Bangladesh will NOT completely disappear under water by 2100

Sea level rise in some tidal stations in the Bangladesh coast are: Hiron Point: 4 mm per year; Char Changa: 6 mm per year and Cox's Bazar: 7.8 mm per year, as reported by the Saarc Meteorological Centre in Dhaka. Regional variability of the rates of rise is due mostly to non-uniform changes in temperature and salinity, and is related to changes in ocean circulation.

M. MONIRUL QADER MIRZA

ANGLADESH is a flat deltaic country where 80% of the land is less than 12 metres above sea level. Coastal southern Bangladesh is mostly at sea level. Because of the geographical setting and physical characteristics, the country is regularly inundated by riverine and coastal flooding.

Climate change will make the country highly vulnerable to sea level rise, intense cyclones and storm surge flooding. A recent special report entitled "Bangladesh is set to disappear under the waves by the end of the century" by Johann Hari, published in the British daily Independent, has drawn significant attention around the world. It has sent a shockwave through the people, scientists and policy-makers, in Bangladesh.

However, will Bangladesh completely disappear under water by 2100 as claimed in the Independent, which cited National Aeronautics and Space Administration (Nasa)? This issue deserves discussion in the context of the findings of the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) that was released in 2007, and the scientific developments that have taken place since then.

Causes of sea level rise

Sea level varies from temporal to spatial scales. For the inhabitants of coastal areas, relative sea level -- the level of the sea surface in relation to land -- is important. Relative sea level can change through vertical movement of the land or through a change in ocean level.

Vertical movement can occur due to tectonic activities and balance between deltaic subsidence caused by massive weight of sediments, and due to the accretion of land as additional sediments are deposited in the coastal areas. Changes in sea surface topography can occur in the shortest timescales due to tidal and meteorologicalphenomena.

Sea level changes are recorded by tide gauges. The relative sea level at a gauge may show long-term changes due to the vertical motion of the gauge, circulation of the ocean, or change in the volume of the ocean, which is caused by melting of ice masses, and warming of the ocean and its thermal expansion. As the ocean warms, the density of water decreases and volume increases. This is called "oceanic thermal expansion." There are three variables in ascertaining the rate of thermal expansion. They are:

changes in the heating of the climate system, the sensitivity of

climate, and the rate of heat uptake

Sea level changes in the recent past

by the oceans.

According to the IPCC, recorded sea level changes show evidence of onset of sea level rise during the 19th century. Estimates for the 20th century show that average sea level rise was at a rate of about 1.7 mm per year. Satellite observations available since the early 1990s provide more accurate sea level data with nearly global coverage.

This decade-long satellite data set shows that, since 1993, sea level has been rising at around 3 mm per year. However, sea level is not rising uniformly around the world. In some regions, the rates are up to several times the global mean rise, while in others sea level is falling.

For the past decade, sea level rise has been the highest in the western Pacific and eastern Indian oceans. Sea level rise in some tidal stations in the Bangladesh coast are: Hiron Point: 4 mm per year; Char Changa: 6 mm per year and Cox's Bazar: 7.8 mm per year, as reported by the Saarc Meteorological Centre in Dhaka. Regional variability of the rates of rise is due mostly to nonuniform changes in temperature

and salinity, and is related to changes in ocean circulation.

What factors contributed to the observed sea level rise? As per IPCC's 4th Assessment Report, among the measurable factors, glaciers and ice caps were found to be largest contributors, for example, from 1961-2003, there contribution was estimated to be 28%, followed by thermal expansion (23%). But for the decade 1993-2003, contribution of thermal expansion was much larger (52%).

Future sea level projections of the IPCC

In its 4th Assessment Report, the IPCC projected that global sea level rise would be in the range of 18 cm to 59 cm by 2100, depending on a range of greenhouse gas emission scenarios. This projection is relative to 1980 1999, and excludes carbon-cycle feedback and future rapid dynamical change in ice flow because of lack of published literature. This is an emerging science. However, Nasa scientist Dr. James Hansen disagrees with the IPCC findings and says that it had addressed "a portion of the

2100: Doomsday for Bangladesh?

The Independent article is partly based on two recent publications of Dr. Hansen, where he discussed the limitations of the IPCC's business as usual (BAU) projection of sea level rise. According to him, the most important component left out was the disintegration of ice sheets in Greenland and West Antarctica. But the IPCC considered 10-20 cm

additional sea level rise because of ice sheet melting.

However, this has not been integrated in its sea level rise projections. Dr Hansen's concerns have been addressed differently by the IPCC. It states: "Larger values cannot be excluded, but understanding of these effects is too limited to assess their likelihood, or provide a best estimate or an upper bound for sealevelrise."

According to Dr. Hansen, the warming by 0.7oC has already produced summer melting in Greenland and West Antarctica. He says: "Global warming of several more degrees, with its polar amplification, would have both Greenland and West Antarctica bathed in summer melt for extended melt seasons." Dr. Hansen further says that until the past few years, contribution from ice sheet disintegration was insignificant, but it has doubled in the past one decade (1995-2005) and is close to 1 mm per year. So if 10 mm contribution from the ice sheets for the decade 2005-2015 doubles in every decade, by 2100 sea level rise only from the melting of ice sheets would be 5 metres.

an assumption and there is no concrete reasoning to back it up. In this regard, Dr. Hansen says: "Of course I cannot prove that my choice of a ten-year doubling time for non-linear response is accurate, but I am confident that provides a far better estimate than a linear response for the ice sheet component of sea level rise under BAU scenario." So, in order to verify Dr. Hansen's "ten-year doubling" assumption, we need to wait a

This estimate is based only on

Loss of land due to future sea level rise in Bangladesh (1m and 3m)

couple of more decades.

The scary part of the Independent article was 25 metres sea level rise and complete disappearance of Bangladesh. Johann Hari wrote: "[A]nd found that many climatologists think the IPCC is way too optimistic about Bangladesh. I turned to Professor James Hansen, the director of Nasa's Goddard Institute for Space Studies, whose climate calculations have proved to be more accurate than anybody else's. He believes the melting of the Greenland ice cap being picked up his satellite today, now, suggests we are facing a 25-metre rise in sea levels this century -- which would drown Bangladesh entirely."

Note that the IPCC report has not considered Bangladesh exclusively, although it has appeared in many instances because of its special geo-physical characteristics and its future vulnerability to



The plan is to remain on the surface.

climate change and sea level rise.

Sea level rise: Implications

for Bangladesh Because of the flatness of the country, for any given magnitude of future sea level rise, the impacts could be devastating. IPCC's Third Assessment Report published in 2001 projected 11% inundation for a 45 cm sea level rise. However, the inundated area may be doubled for a 1 metre rise (Figure 1). Another study conducted by the Institute for water Modeling (IWM), Dhaka, shows intrusion of seawater up to Chandpur, about 80 km upstream from the estuary. With a 32 cm sea level rise, 84% of the Sundarbans (a

Unesco Heritage Site) would be mostly inundated by 2050, and the entire Sundarbans may be lost in a one-metre rise. In Bangladesh, the impact of sea level rise on land and water, crops, livestock, human health and livelihood would be significant. It is, therefore, necessary to formulate and implement appropriate adaptation measures under a long-term plan.

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Women want more than words

The path of growth-oriented development from household to state is very much linked to gender inclusiveness, as shown by our garments sector. The women of Bangladesh will not be happy with only sweet talks around gender sensitivity, but reflection of government's commitment in the budget and programs in implementing National Women Policy towards women's empowerment is the key to sustained growth.

SHAMIMA PERVIN

HE finance advisor termed the budget of 2008-2009 as gender sensitive, and said that gender expenditure would rise from 23.5% to 26.3% in the budget. The budget increased the beneficiary coverage under Allowances Program for the Widowed, Deserted and Destitute Women, Old Age Allowance, and the Vulnerable Group Development (VGD) Program.

new pilot program named "Allowance for Poor Lactating Mothers." The advisor also said that the government had prepared a document titled "National Women Development Strategy," and put in place a set of policies to make overseas employment of Bangladeshi women workers safer and well-regulated.

The government has planned to recruit 60% female teachers in the primary schools. A committee titled "Women in Development"

development seems very encouraging and praiseworthy.

However, the budget does not reflect how 26.3% of the budget will be allocated for genderrelated expenditure. It requires clarification as this year's development budget is smaller than the non-development budget, and The government will launch a women's share in the revenue budget is minimal as they constitute a small part of the governmental staff. Women could be more benefited from this sector if 60 % of the primary school teachers were females, in line with the policy of affirmative action in recruitment.

Nonetheless, the percentage of female teachers in government primary schools is only 37%. The advisor was mum about increasing the number of women, though the 60% quota has been reserved for

(WID) is at work to monitor the women for a long time. As a whole, implementation of National there was a lack of emphasis as to Action Plan for Women what the women would do after Development. This long list of completing their education. Job benefits for gender inclusive oriented training and enterprise development initiatives should be undertaken to solve this problem.

> Despite demand from the women's movement to follow the National Women's Development Policy to ensure women's integration in the national development process, the government kept silent since different groups staged demonstrations in front of the Baitul Mukarram National Mosque protesting against the proposed National Women Development Policy and demanding its withdrawal. This caretaker government might utilise the policy framework to distribute gender related expenditure.

In this budget the government plans to create job opportunities for 20 lakh unemployed poor under a new program titled "100 Days Employment Generation." The rural unemployed poor across the

country will get work for at least 100 days during the whole year, particularly during mid-October to mid-January and mid-March to mid-May periods. At this initial stage there must be a clear strategy to benefit women, particularly widowed or deserted women, through these initiatives as they face barriers in accessing both the formal and the informal labour markets and suffer wage discrimination.

Similarly, the government should spell out a strategy to reduce gender inequality in vocational institutions to be set up in monga-prone areas, as proposed in the budget. The advisor did not report any progress regarding setting up of three new polytechnic institutes for women proposed in a previous budget.

Increasing the existing number of women beneficiaries under different safety net programs is not enough. Reaching the vulnerable, the marginalised and the excluded is a real challenge as the number of beneficiaries is more than the targeted number, andleakage in allocating these fund is recognised by all.

Ensuring Poor Lactating Mothers' health though cash support is going to be toughest job on earth as, culturally, women hardly have any control over the household resources or the benefit they receive from elsewhere. The NGOs, which provide food to

lactating and pregnant mothers have observed men take at least an equal share from the food. So it requires complementary arrangements to monitor lactating mothers' weight and wellbeing.

Benefiting women under Rural Employment and Road Maintenance Program (RERMP), Rural Employment Opportunities for Public Assets (REOPA), Maternal Health Voucher Scheme (MHVS) and Community Nutrition Programs (CNP), allowance for the Insolvent Persons with Physical Disability, Stipend Program for the Disabled Students, Housing Fund for the Homeless, Fund for Climate Change are equally challenging. All these programs must have clear sex disaggregated beneficiary assessment to benefit women.

No separate/special attention has been given to women in general sectors like agriculture, industry, health, power and energy, transport, rural development etc. There is no recognition that women are equal stakeholders in these sectors. Women have been individually/specially considered only in the education and social security sectors.

We welcome government initiatives to promote women entrepreneurship through commencing SME Foundation's credit operation to provide credit to the SME entrepreneurs at a low rate of interest.

However, the poor and extreme poor women are not eligible for SME fund, though they are involved in the product market and showing their creativity by making small products.

To get involved in the growth process they require assistance. With this small note, I would like to say that women should not be relegated to the category of dependent poor, and the government's role should not be limited to only bringing them under a safety net program. Rather, they need to be considered as economically active and included in the growth process, otherwise poverty alleviation would be a far cry.

The path of growth-oriented development from household to state is very much linked to gender inclusiveness, as shown by our garments sector. The women of Bangladesh will not be happy with only sweet talks around gender sensitivity, but reflection of government's commitment in the budget and programs in implementing National Women Policy towards women's empowerment is the key to sustained growth.

(The opinions expressed here are of authors, the views expressed here no way reflect the views of the organisation where she is employed now.)

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prayed for, plus

a lawsuit

Watachi

LL over the world, highly trained newspaper L columnists ("good-fornothings") spend long hours every day doing research, which is a combination of finely-honed skills: reading, making phone calls, staring into space, and drinking themselves into a stupor. They seek interesting, original "source material, which is journalistic jargon for "something I can copy out so I can go home."

But not this column. With its huge network of well-connected readers, this is a partnership, with each side having its own clearly defined function. You do the work. I get the money.

Religious devotees were outraged when a businessman opened a bar right opposite their temple in a small town in India, I

heard from reader Pola Singh. They were horrified at the idea of people gathering to drink and eat and sing and fall over in a place just a few meters away from a site where people did sacred, religious things, such as gathering to eat and drink and

sing and fall over. So temple monks led the congregation in a campaign against it. They prayed. They beseeched their idols. They

burned vast amounts of incense. Had the gods heard them? Apparently not. The grim day came when the bar was complete and almost ready to open for business.

That night, there was a huge storm. There was a bright flash. Lightning struck the bar and burned it to the ground.

The following day, temple devotees, strolling to worship opposite a pile of ashes, were naturally rather smug. Until the bar owner filed a lawsuit suing the temple and the congregation for being "directly or indirectly responsible" for the destruction credit, go to www.vittachi.com.

of his property.

Temple leaders quickly denied that any of their actions had any connection whatsoever to the sudden and dramatic demise of the building opposite.

The argument ended up in court. The judge examining the case said: "I don't know how I'm going to decide this case. But it appears from the paperwork, we have a bar owner who believes in the power of prayer, and we have an entire temple and its devotees who don't."

This story teaches us an important principle to live by. Be careful of what you wish for, as its previous owner may have a lawyer.

A reader told me about one man who recently did receive what he wished for. A night-shift taxi driver named Shen was sitting in his car in Huainan, China, praying for a passenger at three o'clock in the morning.

One appeared. "He had a lot of home appliances, so I helped him put all of his things into the cab," Mr. Shen later told the Xin'an Evening Post. "I noticed he had a fish without a tail, and I thought how much it looked like the fish in my freezer at home. But then I laughed at myself for even having the thought." There are probably thousands of people who go out for a walk with a fish at 3 am in

Huainan city. The taxi driver later returned home to find a burglar had broken into his house and helped himself to all the home appliances, plus the tail-less fish he'd saved for dinner. The well-organised villain had everything but a getaway car, which Mr. Shen had thought-

fully provided. This leads us to a fascinating conclusion: I can now go home.

For other stories for which our columnist takes

Tiger Woods takes a forced hiatus

LETTER FROM AMERICA

Woods, who had reconstructive surgery on June 24, should be back in time for next April's Masters. Currently, Woods (14) trails Nicklaus (18) by four in Major wins and eight (65 to 73) in PGA Tour wins. Jack Nicklaus won his last Major, the Masters in 1986, at the age of 46. Woods is only 32.

FAKHRUDDIN AHMED

MERICA will elect a new president before Tiger Woods, the world's most recognisable face and the best athlete, tees off again. On June 18, Tiger Woods announced on his website that he was "shutting it



A true winner stands firm,

der of the year, to repair three injuries to his left leg.

Although Woods, 32, is now barely in mid-career for a golfer, many sports writers are already saying that he has surpassed boxing and basketball legends Muhammad Ali and Michael Jordan respectively to become the greatest sportsman

now fans will be citing the US Open Golf Championship of 2008, which Woods won on one good leg, as the proof.

Tolerance of pain is a prerequisite for success in sports. Ask any runner and he/she will tell you that pain floods through the body as they approach the finish line; the cham- three life time Grand Slams. pion runs through it fastest.

sonal experience that a marathoner (26.2 miles) "hits the wall" at mile

down" in midseason for the remain- tells the runner, "I have no idea what you are doing; I quit;" but the successful runner continues to the finish. What Woods had to overcome at the US Open was far more than just pain. He was lame.

Woods was suffering because of an unhealed wound from a cartilage operation two months ago, a left knee missing an anterior cruciate ligament (ACL) which he damaged They predict that fifty years from last July while running, and two stress fractures of his left tibia which he suffered two weeks before the US Open. So what does he do? Wincing and grimacing after every shot, he beats the best golfers of the world on one good knee, wins his 14th major Championship, and joins Jack Nicklaus as the only golfer to win

In his book, How I Play Golf, The writer can testify from per- Woods describes how he used to deliberately "snap" his left leg through impact. It is more than 20, when the body shuts down and likely that such an action, especially

over a sustained period and given the number of balls Woods routinely hits, caused the initial damage to the

"That was really what made Tiger decide to change his swing," reveals Hank Haney, his swing coach. "One of the first things he told me was that the knee snap he had worked on had to go, because it was hurting his knee."

more efficient swing, the pain in the his mind. He has no ACL and a knee had never really gone away, as broken leg and he's going to play in Woods confirmed this past week the US Open in three weeks? His when he looked forward to being 100% fit for "the first time in a decade."

be the ACL rather than cartilagerelated. Although Woods could walk forward with little discomfort, any kind of twisting brought with it sharp pain.

enormous strength in his hamstrings and quads. They were compensating for the problem in his ACL. Just to add to the difficulties, the stress fractures in Tiger's left tibia were discovered during his limited preparations for the USOpen.

return better than ever. "So now he has no ACL and a this point. He doesn't have any

three weeks and that it would take six weeks to heal.

"We asked if he could do more damage by playing in the US Open. And he couldn't, given that the ACL was gone already. But the doctor told him the pain would be incredible. As soon as the doc said that, Tiger told him he was going to play in the US Open and that he was Even with a markedly new and going to win. I thought he was out of reaction was, 'let's go practice'."

Struggling to walk, Woods had to play not 72 but 91 holes, not four but The real problem turned out to five days, walking seven miles on the course every day. Despite all of the above, Woods went on to fulfill his prediction and win, a feat comparable with the 1950 victory of Ben Hogan, only 16 months after nearly What was saving him was the losing his life when a bus careered into his car. It was little wonder that, in the immediate aftermath of victory, Woods called this his "greatest ever win."

Haney is confident that Tiger will

"Tiger has to think long-term at broken leg," says Haney. "I asked the choice. He needs to get his strength doctor what the normal protocol is back. I don't think he was at 50 for someone in this situation. He percent strength at the start of last said Tiger would be on crutches for week. And it went down every day.

Eventually, he would just shut down and not be able to play at all.

"He thought he could make it through the year. But he can't. The good thing is he'll come back better than brand new. There are two ways to fix what he has. You can put in a ligament from a cadaver. Or you can graft in part of the hamstring to make another ACL. Both involve about six to eight months' recovery. And you are at your weakest at three to five months. So there is no way to rush it. It doesn't matter how much he works out.

"In three months he can start putting. But the twisting involved in the full swing will take longer. I'm still in shock that he won. I can't believe it. To play with that kind of injury is incredible enough. But to win is off the charts. He knows it too. It has to be his biggest accomplishment so

Woods, who had reconstructive surgery on June 24, should be back in time for next April's Masters. Currently, Woods (14) trails Nicklaus (18) by four in Major wins and eight (65 to 73) in PGA Tour wins. Jack Nicklaus won his last Major, the Masters in 1986, at the age of 46. Woods is only 32.

Dr. Fakhruddin Ahmed is a Rhodes Scholar and a Daily Star columnist.