

## I. ENVIRONMENT

### 7.4 Evaluation

#### 7.4.1 Monitoring Program

In order to ascertain whether environmental management systems are functioning properly, it is necessary to include a program to monitor the progress of development activities on flood proofing and, to the extent possible, during operations. This can be done using two forms of monitoring i.e. (i) Construction & operational and (ii) Environmental construction & operational monitoring shall be ensured by LGED, and its construction contractors, which capable of achieving any standards set, whereas the environmental monitoring to be conducted by a reputed environmental consulting firm with substantial experience in this field and the monitoring to be ensured by the Department of Environment. Usually the project proponent should submit the yearly monitoring report to DOE.

According to the project activities the following monitoring components with monitoring parameters, time schedule and respective organisations responsible for particular monitoring component are given below:

#### **General Information Required for Successful Monitoring Program**

The initial phase of the development of a comprehensive monitoring plan includes: i) Design of the monitoring framework, ii) Identification of the parameters or indicators to be measured, and data sources, iii) Collection of baseline parameters from the data sources, and iv) Selection of parameters/indicators sampling frequency for monitoring.

#### **Submersible Road / Bridge Construction Monitoring**

Construction of submersible roads and bridges, raising plinth of homestead area and clustering houses on high platform would disturb surrounding areas and result in denuded areas that are temporarily susceptible to erosion. Mainly these include excavation and compaction of earth materials. Until vegetation becomes established, these areas would be prone to erosion resulting in a significant impact. Also degree of slope and height of the road and homestead area to be counted for designing of the structures as these will also play role in erosion. Therefore, an erosion control plan shall be prepared to minimize the erosion. In Bangladesh as well as in other parts of the world it is recommended to use Vetivar (*Vetivaria zizaniodes*) as soil stabilizer.

#### **Water Quality Monitoring Program**

Water quality monitoring is essential for the project. Because it is anticipated that uses of agro-chemicals and pesticides will be slightly increased. Also due to construction of submergible roads and other structures there is some possibility of changes of water or water quality deterioration. It is obvious that due to construction activities turbidity of water will increase.

#### **Air Pollution Monitoring Program**

Construction of submersible roads and bridges both in Char and Haor would generate dust emissions from grading and equipment transport along dirt roads. Similarly, raising plinth of homestead area and clustering houses on high platform with some bank repairs and re-vegetation along the cluster and submersible roads would also generate dust emissions. Mainly the air pollution/dust emissions associated with travel on dirt roads, grading and construction activities.

To minimize air pollution/dust generation and its effects on nearby residential and agricultural uses, the concerned authority/department shall schedule grading and related maintenance activities. If it is not possible, then the grading site shall be watered with a spray truck constantly during workday. Monitoring of air pollution during construction period to be done to minimize the dust emission.

#### **Noise Impact Monitoring Program**

Noise impacts from the proposed project would be considered significant if sensitive noise receptors were exposed to project-generated noise exceeding the DOE's standard. Noise would be generated by construction activities especially from construction of submersible roads and bridges, from the movement of trucks and equipment such as excavators, loaders and dozers traveling to the site. To minimize noise generated by construction activities all transport movement and equipment operation shall be limited to the hours of 8 a.m. to 5 p.m. weekdays (except in emergency situations) and also all equipment shall be in good working condition. Monitoring during construction period to be done to ensure that the noise pollution is within the limit.

#### **Fisheries Monitoring Program**

The fisheries monitoring program will consist of a follow up of fish catch, fish migration and fish production in haors, beels, khals and floodplains.

#### **Agriculture Monitoring Program**

Agriculture monitoring will focus on changes in land use during and after construction of the structures and will consider changes in fertility status of the soils. Although uses of agro-chemicals and pesticide will be slightly increased however, the following components such as the soil texture, physical and chemical properties and productivity of the soil should be examined and monitored yearly.

#### **Biological Impact Monitoring Program**

To adequately assess the biological impact the following components to be monitored:

- Changes of both terrestrial and wetland flora & fauna (quantity with quality) of the project area;
- Changes of birds population in the project area; and

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- Overall ecological condition of the project area.

### **Socio-economic and Health Monitoring Program**

The Social and Gender monitoring program includes the following activities:

- Overall socio-economic condition of the communities;
- Health and sanitary issues of the community;
- Creation of community-level institutions to maintain the structures like clustered housing, plinth raising, community latrine, etc. and
- Especial support to the women labors groups.

### **7.4.2 Recommendation**

From the EIA Study it has been observed that the Flood Proofing project items will bring some adverse impacts on the overall environment of the Study area, though this project will be the milestone for the development of the neglected areas like Char and Hoar. For assuage of these negative impacts following mitigation/abatement measures in broader sense are recommended.

### **Agriculture and Soil**

In Char area quick maturing trees on the highest ridge sites and 'Dhaincha' on lower land may be cultured to mitigate the soil erosion if no structural measures considered. More fertilizers on silty soil and more manure/compost on sandy soil should be used for more yields. Early summer crops e.g. Maize, Sorghum, Cheena, Kaon, Ground nut, Sweet potato, etc. may be cultivated for more agricultural benefit in this area.

On the other hand in Haor Local Boro Varieties should be replaced by HYV early maturing variety e.g. BRR-28. Just after receding floods water chili, potato, mustard tori and high yielding groundnut should be cultivated. Khira, Bangi, watermelon may be introduced in this area. To protect the homestead from soil erosion Dhancha should be extensively cultured around the homestead. This will also serve, as fuel and soil fertility will be increased.

Adopt appropriate awareness program like training, motivational program through experts to reduce the use of pesticides, which will also reduce the anticipated toxicity of soil.

### **Ecological Resources**

Before raising the plinth level the existing topsoil if possible should be transferred to any suitable place and replaced over the filled earth as this layer bear soil covering plants, grasses and weeds. Otherwise soil covering plants like; Benna ghas (Vetivaria zizaniodes), Durba ghas (Cynodon dactylon), Motapata ghas (Axonopus compressus), etc. may be introduced on the newly formed

homestead.

To recover biodiversity in the clustered house area, bushy plant like Bamboo and soil covering plants need to be planted. For proper habitat of Amphibians, Lizard, and other wildlife some holes should be made on the homestead area.

Besides soil and soil covering plants should be planted in the area from where soil has been excavated for plinth raising and clustered housing.

### **Socio- Economic Issues**

There are some people who will not move voluntarily, as such need appropriate planning of proper compensation in consultation with the affected stakeholders.

There are some people who will not move voluntarily, as such need appropriate planning of proper compensation in consultation with the affected stakeholders.

To mitigate income disparities among the less privilege people, need proper attention and take development projects like; micro credit, small and cottage industries, etc should be made with the help of this group.

Proper planning should be required to reduce the domestic and other human waste. For domestic waste garbage bin need to implement in proper locations and community latrines should be constructed so that these will be easily accessible to the people, which will reduce the human waste. These also need proper monitoring.

In the project activities there is the provision of raised hand tube wells in both the areas. In Gurai Gram, Haor the tube wells water quality is within Bangladesh Drinking Standard level though Arsenic content in one tested tube well is just above allowable limit (0.055mg/l). But in Algar Char Gram, Char tube well with a depth of about 17m contains high iron (12.8 mg/l) and Arsenic is 0.06mg/l, both are beyond allowable limit. So raising of hand tube well will not solve this problem except prevention of intrusion of floodwater. Therefore, installation of tube well in deeper aquifer (say above 30m) is recommended.

**Table 7.1 Checklist for Proving Environmental Impact Assessment (EIA)**

- 1) Applicable development project/program: for example, Rural development
- 2) Applicable development type: for example, New project
- 3) Applicable environmentally sensitive area: for example, Tropical rain forest

**I. Social Environment**

Category of Environmental Impact	Impact		Evaluation Base
	P+	N-	
<b>1. Socio-economic Issues</b>			
(1) Social Issues			
1. Planned residential settlement			
2. Involuntary resettlement			
3. Substantial changes in way of life			
4. Conflicts on among communities and peoples			
5. Impacts on native peoples			
(2) Demographic Issues			
1. Population increase			
2. Drastic change in population composition			
(3) Economic activities			
1. Change in bases of economic activities			
2. Occupational change and loss of job opportunity			
3. Increase in income disparities			
(4) Institutional and Custom Related Issues			
1. Adjustment and regulation of water or fishing rights			
2. Changes in social and institutional structure			
3. Changes in existing institution and customs			
<b>2. Health and Sanitary Issues</b>			
1. Increased use of agrochemicals			
2. Outbreak of endemic diseases			
3. Spreading of endemic diseases			
4. Residual toxicity of agrochemicals			
5. Increase in domestic and other human wastes			
<b>3. Cultural Asset Issues</b>			
1. Impairment of historic remains and cultural assets			
2. Damage to aesthetic sites			

Note: Applicable columns with the following impact degree are marked with "positive impact (P+) or negative impact (N-)"  
 Positive Impact: Very high (+5), High (+4), Moderate (+3), Low (+2), Very low (+1)  
 Negative Impact: Severe (-5), Higher (-4), Moderate (-3), Low (-2), Very low (-1)

**II. Natural Environment**

Category of Environmental Impact	Impact		Evaluation Base
	P+	N-	
<b>4. Biological and Ecological Issues</b>			
1. Changes in vegetation			
2. Negative impacts on important or indigenous fauna and			
3. Degradation of ecosystems with biological diversity			
4. Proliferation of exotic and/or hazardous species			
5. Destruction of wetlands and peatlands			
6. Encroachment into tropical rain forests and wildlands			
7. Destruction or degradation of mangrove forests			
8. Degradation of coral reefs			
<b>5. Soil and Land Resources</b>			
(1) Soil Resources			
1. Soil erosion			
2. Soil salinization			
3. Degradation of soil fertility			
4. Soil contamination by agrochemicals and others			
(2) Land Resources			
1. Devastation or desertification of land			
2. Devastation of hinterland			
3. Ground subsidence			
<b>6. Hydrology and Air and Water Quality</b>			
(1) Hydrology			
1. Changes in surface water hydrology			
2. Changes in groundwater hydrology			
3. Inundation and flooding			
4. Sedimentation			
5. Riverbed degradation			
6. Impediment of inland navigation			
(2) Water Quality and Temperature			
1. Water contamination and deterioration of water quality			
2. Water eutrophication			
3. Salt water intrusion			
4. Change in temperature of water			
(3) Atmosphere			
1. Air pollution			
<b>7. Landscape and Mining Resources</b>			
1. Damage to landscape			
2. Impediment of mining resources exploitation			

**Table 7.2 Definition of Environmental Impact Categories for EIA**

Categories of Environmental Impact	Definition
<b>Social Environment</b>	
<b>(1) Socio-economic issues</b>	
<b>(1)-1 Social issues</b>	
1. Planned residential settlement	A first type of planned residential settlement is new land settlement implemented in agriculture and rural development projects such as land clearing and leveling, sea/swamp reclamation and irrigation development. A second type of planned residential settlement is exemplified by the estate project approach with settlement schemes for nomad, landless farmers or shifting cultivators.
2. Involuntary resettlement	Involuntary resettlement is defined as forced resettlement to move inhabitants away from their original dwelling places in areas that will be inundated as part of development projects.
3. Substantial changes in the way of life	Substantial change in the way of life is defined as change in the way of life of the affected people, and in particular changes in the role of women in family and society brought about by agricultural and rural development.
4. Conflict among communities and people	Conflict among communities and peoples refer friction due to conflicting interests between beneficiaries and non-beneficiaries, people in favor of and those against development, new settlers and host people, people involved in development and outsiders, people in a project area and those affected in the surrounding area.
5. Impact on native people	Impact on native peoples refers to adverse effects of development on local communities composed partly or entirely of indigenous people (including tribal groups), low-caste groups, ethnic minorities, or nomads.
<b>(1)-2 Demographic issues</b>	
6. Population increase	Population increase is defined as significant population increase in a project or surrounding area due to development.
7. Drastic change in population composition	This term is defined as drastic change in population composition in a project or surrounding area due to development.
<b>(1)-3 Economic activities</b>	
8. Changes in bases of economic activities	Changes in bases of economic activities refers to forced or involuntary relocation of economic bases or means such as farmland, fishing grounds, etc., under a project due to land acquisition, changes in land use regulation, and deterioration or depletion of bases or means for economic activities.
9. Occupational change and loss of job opportunities	This term is defined as forced or involuntary occupational change due to land acquisition and loss or deterioration of means or bases of economic activities; it includes loss of job opportunities due to farm mechanization.
10. Increase in income disparities	This term is defined as the increase in income disparities among groups brought about by the development; it implies relative impoverishment of the economically weak.
<b>(1)-4 Institutional and custom related issues</b>	
11. Adjustment & regulation of water or fishing (riparian) rights	This term is defined as adverse development effects on water or fishing (riparian) rights and necessary adjustments or regulations to rectify the same.
12. Changes in social and institutional structures	This term is defined as changes in social and institutional structures as a result of establishment of new, or modification of existing, rural organizations caused by development.
13. Changes in existing institutions and customs	This term is defined as changes in existing institutions and customs involved in or induced by development activities.

Categories of Environmental Impact	Definition
<b>(2) Health and sanitary issues</b>	
14. Increased use of agrochemicals	Increased use of agrochemicals refers to increased use of chemical pesticides due to intensification of agriculture; introduction of high-yielding species and new crops and irrigation development.
15. Outbreak of endemic diseases	Outbreak of endemic diseases is defined as the spreading of endemic diseases as a result of the adverse effects of development.
16. Spreading of endemic diseases	Spreading of epidemic diseases is defined as spreading of endemic diseases attributable to the adverse effects of development.
17. Residual toxicity of agrochemicals	Residual toxicity of agrochemicals is defined as accumulation in the natural environment (soil, water, etc.) of agrochemicals or chemical substances with high residual toxicity such as organo-chloric insecticides, etc.
18. Increase in domestic and other human wastes	This term is defined as the increase in domestic and other human wastes due to the consequences of development such as population increase.
<b>(3) Cultural asset issues</b>	
19. Impairment of historic remains and cultural assets	Impairment of historic remains and cultural assets is defined as direct or indirect impairment or destruction of sites, structures, and remains of archaeological, historical, religious, cultural, or aesthetic value as result of development.
20. Damage to aesthetic sites	Damage to aesthetic sites is defined as direct or indirect negative effects on aesthetic features as a result of development.
<b>Natural Environment</b>	
<b>(4) Biological and ecological issues</b>	
21. Changes in vegetation	Changes in vegetation are defined as direct or indirect deterioration or degradation of vegetation due to development activities including removal of vegetation cover, alternation of land use, encroachment into forest, alteration of environmental conditions, etc.
22. Negative impact on important or indigenous fauna and flora	Negative impact on important or indigenous fauna and flora are defined as adverse effects on important or indigenous animal & plant species due to destruction of or changes in habitats.
23. Degradation of ecosystems with biological diversity	Degradation of ecosystems with biological diversity refers to the varieties of biological resources and living organisms. Biological diversity is the characteristic of wild species and natural ecosystems with biological diversity is, therefore, a form of natural resources management which has, as its primary goal, to maintain the long – term potential of biological resources to meet the needs and aspirations of future generations.
24. Proliferation of exotic and/or hazardous species	Proliferation of exotic and/or hazardous species is defined as introduction of pathogenic agents or spreading of hazardous species due to creation of environment conducive to their propagation.
25. Destruction of wetlands and peatlands	Destruction of wetlands and peatlands is defined as extinction of wetlands or peat lands due to direct destruction caused by development activities such as large-scale earth filling, or extinction due to indirect effects such as drying and decomposition due to changes in hydrological regime.
26. Encroachment into tropical rain forests and wildlands	Encroachment into tropical rain forests and wildlands is defined as decrease or disappearance of tropical rain forests due to direct or indirect effects of development.
27. Destruction or degradation of mangrove forests	Destruction or degradation of mangrove forests refers to disappearance of mangrove forests attributable to direct destruction, or deterioration of supporting environmental conditions.
28. Degradation of coral reefs	Degradation of coral reefs is defined as encroachment due to direct destruction, or damage to and deterioration of the supporting environment caused by sedimentation, etc.



Categories of Environmental Impact	Definition
<b>(5) Soil and land resources</b>	
<b>(5)-1 Soil resources</b>	
29. Soil erosion	Soil erosion is defined as the washing or blowing away of soil from the earth surface by the action of water or wind. Soil erosion is a smoothing or leveling process, with soil particles being carried, rolled, or washed down by the force of gravity. The main agents which loosen and break down the soil particles are wind and water (differentiated into water erosion or wind erosion according to the agent involved); Soil erosion is aggravated by artificial impacts.
30. Soil salinization	Soil salinization is defined as phenomena in which soluble salts accumulate in the surface layer of soil and crops growth is consequently adversely affected. According to FAO guidelines, soils with EC (electric conductivity of saturated soil moisture) higher than 4 ds are defined as saline soils.
31. Deterioration of soil fertility	Deterioration of soil fertility is defined as deterioration of soil productivity due to leaching and decomposition of nutrients, nutrient absorption by plants, surface soil erosion, salinization, failure in soil management, etc.; Tropical forests maintain high bio-mass productivity based on a delicately balanced plan and soil nutrient cycle; Removal of vegetation will result in rapid deterioration of soil fertility due to leaching of nutrients, decomposition of organic matter, and erosion of surface soil.
32. Soil contamination by agrochemicals and others	Soil contamination by agrochemicals and others is defined as accumulation of agrochemicals in soil with high residual toxicity.
<b>(5)-2 Land resources</b>	
33. Devastation or desertification of land	Devastation or desertification of land is defined as deterioration of land productivity or desertification caused by artificial or natural impacts; Accelerated and irreversible devastation of lands constitutes an important global environmental issue.
34. Devastation of hinterland	Devastation of hinterland is defined as devastation of areas surrounding a project area as a result of secondary or indirect impacts of development.
35. Ground subsidence	Ground subsidence is defined as settlement of ground caused by the dehydration or drying of wetlands, peat swamp, or reclaimed lands, or excessive exploitation of groundwater.
<b>(6) Hydrology and air and water quality</b>	
<b>(6)-1 Hydrology</b>	
36. Changes in surface water hydrology	Changes in surface water hydrology is defined as alteration of river discharge or water level as the effects of reservoir construction, irrigation water intake, or drainage.
37. Changes in groundwater hydrology	Changes in groundwater hydrology is defined as changes in the groundwater recharge mechanism or groundwater table caused by infiltration of irrigation water and exploitation of groundwater.
38. Inundation and flooding	Inundation and flooding are defined as overflowing of a river onto the surrounding land or the surrounding of seawater onto the coastal land. Inundation or flooding are caused by increased river or run-off discharge or poor water management.
39. Sedimentation	Sedimentation is defined as settlement of transported sediment in river, estuaries and reservoir.
40. Riverbed degradation	Riverbed degradation is defined as degradation of riverbeds in lower basin areas due to insufficient sediment load to maintain riverbed level.

Categories of Environmental Impact	Definition
41. Impediment of inland navigation	Impediment of inland navigation is defined as adverse impacts on navigation due to development activities.
<b>(6)-2 Water quality and temperature</b>	
42. Water contamination and deterioration of water quality	Water contamination and deterioration of water quality is defined as deterioration of water quality due to development activities.
43. Water eutrophication	Water eutrophication is defined as accumulation in water of nutritive soluble salts such as nitrate and phosphate.
44. Sea water intrusion	Sea water intrusion is defined as intrusion of a salt water wedge along the riverbed.
45. Change in temperature of water	Change in temperature of water is defined as adverse impact of low temperate irrigation water on crops.
<b>(6)-3 Atmosphere</b>	
46. Air pollution	Air pollution is defined as diffusion of agrochemicals, sand dust and odoriferous particles such as exhaust from vehicles and machinery into the air.
<b>(7) Landscape and mining resources</b>	
47. Damage to landscape	Damage to landscape is defined as direct or indirect negative effects on features of landscape as a result of development.

**Table 7.3 Summary of Checklist on Proposed Programs in Algar Char Gram**

Environmental Elements	Environmental Impact Score													
	Class I	Class II	Class III	Class IV	Class V	Class VI	Class VII	Class VIII	Class IX	Class X	Class XI	Class XII	Class XIII	
Proposed projects and Programs	Planned residential settlement													
	Involuntary resettlement													
	Substantial changes in the way of life													
	Conflict among communities and people													
	Impact on native people													
	Population increase													
	Drastic change in population composition													
	Changes in bases of economic activities													
	Occupational changes and loss of job opportunities													
	Increase in income disparities													
	Adjustment & regulation of water or fishing rights													
	Changes in social and institutional structures													
	Changes in existing institutions and customs													
	Increased use of agrochemicals													
Outbreak of endemic diseases														
Spread of endemic diseases														
Residual toxicity of agrochemicals														
Increase in domestic and other human wastes														
Impairment of historic remains and cultural assets														
Damages to aesthetic sites														
Changes in vegetation														
Negative impact on important or indigenous fauna and flora														
Degradation of ecosystems with biological diversity														
Proliferation of exotic and/or hazardous species														
Destruction of wetlands and peatlands														
Destruction of tropical rain forests and wildlands														
Destruction or degradation of mangrove forests														
Degradation of coral reefs														
Soil erosion														
Soil salinization														
Deterioration of soil fertility														
Soil contamination by agrochemicals and others														
Devastation or desertification of land														
Devastation of hinterland														
Ground subsidence														
Change in surface water hydrology														
Change in ground water hydrology														
Inundation and flooding														
Sedimentation														
Riverbed degradation														
Impediment of inland navigation														
Water contamination and deterioration of water quality														
Water eutrophication														
Sea water intrusion														
Change in temperature of water														
Air pollution														
Noise pollution														
Damage to landscape														
Impediment of mining resources exploitation														

**Environmental Elements**  
 I. Social issues II. Demographic issues III. Economic activities  
 IV. Institutional and custom related issues V. Health and sanitary issues  
 VI. Cultural asset issues VII. Biological and ecological issues  
 VIII. Soil resources IX. Land resources X. Hydrology  
 XI. Water quality and temperature XII. Atmosphere  
 XIII. Landscape and mining resources

**Environmental Impact Score**  
 Applicable columns with the following impact degree are marked with " positive impact (+) or negative impact (-) "  
 Positive impact: Very high (+5), high (+4), moderate (+3), low (+2), very low (+1)  
 Negative impact: Severe (-5), higher (-4), moderate (-3), low (-2), very low (-1)

**Table 7.4 Checklist For Proving Environmental Impact of Proposed Program  
on Raising Plinth of Homestead Area in Char Area**

District: Gaibandha

Upazila: Fulchari

Union: Erendabari

Mouza: Algar char

**I. Social Environment**

Category of Environmental Impact	Impact		Evaluation Base
	P+	N-	
<b>1. Socio- economic Issues</b>			
<b>(1) Social Issues</b>			
1.Planned residential settlement	4		There is no planned residential settlement in the project site. After implementation of the project out-migrated people, landless farmers and shifting cultivators will get opportunities to be settled back to their original dwelling places.
2.Involuntary resettlement		1	About 15.3% of the household heads of Algarchar village are not willing to move from their ancestral home primarily for sentimental weakness. A motivational campaign may help to smooth out their sentiment.
3.Substantial changes in the way of life.	4		Three indicators used for measuring these changes are: religious beliefs and practices, empowerment of women, purdha system, and roles of spouses in the family.
4.Conflict among communities and people.	2		The proposed activity are not going to create any major conflict in the society because of limited development and adequate compensation for the affected people.
5.Impact on native people			There is no tribal or indigenous group in the locality. So no significant impact on native people.
<b>(2) Demographic Issues</b>			
6.Population Increase		2	Nearly 1.3% of the households are reported to be shifting cultivators. These people may permanently in the locality in the post development period. Also nearby poor may also come to settle here with the hope of better life under the changed situation.
7.Drastic change in population composition		2	After implementation of the project there may be an influx of immigrants in the locality and they are likely to be young because older people hardly migrate to settle permanently.
<b>(3) Economic activities</b>			
8.Changes in bases of economic activities	3		About 42% of the household heads anticipate some changes in the economic bases of livelihoods of people. Those who believe in the change anticipate major new areas will be farming (new crop), service, and business.
9.Occupational change and loss of Job opportunities.			No significant occupational changes and loss of job opportunities.
3.Increase in income disparities		1	The household heads and the key-informants believe in some improvement of economic condition of people.
<b>(4) Institutional and Custom related issues</b>			
1.Adjustment and regulation of water or fishing rights		1	Regulations related to water and fishing rights will affect the livelihood of only few people. The respondents of all categories want the regulations should be made considering the possible effects of the rules upon the people who are directly involved with it.
2.Changes in social and institutional structure	1		The possible changes in institutional structure are measured using following indicators: family structure, religious practices, village judicial system (salish), and land related practices.
3.Changes in existing institution and custom	1		These changes are measured by using indicators that exemplify deep-rooted values of the society. These are respect to elders, social rituals, mutual help, and role of village samaj (community). These traditional customs and rituals are likely to remain in vogue in the post development phase.
<b>2. Health and Sanitary Issues</b>			
1.Increased use of agro-chemicals		1	About 100% of survey respondents opine that use of agrochemicals for crop production will increase. Key-informants also hold similar views.
2.Outbreak of endemic diseases		1	Endemic diseases may breakout but mostly at a low rate. In Algarchar people anticipate air-borne diseases. This could be because the area is sandy.
3.Spreading of endemic diseases		1	People don't see the possibility of spreading endemic diseases.
4.Residual toxicity of agro-chemicals		2	The majority of the key-informants of char believe that increase use of agrochemicals in land will result in accumulation of chemical in soil and water. It will adversely affect on soil fertility.

5.Increase in domestic and other human waste		1	Over 93% of respondents think domestic and human wastes will increase due
<b>3.Cultural Asset Issues</b>			
cultural assets.			No impairment of historic remains and cultural assets.
2.Damage to aesthetic sites			There is no significant aesthetic site in the project area.
<b>II.Natural Environment</b>			
<b>4.Biological and Ecological Issues</b>			
1.Change in vegetation		2	The homestead vegetation will be change if the plinth of homestead area rises.
2.Negative impacts on important or indigenous		3	Soil covering plants, grasses and weeds such as Chenopodium ambrosoides,
3.Degradation Of ecosystems with biological Diversity		3	The bio-diversity (flora and fauna) will be degraded due to the proposed activities if the new soil does not support the existing ecosystem. The original ecosystem will be hampered due to the proposed activities.
4.Proliferation of exotic and / or hazardous species			Not evaluated. Microbiological research is needed.
5.Destruction of wetlands and peat lands		2	Topsoil of wetland and the peat land will be destroyed for this type of activity
6.Encroachment into tropical rain forest and wild			Not Applicable
7.Destruction or degradation of mangrove forests			Not Applicable
8.Degradation of coral reefs			Not Applicable
<b>5.Soil and Land Resources</b>			
<b>(1).Soil Resources</b>			
1.Soil erosion		1	Water flow will be restricted and soil erosion may occur.
2.Soil salinization			No significant soil salinization is noticed in the project site.
3.Degradation of soil fertility	3		As a result of siltration soil fertility will be enhanced.
4.Soil contamination by agrochemicals and others		1	Agrochemical using will not change.
<b>(2)Land Resources</b>			
1.Devastation or desertification of land	1		No significant devastation or desertification of land due to this intervention.Soil fertility will increase.
2.Devastation of hinterland		1	Hinterland will be inundated.
3.Ground Subsidence			No impact is anticipated.
<b>6.Hydrology and Air and Water Quality</b>			
<b>(1)Hydrology</b>			
1.Change in surface water hydrology.			There will be no change in surface water hydrology due to raising homestead
2.Change in ground water Hydrology			No change in ground water quantity and ground water table is anticipated due to this intervention as homestead raising will not affect ground water in any way.
3.Inundation and flooding			No significant environmental impact will be anticipated.
4.Sedimentation		1	There is a little chance of sedimentation into the ponds.
5.Riverbed Degradation			Proposed activity will not affect river bed degradation as it will not obstruct river flow.
6.Impediment of inland navigation			No significant impediment of inland navigation.
<b>(2) water Quality and Temperature</b>			
1.water contamination and deterioration of water quality.		1	This activity will not affect water quality. However, if heavy rainfall occurs during construction work, turbidity of surface water may rise. But this will be of temporal nature.
2.Water eutrophication			Water eutrophication will not be anticipated by this activity.
3.Salt water intrusion			No salt water intrusion will be anticipated.Because there is no salt water source around the project site.
4.Change in temperature of water			No change in temperature due to this activity.
<b>(3)Atmosphere</b>			
1.Air pollution		1	During earth work, there will be little dust emission in the air. This will be for short duration only.
2.Noise pollution			Since earth work will not involve any equipment rather than hand tools, noise pollution is not anticipated.
<b>7.landscape and MiningResources</b>			
1.Damage to landscape		2	Due to earth work some dishes on agricultural land may be required that will affect existing landscape . For raising of plinth of homestead area there will be loss in regulation , tree-felling may be expected.
2. Impediment of mining resources exploitation			No impediment of mining resources exploitation anticipated.

**Table 7.5 Checklist for Proving Environmental Impact of Long-term Program on Clustering Houses on High Platform in Char Area**

District: Gaibandha

Upazila: Fulchari

Union: Erendabari

Mouza: Algar char

**I.Social Environment**

Category of Environmental Impact	Impact		Evaluation Base
	P+	N -	
<b>1.Socio- economic Issues</b>			
(1) Social Issues			
1.Planned residential settlement	4		There is no planned residential settlement in the project site. After implementation of the project out-migrated people, landless farmers and shifting cultivators will get opportunities to be settled back to their original dwelling places.
2.Involuntary resettlement		1	About 15.3% of the household heads of Algarchar village are not willing to move from their ancestral home primarily for sentimental weakness A motivational campaign may help smooth out their sentiment.
3.Substantial changes in the way of life.	4		Three indicators used for measuring these changes are: religious beliefs and practices, empowerment of women, purdha system, and roles of spouses in the family.
4.Conflict among communities and people.	2		The proposed activities are not going to create any major conflict in the society because of limited development and adequate compensation for the affected people. The influx of outsiders in the post project implementation period in the locality will not be a source of conflict among the locals and outsiders according to key-informants.
5.Impact on native people			There is no tribal or indigenous group in the locality.So no significant impact on native people.
(2) Demographic Issues			
6.Population Increase		2	Nearly 1.3% of the households are reported to be shifting cultivators. These people may permanently in the locality in the post development period. Also nearby poor may also come to settle here with the hope of better life under the changed situation.
7.Drastic change in population composition		2	After implementation of the project there may be an influx of immigrants in the locality and they are likely to be young because older people hardly migrate to settle permanently.
(3)Economic activities			
8.Changes in bases of economic activities	3		About 42% of the household heads anticipate some changes in the economic bases of livelihoods of people. Those who believe in the change anticipate major new areas will be farming (new crop), service, and business.
9.Occupational change and loss of Job opportunities.			No significant occupational changes and loss of job opportunities.
10.Increase in income disparities		1	The household heads and the key-informants believe in some improvement of economic condition of people. However, they all agree that the benefits will go more to the well to do because they will avail the business opportunities with their already advantageous resources.
(4) Institutional and Custom related issues			
11.Adjustment and regulation of water or fishing rights		1	Regulations related to water and fishing rights will affect the livelihood of only few people. The respondents of all categories want the regulations should be made considering the possible effects of the rules upon the people who are directly involved with it.
12.Changes in social and institutional structure	1		The possible changes in institutional structure are measured using following indicators: family structure, religious practices, village judicial system (salish), and land related practices.
13.Changes in existing institution and custom	1		These changes are measured by using indicators that exemplify deep-rooted values of the society. These are respect to elders, social rituals, mutual help, and role village samaj (community).
<b>2.Health and Sanitary Issues</b>			
14.Increased use of agro-chemicals		1	About 100% of survey respondents opine that use of agrochemicals for crop production will increase. Key-informants also hold similar views.
15.Outbreak of endemic diseases		1	Endemic diseases may breakout but mostly at a low rate. In Algarchar people anticipate air-borne diseases.
16.Spreading of endemic diseases		1	People don't see the possibility of spreading endemic diseases.
17.Residual toxicity of agro-chemicals		2	The majority of the key-informants of char believe that increase use of agro-chemicals in land will result in accumulation of chemical in soil and water.It will adversely affect on soil fertility.
18.Increase in domestic and other human waste		1	Over 93% of respondents think domestic and human wastes will increase due to implementation of the project.

<b>3.Cultural Asset Issues</b>			
19.Impairment of historic remains and and cultural assets.			No impairment of historic remains and cultural assets.
20.Damage to aesthetic sites			There is no significant aesthetic site in the project area.
<b>II.Natural Environment</b>			
<b>4.Biological and Ecological Issues</b>			
21.Change in vegetation	2		Clustering of houses in the char area will change the existing vegetation. New vegetation will form in the mean time naturally and by the settlers.
22.Negative impacts on important or indigenous fauna and flora		2	Negative impacts on indigenous flora and fauna may be seen due to this type of altered habitat.Burrowing animals' (Bee eater,King fisher etc.) will be destroyed.
23.Degradation Of ecosystems with biological Diversity		3	The clustering houses on high platform will destroyed the current ecosystem with bio-diversity as the existing area will remain under the platform.
24.Proliferation of exotic and / or hazardous species		-	Not evaluated. Microbiological research is needed.
25.Destruction of wetlands and peat lands		3	Seasonal wetland will be destroyed due to this type of activists that may hamper the fish, turtle and dolphin migration. It may change the water flow of the study area that will create a serious problem for the future migration of the fishes and other wildlife.
26.Encroachment into tropical rain forest and wild lands			Not applicable
27.Destruction or degradation of mangrove forests			Not applicable
28.Degradation of coral reefs			Not applicable
<b>5.Soil and Land Resources</b>			
(1).Soil Resources			
29.Soil erosion		1	Water flow will be restricted and soil erosion may happen.
30.Soil salinazation			No significant soil salinization is noticed in the project site.
31.Detioration of soil fertility	3		As a result of siltration soil fertility will be enhanced.
32.Soil contamination by agrochemicals and others		1	Agrochemical using will not change.
(2)Land Resources			
33.Devastation or desertification of land	1		No significant devastation or desertification of land due to this interventation.Soil fertility will increase.
34.Devastation of hinterland		1	Hinterland will be inundated.
35.Ground Subsidence			No significant impact is anticipated.
<b>6.Hydrology and Air and Water Quality</b>			
(1)Hydrology			
36.Change in surface water hydrology.			No impact is anticipated.
37.Change in ground water Hydrology			No impact is anticipated.
38.Inundation and flooding			No impact is anticipated.
39.Sedimentation			No impact is anticipated.
40.Riverbed Degradation			No impact is anticipated.
41.Impediment of inland navigation		1	Depending on location of clustered village , inland navigation during monsoon can be obstructed. But impact will be minimal.
(2) Water Quality and Temperature			
42.Water contamination and deterioration of water quality.			No impact is anticipated.
43.Water eutrophication			No impact is anticipated.
44.Salt water intrusion			No impact is anticipated.
45.Change in tempereture of water			No impact is anticipated.
(3)Atmosphere			
46.Air pollution		1	During earth excavation, there will be little dust emission.
47.Noise pollution			Noise pollution is not anticipated.
<b>7.landscape and MiningResources</b>			
48.Damage to landscape		2	Due to earth work some dishes on agricultural land may be required that
49. Impediment of mining resources exploitation			No impediment of mining resourses exploitation anticipated.

**Table 7.6 Checklist for Proving Environmental Impact of Proposed Program on Provision of Raised Hand Tube-well in Char Area**

District: Gaibandha

Upazila: Fulchhari

Union: Erendabari

Mouza: Algar char

**I. Social Environment**

Category of Environmental Impact	Impact		Evaluation Base
	P+	N-	
<b>1. Socio-economic Issues</b>			
<b>(1) Social Issues</b>			
1.Planned residential settlement			This activity will not be anticipated significantly with planned residential settlement.
2.Involuntary resettlement			This intervention will not affect to force settlement.
3.Substantial changes in the way of life.			This activity will not be anticipated significantly to substantial changes in the way of life.
4.Conflict among communities and people.			No contradiction is expected through this activity.
5.Impact on native people			There is no tribal or indigenous group in the locality.
<b>(2) Demographic Issues</b>			
6.Population Increase			No significant increase will be anticipated due to project activity.
7.Drastic change in population composition			No significant change in population composition will be anticipated due to project activity.
<b>(3)Economic activities</b>			
8.Changes in bases of economic activities			No significant changes in the base of economy will be anticipated due to project activity.
9.Occupational change and loss of Job opportunities.			No significant occupational change and loss of job opportunity will be anticipated due to project activity.
10.Increase in income disparities			No significant increase in income disparities will be anticipated due to project activity.
<b>(4) Institutional and Custom related issues</b>			
11.Adjustment and regulation of water or fishing rights			No significant adjustment and regulation of water or fishing rights is anticipated due to this intervention.
12.Changes in social and institutional structure			No significant change in social and institutional structure will be anticipated due to project activity.
13.Changes in existing institution and custom			No significant change in existing institution and customs will be anticipated due to this intervention.
<b>2.Health and Sanitary Issues</b>			
14.Increased use of agro-chemicals			No significant changes in the use of agrochemicals
15.Outbreak of endemic diseases			No significant outbreak of endemic diseases due to this intervention.
16.Spreading of endemic diseases		1	Endemic diseases may spread but mostly at a low rate.
17.Residual toxicity of agro-chemicals			This intervention will not affect to residual toxicity of agro-chemicals.
18.Increase in domestic and other human waste			No significant increase in domestic and human waste due to this intervention.
<b>3.Cultural Asset Issues</b>			
19.Impairment of historic remains and cultural assets.			No historic and cultural asset in the project site.
20.Damage to aesthetic sites			There is no significant aesthetic site in the project area.
<b>II.Natural Environment</b>			
<b>4.Biological and Ecological Issues</b>			
1.Change in vegetation			No impact is anticipated.
2.Negative impacts on important or indigenous fauna and flora			No impact is anticipated.
3.Degradation Of ecosystems with biological Diversity			No impact is anticipated.
4.Proliferation of exotic and / or hazardous species			No impact is anticipated.
5.Destruction of wetlands and peat lands			No impact is anticipated.
6.Encroachment into tropical rain forest and wild lands			No impact is anticipated.
7.Destruction or degradation of mangrove forests			No impact is anticipated.
8.Degradation of coral reefs			No impact is anticipated.



<b>5. Soil and Land Resources</b>		
<b>(1) Soil Resources</b>		
1. Soil erosion		No impact is anticipated.
2. Soil salinization		No impact is anticipated.
3. Soil contamination by agrochemicals and		No impact is anticipated.
<b>(2) Land Resources</b>		
1. Devastation or desertification of land		No impact is anticipated.
2. Devastation of hinterland		No impact is anticipated.
3. Ground Subsidence		No impact is anticipated.
<b>6. Hydrology and Air and Water Quality</b>		
<b>(1) Hydrology</b>		
1. Change in surface water hydrology.		No significant change in surface water hydrology will be anticipated due to project activity.
2. Change in ground water Hydrology	1	Villagers are depended on ground water in mainly for drinking, household and irrigation purposes that will continue throughout the year. This will cause lowering of ground water level temporarily only. Because there will be recharge from the river Jamuna.
3. Inundation and flooding		No adverse impact is expected.
4. Sedimentation		No adverse impact is expected.
5. Riverbed Degradation		No adverse impact is expected.
6. Impediment of inland navigation		No adverse impact is expected.
<b>(2) water Quality and Temperature</b>		
1. water contamination and deterioration of water		No adverse impact is expected.
2. Water eutrophication		No adverse impact is expected.
3. Salt water intrusion		No adverse impact is expected.
4. Change in temperature of water		No adverse impact is expected.
<b>(3) Atmosphere</b>		
1. Air pollution		No adverse impact is expected.
2. Noise pollution		No adverse impact is expected.
<b>7. landscape and Mining Resources</b>		
1. Damage to landscape		No adverse impact is expected.
2. Impediment of mining resources exploitation		No adverse impact is expected.

**Table 7.7 Checklist for Proving Environmental Impact of Proposed Program on Provision of Community Latrine in Char Area**

District: Gaibandha      Upazila: Fulchhari      Union: Erendabari      Mouza: Algar char

**I. Social Environment**

Category of Environmental Impact	Impact		Evaluation Base
	P+	N-	
<b>1. Socio- economic Issues</b>			
<b>(1) Social Issues</b>			
1.Planned residential settlement			No signifact impact willbe anticipated.
2.Involuntary resettlement			No signifact impact willbe anticipated.
3.Substantial changes in the way of life.			No signifact impact will be anticipated.
4.Conflict among communities and people.			No adverse effect is anticipated.
5.Impact on native people			There is no tribal or indigenous group in the locality.
<b>(2) Demographic Issues</b>			
6. Population Increase			No impact due to this development
7.Drastic change in population composition			No significant change in population composition will be anticipated due to project activity.
<b>(3)Economic activities</b>			
8.Changes in bases of economic activities			No impact due to this development
9.Occupational change and loss of Job opportunities.			No significant occupational changes and loss of job opportunities.
10.Increase in income disparities			No impact due to this development
<b>(4) Institutional and Custom related issues</b>			
11.Adjustment and regulation of water or fishing rights			No impact due to this development
12.Changes in social and instiuitonal structure			No impact due to this development
13.Changes in existing institution and custom			No impact due to this development
<b>2.Health and Sanitary Issues</b>			
14.Increased use of agro-chemicals			No significant changes in the use of agrochemicals
15.Outbreak of endemic diseases			No significant outbreak of endemic diseases due to this intervention.
16.Spreading of endemic diseases		1	Endemic diseases may breakout but mostly at a low rate.
17.Resudial toxicity of agro-chemicals			This intervention will not affect to residual toxicity of agro-chemicals.
18.Increase in domestic and other human waste		2	Over 85% of respondents think human wastes will increase due to implementation of the project.
<b>3.Cultural Asset Issues</b>			
19.Impairment of historic remains and and cultural assets.			No historic and cultural asset in the project site.
20.Damage to aesthetic sites			There is no significant aesthetic site in the project area.
<b>II.Natural Environment</b>			
<b>4.Biological and Ecological Issues</b>			
21.Change in vegetation		2	If it remains as close modern type, it will provide a little negative impact.
22.Negative impacts on important or indigenous fauna and flora		2	If the latrine remains closed type, it will help to get food for fishes and other wildlife,after removing the sewage from pit.
23.Degradation Of ecosystems with biological Diversity			No Impact will be anticipated.
24.Proliferation of exotic and / or hazardous species			Not evaluated. Microbiological research is needed.
25.Destruction of wetlands and peat lands			No Impact
26.Encroachment into tropical rain forest and wild lands			Not applicable
27.Destruction or degradation of mangrove forests			Not applicable
28.Degradation of coral reefs			Not applicable

<b>5. Soil and Land Resources</b>		
<b>(1). Soil Resources</b>		
29. Soil erosion		No impact is anticipated.
30. Soil salinization		No impact is anticipated.
31. Deterioration of soil fertility		No impact is anticipated.
32. Soil contamination by agrochemicals and		No impact is anticipated.
<b>(2) Land Resources</b>		
33. Devastation or desertification of land		No impact is anticipated.
34. Devastation of hinterland		No impact is anticipated.
35. Ground Subsidence		No impact is anticipated.
<b>6. Hydrology and Air and Water Quality</b>		
<b>(1) Hydrology</b>		
36. Change in surface water hydrology.		Due to this intervention both surface water quantity and quality will not be anticipated.
37. Change in ground water Hydrology		No significant change in ground water.
38. Inundation and flooding		No impact is anticipated.
39. Sedimentation		No impact is anticipated.
40. River bed Degradation		No impact is anticipated.
41. Impediment of inland navigation		No impact is anticipated.
<b>(2) water Quality and Temperature</b>		
1. water contamination and deterioration of water quality.	1	During construction, adequate sanitary measures have to be adopted so that there is no chance of contamination of both surface and ground water.
2. Water eutrophication		No impact is anticipated.
3. Salt water intrusion		No impact is anticipated.
4. Change in temperature of water		No impact is anticipated.
<b>(3) Atmosphere</b>		
1. Air pollution		No impact is anticipated.
2. Noise pollution		No impact is anticipated.
<b>7. landscape and Mining Resources</b>		
1. Damage to landscape		No impact is anticipated.
2. Impediment of mining resources exploitation		No impact is anticipated.

**Table 7.8 Checklist for Proving Environmental Impact of Long-term Program on Construction of Submersible Road in Char Area**

District: Gaibandha      Upazila: Fulchari      Union: Erendabari      Mouza: Algar char

**I. Social Environment**

Category of Environmental Impact	Impact		Evaluation Base
	P+	N-	
<b>1. Socio- economic Issues</b>			
(1) Social Issues			
1.Planned residential settlement			No significant impact will be anticipated.
2.Involuntary resettlement		1	About 15.3% of the household heads of Algarchar village are not willing to move from their ancestral home primarily for sentimental weakness A motivational campaign may help smooth out their sentiment.
3.Substantial changes in the way of life.	4		Three indicators used for measuring these changes are: religious beliefs and practices, empowerment of women, purdha system, and roles of spouses in the family.
4.Conflict among communities and people.	2		The proposed activities are not going to create any major conflict in the society because of limited development and adequate compensation for the affected people.
5.Impact on native people			There is no tribal or indigenous group in the locality.
(2) Demographic Issues			
1.Population Increase		2	Nearly 1.3% of the households are reported to be shifting cultivators. These people may permanently in the locality in the post development period. Also nearby poor may also come to settle here with the hope of better life under the changed situation.
2.Drastic change in population composition		2	After implementation of the project there may be an influx of immigrants in the locality and they are likely to be young because older people hardly migrate to settle permanently.
(3)Economic activities			
1.Changes in bases of economic activities	3		About 42% of the household heads anticipate some changes in the economic bases of livelihoods of people. Those who believe in the change anticipate major new areas will be farming (new crop), service, and business.
2.Occupational change and loss of Job opportunities.		1	More people are likely to engage in business than before as road communication will provide opportunity for transportation of agricultural products and bring consumer goods more easily than before. Since development activities are likely to improve economic status of people there will demand for more consumer goods resulting in more business and employment.
3.Increase in income disparities		1	The household heads and the key-informants believe in some improvement of economic condition of people. However, they all agree that the benefits will go more to the well to do because they will avail the business opportunities with their already advantageous resources.
(4) Institutional and Custom related issues			No significant impact is anticipated.
1.Adjustment and regulation of water or fishing rights		1	Regulations related to water and fishing rights will affect the livelihood of only few people. The respondents of all categories want the regulations should be made considering the possible effects of the rules upon the people who are directly involved with it.
2.Changes in social and institutional structure	1		The possible changes in institutional structure are measured using following indicators: family structure, religious practices, village judicial system (salish), and land related practices.
3.Changes in existing institution and custom	1		These changes are measured by using indicators that exemplify deep-rooted values of the society. These are respect to elders, social rituals, mutual help, and role village samaj (community).
<b>2.Health and Sanitary Issues</b>			
1.Increased use of agro-chemicals		1	About 100% of survey respondents opine that use of agrochemicals for crop production will increase. Key-informants also hold similar views.
2.Outbreak of endemic diseases		1	Endemic diseases may breakout but mostly at a low rate. In Algarchar people anticipate air-borne diseases. This could be because the area is sandy.
3.Spreading of endemic diseases		1	People don't see the possibility of spread of disease.
4.Residual toxicity of agro-chemicals		2	The majority of the key-informants of char believe that increase use of chemicals in land will result in accumulation of chemical in soil and water.
5.Increase in domestic and other human waste		1	Over 93% of respondents think domestic and human wastes will increase due to implementation of the project.

<b>3.Cultural Asset Issues</b>			
1.Impairment of historic remains and and cultural assets.			No historic and cultural asset in the project site.
2.Damage to aesthetic sites			There is no significant aesthetic site in the project area.
<b>4.Biological and Ecological Issues</b>			
1.Change in vegetation			No major changes in vegetation.
2.Negative impacts on important or indigenous fauna and flora		2	Some impact may be observed on the Indigenous flora and fauna. Biomass production of this submersible road area will stop that will reduce the availability of fish food during the monsoon.
3.Degradation Of ecosystems with biological Diversity		1	If the submersible road needs a lot of area that will degrade the ecosystem totally.
4.Proliferation of exotic and / or hazardous species			Not evaluated. Microbiological research is needed.
5.Destruction of wetlands and peat lands		1	Biomass of wetland and peat land will be destroyed due to the above activities.
6.Encroachment into tropical rain forest and wild lands			Not applicable
7.Destruction or degradation of mangrove forests			Not applicable
8.Degradation of coral reefs			Not applicable
<b>5.Soil and Land Resources</b>			
<b>(1).Soil Resources</b>			
1.Soil erosion		3	Water flow will be restricted and there will be siltation in the project area.
2.Soil salinization			No impact will be anticipated.
3. Degradation of soil fertility			No impact will be anticipated.
4.Soil contamination by agrochemicals and		1	Use of agrochemicals may increase.
<b>(2)Land Resources</b>			
1.Devastation or desertification of land		1	Soil fertility will increase.
2.Devastation of hinterland		1	Hinterland will be inundated.
3.Ground Subsidence			No impact is anticipated.
<b>6.Hydrology and Air and Water Quality</b>			
<b>(1)Hydrology</b>			
1.Change in surface water hydrology.			No impact is anticipated due to this intervention.
2.Change in ground water Hydrology			No impact is anticipated due to this intervention.
3.Inundation and flooding			No impact is anticipated due to this intervention.
4.Sedimentation			No impact is anticipated due to this intervention.
5.Riverbed Degradation			No impact is anticipated due to this intervention.
6.Impediment of inland navigation		1	During post monsoon when water depth reaches to the top surface of road internal navigation will be interrupted for somedays.
<b>(2) water Quality and Temperature</b>			
1.water contamination and deterioration of			No impact is anticipated due to this intervention.
2.Water eutrophication			No impact is anticipated due to this intervention.
3.Salt water intrusion			No impact is anticipated due to this intervention.
4.Change in tempereture of water			No impact is anticipated due to this intervention.
<b>(3)Atmosphere</b>			
1.Air pollution		1	During construction, adequate measures have to be adopted so that there is minimum emission of dusrt in air.
2.Noise pollution		1	Noise pollution will be anticipated during construction due to use of construction equipment.
<b>7.landscape and MiningResources</b>			
1.Damage to landscape		2	Due to earth work some dishes on agricultural land may be required that will affect existing landscape . For construction of submersible road there will be loss of regulation in existing landuse.
2. Impediment of mining resources exploitation			No impediment of mining resources exploitation anticipated.

**Table 7.9 Checklist for Proving Environmental Impact of Long-term Program on Construction of Submersible Bridge in Char Area**

District: Gaibandha      Upazila: Fulchhari      Union: Erendabari      Mouza: Algar char

**I.Social Environment**

Category of Environmental Impact	Impact		Evaluation Base
	P+	N+	
<b>1.Socio- economic Issues</b>			
(1) Social Issues			
1.Planned residential settlement			No significant impact will be anticipated.
2.Involuntary resettlement		1	About 15.3% of the household heads of Algarchar village are not willing to move from their ancestral home primarily for sentimental weakness A motivational campaign may help smooth out their sentiment.
3.Substantial changes in the way of life.	4		Three indicators used for measuring these changes are: religious beliefs and practices, empowerment of women, purdha system, and roles of spouses in the family. Char people being very religious purdha and religious beliefs and practices are going to remain as they are while empowerment of women and roles of spouses are going to change to a great extent.
4.Conflict among communities and people.			No significant conflict among communities.
5.Impact on native people			There is no tribal or indigenous group in the locality.
(2) Demographic Issues			
1.Population Increase			No change in population.
2.Drastic change in population composition		2	After implementation of the project there may be an influx of immigrants in the locality and they are likely to be young because older people hardly migrate to settle permanently.
(3)Economic activities			
1.Changes in bases of economic activities	3		About 42% of the household heads anticipate some changes in the economic bases of livelihoods of people. Those who believe in the change anticipate major new areas will be farming (new crop), service, and business.
2.Occupational change and loss of Job opportunities.		1	More people are likely to engage in business than before as road communication will provide opportunity for transportation of agricultural products and bring consumer goods more easily than before. Since development activities are likely to improve economic status of people there will demand for more consumer goods resulting in more business and employment. However, land acquisition may create a group of landless people if they fail to buy suitable lands with their compensation money. The project planners should make some provisions for these people.
3.Increase in income disparities		1	The household heads and the key-informants believe in some improvement of economic condition of people. However, they all agree that the benefits will go more to the well to do because they will avail the business opportunities with their already advantageous resources.
(4) Institutional and Custom related issues		1	Regulations related to water and fishing rights will affect the livelihood of only few people. The respondents of all categories want the regulations should be made considering the possible effects of the rules upon the people who are directly involved with it.
1.Adjustment and regulation of water or fishing rights		1	Regulations related to water and fishing rights will affect the livelihood of only few people. The respondents of all categories want the regulations should be made considering the possible effects of the rules upon the people who are directly involved with it.
2.Changes in social and institutional structure			No significant change in social and institutional structure is anticipated due to this intervention.
3.Changes in existing institution and custom	1		These changes are measured by using indicators that exemplify deep-rooted values of the society. These are respect to elders, social rituals, mutual help, and role village samaj (community).
<b>2.Health and Sanitary Issues</b>			
1.Increased use of agro-chemicals		1	About 100% of survey respondents opine that use of agrochemicals for crop production will increase. Key-informants also hold similar views.
2.Outbreak of endemic diseases		1	Endemic diseases may breakout but mostly at a low rate. In Algarchar people anticipate air-borne diseases.
3.Spreading of endemic diseases		1	People don't see the possibility of spread of disease.

4. Residual toxicity of agro-chemicals	2	The majority of the key-informants of char believe that increase use of chemicals in land will result in accumulation of chemical in soil and water.
5. Increase in domestic and other human waste	1	Over 93% of respondents think domestic and human wastes will increase due to implementation of the project.
<b>3. Cultural Asset Issues</b>		
1. Impairment of historic remains and cultural assets.		No historic and cultural asset in the project site.
2. Damage to aesthetic sites		There is no significant aesthetic site in the project area.
<b>II. Natural Environment</b>		
<b>4. Biological and Ecological Issues</b>		
1. Change in vegetation		No impact will be anticipated.
2. Negative impacts on important or indigenous fauna and flora		No impact will be anticipated.
3. Degradation Of ecosystems with biological Diversity		No impact will be anticipated.
4. Proliferation of exotic and / or hazardous species		Not evaluated. Microbiological research needed.
5. Destruction of wetlands and peat lands		No impact will be anticipated.
6. Encroachment into tropical rain forest and wild lands		Not applicable
7. Destruction or degradation of mangrove forests		Not applicable
8. Degradation of coral reefs		Not applicable
<b>5. Soil and Land Resources</b>		
<b>(1). Soil Resources</b>		
1. Soil erosion		No impact is anticipated due to this intervention.
2. Soil salinization		No impact is anticipated due to this intervention.
3. Degradation of soil fertility		No impact is anticipated due to this intervention.
4. Soil contamination by agrochemicals and		No impact is anticipated due to this intervention.
<b>(2) Land Resources</b>		
1. Devastation or desertification of land		No significant impact is anticipated due to this intervention.
2. Devastation of hinterland		No significant impact is anticipated due to this intervention.
3. Ground Subsidence		No significant impact is anticipated due to this intervention.
<b>6. Hydrology and Air and Water Quality</b>		
<b>(1) Hydrology</b>		
1. Change in surface water hydrology.		No impact is anticipated due to this intervention.
2. Change in ground water Hydrology		No impact is anticipated due to this intervention.
3. Inundation and flooding		No impact is anticipated due to this intervention.
4. Sedimentation		No impact is anticipated due to this intervention.
5. Riverbed Degradation		No impact is anticipated due to this intervention.
6. Impediment of inland navigation	1	During post monsoon when water depth reaches to the top surface of road internal navigation will be interrupted for some days.
<b>(2) water Quality and Temperature</b>		
1. water contamination and deterioration of water		No impact is anticipated due to this intervention.
2. Water eutrophication		No impact is anticipated due to this intervention.
3. Salt water intrusion		No impact is anticipated due to this intervention.
4. Change in temperature of water		No impact is anticipated due to this intervention.
<b>(3) Atmosphere</b>		
1. Air pollution	1	During construction, adequate measures have to be adopted so that there is minimum emission of dust in air.
2. Noise pollution	1	Noise pollution will be anticipated during construction due to use of construction equipment
<b>7. landscape and Mining Resources</b>		
1. Damage to landscape	2	Due to earth work some dishes on agricultural land may be required that will affect existing landscape. For implementation of the project of regulation in existing landscape.
2. Impediment of mining resources exploitation		No impediment of mining resources exploitation anticipated.

**Table 7.10 Summary of Environmental Impact Identification on Development Programs for Char Area**

District: Gaibandha      Upazila: Fulchari      Union: Erendabari      Mouza: Algar char			
Category of Environmental Impact	Impact		Evaluation Base
	P+	N-	
<b>I. Social Environment</b>			
<b>1. Socio- economic Issues</b>			
<b>(1) Social Issues</b>			
1. Planned residential settlement	4		There is no planned residential settlement in the project site. After implementation of the project out-migrated people, landless farmers and shifting cultivators will get opportunities to be settled back to their original dwelling places. The project may contribute to plan residential settlement.
2. Involuntary resettlement		1	About 15.3% of the household heads of Algarchar village are not willing to move from their ancestral home primarily for sentimental weakness.
3. Substantial changes in the way of life.	4		Four indicators used for measuring these changes are: religious beliefs and practices, empowerment of women, purdha system, and roles of spouses in the family. Char people being very religious purdha and religious beliefs and practices are going to remain as they are while empowerment of women and roles of spouses are going to change to a great extent. Purdha is much relaxed here.
4. Conflict among communities and people.	2		The proposed activities are not going to create any major conflict in the society because of limited development and adequate compensation for the affected people. The influx of outsiders in the post project implementation period in the locality will not be a source of conflict among the locals and outsiders according to key-informants. However, some host-settlers may not accept the in-migrants as their equal for social relationship. In other words they will look down upon the outsiders.
<b>5. Impact on native people</b>			
There is no tribal or indigenous group in the locality.			
<b>2. Demographic Issues</b>			
1. Population increase		2	Nearly 1.3% of the households are reported to be shifting cultivators. These people may permanently settle in the locality in the post development period. Also nearby poor may come to settle here with the hope of better life under the changed situation. Therefore, there is a possibility of population growth in the area in addition to high natural fertility.
2. Drastic change in population composition		2	After the flood proofing activities there may be an influx of immigrants in the locality and they are likely to be young because older people hardly migrate to settle permanently. Hence there is a possibility of disproportionately more young people in the village.
<b>(3) Economic activities</b>			
1. Changes in the bases of economic activities	3		About 95% of the household heads anticipate some changes in the economic bases of livelihoods of people. Those who believe in the change anticipate major new areas will be farming (new crop), service, and business.
2. Occupational change and loss of Job opportunities.		1	More people are likely to engage in business than before, as road communication will provide opportunity for transportation of agricultural products and bring consumer goods more easily than before. Since development activities are likely to improve economic status of people there will demand for more consumer goods resulting in more business and employment. The employment seems to be more as wage labor.
3. Increase in income disparities		1	The household heads and the key-informants believe in some improvement of economic condition of people. However, they all agree that the benefits will go more to the well to do because they will avail the business opportunities with their already advantageous resources. The income gap will increase but trickle down effects to poor will be higher than what they are getting now. This means the relative position of poor will be bad but their absolute condition will be better.
<b>(4) Institutional and Custom related issues</b>			



Category of Environmental Impact	Impact		Evaluation Base
	P+	N-	
1. Adjustment and regulation of water or fishing rights		1	Regulations related to water and fishing rights will affect the livelihood of only few people. The respondents of all categories want the regulations should be made considering the possible effects of the rules upon the people who are directly involved with it. They should be consulted before making the rules.
2. Changes in social and institutional structure	1		The possible changes in institutional structure are measured using following indicators: family structure, religious practices, village judicial system (salish), and land related practices. The family structure, which is already in the process of becoming nuclear, will become nuclear at a faster rate with the population growth and economic advancement. Respondents anticipate that the new settlers may not yield to village salish like the host settlers as this institution is manned by them. However, these minor changes in the structure institutions will not create any disorder in society.
3. Changes in existing institution and custom	1		These changes are measured by using indicators that exemplify deep-rooted values of the society. These are respect to elders, social rituals, mutual help, and role village samaj (community). These traditional customs and rituals are likely to remain in vogue in the post development phase. Some of the respondents opine that these customs will become stronger with the better economic of the people.
<b>2. Health and Sanitary Issues</b>			
1. Increased use of agro-chemicals		1	About 100% of survey respondents opine that use of agrochemicals for crop production will increase. Key-informants also hold similar views.
2. Outbreak of endemic diseases		1	Endemic diseases may breakout but mostly at a low rate. In Algar char people anticipate air-borne diseases. This could be because the area is sandy.
3. Spreading of endemic diseases	3		People don't see the possibility of spreading of disease.
4. Residual toxicity of agro-chemicals		2	The majority of the key-informants of char believe that increased use of chemicals in land will result in accumulation of chemical in soil and water.
5. Increase in domestic and other human wastes.		1	Over 87% of respondents think domestic and human wastes will increase due to implementation of the project.
<b>3. Cultural Asset Issues</b>			
1. Impairment of historic remains and cultural assets.			There are no major historical remains in the area.
2. Damage to aesthetic sites			There is no mentionable aesthetic site in Algarchar village.
<b>4. Biological and Ecological Issues</b>			
1. Change in vegetation		2	The homestead vegetation will be changed. The existing vegetation including herbaceous and micro flora of the homestead area will be destroyed. Later new vegetation will grow that may be suppress the previous flora.
2. Negative impacts on important or indigenous fauna and flora		3	Soil covering plants, grasses and weeds such, as Chenopodium ambrosoides, heliotropium indicum etc. will be destroyed. Borrowing animals such as amphibia (toads, microhyla etc.), snakes, lizards (monitor lizard), birds (bee-eater, kingfisher etc), mammals (rats) and ma micro-fauna will be affected.
3. Degradation Of ecosystems with biological Diversity		3	The bio-diversity (flora and fauna) will be degraded due to the proposed activities if the new soil does not support the existing ecosystem. The original ecosystem will be hampered due to the proposed activities.
4. Proliferation of exotic and / or hazardous species		-	Not evaluated. Microbiological research is needed.
5. Destruction of wetlands and peat lands		2	Topsoil of wetland and the peat land will be destroyed for this type of activity, as the topsoil of these lands may be use by the herbaceous plants and the indigenous fishes.
6. Encroachment into tropical rain forest and wild lands			There is no tropical rain forest and wild lands in the area
7. Destruction or degradation of mangrove forests			There is no mangrove forest in the area.
8. Degradation of coral reefs			There is no coral reefs in the area

Category of Environmental Impact	Impact		Evaluation Base
	P+	N-	
<b>5. Soil and Land Resources</b>			
(1). Soil Resources			
1. Soil erosion		3	Due to implementation of the project, water flow will be restricted and soil erosion will be induced.
2. Soil salinization			No significant soil salinization is noticed in the project site.
3. Degradation of soil fertility	3		No significant degradation of soil fertility due to implementation of the project. However, as a result of siltration soil fertility will be enhanced.
4. Soil contamination by agrochemicals and others		1	Agrochemical using will change due to better communication.
(2) Land Resources			
1. Devastation or desertification of land	1		Soil fertility will increase.
2. Devastation of hinterland		1	Hinterland will be inundated.
3. Ground Subsidence			No significant impact is anticipated.
<b>6. Hydrology and Air and Water Quality</b>			
(1) Hydrology			
1. Change in surface water hydrology.			There will be no change in surface water hydrology due to the project works because these interventions will neither use surface water nor occupy any surface water source like pond, river etc.
2. Change in ground water Hydrology			No change in ground water quantity and ground water table is anticipated due to this project.
3. Inundation and flooding			No impact is anticipated due to implementation of the project.
4. Sedimentation		1	There is little chance for sedimentation in the surrounding pond.
5. Riverbed Degradation			Will not affect riverbed degradation as it will not obstruct river flow.
6. Impediment of inland navigation			No significant impact is anticipated of inland navigation.
(2) Water Quality and Temperature			
1. water contamination and deterioration of water quality.		1	This is no significant adverse impact in water quality and quantity due to implementation of the project. However, if heavy rainfall occurs during construction work, turbidity of surface water may rise. But this will be of temporal nature.
2. Water eutrophication			Water eutrophication will not be anticipated by this activity.
3. Salt water intrusion			No salt-water intrusion will be anticipated. Because there is no sea around the project site.
4. Change in temperature of water			No change in temperature due to this activity.
(3) Atmosphere			
1. Air pollution		1	During earthwork, there will be little dust emission in the air. This will be for short duration only.
2. Noise pollution		1	During construction, using of constructions equipments may cause noise pollution. After post project condition, vehicles may move through the road, which may cause noise pollution on the surrounding environment.
<b>7. Landscape and Mining Resources</b>			
1. Damage to landscape		2	Due to earthwork some dishes on agricultural land may be required that will affect existing landscape. For implementation of the project there will be loss in regulation of the existing landuse.
2. Impediment of mining resources exploitation			No impediment of mining resources exploitation anticipated.

Applicable columns with the following impact degree are marked with "positive impact (P+) or negative impact (N-)"  
Positive impact: Very high (+5), high (+4), moderate (+3), Low (+2), very low (+1)  
Negative impact: Severe (-5), higher (-4), moderate (-3), Low (-2), very low (-1)

Table 7.11 Summary of Checklist on Proposed Programs in Gurai Gram

Environmental Elements	Class													
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	
Proposed projects and Programs	Planned residential settlement													
	Involuntary resettlement	+3	-1	+3	+2									
	Substantial changes in the way of life													
	Conflict among communities and people													
	Impact on native people													
	Population increase													
	Drastic change in population composition													
	Changes in bases of economic activities													
	Occupational changes and loss of job opportunities													
	Increase in income disparities													
	Adjustment & regulation of water or fishing rights													
	Changes in social and institutional structures													
	Increased use of agrochemicals													
Outbreak of endemic diseases														
Spread of endemic diseases														
Residual toxicity of agrochemicals														
Increase in domestic and other human wastes														
Impairment of historic remains and cultural assets														
Damage to aesthetic sites														
Changes in vegetation														
Negative impact on important or indigenous fauna and flora														
Degradation of ecosystems with biological diversity														
Proliferation of exotic and/or hazardous species														
Destruction of wetlands and peatlands														
Decrease of tropical rain forests and wildlands														
Destruction or degradation of mangrove forests														
Degradation of coral reefs														
Soil erosion														
Soil salinization														
Deterioration of soil fertility														
Soil contamination by agrochemicals and others														
Devastation or desertification of land														
Devastation of hinterland														
Ground subsidence														
Change in surface water hydrology														
Change in ground water hydrology														
Inundation and flooding														
Sedimentation														
Riverbed degradation														
Impediment of inland navigation														
Water contamination and deterioration of water quality														
Water eutrophication														
Sea water intrusion														
Change in temperature of water														
Air pollution														
Noise pollution														
Damage to landscape														
Impediment of mining resources exploitation														

Environmental Elements  
 I. Social issues II. Demographic issues III. Economic activities  
 IV. Institutional and custom related issues V. Health and sanitary issues  
 VI. Cultural asset issues VII. Biological and ecological issues  
 VIII. Soil resources IX. Land resources X. Hydrology  
 XI. Water quality and temperature XII. Atmosphere  
 XIII. Landscape and mining resources

Environmental Impact Score  
 Applicable columns with the following impact degree are marked with " positive impact (+) or negative impact (-) "  
 Positive impact: Very high (+5), high (+4), moderate (+3), low (+2), very low (+1)  
 Negative impact: Severe (-5), higher (-4), moderate (-3), low (-2), very low (-1)

**Table 7.12 Checklist for Proving Environmental Impact of Proposed Program on Wave Protection Plan in Haor Area**

District: Kishoreganj

Upazila: Nikli

Union: Gurai

Village: Gurai

**I. Social Environment**

Category of Environmental Impact	Impact		Evaluation Base
	P+	N-	
<b>1. Socio- economic issues</b>			
<b>(1) Social Issues</b>			
1.Planned residential settlement	3		There is no planned residential settlement in the project site. After implementation of the project out-migrated people, landless farmers and shifting cultivators will get opportunities to be settled back to their original dwelling places. The project may contribute to plan residential settlement.
2.Involuntary resettlement		1	About 20% of the household heads of Gurai village are not willing to move from their ancestral home for sentimental weakness and strong kinship bond. A motivational campaign may help sooth out the situation.
3.Substantial changes in the way of life.	3		Three indicators used for measuring these changes are: religious beliefs and practices, empowerment of women, purdha system, and roles of spouses in the family. Except religious practices all other factors mentioned above are likely to go some changes in the liberal direction in Gurai.
4.Conflict among communities and people.	2		The proposed activity is not going to create any major conflict in the society because of limited development and adequate compensation for the affected people.
5.Impact on native people			There is no tribal or indigenous group in the locality.
<b>Demographic Issues</b>			
1.Population increase		2	Nearly 7.3% of the households are reported to be shifting cultivators. These people may permanently in the locality in the post development period. Also nearby poor may also come to settle with the hope of better life under the changed situation.
2.Drastic change in population composition		2	After implementation of this intervention there may be an influx of immigrants in the locality and they are likely to be young because older people hardly migrate to settle permanently.
<b>(3)Economic activities</b>			
1.Changes in bases of economic activities	3		About 42% of the household heads anticipate some changes in the economic bases of livelihoods of people.
2.Occupational change and loss of Job opportunities.		1	More people are likely to engage in business than before as road communication will provide opportunity for transportation of agricultural products and bring consumer goods more easily than before.
3.Increase in income disparities		2	The household heads and the key-informants believe in some improvement of economic condition of people. However, they all agree that the benefits will go more to the well to do because they will avail the business opportunities with their already advantageous resources. The income gap will increase but trickle down effects to poor will be higher than what they are getting now. This means the relative position poor will be bad but their absolute condition will be better.
<b>(4) Institutional and Custom related issues</b>			
1.Adjustment and regulation of water or fishing rights		1	About 15% of population in Gurai village directly or indirectly depend on water resources for their livelihoods.
2.Changes in social and institutional structure	1		The possible changes in institutional structure are measured using following indicators: family structure, religious practices, village judicial system (slish), and land related practices.
3.Changes in existing institution and custom	3		These changes are measured by using indicators that exemplify deep-rooted values of the society. These are respect to elders, social rituals, mutual help, and role village samaj (community).
<b>2.Health and Sanitary Issues</b>			
1.Increased use of agro-chemicals		2	About two-thirds of survey respondents opine that use of agrochemicals for crop production will increase. Key-informants also hold similar views.
2.Outbreak of endemic diseases			Endemic diseases may breakout but mostly at a low rate.
3.Spreading of endemic diseases			People don't see the possibility of spread of disease.
4.Resudial toxicity of agro-chemicals		2	The majority of the key-informants of haor believe that increase use of chemicals in land will result in accumulation of chemical in soil and water.
5.Increase in domestic and other human waste		2	Over 85% and 79% of respondents think domestic and human wastes will increase due to implementation of the project.

<b>3.Cultural Asset Issues</b>		
1.Impairment of historic remains and cultural ass	2	There is a 900-year mosque and a 500-year temple in Gurai. Local people want these historical remains to be preserved.
2.Damage to aesthetic sites		There is no mentionable aesthetic site in Gurai village.
<b>4.Biological and Ecological Issues</b>		
1.Change in vegetation	2	The homestead vegetation will be changed if the plinth of homestead area
2.Negative impacts on important or indigenous fauna and flora	3	Soil covering plants, grasses and weeds such as <i>Chenopodium ambrosoides</i> , <i>heliotropium indicum</i> etc. will be destroyed. Borrowing animals such as amphibia (toads, microhyla etc.), snakes, lizards (monitor lizard), birds (bee-
3.Degradation Of ecosystems with biological	3	The bio-diversity (flora and fauna) will be degraded due to the proposed
4.Proliferation of exotic and / or hazardous		Not evaluated.Microbiological research is needed.
5.Destruction of wetlands and peat lands	2	Topsoil of wetland and the peat land (Haor Area) will be destroyed for this
6.Encroachment into tropical rain forest and wild		Not Applicable
7.Destruction or degradation of mangrove forests		Not Applicable
8.Degradation of coral reefs		Not Applicable
<b>5.Soil and Land Resources</b>		
<b>(1).Soil Resources</b>		
1.Soil erosion		Soil erosion is protected by wave protection wall.
2.Soil salinization		No significant salinization in the project area is anticipated.
3.Degradation of soil fertility	3	As a result of siltration soil fertility will be enhanced.
4.Soil contamination by agrochemicals and	1	Agrochemical using will not change.
<b>(2)Land Resources</b>		
1.Devastation or desertification of land	1	Soil fertility will increase.
2.Devastation of hinterland	1	Hinterland will be inundated.
3.Ground Subsidence		No significant impact is anticipated.
<b>6.Hydrology and Air and Water Quality</b>		
<b>(1)Hydrology</b>		
1.Change in surface water hydrology.		There will be no change in surface water hydrology due to raising homestead
2.Change in ground water Hydrology		No change in ground water quantity and ground water table is anticipated due
3.Inundation and flooding		No significant environmental impact will be anticipated.
4.Sedimentation	1	There is little chance of sedimentation into the ponds.
5.Riverbed Degradation		Proposed activity will not affect river bed degradation as it will not obstruct
6.Impediment of inland navigation		No significant impact is anticipated.
<b>(2) water Quality and Temperature</b>		
1.water contamination and deterioration of water		This activity will not affect water quality.
2.Water eutrophication		Water eutrophication will not be anticipated by this activity.
3.Salt water intrusion		No salt water intrusion will be anticipated.
4.Change in tempereture of water		No change in tempereture due to this activity.
<b>(3)Atmosphere</b>		
1.Air pollution	1	During earth work, there will be little dust emission in the air. This will be for short duration only.
2.Noise pollution	1	Since earth work will involve some equipments, noise pollution may be affected through the construction phase.
<b>7. Landscape and Mining Resources</b>		
1.Damage to landscape	2	Due to earth work some dishes on agricultural land may be required that will affect existing landscape . For raising of plinth of homestead area there will be loss in regulation , tree-felling may be expected.
2. Impediment of mining resources exploitation		No impediment of mining resources exploitation anticipated.

**Table 7.13 Checklist for Proving Environmental Impact of Proposed Program on Provision of Raised Hand Tube-well in Haor Area**

District: Kishoreganj

Upazila: Nikli

Union: Gurai

Village: Gurai

**I. Social Environment**

Category of Environmental Impact	Impact		Evaluation Base
	P+	N-	
<b>1. Socio- economic Issues</b>			
<b>(1) Social Issues</b>			
1.Planned residential settlement			This activity will not be anticipated significantly with planned residential settlement.
2.Involuntary resettlement			This intervention will not affect to force settlement.
3.Substantial changes in the way of life.	3		Three indicators used for measuring these changes are: religious beliefs and practices, empowerment of women, purdha system, and roles of spouses in the family. Except religious practices all other factors mentioned above are likely to go some changes in the liberal direction in Gurai.
4.Conflict among communities and people.	2		The proposed activity is not going to create any major conflict in the society because of limited development.
5.Impact on native people			No significant environmental impact will be anticipated.
<b>(2) Demographic Issues</b>			
1.Population Increase			No significant increase of population will be anticipated due to this activity.
2.Drastic change in population composition			No significant change in population composition will be anticipated due to project activity.
<b>(3)Economic activities</b>			
1.Changes in bases of economic activities			No significant change in the base of economic activities will be anticipated due to this intervention.
2.Occupational change and loss of Job opportunities.			No possibility in occupational change and loss of job opportunity.
3.Increase in income disparities			Not anticipated increase in income disparities.
<b>(4) Institutional and Custom related issues</b>			
1.Adjustment and regulation of water or fishing rights			Not required adjustment and regulation of water or fishing rights due to this intervention.
2.Changes in social and institutional structure			No significant change in social and institutional structure.
3.Changes in existing institution and custom			No significant change in existing institution and customs.
<b>2.Health and Sanitary Issues</b>			
1.Increased use of agro-chemicals			No significant changes in the use of agrochemicals
2.Outbreak of endemic diseases			No significant outbreak of endemic diseases due to this intervention.
3.Spreading of endemic diseases		1	Endemic diseases may spread but mostly at a low rate.
4.Residual toxicity of agro-chemicals			This intervention will not affect to residual toxicity of agro-chemicals.
5.Increase in domestic and other human waste			No significant increase in domestic and human waste due to this intervention.
<b>3.Cultural Asset Issues</b>			
1.Impairment of historic remains and cultural assets.			No significant effect will be anticipated.
2.Damage to aesthetic sites			No significant effect will be anticipated.
<b>II. Natural Environment</b>			
<b>4.Biological and Ecological Issues</b>			
1.Change in vegetation	1		Additional water supply from the tube well will help the vegetation to grow well.
2.Negative impacts on important or indigenous fauna and flora			No impact will be anticipated
3.Degradation Of ecosystems with biological Diversity			No significant impact will be anticipated.
4.Proliferation of exotic and / or hazardous species			Not evaluated.Microbiological research is needed.

5. Destruction of wetlands and peat lands			No impact will be anticipated.
6. Encroachment into tropical rain forest and wild lands			Not applicable
7. Destruction or degradation of mangrove forests			Not applicable
8. Degradation of coral reefs			Not applicable
<b>5. Soil and Land Resources</b>			
<b>(1) Soil Resources</b>			
1. Soil erosion			No impact is anticipated.
2. Soil salinization			No impact is anticipated.
3. Degradation of soil fertility			No impact is anticipated.
4. Soil contamination by agrochemicals and others			No impact is anticipated.
<b>(2) Land Resources</b>			
1. Devastation or desertification of land			No impact is anticipated.
2. Devastation of hinterland			No impact is anticipated.
3. Ground Subsidence			No impact is anticipated.
<b>6. Hydrology and Air and Water Quality</b>			
<b>(1) Hydrology</b>			
1. Change in surface water hydrology.			No impact is anticipated.
2. Change in ground water Hydrology			No significant change in ground water will be anticipated.
3. Inundation and flooding			There will be no significant effect in inundation and flooding due to this intervention.
4. Sedimentation			No impact is anticipated.
5. Riverbed Degradation			No impact is anticipated.
6. Impediment of inland navigation			No impact is anticipated.
<b>(2) water Quality and Temperature</b>			
1. water contamination and deterioration of water quality.			No impact is anticipated.
2. Water eutrophication			No impact is anticipated.
3. Salt water intrusion			No impact is anticipated.
4. Change in temperature of water			No impact is anticipated.
<b>(3) Atmosphere</b>			
1. Air pollution			No impact is anticipated.
2. Noise pollution			No impact is anticipated.
<b>7. landscape and Mining Resources</b>			
1. Damage to landscape			No impact is anticipated.
2. Impediment of mining resources exploitation			No impact is anticipated.

**Table 7.14 Checklist for Proving Environmental Impact of Proposed Program on Provision of Community Latrine in Haor Area**

District: Kishoreganj      Upazila: Nikli      Union: Gurai      Village: Gurai

**I.Social Environment**

Category of Environmental Impact	Impact		Evaluation Base
	P+	N+	
<b>1.Socio- economic Issues</b>			
<b>(1) Social Issues</b>			
1.Planned residential settlement	1		This will be anticipated positively to settle landless farmers and shifting cultivators to their original dwelling places.
2.Involuntary resettlement			This intervention will not affect to force settlement.
3.Substantial changes in the way of life.	3		Three indicators used for measuring these changes are: religious beliefs and practices, empowerment of women, purdha system, and roles of spouses in the family.
4.Conflict among communities and people.	2		The proposed activity is not going to create any major conflict in the society because of limited development.
5.Impact on native people			There is no tribal or indigenous group in the locality.
<b>(2) Demographic Issues</b>			
1.Population Increase			No significant increase of population will be anticipated due to this activity.
2.Drastic change in population composition			No significant change in population composition will be anticipated due to this intervention.
<b>(3)Economic activities</b>			
1.Changes in bases of economic activities			No significant changes in bases of economic activities will be anticipated.
2.Occupational change and loss of Job opportunities.			No possibility in occupational change and loss of job opportunity.
3.Increase in income disparities			No significant increase in income disparities will be anticipated.
<b>(4) Institutional and Custom related issues</b>			
1.Adjustment and regulation of water or fishing rights			Not required adjustment and regulation of water or fishing rights due to this intervention.
2.Changes in social and institutional structure			No significant change in social and institutional structure.
3.Changes in existing institution and custom			No significant change in existing institution and customs.
<b>2.Health and Sanitary Issues</b>			
1.Increased use of agro-chemicals			No significant changes in the use of agrochemicals
2.Outbreak of endemic diseases			No significant outbreak of endemic diseases due to this intervention.
3.Spreading of endemic diseases		1	Endemic diseases may breakout but mostly at a low rate. In Gurai water borne diseases are most likely.
4.Residual toxicity of agro-chemicals			This intervention will not affect to residual toxicity of agro-chemicals.
5.Increase in domestic and other human waste		2	Over 85% of respondents think human wastes will increase due to implementation of the project.
<b>3.Cultural Asset Issues</b>			
1.Impairment of historic remains and and cultural assets.			No adverse impact is anticipated.
2.Damage to aesthetic sites			No adverse impact is anticipated.
<b>II.Natural Environment</b>			
<b>4.Biological and Ecological Issues</b>			
1.Change in vegetation		2	If it remains as close modern type, it will provide a little negative impact.
2.Negative impacts on important or indigenous fauna and flora		2	If the latrine remains closed type, it will help to get food for fishes and other wildlife,after removing the sewage from pit.
3.Degradation Of ecosystems with biological Diversity			No impact will be anticipated.
4.Proliferation of exotic and / or hazardous species			Not evaluated and needs microbiological research.
5.Destruction of wetlands and peat lands			No Impact will be anticipated.
6.Encroachment into tropical rain forest and wild lands			Not applicable
7.Destruction or degradation of mangrove forests			Not applicable
8.Degradation of coral reefs			Not applicable
<b>5.Soil and Land Resources</b>			
<b>(1).Soil Resources</b>			
1.Soil erosion			No impact is anticipated.



2. Soil salinization			No impact is anticipated.
3. Degradation of soil fertility			No impact is anticipated.
3. Soil contamination by agrochemicals and others			No impact is anticipated.
<b>(2) Land Resources</b>			
1. Devastation or desertification of land			No impact is anticipated.
2. Devastation of hinterland			No impact is anticipated.
3. Ground Subsidence			No impact is anticipated.
<b>6. Hydrology and Air and Water Quality</b>			
<b>(1) Hydrology</b>			
1. Change in surface water hydrology.			No significant change in surface water quality and quantity.
2. Change in ground water Hydrology			No significant change in groundwater.
3. Inundation and flooding			No impact is anticipated.
4. Sedimentation			No impact is anticipated.
5. Riverbed Degradation			No impact is anticipated.
6. Impediment of inland navigation			No impact is anticipated.
<b>(2) water Quality and Temperature</b>			
1. water contamination and deterioration of water quality.		1	During construction, adequate sanitary measures have to be adopted so that there is no chance of contamination of both surface and ground water.
2. Water eutrophication			No impact is anticipated.
3. Salt water intrusion			No impact is anticipated.
4. Change in temperature of water			No impact is anticipated.
<b>(3) Atmosphere</b>			
1. Air pollution			No impact is anticipated.
2. Noise pollution			No impact is anticipated.
<b>7. landscape and Mining Resources</b>			
1. Damage to landscape			No impact is anticipated.
2. Impediment of mining resources exploitation			No impact is anticipated.

**Table 7.15 Checklist for Proving Environmental Impact of Long-term Program on Construction of Submersible Road in Haor Area**

District: Kishoreganj      Upazila: Nikli      Union: Gurai      Village: Gurai

**I.Social Environment**

Category of Environmental Impact	Impact		Evaluation Base
	P+	N-	
<b>1.Socio- economic Issues</b>			
<b>(1) Social Issues</b>			
1.Planned residential settlement	3		There is no planned residential settlement in the project site. After implementation of the project out-migrated people, landless farmers and shifting cultivators will get opportunities to be settled back to their original dwelling places. The project may contribute to plan residential settlement.
2.Involuntary resettlement		1	About 20% of the household heads of Gurai village are not willing to move from their ancestral home for sentimental weakness and strong kinship bond. A motivational campaign may help sooth out the situation.
3.Substantial changes in the way of life.	3		Three indicators used for measuring these changes are: religious beliefs and practices, empowerment of women, purdha system, and roles of spouses in the family.
4.Conflict among communities and people.	2		The proposed activity is not going to create any major conflict in the society because of limited development and adequate compensation for the affected people.
5.Impact on native people			There is no tribal or indigenous group in the locality.
<b>(2) Demographic Issues</b>			
1.Population Increase		2	Nearly 7.3% of the households are reported to be shifting cultivators. These people may permanently in the locality in the post development period. Also nearby poor may also come to settle with the hope of better life under the changed situation. Also 15% to 20 % of the adult male of the haor area who migrate to other areas during lean period may permanently settle in their home.
2.Drastic change in population composition		2	After implementation this interventation there may be an influx of immigrants in the locality and they are likely to be young because older people hardly migrate to settle permanently.
<b>(3)Economic activities</b>			
1.Changes in bases of economic activities	3		About 42% of the household heads anticipate some changes in the economic bases of livelihoods of people. Those who believe in the change anticipate major new areas will be farming (new crop), service, and business.
2.Occupational change and loss of Job opportunities.		1	More people are likely to engage in business than before as road communication will provide opportunity for transportation of agricultural products and bring consumer goods more easily than before.
3.Increase in income disparities		2	The household heads and the key-informants believe in some improvement of economic condition of people. However, they all agree that the benefits will go more to the well to do because they will avail the business opportunities with their already advantageous resources.
<b>(4) Institutional and Custom related issues</b>			
1.Adjustment and regulation of water or fishing rights		1	About 15% of population in Gurai village directly or indirectly depend on water resources for their livelihoods. Regulations related to water and fishing rights will affect their lives. The respondents of all categories want the regulations should be made considering the possible effects of the rules upon the people who are directly involved with it.
2.Changes in social and instiuitonal structure	1		The possible changes in institutional structure are measured using following indicators: family structure, religious practices, village judicial system (salish), and land related practices.
3.Changes in existing instiution and custom	3		These changes are measured by using indicators that exemplify deep-rooted values of the society. These are respect to elders, social rituals, mutual help, and role village samaj (community).
<b>2.Health and Sanitary Issues</b>			
1.Increased use of agro-chemicals		2	About two-thirds of survey respondents opine that use of agrochemicals for crop production will increase. Key-informants also hold similar views.
2.Outbreak of endemic diseases		1	Endemic diseases may breakout but mostly at a low rate. In Gurai water borne diseases are most likely.
3.Spreading of endemic diseases		1	People don't see the possibility of spread of disease.
4.Resudial toxicity of agro-chemicals		2	The majority of the key-informants of haor believe that increase use of chemicals in land will result in accumulation of chemical in soil and water.

5. Increase in domestic and other human waste		2	Over 85% of respondents think domestic and human wastes will increase due to implementation of the project.
<b>3. Cultural Asset Issues</b>			
1. Impairment of historic remains and cultural assets.		2	There is a 900-year mosque and a 500-year temple in Gurai. Local people want these historical remains to be preserved.
2. Damage to aesthetic sites			There is no mentionable aesthetic site in Gurai village.
<b>II. Natural Environment</b>			
<b>4. Biological and Ecological Issues</b>			
1. Change in vegetation			No major changes in vegetation.
2. Negative impacts on important or indigenous fauna and flora		2	Some impact may be observed on the Indigenous flora and fauna. Biomass production of this submersible road area will be stop that will reduce the availability of fish food during the monsoon.
3. Degradation Of ecosystems with biological Diversity		1	If the submersible road needs a lot of area that will degrade the ecosystem totally.
4. Proliferation of exotic and / or hazardous species			Not evaluated
5. Destruction of wetlands and peat lands		1	Biomass of wetland and peat land will be destroyed due to the above activities.
6. Encroachment into tropical rain forest and wild lands			Not applicable
7. Destruction or degradation of mangrove forests			Not applicable
8. Degradation of coral reefs			Not applicable
<b>5. Soil and Land Resources</b>			
<b>(1). Soil Resources</b>			
1. Soil erosion		3	Due to implementation of the project, water flow will be restricted and soil erosion will be induced.
2. Soil salinization			No impact will be anticipated.
3. Degradation of soil fertility			No impact will be anticipated.
4. Soil contamination by agrochemicals and others		1	Use of agrochemicals may increase.
<b>(2) Land Resources</b>			
1. Devastation or desertification of land		1	Soil fertility will increase.
2. Devastation of hinterland		1	Hinterland will be inundated.
3. Ground Subsidence			No possibility of significant ground subsidence.
<b>6. Hydrology and Air and Water Quality</b>			
<b>(1) Hydrology</b>			
1. Change in surface water hydrology.			No impact is anticipated due to this intervention.
2. Change in ground water Hydrology			No impact is anticipated due to this intervention.
3. Inundation and flooding			No impact is anticipated due to this intervention.
4. Sedimentation			No impact is anticipated due to this intervention.
5. Riverbed Degradation			No impact is anticipated due to this intervention.
6. Impediment of inland navigation		1	During post monsoon when water depth reaches to the top surface of road inland navigation will be interrupted for some days.
<b>(2) water Quality and Temperature</b>			
1. water contamination and deterioration of water quality.			No impact is anticipated due to this intervention.
2. Water eutrophication			No impact is anticipated due to this intervention.
3. Salt water intrusion			No impact is anticipated due to this intervention.
4. Change in temperature of water			No impact is anticipated due to this intervention.
<b>(3) Atmosphere</b>			
1. Air pollution		1	During construction, adequate measures have to be adopted so that there is minimum emission of dust in air.
2. Noise pollution		1	Noise pollution will be anticipated during construction due to use of construction equipments
<b>7. landscape and Mining Resources</b>			
1. Damage to landscape		2	Due to earth work some dishes on agricultural land may be required that will affect existing landscape . For construction of submersible road there will be loss of regulation in existing landuse.
2. Impediment of mining resources exploitation			No impediment of mining resources exploitation anticipated.

**Table 7.16 Checklist for Proving Environmental Impact of Long-term Program on Construction of Submersible Bridge in Haor Area**

District: Kishoreganj

Upazila: Nikli

Union: Gurai

Village: Gurai

**I.Social Environment**

Category of Environmental Impact	Impact		Evaluation Base
	P+	N-	
<b>1.Socio- economic Issues</b>			
<b>(1) Social Issues</b>			
1.Planned residential settlement	3		There is no planned residential settlement in the project site. After implementation of the project out-migrated people, landless farmers and shifting cultivators will get opportunities to be settled back to their original dwelling places. The project may contribute to plan residential settlement.
2.Involuntary resettlement		1	About 20% of the household heads of Gurai village are not willing to move from their ancestral home for sentimental weakness and strong kinship bond.
3.Substantial changes in the way of life.	3		Three indicators used for measuring these changes are: religious beliefs and practices, empowerment of women, purdha system, and roles of spouses in the family. Except religious practices all other factors mentioned above are likely to go some changes in the liberal direction in Gurai.
4.Conflict among communities and people.	2		The proposed activity is not going to create any major conflict in the society because of limited development and adequate compensation for the affected people. The influx of outsiders in the post project implementation period in the locality will not be a source of conflict among the locals and outsiders.
5.Impact on native people			There is no tribal or indigenous group in the locality.
<b>(2) Demographic Issues</b>			
1.Population Increase		2	Nearly 7.3% of the households are reported to be shifting cultivators. These people may permanently in the locality in the post development period.
2.Drastic change in population composition		2	After the implementation of this intervention there may be an influx of immigrants in the locality and they are likely to be young because older people hardly migrate to settle permanently.
<b>(3)Economic activities</b>			
1.Changes in bases of economic activities	3		About 42% of the household heads anticipate some changes in the economic bases of livelihoods of people. Those who believe in the change anticipate major new areas will be farming (new crop), service, and business.
2.Occupational change and loss of Job opportunities.		1	More people are likely to engage in business than before as road communication will provide opportunity for transportation of agricultural products and bring consumer goods more easily than before.
3.Increase in income disparities		2	The household heads and the key-informants believe in some improvement of economic condition of people. However, they all agree that the benefits will go more to the well to do because they will avail the business opportunities with their already advantageous resources. The income gap will increase but trickle down effects to poor will be higher than what they are getting now. This means the relative position of poor will be bad but their absolute condition will be better.
<b>(4) Institutional and Custom related issues</b>			
1.Adjustment and regulation of water or fishing rights		1	About 15% of population in Gurai village directly or indirectly depend on water resources for their livelihoods. Regulations related to water and fishing rights will affect their lives.
2.Changes in social and institutional structure	1		The possible changes in institutional structure are measured using following indicators: family structure, religious practices, village judicial system (salish), and land related practices.
3.Changes in existing institution and custom	3		These changes are measured by using indicators that exemplify deep-rooted values of the society. These are respect to elders, social rituals, mutual help, and role village samaj (community).
<b>2.Health and Sanitary Issues</b>			
1.Increased use of agro-chemicals		2	About two-thirds of survey respondents opine that use of agrochemicals for crop production will increase. Key-informants also hold similar views.

2.Outbreak of endemic diseases		1	Endemic diseases may breakout but mostly at a low rate. In Gurai water borne diseases are most likely.
3.Spreading of endemic diseases		1	People don't see the possibility of spread of disease.
4.Residual toxicity of agro-chemicals		2	The majority of the key-informants of haor believe that increase use of chemicals in land will result in accumulation of chemical in soil and water.
5.Increase in domestic and other human waste		2	Over 85% of respondents think domestic and human wastes will increase due to implementation of the project.
<b>3.Cultural Asset Issues</b>			
1.Impairment of historic remains and and cultural assets.	2		There is a 900-year mosque and a 500-year temple in Gurai. Local people want these historical remains to be preserved.
2.Damage to aesthetic sites			There is no mentionable aesthetic site in Gurai village.
<b>II.Natural Environment</b>			
<b>4.Biological and Ecological Issues</b>			
1.Change in vegetation			No impact will be anticipated.
2.Negative impacts on important or indigenous fauna and flora			No impact will be anticipated.
3.Degradation Of ecosystems with biological Diversity			No impact will be anticipated.
4.Proliferation of exotic and / or hazardous species			Not evaluated. Microbiological research is needed.
5.Destruction of wetlands and peat lands			No impact will be anticipated.
6.Encroachment into tropical rain forest and wild lands			Not applicable
7.Destruction or degradation of mangrove forests			Not applicable
8.Degradation of coral reefs			Not applicable
<b>5.Soil and Land Resources</b>			
<b>(1).Soil Resources</b>			
1.Soil erosion			No impact is anticipated due to this intervention.
3.Degradation of soil fertility			No impact is anticipated due to this intervention.
2.Soil salinazation			No impact is anticipated due to this intervention.
3.Soil contamination by agrochemicals and others			No impact is anticipated due to this intervention.
<b>(2)Land Resourses</b>			
1.Devastation or desertification of land			No significant impact is anticipated due to this intervention.
2.Devastation of hinterland			No significant impact is anticipated due to this intervention.
3.Ground Subsidence			No significant impact is anticipated due to this intervention.
<b>6.Hydrology and Air and Water Quality</b>			
<b>(1)Hydrology</b>			
1.Change in surface water hydrology.			No impact is anticipated due to this intervention.
2.Change in ground water Hydrology			No impact is anticipated due to this intervention.
3.Inundation and flooding			No impact is anticipated due to this intervention.
4.Sedimentation			No impact is anticipated due to this intervention.
5.Riverbed Degradation			No impact is anticipated due to this intervention.
6.Impediment of inland navigation		1	During post monsoon when water depth reaches to the top surface of road inland navigation will be interrupted for somedays.
<b>(2) water Quality and Temperature</b>			
1.water contamination and deterioration of water quality.			No impact is anticipated due to this intervention.
2.Water eutrophication			No impact is anticipated due to this intervention.
3.Salt water intrusion			No impact is anticipated due to this intervention.
4.Change in tempereture of water			No impact is anticipated due to this intervention.
<b>(3)Atmosphere</b>			
1.Air pollution		1	During construction, adequate measures have to be adopted so that there is minimum emission of dust in air.
2.Noise pollution		1	Noise pollution will be anticipated during construction due to use of constrution equipments
<b>7.landscape and MiningResources</b>			
1.Damage to land		2	Due to earth work some dishes on agricultural land may be required that will affect existing landscape . For implementation of the project of regulation in existing landscape.
2. Impediment of mining resources exploitation			No impediment of mining resourses exploitation anticipated.

**Table 7.17 Summary of Environmental Impact Identification on Development Programs for Haor Area**

District: Kishoreganj		Upazila: Nikli		Union: Gurai		Village: Gurai	
Category of Environmental Impact	Impact		Evaluation Base				
	P+	N-					
<b>I. Social Environment</b>							
<b>1. Socio- economic Issues</b>							
1. Planned residential settlement	3		There is no planned residential settlement in the project site. After implementation of the project out-migrated people, landless farmers and shifting cultivators will get opportunities to be settled back to their original dwelling places. The project may contribute to plan residential settlement.				
2. Involuntary resettlement		1	About 20% of the household heads of Gurai village are not willing to move from their ancestral home for sentimental weakness and strong kinship bond.				
3. Substantial changes in the way of life	3		Four indicators used for measuring these changes are: religious beliefs and practices, empowerment of women, purdha system, and roles of spouses in the family. Except religious practices all other factors mentioned above are likely to go some changes in the liberal direction in Gurai.				
4. Conflict among communities and people	2		The proposed activities are not going to create any major conflict in the society because of limited development and adequate compensation for the affected people. The influx of outsiders in the post project implementation period in the locality will not be a source of conflict among the locals and outsiders as Gurai villagers are used to receive outsiders who are victim of bank erosion in the surrounding areas.				
5. Impact on native people			There is no tribal or indigenous group in the locality.				
<b>(2) Demographic issues</b>							
1. Population increase		2	Nearly 7.3% of the households are reported to be shifting cultivators. These people may permanently settle in the locality in the post development period. Also nearby poor may also come to settle with the hope of better life under the changed situation. Also 15% to 20 % of the adult male of the Haor area who migrate to other areas during lean period may also permanently settle. Therefore, there is a possibility of population increase in the area in addition to high natural fertility.				
2. Drastic change in population composition		2	After the flood proofing activities there may be an influx of immigrants in the locality and they are likely to be young because older people hardly migrate to settle permanently. Hence there is a possibility of disproportionately more young people in the village.				
<b>(3) Economic activities</b>							
1. Changes in the bases of economic activities	3		About 42% of the household heads anticipate some changes in the economic bases of livelihoods of people. Those who believe in the change anticipate major new areas will be farming (new crop), service, and business.				
2. Occupational change and loss of job opportunities		1	More people are likely to engage in business than before as road communication will provide opportunity for transportation of agricultural products and bring consumer goods more easily than before. Since development activities are likely to improve economic status of people there will demand for more consumer goods resulting in more business and employment. However, land acquisition may create a group of landless people if they fail to buy suitable lands with their compensation money.				
3. Increase in income disparities		2	The household heads and the key-informants believe in some improvement of economic condition of people. However, they all agree that the benefits will go more to the well to do because they will avail the business opportunities with their already advantageous resources. The income gap will increase but trickle down effects to poor will be higher than what they are getting now. This means the relative position of poor will be bad but their absolute condition will be better.				
<b>4. Institutional and custom related issues</b>							
1. Adjustment and regulation of water or fishing rights		1	About 15% of population in Gurai village directly or indirectly depends on water resources for their livelihoods. Regulations related to water and fishing rights will affect their lives. The respondents of all categories want the regulations should be made considering the possible effects of the rules upon the people who are directly involved with it.				
2. Changes in social and institutional structure	1		The possible changes in institutional structure are measured using following indicators: family structure, religious practices, village judicial system (slish), and land related practices. The family structure, which is already in the process of becoming nuclear, will				

Category of Environmental Impact	Impact		Evaluation Base
	P+	N-	
			become nuclear at a faster rate with the population growth and economic advancement. Respondents anticipate that the new settlers may not yield to village salish like the host settlers as this institution is manned by them. However, these minor changes in the structure institutions will not create any disorder in society.
3.Changes in existing institution and custom	3		These changes are measured by using indicators that exemplify deep-rooted values of the society. These are respect to elders, social rituals, mutual help, and role village samaj (community). These traditional customs and rituals are likely to remain in vogue in the post development phase. Some of the respondents opine that these customs will become stronger with the better economic of the people.
<b>2. Health and sanitary condition</b>			
1.Increased use of agrochemicals		2	About two-thirds of survey respondents opine that use of agrochemicals for crop production will increase. Key-informants also hold similar views.
2.Outbreak of endemic diseases		1	Endemic diseases may breakout but mostly at a low rate. In Gurai water borne diseases are most likely.
3. Spreading of endemic diseases	3		People don't see the possibility of spreading of disease.
4. Residual toxicity of agro-chemicals		2	The majority of the key-informants of haor believe that increased use of chemicals in land will result in accumulation of chemical in soil and water.
5. Increase in domestic and other human wastes.		2	Over 85% of respondents think domestic and human wastes will increase due to implementation of the project.
<b>3. Cultural Asset Issues</b>			
1. Impairment of historical and cultural remains	2		There is a 900-year mosque and a 500-year temple in Gurai. Local people want these historical remains to be preserved.
2.Damage to aesthetic sites			There is no mentionable aesthetic site in Gurai village.
<b>4.Biological and Ecological Issues</b>			
1.Change in vegetation		2	The homestead vegetation will be changed. The existing vegetation including herbaceous and micro flora of the homestead area will be destroyed. Later new vegetation will grow that may be suppress the previous flora.
2.Negative impacts on important or indigenous fauna and flora		3	Soil covering plants, grasses and weeds such as Chenopodium ambrosoides, heliotropium indicum etc. will be destroyed. Borrowing animals such as amphibia (toads, microhyla etc.), snakes, lizards (monitor lizard), birds (bee-eater, kingfisher etc), mammals (rats) and ma micro-fauna will be affected.
3.Degradation Of ecosystems with biological Diversity		3	The bio-diversity (flora and fauna) will be degraded due to the proposed activities if the new soil does not support the existing ecosystem. The original ecosystem will be hampered due to the proposed activities.
4.Proliferation of exotic and / or hazardous species		-	Not evaluated. Microbiological research is needed.
5.Destruction of wetlands and peat lands		2	Topsoil of wetland and the peat land (Haor Area) will be destroyed for this type of activity as the topsoil of these lands may be use by the herbaceous plants and the indigenous fishes.
6.Encroachment into tropical rain forest and wild lands			There is no tropical rain forest and wild lands in the area.
7.Destruction or degradation of mangrove forests			There is no mangrove forest in the area.
8.Degradation of coral reefs			There is no coral reef in the area.
<b>5. Soil and Land Resources</b>			
<b>(1).Soil Resources</b>			
1.Soil erosion		3	Due to implementation of the project, water flow will be restricted and soil erosion will be induced.
2.Soil salinazation			No significant soil salinization is noticed in the project site.
3.Degradation of soil fertility	3		No significant degradation of soil fertility due it implementation of the project. However, as a result of siltation, soil fertility will be enhanced.
4.Soil contamination by agrochemicals and others		1	Agrochemical using will change due to better communication.

Category of Environmental Impact	Impact		Evaluation Base
	P+	N-	
<b>(2) Land Resources</b>			
1. Devastation or desertification of land	1		Soil fertility will increase.
2. Devastation of hinterland		1	Hinterland will be inundated.
3. Ground Subsidence			No impact anticipated.
<b>6. Hydrology and Air and Water Quality</b>			
<b>(1) Hydrology</b>			
1. Change in surface water hydrology.			There will be no change in surface water hydrology due to this project activities, as this will neither use surface water nor occupy any surface water source like pond, river etc.
2. Change in ground water Hydrology			No change in ground water quantity and ground water table is anticipated due to this project works.
3. Inundation and flooding			No impact anticipated.
4. Sedimentation		1	There is little chance for sedimentation in the surrounding pond.
5. Riverbed Degradation			Will not affect riverbed degradation, as it will not obstruct river flow.
6. Impediment of inland navigation			No impact anticipated.
<b>(2) Water Quality and Temperature</b>			
1. Water contamination and deterioration of water quality.		1	This activity will not affect water quality. However, if heavy rainfall occurs during construction work, turbidity of surface water may rise. But this will be of temporal nature.
2. Water eutrophication			Water eutrophication will not be anticipated by this activity.
3. Salt water intrusion			No salt-water intrusion will be anticipated.
4. Change in temperature of water			No change in temperature due to this activity.
<b>(3) Atmosphere</b>			
1. Air pollution		1	During earthwork, there will be little dust emission in the air. This will be for short duration only.
2. Noise pollution		1	During construction using of constructions equipments may cause noise pollution. After post project condition, vehicles may move through the road, which may cause noise pollution on the surrounding environment.
<b>7. Landscape and Mining Resources</b>			
1. Damage to landscape		2	Due to earthwork some dishes on agricultural land may be required that will affect existing landscape. For implementation of the project there will be loss in regulation of the existing land use.
2. Impediment of mining resources exploitation			No impediment of mining resources exploitation anticipated.

Applicable columns with the following impact degree are marked with "positive impact (P+) or negative impact (N-)"  
Positive impact: Very high (+5), high (+4), moderate (+3), Low (+2), very low (+1)  
Negative impact: Severe (-5), higher (-4), moderate (-3), Low (-2), very low (-1)



**Table 7.18 Summary of Checklist Environmental Impact Issues in Comparison between Char and Haor Area**

SL No.	Categories of Environmental Impact	IMPACT		Remarks/ Evaluation Basis
		Char	Haor	
1.	Planned Residential Settlement	+4	+3	The project will provide Planned homestead area and protect it from flood, which will be beneficial for the floating, out migrated, landless or shifting cultivators.
2.	Involuntary resettlement	-1	-1	People who are not willing to move voluntarily due to sentimental weakness of ancestral home and strong kinship bond, as such need appropriate planning of proper compensation in consultation with the affected stakeholders.
3.	Substantial Changes in the Way of Life	+4	+3	Four indicators used for measuring these changes are: religious beliefs and practices, empowerment of women, purdha system, and roles of spouses in the family. Char and Haor people being very religious purdha and religious beliefs and practices are going to remain as they are while empowerment of women and roles of spouses are going to change to a great extent.
4	Conflict among communities	+2	+2	The proposed activities are not going to create any major conflict in the society because of limited development and adequate compensation for the affected people. The influx of outsiders in the post project implementation period in the locality will not be a source of conflict among the locals and outsiders according to key-informants. However, some host-settlers may not accept the in-migrants as they are equal for social relationship. In other words they will look down upon the outsiders.
5.	Population increase	-2	-2	Nearly 1.3% and 7.3% of the households in the Char and Haor areas respectively are reported to be shifting cultivators. These people may settle permanently in the locality in the post development period. Also nearby poor may also come to settle here with the hope of better life under the changed situation. Therefore, there is a possibility of population growth in the area in addition to high natural fertility. The project planners should plan anticipating such a population growth.
6.	Drastic changes in population composition.	-2	-2	After the flood proofing activities there may be an influx of immigrants in the locality and they are likely to be young because older people hardly migrate to settle permanently. Hence there is a possibility of disproportionately more young people in the village.
7.	Changes in bases of economic activities	+3	+3	About 95% and 42% of the household heads in Char and Haor areas respectively anticipate some changes in the economic bases of livelihoods of people. Those who believe in the change anticipate major new areas will be business and wage labor.
8.	Increase in income disparities.	-1	-2	The household heads and the key-informants believe in some improvement of economic condition of people. However, they all agree that the benefits will go more to the well to do because they will avail the business opportunities with their already advantageous resources. The income gap will increase but trickle down effects to poor will be higher than what they are getting now. This means the relative position of poor will be bad but their absolute condition will be better.

<b>3.Cultural Asset Issues</b>		
19.Impairment of historic remains and and cultural assets.		No impairment of historic remains and cultural assets.
20.Damage to aesthetic sites		There is no significant aesthetic site in the project area.
<b>II.Natural Environment</b>		
<b>4.Biological and Ecological Issues</b>		
21.Change in vegetation	2	Clustering of houses in the char area will change the existing vegetation. New vegetation will form in the mean time naturally and by the settlers.
22.Negative impacts on important or indigenous fauna and flora	2	Negative impacts on indigenous flora and fauna may be seen due to this type of altered habitat.Burrowing animals' (Bee eater,King fisher etc.) will be destroyed.
23.Degradation Of ecosystems with biological Diversity	3	The clustering houses on high platform will destroyed the current ecosystem with bio-diversity as the existing area will remain under the platform.
24.Proliferation of exotic and / or hazardous species	-	Not evaluated. Microbiological research is needed.
25.Destruction of wetlands and peat lands	3	Seasonal wetland will be destroyed due to this type of activists that may hamper the fish, turtle and dolphin migration. It may change the water flow of the study area that will create a serious problem for the future migration of the fishes and other wildlife.
26.Encroachment into tropical rain forest and wild lands		Not applicable
27.Destruction or degradation of mangrove forests		Not applicable
28.Degradation of coral reefs		Not applicable
<b>5.Soil and Land Resources</b>		
<b>(1).Soil Resources</b>		
29.Soil erosion	1	Water flow will be restricted and soil erosion may happen.
30.Soil salinazation		No significant soil salinization is noticed in the project site.
31.Detioration of soil fertility	3	As a result of siltration soil fertility will be enhanced.
32.Soil contamination by agrochemicals and others	1	Agrochemical using will not change.
<b>(2)Land Resources</b>		
33.Devastation or desertification of land	1	No significant devastation or desertification of land due to this interventation.Soil fertility will increase.
34.Devastation of hinterland	1	Hinterland will be inundated.
35.Ground Subsidence		No significant impact is anticipated.
<b>6.Hydrology and Air and Water Quality</b>		
<b>(1)Hydrology</b>		
36.Change in surface water hydrology.		No impact is anticipated.
37.Change in ground water Hydrology		No impact is anticipated.
38.Inundation and flooding		No impact is anticipated.
39.Sedimentation		No impact is anticipated.
40.Riverbed Degradation		No impact is anticipated.
41.Impediment of inland navigation	1	Depending on location of clustered village , inland navigation during monsoon can be obstructed. But impact will be minimal.
<b>(2) Water Quality and Temperature</b>		
42.Water contamination and deterioration of water quality.		No impact is anticipated.
43.Water eutrophication		No impact is anticipated.
44.Salt water intrusion		No impact is anticipated.
45.Change in tempereture of water		No impact is anticipated.
<b>(3)Atmosphere</b>		
46.Air pollution	1	During earth excavation, there will be little dust emission.
47.Noise pollution		Noise pollution is not anticipated.
<b>7.landscape and MiningResources</b>		
48.Damage to landscape	2	Due to earth work some dishes on agricultural land may be required that will
49. Impediment of mining resources exploitation		No impediment of mining resourses exploitation anticipated.