Research on the Sea Level Rise of Maldives

Hanlong Zhang[1, a], Caimanwei Wu[2, b], Mengyuan Tu[3, c]

[1]Law School, Beijing University of Chemical Technology, Beijing 100029, China;

[2]Affiliated Middle School of Hunan Normal University, Changsha 410006, China;

[3]Affiliated High School of Hunan Normal University, Changsha 410006, China.

[a]han5ands@163.com, [b]2631201221@qq.com, [c]1939767154@qq.com

Abstract

In recent years, the pursuit of economic and society development in most parts of the world has led to a series of environmental problems, among which global warming has greatly aggravated sea level rise, threatening the living environment of low-altitude island countries such as Maldives. Therefore, in order to maintain a pleasant living environment, this paper analyzes he sea level problem of Maldives and offers some strategies adopted by the country to deal with the problem.

Keywords

Sea level rise, Maldives, measures.

1. Introduction

1.1. Definition

Sea level means the average height of the sea. It means the water level of the sea assuming when there is no fluctuation of the sea surface caused by tides, waves, sea surges or other factors.

1.2. Backgrounds

Maldives is a large maritime country surrounded by the Indian Ocean. It consists of 26 atolls and more than 1,000 islands, located in the southwest of Sri Lanka and India. Maldives is one of the most widely distributed countries in the world.

In the past few decades, people gradually noticed seawater is getting higher – rising sea levels are slowly eroding the lands. As a result of rising sea levels, many coastal low-altitude areas and islands may be engulfed by seawater. According to the British "Daily Mail" report, a new study recently pointed out that this day may come earlier. The island may be uninhabitable within 30 years due to rising sea levels and floods. Places like Seychelles in Maldives may become inhabitable in 2030. “Amagard Updura of the Alliance of Small Island States says that some countries have been “not too late” on climate change issues.” “A leading climate negotiator warned on Friday that due to sea level Rising, island countries such as Maldives are almost at the “sinking zero point.” “The Association of Small Island States’ chief negotiator Amagar de Apdura warned that as the planet warms, many islands are warming due to the ocean. In addition to losing land and infrastructure, it is also facing extreme floods and tropical storms."

1.3. The Impact of Sea Level Rise

Sea level rise has a significant impact on the social economy, natural environment and ecosystem of coastal areas. Firstly, the rise of sea level would submerge some low-lying coastal areas, which would strengthen the ocean dynamic to the beach and then erode the coast to change "mulberry fields" into "sea". Secondly, rising of sea levels would increase the frequency of storm surges, which would not only endanger the lives and people in coastal areas, but also salinize the coastal lands. Seawater invasion causes agricultural production reduction and

destruction of ecological environment and conversely it would aggravate environmental degradation and lead to severe climate change which results in a vicious cycle.

Maldives is threatened by rising sea levels mainly caused by global climate change. It is made of about 1200 islands while these islands are only 6 feet sea above level on average, if the sea level keeps going up, maybe someday the whole country would be submerged. Meanwhile, with the sea level rising, most of the Maldives coasts would suffer from floods and tropical storm. Besides, for Maldives, it would also affect its economy's development especially the three pillar industries of fishing, shipping and tourism which inevitably influenced residents' normal incomes and daily life ultimately and even endangered their lives. Coastal erosion and damage would aggravate the submergence of Maldives; windstorms and other related natural disasters would endanger the lives of people and to some extent reduce tourists from abroad.

2. Factors for Sea Level Rise

There are many factors that contributes to sea level rise, for example, the ocean thermal expansion, the melting of mountain glaciers, Greenland land ice and Antarctic ice sheets etc., as reported, most of the world's mountain glaciers have retreated in the past 100 years. The reason for ocean thermal expansion is that the seawater surface temperature is higher than that of deep seawater temperature which would lead to deep seawater temperature's increase and the thermal expansion of sea water; in which way, the volume of seawater would be enlarged and the sea level rises. While melting glaciers caused by global warming are the main cause of rising sea levels. Global sea levels have risen through the 20th century. These rises accelerate until now due to global warming, continued growth of greenhouse gas emissions. [1]

3. The Measures That the Government Has Taken to Alleviate Sea Level Rise

To cope with this crisis, Maldives not only issued a series of laws and regulations at home to strictly control greenhouse gas emissions, but also advocated green energy globally to slow down the rise of sea level [2]. Furthermore, in Maldives almost every school has offered the environmental science courses to heighten people's environmental awareness. In the past years, Maldives government has carried out a series of strategies for environmental protection so as to reduce the greenhouse gas including:

3.1. At Home

(1) In 1984, the State Environmental Administration was established in Maldives;

(2) In 1989, Maldives formulated the first national ten-year action plan for environmental protection;

(3) In 1990, the Ministry of the Environment has been set up and then the department of environment was established in cabinet to oversee the environmental plan and protection in the country;

(4) In 1993 the State introduced the environmental protection act and then with the help of the media and NGOs, a national campaign has been launched to raise environmental awareness

(5) In 2001, the government established Ozone Layer Protection Committee;

(6) In 2002, Maldives issued its first national environmental report, which comprehensively and systematically summarized and planned its environmental problems. Later, a new environmental protection slogan was put forward to build Maldives into "a clean Maldives" and made the capital Male into the cleanest capital city in the world;

(7) In 2009, Maldives proposed a plan for the world's first carbon-neutral country with zero emissions of carbon dioxide by 2020.

In general, Maldives is a country that advocates environmental protection. For a long time, the government has paid special attention to the protection of ecological environment, especially the protection of the atmosphere.

3.2. At abroad

(1) In In 1987, the President of Maldives stated his views and suggestions on the threat caused by global warming and sea level rise to Maldives and other low-altitude countries at the UN General Assembly, which was widely approved by the participating countries;

(2) In 1989, Maldives hosted a conference in Male on the issue of sea level rise and called on participating states to take multifaceted cooperative action for slowing down the sea level rise;

(3) In 1991, after the establishment of the Alliance of Small Island States (AOSIS), Maldives took an active part in it. Supported by the AOSIS, Maldives together with many small island states, called on all countries to take actions to control global warming as soon as possible.

(4) In 1992, Maldives attended the Global Climate Summit in Rio de Janeiro.

(5) In 1994, Maldives participated in the global conference on the sustainable development of small island developing countries;

(6) In 1997, Maldives attended the Kyoto Conference and the 13th inter-country consultation conference on climate change held in Maldives. Since then, Maldives representatives have attended many international conferences on environmental protection. According to Maldives' opinion, "climate change is not simply an environmental issue, but a national security issue for Maldives";

(7) On October 17, 2009, Maldives held a famous "underwater cabinet meeting" and signed an "SOS" document, calling on all countries to reduce greenhouse gas emissions and take practical actions to combat global warming. In November, Maldives hosted the first "climate vulnerability BBS" to call on all countries to unite, coordinate their standpoints, and strive for financial and technical support from developed countries to better resolve the worsening climate change. In the conference, the BBS Declaration on Climate Vulnerability has been passed by the participating countries;

(8) In December 2009, at the world climate conference in Copenhagen, Maldives president stressed the serious impact of global climate change on Maldives. As one of the countries most expected to be "saved", Maldives, together with other small island countries, called for global greenhouse gas emission reduction of 85% by 2050. The president pointed out that if Maldives failed in dealing with the global climate change, other countries will inevitably be affected later.

(9) On June 20, 2012, at the UN conference on sustainable development (Rio+20 Summit), Maldives president called for the third conference of small island developing countries to be held in 2014 to discuss carbon emissions.[3]

"Think globally and act locally" is the fundamental concept of Maldives' idea regarding to atmospheric environment. Under the guidance of this idea, except for appealing to cooperating with many island countries to handle environmental protection issues internationally, Maldives also at home take a series of practical actions to strengthen the protection of environment, including setting up the Ozone Layer Protection Committee, advocating the use of clean energy, carrying out afforestation movement, implementing measures on emissions of carbon dioxide and taking project environmental assessment before constructing etc.

4. Future Efforts That Maldives Need to Take for Controlling Sea Level Rise

Although Maldives has taken a series of measures for reducing the sea level rise, a continuing effort should be made for its future development. For instance, vegetation coverage of the

islands especially along the coastlines should be improved so that it could effectively absorb dioxide and produce oxygen to reduce the carbon dioxide; besides it could resist natural disasters such as storms, tides and protect the coastlines from the sea water's corrosion. Furthermore, Maldives should strive to learn advanced technology and improve its seawater desalination technology to reduce the exploitation and usage of groundwater so as to prevent the ground from collapsing and slow down the seawater's submergence to the island. In the meantime, Maldives could improve the energy structure and develop clean energy so that achieve the environmental sustainable development. In addition, Maldives should also make appropriate use and development of tourism resources to reduce the ecological damage caused by excessive tourists sightseeing. More importantly, Sea level rise is a problem faced by all mankind especially the coastal citizens [4]. The climate change, as one of the main factors leading to sea level rise has a lot of uncertainties. Efforts to mitigate climate change must rely on science and technology. Therefore, it is necessary to strengthen scientific research on climate. By above efforts, it could slow down the sea level rise by the methods of reducing emissions of greenhouse gases such as carbon dioxide to alleviate the human factors that cause global climate change [5].

5. Conclusion

The sea level rise in Maldives is urgent. Maldives needs to take this issue seriously and strengthen its environmental protection to reduce the Maldives's economy, environment and other hazards caused by the sea level rise. Other countries should also pay attention to this issue and realize the importance of protecting the ecological environment for future development.

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