

Resilient Infrastructure and Livelihood for Flash Flood Prone *Haor* Areas of Bangladesh

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Background-Setting the context

Geographical Context- Physical settings

- Haors are large bowl shaped floodplain depressions located in the north-eastern region of Bangladesh
- Low elevation of land and subjected to floods
- Unique hydro-ecological characteristics
- There are about 373 haors/wetlands
- Sunamganj, Habiganj, Netrakona, Kishoreganj, Sylhet, Maulvibazaar and Brahmanbaria



Geographical Context- Physical settings

- Haors cover an area of about 858,000 ha which is around 43% of the total area of the region.
- It is a mosaic of wetland habitats including rivers, streams, canals, large areas of seasonally flooded cultivated plains, and beels.
- *Haors* are rich in aquatic bio-diversity, particularly in diverse fish species. There are 140 species of fish in the *haor* region, which is also home to thousands of migratory birds.



Background-Setting the context

Geographical Context- Climate

- Subtropical Monsoon climate prevails in the *haor* basins area
- The rainfall pattern of the upstream catchment has a great influence.
- Annual average rainfall in the *haor* districts are huge and found to have substantive variation over the area
- The mean annual rainfall varies between 3,600 mm and 7,800 mm in Sunamganj



Background-Setting the context

Climate change and flash floods- **Projections**

- Regional projections revealed that climate changes would strengthen monsoon circulation, increase in surface temperature, and increase the magnitude and frequency of extreme rainfall events.
- Significant increase in magnitudes and variability both rainfall and temperature
- Highest variability occurs during the pre-monsoon season when flash flood normally occurs.



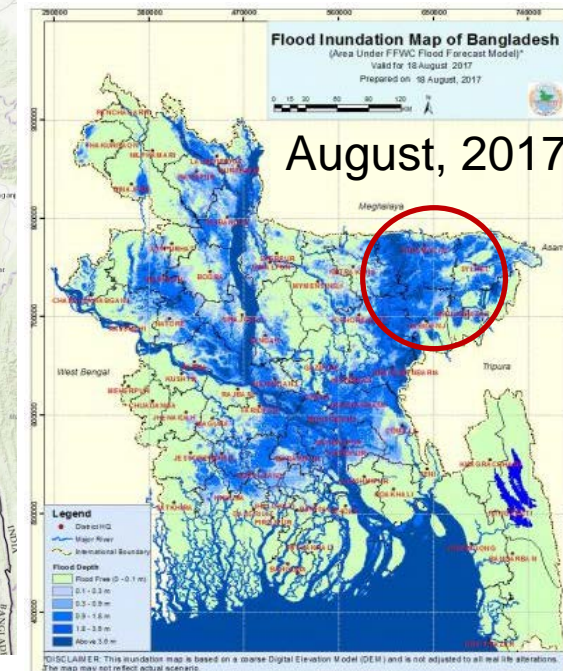
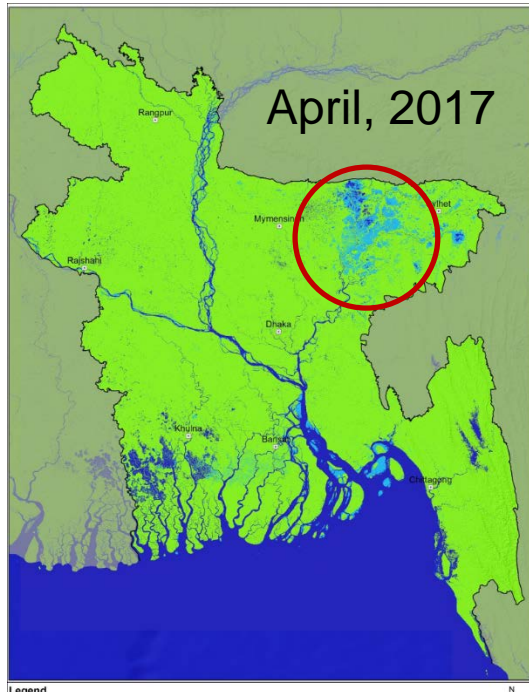
Background-Setting the context

Climate change and flash floods- **Projections**

- The summer pre-monsoon rainfall over Surma-Kushiyara basin is expected to be 0.42 - 75% more in 2080s compared to the baseline (1971–2000) under global warming conditions.
- The projected change may be non-uniform over the *Haor* basin
- The rainy days are projected to be less frequent and more intense where the deeply flooded Haors are situated
- The haor region of Bangladesh is prone to flash flood caused due to unpredicted and excessive rainfall in Assam, Meghalay and Tripura states of India.
- Flash flood has become unprecedented.

Frequency of big floods increased

- In 2017, floods have occurred three times in different parts of the country.
 - the first one in March and April, 2017 which was severe flash flood,
 - the second one in July, 2017 and
 - the third one in August 2017.





Background-Setting the context

Impacts of Flash floods

- April flash flood cause severely damage to nearly 220000 hectors of crops, mostly to the ready-to-be harvested “boro” paddy crop in low-lying areas.
- This year (2017), flash flood affected approximately 850000 households
- Caused severe damage to food crops, housing and infrastructure, including bridges and roads
- Over 20 million people at haor region and river basin areas are facing severe food deficit this year (2017-18).
- The most affected districts were Sylhet, Moulvibazar, Sunamganj, Habiganj, Netrokona and Kishoreganj



Background- Vulnerability Context

- The haor region is mostly inhabited by poor and disadvantaged groups lacking access to basic services.
- The settlement area situated in low lying land is characterized by water logging
- Wave erosion or *Afal* is one of the major threats to the *haor* settlements.
- Most of the tube-wells are submerged during monsoon and flood periods, creating scarcity of drinking water and threatening the health of the haor community



Background- Vulnerability Context

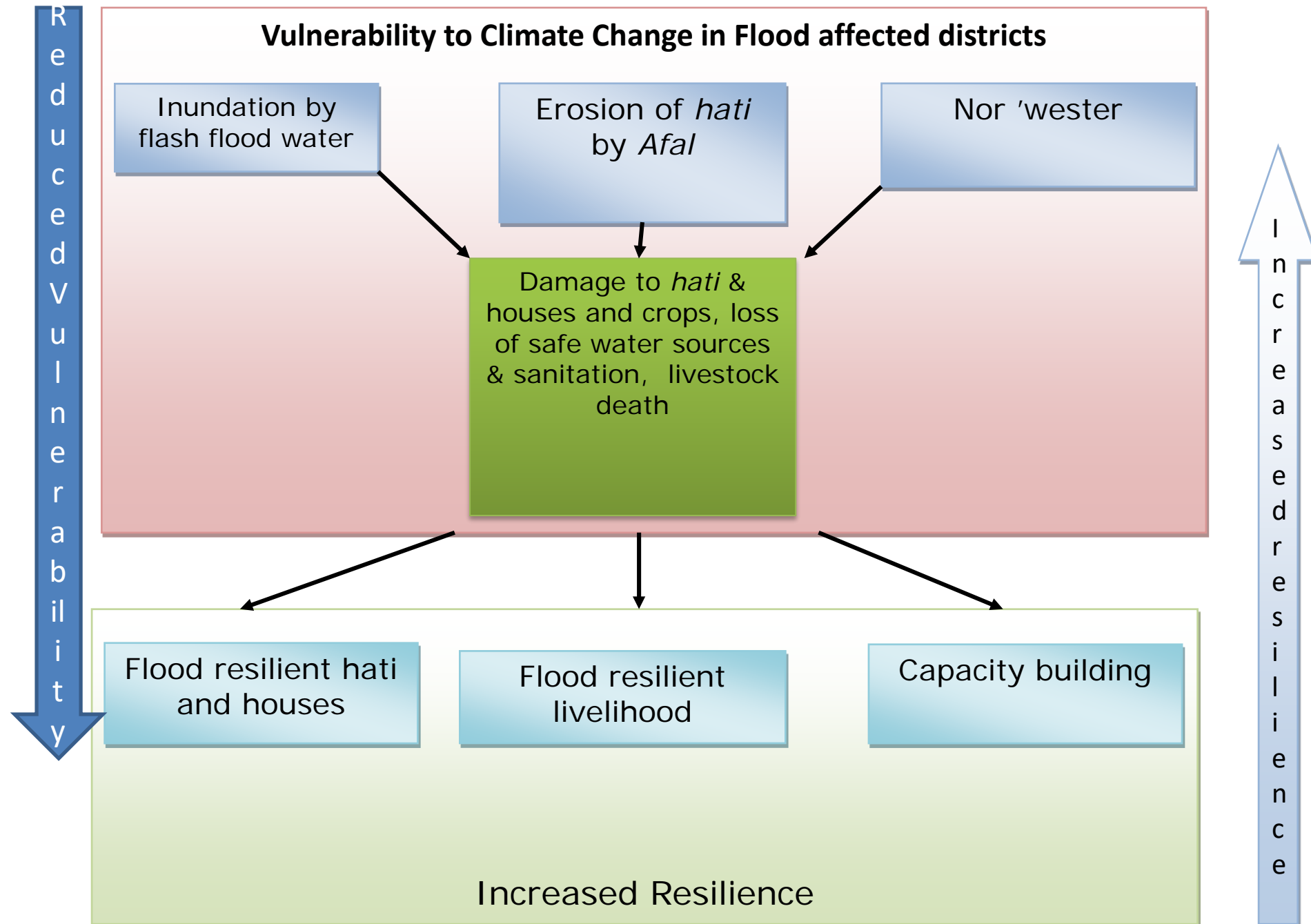
- Lack of appropriate sanitation facilities in flood-prone areas particularly during the flood period is the main factor contributing to health problems and severe environmental degradation.
- Early flash flood is occurring frequently and damaged only one standing crop i.e. Boro paddy
- The damage to crop occurs in such a time when all investment for growing crop is completed
- The farmers could not adjust the time of paddy plantation with occurrence of flash flood



Background- Vulnerability Context

- Vulnerabilities of the haor people to climate change
 - Shelter/housing i.e. *hati*
 - Source of income/livelihood

Conceptual Framework





Goal and Objective

Goal

The overall goal of the project is to *enhance adaptive capacity of the climate vulnerable community in north-eastern haor areas of Bangladesh.*

Objectives-

- To protect homesteads and villages from flash flood.
- To promote flood resilient agriculture and livelihood for targeted community people particularly women.
- To facilitate and promote flood resilient WASH system



Proposed project area

- Selection Criteria
 - Existence of Haor
 - Poverty density

Proposed project area





Proposed project area

District	Upazila
Sylhet	Gowainghat, Jaintapur, Companiganj, Kanaighat, Zakiganj, Bakshi Bazar, Fenchuganj, Balaganj
Sunamganj	Jamalganj, Dharma Pasha, Tahirpur, Shalla, Daxin Sunamganj, Dirai, Jagannathpur, Sunamganj Sadar, Dowarabazar, Bishwambarpur, Chatak
Habiganj	Ajmiriganj, Baniachang, Bahubal, Habiganj Sadar, Lakhai
Netrokona	Kendua, Madan, Atpara, Mohonganj, Barohatta, Khalijuri, Komolkanda
Kishoreganj	Itna, Mithamoeen, Austogram, Nikli, Bajitpur, Pakundia, Tarail, Kuliarchar
Moulvi Bazar	Sreemongol, Moulvi Bazar Sadar, Jari, Kulaura, Rajnagar
Brahmanbaria	Brahmanbaria Sadar, Sarail, Nasirnagar



Expected Impacts

Impacts- flood (flash) resilient community development at project areas.

Indicators-

- 30% Settlements and community infrastructure are protected from wave erosion and flash floods
- Climate adaptive employment increased by 70%;
- Improved quality of health by 70%



Expected outcomes

Outcome- 1 Climate resilient settlement and community infrastructure developed.

Indicators-

- Number of villages reduced flash flood and Afal induced erosion
- % of farmers reduced post-harvesting loss of crops
- Improved drainage condition



Expected outcomes

Outcome- 2: Climate-adaptive livelihood developed and practiced by targeted HHs/community.

Indicators-

- 75% community people (targeted) reduced climate change related impacts on their livelihood option.
- Average income increased by 50%.
- Women's employment increased by 30%



Expected outcomes

Outcome- 3 Water-borne disease reduced by ...%

Indicators-

- Increased access to safe drinking water by%
- Increased access to climate resilient sanitation system by%
- Increased access to primary health care services by%



Proposed Activities

Activities under outcome 1:

Climate resilient settlement and community infrastructure developed

- Extension of village area and construction of village protection wall
- Construction of crop-drying areas
- Plantation of suitable tree species along villages
- Construction of culverts
- Re-excavate canals for improving drainage



Proposed Activities

Activities under outcome 2:

Climate-adaptive livelihood developed and practiced by targeted HHs/community

- Promote improved management of cow fattening for dry season
- Promote diversification of stress tolerant crops
- Promote improved management of duck rearing
- Cage fish aquaculture
- Fish sanctuary development and management
- Introduce pearl culture



Proposed Activities

Activities under Outcome 3:

Water-borne disease reduced by ...%

- Install tube wells for safe drinking water
- Construct climate-resilient sanitary latrines at household levels
- Construction or facilitation of sanitary latrine at public places.



Proposed Activities

Activities under Outcome 4:

Enhanced capacity and knowledge of communities and institutions

- Baseline survey
- Participatory vulnerability assessment
- Capacity building training
- Develop necessary tools and guidelines
- Conduct result based monitoring (RBM) studies
- Project evaluation
- Workshops/seminars
- Different publications



Activity Budget

Activity	Unit	Total Unit	Unit cost
Outcome 1: Climate resilient settlement			
Construction of village protection wall	Km	35	60000000
Extension of villages	No	10	900000
Establish green wall round the village/hati	Km	30	500000
Construction of community based crop threshing and drying areas	No	15	900000
Reexcavation of canals	km	20	10000000
Construction of culverts/cross dam	no.	50	3000000



Activity Budget

Activity	Unit	Total Unit	Unit cost (BDT)
Outcome 2: Climate Adaptive Livelihood			
Promote improved management of cow fattening	No	5000	40000
Promote diversification of stress tolerant crops	No	3000	5000
Promote improved management of duck rearing	No	5000	11500
Cage fish culture	No	2000	30000
Fish sanctuary development and management	No.	100	500000
Introduce pearl culture	No	100	50000
Advocacy with government on access to water resources for the poor	meetings/workshop	8	150000



Activity Budget

Activity	Unit	Total Unit	Unit cost (BDT)
Outcome 3: Water-borne disease reduced			
Installation of tube-wells for drinking water	No	2500	80000
Construct climate-resilient sanitary latrines at household level	No	2500	20000
Construct sanitary latrine at public places	No.	100	150000



Activity Budget

Activity	Unit	Total Unit	Unit cost
Outcome 4: Enhanced capacity and knowledge			
Selection and profiling of beneficiaries	Lums um	200000	50
Baseline survey	Lums um	1	2500000
Project launching and completion ceremony	No	2	2000000
Training to PIPs staffs	Batch	25	200000
Training to project participants on different intervention	No	17100	1000
Develop operational policy and guideline	No	12	200000
Workshops, seminar etc.	No	20	100000
Mid term and final evaluation	No	2	2500000



Activity Budget

Activity	Unit	Total Unit	Unit cost
Outcome 4: Enhanced capacity and knowledge			
Capacity building and exposure visit of PMU and PIP	Lump sum	35	50000
Project completion report	No.	1	300000
Result based monitoring	No.	10	500000
Web development and management	Lump sum	1	1000000
GIS based monitoring	Lump sum	1	1000000
External audit	No.	5	500000
Project monitoring and supervision	Year	5	500000

Thank You All