

# Handbook of M&E Indicators for Climate Change Projects in Bangladesh

## Draft list of key indicators for different sectors

- ✦ Inputs from Inception Workshop with multi-stakeholders
- ✦ Inputs from local level consultation workshop
- ✦ Inputs from Bangladesh Climate Change Trust, Action Aid Bangladesh, Caritas Bangladesh, Practical Action, Water Aid, CREL and BAGH project, C3ER, BCAS and number of experts)
- ✦ Review of secondary literature (Notre Dame University, GIZ and IISD, IPCC, 2008 (Technical paper on climate change and water; IPCC, 2001; Harvard Medical School, Johns Hopkins University (Climate Variability and change

Agriculture Sector			
Hazard	Exposure	Sensitivity	Adaptive Capacity
Temperature variation	<ul style="list-style-type: none"> <li>● Projected Change in temperature (in degrees Celsius)</li> </ul>	<ul style="list-style-type: none"> <li>● Area of agricultural land exposed to extreme temperatures</li> <li>● Yiled reduction per ha/per acre/bigha</li> <li>● No of farming households faced loss and damage of crops</li> <li>● No of households facing food shortage</li> <li>● No of people suffering from malnutrition</li> <li>● Crop diseases/pest atattack</li> </ul>	<ul style="list-style-type: none"> <li>● Policies/Strategies and Plans to address disasters inclduing flood (E.g. SoD, DMA, NPDM, BCCSAP and so on)</li> <li>● No of heat tolerant cultivars available</li> <li>● Number of heat resistant farming technology introduced</li> <li>● Number of farmers with access to short duration crop variety</li> <li>● Number of trainings on alternative livelihoods</li> </ul>
Rainfall Variation	<ul style="list-style-type: none"> <li>● Projected Changes in rainfall (mm)</li> </ul>	<ul style="list-style-type: none"> <li>● Area of agricultural land inundated by excessive rainfall</li> <li>● Crop failure due to lack of rainfall (per ha/acre)</li> <li>● Cost of production per ha (increased/decreased)</li> </ul>	<ul style="list-style-type: none"> <li>● Number of farmers with access to rice variety with limited water condition</li> <li>● Number of submergence tolerant variety</li> <li>● Percentage of farms with access to adequate water for irrigation</li> </ul>
Flood/Flash flood	<ul style="list-style-type: none"> <li>● Projected Frequency, duration and intensity of flood events</li> <li>● Number of flash floods</li> <li>● No of days of flood inundation (duration)</li> </ul>	<ul style="list-style-type: none"> <li>● Area of agricultural land inundated by last flood</li> <li>● Total amount of crop and vegetable loss due to last flood</li> <li>● No of people/farmers experienced loss of livelihoods (seasonal)</li> <li>● No of farmers (men and women) depend on the relief (food)</li> <li>● No of farmers (men and women) depend on the seeds/fertilizer</li> <li>● No of HHs take loan/micro credit</li> </ul>	<ul style="list-style-type: none"> <li>● Policies/Strategies and Plans to address disasters inclduing flood (E.g. SoD, DMA, NPDM, BCCSAP and so on)No of HHs received flood florecasting and early warning in last flood</li> <li>● Number of trainings received by farmers (male and female)</li> <li>● Number of floating technology introduced</li> <li>● Number of farmers with access to short duration crop variety (flash flood)</li> </ul>

		for cultivation in the following seasons	<ul style="list-style-type: none"> <li>Number of new submergence tolerant/flood resilient seeds/crop varieties</li> <li>No of HHs received relief and rehabilitation</li> <li>No of HHs received seeds/fertilizer and other assistance to continue cultivation</li> </ul>
Drought	<ul style="list-style-type: none"> <li>Projected Increased dry spell</li> <li>Ground water depletion</li> </ul>	<ul style="list-style-type: none"> <li>Reduced crop production per ha/acre/bigha</li> <li>Area of agricultural land experienced lack of irrigation facilities</li> </ul>	<ul style="list-style-type: none"> <li>Number of alternative irrigation technology introduced</li> <li>Number of drought tolerant seeds/crop varieties available</li> <li>Number of farmers (men and women) receiving training on drought management farming</li> <li>No of HHs/farmers with access to adequate water for irrigation</li> </ul>
Cyclone/Storm Surges	<ul style="list-style-type: none"> <li>Projected Frequency and intensity of cyclonic events increased</li> </ul>	<ul style="list-style-type: none"> <li>Areas of vegetation cover affected by cyclones and storm surges</li> <li>Area of agricultural land affected by cyclones and storm surges</li> <li>Total loss of crop production per farming HH in the following years (2 or 3)</li> <li>No of HHs experienced food shortage in the following season/year</li> <li>No of women and children suffering from malnutrition in respective village/UP/UPZ/District</li> </ul>	<ul style="list-style-type: none"> <li>Policies/Strategies and Plans to address disasters including flood (E.g. SoD, DMA, NPD, BCCSAP and so on)Number of trainings received by farmers</li> <li>Number of farmers with access to saline tolerant crop/vegetables/fruit variety</li> <li>Number of new flood resilient seeds/crop varieties</li> <li>Number of women receiving farming trainings</li> <li>No of HHs received food support from the Gos/NGOs and others</li> <li>No of farmers/HHs received health treatment from health care facilities of the Gos/NGOs and others</li> </ul>
Salinity Intrusion	<ul style="list-style-type: none"> <li>Salinity increased in soil and water resources</li> </ul>	<ul style="list-style-type: none"> <li>Amount of Crop loss and damage per ha/acre/bigha</li> <li>Total amount of Vegetables yields reduced</li> </ul>	<ul style="list-style-type: none"> <li>Number of trainings received by farmers</li> <li>Number of farmers with access to saline tolerant crop/vegetables/fruit variety</li> <li>Number of new flood resilient seeds/crop varieties</li> <li>Number of women receiving farming trainings</li> </ul>
River Erosion	<ul style="list-style-type: none"> <li>Intensity of erosion increased/decreased</li> </ul>	<ul style="list-style-type: none"> <li>Area of agricultural land lost</li> <li>Area of infrastucture loss/damaged</li> </ul>	<ul style="list-style-type: none"> <li>No of rivers with protection</li> <li>Area of river bank protected</li> <li>No of people affected by river erosion with access to government support</li> </ul>
Sea Level Rise	<ul style="list-style-type: none"> <li>Change in sea level in central, southwest</li> </ul>	<ul style="list-style-type: none"> <li>Area of agricultural land below level of high tides</li> </ul>	<ul style="list-style-type: none"> <li>Number of new saline tolerant seeds/crop varieties tested</li> </ul>

	and south east coast	<ul style="list-style-type: none"> <li>Area of agro-cultural productive land submerged with sea water</li> </ul>	<ul style="list-style-type: none"> <li>Area of agricultural land protected by embankments</li> </ul>
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Water Sector			
Hazard	Exposure	Sensitivity	Adaptive Capacity
Temperature Variation	Projected Change in Temperature (°C)	<ul style="list-style-type: none"> <li>cm/mm increase of water level in the rivers caused by melting of Himalayan glaciers.</li> <li>No of infrastructural Damage caused by flooding</li> <li>Increase in surface water temperature and pH</li> <li>No of cities/towns/urban areas with Shortage of water supply</li> <li>Amount of Increased cost for water purification</li> <li>m/cm/mm declining of ground water caused by over extraction</li> <li>Mortality and morbidity on temperature related health disorders</li> </ul>	<ul style="list-style-type: none"> <li>Policies/Strategies and Plans to address disasters including flood (E.g. SoD, DMA, NPDM, BCCSAP and so on)Percentage of urban and local population with access to drinking water around the year/different seasons</li> <li>No of policies and coordination mechanisms to deal with water shortage</li> <li>No of programmes/projects being implemented by GOs/NGOs/CSOs/Private sectors for water conservation and supply</li> <li>No of public awareness campaigns on water efficiency</li> <li>No of vulnerable stakeholders using climate responsive tools</li> <li>No of women involved in fetching/conserving water</li> <li>Percentage of poor people with access to safe and reliable water</li> <li>Percentage of water demand being met by existing supply</li> <li>Production of vulnerability maps</li> <li>Volume of water consumed by tourist facilities</li> <li>No of retrofitted ponds in the rural and urban areas</li> </ul>
Rainfall variation	Projected Change in rainfall (mm)	<ul style="list-style-type: none"> <li>Changes in water availability due to changes in rainfall patterns</li> <li>Increased water logging, turbidity and sedimentation</li> <li>Water treatment challenges (urban)</li> <li>Cost of repairing damaged water supply infrastructure caused by excessive rainfall</li> <li>Incidences of water borne</li> </ul>	<ul style="list-style-type: none"> <li>No of households with access to rain water harvesting facilities/technologies</li> <li>No of community infrastructure projects located in areas at risk that harvest rainwater</li> <li>No of public awareness campaigns on water efficiency</li> <li>No of water retention tools developed and tested</li> </ul>

		diseases	<ul style="list-style-type: none"> <li>No of women involved in conserving water</li> <li>No of local/government/international attention/projects that address RWHS</li> </ul>
Flood	<ul style="list-style-type: none"> <li>Projected Frequency, duration and intensity of flood events</li> <li>No of flash floods in last 5 years</li> </ul>	<ul style="list-style-type: none"> <li>No of rivers/canals overflowed</li> <li>No of people living in flood-prone areas</li> <li>Percentage of flood affected households</li> <li>No of water sources (e.g. ponds, tube wells, dug wells, ditches) are contaminated with flood water</li> <li>No of tube wells, dug wells, deep tube wells, latrines fully/partially damaged</li> <li>No of HHs experienced drinking water shortage during the last flood</li> <li>No of HHs experienced water borne diseases during the last flood event</li> <li>No of incidences of diarrheal diseases (male, female, children)</li> <li>Cost of treatment for water borne diseases per HH</li> <li>Area of drainage system damaged in the urban areas</li> <li>Total Damage of water supply system</li> </ul>	<ul style="list-style-type: none"> <li>Policies/Strategies and Plans to address disasters including flood (E.g. SoD, DMA, NPDM, BCCSAP and so on)No of HHs received flood forecasting and early warning</li> <li>No of flood forecasting and awareness measures initiated</li> <li>Area of drainage system constructed/re-constructed with climate resilience</li> <li>No of flood vulnerability and risk assessment maps produced</li> <li>No of effective disaster plans produced with information on discharge pathways, public service and infrastructure supplies</li> <li>Percentage of people reached with awareness campaigns and training on flood management</li> <li>No of materials/equipment/supplies for flood preparedness prepared</li> <li>No of youth trained for disaster preparedness and emergency response</li> <li>No of project/programmes on flood flow protection and regulation</li> <li>No of rescue and relief operations successfully conducted</li> <li>No of initiatives to restore and recover damaged water sources</li> </ul>
Drought	<ul style="list-style-type: none"> <li>Projected Duration and intensity of drought</li> </ul>	<ul style="list-style-type: none"> <li>Reduce surface water availability</li> <li>Increase over extraction of groundwater</li> <li>Reduced rate of groundwater recharge</li> <li>Increased demand for domestic purposes</li> </ul>	<ul style="list-style-type: none"> <li>Amount of emergency water retained</li> <li>No of households having access to safe water</li> <li>No of drought vulnerability and risk assessment maps produced</li> <li>No of drought forecasting and awareness measures</li> <li>Percentage of people reached with awareness campaigns</li> <li>No of materials/equipment/supplies prepared for drought preparedness</li> <li>No of organizations providing usable and safe drinking water</li> </ul>

			<ul style="list-style-type: none"> <li>No of plans reviewed to advance water-drought planning for future hazards</li> <li>No of women involved in fetching water</li> </ul>
Cyclone/Storm Surges	<ul style="list-style-type: none"> <li>Projected change in frequency and intensity of cyclonic events</li> <li>Projected storm surge</li> </ul>	<ul style="list-style-type: none"> <li>No of water bodies including ponds, ditches, canals, reservoirs overflowed with saline water</li> <li>Percentage of cyclone affected households</li> <li>No of tube wells, dug wells, deep tube wells, latrines fully/partially damaged</li> <li>No of HHs experienced drinking water shortage during the last cyclone e.g. cyclone Aila/Sidr</li> <li>No of HHs experienced water borne diseases during the cyclonic event</li> <li>No of incidences of diarrheal diseases (male, female, children)</li> <li>Cost of treatment for water borne diseases per HH</li> <li>Area of drainage system damaged in the urban areas</li> <li>No of RWHS damaged</li> </ul>	<ul style="list-style-type: none"> <li>Policies/Strategies and Plans to address disasters including flood (E.g. SoD, DMA, NPDM, BCCSAP and so on)No of HHs received cyclone forecasting and early warning</li> <li>No of cyclone shelter/exposed coastal Upazilla</li> <li>No of cyclone shelters with proper access to safe water and sanitation</li> <li>No of HHs/People (male, female, elderly, children) with access to drinking water in cyclone shelter during the last cyclonic event</li> <li>No of cyclone vulnerability and risk assessment maps produced</li> <li>No of effective disaster plans produced with information on cyclone vulnerabilities</li> <li>No of surface water bodies altered pre and post disaster period</li> </ul>
Salinity Intrusion in water resources	<ul style="list-style-type: none"> <li>Projected change in salinity level in water sources</li> </ul>	<ul style="list-style-type: none"> <li>No of water bodies including ponds, ditches, canals, reservoirs overflowed with saline water</li> <li>No of HHs on long term consumption of drinking water with salinity level above 5 PPT</li> <li>No of HHs experiencing safe drinking water shortage</li> <li>No of HHs experienced water borne diseases</li> <li>No of incidences of diarrheal diseases (male, female, children)</li> <li>Incidences of hypertension, miscarriage and gynecological problems among the women</li> <li>Cost of treatment for water borne diseases per HH</li> <li>Increased dependency on the RWHS, desalination water supply system</li> </ul>	<ul style="list-style-type: none"> <li>No of HHs/People (male, female, elderly, children) with access to drinking water in cyclone shelter during the last cyclonic event</li> <li>No of salinity vulnerability and risk assessment maps produced</li> <li>No of effective disaster plans produced with information on salinity vulnerabilities</li> <li>No of surface water bodies altered pre and post disaster period</li> </ul>

		<ul style="list-style-type: none"> <li>Lack of freshwater for small scale irrigation at the HH level</li> </ul>	
<b>Human Health</b>			
Hazard	Exposure	Sensitivity	Adaptive Capacity
Temperature variation	<ul style="list-style-type: none"> <li>Change in temperature (in degrees Celsius)</li> <li>Projected change in climate sensitive diseases</li> </ul>	<ul style="list-style-type: none"> <li>Number of incidences of vector-borne diseases</li> <li>Number of incidences of water-borne diseases</li> <li>Number of people at high risk of heat stress</li> <li>Reduced work productivity due to heat stress</li> <li>Number of incidences of hypothermia</li> </ul>	<ul style="list-style-type: none"> <li>Extension of healthcare service</li> <li>Additional hours of health care services</li> <li>Access to health care facility</li> <li>Access to emergency medical services</li> <li>Medical surveillance of population exposed to extreme temperatures</li> </ul>
Rainfall variation	<ul style="list-style-type: none"> <li>Change in rainfall (mm)</li> <li>Projected change in vector borne diseases</li> </ul>	<ul style="list-style-type: none"> <li>Number of households depending on rain water harvesting technology</li> <li>Number of cases of vector borne diseases</li> </ul>	<ul style="list-style-type: none"> <li>No of HHs with access to rain water harvesting technology</li> <li>No of doctors/nurses experienced “no leave” during climate sensitive diseases epidemic (e.g. Dengue, Chikungunya, Malaria)</li> <li>Human resources (No of doctors/nurses) for special health care facilities</li> <li></li> </ul>
Flood	<ul style="list-style-type: none"> <li>Change in Frequency, duration and intensity of flood events</li> <li>Number of flash floods in last 5 years</li> </ul>	<ul style="list-style-type: none"> <li>No of HHs experienced scarcity of safe drinking water during and immediate after flood periods</li> <li>Number of water reservoirs/ponds contaminated by floodwater</li> <li>No of HHs had to purchase drinking water during last flood</li> <li>No of HHs (male, female, children) suffered from diarrheal diseases during and immediate post disaster period</li> <li>Number of households depending on relief water during and immediate post disaster</li> <li>Number of skin diseases</li> <li>Mortality and morbidity (male, female and children) due to flood inundation</li> </ul>	<ul style="list-style-type: none"> <li>Policies/Strategies and Plans to address disasters including flood (E.g. SoD, DMA, NPDM, BCCSAP and so on)Number of tube wells and latrines with raised plinth</li> <li>No of ponds with raised edge/embankment</li> <li>Number of household with access to WASH tools and technology</li> <li>Additional number of healthcare providers/volunteers</li> <li>Number of mobile/floating health care services</li> <li>Number of health care providers deployed during flood</li> <li>Number of emergency relief initiatives</li> <li>Number of people receiving necessary medication during floods</li> </ul>
Drought	<ul style="list-style-type: none"> <li>Duration and</li> </ul>	<ul style="list-style-type: none"> <li>Population facing water scarcity</li> </ul>	<ul style="list-style-type: none"> <li>Number of water retention technology</li> </ul>

	intensity of drought	<ul style="list-style-type: none"> <li>in drought prone areas</li> <li>Percentage of population affected by waterborne diseases in drought prone areas</li> <li>Number of skin diseases</li> </ul>	<ul style="list-style-type: none"> <li>installed</li> <li>Number of trainings (male and female) provided for awareness on WASH</li> </ul>
Cyclone/Storm Surges	<ul style="list-style-type: none"> <li>Projected Frequency and intensity of cyclonic events (increased)</li> <li>No of cyclonic events that hit the lands</li> </ul>	<ul style="list-style-type: none"> <li>No of Population at risk of cyclone and storm surges</li> <li>Mortality and morbidity of cyclones and storm surges</li> <li>Incidences of diarrheal diseases during and immediate post cyclonic event</li> <li>Number of skin diseases</li> <li>Number of people with hypertension and heart diseases</li> </ul>	<ul style="list-style-type: none"> <li>No of HHs received early warning</li> <li>Number of people evacuated/relocated before cyclone and storm surge strikes</li> <li>Number of emergency health care providers</li> <li>Number of people receiving trainings on climate change and health aspects</li> <li>Number of gender friendly cyclone shelters</li> <li>Percentage of women maintaining menstrual hygiene in cyclone shelters</li> <li>Number of cyclone forecasting and awareness initiatives</li> <li>Number of women and youth trained for emergency disaster response</li> <li>Number of rescue and relief operations successfully conducted</li> <li>Number of safe water sources resilient to cyclone and storm surges</li> <li>Number of patients receiving post disaster mental healthcare</li> </ul>
Sea Level Rise	<ul style="list-style-type: none"> <li>Increased tide levels in millimeters</li> <li>Salinity in soil and water in parts per million</li> </ul>	<ul style="list-style-type: none"> <li>Number of people with hypertension and heart diseases</li> <li>Salinity intrusion in drinking water and water for irrigation</li> <li>Salinity in farm fields</li> </ul>	<ul style="list-style-type: none"> <li>Number of ponds with raised edge/embankments</li> <li>Number of tube wells and latrines located significantly higher than tide levels in peak season</li> <li>Number of people with access to emergency health care</li> <li>No of HHs with access to RWHS</li> </ul>

Infrastructure			
Hazard	Exposure	Sensitivity	Adaptive Capacity
Rainfall Variation	Projected Change in rainfall (mm)	<ul style="list-style-type: none"> <li>Number of buildings/houses/drainage systems inundated and damaged due to excessive rainfall caused water logging</li> <li>Number of roads/bridges/culverts inundated resulting disruption of transportation/communication</li> </ul>	<ul style="list-style-type: none"> <li>Number of houses, tubewells, latrines with raised plinth</li> <li>Number of retrofitted buildings</li> <li>Number of roads/bridges elevated</li> <li>Integration of climate change in sectoral plans/programmes/projects</li> <li>No of initiatives to avoid damage in infrastructure</li> </ul>

		<p>within urban areas</p> <ul style="list-style-type: none"> <li>• Cost of repairing energy supply networks damaged by rainfall/water logging per thana/Upazilla</li> </ul>	
Flood	<ul style="list-style-type: none"> <li>• Projected Frequency, duration and intensity of flood events</li> <li>• Number of flash floods in last 5 years</li> </ul>	<ul style="list-style-type: none"> <li>• Number of buildings/houses inundated/damaged</li> <li>• Number of roads/bridges/culverts inundated and damaged</li> <li>• Number of flood embankments overflowed and damaged</li> <li>• Total cost of repairing infrastructure damage per Union/UPZ/thana</li> </ul>	<ul style="list-style-type: none"> <li>• Policies/Strategies and Plans to address disasters including flood (E.g. SoD, DMA, NPDM, BCCSAP and so on)</li> <li>• Number of houses/buildings with raised plinth</li> <li>• Number of embankments/roads/highways constructed/reconstructed considering potential climate change projections</li> <li>• Number of floating schools</li> <li>• Budget allocation to address damage and repairment</li> </ul>
Cyclone/Storm Surges	<ul style="list-style-type: none"> <li>• Projected frequency and intensity of cyclone</li> <li>• Projected storms surge</li> </ul>	<ul style="list-style-type: none"> <li>• Number of buildings/houses inundated/damaged</li> <li>• No of school/college/educational institutions damaged</li> <li>• Number of roads/bridges/culverts inundated and damaged</li> <li>• Number of coastal embankments/polders overflowed and damaged</li> <li>• No of public facilities including health care services</li> <li>• Total cost of repairing public infrastructure damage</li> </ul>	<ul style="list-style-type: none"> <li>• Policies/Strategies and Plans to address disasters including flood (E.g. SoD, DMA, NPDM, BCCSAP and so on)</li> <li>• Number of cyclone resilient houses</li> <li>• Number of cyclone shelters</li> <li>• Number of gender friendly cyclone shelters</li> <li>• Number of embankments that have been retrofitted to meet current requirements</li> <li>• Length of cyclone resilient roads</li> </ul>
River Erosion	<p>Projected Duration, rate and seasonal variability of river erosion</p>	<ul style="list-style-type: none"> <li>• Area of river erosion</li> <li>• No of houses/buildings/schools destroyed</li> <li>• Amount of agricultural land lost</li> <li>• No of people displaced</li> </ul>	<ul style="list-style-type: none"> <li>• Policies/Strategies and Plans to address disasters including flood (E.g. SoD, DMA, NPDM, BCCSAP and so on)</li> <li>• Number of embankments built</li> <li>• Number of embankments repaired</li> <li>• Number of households relocated</li> <li>• Allocation of budget to address river erosion</li> </ul>
Sea Level Rise	<p>Projected SLR</p>	<ul style="list-style-type: none"> <li>• Area under risk of permanent and temporary inundation</li> <li>• Number of buildings/houses under risk of inundation</li> <li>• No of school/college/educational institutions damaged</li> <li>• Number of roads/bridges/culverts inundated</li> </ul>	<ul style="list-style-type: none"> <li>• Policies/Strategies and Plans to address disasters including flood (E.g. SoD, DMA, NPDM, BCCSAP and so on)</li> <li>• Number of houses with elevated plinth</li> <li>• Number of embankments</li> <li>• Number of embankments that meet current standards/requirements</li> <li>• Number of resilient structures for</li> </ul>



		and damaged <ul style="list-style-type: none"> <li>• Number of coastal embankments/polders overflowed and damaged</li> <li>• No of public facilities including health care services damaged</li> <li>• Total cost of repairing public infrastructure damage</li> </ul>	shelter during disasters <ul style="list-style-type: none"> <li>• Length of roads above sea level at high tides</li> </ul>
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Fisheries			
Hazard	Exposure	Sensitivity	Adaptive Capacity
Temperature Variation	Projected Change in Temperature (°C)	<ul style="list-style-type: none"> <li>• No of freshwater species under risk of growth, mortality, reproductive system, feeding behavior, production, migration in inland and marine waters</li> <li>• Marine fisheries capture may be reduced because of migration of marine species from warmer area to cooler area</li> <li>• No of fish habitats being affected</li> <li>• No of freshwater and marine species being affected</li> </ul>	<ul style="list-style-type: none"> <li>• Conservation of aquatic resources</li> <li>• Increase in the percentage of climate resilient fish being used</li> <li>• No of methodological guides produced to assess impacts of extreme weather events on fish transport systems</li> <li>• No of policies and coordination mechanisms explicitly addressing fish conservation</li> <li>• No of policies, plans or programmes introduced or adjusted that mainstream climate risks</li> <li>• No of trainings initiated for fish farmers</li> <li>• Total sum of investments in programmes for the protection of fisheries</li> </ul>
Rainfall variation	Projected Change in rainfall (mm)	<ul style="list-style-type: none"> <li>• Acidification of marine water</li> <li>• Distribution of climate sensitive species</li> <li>• Distribution of warmth-adapted marine species</li> <li>• Percentage of area of ecosystem that has been disturbed or damaged</li> <li>• No of habitat degradation (Erratic rainfall and temperature fluctuation have already negatively impacted spawning performance of major carp in the only natural spawning ground of major carp in Halda river of Bangladesh)</li> </ul>	<ul style="list-style-type: none"> <li>• Development of data on species distribution</li> <li>• Conservation of aquatic resources</li> <li>• Local/Scientific research and availability of data on fish reproduction, recruitment and immigration with changing rainfall patterns</li> <li>• Change in fishing duration during rainy days</li> <li>• No of people supported to cope with the effects of irregular fishing</li> </ul>

<p>Flood</p>	<ul style="list-style-type: none"> <li>• Projected inundation, duration and intensity of flood events</li> <li>• No of flash floods in last 5 years</li> </ul>	<ul style="list-style-type: none"> <li>• No of ponds at risk of flash floods</li> <li>• No of downstream fish habitats at risk of flash flood</li> <li>• No of fish farms inundated in the last flood event</li> <li>• Total loss of fish farmers in the last flood event (flood inundates aquaculture ponds/ gher facilitating escape of cultured fish and heavy loss is incurred to the farmers)</li> <li>• Percentage of poor people dependent on fisheries for livelihood</li> <li>• No of ponds/ghers/fish farms affected by predator fish (Predator fish enter into pond during flood and affect aquaculture in future)</li> </ul>	<ul style="list-style-type: none"> <li>• No of temporary fencing is put on the pond dyke to protect the fish.</li> <li>• No of fish farms harvest fish at the advents of flood to avoid loss of fish.</li> <li>• No of Pond dikes are also raised to protect the fish against flood.</li> <li>• No of affected ponds need to be renovated by removing predators and excessive silts and repairing pond dykes before stocking the ponds with fish/shrimp fry for cultivation.</li> <li>• Use of innovative fishing practice (cage culture)</li> <li>• No of financial mechanisms identified to support poor farmers pre and post disaster</li> <li>• No of fish farmers that have received training on adaptation</li> <li>• No of policies and coordination mechanisms explicitly addressing fish conservation</li> </ul>
<p>Cyclone/Storm Surges</p>	<ul style="list-style-type: none"> <li>• Projected change in frequency and intensity of cyclone</li> <li>• Projected level of storm surge</li> </ul>	<ul style="list-style-type: none"> <li>• No of fisheries (business) located in cyclone-prone areas</li> <li>• No of fish habitats located in cyclone-prone areas</li> <li>• No of fishermen affected in last cyclone</li> <li>• No of the coastal aquaculture, fishing equipment (boats and net), fishers lives at risk of cyclonic events</li> <li>• No of fish ponds and shrimp ghers affected by the last cyclone (More than 60% of fish ponds and shrimp ghers in coastal area of Bangladesh were totally damaged by Sidr-2007 and remaining were partially damaged)</li> <li>• Total loss of fish/fisheries production of cyclonic event (cyclone Sid caused an approximate loss of more than USD 200 million including USD 6.71 million as loss of infrastructure damage (DoF 2008, GoB 2008).</li> <li>• Percentage of fish habitats destroyed after a disaster event</li> </ul>	<ul style="list-style-type: none"> <li>• Policies/Strategies and Plans to address disasters including flood (E.g. SoD, DMA, NPDM, BCCSAP and so on)</li> <li>• No of cyclone vulnerability and risk assessment maps on fisheries sector produced</li> <li>• No of initiatives to restore and recover damaged businesses</li> <li>• No of surface water bodies altered pre and post disaster</li> <li>• No of financial mechanisms identified to support poor farmers pre and post disaster</li> <li>• No of fish farmers that have received training on adaptation</li> <li>• No of policies and coordination mechanisms explicitly addressing fish conservation</li> <li>• Decrease in fish species in the ecosystem/market</li> </ul>

Salinity intrusion and Sea Level Rise	<ul style="list-style-type: none"> <li>Projected level of salinity in the freshwater bodies</li> <li>Projected SLR</li> </ul>	<ul style="list-style-type: none"> <li>No of low-lying fish habitats under risk of inundation</li> <li>No of fresh water ponds with saline water/under risk of inundation due to SLR</li> <li>No of freshwater local species are no more available in pond, rivers, canals due to increase of salinity level</li> <li>Loss of local fish species production in the coastal zone</li> <li>Decrease in fish species in the ecosystem/market</li> </ul>	<ul style="list-style-type: none"> <li>Increase of wetlands/saline tolerant species introduced</li> <li>Rate of change of fisheries to shrimp/crab cultivation</li> <li>No of businesses that shifted from fresh water species to saline tolerant species</li> <li>Development of shoreline protection projects</li> <li>No of tools/research developed on restraining saline water intrusion into fish culture/fish habitat</li> <li>Mapping on fish habitat declination</li> </ul>

Livestock			
Hazard	Exposure	Sensitivity	Adaptive Capacity
Temperature Variation	<ul style="list-style-type: none"> <li>Projected Change in Temperature (°C)</li> </ul>	<ul style="list-style-type: none"> <li>No of households (with livestock) affected by extreme temperature</li> <li>No of livestock affected by diseases</li> <li>No of livestock farms affected by decreased production</li> <li>No of incidences of livestock diseases outbreaks</li> </ul>	<ul style="list-style-type: none"> <li>No of policies that support and facilitate the implementation of climate change adaptation on livestock sector</li> <li>Change in livestock water consumption patterns</li> <li>Total sum of investments in programmes for the protection of adaptive livestock</li> <li>No of disease surveillance and technologies (genome sequencing, antiviral medication, cross-breeding, etc) acquired/used</li> <li>Area of shelter (trees, constructed) for livestock</li> <li>Trend of livestock handled or transported during high temperatures</li> </ul>
Rainfall variation	<ul style="list-style-type: none"> <li>Projected Change in rainfall (mm)</li> </ul>	<ul style="list-style-type: none"> <li>No of households (with livestock) affected by erratic rainfall caused water logging</li> <li>No of livestock affected by water borne diseases</li> <li>No of incidences of livestock diseases outbreaks</li> </ul>	<ul style="list-style-type: none"> <li>No of assessments related to the use of livestock adaptation measures</li> <li>No of policies that support and facilitate the implementation of climate change adaptation</li> <li>No. of policies evaluating disease dynamics (transmission, spread of vector-borne pests) on livestock</li> <li>Total sum of investments in</li> </ul>

			<p>programmes for the protection of livestock</p> <ul style="list-style-type: none"> <li>• No of water use efficiency measures used for livestock (drinking, feed crops, product processes)</li> <li>• No of disease surveillance and technologies (genome sequencing, antiviral medication, cross-breeding, etc) acquired/used</li> <li>• Area of shelter (trees, constructed) for livestock</li> </ul>
Flood	<ul style="list-style-type: none"> <li>• Projected inundation, duration and intensity of flood events</li> <li>• No of flash floods in last 5 years</li> </ul>	<ul style="list-style-type: none"> <li>• No of domestic farms at risk of flood/flash floods</li> <li>• No of downstream farms at risk of flood/flash flood</li> <li>• Percentage of poor people dependent on farms for livelihood</li> <li>• Morbidity and mortality rate of livestock during and after the flood event</li> <li>• Total livestock related loss of HHs in flood prone areas</li> </ul>	<ul style="list-style-type: none"> <li>• Flood zone vulnerability maps developed</li> <li>• No of financial mechanisms identified to support poor farmers pre and post disaster period</li> <li>• No of farmers that have received training on adaptation on livestock rearing under flood condition</li> <li>• No of training for women on both on-farm and off-farm income generating activities (handicraft, tailoring)</li> <li>• No of youth trained for disaster preparedness and emergency response</li> <li>• No of affected livestock farms/HHs supported by the GOs/NGOs/CSOs</li> </ul>
Cyclone/Storm Surges and Salinity	<ul style="list-style-type: none"> <li>• Projected change in frequency and intensity of cyclone</li> <li>• Projected level of storm surge</li> <li>• Projected salinity level in water</li> </ul>	<ul style="list-style-type: none"> <li>• No of livestock (business) located in cyclone-prone areas</li> <li>• No of HHs with livestock affected in last cyclone</li> <li>• No of livestock affected by the last cyclone</li> <li>• Mortality and morbidity rate during cyclone</li> <li>• Total loss of livestock during last cyclone</li> <li>• Livestock production decreased due to lack of freshwater in the coastal zone</li> </ul>	<ul style="list-style-type: none"> <li>• No of initiatives to restore and recover damaged businesses</li> <li>• Net loss of investment and revenue after a cyclone event</li> <li>• No of cyclone shelters equipped to accommodate livestock</li> <li>• Percentage of additional fodder for grazing livestock</li> <li>• Total sum of investments in programmes for the protection of livestock</li> <li>• No of training for women on both on-farm and off-farm income generating activities (handicraft, tailoring)</li> </ul>

**Energy**

Hazard	Exposure	Sensitivity	Adaptive Capacity
Temperature variation	Projected Change in temperature (in degrees Celsius)	<ul style="list-style-type: none"> <li>• Additional cost of installation of heating or cooling devices</li> <li>• Cost of cooling per HH in urban areas</li> <li>• Dependancy of imported cooling technology</li> </ul>	<ul style="list-style-type: none"> <li>• Number of additional heating or cooling devices</li> <li>• Additional units of energy consumed by heating or cooling devices</li> <li>• No of Solar Powered Irrigation systems (SPIS)</li> <li>• Area covered with SPIS</li> </ul>
Flood	<ul style="list-style-type: none"> <li>• Projected inundation, duration and intensity of flood events</li> <li>• Number of flash floods in last 5 years</li> </ul>	<ul style="list-style-type: none"> <li>• Number of electric devices damaged</li> <li>• Total estimated loss of damage of energy infrastructure</li> <li>• Mortality and morbidity on electric shock with flood damaged energy networks</li> <li>• No of days with power failure</li> </ul>	<ul style="list-style-type: none"> <li>• Policies/Strategies and Plans to address disasters including flood (E.g. SoD, DMA, BCCSAP and so on)</li> <li>• No of projects/programmes to deal with flood inundation</li> <li>• No of training/awareness campaign on energy</li> <li>• Flood forecasting and early warning received by the no of HHs</li> <li>• No of HHs with Solar Homes System (SHS)</li> <li>•</li> </ul>
Cyclone/Storm Surges	<ul style="list-style-type: none"> <li>• Projected change in frequency and intensity of cyclone</li> <li>• Projected level of storm surges</li> </ul>	<ul style="list-style-type: none"> <li>• Number of electric devices damaged</li> <li>• Total estimated loss of damage of energy infrastructure</li> <li>• No of days with power failure</li> </ul>	<ul style="list-style-type: none"> <li>• Policies/Strategies and Plans to address disasters including flood (E.g. SoD, DMA, BCCSAP and so on)</li> <li>• No of projects/programmes to deal with flood inundation</li> <li>• No of training/awareness campaign on energy</li> <li>• Flood forecasting and early warning received by the no of HHs</li> <li>• No of HHs with Solar Homes System (SHS)</li> </ul>

**Note:**

Some of the common general indicators can be included in a separate list in the same format. That may include indicators related to gender, policy, institutional capacity, education, media and awareness.