



## Combating climate change impact

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population of 270,000, is considered to be highly vulnerable to the effects of climate change - from agricultural impacts to the destruction of its coastal ecosystems.

However, this small nation has taken big steps to reduce its climate impact and to provide clean, renewable energy - as well as opportunities for green economic growth - to its people. Among other things, Barbados has pledged to increase the share of renewable energy across the island to 29 percent of all electricity consumption by 2029. This would cut total electricity costs by an estimated USD 283.5 million and reduce CO2 emissions by 4.5 million tonnes, according to the government. It is estimated that Barbados' tourism sector, which contributes about 15 per cent of the island's Gross Domestic Product (GDP), and its sugar industry, which contributes about 2 per cent, could both be severely affected by changing weather patterns.

In response to such threats, Barbados has made "Building a Green Economy: Strengthening the Physical Infrastructure and Preserving the Environment" one of six concrete goals built into its National Strategic Plan (2006-2025).

"Small Island Developing States the world over are facing a host of risks related to climate change, from temperature increases that nega-

tively affect agriculture to sea level rise that threatens the very existence of some nations," said UN Under-Secretary-General and UNEP Executive Director Achim Steiner.

"Barbados has put conservation and the transition to an inclusive green economy at the heart of its national strategy. Through this framework, it has enacted a number of proactive, concrete measures to combat climate change, including incentives that support one of the island's fastest growing sectors - solar power.

"As the host of WED, Barbados will have the opportunity to showcase these initiatives and to act as an example for countless Small Island Developing States facing similar challenges. The country has shown tremendous leadership and political will, proving that the transition to a green economy is possible - even in countries facing the greatest threats - when robust environmental policy is translated into action on the ground," he added.

Solar water heaters are now a widely used renewable energy technology in Barbados, with installations in nearly half of the island's dwelling units. In 2002 alone, Barbados saved 15,000 metric tons of carbon emission and over USD 100 million in energy savings from the 35,000 solar hot water systems that had been installed at the time. The solar water heater use is one of the

highest in the world.

More recently, the Barbadian government has implemented several plans to further stimulate the use of solar electric systems. For example, from the US\$5,000 allotted per year under the 2008 modified Income Tax Allowance for Home Improvement, up to US\$ 1,000 can be used for energy audits.

The import duties on renewable energy electricity systems and VAT have been reduced to zero and companies involved in the development, installation or manufacturing are eligible for a 10-year tax free holiday.

Financial incentives for manufacturers, such as the provision of low-interest loans, may further serve to assist the diversification and growth of the solar water heater industry.

In 2012, Barbados and UNEP launched the Green Economy Scoping Study - Barbados Synthesis Report, which was designed to identify challenges and opportunities in the island's transition to a Green Economy, and to accelerate that transition.

Projects and events in Barbados to celebrate WED will take place over five days. They will focus on climate adaptation technologies, busi-

ness, sustainable resource management, protected areas, schools and Barbadian local culture, as well as spotlighting challenges and opportunities facing Small Island Developing States around the globe.

The United Nations Secretary-General Ban Ki-moon in his message on the occasion of world environment day 2014 said, "Small island nations share a common understanding that we need to set our planet on a sustainable path. This demands the engagement of all sectors of society in all countries. On World Environment Day, millions of individuals, community groups and businesses from around the world take part in local projects - from clean up campaigns to art exhibits to tree-planting drives. This year, I urge everyone to think about the plight of Small Island Developing States and to take inspiration from their efforts to address climate change, strengthen resilience and work for a sustainable future. Raise your voice, not the sea level. Planet Earth is our shared island. Let us join forces to protect it".

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## Rising sea level: Emerging threat to human security

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of 0.25 to 1.00 mm yr<sup>-1</sup> during 1971-2010. Based on tide gauge records and satellite data since 1993, it is estimated that GMSL has risen by 0.19 m over the period 1901-2010 and the likely mean rate of sea level rise was 1.7 mm yr<sup>-1</sup> between 1901 and 2010. And the rate was very higher at 3.2 mm yr<sup>-1</sup> from 1993 to 2010. It is also projected in the AR5 that GMSL rise for 2081-2100 (relative to 1986-2005) will likely be in the 5-95% ranges.

Rising sea level, however, in conjunction with storm surges, flooding and erosion, acts as a threat multiplier to low-lying Small Island Developing States (SIDS) of the tropics and the subtropics which are home to more than 63 million people and places of outstanding natural beauty, rich ecosystems, biodiversity and dazzling landscapes. These island states include Vanuatu, Tuvalu, Samoa, Tobago, Tonga, Mauritius, Suriname, Maldives, Kiribati, Jamaica, Dominica, Barbados, Bahamas, Cape Verde that span the ocean regions of the Pacific, Indian, and Atlantic etc.

Recent estimations indicate that the small island states are badly experiencing annual or

frequent flooding, inundation, beaches erosion, salinization of freshwater aquifers, damage to coastal infrastructures and ecosystems due to global sea level rise that undoubtedly jeopardizes human security and long-term sustainability. The islanders face considerable challenges to guarantee of material aspects of human security including access to alternative livelihoods, food security, housing, clean water, employment, health safety, and poverty alleviation. Furthermore, rising sea level and extreme events threaten to erode and engulf significant land areas and associated infrastructures and settlements of small island states.

Human security of island states is punctured by sea level rise and a range of extreme events such as tropical storms, sea surges, hurricanes, droughts, etc. Water supply is likely to be affected by these extreme events. Reduction in rainfall is likely to shrink surface and ground water availability whereas increased rainfall particularly in the form of torrential downpours is likely to produce landslides, beaches erosion, and damage of residential and commercial areas. Water scarcity will badly affect the viability of food and cereal production of

small island states. Moreover, loss of land and growing beach erosion directly affect the countries' tourism sectors on which their national economy depends. It is estimated that, for instances, 45% of tourist resorts in Maldives face varying degrees of beach erosion and projected sea level rise would aggravate the current conditions, and rise by 1 m would even cause disappearance of entire Maldives. All human settlements, infrastructures and industries are close to shorelines that are often adversely affected by extreme climatic events, and the projected sea level rise even poses a decisive threat to the existence of these infrastructures.

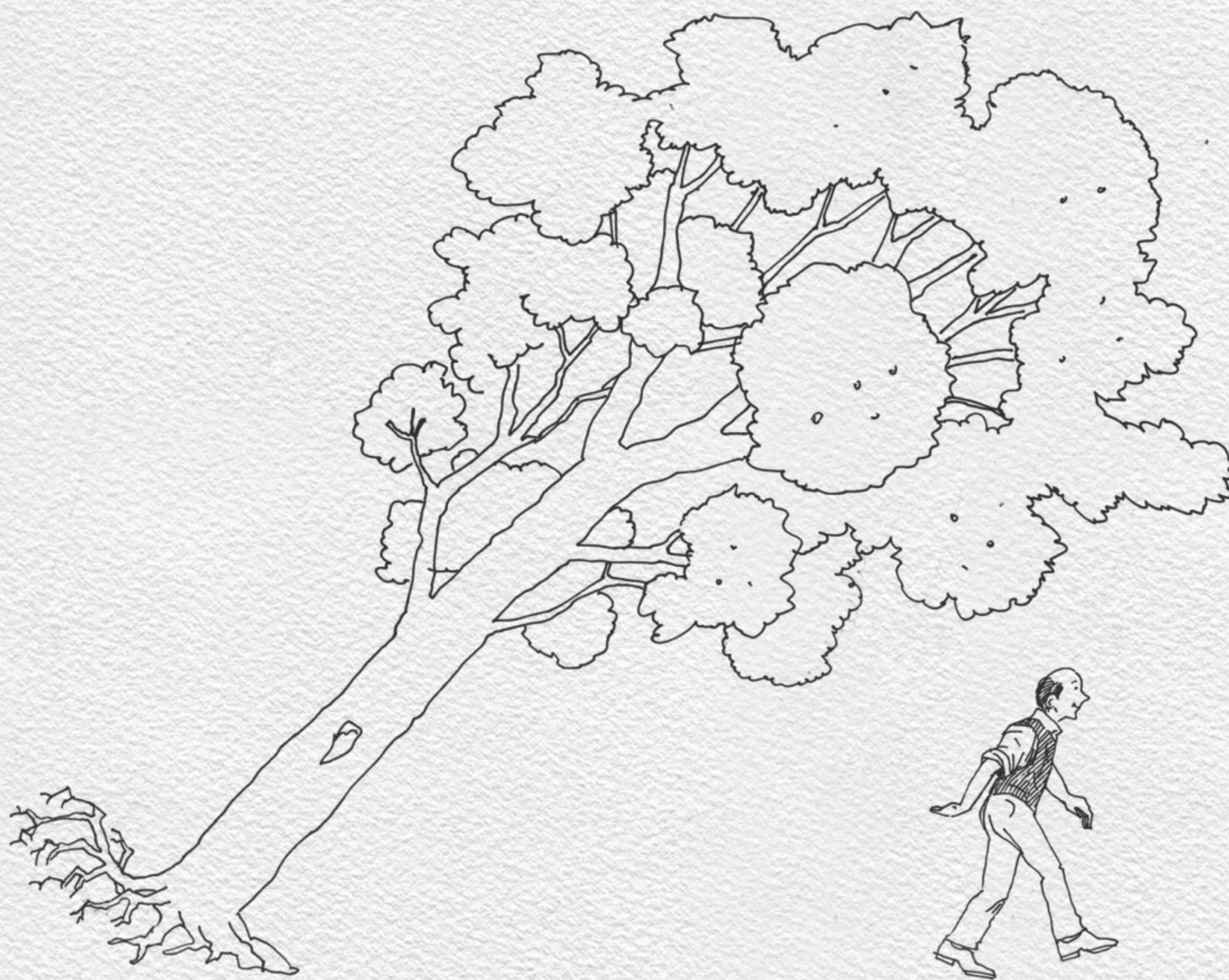
Coral reefs provide not just natural protection to islands but are also associated with main economic success like tourism, fisheries and local livelihood activities. It is expected that survival of coral reefs would be badly staked by rising sea level, and sea surface temperatures. The emerging threats to beaches, reefs, infrastructures, biodiversity and natural beauty of resort island countries would cause fall of tourism industries on which their state economy predominantly relies. The vulnerability of agricultural production and crisis of

locally grown foods within islands might increase dependency on imported food items and threaten food security of island dwellers. Besides, poor sanitation of rural island communities would be affected by increasing rainfalls that might cause waterborne diseases like diarrhea. Present state of health services and facilities would simply be inadequate if weather related diseases aggravate.

For Bangladesh, IPCC warned in the Third Assessment Report (TAR) of 2001 that 29,846 sq. km area of coastal land particularly Hatia, Sandweep, Maishkhali, St. Martin, Bhola and southern coasts will be lost, and 14.8 million people will be landless by 1-m sea level rise. Land loss expedites loss of agricultural fields, homesteads, infrastructures, biodiversity, communication and lifeline services etc. In 2001, the World Bank cautioned that the Sundarbans will be completely destroyed by 1-m sea level rise and life and livelihoods of forest dependent people will be jeopardized. The longest sea-beach and tourist site of Cox's Bazar being highly exposed to anticipated sea level rise, might be destroyed.

Similarly, Kuakata and Patenga beaches are extremely vulnerable to projected rise that threatens country's tourism industry as all facilities are close to coastlines. Some decisive impacts of sea level rise for the people of Bangladesh are extreme salinity concentration in soil and water, damage of habitation and forests, fresh water crisis, eroding beach and coastal land, acute health hazards, loss of fisheries, agriculture and biodiversity etc. The World Bank projects that rice production would decrease by 0.2 million metric tons for salinity intrusion resulted from sea level rise. Thus, rising sea level might be an emerging threat to human security as well as for all living beings. So, "Raise Your Voice: Not Sea Level" is the motto of World Environment Day 2014. That is raise your voice against harmful emission that cause global warming melting glaciers and ice caps as well as polar ice sheet leading to sea level rise to the peril of Small Island Developing States, among others.

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