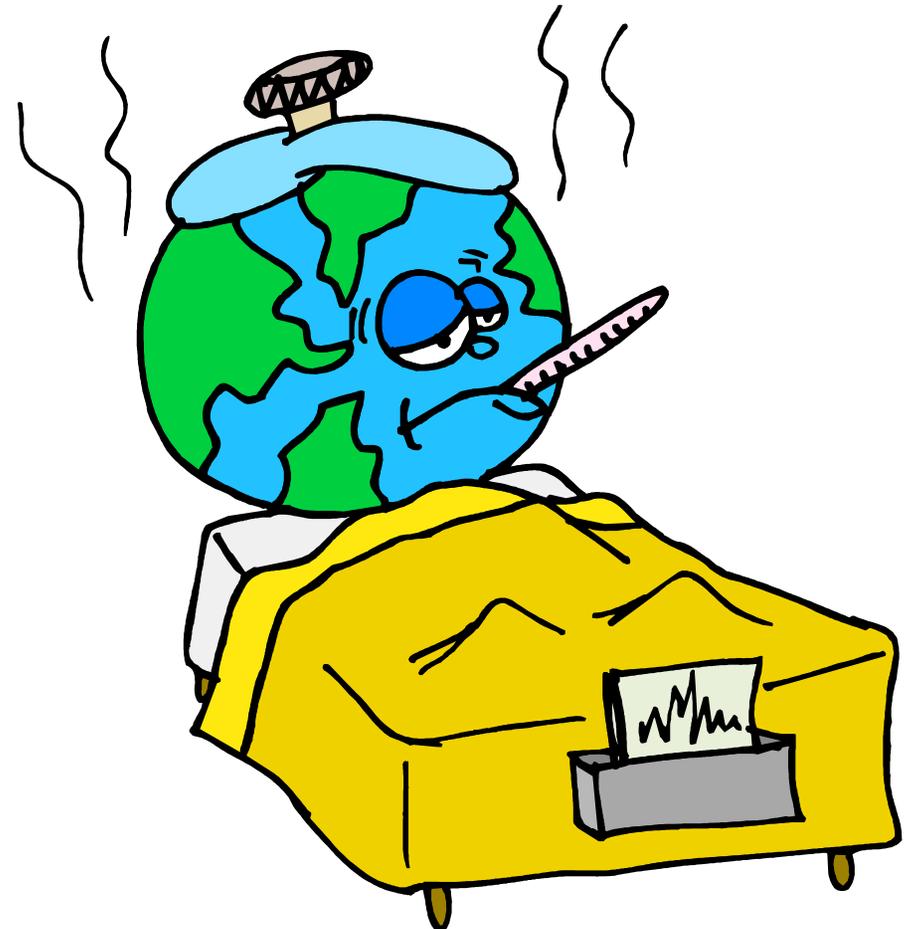




MICRONESIAN SEMINAR
P.O. Box 160
Pohnpei, FM 96941



Climate Change is Real



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Page 20



Australian Government
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Ben Namakin

What is Climate Change?

In Central Africa, Lake Chad, once the sixth-largest lake in the world, has all but disappeared. In just 45 years it has shrunk to a fraction of its original size with only 10 percent remaining.

The Amazon rainforest is the largest in the world and covers nearly 70 percent of Brazil. The rainforest produces about 20 percent of the Earth's oxygen and plays a big role in controlling the climate of the entire planet. The Amazon also is home to more species of plants and animals than any other ecosystem on Earth, 30 percent of the world's total.

About one-fifth of the Amazon has disappeared in the past three decades.

Closer to home here in the South Pacific, the Carteret Islands of Papua New Guinea are fighting a losing battle against the ocean. It's estimated the six islands will disappear into the water by 2015.

Closer to home here in the South Pacific, the Carteret Islands of Papua New Guinea are fighting a losing battle against the ocean. It's estimated the six islands will disappear into the water by 2015.

I am sure many of us have heard so much about climate change and global warming. We hear about it on television, in magazines, on the internet, from friends, and mostly from environmentalists. But have we really thought about what it means to us?

Climate change is driven by global temperature rises because of too many greenhouse gases (GHGs) being released into the atmosphere. GHGs, such as carbon dioxide, methane, water vapor and nitrous oxide, exist naturally in the atmosphere, creating a kind of blanket around the earth, which helps to keep temperatures warm enough to support life. Without these gases the earth would simply be too cold for any living thing to survive. However, over the last two centuries, human activities have resulted in more GHGs being released into the atmosphere, causing global temperatures to steadily increase. This process is often



Island Music Wanted

Chants? Traditional dance songs? Pop island tunes from the 60's or 70's, or even the 80's? Old church songs (no matter what denomination)? Funny songs composed during Japanese times or during the war? MicSem would like to copy any of this island music onto disk. We are now collecting island music just as we have long gathered old photos on the island. The music, like the photos, will be archived and made available to those who want it (assuming that we have the permission of the donors to do so).

Please check under the bed, in the closet, in the locked chest to see if you have anything that should be saved. If you find something that you think ought to be preserved, just let us know.

Call Micronesia Seminar at 320-4067 or mail us at micsem@micsem.org. We're located just below the Catholic Church in Kolonia.



Mic Sem is giving out Pedometers. Grab one today. Its time to walk 10,000 steps.

Keep Walking.

Stop TB



There are a few things everyone in the Pacific needs to know about TB. This short documentary points out what the disease is, how it spreads, and what to do if you're at risk.

TB rates might be dropping in many parts of the world, but the disease is still a serious problem in the Pacific. This video documentary explains what causes the disease and how it can easily spread from one person to another. This video is a factual account of disease and how it can be controlled in the Pacific.

New MicSem email addresses!

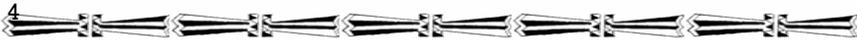
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referred to as “global warming,” or the “enhanced greenhouse effect” (see figure below).

Increasing global temperatures due to global warming have initiated a series of major changes in the world's climate, which is where the term “climate change” comes from. The consequences of warmer temperatures include:

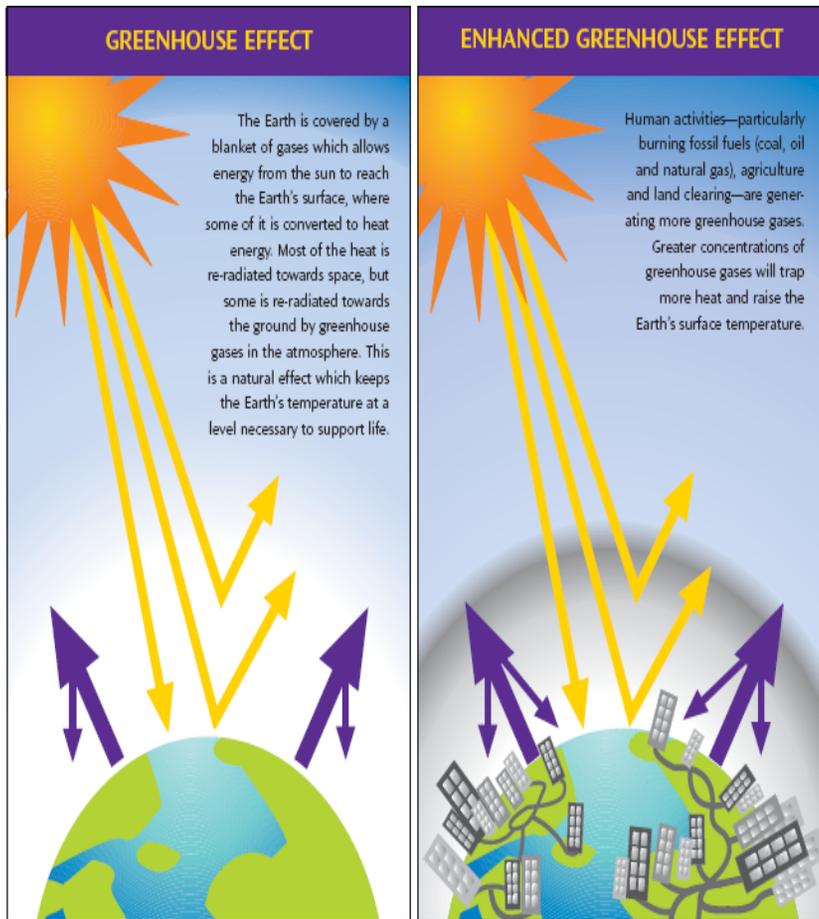
- ❖ Effects on precipitation and local weather from temperature changes.
- ❖ Decrease in the strength of ocean currents with the possibility of rapid change in climate.
- ❖ Increase in frequency of severe storms and weather anomalies.
- ❖ Sea level rise due to melting of ice, and expansion of the ocean water.
- ❖ Increase of tropical disease in temperate climates.
- ❖ Poleward shift in ecosystems at a rate faster than some plants and animals can migrate resulting in more rapid extinctions.
- ❖ Decrease in grain production due to decrease in precipitation in many grain growing areas.
- ❖ Reduction of forests due to a variety of causes including changes in frost free periods, draught stress, and insect damage.





The most important GHG is carbon dioxide and this comes from human activities like deforestation, burning of fossil fuels, and coal mining. These human activities have been increasing every year especially by the industrial companies and automobiles around the world, mostly in the more developed countries.

The atmospheric levels of carbon dioxide are rising, and the earth is warming up. . The link between the two is established beyond doubt, only the degree of warming is still debated, and how the warming will effect local environments.



Australian Greenhouse Office (www.greenhouse.gov.au)



New Videos!

www.micsem.org

Planting The Foreign Flag

Part 2: Micronesian History Series



This video, the second in a five-part series on the history of Micronesia, explores the beginning of colonial rule in the islands. After a brief look at Spanish rule, the video explores the policies and programs of the German colonial era between 1899 and 1914. The Sokehs Uprising on Pohnpei was a final major event in that period. When the Japanese seized the German-held islands at the outbreak of World World I

10,000 Steps



Diabetes, like heart disease, has become a serious health problem in our day. To control the disease people need to watch their diet and get exercise each day. Exercise is not just running laps, lifting weights or playing basketball. There are other options. One way is to clip on a pedometer and start walking. As the clicks multiply, you may find that walking 10,000 steps a day isn't as hard as you might think.

way to preserve endangered species of plant, bird, fish and animals and prevent them from becoming extinct.

Coastal Areas: Coral reefs must be well protected as they shield the shores and coastal areas from storm surges. Protecting and replanting mangroves is important for the security of our coastlines. Although we need them for building materials and firewood, trees and timber must be harvested in a sustainable manner so we don't lose them all.

Governance: We have to get all governments, local communities and organizations to champion the conservation movements at the grassroots level. The more we save the trees, mangroves and marine life the more we stay resilient to the impacts of climate change.

Health: To prevent health risk from climate-related disease, a community cleanup should be organized. This can be done by clearing our yards, keeping the lawns short (as mosquitoes love to hide in long grass), and emptying bottles and containers with water around the area where mosquitoes can breed.

Education: Educating friends and people in our community about climate change, environmental issues, and conservation methods are great ways of spreading the message.

About Author:

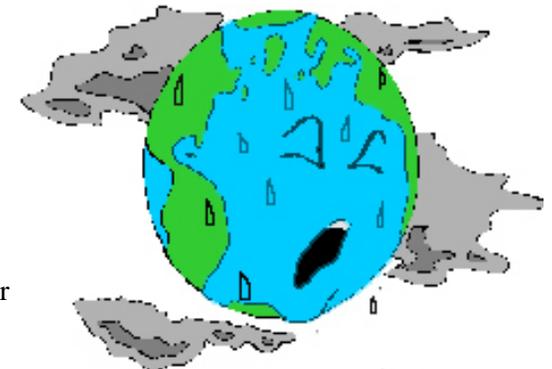
Ben Namakin originally from Kiribati, a graduated of PATS in Marine Science & Agriculture is now Program Manager Of Environmental Education & Awareness Program at the Conservation Society Of Pohnpei.

We would like to thank Jeff Martin for his help in editing this article.

Impacts of Climate Change can be experienced in different aspects of life:

The international community has recognized that climate change is one of the most important issues for the future of humanity. To help us understand and deal with climate change, the world's leading scientists have been brought together to form the Intergovernmental Panel on Climate Change (IPCC) which provides comprehensive and authoritative updates of all issues on climate change. Since it was formed in 1988, the IPCC has issued four "assessment reports" which form the basis of international and national policy making to deal with the issue on climate change. According to the most recent assessment report released this year, it confirms that climate change is one of the biggest challenges to the social, economic, and environmental well being of the Pacific Island Countries. The IPCC in its latest report, confirms regarding **temperature that:**

- ❖ Global mean surface temperature has risen from by approximately by 0.74 degree C over the last 400 years;
- ❖ Mean temperatures for the Pacific Islands region have increased by 0.6 to 1.0 deg c since 1910;
- ❖ Temperatures in the Pacific island region are projected to rise by 0.45 to 0.82 deg c above the 1961-1990 baseline over the coming three decades;
- ❖ By the end of this century, temperatures could be as high as

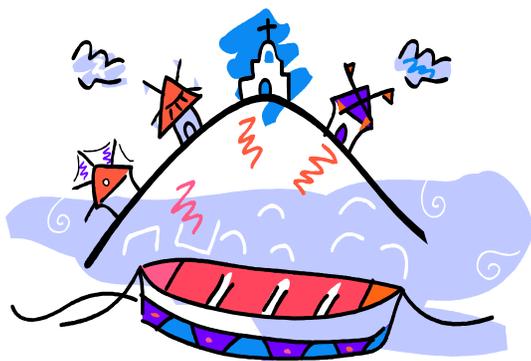


3.11 deg c above this baseline;

- ❖ Trends in extreme temperatures across the Pacific Islands region show an increasing number of hot days;

The report also states the following about sea level rise:

- ❖ Sea levels in the Pacific islands region have risen at an average rate of 1.6mm/yr over the last 50 yrs;
- ❖ By the end of this century, global average sea levels will rise by 0.19 to 0.58 mm. yr above the 1980-1999 baseline. However



these projections do not account for the true extent of melting ice caps and may therefore grossly underestimate potential sea level rise over the coming century, which could rise by more than one meter.

From the latest report, the changes of temperature will heavily impact the changes to the rising sea level, tropical cyclone, changes of rainfall, biodiversity, water resources and coastal and marine resources.

Why should Micronesians be concerned?

Micronesians, along with our other Pacific island neighbors, are among the lesser contributors to global warming, but at the same time we are at greatest risk from its negative impacts – especially rising sea levels. A number of islands in Micronesia, like in the rest of the Pacific, are small island states/territories and low-lying atolls. Although we have some volcanic or mountainous islands like Guam, Palau, Nauru, Pohnpei and CNMI, even in these places the majority of the population lives in the coastal areas. In the case of the FSM, much of the

and replacing our lights with fluorescence (CFC) lights which do not consume as much energy. For those who own diesel vehicles, they could be powered with coconut oil since it is clean to our atmosphere. All of these options will cost us less money while allowing the atmosphere a chance to be clean.

While we have a moral obligation to support mitigation efforts, the most important response to climate change for all Pacific islands is adaptation. Adaptation involves individuals, communities and governments taking steps to ensure the negative impacts of climate change are minimized, so that our economic, social and environmental future is ensured. Here are some of the things off the top of my head that I hope can be useful for us to adapt to climate change.

Water: With droughts predicted to happen more regularly, it is important to protect our water resources. This means conserving water, and increasing water storages. We have to make sure that our pipes are not leaking, the gutters are clean, and that we turn off water when not in use. We should consider building or buying a water tank as extra water storage.

Agriculture: We must consider shifting agricultural developments further inland to avoid the threat of saltwater intrusion. We also need to consider adopting new techniques of farming such as irrigation systems, and making different planting schedules to take advantage of the changing climate.

Infrastructure: As the sea level continues to rise, it is important to avoid building too close to the coastal areas. The same can be said for graveyards, as coastal erosion has destroyed a number of cemeteries in Kiribati, Fiji, and other parts of the Pacific.

Biodiversity: The establishment of the Marine Protected Areas and Watershed Forest Reserve are vital to keep the ecosystem healthy. Healthy ecosystems can survive the stress they face from climate change. Establishing forest and marine reserves is also an important

What can we as individuals do to fight global warming?

Simply put, there are two key ways that we can respond to climate change. On the one hand we can attempt to stop climate change from happening by reducing GHG emissions. This is known as “mitigation” because it involves taking action to mitigate the threat of climate change. On the other hand, we can attempt to adapt to the changing climatic conditions. Obviously, these two responses are not mutually exclusive. In fact, internationally, we need to implement both mitigation and adaptation measures. Given limited resources, however what is the best option for Micronesian countries and territories?

According to some, we are not responsible for climate change because we produce less than one percent of GHG emission. They suggest that we leave it up to the most industrialized nations to take responsibility in solving the problem. Perhaps others nations are more to blame than ourselves but this does not excuse us from taking steps to reduce GHG emissions. In fact, it would be very hypocritical of us, as the most vulnerable to climate change, to sit back and do nothing to limit our contribution to GHG emissions. Micronesians, along with the rest of the world, need to do their bit to minimize GHG emissions. Of course we also need to ensure we do this without blocking social and economic development. With the support from donors and other development partners, we should work hard to find ways to ensure our progress without the negative impact of GHG emissions.

Ironically, it is the industrialized nations, the most egregious violators that also have introduced a number of movements to push their governments to sign pledges on clean energy policy as a way to address climate change issues. That is why it is also important for us in Micronesia to show our support and concern on the issue of energy conservation by turning off our air conditioning as well as our engines and cars when not use,



population is in the low-lying atolls of the outer islands. Micronesia has very limited land space or human and financial resources, which makes us particularly vulnerable to rising sea levels as they slowly continue to cover our islands.

Another reason we are so vulnerable to climate change is that our life depends on the natural resources from the land and the sea. Natural resources and sectors like fisheries, tourism, and agriculture dominate our economy and will be directly affected by the changing climate.

The Marshall Islands and Kiribati are particularly vulnerable, having been hit with storm surges that lead to coastal erosion and flooding. We also cannot forget the severe drought Pohnpei -- one of the wettest places on earth -- experienced in 1998. Scientists predict that climate change will see such extreme events become both more frequent and intense over the coming years and decades.

Our island lifestyle, which depends on fisheries as a source of food, and income from the coral reef and mangroves, is going to be threatened by the rising temperature and level of the sea. The question is, where are we going? We don't know, and that is why we are so vulnerable to the negative impact of climate change. It is time for those of us in Micronesia to better understand exactly what climate change will mean in our every day lives. Scientists believe that the sea level is slowly rising and the weather patterns are changing, and we should too. Although I am not a scientist, I have seen the changes within the environment which I did not see when I was a child. We must look forward with hope. However, while there are solutions out there, action must be taken.

The Climate Change Story in Micronesia

Climate change is a process that affects the lives of all people, especially those of us in Micronesia. As the scientists tell us, climate

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change has shown some of its very serious impacts on our environment; land, freshwater, agriculture, and more. In particular, storm surges from rising sea levels have led to coastal erosion, saltwater intrusion, and infrastructure destroyed.

During my childhood days on the low lying atoll of Kiribati, we never experienced severe sea flooding. There were storms, but they weren't that bad. However, as the sea levels continued to rise several king tides hit the islands in Kiribati. In recent years, storm surges have caused severe coastal erosion in Kiribati, including the 2006 collapse of the beautiful Dai Nippon causeway. These incidents have huge costs, both financially and emotionally, for the people of Kiribati, who have had to build new homes and dig up their deceased relatives from their graves to bury them further inland. Importantly, this is not only happening in Kiribati, but also in other low lying islands in the region.

Upon arrival in Pohnpei I came to experience the same thing. While studying for my high school degree in Pohnpei in 2001, during my free time I would hang out with my friends on a small islet name Dekehtik, located on a barrier reef a couple of miles away from the school. It was my favorite camping, picnicking and snorkeling spot. In 2005, I found to my surprise that Dekehtik Islet had split into two. I went to see for myself, with my own eyes, and there it was, badly destroyed by sea flooding. How sad it was to see this unexpected and sudden threat to the islanders and the landowners!

. . . Coastal communities have been flooding lately. .

.Some villagers had built their houses on raised foundations as the sea water was flooding their homes during high tide.

Even the coastal communities have been flooding lately. When I visited the community on the coast of Sokehs, Pohnpei, I learned that some villagers had built their houses on raised foundations as the sea water was flooding their homes during high tide. They also built walls in front of their houses to prevent flooding during heavy rains. The villagers I spoke to mentioned they noticed these changes in the last

difficult to have good crops to sell or export if we are hit with drought or heavy rainfall due to the changing weather patterns.

Much of the infrastructure in Pacific nations, 'would be at serious risk from inundation, flooding and physical damage', including, roads, airports and port facilities (all predominantly found on the coastal areas). Such damages could disrupt food and energy supplies and tourists arrivals, while tourism and associated industries are likely to be affected by damage to coral reefs and other coastal systems .

Violation of Rights

It is not often discussed, but climate change can also be viewed as a threat to our human rights.

What makes us unique is our culture. Everything around us, such as the land and sea are important aspects of our culture. The crops we grow, the type of fish we eat from the sea, the local clothing we make from the plant and tree species, our language and many other things are all important to our culture. As sea levels rise and other climatic changes occur, our culture is threatened. A number of people in Tuvalu (one of the lowest lying atolls in the South Pacific) have been relocated to New Zealand – an event that is likely to happen to the rest of the low lying atolls in the region. Can they carry on their culture in New Zealand? I don't think so.

Those who live on high islands, such as Pohnpei, will also have to move further inland, which means they will also lose their customary land, perhaps the most important right possessed by Pacific islanders.

While on the topic of rights, it is worth noting that we must also exercise the right to vote for the leaders in the government who can help us find the right options to deal with climate change.

A number of people in Tuvalu (one of the lowest lying atolls in the South Pacific) have been relocated to New Zealand

also disrupts sewage systems and piggins located close to rivers, streams and other water supplies. This may have been the cause of the cholera outbreak in Pohnpei in 2000 – the worst the island has ever experienced. Other types of diseases found in some parts of the Pacific include amoebiasis and giardia (the parasite found in contaminated water that can cause diarrhea and is highly contagious), also caused by the damage of sewage and other water supplies from flooding.

In the case of the low lying islands, saltwater intrusion affects the quality of water in wells, floods taro patches, and gardens – all the things that people on the atolls depend on for their survival. And when these taros and other local foods are destroyed by saltwater or during storm surges and flooding then the people on the island may end up depending on imported foods..

Impacts on Our Economy

Many of us think climate change is an environmental problem. But I want to make it clear here that it is also likely to have a serious impact on the economy in the Pacific region. Tourism, agriculture and fisheries, which are main economic sectors, will likely see the effects of climate change, climate variability and rising sea levels.

During the 1998 El Nino, a massive coral bleaching killed one third of Palau's coral reef, causing annual tourism revenues to drop by 9% and the local economy to lose an estimated \$91 million

During the 1998 El Nino, a massive coral bleaching killed one third of Palau's coral reef, causing annual tourism revenues to drop by 9% and the local economy to lose an estimated \$91 million . Rising sea temperatures could possibly reduce the tuna catch in some Pacific Island Countries , according to IPCC Fourth Assessment Report .

Our local fishermen may face trouble and see their income decline if more coral bleaching occurs in the future. Likewise, farmers may find it

five years but not before that.

In addition to increased droughts, flooding and storms, climate change can cause an adverse effect on the forests too. This can lead to dry streams or contaminated drinking water from rivers where flooding and erosion takes place.

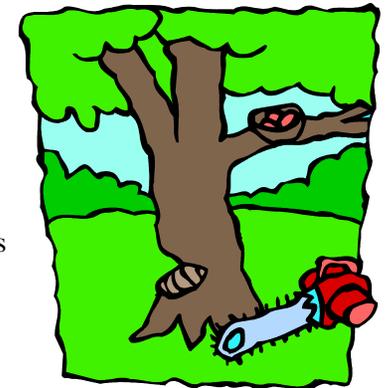
Impacts on Biodiversity:

Climate change is having major impacts on biodiversity in Micronesia. Saltwater intrusion puts stress on plants and tree species that are very important to our life and culture. For example in Kiribati, pandanus trees used for house construction, local medicine, food and traditional clothing - are dying from saltwater intrusion as the seawater slowly seeps into the ground.

When I was in Palau in September 2006, the National Climate Change Coordinator, Ms. Olai Polloi, told me she received a complaint from an elderly woman about her taro patches being destroyed by sea flooding. The woman said she never experienced this before and added that the taro has been the main staple throughout her life.

Due to the changes of weather patterns some wet areas can become drier. Even Pohnpei, one of the world's wettest places, is facing problems at this point. When unexpected drought occurs, it may lead to the loss of plant species, as well as the bird species that live in the forest. This is a major concern because forests are an important ecosystem that supports birds, plants, humans and other animals. For us humans, forests provide food, building materials, local medicines, firewood, and drinking water. In some Pacific countries timber from the forest is exported to help build the economy.

We also have to be mindful that forests act as sinks by absorbing and storing carbon dioxide. The more forest we cut, the more CO2 we release into the atmosphere and then contribute to

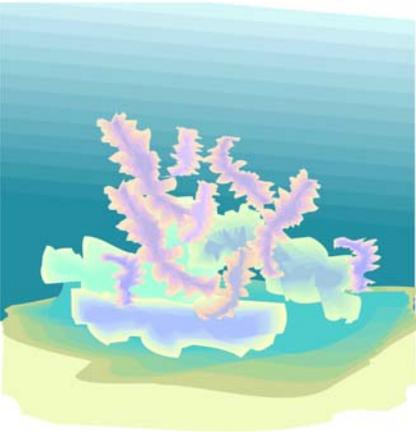


global warming. If we continue to clear forests, as is currently happening in Pohnpei and other islands, it will worsen the effects of climate change.

Our ecosystem is connected -- the forest and trees, the mangroves and the ocean. Therefore if we talk about the impacts of climate change on the land, we must also consider the impacts on coastal and marine ecosystems.

In Micronesia mangroves are very much valued for important reasons. Mangroves are home to crabs and birds, and provide excellent nurseries for fish. In addition, they help to prevent sediments from going out into the ocean, which would otherwise damage coral reefs. Mangroves also protect us from storm surges, typhoons and big waves, and prevent the coast from being eroded. Because of the rising sea level, however mangroves will have to retreat inland to survive. This will not be easy, as a number of infrastructure developments have taken place on the coastal areas or shorelines. Cutting and dredging the mangrove forests will also lessen its ability to stay resilient to cope with the rising sea level. Increased rainfall and silts being washed down can also affect mangrove growth, further weakening its resilience.

As atmospheric temperatures have increased, so too have the temperatures of the ocean. Higher sea surface temperatures put stress on marine species, which can only survive within a very narrow temperature range. The most noticeable damage caused by high sea temperatures is coral bleaching. We have all seen the ugly sight of our



beautiful coral reefs turned into colorless wastelands due to coral bleaching.

Coral is a small animal with tentacles to snare food, but it is also dependent on a species of algae that lives symbiotically in its body and produces additional food by photosynthesis. When the sea temperature rises above 28 degrees C., the coral expels the algae. If the condition persists, it will starve.

According to the Whole Systems Foundation, a grant making organization dedicated to the environment, out of 207 coral reefs monitored by the Global Coral Reef Alliance in 1998, 75% were bleached, and in 50% most of the coral was dead

The second major killer of coral is pollution, both in the form of sediment washed from the rivers, and in the form of swamps resulting from construction, agriculture, and most often from the destruction of mangrove swamps that trap the sediment. The effect of the toxins is obvious, but the effect of the nutrients is just as severe, for the excess nutrients cause algae blooms which deprive the coral of light, invade the coral directly, and smother the coral with dead material.

When the coral is bleached, the fish lose their habitat. This impacts on the fish population and the other marine species we depend on for living.



Impacts on Human Health

Climate change has serious implications for the health and well being of Micronesian people. Indeed, changing weather patterns, flooding that led to a disruption of water supply, and the contamination and rise in the air and water temperatures have already had a direct impact on the population's health in the region.

Vector-borne diseases, water-borne diseases, and aquatic pathogens that are harmful to human health are on the rise. Vector-borne diseases like malaria and dengue are transmitted from mosquitoes. Mosquitoes increase in number when flooding occurs and the temperature gets warmer. Mosquitoes breed in warm areas and lay their eggs in wet areas. An increase in mosquitoes means an increase in vector-borne diseases which can cost human lives.

Flooding and contaminated water also lead to water-borne diseases. This happens when an unusually heavy rainfall causes flooding, and