IMPACTS OF CLIMATE CHANGE ON WATER RESOURCES, CASES OF MADAGASCAR

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ABSTRACT

Deforestation in tropical rainforests adds more carbon dioxide to the atmosphere than the sum total of cars and trucks on the world's roads. In Madagascar slash and burn agriculture is the most method practiced in the country. EDF says "Unless we change the present system that rewards forest destruction, forest clearing will put another 200 billion tons of carbon into the atmosphere in coming decades…,"
So, this traditional farming method "Tavy" in Madagascar highlights the impacts of climate change. First, increases global warming, and second has an impact in the quality of water supply. As we have already known, trees capture greenhouse gases (GHGs) like carbon dioxide, preventing them from accumulating in the atmosphere. And also when trees are felled, they release into the atmosphere all the carbon they've been storing. In addition trees release water vapor into the atmosphere, so fewer trees means less rain. For that, the temperature rise during long time, and when the rain comes, the heavy rain, and very intense cyclone hit Madagascar. Therefore, concerning water resources, trees and plants act also as a natural barrier to slow water as it runs off the land. As a result, sea level rise have an impact in freshwater resources especially in the costs, the saltwater moves into freshwater and increase its salinity. Hail is also another impact of deforestation in weather and climate. In case of Antananarivo (Capital of Madagascar), last year, hail was reported caused by thunderstorm. After the hail has melted, it has the same effects on the environment as rain water.

Keyword: *climate change, global warming, water resources, trees, hail, Madagascar*

1. INTRODUCTION

Madagascar is one of ten countries expected to be the most affected by climate change in the world [1].
This paper reviews the cause and the potential impacts of climate change in the country.

2. METHODS

Madagascar has a tropical climate, and subdivided in two seasons:

- Rainy season from November to march and
- Dry season from April to October

The diagram in figure1 below shows the water cycle [2].
The water falling on land collects in rivers and lakes, soil and porous layers of rocks, and one part of it flows back into the oceans, and another part concentrated in the plants and transpires from them where they will once more evaporate and transpire.

Fig- 1: Diagram of the water cycle showing, evaporation, condensation, and precipitation

3. RESULTS

Now, these two seasons in Madagascar is confused. The main cause of this climate change in Madagascar is the deforestation.

In Madagascar "Tavy" is a traditional farming method. The word "Tavy" means slash and burn agriculture practiced in the country. Culturally, the most of Malagasy people execute this deforestation for their agriculture during dry season.

First of all, when people burns forest, carbon dioxide in the atmosphere increases and highlights the global warming.

Furthermore, as plants absorb atmospheric carbon dioxide and water, so when the forest is cleared, carbon dioxide is not absorbed and water cycle is disrupted (Figure 1).

For these reasons, Madagascar has the highest occurrence of cyclones in Africa [1]. The global warming highlights the drought and flooding and has an impacts climate change [3] in the country: (i) the temperature rise during long time, and when the rain comes, the heavy rain, very intense cyclone hit Madagascar like cyclone Gafilo in march 2004, Giovanna in February 2012, Enawo in March last year.

For that, sea level rise have an impact in freshwater resources especially in the costs, the saltwater moves into freshwater and increase its salinity. (ii)This year on October 15th, Hail was reported in Antananarivo (capital of Madagascar) caused by thunderstorm in Figure 2 [4].

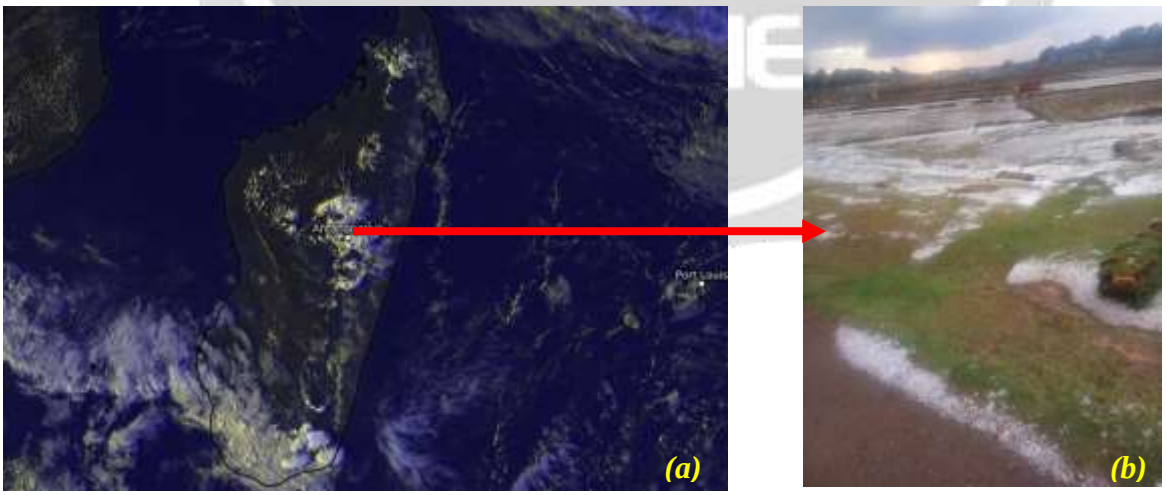

Figure 2: (a) satellite image shown the origin of hail in Antananarivo – Madagascar [4]
(b) Hail in Antananarivo

4. CONCLUSIONS

Traditional farming method is the main cause of intense cyclone and hail in Madagascar. The country has lost 80 – 90% of forest cover. Primary of forest loss include slash and burn for agriculture. This deforestation highlights global warming.
To conclude, the climate change has an impact on water resource, saltwater moves into freshwater so increase its salinity and the quality of water supply is at risk.

5. REFERENCES

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BIOGRAPHY

	Responsible of bachelor's degree and lecturer researcher at Department of Erath and Sciences – University of Antananarivo - MADAGASCAR Has a PhD degree in Gitology - Metallogeny from University of Toulouse and University of Antananarivo cooperation in 2009. Participating as Madagascar speaker on Geology and Mineral Resources of Madagascar on international event