障事業 (IFSP) の後継事業で、上位目標 (overall goal) は「慢性的・一時的な飢えの不安を持続的に解消すること」とされている。事業目的としては以下の 4 点が挙げられており、洪水関連は第 4 点である。

- ① 生計能力強化、行政サービス提供者の質向上等により弱者世帯が食料へのアクセスを改善すること。
- ② 事業参加者が健康と栄養状態を持続的に改善すること
- ③ 弱者世帯の 40 万女性と女子がエンパワーされること。
- ④ 対象地域と対象組織が自然災害への対応能力、ミティゲーション能力を高めること。

4.備考

活動内容は別添 x 面談記録によると「ソフト投入重点化」とのことで、事業の実施方針はウェブサイトでは以下の通りである。このうち、洪水の関係では④と⑤が注目される。

- ① コミュニティに認定された極貧層の重点化
- ② コミュニティ主導のプロセス
- ③ 既存グループと組織の優先
- ④ ハードウェアよりもソフトウェア
- ⑤ 伝統的知識の活用
- ⑥ 真に総合的な取り組み
- ⑦ 他組織が行かない地域での取り組み
- ⑧ ジェンダー平等な事業実施
- ⑨ 人権重視の事業実施
- ⑩ 環境モニタリング

¹² 情報出所 : CARE ウェブサイト http://www.carebd.org/project_dtls.php?pid=37

CONCERN: Disaster Preparedness Programme

1. 実施期間：1999年～
2. 対象地域：バングラデシュ全土。¹³
3. 事業内容：¹⁴
 - ①地方組織の能力強化
 - ・ 技術移転
 - ・ マネジメント支援
 - ・ ネットワーキングとアドボカシー
 - ・ 災害対応計画の立案
 - ②地方政府の能力強化
 - ・ 研修
 - ・ 災害対応計画の立案
 - ・ 意識向上キャンペーンの支援
 - ③適正技術での災害復興
 - ・ 災害頻発地区での植栽
 - ・ かさ上げされた避難所の整備
 - ・ 家屋用土地の整備と井戸整備
 - ・ 改良かまど

¹³ 事項脚注文書の p.4 地図によると、活動箇所はバングラデシュ全 6 州にわたっている。

¹⁴ 情報出所:Development Strategies for Disaster Preparedness: Bangladesh (Concern, 2004)
<http://www.concern.net/docs/casestudies/DSDP%20Case%20Study%20-%20Final,%20181104.pdf>

OXFAM: River Basin Programme (RBP)

1. 実施期間：1999年～¹⁵
2. 対象地域：ブラマプトラ/ガンジス川流域のネパール、東北インド、バングラデシュ。
バングラデシュで無償要請と重複する地域としては、チャール地域4県(Kurigram, Jamalpur, Gaibandha, Sirajganj) の計11UPで活動している。¹⁶
3. 事業内容¹⁷
 - ① 集落のかさ上げ (64ヶ所)
 - ② 避難所建設 (19ヶ所)
 - ③ 家屋かさ上げ (8,270ヶ所)
 - ④ 災害対応委員会の設立 (267ヶ所での設立)
 - ⑤ 救援ボートの提供 (33艘)
 - ⑥ ラジオの提供 (205ヶ所の提供。1ヶあたり300世帯の受益)

¹⁵ 情報出所：British Red Cross Society, 2000-1, “NGO Initiatives in Risk Reduction: Case Study no. 10: Disaster mitigation at regional level”

<http://www.redcross.org.uk/uploads/documents/riskred10.pdf>

¹⁶ 情報出所：開調報告書 Annex F・Figure 1.1.

¹⁷ 情報出所：OXFAM ウェブサイト

http://www.oxfam.org.uk/what_we_do/where_we_work/bangladesh/emergency/river_basin/index.htm

JICA：洪水共生事業(Flood Proofing Project: FPP)パイロット（参考）

1. 実施期間：2003年～（GOB負担のソフト投入は現在も実施中だがJICA資金充当分は2004年で完了）

2. 対象地域：

- ・チャール地域 Gaibandha 県 Fulchari ウパジラ Elendabari ユニオン Algor Char 村
- ・ハオール地域 Kishoregonj 県 Nikli ウパジラ Gurai ユニオン Gurai 村

3. 事業内容及び事業費：¹⁸

① チャール地域

(万 Tk)

コンポーネント	GOB	JICA	合計
アルガルチャール小学校避難所連絡道路のかさ上げ・拡幅(445m)	70	7	77
同道路のボックスカルバート整備	160	0	160
同校の避難所 1m かさ上げ	0	33	33
合計	230	40	270

②ハオール地域

(万 Tk)

コンポーネント	GOB	JICA	受益者*	合計
グライ村住民によるレンガ擁壁建設(38m)	0.4	35.2	0.2	35.8
井戸整備 7ヶ所（新設 3、土台かさ上げ 4）	0.1	4.2	0.2	4.5
貧困層へのスキルトレーニング（25人）	4.4	0	0	4.4
受講者 24人へのマイクロクレジット供与（各 5千 Tk）	12.0	0	0	12.0
合計	16.9	39.4	0.4	56.7

*受益者負担はレンガ擁壁の掘削作業 (73.67m³) と既存井戸の土台かさ上げ (35.84 m³) の労務を事業費に計上したもの。

¹⁸ 情報出所：LGED 派遣 JICA 長期専門家上潟口氏作成のペーパー及び LGED の 2005 年 9 月 12 日プレゼンテーション資料。