U.S.-South Asia Leader Engagement Program
“Charting the Water Future of South Asia”

Global Climate Stress and Water Security
30 April 2013

Sherri Goodman
SVP, General Counsel and Corporate Secretary of CNA
Executive Director CNA Military Advisory Board
Your Challenge

3 minutes with your Head of State …

… What are the three most critical issues?

… What is the most pressing issue?

… What is your recommended course of action?

… Why?
Food, Water, Energy Nexus

“Demand for these resources will grow substantially owing to an increase in the global population. Tackling problems pertaining to one commodity will be linked to supply and demand for the others.”

Example -- South Asia

• Impacts from climate change, including water stress, in addition to low economic growth, rising food prices, and energy shortages will pose stiff challenges to governance in Pakistan and Afghanistan.

• Afghanistan’s and Pakistan’s youth bulges are large—similar in size to those found in many African countries—and when combined with slow-growing economies portend increased social instability.
Challenges of Our Time - Population

50% more people in next 40 Years

- 80% of peak in next 30 years
- Nearly all in developing nations

NIC Global Trends 2030

- 25% More Food
- 40% More Fresh Water
- 50% More Infrastructure Energy

What are the population projections in your country?
2-4 degrees C rise over next 50 years

We never have 100% certainty.
If you wait until you have 100% certainty, something bad is going to happen on the battlefield.
That’s something we know. GEN Sullivan

Sea level rise
1-3 meters

Changed Weather Patterns (Drought)

Extreme Weather
Storms/flooding

How might the security of your country be affected by climate changes in other nations?
• Projected climate change poses a **serious threat** to America’s national security
• Climate change acts as a **threat multiplier** for instability in some of the most volatile regions of the world

• Projected climate change will add to **tensions** even in stable regions of the world

• **Climate change, national security, and energy dependence** are a related set of global challenges
Level of Concern about how Climate Change Threatens Security

- Green — Climate is a national security threat
- Yellow — Climate is an environmental issue
- Red — Climate is not a defined concern
- Grey — No information available
Climate and Social Stress: Implications for Security Analysis

National Research Council
Climate Study (2012)
NRC Findings: Expect to be surprised

...prudent for security analysts to expect climate surprises in the coming decade, including:

- More single events that were considered rare
- Simultaneous or sequential conjunctions of events will stress response capacity
- Shocks to globally integrated systems (e.g., food supply, strategic commodities, public health)
- Impacts occurring far from triggering events
Climate and Sea Level Rise

Sea level rise 1-3 meters

- Salt water intrusion, loss of agriculture
- Salt water intrusion on underground aquifers
- Costal and inland flooding
- Loss of low lying islands/land

Food
Fresh Water
Infrastructure
Energy

How much food production capacity will be lost?
Where will displaced population go?
**Climate and Less Water**

**Changed Weather Patterns (Drought)**

- Less water for crops – higher food prices/food shortages
- Bigger drain on aquifers – more susceptible to salting
- Less fresh water for humans/livestock
- Less cooling capacity of power plants – less energy
- Increase in fires

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Food

Fresh Water

Infrastructure Energy

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**Vyksa, Russia, 2010**

**Rice paddies in India**

**Wild fire closes airport Katmandu, Nepal, Feb. 7, 2012**
Global Trends 2030 Water Scarcity

What are scarcity predictions for your country?
Are you prepared?
What will be your impact from scarcity in ME?
Climate and Extreme Weather

- Loss of life
- Human displacement
- Spread of disease
- Loss of food crops
- Destruction of infrastructure
- Loss of energy production capacity

Pakistan Aug 2010

How can you be prepared better?
What will be the impact of burgeoning population?
Exposure

- Exposure of people and “valued things” (infrastructure) is linked to vulnerability

- Exposure mediated by
  - Resilience
    - Society - governance
    - Infrastructure
  - Globalized systems that support societies

*How dependent is your nation on globalized systems and will they be available or not?*
Susceptibility and Coping/resilience

• To understand risk we must increase understanding of vulnerability including:
  ▪ Susceptibility to harm
  ▪ Potential for coping, response and recovery

• Prudent to expect climate events to exceed local capacity and compel international response

• Demand for response more common in future

*How susceptible is your population?*

*What investments should be made in disaster risk reduction and in response capability?*
Regional Impacts: Middle East

Water security will be threatened – two-thirds of the Arab world already depends on water sources external to their borders.

Loss of food and water security will increase pressure to emigrate across borders.
Almost 40 percent of South Asia’s 2 billion people live within 100 miles of the coast. Inundation of coastal areas, with loss of settled areas and agricultural land. Threats to water including loss of glacier fed rivers will increase cross border tensions.
Melting Glaciers

Progressive retreat of the Gangotri Himalayan glacier 1780-2001
Pakistan: Challenges

Socio-economic and political conditions

- Prominent agricultural sector (23% of GDP, 44% of labor force, 65% of foreign exchange earnings)
- Sharp water allocation tradeoffs
  - Irrigation vs. power generation
  - Irrigation across provinces
- Internally fragile society -- Nuclear Armed

Climate Challenges

- Reduction of Indus river flows resulting from loss of the Karakoram glaciers and up stream irrigation
- Increasing ambient temperatures affecting agricultural product cycles
- Increased precipitation variability causing drought in some areas and devastating floods in others
- Sustained internal protest already evident over repeated power outages
**Bangladesh: Challenges**

**Socio-economic and political conditions**

- *150-170 million people*, eighth most populous
- One of *most densely populated*
- GDP drivers are service and agriculture
- “Among Bangladesh’s most significant obstacles to growth are poor governance and weak public institutions.” World Bank

**Climate challenges**

- *Ranks first as the most vulnerable nation to the impacts of climate change* in the coming decades
- Rainfall, rising sea levels, and tropical cyclones are expected to increase
- Sea level and extreme weather will affect agriculture, water and food security, human health and shelter
- Rising sea level expected to create more than 20 million refugees
PACOM: Climate Change is Biggest Long Term Concern

- "Significant upheaval related to the warming planet is probably the most likely thing that is going to happen . . . that will cripple the security environment, probably more likely than the other scenarios we all often talk about."

- "We have interjected into our multilateral dialogue - even with China and India - the imperative to kind of get military capabilities aligned [for] when the effects of climate change start to impact these massive populations,"

- "If it goes bad, you could have hundreds of thousands or millions of people displaced and then security will start to crumble pretty quickly."

Navy Admiral Samuel J. Locklear III
Commander US Forces Pacific

Admiral Samuel Locklear, Mar 2013
**PACOM: Partners must build capabilities**

- In the Indo-Asia Pacific region, as we go from about 7 billion people in the world to 9 or 10 by the century, about 70 percent of them are going to live in this part of the world.
- About 80 percent of them today live within about 200 miles of the coast, and that trend is increasing...

- If you go to USAID and you ask the numbers for my PACOM AOR how many people died due to natural disasters from 2008 to 2012, it was about 280,000. Now, they weren’t all climate change or weather-related, but a lot of them were due to that.

- About 800,000 people were displaced and there was about $500 billion of lost productivity. So when I look and I think about our planning and I think about what I have to do with allies and partners and I look long-term, it’s important that the countries in this region build the capabilities into their infrastructure to be able to deal with the types of things that

Admiral Samuel Locklear, April 2013
President Obama, 2013 Inaugural Address

• “We…still believe that our obligations … are not just to ourselves, but to all posterity. We will respond to the threat of climate change, knowing that the failure to do so would betray our children and future generations.”

President Obama, Jan 2013
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BACK UP
QDR and Threat of Climate Change

• Climate change alone does not cause conflict, it may act as an accelerant of instability or conflict, placing a burden to respond on civilian institutions and militaries around the world

• Extreme weather events may lead to increased demand for defense support of civil authorities…within the U.S. and abroad

2010 QDR
Climate change will exacerbate:
- weakened governance
- economic collapse
- human migrations
- potential conflicts
- northern spread of disease

Stability operations and humanitarian missions could increase for U.S.
Arctic Challenges and Opportunities

- Increased maritime shipping – both intra Arctic and trans Arctic
- Improved access to energy, mineral, fisheries resources
- Other strategic considerations
  - Loss of permafrost
  - Arctic as an area for Naval Operations (SAR)
  - Risk of accelerated environmental degradation (spills, pollution)
  - Potential dispute over resources
  - Changes to the livelihood/sustainment of indigenous peoples

Shrinking cap
The Arctic polar ice cap is at its smallest size in 30 years of observations:

Average minimum polar cap, 1979-2010
Current extent of Arctic ice cap, Aug. 26, 2012

Source: NASA Goddard Space Flight Center