TESTIMONY OF
THE REVEREND JIM BALL, PH.D
Senior Director, Climate Campaign
Evangelical Environmental Network[1]

"A CHRISTIAN PERSPECTIVE ON INTERNATIONAL ADAPTATION"

Before the
SUBCOMMITTEE on INTERNATIONAL DEVELOPMENT AND FOREIGN ASSISTANCE, ECONOMIC AFFAIRS, AND INTERNATIONAL ENVIRONMENTAL PROTECTION
of the
COMMITTEE ON FOREIGN RELATIONS
U.S. SENATE
OCTOBER 15, 2009

Preamble

Thank you, Chairman Menendez and Ranking Member Corker, and thank you to the subcommittee members, for having this hearing on international adaptation, or addressing the impacts of climate change in the world's most vulnerable nations. I am the Rev. Jim Ball, Senior Director of the Evangelical Environmental Network's Climate Campaign, and it is an honor to testify before you today. My testimony will offer an evangelical Christian perspective on the need for significant funding for international adaptation.

The views expressed here are my own. However, over 270 senior evangelical Christian leaders who are part of the Evangelical Climate Initiative have stated that "as a society and as individuals we must also help the poor adapt to the significant harm that global warming will cause."[2] In addition, a recent poll by Public Religion Research found that 89% of evangelicals support the US helping the poor adapt to climate-intensified natural disasters, and 79% support helping with food and water shortages caused by climate change.[3]

Introduction

For many who have cared for the poor in poor countries by supporting relief and development organizations in their efforts to fight hunger, disease, natural disasters, and poverty, it may be disconcerting to discover that the pollution coming out of our vehicles and from our factories and power plants will lead to an insidious reversal of such efforts due to the impacts of climate change. Most of us have grown up thinking of pollution as a local or perhaps regional problem, not a global one. How could pollution coming out of cars in Chattanooga, for example, help cause hunger in Africa? But when such pollution is added to millions of vehicles and smokestacks around the world releasing heat-trapping global warming pollution, it results in

climate change, a natural disaster intensifier. It makes floods fiercer, hurricanes harsher, and droughts dryer. The one thing the world certainly doesn't need are more victims of natural disasters, like the father and his family during the 2005 Niger famine found hundreds of miles from the nearest feeding station. "I'm wandering like a madman. I'm afraid we'll all starve."[4] At one of the feeding stations, a mother lamented as she watched her young daughter die. "'As far as I'm concerned, God did not make us all equal. I mean, look at us all here. None of us has enough food.'"[5]

The Scale of the Impacts

The reason such stories should not simply touch us as compassionate individuals but rouse us as a country is because of the scale of the impacts of climate change. These impacts have important implications for our economic and national security and therefore addressing them is in our national interest. As Senators Kerry (D-MA) and Graham (R-SC) have recently stated in a *New York Times* op-ed: "many scientists warn that failing to reduce greenhouse gas emissions will lead to global instability and poverty that could put our nation at risk."[6] My thanks to both of these Senators for their leadership on this issue (and for speaking at the launch of the Evangelical Climate Initiative in 2006). Here are some of the projected consequences for the poor:

- 40-170 million at risk of hunger and malnutrition.[7]
- 1-2 billion people already in a water stressed situation could see a further reduction in water availability.[8]
- 100 million impacted by coastal flooding; millions more by inland flooding.[9]
- 90-200 million could become more vulnerable to malaria,[10] 1.4 billion could become at increased risk of dengue fever, [11] and the number of children vulnerable to diarrheal diseases – the number one killer of children – will increase significantly.[12]
- Approximately 20- 30% of God's creatures could be committed to extinction by 2050, making climate change the largest single threat to biodiversity.[13]
- The creation of 200 million "climate refugees" by 2050.[14]
- Billions could be at increased risk for violent conflicts, including in areas sensitive to energy security and the growth of terrorism.[15]

Important Christian Teachings

Given that climate impacts will fall hardest on the poor in poor countries, those who have done least to cause this problem and yet will suffer the most, it should not surprise you that the heart of the moral teaching of the Bible speaks to our responsibility to overcome climate change.

In several accounts in the Gospels people ask Jesus what is the greatest commandment in the Law. In effect, they were asking: if there is one thing our lives should be about, what is it? What is the most important thing in life?[16]

Jesus quotes Dt 6:4-5, something that observant Jews of his time recited in the morning and in the evening: "'Hear, O Israel, the Lord our God, the Lord is one. Love the Lord your God with all your heart and with all your soul and with all your mind and with all your strength'" (Mk 12:29-30). Jesus immediately says, "'And the second is like it: 'Love your neighbor as yourself,'" (Mt 22:39, quoting Lev 19:18). To make things perfectly clear, Jesus adds: "All the Law and the Prophets hang on these two commandments" (Mt 22:40).[17]

Why does Jesus add the second commandment to love our neighbors as ourselves? He does so because you can't love God unless you love your neighbor, because while God loves you, He loves your neighbor, too. These two commandments joined together by Jesus are what the Church has called The Great Commandments, and from a Christian perspective they are what our lives should be all about.

In the Gospel of Luke's version of Jesus' teaching of the Great Commandments, one of the experts in the law asks Jesus a follow up question: "'And who is my neighbor?'" This sets up one of the most memorable and loved of Jesus' stories, the parable of the Good Samaritan.

> *A man was going down from Jerusalem to Jericho, when he fell into the hands of robbers. They stripped him of his clothes, beat him and went away, leaving him half dead. A priest happened to be going down the same road, and when he saw the man, he passed by on the other side. So too, a Levite, when he came to the place and saw him, passed by on the other side. But a Samaritan, as he traveled, came where the man was; and when he saw him, he took pity on him. He went to him and bandaged his wounds, pouring on oil and wine. Then he put the man on his own donkey, took him to an inn and took care of him. The next day he took out two silver coins and gave them to the innkeeper. 'Look after him,' he said, 'and when I return, I will reimburse you for any extra expense you may have'* (Lk 10:30-35).

During Jesus' time Samaritans were considered by Jews to be heretical, traitorous, half-breeds and were regarded with utter contempt. By having the Samaritan be the one who demonstrated love by his actions, Jesus in effect says that everyone is our neighbor – even or especially others we hold in contempt. And furthermore, those of us who think of ourselves as religious, as doing the right things to appease God and look righteous to others better think again.

Here is where this parable intersects with climate change.

The priest and the Levite were not the ones who robbed the man, just like in our time we didn't create the poverty of the poor, a situation that makes them much more vulnerable to the impacts of climate change. But the priest and the Levite did pass by on the other side. Righteousness and love are the presence of good and loving acts, not simply the absence of bad ones. By not helping the man in the ditch, the priest and the Levite made his plight worse and failed to love God and be who God created them to be.

Today, collectively, we are in fact making the plight of the poor worse through our contribution to climate change. And knowing their plight and not doing what we can to help to overcome climate change is like passing by on the other side.

We may be highly observant of the outward signs of what it means to be religious or moral in our community. So, too, I'm sure, were the priest and the Levite. That's exactly why Jesus chose them to be characters in his parable. But if we don't help the poor who through no fault of their own find themselves victims in the ditch of climate change's impacts, then we have failed to completely fulfill the Great Commandments, to be morally mature persons, and our nation will not have lived up to its character as a compassionate country.

Matthew 25 lets us in on a little secret about the parable of the Good Samaritan. While the Good Samaritan is Christ-like in his behavior, **it is Jesus Himself who is the man in the ditch**. For Jesus says that whatever we do for "the least of these" we do for him (Mt 25:40).

In terms of the problem of climate change, right now it is as if you are approaching a victim of climate change in the ditch. You are just within sight of the person. You don't yet quite know what is going on. Is it risky to go over to this person? You can't quite yet tell anything about who it is – just that there is a lump in the ditch that looks human. Whoever it is could be drunk you think to yourself – maybe not a victim at all! But as you venture closer you come to find that it is a child, not a man. It is a young girl.

She is in distress. Is she sick? Weak from hunger? Both? Maybe she has an infectious disease. Where are her parents? Who is responsible for this young girl? How did she get in this situation? Suddenly you notice that someone else is in the ditch with her. It is Jesus, and he and the girl need our help.

When it comes to helping the poor adapt to climate impacts, what is true for Christians is also true for others. No morally mature individual or nation can pass by on the other side and leave the victims in the ditch of global warming's impacts. We must be Good Samaritans.

Adaptation in Poor Countries

Is it possible to overcome the consequences of climate change through adaptation? The short answer is YES. But it is only yes if we do two basic things: (1) sufficiently address the causes through mitigation, and; (2) making the necessary investments of time and treasure.

If we don't address the causes as we should, then at some point we will not be able to adapt to the consequences in a meaningful way. The impacts will overwhelm our capacity to adapt. This is especially true for the poor in poor countries, who would be the first to face such a situation.

Even if we mitigate or address the causes, could those of us in the rich countries invest enough in the adaptation efforts of the poor in poor countries so that they had the resources necessary to adapt?

Of course, the poor have been adapting to such things a floods and droughts for years with varying degrees of success. However, in many cases such coping strategies have been and will be completely overwhelmed by climate change.

A poor family in a slum in Ghana serves as an example. Their home and their furniture were made to withstand a certain amount of flooding. The mother explains that "When the rain starts falling abruptly, we turn off the electricity meter in the house. We climb on top of our wardrobes and stay awake till morning … our tables are very high and so also are our wardrobes, they are made in such a way that we can climb and sit on top of them." Unfortunately, these adaptive strategies have reached their limits due to more frequent and more intense flooding, leading to a partial break-up of the family. "I have two children, but because of the floods my first child has been taken to Kumasi to live with my sister in-law."[18]

While what has helped in the past may simply need to be modified over time, relying just on past strategies could in fact prove dangerous, could become what experts call maladaptive, given that some of the impacts of climate change will fall outside of historical experience.

A similar situation occurs in the biblical story of Joseph found in the 41st chapter of Genesis, where an unusually severe and prolonged drought required a massive response outside of normal practice in order to avoid dire consequences. Like so much of what will be needed to successfully adapt to climate change, Joseph's story is an example of planning for hard times to come.

Because Joseph accurately predicted the dreams of others, the Pharaoh believed Joseph's interpretation of his dreams that there would be seven years of plenty followed by seven years of famine, a famine so severe that "the abundance in the land will not be remembered …" (v. 31). Then Joseph recommended a plan of action:

> 34 Let Pharaoh appoint commissioners over the land to take a fifth of the harvest of Egypt during the seven years of abundance. 35 They should collect all the food of these good years that are coming and store up the grain under the authority of Pharaoh, to be kept in the cities for food. 36 This food should be held in reserve for the country, to be used during the seven years of famine that will come upon Egypt, so that the country may not be ruined by the famine (vv. 34-36).

Planning in the present to survive major problems in the future – this is a vital part of what climate change adaptation is all about.

Under Joseph's direction and authority the government took steps in the present to invest in the future, a time when "the abundance in the land will not be remembered." This required a great deal of organization, from the appointment of commissioners to the storage of grain to its proper distribution when conditions called for it. Additional storage facilities probably had to be built, distribution centers created, people trained, the populace educated.

I'm sure there were some doubters. I'm sure a good number didn't like a fifth of their grain being taken by the government for some future threat they didn't understand or believe in. But I bet they were glad when the famine came that they had food to eat because of Joseph's leadership.

Today, in light of climate change, we see Joseph in a new light. He is the Patriarch of adaptation; he is adaptation's "patron Saint," if you will.

Before going further, it will be helpful to have a working definition of adaptation. According to the Intergovernmental Panel on Climate Change or IPCC, adaptation actions are those that "enhance resilience or reduce vulnerability to observed or expected changes in climate."[19] This is exactly what Joseph did: he enhanced resilience in order to reduce vulnerability from expected changes in climate.

There are two complementary and sometimes overlapping ways to achieve adaptation, to enhance resilience and reduce vulnerability. One is broader, the other more targeted. The first is achieved by realizing the poverty-reducing and democracy-increasing dimensions of freedom, something as a country that our standard overseas development assistance (ODA) should be helping to foster. The second is achieved through projects, processes, and mechanisms designed in whole or in part to address climate impacts. Both are needed. Neither can be neglected. Federal funding for international adaptation in comprehensive climate change legislation, which needs to be new and additional in comparison to ODA, should go towards addressing the additional burdens created by climate impacts. In other words, such funding should go towards targeted adaptation based on what the likely major impacts of climate change will be in a particular area. Is there going to be more flooding? More drought? Higher temperatures? How do we prepare?

Targeted actions to enhance resilience or reduce vulnerability could take a variety of forms, including concrete projects like switching to more drought-resistant food crops. Just as in the Patriarch Joseph's case, this sounds rather straightforward. But when you go to apply it in a particular situation it can become quite complex. For example, sorghum is more drought-resistant than other crops. But it also brings in less revenue. If you switch, how, then, do you make up that revenue? Or, instead of simply switching to a crop already at hand you create one. The thing is, creating more drought-resistant crops can take decades. It has taken 30 years to achieve drought-tolerant beans for Latin America, for example. And that is the norm.[20] Furthermore, changing to such a drought resistant crop is not simply a matter of providing new seeds. Their acceptance by a family or community also depends upon such factors as their taste and how they can be prepared, storage requirements, and the availability and affordability of other inputs like fertilizers.[21]

As anyone who has managed a major project before knows, they are usually much more complicated than meets the eye and are just as much about process as they are about product. Furthermore, when the project means major changes in the way people do things, part of that process includes education and persuasion and buy-in of those who need to approve and participate in the changes. In many if not most cases, adaptation projects will need to involve both the private and the public sector. Governments, businesses, non-profits, community groups, churches, families, and individuals will have to participate and play their respective roles.

Examples of Adaptation

As briefly mentioned earlier, climate change will increase both the frequency and intensity of inland flooding. One consequence will be a diminishment of the ability of poor people living on increasingly flood-prone lands to grow crops. A simple, practical solution made from resources readily at hand is a floating garden. Water hyacinth (a free-floating perennial aquatic plant) is collected and formed into a raft, upon which soil and cow dung is placed. Seeds of suitable crops are then planted in the soil.

Such floating gardens have been successfully demonstrated in one of the poorest, most remote and flood-prone areas of Bangladesh, the Gaibandha district, located at the confluence of two major rivers, the Tista and the Brahmaputra. The local populations live below the subsistence level, and out of necessity many fathers leave the area in search of work, leaving behind their families. [22]

Now, however, some of the wives and mothers who have been trained on how to create and keep floating gardens are planting them to see them through the lean times. One such mother is Tara Begum, who was able to grow such crops as red onion, pumpkin, and okra. "This has made a great difference to my life. Now I have enough food in the floods and I can give some to help my relatives as well."[23]

Another consequence of flooding is the damage or destruction of housing. One successful formula being implemented in Bangladesh, utilizing locally available resources, involves creating a two-foot high foundation upon which to erect one's home. This simple foundation is made of earth with an outer protective layer of cement and stones. The walls of the home are constructed of easily replaceable panels made of jute (a readily available plant in the area). Water-thirsty plants, such as bamboo and banana, are planted around the structure to soak up water and retain the soil. As one father said, "Before, when the rain came, we wouldn't sleep. We were terrified. But now at last we can live our lives in peace."[24]

From flooding to drought.

As the old saying goes, necessity is the mother of invention. For thousands of years, when people have needed to they have found various ways to capture rainwater, called in the literature "rainwater harvesting." Because of increased water scarcity brought on by climate change, many will need to discover anew how to do it in their local area.

One way to capture rainwater for crops in a time of drought is by constructing ridges of soil along the contours of fields so that the rainwater doesn't simply run off the hard-baked soils. Before utilizing this technique, Tias Sibanda, a local farmer from the Humbane village of Gwanda, Zimbabwe, frequently harvested nothing during times of drought and would then have to sell some of his livestock to survive.

But utilizing this rain harvesting technique has made a tremendous difference for Tias Sibanda and his family. In the first year he had two crops, which he calculates saved him from having to sell 12 goats (worth about $320). Tias states: "I am confident of further improvements in the future and, if the drought eases, would soon be able to sell some of my maize crop."[25]

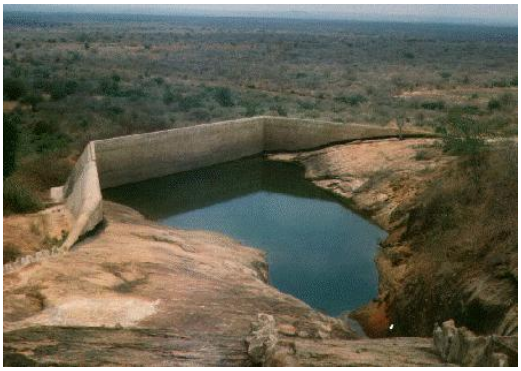
Another rainwater harvesting technique is to capture rainwater that flows off of rooftops by a system of gutters and pipes that channel the water into a storage tank. Efforts in Muthukandiya, a drought-stricken village in Sri Lanka, serve as an example, not only of effective use of this technology, but of how intentional efforts at community involvement increased the success rate.

Previous top-down efforts in Muthukandiya by the government proved ineffective. So a relief and development group working in the area, Practical Action, called a meeting of the village where they asked their views. As a result, this particular rooftop-to-tank storage system of rainwater harvesting was chosen and a plan was developed to make it a reality. A village committee was set up to run the project. Nearly forty families agreed to participate. Two local masons were trained in how to construct the 1,300 gallon storage tanks. Participating households were trained in how to maintain the system. The entire system cost $195 (equal to a month's income for a family), but over half of the cost was covered by the community in the form of materials and unskilled labor.

The results? During the driest times participating households have nearly twice as much water as non-participating ones – and such water is much cleaner, too.

A widow in the village, Nandawathie, has capitalized on the opportunities provided by increased water by growing and selling vegetables at her doorstep. With this additional revenue stream she applied for a loan to install solar power in her house, and she is thinking of building another storage tank to grow more produce. Nandawathie also feels safer not having to fetch water. Her children have less diarrhea, and her daughter Sandamalee has more time for school work.

The benefits from this project are clear and compelling. However, Practical Action reminds us that "a lot of effort and patience are needed to generate the interest, develop the skills, and organize the management structures needed to implement sustainable community-based projects" like this one.[26]



A final rainwater harvesting example involves a community-based project in a poor village in the drought-stricken Kitui district of eastern Kenya. Such rainwater harvesting projects are desperately needed in the country, given that only 4% of its rainwater collection potential is being tapped even though it is chronically water-scarce.[27] The particular technique utilized for this project was a "rock catchment," which requires a rock outcrop of sufficient size and with impermeable rock. In the area where the rock slopes down a wall is built, essentially creating a dam. This particular project provided nearly a gallon of clean water within walking distance for each village resident during the dry season.[28]

Successive natural disasters can create a downward spiral that thwarts the efforts of the poor to try to create a better life for themselves, and climate-intensified disasters could make this dynamic even worse. I call this "the downward disaster spiral." But recent efforts in Malawi, one of the world's poorest, most densely populated countries, demonstrate that concerted efforts can thwart this downward disaster spiral. Because of successive floods and droughts, the 2005 harvest was one of the worst ever recorded, declining 29 percent.[29] Given that 85% of the country lives in rural areas and one third of GDP comes from agriculture,[30] such impacts are particularly devastating. Over 5 million people faced food shortages. But just as the biblical Patriarch Joseph planned for hard times to come, the government of Malawi worked with relief and development organizations and development financing institutions to help ensure that the population was better positioned to withstand the next round of natural disasters. Because the resources of many families had been depleted by successive calamities, leaving them unable to buy fertilizers and other inputs, these items were heavily subsidized and distributed by both government and non-government entities in order to raise production. The result was an additional 600,000 tons of maize worth at least $100 million from an investment of $70 million.[31] So not only did this effort thwart the downward disaster spiral, allowing millions to continue creating a better life, it made money for the entire economy in the process.

Another example involves the recent efforts in Mozambique, the sixth poorest country in the world and one that will be hit hard by climate change. Both coastal and inland flooding are constant threats with tropical cyclones (hurricanes) roaring in from the Indian Ocean and nine major rivers flowing through the country to the ocean. Heavy rains in 1999 had swollen the rivers and in February and March of 2000 Mozambique was hit with two major cyclones. Seven hundred people died and 650,000 were displaced. But when a similar situation occurred in 2007 only 80 died, an 89% reduction.

What made this dramatic difference? The government worked with relief and development organizations to conduct a detailed analysis identifying the 40 most vulnerable areas, home to nearly 6 million. At the community level disaster plans were developed and training exercises conducted. Early warning systems were created. In 2007 the activation of these plans and systems helped with the evacuation of those most at risk.[32] Even though they are poor, these

concerted efforts by the government, relief and development organizations, and their local communities made them less vulnerable.

If success can be achieved in two of the poorest countries in the world, Malawi and Mozambique, then success can be achieved anywhere. And such successes not only save lives, they can be highly cost-effective economically, with benefits exceeding costs anywhere from 1 to 38 times, depending upon the project.[33]

Enhancing Freedom by Helping with Adaptation

For a freedom-loving people like ourselves, climate change represents a worldwide scourge. It is a freedom denier, a freedom destroyer, not only in terms of denying opportunities for individuals, but potentially for the cause of freedom in entire countries.

A recent study has demonstrated that it is poor countries that lack a literate population that are more vulnerable to climate impacts. Why? "A literate population will be better able to lobby for political and civil rights, which in turn will allow it to demand accountable and effective government. Where such rights exist, governments are more likely to become accountable for reducing the impact of successive high mortality disasters, and are thus more likely to address vulnerability."[34] The history of our own freedom proves the point. If our Founding Fathers had not been literate there would have been no American Revolution, no Declaration of Independence, no Constitution, no Bill of Rights.

As climate change helps to keep the poor, poor, it could also help rob them of their chance to become free in this democratic sense of being able to petition and influence one's government. More malnutrition, more stunted children, more maternal mortality, more loss of educational opportunities, and increasing conflicts over scarce resources – these consequences of climate change and others could either erode the democratic dimension of freedom or strangle it in its cradle.

The point is this: climate change will help to keep them poor and will strengthen the possible stifling of the democratic dimension of freedom – one of the very things that are needed to make them less vulnerable.

Given all of this, to be on the right side of history, to be on the right side of the cause of freedom today means overcoming the tyranny of climate change. This is one of the great causes of freedom in the 21st Century.

Christians believe that we don't simply have freedom for freedom's sake. We have it for God's sake. We have it for the sake of doing God's will. We have the gift of freedom so we can freely become the ever increasingly glorious images of Christ as we love God and love our neighbors as ourselves and care for the least of these we find in the ditch as if they were the LORD Himself.

As the Apostle Paul said to the Galatians: "It is for freedom that Christ has set us free …You, my brothers and sisters, were called to be free. But do not use your freedom to indulge the sinful nature; rather, serve one another in love. The entire law is summed up in a single command: 'Love your neighbor as yourself'" (5:1, 13-14).

In America's best moments we have been the harbingers of freedom around the world. So too can we be in helping the poor adapt to climate change. We can and we must rise to this occasion. We must not pass by on the other side and ignore those with Christ in the ditch of global warming's impacts. As a compassionate country, we must fulfill the content of our character to maintain our moral strength, which is the backbone of our nation.

Funding

Like we have done with AIDS and malaria and in times of major natural disasters, the US should lead the world with our generosity in helping poor people adapt to consequences they did not cause. And while we may not have understood that our actions in burning fossil fuels would contribute to harmful impacts being visited upon them, that is in fact the case. Our country has a strong value of fairness, and it is only fair that we help those we have unintentionally harmed.

Recent contributions from the rich countries, unfortunately, have been woefully inadequate. One estimate for targeted adaptation puts it at less than 0.2% of what is required.[35]

This of course begs the question: what amount of financial resources will be required?[36]

An estimate from the United Nations Development Program concludes that it will cost approximately $86 billion per year, which would represent a mere 0.2% of developed country GDP, or roughly one tenth what developed countries spend on their militaries.[37]

A study just released by the World Bank estimated targeted adaptation to cost between $75-100 billion a year between 2010-2050.[38]

Another estimate by the UN Framework Convention on Climate Change (UNFCCC) of some of the major areas that will require targeted adaptation provides a range of $28-67 billion, with the upper and lower ranges based upon how severe one assumes the impacts will be.[39] Other respected experts have collectively criticized the UNFCCC funding levels as underestimating the costs "by a factor of between 2 and 3" for the areas estimated. A key sector not included by the UNFCCC, the protection of ecosystems, "could add a further $65-300 billion per year in costs."[40]

What should be the contribution from the US government for targeted adaptation? Given that historically our generous spirit as a country has led the US to contribute 20-30% of the funds for major natural disasters and for such health problems like AIDS, let's assume 25 percent.[41] If we make a further assumption that the needs will be on the low end – $28 billion per year – then the minimum contribution from the US government would be $7 billion annually.

This is the level of federal funding within comprehensive climate change legislation that the partner organizations of the National Religious Partnership for the Environment (NRPE) have called for. The NRPE includes the Evangelical Environmental Network (the organization I work for), the US Catholic Conference of Bishops, the National Council of Churches of Christ, and the Coalition on the Environment and Jewish Life. Together, in a joint letter to Senators (see attached example addressed to Sen. Kerry), we have called for there to be in comprehensive cap-and-trade climate change legislation "an allocation equivalent to $3.5 billion annually, starting in 2012, which moves rapidly toward $7 billion annually by 2020."

Unfortunately, the Waxman-Markey American Clean Energy and Security bill passed by the House of Representatives only provided a 1% allocation for international adaptation, which would be the equivalent of approximately $700 million – an amount that is woefully inadequate. Such funding levels must be increased significantly to capture the full support of the religious community.

While such funding can be justified in a variety of ways, one important way for *our country* to understand financing for targeted adaptation is as **a strategic investment**.

First, investments in targeted adaptation will in most cases generate a healthy rate of return (assuming the money is spent as intended). As mentioned previously, studies have shown that in the area of disaster risk reduction benefits can exceed costs anywhere from 1 to 38 times depending upon the project. As a recent major report on adaptation puts it: "well-targeted, early investment to improve climate resilience – whether in infrastructure development, technology advances, capacity improvement, shifts in systems and behaviors, or risk transfer measures – is likely to be cheaper and more effective for the world community than complex disaster relief efforts after the event."[42] In other words, much better to avoid a big mess than have to clean one up. Much better to do things right the first time.

Second, a stable world is in our national interest (as Gen. Wald will testify to much more authoritatively than I). Diminishing the ways climate change functions as a "threat multiplier" helps to keep our military personnel out of harm's way and forestalls situations that can become breeding grounds for terrorists. A stable world also enhances our economic security by facilitating the free flow of commerce.

Former Senator John Warner has reminded us all – most recently at the July 30 hearing by the Environment and Public Works Committee on Climate Change and National Security – that America's military policy, energy policy and climate policies are interrelated and that, as he quotes Senator Kerry: "Climate change injects a major new source of chaos, tension and human insecurity into an already volatile world."[43] Helping the vulnerable adapt will dampen the prospects for such outcomes.

Third, the US cannot overcome climate change on our own. It is an international problem requiring an international solution. Our investments in both climate mitigation and adaptation will be ultimately futile without an international treaty or agreement, especially since a recent McKinsey & Co analysis concluded that 67% of the greenhouse gas mitigation opportunities required to keep the world below 2°C above preindustrial levels (or about 1°F above 2009 levels) are found in developing countries.[44] Such countries have made it clear that without sufficient funds for adaptation there will be no deal, and having sufficient dedicated funding for international adaptation in a climate bill is the best way for the United States to meet this need.

Fourth and finally, remaining true to our character and our values of fairness, compassion, generosity, and freedom keeps us strong as a country.

We have the means. Let us now summon the will. Thank you for your attention and for your leadership.

---

[1] The purpose of the Evangelical Environmental Network is "to declare the Lordship of Christ over all creation." For more information, go to: www.creationcare.org.
[2] See the Evangelical Climate Initiative's statement at http://christiansandclimate.org/learn/call-to-action/.
[3] See http://www.faithinpubliclife.org/tools/polls/climate-change/.
[4] Hilary Anderson, BBC, "Niger Children Starving to Death," July 20, 2005; http://news.bbc.co.uk/1/hi/world/africa/4695355.stm.
[5] Hilary Anderson, BBC, "Niger Children Starving to Death," July 20, 2005; http://news.bbc.co.uk/1/hi/world/africa/4695355.stm.
[6] Sen. John Kerry and Sen. Lindsey Graham, "Yes We Can (Pass Climate Change Legislation)," *New York Times* (Oct 10, 2009): http://www.nytimes.com/2009/10/11/opinion/11kerrygraham.html?_r=1.
[7] IPCC, 4th Assessment Report (AR4), Working Group Two (WG2), pp. 298-300.
[8] Nigel Arnell, "Climate Change and Water Resources: a Global Perspective," Ch. 17 in *Avoiding Dangerous Climate Change*, H.J. Schellnhuber, et al. eds., p. 167. Arnell's projections are utilized heavily by the IPCC.
[9] IPCC, AR4, WG2, p. 334.
[10] M. van Lieshout et al., "Climate Change and Malaria: Analysis of the SRES Climate and Socio-economic Scenarios," *Global Environmental Change* 14 (2004): 87–99; IPCC AR4 WG2 Ch 8, pp. 408-410.
[11] S. Hales, et al., "Potential effect of population and climate changes on global distribution of dengue fever: an empirical model," *Lancet*, **360** (2002): 830-834. The IPCC utilizes the work of Hales et al. See IPCC AR4 WG2 Ch 8, pp. 408, 410.
[12] World Health Organization (WHO), A. J. McMichaels, et al., eds., *Climate Change and Human Health: Risks and Responses* (WHO: Geneva, 2003): p. 85; http://www.who.int/globalchange/publications/cchhbook/en/index.html. See also IPCC AR4 WG2 Ch 8, p. 401.
[13] IPCC, AR4, WG2 p. 213.
[14] United Nations Development Program (UNDP), Human Development Report Office, Oli Brown, *Human Development Report 2007/2008 Fighting climate change: Human solidarity in a divided world Human Development Report Office, Occasional Paper, Climate change and forced migration: Observations, projections and implications* (Geneva, 2007): p. 20; http://hdr.undp.org/en/reports/global/hdr2007-2008/papers/brown_oli.pdf. See also National Intelligence Council (NIC) and the Office of the Director of National Intelligence, *Global Trends 2025: A Transformed World* (Washington, DC, Nov 2008): p. 53; http://www.dni.gov/nic/PDF_2025/2025_Global_Trends_Final_Report.pdf.
[15] International Alert, Dan Smith and Janani Vivekananda, *A Climate of Conflict: The Links Between Climate Change, Peace, and War* (International Alert, Nov 2007): p. 3; http://www.international-alert.org/pdf/A_Climate_Of_Conflict.pdf. See also CNA, *National Security and Climate Change*.
[16] See Mt 22:34-40; Mk 12:28-34; Lk 10:25-37. See also Rom 13:9-10; Gal 5:13-14; James 2:8; Dt 6:4-5; Lev 19:18.

[17] Here is a nice quotation from Augustine where he states that the Great Commandments are an interpretative key to understanding Scripture: "Whoever, then, thinks that he understands the Holy Scriptures, or any part of them, but puts such an interpretation upon them as does not tend to build up this twofold love of God and our neighbour, does not yet understand them as he ought." See *On Christian Doctrine*, Book One, Chapter 36.40. You can find it online at: http://personal2.stthomas.edu/gwschlabach/docs/xndoct.htm#I.36.
[18] International Institute for Environment and Development (IIED), Sheridan Bartlett, *Climate Change and Urban Children: Impacts and Implications for Adaptation in Low- and Middle-income Countries* (IIED, August 2008); http://www.iied.org/pubs/pdfs/10556IIED.pdf.
[19] IPCC, AR4, WG2, Ch 17, p. 720.
[20] International Livestock Research Institute, P. K. Thornton, et al., "The livestock-climate-poverty nexus: A discussion paper on ILRI research in relation to climate change," Discussion Paper No. 11. ILRI: Nairobi, Kenya, (May 2008). p.41;
http://www.ilri.org/Infoserv/webpub/fulldocs/DiscuPaper11_Climate/Livesto_Climat_Pover_Nexus_DP11.pdf.
[21] United Nations Framework Convention on Climate Change (UNFCCC), Technical Paper, *Investment and financial flows to address climate change: an update* (UNFCCC, Nov 2008): p. 30;
http://unfccc.int/resource/docs/2008/tp/07.pdf.
[22] United Nations, International Strategy for Disaster Reduction, *Linking Disaster Risk Reduction and Poverty Reduction: Good Practices and Lessons Learned* (UNISDR, 2008): pp. 2-5;
http://www.unisdr.org/eng/about_isdr/isdr-publications/14_Linking_Disaster_Risk_Reduction_Poverty_Reduction/Linking_Disaster_Risk_Reduction_Poverty_Reduction.pdf. See also the website of a non-profit relief and development organization in Great Britain called Practical Action, http://practicalaction.org/?id=climatechange_floatinggardens.
[23] Practical Action website, http://practicalaction.org/?id=climatechange_floatinggardens.
[24] Practical Action website, http://practicalaction.org/?id=flood-resistant_housing.
[25] Practical Action website, http://practicalaction.org/?id=climatechange_rainwater.
[26] Practical Action website, http://practicalaction.org/?id=rainwater_case_study.
[27] UN, ISDR, *Linking Disaster Risk Reduction and Poverty Reduction: Good Practices and Lessons Learned*, p. 36.
[28] UN, ISDR, *Linking Disaster Risk Reduction and Poverty Reduction: Good Practices and Lessons Learned*, pp. 33-36.
[29] UNDP, Watkins, *Fighting Climate Change*, Box 4.4, p. 182.
[30] Central Intelligence Agency, The World Fact Book, https://www.cia.gov/library/publications/the-world-factbook/geos/MI.html.
[31] UNDP, Watkins, *Fighting Climate Change*, Box 4.4, p. 182.
[32] UNDP, Watkins, *Fighting Climate Change*, p. Box 4.6, p. 184.
[33] United Nations, International Strategy for Disaster Reduction (ISDR), *Global Assessment Report on Disaster Risk Reduction: Risk and Poverty in a Changing Climate* (United Nations: Geneva, 2009): p. 134;
http://www.preventionweb.net/english/hyogo/gar/report/index.php?id=1130&pid:34&pih:2. The IPCC also states that "there is *high confidence* that there are viable adaptation options that can be implemented in some of these sectors at low cost and/or with high benefit- cost ratios. Empirical research also suggests that higher benefit- cost ratios can be achieved by implementing some adaptation measures at an early stage compared to retrofitting long-lived infrastructure at a later date." See IPCC, AR4, Synthesis, p. 56.
[34] Brooks, N., W.N. Adger and P.M. Kelly, "The determinants of vulnerability and adaptive capacity at the national level and the implications for adaptation," *Global Environmental Change*, vol 15 (2005): p. 161.
[35] UN, ISDR, *Global Assessment Report on Disaster Risk Reduction: Risk and Poverty in a Changing Climate*, p. 143.
[36] For a very helpful Table summarizing the major reports estimating the investments needed for both mitigation and adaptation in developing countries, see the World Bank's *World Development Report 2010: Development and Climate Change* (World Bank, 2009),Table 6.2 [p. 270 of the embargoed draft pdf]:
http://siteresources.worldbank.org/INTWDR2010/Resources/5287678-1226014527953/WDR10-Full-Text.pdf.
[37] UNDP, Watkins, *Fighting Climate Change*, p. 194.
[38] World Bank, *The Costs to Developing Countries of Adapting to Climate Change: New Methods and Estimates: The Global Report of the Economics of Adaptation to Climate Change Study*, Consultation Draft, (World Bank 2009) pp. 4-6; http://siteresources.worldbank.org/INTCC/Resources/EACCReport0928Final.pdf.
[39] UNFCCC, *Investment and Financial Flows to Address Climate Change*, (October 2007): p. 8;
http://www.preventionweb.net/files/1143_backgroundpaper.pdf. When determining its estimate of how much

adaptation funding will be required, the UNFCCC adheres to the concept of "additionality." As they explain in their Nov 2008 update, "the financing of adaptation needs to reflect the fact that adaptation is responding to the additional burden posed by climate change; quite distinct from the aggregate flow of resources towards overall socio-economic development goals." See UNFCCC, *Investment and Financial Flows to Address Climate Change: An Update*, p. 26.

[40] Martin Parry et al., *Accessing the Costs of Adaptation to Climate Change: A Review of the UNFCCC and Other Recent Estimates* (International Institute for Environment and Development and the Grantham Institute on Climate Change: London, Aug 2009): p.14; http://www.iied.org/pubs/pdfs/11501IIED.pdf.

[41] The US has contributed nearly 30% to the Global Fund for AIDS. See U.S. President's Emergency Plan for AIDS Relief (PEPFAR), 2009 Annual Report to Congress, p. 31; http://www.pepfar.gov/documents/organization/113827.pdf.

[42] Economics of Climate Adaptation Working Group, *Shaping Climate Resilient Development: A Framework for Decision-making*, p. 12; http://www.mckinsey.com/App_Media/Images/Page_Images/Offices/SocialSector/PDF/ECA_Shaping_Climate%20Resilent_Development.pdf. This Working Group is a partnership of McKinsey and Co., the Global Environmental Facility, Climate Works Foundation, Rockefeller Foundation, Standard Charter Bank, Swiss Re, and the European Commission.

[43] See The Honorable John Warner (retired), Testimony before the Senate Environment and Public Works Committee, July 30, 2009; http://epw.senate.gov/public/index.cfm?FuseAction=Files.View&FileStore_id=c8fd0cae-f523-4041-8325-7e3410265e8d.

[44] McKinsey & Co., *Pathways to a Low-Carbon Economy: Version 2 of the Global Greenhouse Gas Abatement Cost Curve* (January 2009): p. 35 http://www.mckinsey.com/clientservice/ccsi/pathways_low_carbon_economy.asp. According to the IPCC, keeping temperature rise to 2-2.4°C above pre-industrial levels would require a stabilization of GHG concentrations at between 445-490 ppm (parts per million). See IPCC, AR4, WG3, SPM, Table SPM.5, p. 15. See also, World Bank, *World Development Report 2010*, pp. 66-69 [embargoed pdf].