

Statement by Espen Ronneberg at University of Sao Paulo conference on climate change

While I work for the United Nations I am here in a personal capacity, and will be speaking in regards to climate change and my adopted island of the Republic of the Marshall Islands.

The Marshall Islands are coral atolls, which were formed from volcanic islands that sank. The remaining islands are largely the rim of the volcano with a fringing reef on the ocean side and a lagoon in the middle. Often this rim is broken into smaller islands, sometimes it is fairly contiguous. But it is a narrow small island as a result, and you can throw a stone from the oceanside to the lagoonside most places.

The Marshall Islands is a nation of 29 coral atolls and 5 islands which form two vast parallel chains scattered over 822,779 square miles of the Central Pacific. The Marshall Islands' 29 atolls and 5 individual islands make up a total of 70 square miles of land and are located between 4° and 19° North latitude and 160° and 175° East longitude. There are over 1,225 islands and 870 reef systems in the Marshall Islands with over 800 species of fish and 160 species of coral.

Climate change is a serious issue for us, when one considers that the average height above sealevel is only 2 metres. In fact the highest point in the capital Majuro is the bridge that leads to the airport island. Climate change raises immediate concerns from sealevel rise and the increased height observed currently in storm surges. Being so close to the equator Marshall Islands is generally spared typhoons and cyclones, except that there were three in the 90's after a hiatus lasting from 1918. Storm surges are formed when the cyclone passes through, and seawater washes over the islands – ruining crops and causing much disruption.

Another climatic effect is the changes to the rain patterns. During the rainy seasons the rain comes much more abruptly and for shorter periods. The ground tends to get too dry and these short but heavy rainfalls wash off rather than sink into the ground. So this affects our agriculture and the quality of life of the people. We have also noticed shifts in the ranges of the various tuna stocks during the el Nino season, and we fear that this will be further exacerbated by climate change. We have also experienced coral bleaching which is bad for our tourism as it is mostly devoted to diving. Coral bleaching also affects the fisheries through a depleted nursery function, and bleached coral is a less effective wave breaker.

So what do we? Moving the population has been suggested. But people have lived in the Marshall Islands for over 2000 years, it's a unique culture and it is a sovereign country. They do not wish to move, and have had bad experiences with forced evacuations during the nuclear testing in Bikini in the 40's and 50's.

Adaptation therefore is a must for the Marshall Islands.

National progress made towards adaptation needs have been carried out through dialogues between government and the public. For instance, queries have been raised about what the nation can do within the time frame of 20-100 years predicted for sea level rise. In addition, the discussion of global warming prompts dialogues on the change of weather patterns to increase the probability of more typhoons hitting the Marshall Islands. These discussions have prompted the Marshall Islands to include climate change and adaptation measures and strategies as part of our high priority issues the nation needs to deal with as soon as it can. Additionally, Marshall Islands will negotiate international treaties for climate change taken into account the serious issue of greenhouse gases, which need to be reduced by the industrialized countries. The Marshall Islands has studies being conducted by the regional organizations such as SOPAC on the Environmental Vulnerability Index (EVI).

The Marshall Islands has already begun its action for adaptation by the effort it is currently placing on integrating economic/social issues with environmental issues or sustainable development. The political level of support has increased to the highest of levels in the national government, thereby, creating and transferring MEAs such as the UNFCCC to the newly created Office of Environmental Planning and Policy Coordination (OEPPC) under the Office of the President. The Office was created by Cabinet in early 2003 and further established by legislation September 1, 2003. The Office is currently establishing its physical existence in order to take on to its portfolio, the Conventions on Climate Change, Biodiversity, Land Degradation and so on. The Office is now the Center responsible for Climate Change policies and advice to the National Government. The general needs are the following:

CAPACITY BUILDING

1. Limited human resources
2. Financial constraints for implementation and assistance with development of public awareness, strategies and adaptation strategies
3. Infrastructure limitations
4. strengthening of policy advice

And the issues are being addressed. For example the entire runway at the airport acts as a rainwater catchment, and this water is pumped to a central reservoir, supplemented by rooftop catchments on government buildings. Most private homes also supplement with their own rooftop catchments. There is also some experimentation with scavenger wells. When groundwater is withdrawn from a well or borehole, an immediate drop in hydrostatic pressure occurs throughout the entire length of open well. Water will enter the borehole along its length in accordance with the hydraulic conductivity (permeability) of aquifer material along the borehole as long as pumping continues. The amount of water entering is proportional to the pumping rate (within the laminar-flow range); for example, if the abstraction rate from the well is doubled, then the contribution of water at each point along the borehole is doubled. During pumping, a distinct amount of water enters at every point along the borehole, having a distinct chloride concentration. The composite water is delivered by the pump or, in the case of a scavenger-well couple, two

pumps. As saltwater migrates upward – or as freshwater moves laterally from the upper surface of the lens toward the well (down-gradient, in both cases) - the chloride mix will change. Scavenger wells address this most effectively.

We are also seeking measures to protect the reef from other and indirect sources of bleaching, such as banning sand mining, no anchoring on the reef and pollution reduction. We are researching new forms of agriculture adaptable to the changing climate. We are studying the near-shore wave dynamics to better understand the system and placement of any future wavebreakers, such as artificial reefs.

We have miniscule GHG emissions yet we are seeking to do our part with renewable energy such as biofuels, solar power and wave power. Right now several diesel buses and a tugboat are being run on coconut oil as a diesel substitute.

But the bottom line is that we need emissions reductions at the earliest possible time, given the slow rate at which the atmosphere reacts to emissions already made.