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One Trillion Tons: The Iceberg, Antarctica and Climate Change

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The second week of July 2017 saw an event that can only be described as a 'mammoth moment' taking place, as a trillion ton iceberg broke off from western Antarctica. The size of the iceberg has been pegged at more than three times the size of the greater London area. Scientists who had been monitoring the progress of a crack nearly 100 miles long in an ice shelf in western Antarctica had been anticipating the break and the iceberg was finally reported to have broken off on July 12, 2017.

Dramatic as the event itself seems, it is important to assess the effects of the breaking off of such a large mass of ice on the seas surrounding this area and to also try and understand if climate change and the attendant global warming is responsible for this occurrence. The common perception is that if something so large, so dramatic has occurred, especially in the contemporary world where numbers- and big ones at that- never fail to impress, then so must be its implications. To view this phenomenon holistically, it is important to understand what happened and how it happened.

Antarctica is the southernmost continent and is situated at the South Pole. The size of the continent is approximately 14 million square kilometres, where temperatures dip to -90 deg Celsius and wind speeds at times exceed 300 kmph. A less known fact is that it is the world's highest continent with an average land height of 2.3 km. All these facts apart, what is more of interest and consequence is that Antarctica is almost completely covered with a sheet of ice. The trillion ton iceberg broke off from an ice shelf, known as the Larsen C ice shelf in western Antarctica. This ice shelf happens to be the northernmost major ice shelf of the continent and is situated at the edge of western Antarctica. The shelf is around 1100 feet thick. North of the Larsen C are the Larsen B and Larsen A ice shelves. So is it odd that such a large iceberg has just broken off in the Antarctica? The Larsen A ice Shelf, which is furthest north, collapsed in 1995 while the Larsen B ice shelf disintegrated in

2002. The iceberg which has now broken off from the Larsen C ice shelf, was confirmed to have broken off between July 10 and July 12, 2017 by NASA's Aqua MODIS satellite. While the break off is normal behaviour for ice shelves, what is of note is its size- approximately 5,800 Sq km or over 2,200 Sq miles. The iceberg named A68, while said to weigh more than one trillion tons is not the largest iceberg or for that matter anywhere close to being the biggest. In fact, the largest iceberg recorded, the B15, with an area of 11,007 square kilometres, about double the size of the Larsen C iceberg and as big as the island of Jamaica, calved off the Ross ice shelf in 2000.

So is climate change responsible for this trillion ton chunk of ice breaking off? The calving of bergs at the forward edge of the shelf is a very natural behaviour. The breaking away of icebergs is one of the means for the shelf to maintain equilibrium against the inflow of ice from feeding glaciers on land and from snowfall mass. Scientists from Project MIDAS who had been monitoring the break in the Larsen C ice shelf believe that this is part of the normal behaviour of ice shelves though its size is what makes it unusual. The team of researchers also have not yet found 'any link to human-induced climate change.' However, there is no denying that climate change and global warming are affecting the environment and thus this event should not be seen in isolation.

Climate scientists are also looking into how the Earth's Albedo fluctuates over a period of time. White surfaces like snow on glaciers reflect the solar rays while darker ones like oceans are more absorbent. On the whole, about 30 per cent of the energy coming to earth is reflected back into space. Albedo is a ratio which describes how much of solar energy any given surface reflects. A warming climate would result in glaciers shrinking and sea ice melting, thus reducing the reflecting surface and increasing the absorbent surfaces, as darker and greater heat absorbing surfaces would now be exposed. A reduction in the albedo would disrupt the balance and cause an even faster heating up of the planet. Pollution also has a role to play as deposits on ice sheets would darken them allowing more absorption. However, it would be prudent to mention that as regards the Larsen A and B ice shelves that disintegrated earlier, there is a view that warming climate very probably played a part- but also that the signs like thinning that were observed at Larsen A and B have not been seen in Larsen C, as yet. Glaciologists are largely of the view that while there is currently no cause for worry, monitoring will have to be done to keep a watch on the stability of the shelf and its calving rate.

As regards a rise in the sea levels, the common perception is that the creation of such an inordinately huge iceberg would result in an increase in sea levels. This is a

misconceived notion. And this is why. Ice sheets become icebergs when they separate from the land mass and become free floating. However, ice shelves float on water and as the sheet of ice was floating before it became an iceberg- there would be no change in the sea levels. Thus, the iceberg is unlikely to immediately contribute to any rise in sea levels. However, on a cautious note, the rate of melt in the polar regions would need continuous monitoring to assess the impact of climate change in the years to come.

Finally, would the iceberg pose a threat to shipping? The 200 metre thick iceberg is not expected to move very far in a short span of time. However, it could under the influence of currents and winds, move northwards perhaps even to the South Atlantic. Incidentally, many icebergs from this region have ended up around South Georgia, a British overseas territory in the South Atlantic. And unlike in the days gone by of the 'Titanic' and others, there is but a slim chance of the berg posing a threat at sea as the availability of satellite imagery and advanced navigation systems would by and large preclude iceberg collisions.

While climate change may not have been directly responsible for this event, it is a well-established fact that climate change and global warming are a reality- and the effects are already showing in the Arctic. The calving of the iceberg, while resulting largely in nought change in the immediacy of the event, brings attention once again to the environment that needs to be continuously monitored, especially of regions such as the Antarctic and the Arctic, to enable us to forecast changes that could affect the oceans and all that they entail.

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