

# Effects of Climate Change on South Asia: A Threat to National and Global Security

By: Stanley Farkas, PhD, Gary Latshaw, PhD, Philip Russell, PhD.

July, 2017

< Extended Summary >

The Department of Defense recognizes the reality of climate change and the significant risk it poses to U.S. interests globally. Climate change is considered a threat multiplier, aggravating stressors abroad such as poverty, environmental degradation, political instability, social tensions, and mass migration— conditions that can enable terrorism and conflict. The impacts of climate change are occurring globally, and the scope, scale, and intensity of these impacts are projected to increase over time as greenhouse gases concentrations increase.

South Asia is one of the most critical hot spots in the world and will be highly impacted by climate change with millions from Pakistan and Bangladesh crossing or attempting to cross into India. Migration, especially from the coastal, and delta river basins and surrounding areas, is of major concern. Migration policies and resource allocation agreements in South Asia are not comprehensive enough to deal with the added impacts of climate change. The potential for a major nuclear conflict between India and Pakistan, also entangling Bangladesh, over migration and resources could multiply. A regional war between these countries would have extremely serious political, humanitarian, and planetary consequences on the global scale. Without rationale, the current administration has prohibited US Government agencies from including climate change in their planning and decision-making, compromising the US leadership and capability to defuse the likelihood of threat to our nation and global security.

**Lessons from Syria:** Reports have linked climate change to the severe long-term drought in Syria which has contributed to or caused mass internal, and external migration, and exacerbated the current on-going civil war - a possible precursor for the future of South Asia.

**Temperature Increase:** A global average rise of 4°C by 2100 with business as usual. Rise in global temperatures will cause rise in sea levels, health issues, loss in crop and livestock production, useable water, stress on the environment, air and water quality, and spread diseases of man, plant, and livestock.

**Sea Level Rise:** Rise in global average sea level is projected to be 1 meter by 2100. Sea level rise intrudes into coastal river deltas increasing the inland range of storm surges as much as 50-60 miles into Bangladesh. Sea level rise causes an increase in soil and water salinity, affects crop yields, and reduces the available land for agriculture and shelter. Sea level rise is not uniform globally; where one coastal area rises another can fall.

**Storms, Droughts, Monsoons:** Climate change is expected to increase the frequency and severity of storms, droughts, and the tropical monsoons. Areas that currently experience droughts and severe storms will experience them more frequently and more severely.

**Water Resources:** Water for drinking and agriculture originates from both glacial and seasonal snowpack melt, and from ground water. With rising temperatures, early seasonal melt of snowpack and glaciers will increase resulting in early water flows and possible flooding followed by receding glaciers and snow pack. This can lead to severe water shortages for both agriculture and drinking. In delta river areas, ground water will be severely impacted due to saline intrusion.

# Effects of Climate Change on South Asia: A Threat to National and Global Security

By: Stanley Farkas, PhD, Gary Latshaw, PhD, Philip Russell, PhD.

July, 2017

**Agriculture - Food Crops:** Food crops will be impacted by high temperatures, sea level rise, storms, pests, atmospheric particulates, and lack of salt-free water. The current gap between night and daytime temperatures is rapidly decreasing, reducing cereal yields. Livestock will be impacted by high temperatures, vector-borne diseases, and lack of fresh water. Food shortages would most likely result in increased food prices, placing the poor at risk with malnutrition.

**Ocean Health and Fisheries:** Sea level rise, saline intrusion, ocean acidification, and warming destroy coastal mangrove ecosystems, coastal lagoons, estuaries, and coral reefs affecting the whole range of marine life and impacting 80% of fish caught offshore. Rise in ocean temperatures forces fish to migrate to cooler waters, also reducing their harvest.

**Health and Contagious Disease:** An increase in exposure to stagnant air with the build-up of soot, dust and ozone leads to hazardous air quality conditions. South Asia will experience an increase in heat-related mortality, an expansion of vector-borne diseases like malaria and dengue, and an increase in diarrheal diseases from contaminated water.

**Energy:** Receding glaciers and snowpack change seasonal river flow, impacting hydroelectric generation. Projected construction of 380+ coal plants in South Asia will increase atmospheric CO<sub>2</sub>. Nearly half of the net increase in coal-fired generation capacity worldwide through 2040 occurs in India. Greater uncertainty in the reliability of hydroelectricity will heighten disputes between the countries through which the rivers flow.

**Migration:** Tens of millions of victims of climate change from Bangladesh and Pakistan are projected to seek food, water and shelter within their own country or attempt to migrate to India. India is currently building a fence on its borders with Bangladesh and Pakistan to keep out illegal migrants and terrorists. This could increase the risk of food and water riots. Human trafficking is of major concern with the effects of climate change.

## **Country Facts:**

### **Bangladesh**

- 8th most populous country in the world (161M); 12th in density.
- ¼ of population live in the coastal area vulnerable to sea level rise and storm surges.
- Ranks low on most all measures of economic development; 35% malnutrition.
- Ranked 21<sup>st</sup> from the bottom for political stability.

### **Pakistan**

- 6th most populous country in the world (201M); 54th in density.
- Large population living in the high-density coastal area and major cities.
- Prone to recurring large-scale floods, earthquakes, droughts and landslides.
- 30 % below poverty line; high rates of malnutrition and food insecurity.
- Ranked 3<sup>rd</sup> from the bottom for political stability.

### **India**

- 2nd most populous country in the world (1.3); 28th in density.
- 22% below the poverty line; high rates of illiteracy, malnutrition, and food insecurity.
- Ranked 33<sup>rd</sup> from the bottom for political stability - improved over the last 8 years.