Risk Management Approach: as applied to Energy Sector

The stakeholders identified included:

- Utility companies
- Independent Power Producers (becoming increasingly important in the region)
- Government
- Consumers (general public, business, industry)
- Fuel suppliers

Forms of energy generation for the region were:

- Fossil fuel dependent generation
- Hydroelectricity
- Use of biomass (eg. Wood fuel, charcoal, bagasse)

Some generalizations made for the region:

It was generally recognized that many fossil fuel dependent plants and fuel storage facilities are located in the vulnerable coastal zone area in many countries of the region.

Hydro plant energy supply is supplemented by fossil fuels

Biomass used as a fuel supply is generally found inland (eg. Bagasse from sugar cane, fire wood; charcoal production areas).

		Aspect of Climate Change					
Risk Management Step	**Example Issue**	**Mean Sea Level Rise (5 mm/yr)**	**Mean rise of approx. 2^{o}C In Temperature**	**Cbbean Precipitation (Drier Winters/Unchanged Summers)**	**Increased Hurricane Intensity**	**Increase in Frequency of Heavy Convective Rainfall Events**	**ENSO (drier conditions for region**
INITIATION	**DEFINE PROBLEM AND RISK ISSUES (HAZARD CHANGES FROM YR 2000)**	(i) Coastal inundation (ii) increase in flood plain area (iii) Coastal erosion (iv) Saline intrusion	(i) heat waves, incl. Diminished nocturnal cooling	(i) Decreased rainfall	(i)increased wind intensity (ii) flooding; and other forms of water damage	(i)increase in flooding (incl. flash flood) (ii) landslides and erosion	(i)Decreased rainfall

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PRELIMINARY ANALYSIS	**IDENTIFY HAZARDS USING RISK SCENARIOS (VULNERABLE SECTORS, PEOPLE AND RESOURCES)**	(i)Loss of generating capacity (ii) Loss of distributive capacity (iii) Loss of market For fuel suppliers, loss of ability to provide storage	(i) Increased demand, due to increased nocturnal demand (ii) Increased temps can in some cases decrease biomass (eg sugar cane)*	(i)decreased water availability for hydro and cooling Dry winter coincides with increased demand from tourist winter arrivals. *	(See Mean SLR) (eg. Via siltation of hydro works; downed lines *	(See Hurricane Intensity) *	(i)Reduced biomass availability (ii)Decreased water availability for hydro and cooling

* A decrease in availability of biomass can be expected for all aspects of climate change, except mean sea level rise. This can correspond to a loss of independent generating capacity.

		Aspect of Climate Change					
Risk Management Step	**Example Issue**	**Mean Sea Level Rise (5 mm/yr)**	**Mean rise of approx. 2^{o}C In Temperature**	**Cbbean Precipitation (Drier Winters/Unchanged Summers)**	**Increased Hurricane Intensity**	**Increase in Frequency of Heavy Convective Rainfall Events**	**ENSO (drier conditions for region**
RISK EVALUATION	**ESTIMATE POTENTIAL CONSEQUENCES OF HAZARD CHANGES**	(i)Loss of insurance coverage (ii)Loss of revenue (iii)Increased maintenance and operational cost (iv)Increased investment cost	(i) Increased investment cost (ii) Increased operating cost (iii) Potential increased revenue for utility and fuel supplier (iv) reduced supply of biomass can also result in loss of income	In case of hydro:- (i)increased cost of electricity for consumer (ii)increased operational cost Also: reduced supply of biomass may lead to loss of income	See Mean SLR Also: reduced supply of biomass may lead to loss of income	See Mean SLR Also: reduced supply of biomass may lead to loss of income	See Cbbean Precipitation Also: reduced supply of biomass may lead to loss of income

It should be realized that a loss of power also has HEALTH implications: poor back up power supply at critical service institutions can result in loss of life (eg. Within health care institutions); and loss of power to water pumping stations for an extended period also critical!

		Aspect of Climate Chan					
Risk Management Step	**Example Issue**	**Mean Sea Level Rise (5 mm/yr)**	**Mean rise of approx. 2°C In Temperature**	**Cbbean Precipitation (Drier Winters/Unchanged Summers)**	**Increased Hurricane Intensity**	**Increase in Frequency of Heavy Convective Rainfall Events**	**ENSO (drier conditions for region**
RISK EVALUATION	**ESTIMATE WHETHER RISKS HIGH, MEDIUM OR LOW**	HIGH	MEDIUM	LOW-for fossil fuel dependent situation HIGH- for hydro	HIGH	MEDIUM	

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RISK CONTROL (CONT'D): COMMUNICATIONS AND OUTREACH (NEEDS AND METHODS)

RISK CONTROL (CONT'D): COMMUNICATIONS AND OUTREACH (NEEDS AND METHODS)(cont'd)

ACTION AND MONITORING: WHO TAKES CHARGE OF THE IMPLEMENTATION PLAN?

GOVERNMENT ***MUST*** take the lead in all cases.

However:

- ✓ Cross-Sectoral cooperation CRUCIAL (use of NGO's, various sectors of Civil Society partner with private/business sector)
- ✓ Regional Climate Centre should certainly play a part
- ✓ Community groups must also be involved