



# *Environmental Challenges And Global Security*

*LTC Steve Lynch  
Joint Staff J-5*

***The answers to 21<sup>st</sup> Century challenges must be as integrated and dynamic as the threats. These are solutions not yet sought***



## *Agenda*

- **GAO “Global Food Security” Review**
- **Stakeholders**
- **Food Security - A System of Systems**
- **Current vs New Strategic Approach**
- **Recommendations**
- **End State**

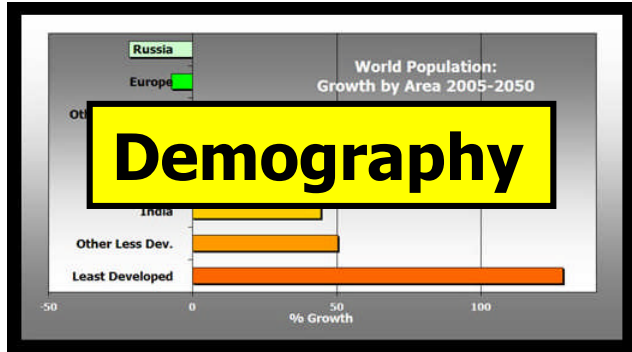


## *GAO “Global Food Security” Review*

- **Who:** Government Accounting Office
- **What:** Review of Global Food Security
- **When:** Complete review NLT Oct 09
- **Where:** Throughout the interagency
- **Why:** House Subcommittee on Agriculture, Rural Development, Food and Drug Administration, and Related Agencies



# Contributors to Food Insecurity & Related Stakeholders



**Demography**

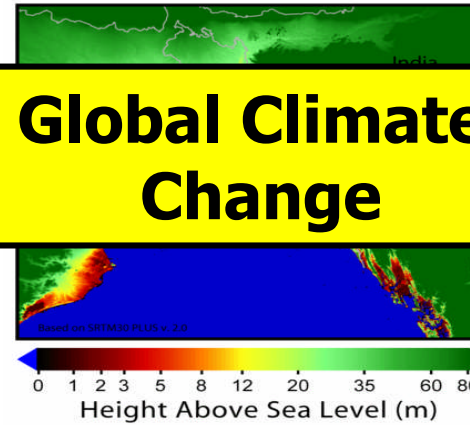
Of the 2.4 billion people to be added to world population by mid-century, the vast majority will be born in countries where agriculture's natural support systems are already deteriorating in the face of excessive demands

USDA projects the number of malnourished/chronically hungry people in developing countries will reach 1.2 billion by 2017



**Food**

Sea Level Risks - Bangladesh



**Global Climate Change**

One-meter rise in sea level could flood close to half of the riceland in Bangladesh, proportionately shrinking the rice supply of the country's 161 million people



**Energy**

World's automobile fleet is growing by 23M cars per year, 0.4 hectares of land has to be paved for every 20 vehicles added

Of all the environmental trends that are shrinking the world's food supplies, the most immediate is water shortages



**Water**

**Social/Cultural**



**Economic**

One-degree Celsius temperature rise above the norm lowers wheat, rice, and corn yields by 10 percent

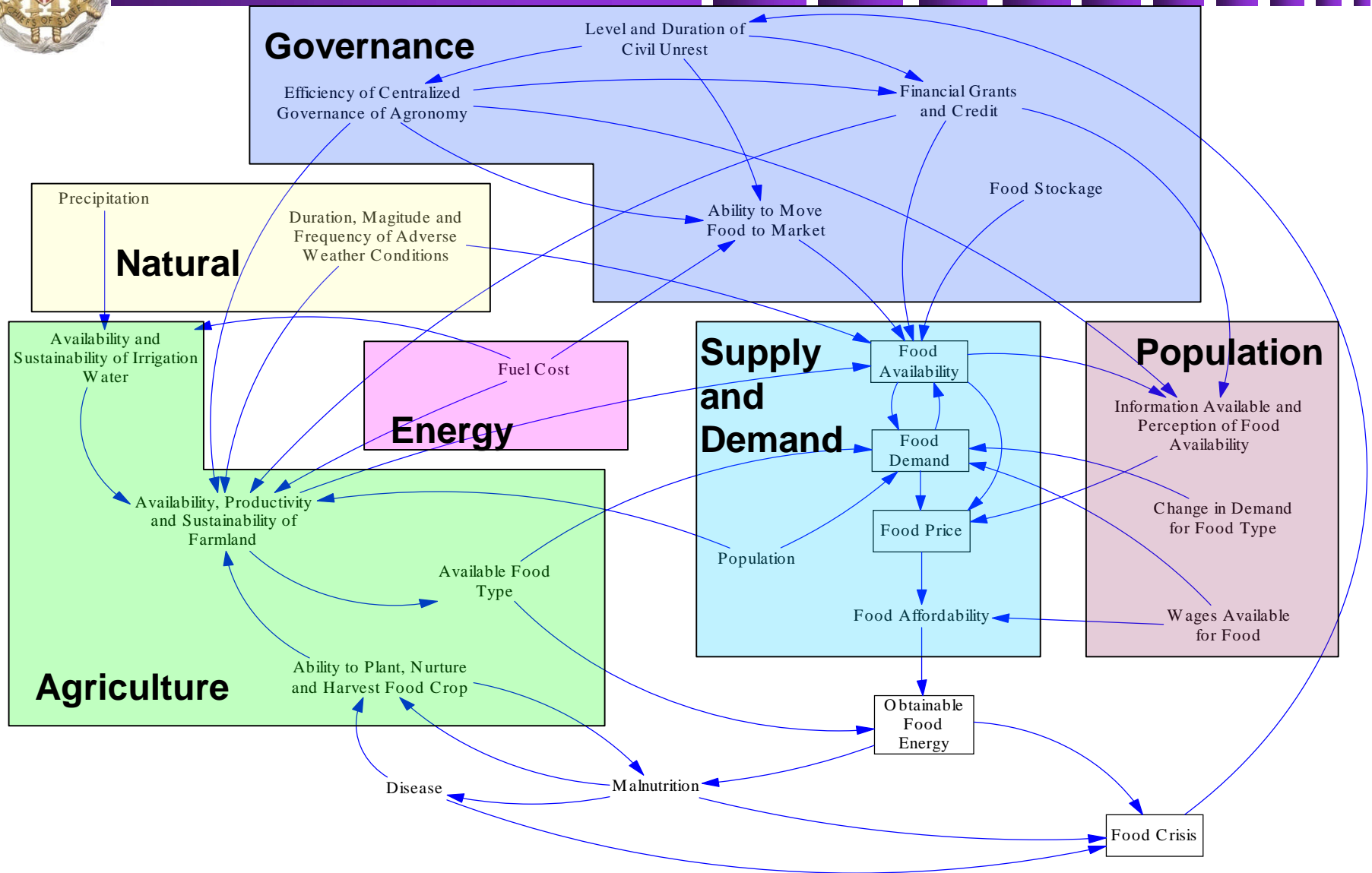
Some of the world's most productive cropland is being lost to construction

**Political**





# Food Security is Part of a System of Systems

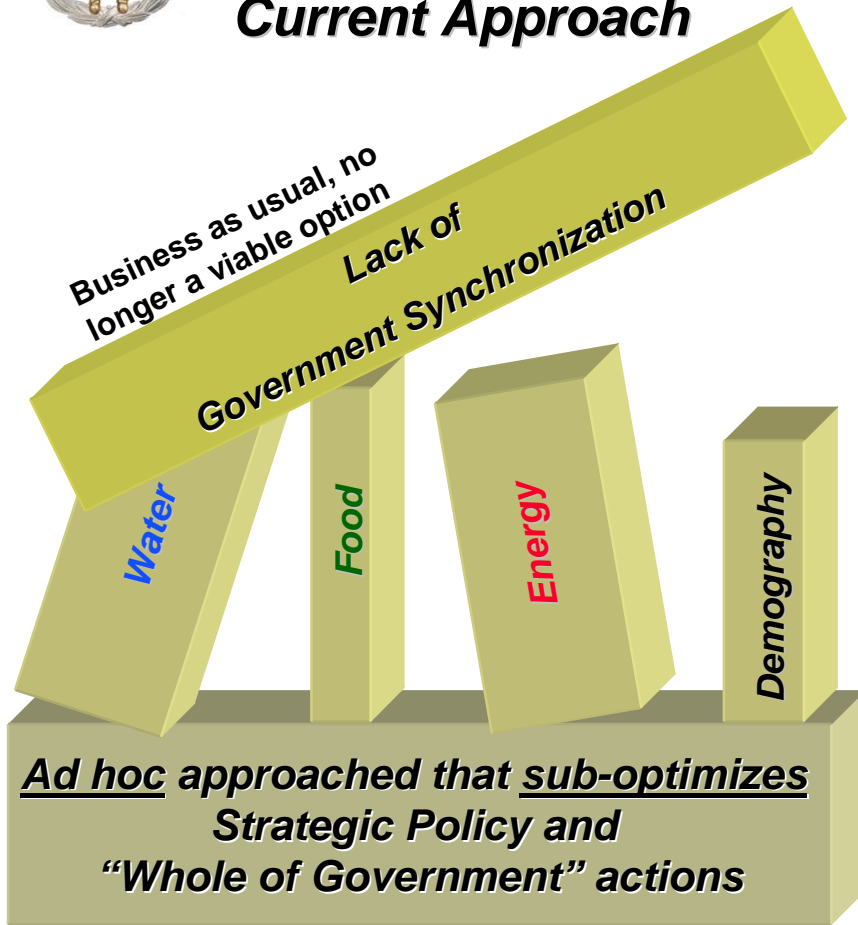


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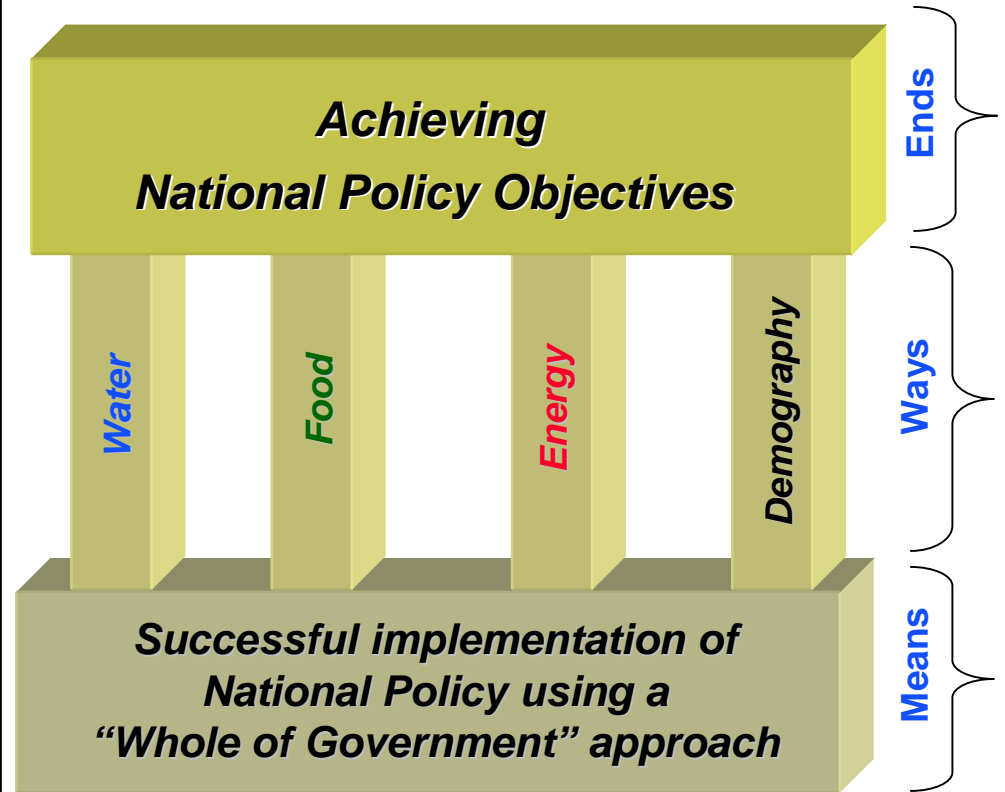
# Current Approach vs New Strategic Approach

## Current Approach



**Four (4) Components of Environmental Security (ES)**

## New Approach



**Four (4) Components of Environmental Security (ES)**

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# ***RECOMMENDATIONS***

Unclassified



## *Strategic Policy “Whole of Government” Approach*

### ***Stand up a National Security Council (NSC) Interagency Policy Committee (IPC) on Environmental Security (ES)***

Submit a co-sponsored NSC proposal to establish an Environmental Security (ES) IPC to develop a Strategic, “whole of government” ES strategy.

Under the proposed ES IPC, elements such as: Food, Water, Energy, Demography would be properly coordinated and synched to an overarching national policy objectives

ES strategy would utilize all instruments of national power (Diplomatic, Information, Military, and Economic – Private and International (DIME – PI)

Ensure inclusion of U.S. strategic end state and objectives into all interagency documents

***Left unchecked, these independent, uncoordinated, ad hoc efforts lead to sub-optimization of U.S. national strategic policy***





*End State*

*End State*

***Development of a fully integrated U.S. Environmental Strategy that takes advantage of interagency actions to prevent conflict and promote regional stability.***

As the new National Security Advisor, Mr. Jones will create new NSC directorates that will deal with such department-spanning 21<sup>st</sup> century issues such as **Energy, Climate Change, Nation Building and Infrastructure**

Washington Post 8 February 2009

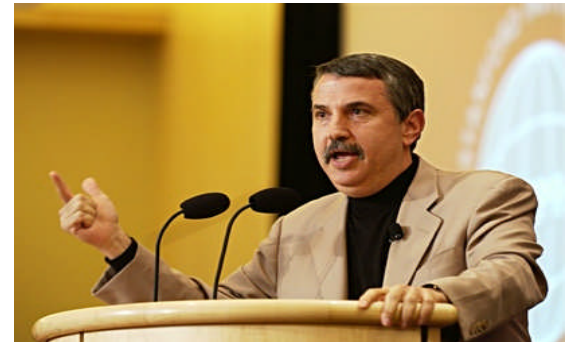




# QUESTIONS

***“ If we’ve learned anything from September 11, it is that if you don’t visit a bad neighborhood, it will visit you.”***

***-- Thomas Friedman***



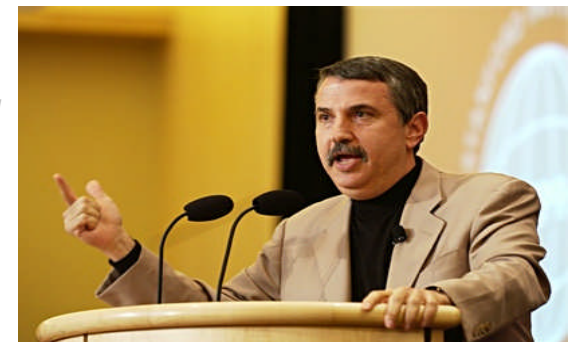


## *DOD Authorities*

- Congressional mandated language (see Section 931 of the FY08 NDAA) on climate change exist in NDS.
  - One missed opportunity is the chance to explicitly connect ungoverned area of failed or weak states with population-environmental issues
  - Strategic and Operational documents need to reflect today's realities (NSS, NDS, NSS, QDR, GEF, JSCP)
- Congress mandated in Public Law No. 110-181 that the Defense Department consider climate change in its planning, and use “the mid-range projections

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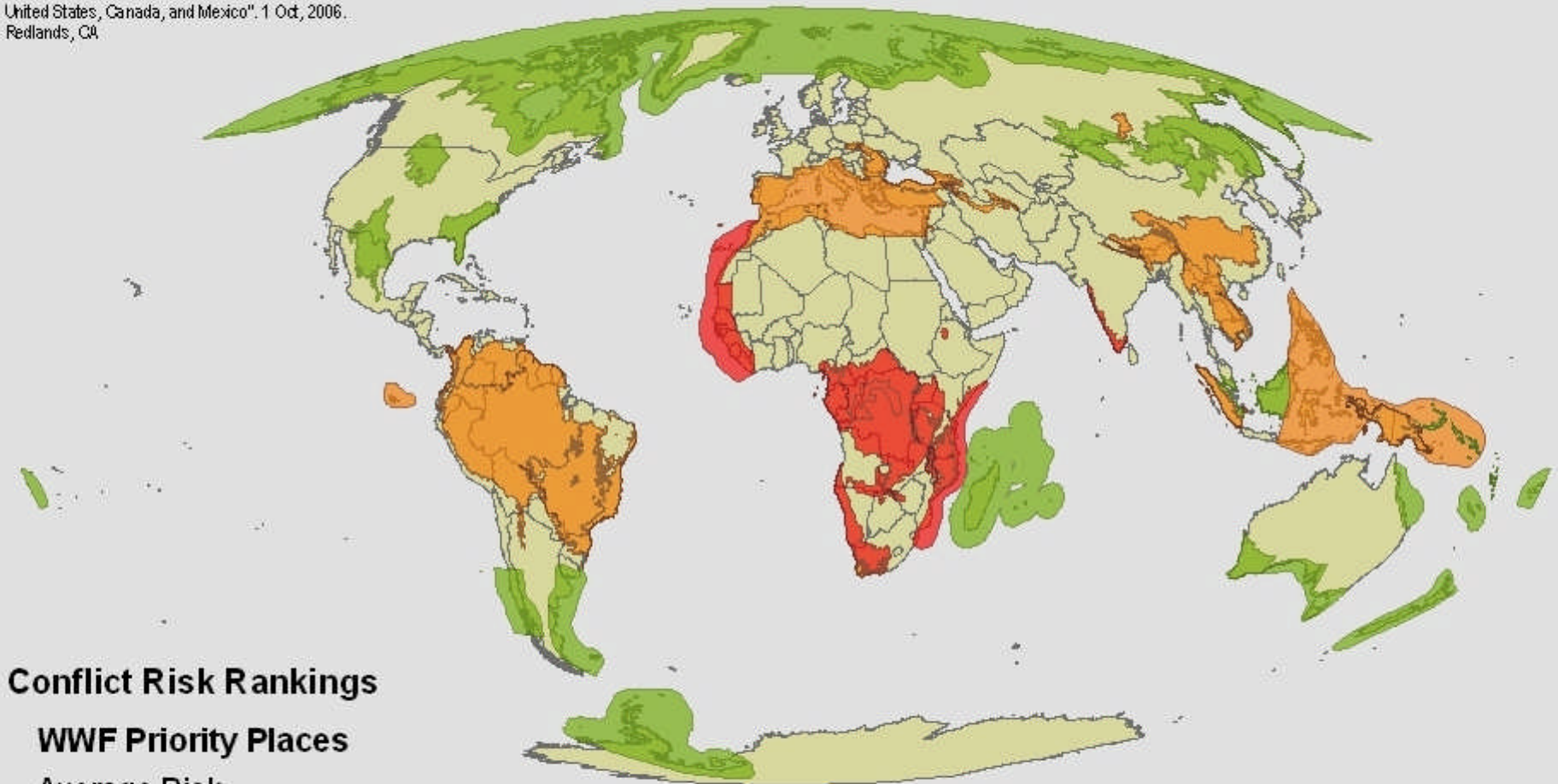
**Unclassified**

Priority Place Data: "World Wildlife Fund 35 Priority Places".  
Conservation Science, World Wildlife Inc. 23 Jul, 2008.  
Washington, D.C.

Political Boundary Data: "ESRI 2006 World, Europe,  
United States, Canada, and Mexico". 1 Oct, 2006.  
Redlands, CA

# Conflict and Instability Forecast World Wildlife Fund Priority Places

Instability Risk Data: Hewitt J. 2008. "The Peace and  
Conflict Instability Ledger: Ranking States on Future Risk".  
In J. Hewitt, J. Wilkenfeld, and T.R. Gurr "Peace and  
Conflict 2008". University of Maryland. Paradigm. Boulder  
and London.



## Conflict Risk Rankings

### WWF Priority Places

#### Average Risk

- High
- Moderate
- Low



This analysis examines the risk of future conflict for areas of high concentrations of biodiversity under imminent threat of habitat conversion and degradation. These areas have been identified by the World Wildlife Fund Inc. as high priority areas for conservation efforts.

Forecasting the risk of future conflict and political instability for Priority Places involves first identifying the political, economic, and social conditions necessary for conflict to erupt in individual countries, and then forecasting the likelihood that those conditions will exist in Priority Places. While this forecast does not predict where conflict will actually occur in the future, it does show which conservation priority areas are most likely to experience a social, economic, and political propensity for conflict in the future.





## *Environmental Conflict Connection*

**As global population continues to rise, and demand for resources continues to grow, conflicts over natural resources will intensify**

- **Since 1990, at 18 violent conflicts have been fueled by exploitation of natural resources:** Afghanistan, Angola, Burma, Cambodia, Colombia, Congo, Dem Rep. of , Congo, Rep. of, Côte d'Ivoire, Indonesia – Aceh, Indonesia – West Papua, Liberia, Nepal, PNG – Bougainville, Peru, Senegal – Casamance, Sierra Leone, Somalia, Sudan (UNEP “From Conflict to Peacebuilding)
- **Over the last sixty years at least 40% of all intrastate conflicts have a natural resource link**
- **Exploitation of natural resources can be implicated in all phases of the conflict cycle (outbreak, perpetuation of violence, undermining peace)**

**Climate change will further exacerbate political, economic, and social instability...serves as a threat multiplier**



## *Environmental Degradation & Conflict*

### *Border Between Haiti & Dominican Republic*

- **95% deforestation and severe soil erosion has destroyed Haiti's subsistence & livelihoods, creating unsustainable urban migration, and illegal immigration (specifically U.S.)**
- **Haitian decimation of resources has contributed to:**
  - **Mass rural to urban migration**
  - **Government inability to provide basic services**
  - **Resource competition between government, elites, and gangs**
  - **De-legitimacy of Government**



## Case Study - Sudan

### **Environmental degradation, resource scarcity, and climate change as underlying contributors of conflict in Sudan- including Darfur**

- Increased human and livestock population pressures
- A 50 to 200 km southward shift of the boundary between desert and semi-desert has occurred since the 1930s
- Rainfall in Northern Darfur has dropped over 30% over 50 years
- Climate change and crop models forecast a drop of 20-70% in food production capacity in parts of the Sahel Belt by 2030
- Historical reconciliation mechanisms have broken down
- Conflict between Pastoralists versus agriculturalists

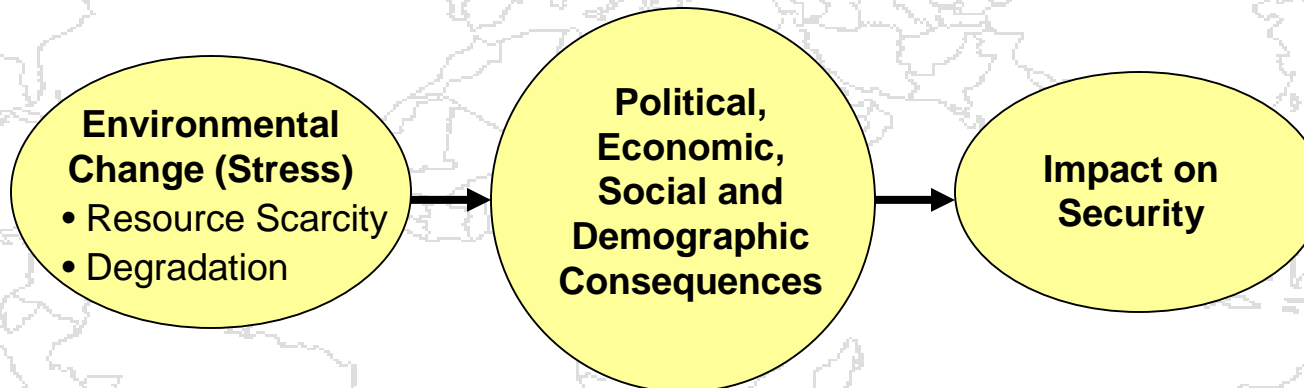




# *Environmental Security Defined*

*Environmental Security (ES) is a process whereby solutions to environmental problems contribute to national security objectives.*

*Dr. Alan Hecht, National Security Council*



**Addressing the environmental components of security, threats to international security can be prevented before they become a threat to political or economic stability or peace.”**





## *DOD ES Requirements*

- **Recognize Link Between Climate Change and Traditional Security Challenges**
- **Enhance operational capabilities by accelerating the adoption of improved business processes and innovative technologies that result in improved U.S. combat power**
- **Develop enhanced military disaster response and humanitarian relief (rescue, lift, engineering, peace and security) tactics, techniques, and procedures**
- **Engagement for capacity building with host national militaries to address adaptation problems of ES**
- **Develop military capacities for early warning and early action**
- **Integrate environmental issues into all phases of operational planning**

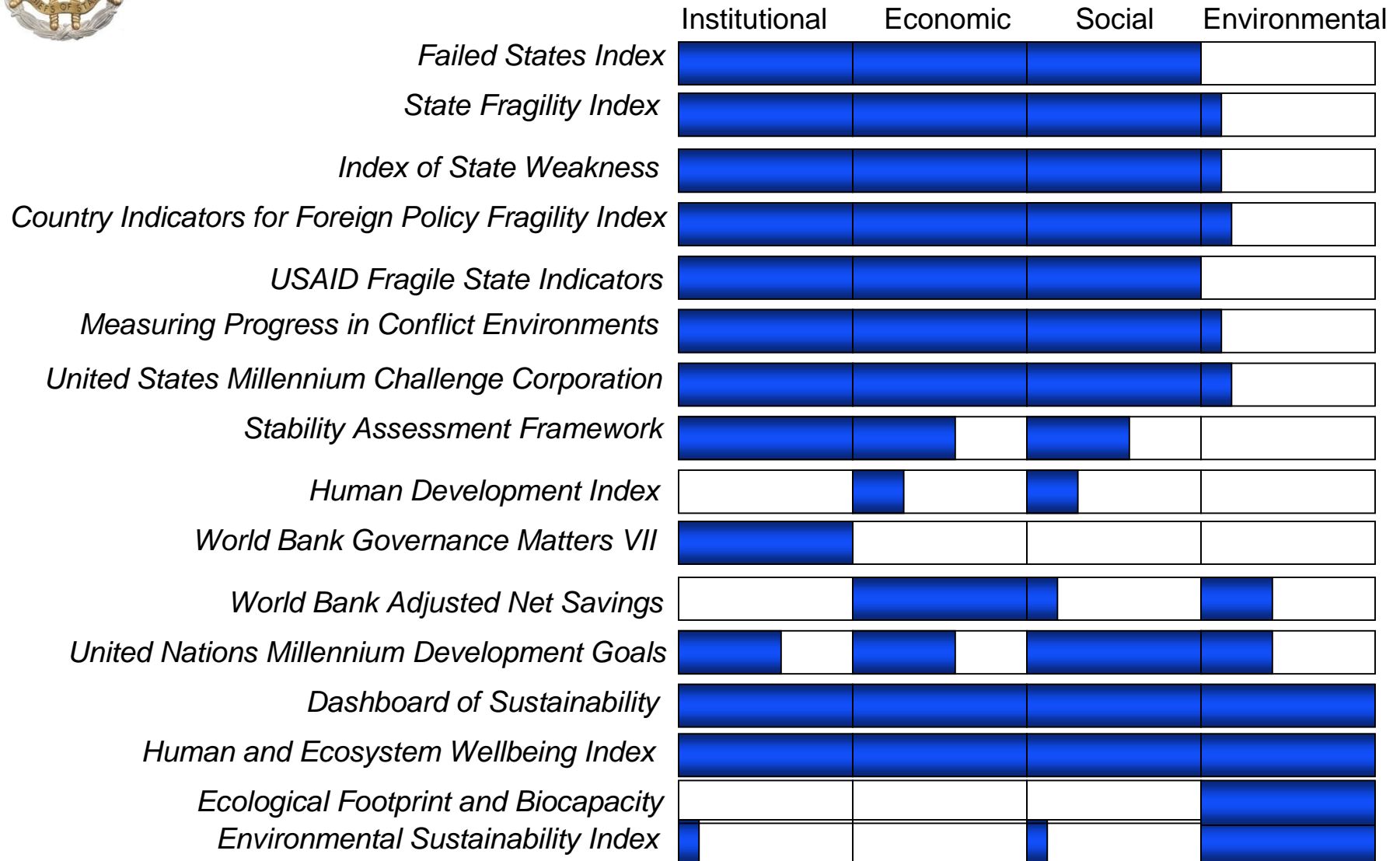


## *Key Institutional Challenges to “Whole of Government” Approach*

- **USG development of strategic, operational, and tactical ES policy, processes, and procedures:** best mix of DOD, interagency, NGO, and International?
- **Overcoming barriers to cooperation**
- **Different Service/COCOM assumptions about the meaning of environmental security and type U.S. response** – This disconnect shapes both threat assessment and policy recommendations
- **Multiple opportunities for success along conflict continuum:** environment security critical to all phases
- **Development of DOD planning, and assessment tools that are fully integrated into USG strategic policy**
- **Identifying interagency, NGO, commercial intergovernmental skills sets necessary to assist DOD in ES planning**
- **Staying behind the scenes: DOD serving in a supporting vice supported role**
- **How to demonstrate/measure success or failure of DOD ES operations/initiatives**



# Comparison of Indicator Sets and Indices



Source: Hearne, Pre-publishable Paper Submitted to George C. Marshall Center, 2008

Unclassified



## *Potential National Security Implications Cont.*

- **Saudi Arabia.** Will phase out wheat production by 2016 -- after being self-sufficient for over 20 years - first country to publicly reveal how aquifer depletion impacts food production.
- **China.** After peaking at 111 MMT in 1997, harvest fell to 103 MMT this year, a drop of 7% within a decade. During the same period, production of rice dropped 6% from 127 MMT to 119 MMT China imports nearly 70 percent of its soybeans.
- **Bangladesh.** 2004 study published by the US National Academy of Sciences, one-degree Celsius temperature rise lowers world wheat, rice, and corn yields by 10%. A one-meter rise in sea level would flood close to half of the riceland.
- **Libya,** which imports close to 90 percent of its grain has leased 250,000 acres of land in Ukraine in exchange for access to one of its oil fields.
- **China.** Most ambitious "farming abroad" goals of all: In 2007 China attempted to negotiate 2.5M acres in the Philippines, an area equal to roughly 10% of that country's farmland, negotiations failed. China is now looking for long-term leases of land in other countries, including **Australia, Russia, and Brazil.**
- Water tables are falling in countries that contain half the world's people, including the three biggest grain producers -- **China, India, and the United States**



# Warfare & Biodiversity Hotspots

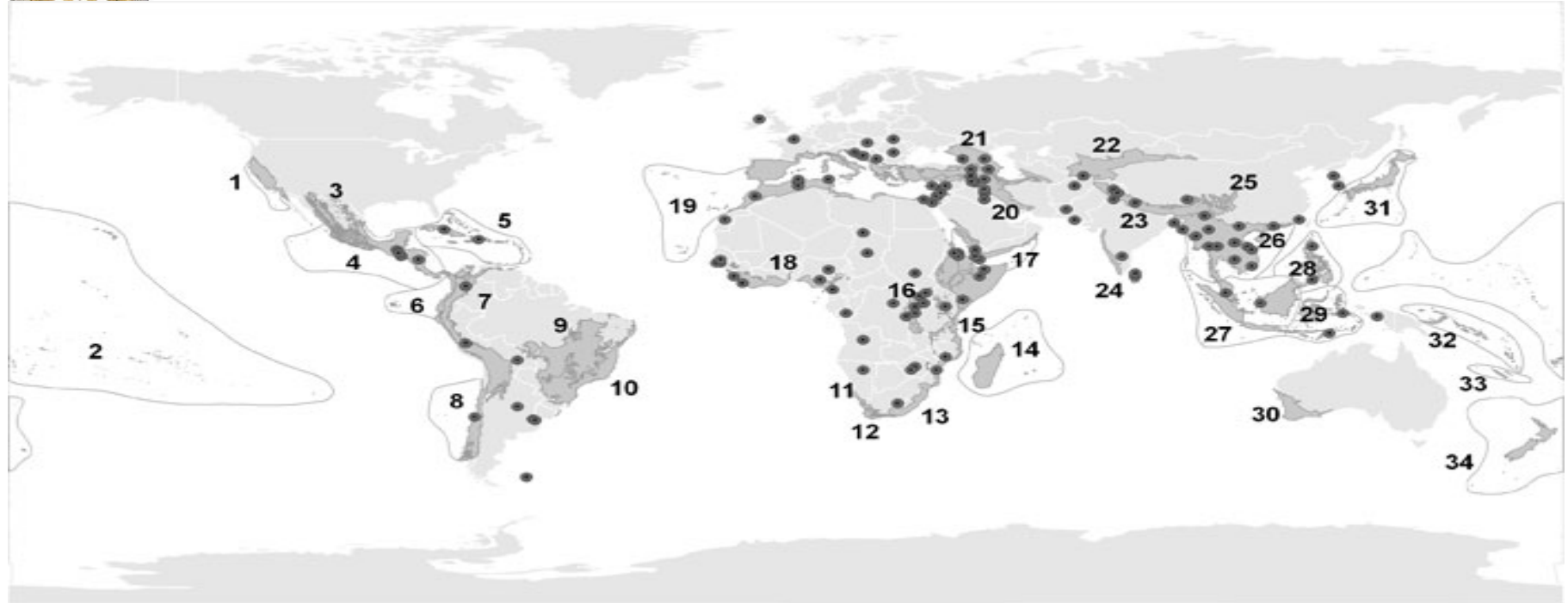


Figure 1. The world's thirty-four **biodiversity hotspots** (numbers) and the location of all armed conflicts with >1000 casualties between 1950 and 2000 (points) (conflict data from Arnold 1991, Sarkees 2000, Gleditsch et al. 2002). Biodiversity Hotspots as follows: 1 – California Floristic Province; 2 – Polynesia-Micronesia; 3 – Madrean Pine-Oak Woodlands; 4 – Mesoamerica; 5 – Caribbean Islands; 6 – Tumbes-Chocó-Magdalena; 7 - Tropical Andes; 8 – Chilean Winter Rainfall and Valdivian Forests; 9 – Cerrado; 10 – Atlantic Forest; 11 – Succulent Karoo; 12 – Cape Floristic Region; 13 – Maputaland-Pondoland-Albany; 14 – Madagascar and the Indian Ocean Islands; 15 – Coastal Forests of Eastern Africa; 16 – Eastern Afromontane; 17 – Horn of Africa; 18 – Guinean Forests of West Africa; 19 – Mediterranean Basin; 20 – Irano-Anatolian; 21 – Caucasus; 22 – Mountains of Central Asia; 23 – Himalaya; 24 – Western Ghats and Sri Lanka; 25 – Mountains of Southwest China; 26 – Indo-Burma; 27 – Sundaland; 28 – Philippines; 29 – Wallacea; 30 – Southwest Australia; 31 – Japan; 32 – East Melanesian Islands; 33 – New Caledonia; 34 – New Zealand.



## *Civil wars and internal unrest fuelled by natural resources*

Country	Duration	Resources
• Afghanistan	1978-2001	Gems, timber, opium
• Angola	1975-2002	Oil, diamonds
• Burma	1949-Present	Timber, tin, gems, opium
• Cambodia	1978-1997	Timber, gems
• Colombia	1984-Present	Oil, gold, coca, timber, emeralds
• Congo, Dem Rep. of	1996-1998, 1998-2003, 2003-2008	Copper, coltan, diamonds, gold, cobalt, timber, tin
• Congo, Rep. of	1997-Present	Oil
• Côte d'Ivoire	2002-2007	Diamonds, cocoa, cotton
• Indonesia – Aceh	1975-2006	Timber, natural gas
• Indonesia – West Papua	1969-Present	Copper, gold, timber
• Liberia	1989-2003	Timber, diamonds, iron, palm oil, cocoa, coffee, rubber, gold
• Nepal	1996-2007	Yarsa gumba (fungus)
• PNG – Bougainville	1989-1998	Copper, gold
• Peru	1980-1995	Coca
• Senegal – Casamance	1982-Present	Timber, cashew nuts
• Sierra Leone	1991-2000	Diamonds, cocoa, coffee
• Somalia	1991-Present	Fish, charcoal
• Sudan	1983-2005	Oil

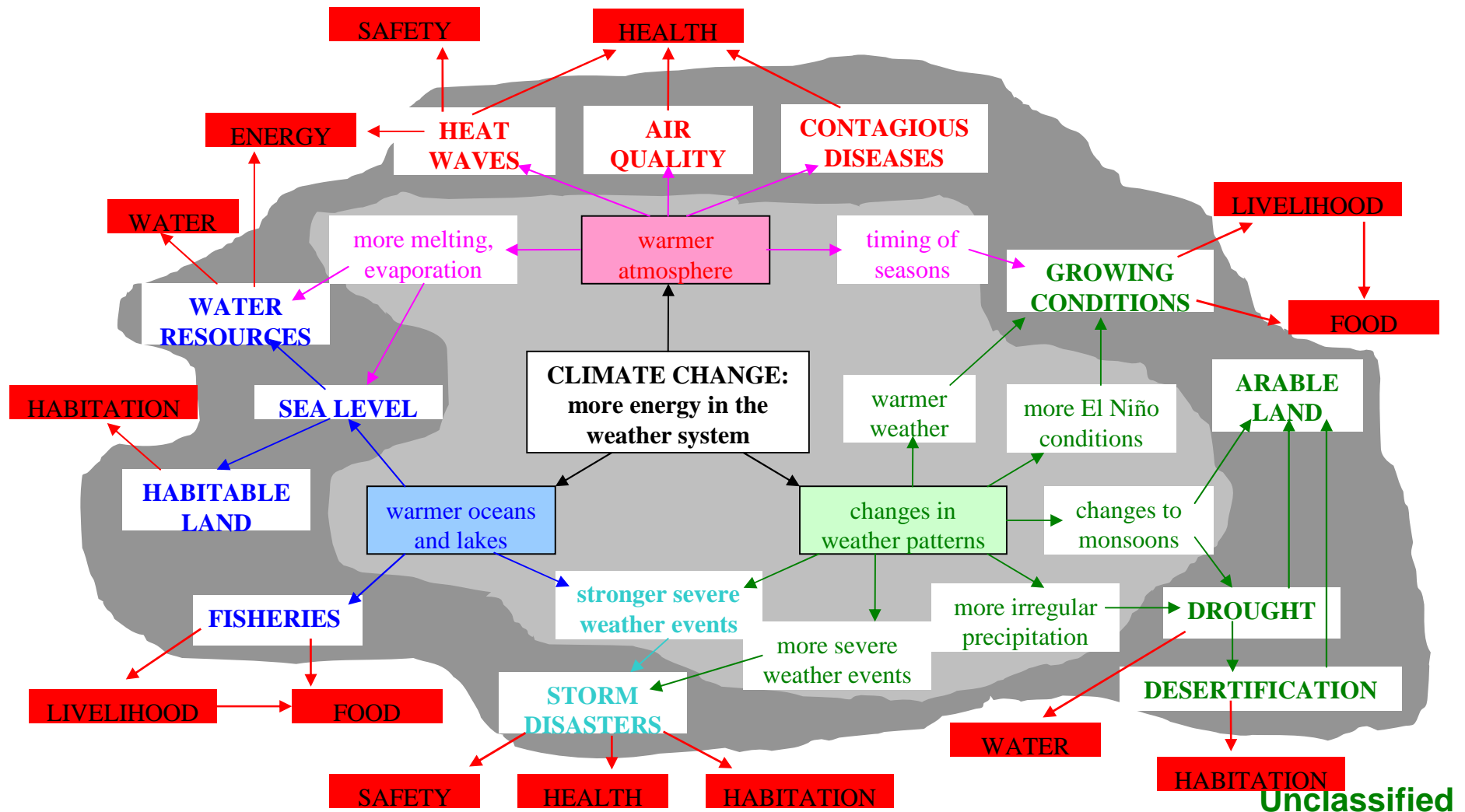
Source. United Nations Environment Program

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# Climate Impact

The warming we are experiencing adds energy to the Earth's weather system (atmosphere and oceans). The three major changes are (1) a warmer atmosphere, (2) warmer large bodies of water, and (3) changes in weather patterns.



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# *New and increased demands on US from global climate change*



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## *Why is Environmental Security Important*

***Climate change, energy, global health and environmental security are often intertwined, and while not **traditionally viewed** as ‘threats’ to U.S. national security, they will affect Americans in major ways.***

**“Such a complex and unprecedented syndrome of problems could cause outright state failure, or weaken pivotal states counted on to act as anchors of regional stability.”**

Adm. Dennis Blair, Director of National Intelligence, Annual Threat Assessment of the Intelligence Community for the Senate Select Committee on Intelligence, February 12, 2009



**Unclassified**