

Attachment 7 Environmental and Social Consideration

ENGINEERS ASSOCIATES LIMITED

7/7 Sir Syed Road, Block- A, Mohammadpur Housing Estate, Dhaka-1207
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Project Name: Feasibility Study on Bheramara 450MWCCPP, 2008

Good morning/afternoon/evening. I,....., am
from Engineers Associates Ltd. , a consulting firm for carrying out survey of this area
aiming at the installation of new power station in this area.

Identification Code:

Name of Respondent (Name of Head of HH):

Address:

.....
.....
.....

Respondent's Category:

1. Inside Homestead / Land with documents

2. Inside Homestead / Land without documents

3. Outside Homestead / Land with documents

01. What is your age?.....years

02. Have you studied in school/college?

Yes

1

No

2

03. Which highest class you have passed:

04. Marital Status

Married

1

Unmarried

2

Widow/Widower

3

Divorced

4

Separated

5

05. What is the main occupation of HH Head:

06. What is your family monthly income :Taka.....

07. What is your family monthly expenditure :Taka.....

08. Specify Category of Monthly Expenditure and the respective Amount:

- a) Cloth..... Taka.....
- b) Furniture..... Taka.....
- c) Guest Entertainment..... Taka.....
- d) Transportation..... Taka.....
- e) Treatment..... Taka.....
- f) Seeds, Fertilizer, Pesticides..... Taka.....
- g) Food..... Taka.....
- h) Electricity..... Taka.....
- i) Alcohol, Tobacco..... Taka.....
- j) Any Loan..... Taka.....
- k) Water Bill..... Taka.....
- l) Khajna/Tax..... Taka.....
- m) Education..... Taka.....
- n) House Rent..... Taka.....
- o) Fuel..... Taka.....
- Total Expenditure..... Taka.....

09. Do you have your own Land: Yes

1

No

2

20. Do you watch TV ? Yes 1 No 2

21. Do you listen Radio? Yes 1 No 2

22. Where do you go for treatment if your family members fall sick?:
 1 2

23. Please specify the name of the vaccines if the children of max 2 years old are immunized.

24. Please list the types of roof, wall and floor of the house:

	Tin	Pucca	Tiles	Earth	Bamboo	Hey/Leaves	Jute Stick	Wood	Others
Roof	1	2	3		5	6	7	8	
Wall	1	2		4	5	6	7	8	
Floor		2		4	5			8	

25. Is your house electrified? Yes 1 No 2

26. Please mention the nature of utilization of electricity:

27. Please mention the good sides of electricity supplied by PDB/PBS:

28. Please mention the bad sides of electricity supplied by PDB/PBS:

.....

29. What is your opinion if new power station is installed in your area?

.....

30. Which type of fuels are used for cooking?:

- a. Wood.....01
- b. Crops waste.....02
- c. Cow dung.....03
- d. LP/ Liquefied gas.....04
- e. Electric Heater.....05
- f. Gas.....06
- g. Kerosene.....07

31. What is your Monthly Fuel cost Taka.....

32. Specify which properties of the following you belong to:

- a. Radio 01
- b. Television 02
- c. Bi cycle 03
- d. Motor cycle 04
- e. Sewing Machine 05
- f. Land Phone 06
- g. Mobile Phone 07
- h. Refrigerator 08
- i. Car/Truck 09
- j. Rickshaw Van 10
- k. Boat 11
- l. Clock 12
- m. Almirah 13
- n. Khat / Bed 14
- o. Chair/Bench 15
- p. Automobile 16

33. Please give the names of your family members and age:

- 1.(.....)
- 2.(.....)
- 3.(.....)
- 4.(.....)
- 5.(.....)
- 6.(.....)
- 7.(.....)
- 8.(.....)
- 9.(.....)
- 10.(.....)

34. Description of your major installations with total value in Taka:

Description:
.....
.....

Total Value Taka

35. Trees with total value:

Trees:
.....
.....

Total Value Taka:.....

36. Do you have any objection if gas / power transmission lines are installed in your land? Please give your comments.

.....
.....
.....
.....

-----:Thank you:-----

Site A

Sl. No.	Name	Occupation	Monthly Income ⁽¹⁾ (Taka) (X)	Address	Required land (Affected area)	Yearly Loss crop(rice) (Taka) (Y)	Y/X (%)	Items		
								Definition of Entitlement	Application Guidelines	Additional Services
1	Kolim Uddin	Agriculture	5,000.00	68 Para	total:1ha (227m2/person)	total:69,000Tk (1,600Tk/person)	2.7	Compensation for standing crops, if any, affected at the time of property handover.	1. Give preference to the people at employment 2. Estimated market value at harvest.	None
2	Mojaher Ali Mondol	"	5,000.00	"						
3	Azhar Ali Modol	Service	7,000.00	"						
4	Mojbar Mondol	"	7,000.00	"						
5	Tomej Ali Mondol	Agriculture	3,000.00	"						
6	Rezaul	"	4,000.00	"						
7	Asadul	Unemployed	-	16 Dagg- North Para						
8	Yeasin Ali	Dependant on son	-	"						
9	Rashed Ali		3,000.00	12 Dagg- Baharchar						
10	Nasim	Agriculture	4,000.00	"						
11	Abu Taher Sarder	Retired	2,500.00	"						
12	Ebu	Business	10,000.00	"						
13	Enamul Sarder	Service	5,000.00	"						
14	Yakub Mondol	Agriculture	4,000.00	"						
15	Hannan	Business	15,000.00	16 Dagg-						
16	Zinnah Mondol	Driver	7,000.00	12 Dagg South Para						
17	Ibadat Ali Mondol	Agriculture	6,000.00	12 Dagg-						
18	Ajjul	Labour	3,000.00	"						
19	Rahmat Ali	Labour	2,000.00	"						
20	Maola Boksh	Retired	2,500.00	"						
21	Samad Ali	Retired	10,000.00	"						
22	Rezaul Alam	Business & Agriculture	10,000.00	"						
23	Mukter	Service	10,000.00	16 Dagg-						
24	Doller	Business	3,000.00	12 Dagg-						
25	Safi Pramanik	Labour	3,000.00	"						
26	Saban Uddin	Agriculture	-	"						
27	Akkel Ali	Agriculture	3,000.00	"						
28	Ahad Ali	Retired	2,500.00	"						
29	Idris Ali Mondol	Agriculture	2,000.00	"						
30	Ansar Ali	Retired	3,000.00	16 Dagg-						
31	Golam Mostafa	Service	5,000.00	12 Dagg-						
32	Khajir Ali	Business	10,000.00	"						
33	Abul Hasen Babu	Service	7,000.00	"						
34	Abul Kalam	Business & Agriculture	6,000.00	"						
35	Md. Mahatab Sarder	Service	7,000.00	"						
36	Md. Ajit	Agriculture	3,000.00	"						
37	Md. Afjal Mondol	"	6,000.00	"						
38	Md. Harun-Ar-Rashid	"	4,000.00	"						
39	Md. Arob Ali	Service	7,000.00	"						
40	Md. Nashirul Islam	Agriculture	1,500.00	"						
41	Md. Abdul Manan	"	1,000.00	"						
42	Md. Abul Hashan (Babu)	Service	7,000.00	"						
43	Md. Shohidul Mondol	Agriculture	2,000.00	"						
44	Mrs. Bina Khatun	Butcher/ Slaughter	500	"						

Gas Pipeline

Plot No	Name	Total owner's Land		Required land (Affected area)		Items		
						Definition of Entitlement	Application Guidelines	Additional Services
3538	The original owners of this plot are Mr. Ayej Uddin Sarder and Mr. Anser Ali Sarder both son of Mr. Ajim Uddin Sarder. Mr. Ajim Uddin Sarder and Mr. Ayej Uddin Sarder have already died. Now the land is owned by Mr. Anser Ali Sarder and the successors of Late Ayej Uddin Sarder. The successors are as follows: 1. Mrs. Sofia Khatun - Wife 2. Md Shafique - Son 3. Md Eabid - Son 4. Md Lalou - Son 5. Ms. Rokeya - Daughter 6. Ms. Selma - Daughter 7. Ms. Rozina - Daughter.	87	Decimal	43.8	Decimal	1. Compensation for agricultural land. 2. Compensation for standing crops, if any, affected at the time of property handover.	1. Estimated CUL (Compensation under the law) which includes 50% premium by Compensation Determination Committee. 2. Estimated market value at harvest.	NGO will examine whether they have the required legal documents, and advise and assist with any issues that might prevent timely receipt of CUL.

Transmission Line

Plot No.	Name	Total owner's Land		Required land (Affected area)		Items		
						Definition of Entitlement	Application Guidelines	Additional Services
1132	Azizul Hoque	51.00	Decimal	10.63	Decimal	1. Compensation for standing crops, if any, affected at the time of property handover.	1 Estimated market value at harvest	None
3624	Nekjan Nesa	132.00	Decimal	16.59	Decimal			

Feasibility Study on Bheramara 450MW Combined Cycle Power Station
1st Stakeholder Meeting

Venue : Bheramara Power Station
 Date : June 16, 2008
 Time : 10.00a.m.

List of Participants

Sl. No.	Name	Designation & Organization	Contact No.	Signature
01.	Swapan Kanti Poddar	Environmental Specialist	01670947048	
02.	Tadashi Nakamura	Environmental Expert, JICA	01924097394	
03.	S.M. Zahid Hasan	Assistant Engineer, BPDB	01552464524	
04.	Md. Abdus Salam	Head Teacher	01712120935	
05.	Norihiko Fukazawa	Environmental Specialist	01924097392	
06.	Hideyuki Okano	Team Leader, JICA Team	01924097391	
07.	Md. Mizanur Rahman	A.H.M PDB High School	01558328857	
08.	Md. Tahir Miah	Manager, Bheramara Power Station	01711430204	
09	Moffazzal Hossain Sarkar	XEN (I & C)	01718045278	
10	Engr. S.M. Touhidul Karim	XEN. (Mech) BPS. BPDB.	07022171424	

List of Participants

Sl. No.	Name	Designation & Organization	Contact No.	Signature
11.	Md. Abu Bakkar	Chairman , Bahirchor	01711340368	
12.	Md. Bablu Mondol	UP Member	01726274101	
13.	Md.Asaduzzaman	SDE, UBK	01716770489	
14.	Md. Shahidul Islam	SDE,EMD	01702584429	
15.	Engr. Md. Shahajahan	XEN ,EMD BPS	01725211484	
16.	Mallik Enamullah	XEN ,MMD BPS	01711117350	
17.	Md.Mokhlesur Rahman	XEN ,CMD BPS	01718129791	
18.	Md. Rezaul Alam	UP Member, Bahirchor	017117091162	
19.	A.Z. Md. Rabiul Islam	S.A.E (EMD)	0171652592	
20.	Md. Abdul Jalil	UP Member, Bahirchor	01916490461	
21.	Mufti Abdul Salam Faruki	Emam, Bheramara Power Station	01556560460	
22.	Md. Sirajul Islam	Deputy Director, (Account) RAO, BPS	01718759988	
23.	Md. Abul Khaer	Assistant Teacher, PDB School	0178300203	
24.	Md. Francis Sarkar	SAE (I &C)	01711972691	

List of Participants

Sl. No.	Name	Designation & Organization	Contact No.	Signature
25.	Sardar Md. Abu Saleque	Bheramara Upazila Secondary Education Officer,	01711029704	
26.	Md. Zakir Hossain	SDE, BPS	01715507707	
27.	Md. Shahjahan Ali	SAE (OP)	01727387173	
28.	Dr. Md. Ashfaquul Islam Babul	UNO, Bheramara	01911040555	
29.	Md. Jamal Uddin	Bheramara Upazila Agriculture Officer	01718214607	
30.	Nripandra Nath Biswas	Bheramara Upazila Fisheries Officer	01712278238	
31.	Md. Anisur Rahman	Lecturer, Bheramara Women College.	01719918859	
32.	Anwar Hossian	Teacher, Bheramara Women College.	01712838166	
33.	Md. Zahurul Hasan	Teacher, Bheramara Women College	01917209957	
34.	Md. Ayub Ali	Lecturer., Bheramara College	01717748776	
35.	Md. Shamsudoha	Lecturer, Bheramara Ideal College	01712702153	
36.	Dr. M Karim	M.O, BPS, Kushtia	01718850642	
37.	Md. Abdul Momin	UP Member	01717807076	
38.	Md. Sultan Mahamud	SAE , Bheramara Power Station	017178585422	
39.	Zamela	UP Member	-	

List of Participants

Sl. No.	Name	Designation & Organization	Contact No.	Signature
40.	Md. Gias Uddin Khan	Head Teacher (DAB) Bheramara	01716160104	
41.	Md. Mohasin Ali	U.B Engr., Drazer Division	01711110533	
42.	Md. Abdul Hamid	Cum - Assistant Accountant	01718170055	
43.	Md. Sanzid	UP Member , Bahir chor	01726178068	
44.	Md. Syed Ali	UP Member, Bahir chor	01719477817	
45.	Md. Yusuf Ali	UP Member, Bahir chor	01721392926	
46.	Abdul Hannan	Bhander Officer,	01712165867	
47.	Md. Sirajul Hoque	Electrical Engineer	01916490066	
48.	Advocate Towhidul Islam Alam	Mayor, Bheramara Powrosabha	01715804089	
49.	Md. Abdullah-Al- Mamun	U.E.O	01718416157	
50.	Md. Masud Ahmed	U.S.S. O	01712058871	
51.	Mosammat. Taslima	UP Member	01735223394	
52.	Md. Rabiul Islam	Contractor	01553714532	
53.	Md. Nazrul Islam	Contractor	-	
54.	Mofazzal Hossain	Field Officer	-	

List of Participants

Sl. No.	Name	Designation & Organization	Contact No.	Signature
55.	Md. Ruhul Kafi	Store Keeper, Bheramara P/S	01712547909	
56.	Md. Shahaul Kabir	SAE , Bheramara P/S	01191187933	
57.	Md. Abul Hossain	Plumber	01719662330	
58.	Abdur Razzak	Assistant Teacher ,PDB School	01718084388	
59.	Md. Bazlur Rahman	S.M S.S	01710832927	
60.	Md. Rafikul Islam Sikder	S.B.A .B	01711909546	
61.	Md. Ashraful Hoque	T.A. C	0171752329	
62.	Abdul Alam	Motor Machanices- D	01717581173	
63.	Abdul Kader	Foreman	0178221471	
64.	Md. Hazrat Ali	ADS ,BPS	01724086788	
65.				
66.				
67.				
68				

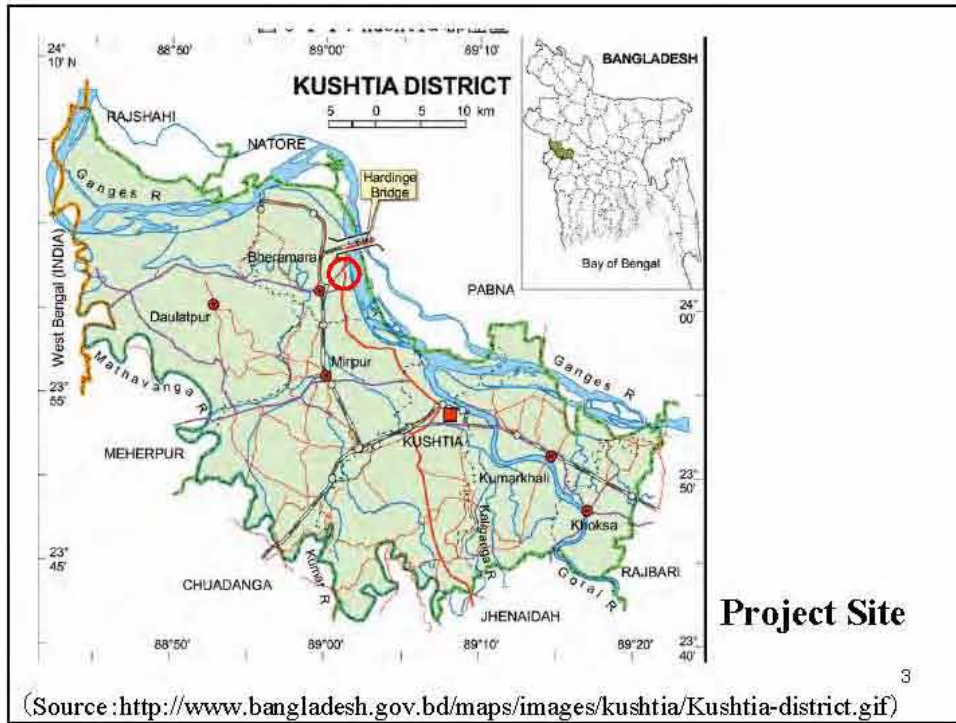
THE STUDY ON
Bheramara 450MW
COMBINED CYCLE POWER
STATION IN BANGLADESH

Environmental and social consideration

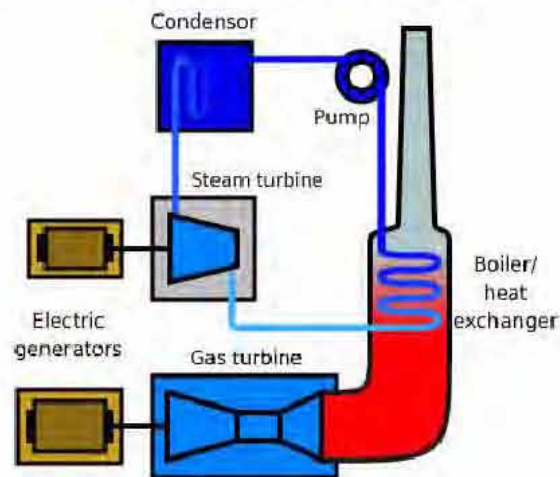
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Project Overview

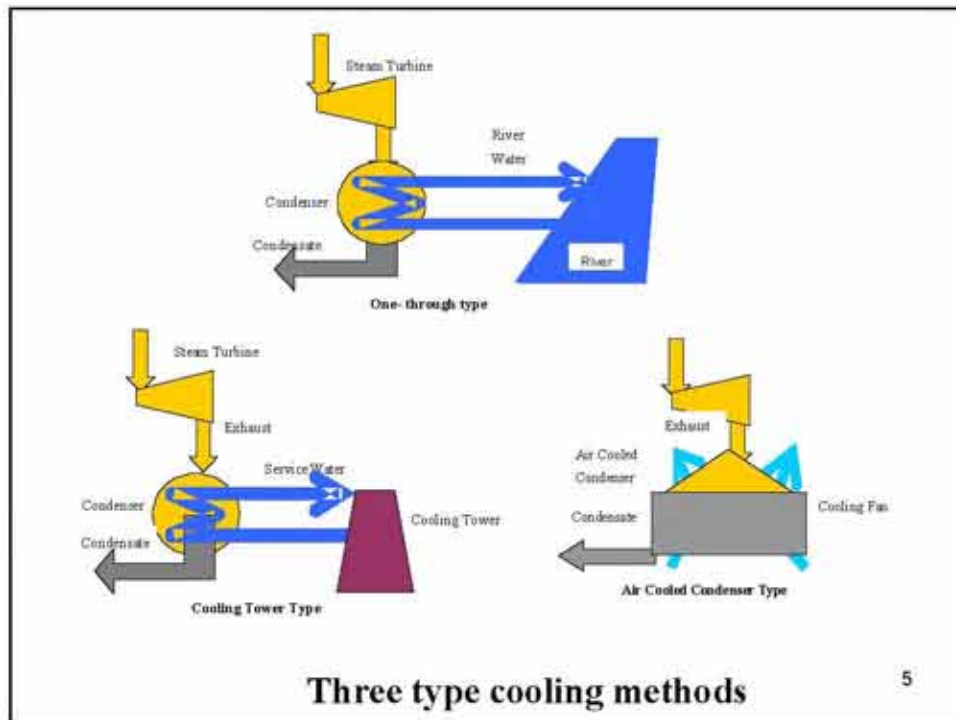
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Power generation method:
 450MW Combined cycle Power Plant
 Fuel: Natural gas and Diesel oil



Source : <http://en.wikipedia.org/wiki/Image:COGAS-diagram.png>



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Items for consideration based on different cooling systems (1)

Cooling methods	One-through method using river water	Using cooling tower	Air cooled condenser
Types of cooling media	River water	Freshwater (River water or Underground water)	Air
Cooling rate	The best efficiency	Lower efficiency than One-through method	The lowest efficiency
Thermal effluent	Generated	Hardly generated (generated when exchanging cooling water)	Not generated
Noise	The noise source is only the pumping equipments.	Other than pumping equipment, cooling fan makes loud noise	Other than pumping equipment, cooling fan makes loud noise

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Items for consideration based on different cooling systems (2)

Cooling methods	One-through method using river water	Using cooling tower	Air cooled condenser
Civil engineering cost	Lower than the air cooled condenser	Same as one-through method	The highest
Maintenance and running cost	Lower than the air cooled condenser	Same as one-through method	The highest

7

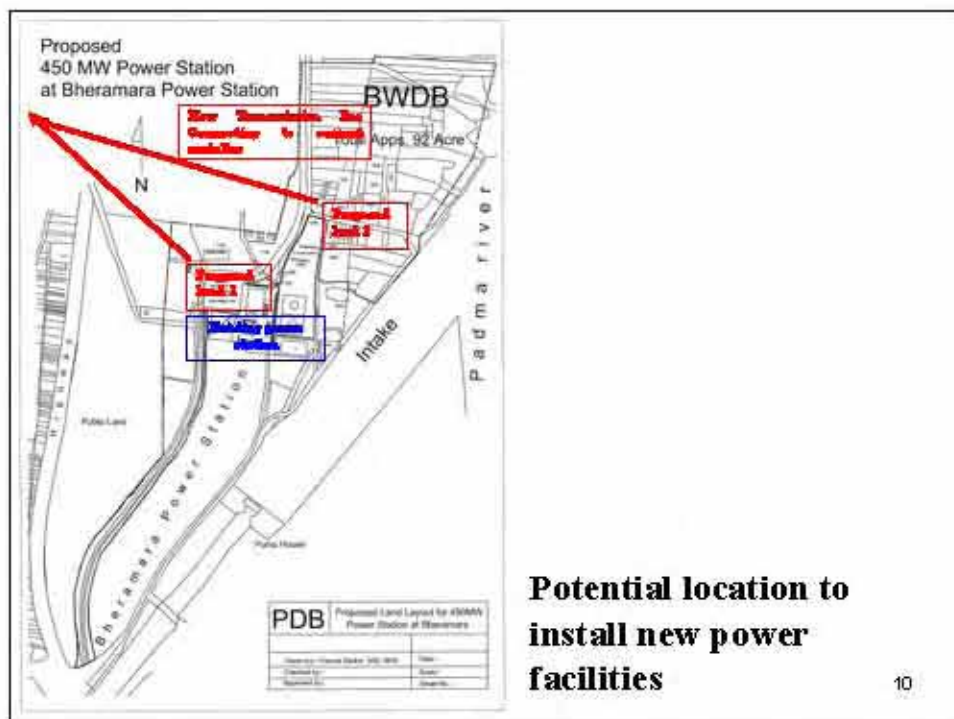
Overview of the location

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Overview of the location

- The site is located in Khulna Division, Kushtia District, Bheramara Upazila which is 250km northwest of the capital city, Dhaka.
- Bheramara Upazila itself in the watershed of Ganges river (Padma river) and the land is flat. It belongs to a fertile alluvial formation and the agricultural productivity is rather high in the nation.
- There is no Natural /Forest reserve and Sanctuary Forest in Bheramara Upazila .
- There is no National Heritage under law in Bheramara Upazila .

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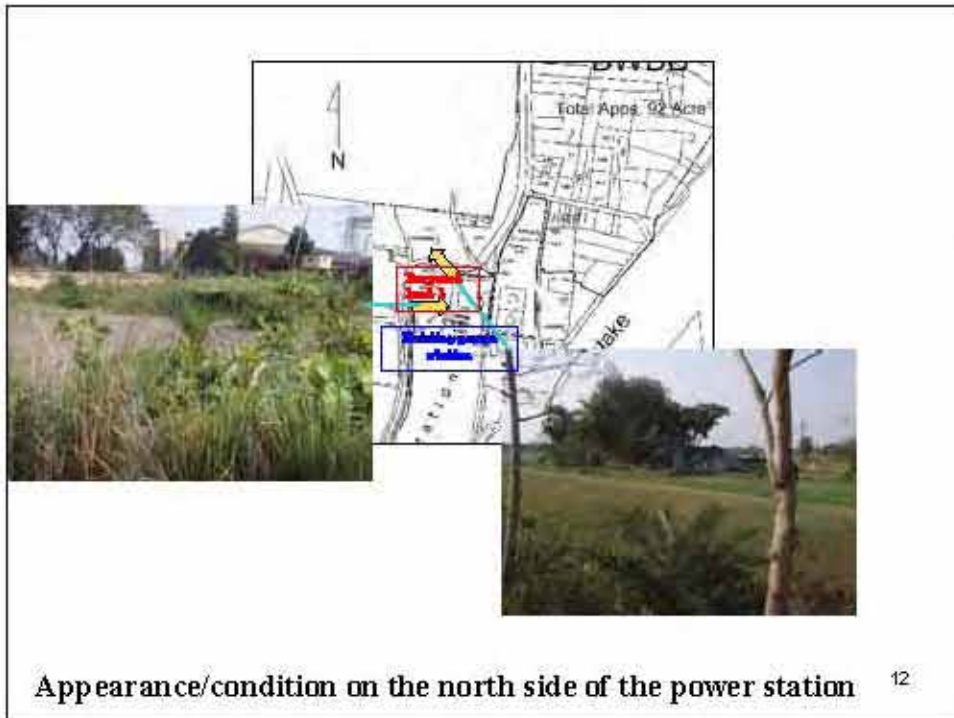


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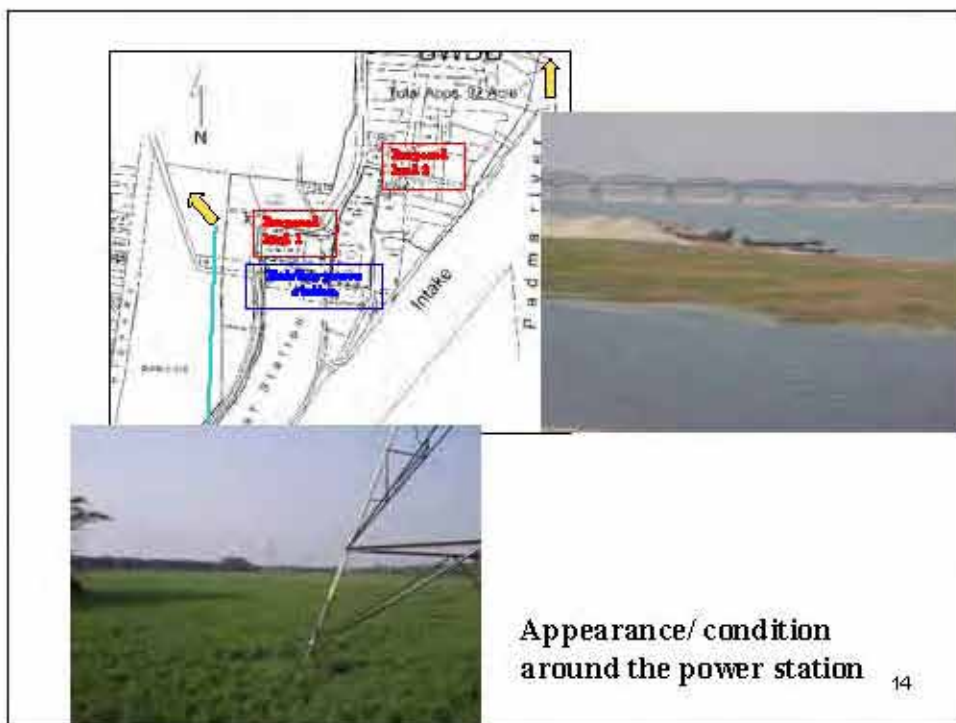
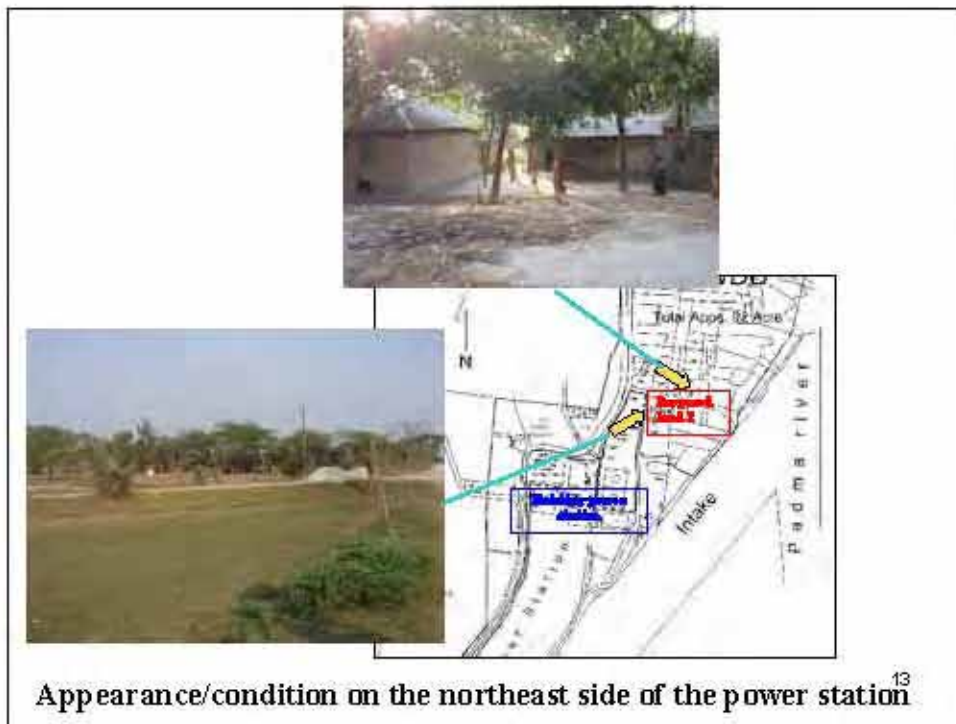
Overview of the potential location

Installation site for the new power facilities	North side of the existing power station	North-east side of the existing power station
Proprietor	BPDB	BWDB
Residents residing on site	Power station staff members reside on the site, no residents relocations	Residents besides staff reside on the site
Size of the site	The layout of facilities is limited.	The layout of facilities is flexibility.

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Scoping results

A: Serious impact is expected.

B: Some impact is expected.

C: Extent of impact is unknown at the moment (Examination is needed)

No mark: No impact is expected. EIA is not necessary.

items to conduct impact assessment through environmental management plan

- : at first by implementing antipollution measure survey to confirm the present situation
- : at first by implementing natural environmental survey to confirm the present situation
- : at first by implementing social environmental survey to confirm the present situation
- : if necessary confirming the present situation by hearing investigation

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Scoping Results (Pollutants and Natural Environment) (1)

	No.	Overall Rating.	Construction Phase		
			Temporary impact by undertaking construction	Operation of construction machinery	Carrying construction materials in and
Environmental contamination	1 Air pollution	A		B	C
	2 Water pollution	A		C	
	3 Solid waste	B		B	
	4 Noise/Vibration	A		A	C
	5 Odor	C			
Natural environment	6 Climate				
	7 Hydrology	C			
	8 Flood				
	9 Underground water	C	C		
	10 Ground subsidence	C	C		
	11 Soil erosion	C	C		
	12 Sanctuary				
	13 Terrestrial ecosystem	C	C		
	14 River ecosystem	A			
	15 Precious species	C	C		

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Scoping Results (Pollutants and Natural Environment) (2)

	No.	Overall Rating	Operation Phase							
			Land-use alteration/consolidation of facilities	Intake of cooling water	operation of facilities				Carrying materials in and out	Generation of solid waste
					Gas emissions	Waste water	Thermal effluents	Odour		
Environmental contaminants	1 Air pollution	A			A			C	C	
	2 Water pollution	A				C	A			
	3 Solid waste	B								C
	4 Noise/Vibration	A						A	C	
	5 Odour	C								C
Natural environment	6 Climate									
	7 Hydrology	C		C			C			
	8 Flood									
	9 Underground water	C		C						
	10 Ground subsidence	C		C						
	11 Soil erosion	C								
	12 Sanctuary									
	13 Terrestrial ecosystem	C	C							
	14 Ecosystem	A		B			A			
	15 Invasive species	C	C							

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Scoping Results (Social Environment and Others)(1)

	No.	Overall Rating	Construction Phase			
			Temporary impact by undertaking construction	Operation of construction machinery	Carrying construction materials in and out	
Social environment	16 Involuntary / resident resettlement	A	A			
	17 Employment /Livelihood	C	C			
	19 Local economy	C	C			
	20 Land utilization					
	22 Social infrastructure/service facilities	C				C
	23 River traffic	C				C
	24 Land traffic	C				C
	25 Sanitation	C	C			
	31 Risks for infectious diseases such as (HIV/AIDS)	C	C			
	26 Local custom					
	27 Burden on vulnerable groups(women, children, aged,impoverished, minorities,indigenous people and such)	A	A			
	28 Uneven distribution of benefit and loss(damage)	B	B			
	30 Utilization/leak of water	B	C			C
	32 Cultural heritage					
	33 Landscape	C				
Other	34 Accident	C		C	C	
	35 Global warming	B				

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Scoping Results (Social Environment and Others) (2)

	No.	Overall Rating	Operation Phase							Carrying materials in and out	Generation of solid waste
			Landscape alteration/contaminance of facilities	operation of facilities					Others		
				Leakage of cooling water	Gas emissions	Waste water	Thermal effluent	Others			
Social environment	16	Involuntary resident resettlement	A	A							
	17	Employment /Livelihood	C	C				C			
	19	Local economy	C	C							
	20	Land utilization									
	22	Social infrastructure/service facilities	C							C	
	23	River traffic	C	C							
	24	Land traffic	C							C	
	25	Sanitation	C	C							
	31	Risks for infectious diseases such as (HIV/AIDS)	C	C							
	26	Local custom									
	27	Burden on vulnerable groups(women, children, aged, impoverished, minorities, indigenous people and such)	A	A							
	28	Uneven distribution of benefit and loss(damage)	B	B							
	30	Utilization/Right of water	B	B	C						
	32	Cultural heritage									
33	Landscape	C	C								
Other	34	Accident	C						C	C	
	35	Global warming	B			B					19

Main impact items and expected impacts

Items	Expected impacts
Air pollution	Predicted increase of exhaust and dust due to construction. Aggravation of air quality with the operation of new power station facilities is also expected.
Water pollution	Possibility of generating pollution contamination due to discharge and flowage of deposit coating material from construction. Water temperature may rise due to discharge of thermal effluent from the one-though type.
Solid waste	Dismantlement of the existing power facilities is pending. However, generation of large amount deposit and waste material from the construction is expected. Disposal system is sufficient for the daily garbage power station, although, caution is needed for the disposal of waste material.

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Items	Expected impacts
Noise / Vibration	Generation of noise vibration from construction and operation is expected.
River ecosystem	Impact to river ecosystem caused by water temperature rise due to discharge of thermal effluents may occur if the one- though type is installed.
Involuntary resident resettlement	Residents in the north-east side of the power station need to relocate themselves if new power facilities are to be constructed there. However, study should be conducted to reveal the actual condition because information on residents varies.
Burden on vulnerable groups	Possible burden on vulnerable groups through such reasons as resident relocation, employment livelihood and sanitation.

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Items	Expected impacts
Uneven distribution of benefit and loss (damage)	Stable electric supply will bring development to the local economy, although, there is no direct benefit to the project site area resulting in uneven distribution of benefit. However, it will create employment for construction workers and operation staff at the time of construction and increase business opportunities relating to the power station
Utilization and right of water	There will be an intake of cooling water if the one- through type is installed. However it does not affect the flow volume and water level which gives no impact to the use of agriculture water. The right of water should be given attention, though. Impact on fishery and agriculture water is expected due to the rise of water temperature.

Work descriptions

Work contents

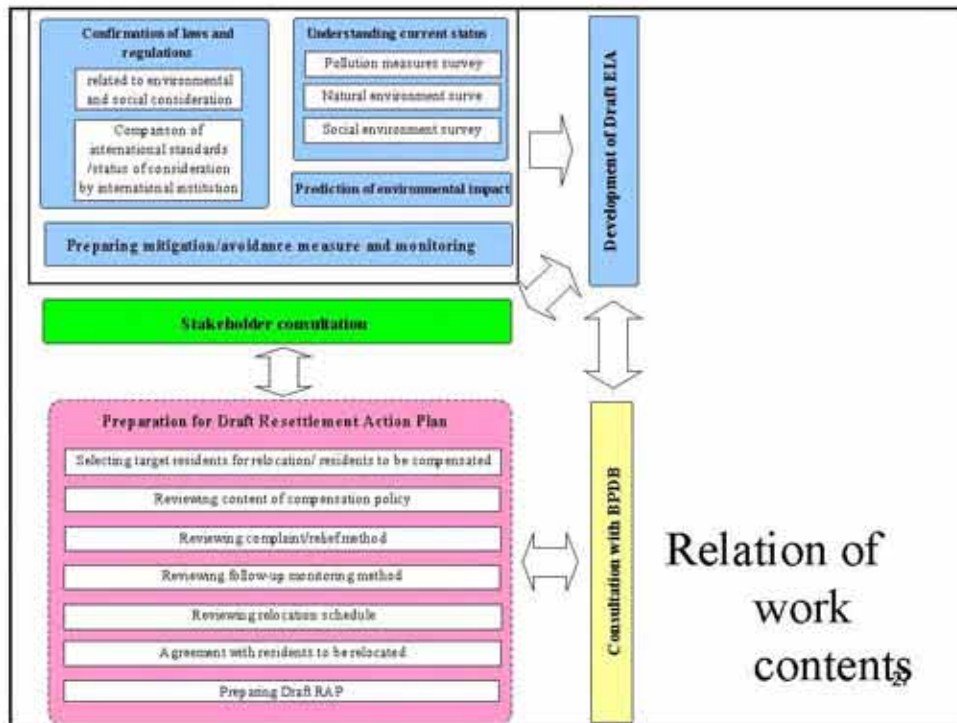
- 1) Gathering environmental related laws and regulations / environmental standards
- 2) Implementing pollution measure/natural environment / social environment survey (Field Survey)
- 3) Assessing environmental impact and planning mitigation / avoidance measures
- 4) Preparing management plan and monitoring plan
- 5) Preparing draft EIA Report (Environmental Impact Assessment)
- 6) Formulation of draft RAP (Resettlement Action Plan)
- 7) Holding stakeholders consultation

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Schedule of the Work

	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Gathering regulations	←→							
Natural and Social Environment survey		←→						
Air and water quality Noise	←→	←→	←→					
Assessing environmental impact				←→				
Management / Monitoring plan					←→			
Draft EIA report				←→				
Draft RAP				←→				
Stakeholder consultation		•				•		•

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Environmental and social consideration survey plan

Survey items and methods

1) Air quality

- The data collection will be conducted at 4 sampling points around the project site in the residential area once respectively in June and August.

2) River water quality

- The data collection will be conducted at 4 sampling points in the river once respectively in June and August.

3) Noise

- Noise level will be measured at 2 sampling points consecutively for 24 hours in the residential area.

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1) Terrestrial Flora and Fauna

- Document investigation
- Interview survey

2) Fish and Stream organism

- Document investigation
- Interview survey
- Catch by fishermen (if possible)

30

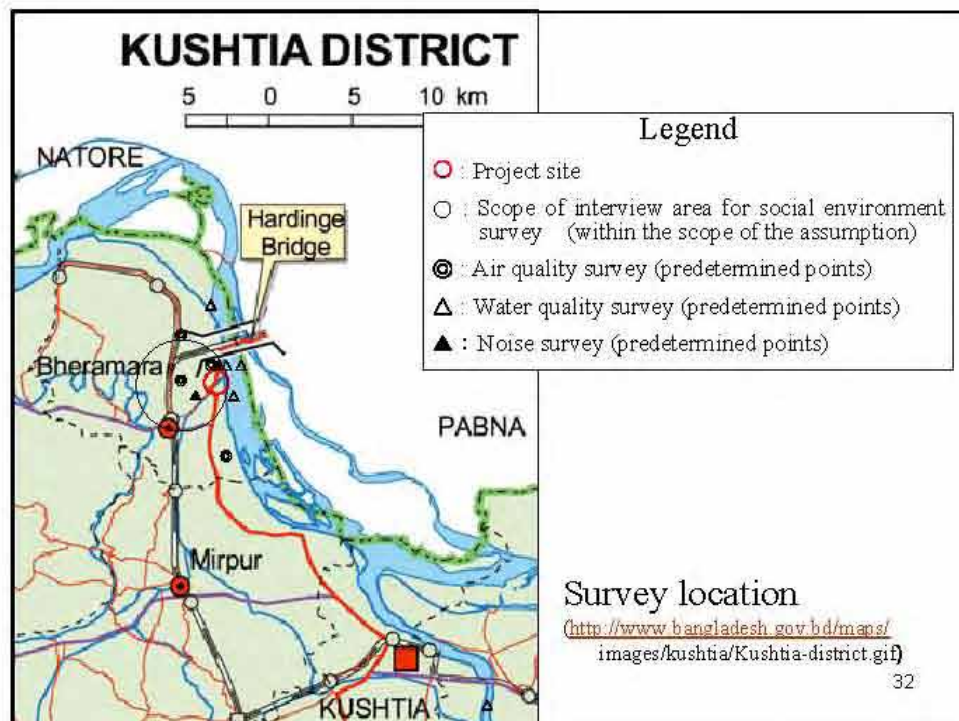
Social Environment Survey

Target: Around 200 households including about 50 households that might relocate.

- 1) Household and Population
- 2) Ethnic minorities
- 3) Family structure
- 4) Land / housing price
- 5) Income
- 6) Utilization of underground /river water
- 7) Others

The survey will be conducted in June. As the result, additional survey might be conducted.

31



Points to keep in mind upon preparing resettlement action plan

- Compensation for loss of property, income and livelihood
- Assistance for relocation
- Assistance for improving their living condition in the future
- Offering land, housing and infrastructure and others equal to what they have now as compensation
- Making sure that they have the access to receiving enough information and consultation on relocation/compensation options

33

Contents of Stakeholder Consultation

Items	1 st meeting	2 nd meeting	3 rd meeting
Predicted issues to be discussed	<ul style="list-style-type: none"> - Description of the Project Overview - Description of the Scoping - Description of purpose, background, content and schedule of the survey - Opinions 	<ul style="list-style-type: none"> - Description of ELA result - Opinions regarding environmental management plan - Opinions regarding resettlement action plan 	<ul style="list-style-type: none"> - Description of environmental management monitoring plan - Description of draft resettlement action plan - Response to the opinions
Scope of target	BPOB, Environmental agency, Local administrative organization, etc	BPOB, Environmental agency, NGOs, residents around the project site, residents to be relocated, Local administrative organization, etc	

34



ভেড়ামারা ৪৫০মে:ও: কম্বাইন্ড সাইকেল
বিদ্যুৎ কেন্দ্রের সম্ভাব্যতা যাচাই কাজের
উপস্থাপনায়

স্বাগতম

বিষয় : পরিবেশগত ও সামাজিক বিষয়াবলী
পর্যালোচনা

1

অনুষ্ঠান সূচী

সকাল ১০.০০-১০.০৫	:	সভাপতি (ভেড়ামারা বিদ্যুৎ কেন্দ্রের ম্যানেজার) কর্তৃক উদ্বোধনী বক্তব্য
সকাল ১০.০৫-১০.১০	:	প্রকল্পের সহকারী প্রকৌশলী কর্তৃক প্রকল্পের ভূমিকা
সকাল ১০.১০-১০.১৫	:	জাইকা স্টাডি টীম লীডারের বক্তব্য
সকাল ১০.১৫-১১.১৫	:	জাইকা স্টাডি টীমের পরিবেশ বিশারদ কর্তৃক পরিবেশগত ও সামাজিক বিষয়াবলীর উপস্থাপনা
সকাল ১১.১৫- দুপুর ১২.০০	:	প্রশ্ন ও উত্তর পর্ব এবং আলোচনা
দুপুর ১২.০০-১২.৩০	:	সভাপতির সমাপনী বক্তব্য ও মধ্যাহ্ন ভোজন

2

প্রকল্পের বিবরণ

প্রকল্পের আউটপুট	:	৪৫০মে: ও: পাওয়ার
প্রকল্পের প্রযুক্তি	:	প্যান টারবাইন ও স্টীম টারবাইন কম্বাইন্ড সাইকেল
প্রাকলিত মূল্য	:	১৭৪৬.৬০ কোটি টাকা (বৈদেশিক বিনিময় অংশ ৯৪৭.৮৪ কোটি টাকা অর্ডজুড) (অক্টোবর ২০০০ সালে প্রাকলিত)
প্রকল্পের জন্য জমির প্রয়োজন	:	৮০ একর (২০০ মিটার X ২০০মিটার)
প্রকল্পের কার্যকরি জীবন	:	২৫ বছর
প্রকল্পের উপকারিতা	:	উন্নত বিদ্যুৎ সরবরাহ এবং বাংলাদেশের আর্থ-সামাজিক অবস্থার উন্নয়ন

3

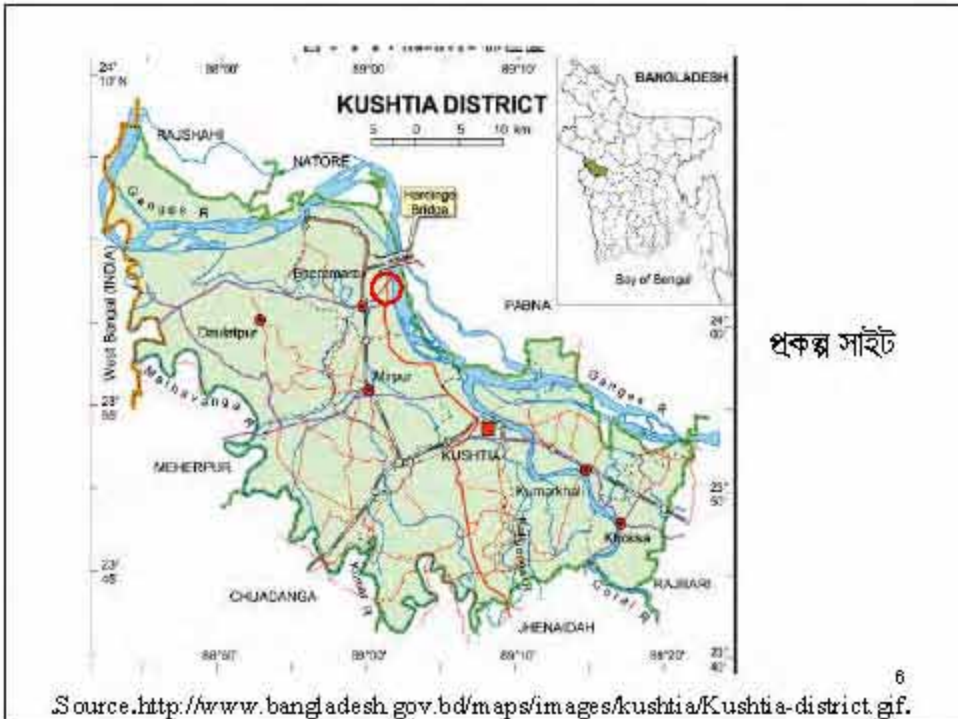
প্রকল্পের অগ্রগতি

- জাতীয় অর্থনৈতিক নির্বাহী পরিষদ কর্তৃক নীতিগতভাবে অনুমোদনের তারিখ : ১৬ মে, ২০০০ইং
- সম্ভাব্যতা যাচাইয়ের কাজ : টেপসকো, টেপকো, ইএএল ও বিউবো এর সহযোগিতায় জাইকা, জার্মান কর্তৃক চলছে।
- প্রকল্পের অর্থায়ন : এখনও ঠিক হয় নাই (জাইকা প্রাথমিকভাবে অর্থায়নের ইচ্ছা পোষন করেছেন)
- প্রকল্প বাস্তবায়ন কর্তৃপক্ষ : বিউবো
- সম্ভাব্য সমাপ্তির কাল : ৩.৫ বছর
- সম্ভাব্য সমাপ্তির সাল/বছর : ২০১২ ইং

4

প্রকল্প সম্পর্কে ধারণা

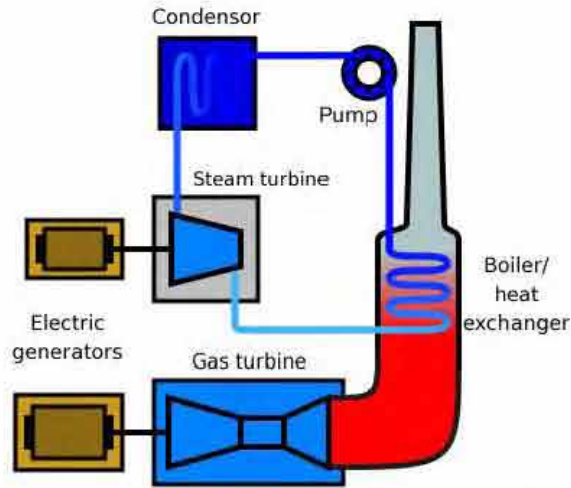
6



প্রকল্প সাইট

6

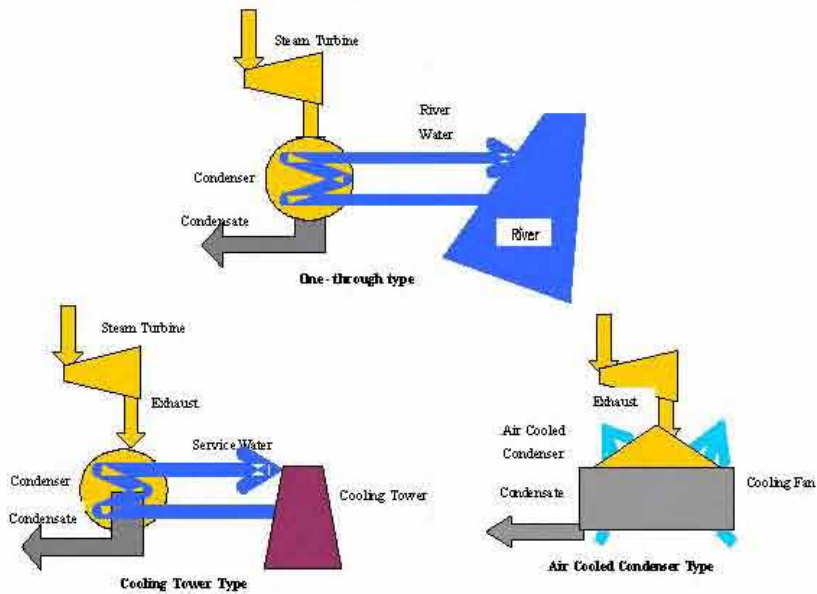
বিদ্যুৎ উৎপাদন পদ্ধতি : SGT জে:এ : কয়লাইভ সাইকেল
 জ্বালানি : প্রাকৃতিক গ্যাস ও ডিজেল তেল



Source: <http://en.wikipedia.org/wiki/Image:COGAS-diagram.png>

7

তিন ধরনের শীতলিকরণ পদ্ধতি (Cooling Method)



8

কুলিং মেথডের তুলনামূলক বিবরণ

কুলিং মেথড	ওয়ান গু	কুলিং টাওয়ার	এয়ার কুলড কন্ডেলার
কুলিং মিডিয়া	নদীর পানি	ফ্রেশ পানি (নদীর পানি বা জুগর্ডহ পানি)	বায়ু
কুলিং রেট (এফিসিয়েন্সি)	সর্বোচ্চ	মাঝামাঝি	সর্ব নিম্ন
তাপীয় বর্জ	তৈরী হয়	কদাচিৎ তৈরী হয়	তৈরী হয় না
শব্দ	কেবলমাত্র পাম্পিং ইকুইপমেন্ট শব্দের উচ্চ	পাম্পিং ইকুইপমেন্ট ছাড়াও কুলিং Fan উচ্চ শব্দ তৈরী করে	পাম্পিং ইকুইপমেন্ট ছাড়াও কুলিং Fan উচ্চ শব্দ তৈরী করে

9

কুলিং মেথডের তুলনামূলক বিবরণ

কুলিং মেথড	ওয়ান গু	কুলিং টাওয়ার	এয়ার কুলড কন্ডেলার
পুরা কৌশল খরচ	এয়ার কুলড কন্ডেলারের তুলনায় কম	ওয়ান গুর মতই	সর্বোচ্চ
মেটেনেল ও রানিং খরচ	এয়ার কুলড কন্ডেলারের তুলনায় কম	ওয়ান গুর মতই	সর্বোচ্চ

10

প্রকল্পের অবস্থান সম্পর্কে ধারণা

11

প্রকল্পের অবস্থান

- খুলনা বিভাগের অন্তর্গত কুষ্টিয়া জেলার ভেড়ামারা উপজেলায় অবস্থিত যা রাজধানী ঢাকা থেকে ২৫০কিমিঃ উত্তর পশ্চিমে
- পদ্মা নদী বিধৌত সমতল ও উর্বর জমি সমন্বয়ে গঠিত ভেড়ামারা উপজেলা এক এ উপজেলার কৃষি উৎপাদনশীলতা জাতীয়ভাবে বেশী
- এ উপজেলায় কোন রিজার্ভ প্রাকৃতিক বনাঞ্চল এক স্কেচুয়ারি বনাঞ্চল নেই
- এ উপজেলায় আইনের অধীন কোন জাতীয় হেরিটেজ নেই

12




বিদ্যুৎ কেন্দ্রের উত্তর দিকের ছবি

15



বিদ্যুৎ কেন্দ্রের উত্তর-পূর্ব দিকের ছবি

16





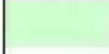

বিদ্যুৎ কেন্দ্রের মর দিকের ছবি

17

স্কোপিং (Scoping) ফলাফল

লিজেস্ট

A	:	অধিক অনিষ্টকর পজাব
B	:	মৃদু অনিষ্টকর পজাব
C	:	এ ক্ষুদ্রতম পজাবের পরিমাণ স্বীকৃতি
No Mark	:	কোন অনিষ্টকর পজাব নেই

	:	বর্তমান অবস্থা বিকিত করার নিমিত্তে দূষণ বিরোধী জরিপ
	:	বর্তমান অবস্থা বিকিত করার নিমিত্তে প্রাথমিক পরিবেশ জরিপ
	:	বর্তমান অবস্থা বিকিত করার নিমিত্তে সামাজিক পরিবেশ জরিপ
	:	সম্মত জরিপ

18

স্কোপিং(Scoping) ফলাফল (Pollutants and Natural Environment) (1)

	No.		Overall Rating	Construction Phase		
				Temporary impact by undertaking construction	Operation of construction machinery	Carrying construction materials in and out
Environmental contamination	1	Air pollution	A		B	C
	2	Water pollution	A		C	
	3	Solid waste	B		B	
	4	Noise/Vibration	A		A	C
	5	Odor	C			
Natural environment	6	Climate				
	7	Hydrology	C			
	8	Flood				
	9	Underground water	C	C		
	10	Ground subsidence	C	C		
	11	Soil erosion	C	C		
	12	Sanctuary				
	13	Terrestrial ecosystem	C	C		
	14	River ecosystem	A			
	15	Precious species	C	C		

19

স্কোপিং(Scoping) ফলাফল (Pollutants and Natural Environment)(2)

	No.		Overall Rating	Operation Phase							
				Land-use alteration/emission of facilities	operation of facilities					Carrying materials in and out	Generation of solid waste
					Inake of cooling water	Gas emissions	Waste water	Thermal effluents	Other		
Environmental contamination	1	Air pollution	A		A				C		
	2	Water pollution	A			C	A				
	3	Solid waste	B							C	
	4	Noise/Vibration	A					A	C		
	5	Odor	C							C	
Natural environment	6	Climate									
	7	Hydrology	C	C			C				
	8	Flood									
	9	Underground water	C	C							
	10	Ground subsidence	C	C							
	11	Soil erosion	C								
	12	Sanctuary									
	13	Terrestrial ecosystem	C	C							
	14	River ecosystem	A		B		A				
	15	Precious species	C	C							

20

স্কোপিং (Scoping) ফলাফল . Social Environment and Others.(1)

	No.	Overall Rating	Construction Phase			
			Temporary impact by undertaking construction	Operation of construction machinery	Carrying construction materials inland	
Social environment	16	Involuntary resident resettlement	A	A		
	17	Employment /Livelihood	C	C		
	19	Local economy	C	C		
	20	Land utilization				
	22	Social infrastructure/service facilities	C			C
	23	River traffic	C			C
	24	Land traffic	C			C
	25	Sanitation	C	C		
	31	Risks for infectious diseases such as (HIV/AIDS)	C	C		
	26	Local custom				
	27	Burden on vulnerable groups(women, children, aged, impoverished, minorities, indigenous people and such)	A	A		
	28	Uneven distribution of benefit and loss(damage)	B	B		
	30	Utilization/Right of water	B	C		C
Others	32	Cultural heritage				
	33	Landscape	C			
	34	Accident	C		C	C
	35	Global warming	B			

21

স্কোপিং (Scoping) ফলাফল . Social Environment and Others.(2)

	No.	Overall Rating	Operation Phase							
			Landscape alteration/existence of facilities	operation of facilities					Carrying materials in and out	Generation of solid waste
				Intake of cooling water	Gas emissions	Waste water	Thermal effluents	Others		
Social environment	16	Involuntary resident resettlement	A	A						
	17	Employment /Livelihood	C	C				C		
	19	Local economy	C	C						
	20	Land utilization								
	22	Social infrastructure/service facilities	C							C
	23	River traffic	C	C						
	24	Land traffic	C	C						C
	25	Sanitation	C	C						
	31	Risks for infectious diseases such as (HIV/AIDS)	C	C						
	26	Local custom								
	27	Burden on vulnerable groups(women, children, aged, impoverished, minorities, indigenous people and such)	A	A						
	28	Uneven distribution of benefit and loss(damage)	B	B						
	30	Utilization/Right of water	B	B	C					
Others	32	Cultural heritage								
	33	Landscape	C	C						
	34	Accident	C						C	C
	35	Global warming	B			B				

22

প্রধান প্রধান প্রভাব ও ইহার কারণসমূহ

23

প্রভাব	সম্ভাব্য কারণসমূহ
বায়ু দূষণ	<ul style="list-style-type: none"> ▪ নির্মাণ কাজের ফলে নির্গত পর্দা ও ধূলাবালি ▪ Gas ট্রান্সমিশন থেকে Gas উদ্গীরণ
পানি দূষণ	<ul style="list-style-type: none"> ▪ নির্মাণ থেকে পানি নির্গমনের ফলে পানি দূষিত বা কলুষিত হওয়ার সম্ভাবনা । ▪ ওয়ান ও কুলিং টাইপ থেকে তাপীয় বর্জ পানিতে নির্গমনের ফলে পানির তাপমাত্রা বাড়ে
কঠিন বর্জ	<ul style="list-style-type: none"> ▪ নির্মাণ ও পরিচালন থেকে তৈরী বর্জ । ▪ বর্তমানে অবস্থিত পাওয়ার স্থাপনা ক্ষেত্রে ফেলার ফলে তৈরী কঠিন বর্জ ।
শব্দ / কম্পন	বিদ্যুৎ কেন্দ্র নির্মাণ ও পরিচালন থেকে তৈরী শব্দ বা কম্পন ।

24

প্রভাব	সম্ভাবনাময় কারনসমূহ
নদীর পরিবেশ অবস্থা	ওয়ান গু কুলিং টাইপ স্থাপন করলে তা থেকে নির্গত তাপীয় বর্জ
জোরপূর্বক বাসিন্দাদের পূর্নবাসন	<ul style="list-style-type: none"> ▪ পুরাতন বিদ্যুৎ কেন্দ্রের উত্তর-পূর্ব দিকে প্রস্তাবিত বিদ্যুৎ কেন্দ্র তৈরী করলে ঐ এলাকায় বসবাসকারীদের পূর্নবাসন করতে হবে। ▪ প্রকৃত অবস্থা জানার নিমিত্তে জরিপ করা হচ্ছে
নির্বাহক বসবাসকারীদের উপর চাপ	পূর্নবাসিত বসবাসকারীদের কর্মসংস্থান, জীবিকা ও পয়ঃনিকাসনের উপর চাপ পড়বে

25

প্রভাব	সম্ভাবনাময় কারনসমূহ
উপকারের অসম বন্টন	<ul style="list-style-type: none"> ▪ স্থানীয়ভাবে বিদ্যুৎ সরবরাহ করা হবে না। ▪ নির্মাণ শ্রমিকদের ও পরিচালন কর্মীর কর্মসংস্থান হবে। ▪ Business এর সুযোগ বাড়বে।
পানির অধিকার ও use	কুলিং System এ নদীর পানি ও ছুপর্ভস্থ পানির use।

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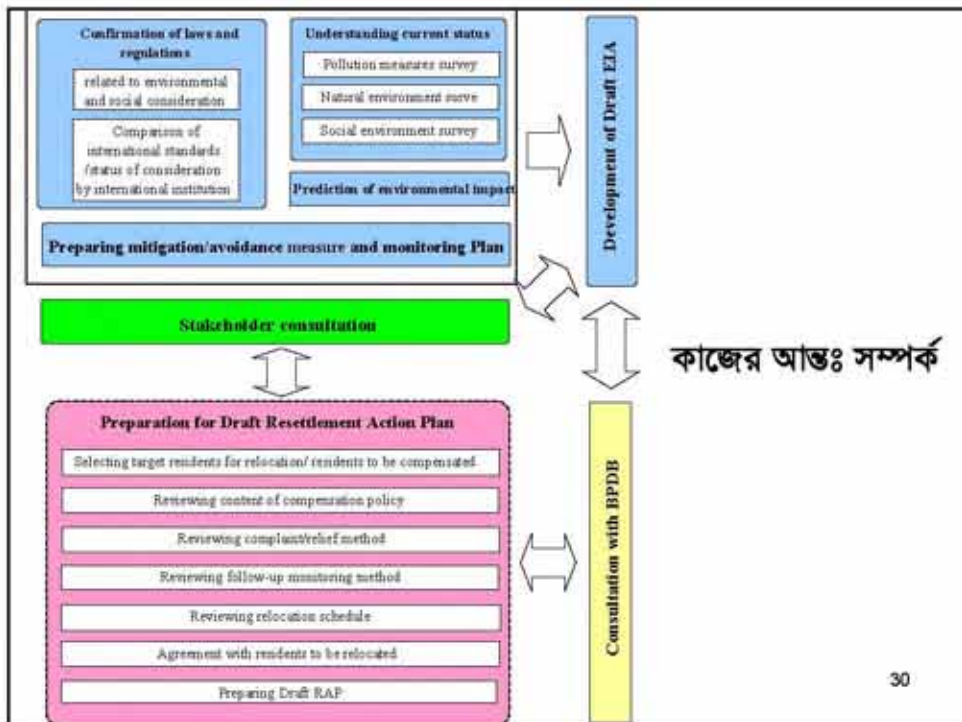
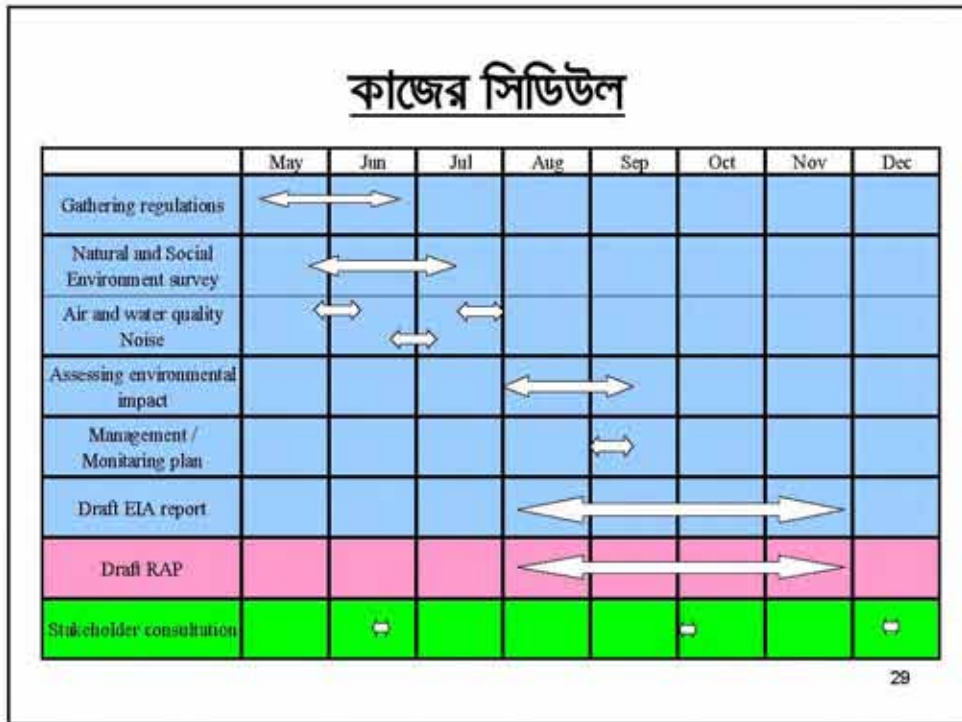
কাজের বিবরণ

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কাজের পরিধি

- পরিবেশ সম্পর্কিত আইন কানুন / স্ট্যান্ডার্ড সংগ্রহকরণ
- দূষণ পরিমাপকরণ / প্রাকৃতিক পরিবেশ / সামাজিক পরিবেশ জরিপকরণ
- পরিবেশের উপর প্রভাব নির্ণয় এবং প্রতিরোধমূলক পরিকল্পনা প্রণয়ন
- ব্যবস্থাপনা ও মনিটরিং প্লান তৈরীকরণ
- খসড়া EIA প্রতিবেদন তৈরীকরণ
- খসড়া RAP প্রণয়ন
- স্ট্যাকহোল্ডার আলোচনা

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প্রাকৃতিক ও সামাজিক পরিবেশ জরিপ কাজের পরিকল্পনা

জরিপ কাজের আইটেম এবং মেথড

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১) বায়ুর গুণ:

- প্রকল্প এলাকাস্থ আবাসিক এলাকায় ৪টা জায়গা থেকে জুন মাসে একবার একে আগষ্ট মাসে একবার বায়ুর ডাটা সংগ্রহ করতে হবে।

২) নদীর পানির গুণ:

- প্রকল্প সন্নিহিত পদ্মা নদীর ৪টা জায়গা থেকে জুন মাসে একবার একে আগষ্ট মাসে একবার পানির ডাটা সংগ্রহ করতে হবে।

৩) শব্দ :

- আবাসিক এলাকায় দুই জায়গা থেকে ২৪ঘণ্টার শব্দের মাত্রা মাপতে হবে।

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- পার্শ্ব গাছ-গাছরা ও জীবজন্তু
 ১. ডকুমেন্ট পর্যালোচনা
 ২. সাক্ষাৎকার জরিপ
- মাছ-জলজ প্রাণী
 ১. ডকুমেন্ট পর্যালোচনা
 ২. সাক্ষাৎকার জরিপ
 ৩. জেলে কতুক ধৃত মাছ-জলজ প্রাণী (সম্ভব হলে)

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সামাজিক পরিবেশের জরিপ কাজ :

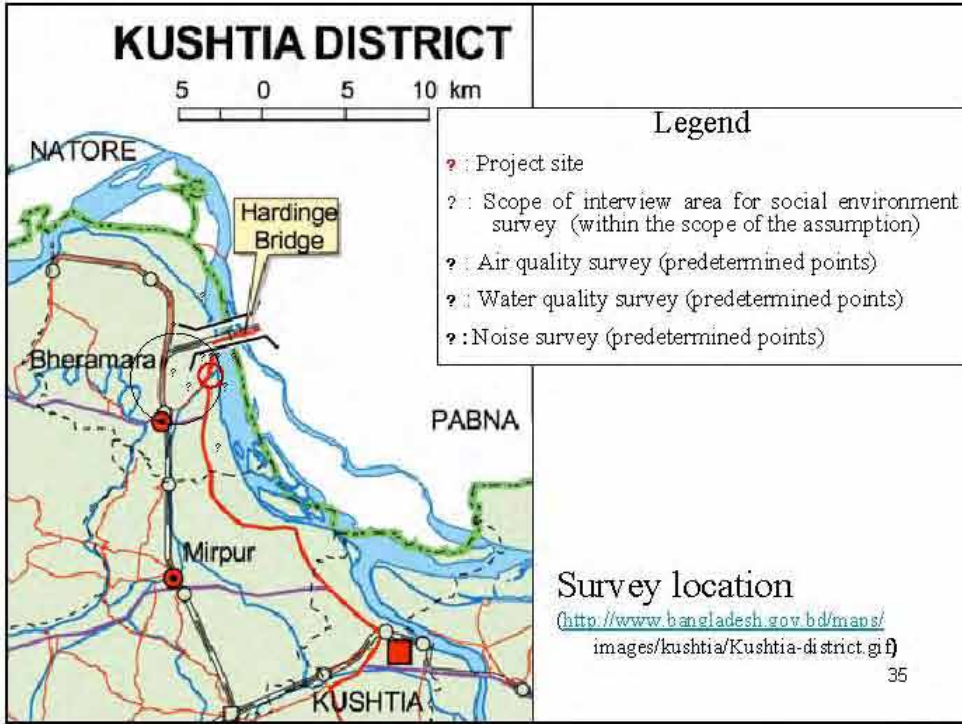
টার্গেট : পুনর্বাসন করতে হবে এরূপ ৫০ বাড়ীসহ ২০০ বাড়ীর জরিপ করতে হবে ।

জরিপ আইটেম :

- বসতবাড়ী ও জনসংখ্যা
- সংখ্যালঘু উপজাতি
- পরিবারের গঠন
- জমি/বাড়ীর দাম
- আয়
- ভূপর্দহ / নদীর পানির ব্যবহার
- অন্যান্য

জুন মাসে জরিপ করতে হবে । প্রয়োজনে আরো জরিপ করতে হতে পারে ।

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Resettlement Action Plan (RAP) তৈরী করার বিষয় সমূহ

১. সম্পদ, আয় ও জীবিকার ক্ষতিপূরণ
২. পুনর্বাসনে সহযোগিতা প্ৰদান
৩. ভবিষ্যতে জীবিকা উন্নয়নে সহযোগিতা প্ৰদান
৪. জমি, বাড়ী এবং অবকাঠামো ক্ষতিপূরণ হিসাবে প্ৰদান
৫. পুনর্বাসন ও ক্ষতিপূরণ বিষয়ে যথেষ্ট ডাটা ও মতামতের প্রবেশাধিকার নিশ্চিত করা

স্টেকহোল্ডার আলোচনা সভার বিষয়

বিষয়	১ম সভা	২য় সভা	৩য় সভা
পূর্ব নির্ধারিত আলোচনার বিষয়বস্তু	<ul style="list-style-type: none"> ● প্রকল্পের বিবরণ ● স্কিমিং বিবরণ ● Objective, পটভূমি, বিষয় এবং জরিপের সিডিউল ● মতামত 	<ul style="list-style-type: none"> ● EIA এর বিবরণ ● EMP এর উপর মতামত ● RAP এর উপর মতামত 	<ul style="list-style-type: none"> ● EMMP এর বিবরণ ● Draft RAP এর বিবরণ ● মতামতের উপর সাড়া
টার্গেটের পরিধি	বিউবো, পরিবেশ এজেন্সি, স্থানীয় প্রশাসন প্রতিষ্ঠান প্রভৃতি	বিউবো, পরিবেশ এজেন্সি, NGOs, Affected বাসিন্দা, প্রতিষ্ঠান প্রভৃতি	স্থানীয় প্রশাসন

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Feasibility Study on Bheramara 450MW Combined Cycle Power Station at Bheramara

Minutes of 1st Stakeholder Meeting

Venue : Kisholoy KG School, Bheramara Power Station
 Date : June 16, 2008
 Time : 10.00am to 12.00noon

Participants : List of Participants is enclosed under **Annex-1**

1. The 1st stakeholder meeting was presided over by **Md. Tahir Mian, Manager, Bheramara Power station (BPS)**. He welcomed all participants. He briefed about the history of the existing Bheramara Power Station. He informed that Bheramara Power Station was established in early sixties. Later in 1976, three 20-MW gas turbine units were installed. Now these three units are running with various problems. On the other hand, the whole nation is suffering from serious power crisis since long. So, it is prime time to install the proposed power station at Bherammara on which JICA Study Team is carrying out feasibility study.
2. After welcome speech given by the president (Manager, BPS), **Mr. Zahid Hasan, AE (Environmental), 450MW Bheramara Power Station Project, BPDB** informed that PP of 450MW Combined Cycle Power Station Project was approved by Executive Committee of National Economic Council (ECNEC) in principle on **May 16, 2000**. The estimated cost of the proposed project was **B.Taka 1746.63 Crore** including **Foreign Exchange Component of B.Taka 947.84**). The economic life of the power station was considered **25 years**. **Japan International Cooperation Agency (JICA)** expressed their interest to finance this project. So, **JICA** has appointed consulting firm to carry out feasibility study on this project. **JICA Study Team** comprising of Tokyo Electric Power Services Co. Ltd. (**TEPSCO**) and Tokyo Electric Power Company (**TEPCO**) is now carrying out Feasibility Study of this Project since February 2008. The estimated duration for implementation of this project is **3.5 years** and it expected to complete by **2012**.
3. **Mr. Okano, Team Leader of JICA Study Team** informed that it is very necessary to consider social and environmental aspects in establishing such a power project. He explained the objective of the stakeholder meeting as part of Environmental Impact Assessment (EIA) study. He informed that the proposed project is situated on the bank of the Padma River in Bheramara upazilla under Kushtia District about 250km north west from Dhaka city. This proposed Power Station will be combined cycle and the source of energy is natural gas and Diesel oil. The exhaust gas of gas turbine contains huge unused heat energy. That unused heat energy will be used to produce steam

in the Steam Turbine to generate power to increase efficiency of the Power station. The steam produced in the Steam Turbine is required to cool down through condenser with help of cooling system. There are three types of cooling methods e.g. a) One through type, b) Cooling Tower type and c) Air Cooled condenser. He also explained the advantages and disadvantages of three cooling methods. Considering all possible aspects, the best one will be selected for this power station.

4. **Mr. Fukazawa** explained two potential location of new power station. One proposed location is on the north of the existing Power station termed as **Land-1** and the other one is in the north east side of the existing power station termed as **Land-2**. **Land-1** is owned by BPDB and **Land-2** is owned by BWDB. However both lands were acquired by GOB. There are some illegal residents staying in Land-2. But there are some residents mostly Power station staff living in Land-1. Considering merits and demerits of Land -1 and Land-2, the best location will be selected.

He has also named possible impacts of the new power station with reasons on the natural and social environment such as, Air pollution, Water pollution, Noise pollution, solid waste, ecosystem of the river, resettlement, Burden on vulnerable groups etc.

He then explained in brief about the activities, work schedule and interrelation of the activities to carry out EIA study. He also explained the procedures for social and environmental study. Stakeholder consultation is one of the main activities for EIA study. Three stakeholder meetings will be held in June, October and December respectively to incorporate the opinions of the stakeholders in the Feasibility Study Report.

5. **Md. Tahir Mian, Manager, BPS** added that the new power station may comprise of 2x150MW Gas turbine Units and 1x150MW Steam Turbine. Natural gas will be used as source of energy for gas turbine and Exhaust heat from gas turbine will be used for source of energy for Steam turbine. So, availability of natural gas is very important to run the proposed power station at cheaper rate. He opined that **gas availability must be ensured by GOB to run this new power station**. He also raised that there are some illegal residents in the lands acquired by the then WAPDA (now BPDB & WAPDA). **He urged the Thana Neerbahi Officer (TNO) and Bahirchar Union Parishad Chairman to extend their cooperation to evacuate the illegal residents from their lands to construct the new power station in that lands.**
6. **Md. Abu Bakkar Mia, Bahirchar UP Chairman**, pointed out that Bangladesh is facing seriously the shortage of power in the last few years as no new power generations were made possible. However, he became very happy to hearing that new 450MW power plant will be installed at Bhermara in his Union under Bheramara Upazilla. This is very good news for him and the inhabitants of his union as well. He requested the financing agency for this project and also the consultants to expedite the process of implementation of

this project. He assured to extend his full cooperation in implementing this project. But, he mentioned that there are some poor people living in the project area illegally. They have no shelter other than this. So, he requested the concerned authority to take consideration of the poor people for evacuation.

7. **Advocate Touhidul Islam Alam, Bheramara Municipality Chairman** informed that Bahirchar Union is so lucky that there are many important installations. in this Union e.g. Hardinge bridge, Lalon Shah Bridge, Bheramara Power station etc. Of course, they have sacrificed for these installations He hoped that they will further come forward to vacate the BPDB land to facilitate the installation of new power station. He also assured to extend his full cooperation in this regard.
8. **Sardar Md. Abu Salek, Bheramara Upazilla Secondary Education officer** raised that there are 4 primary schools around the existing Bheramara Power Station. The educational environment is affected in these schools due to sever noise produced during operation of the existing power station. If the new power station is installed, this may also add further deterioration of noise level and this may cause serious impact on the educational environment of nearby primary schools. So, special attention must be given to mitigate noise problem if the new power station is installed.
9. **Mr. Nripendra Nath Biswas, Bheramara Upazilla Fisheries officer** informed that Fish breeding area is located in the adjoining Hardinge bridge in Padma River. If the water temperature rise is taken place in Padma river due to discharge of hot water from the proposed power station, fish breeding will be affected and river ecosystem may be destabilized. So, he requested the implementing authority to consider this environmental aspect seriously. In reply, Mr. Zahid Hasan, AE (Environmental), Bheramara 450MW Project, BPDB informed that there is less possibility of discharge of hot water in the Padma River as high technology system will be used in this power system. Moreover, even if the hot water is discharged in the river, water will be cooled down below normal temperature say 7-8 degree celcius before discharging in the river to avoid temperature rise of river water.
10. **Finally, Md. Tahir Mian, Manager, BPS** expressed his gratitude to all concerned to undertake construction of 450MW New power station adjacent to the existing power station. He thanked all stakeholders for attending this meeting giving their valuable comments. He also thanked JICA Study Team including Local Experts for carrying out the study in implementing this power station at Bheramara. then the meeting was concluded.

(Md. Taher Mian)
 Manager, Bheramara Power Station, BPDB
 Bheramara, Kushtia.