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Being an Intelligence Wire, we understand the importance of analyzing facts and speaking truth to power to save lives. Given that mission, we take climate change just as seriously as terrorism, the rise of China, and the resurgence of Russia. We have therefore decided to dedicate a special publication to the greatest challenge for our generation: climate change and the grave security implications it brings.

CLIMATE CHANGE: Rising Temperatures Will Pose Significant Security Challenges

Summary: UN climate data released on 26 November indicate global temperatures will rise 3.2 degrees compared to pre-industrial levels Celsius by 2100 if current climate change policy trends do not change. This surpasses the 1.5-degree benchmark set by the Paris Climate Agreement which aimed to halt catastrophic levels of warming. This new projection will significantly increase land degradation, acidify the ocean, reduce fresh water supplies, raise sea levels, and degrade air quality. These forces will contribute to authoritarian tendencies, threaten food and water security, challenge geopolitics, harm global economies, and increase pressure on society, possibly leading to global societal collapse.

Land Degradation Lowers Food Security, Likely Exacerbating Societal Tensions: Rising temperatures will intensify periods of droughts and flooding, speeding desertification and soil degradation processes, resulting in less suitable land to grow crops for a rapidly growing world. Droughts will likely emerge in new regions that today grow large amounts of food, such as Central America, many parts of Africa, Southern Europe, Pakistan, the western United States, Australia, and China. Climate change will particularly harm low coastal areas, river deltas, and especially drylands. The World Economic Forum estimates that the world currently loses 24 billion tons of soil to erosion and 12 million hectares of land each year that can displace approximately 135 million people and reduce global food production by 12 percent, pushing prices upwards by about 30 percent by 2045. The UN estimates that humans will demand nearly twice as much food in 2050 as they do today. Nations will likely struggle to fulfill food demands, exacerbating societal tensions to dangerous levels due to people not fulfilling basic needs and in turn competing for vital resources to survive as seen in the Darfur genocide in 2003.

Ocean Acidification to Cut Seaborne Food and Economic Resources: Current carbon absorption by the oceans coupled with rising temperatures will significantly lower oceanic pH levels, acidifying the oceans, threatening up to 90 percent of the world's coral reefs by 2030 and damaging coastal economies. Coral reefs are fundamental to maintaining fisheries; for example, decline of the Great Barrier Reef in Australia reduced regional fish populations by 32 percent. This will most likely cause harm to coastal societies that rely on local fisheries for food security and economic prosperity. Approximately 20 percent of the world's population relies on animal protein intake from fish. Therefore, the reduction of fish populations will likely lead to a global food shortage especially in highly populated coastal regions that depend on local fisheries for survival. Reefs also add a high level of protection of critical infrastructure in coastal cities against ocean born natural disasters such as hurricanes and typhoons. Coral reefs provide an estimated \$400 million value to coastal nations, such as Indonesia, Philippines, Malaysia, Cuba and Mexico by acting as a buffer against storm surge. Coral reefs also provide significant tourism revenue to coastal regions, such as the coral reefs in the Florida Keys which contribute an estimated \$7.6 billion to the local economy. The degradation of tourist-based economies likely will threaten the future of developing nations that have large sections of their tourism economy tied to coral reefs, such as Indonesia and the Philippines.

Decline of Available Freshwater Increases National Competition: Climate change will almost certainly exacerbate the decline in freshwater through worsening drought and natural disasters that threaten the fresh water supply, causing nations to compete for vital resources in the name of survival. Projections indicate demand for freshwater will increase by 50 percent in the next 30 years. Simultaneously, groundwater tables globally are declining yearly at rates up to 8 centimeters, particularly in southeast Asia, the Middle East, and the central US. In addition, rising temperatures are causing large glaciers to melt into the ocean, such as in Asia, where the continent's 10 largest rivers, which support the most populous region in the world, rely on water from slow, seasonal runoff. Specifically, 82 percent of China's glaciers have retreated since 2015. Additionally, 14 of the 20 largest cities in the world are currently experiencing drought or water scarcity. As municipalities struggle to secure water for their citizens, conflict and unrest in urban areas and between nations will likely increase, as seen during the Cape Town water crisis in 2018, and ongoing competition for control of water sources between India and Pakistan.

Rising Sea Levels Threaten Coastal Cities Likely Disrupting Global Economy: A 3.2 degree rise in temperatures will cause 2-4 meters of sea level rise globally by 2100, which will displace residents and industries in coastal cities around the world. Sea level rose by a rate of 3.6 millimeters per year since 2006, doubling the rate of sea level rise over the entire 20th century. The Intergovernmental Panel on Climate Change attributes the rapid decline of the Antarctic and Greenland ice sheets to this acceleration; runoff from the Antarctic ice sheet tripled between 1997 and 2007 and Greenland runoff doubled in the same period. The rising oceans will permanently flood major areas in large coastal cities including but not limited to San Francisco, Shanghai, Alexandria, Bangkok, New York, and Dhaka. Sea level rise will particularly affect the American South, Southeast Asia, parts of Europe (Germany, France, and the Benelux region), and Oceania. In these and other regions, rising water levels will likely force people to immigrate to new cities and possibly new countries, causing friction between immigrants and native groups as the influx of people increases resource scarcity. This sea level rise will also exacerbate the effect of natural disasters, for example, higher sea levels increased the storm surge and flooding in Houston following Hurricane Harvey. Higher sea levels and storm surge will also affect critical infrastructure such as airports, harbors, and coastal military bases. This sea level rise will almost certainly create a global refugee crisis, while negatively affecting the economy of coastal nations which rely on trade.

Poor Quality Increases Tensions in Society and Internationally: Rising temperatures will almost certainly cause global air quality to exceed the World Health Organization's safe level of 100/500 on the Air Quality Index (AQI), which will likely cause unrest and conflict. Air quality has already degraded to significantly dangerous levels, for example, in 2017 Delhi's air quality reached 999/500 on AQI, making it deadly to even step outside. Approximately 10,000 people die from diseases attributed to air pollution daily. The American Journal of Respiratory and Critical Care Medicine conducted a recent study that shows short term exposure to particulate pollution increases the risk of respiratory infection by 15-32 percent. Current projections by the

National Center for Atmospheric Research concluded that America will face a 70 percent increase in unhealthy smog days by 2050. By 2100, dangerously polluted air will affect 95 percent of the global population. This poses a major threat as air pollution increases it exacerbates the risk of health degradation by both long- and short-term exposure. Long term exposure will increase the likelihood of contracting lung disease, heart disease and cancer. While short term exposure will increase the likelihood of developing asthma, cardiovascular diseases, and adverse pregnancy outcomes. An increase in poor air quality will most likely lead to increased social tension between civilians, government, and corporations. For example, rising pollution levels in developing nations such as India and China have triggered protests against government inaction. Additionally, even if some nations address poor air quality, pollution and one country can spread internationally, causing conflict between nations.

Outlook and Implications: The projected 3.2 degree increase in temperature by 2100 given current policy trends will almost certainly increase food and water scarcity and threaten economies and health through ocean acidification and reduced air quality. Sea level rise and ocean acidification will also strain economies in coastal regions.

As alarm over climate change increases, nations may turn to more authoritarian forms of government to ensure the security of basic needs, sacrificing personal freedoms and democratic governance for survival. Historically, nations facing a national crisis have greater authoritarian inclinations, as when citizens face fear they search for reassurance, likely an autocratic leader. Facing economic crisis, post-WW1 Germany turned to Hitler, a Japanese occupied China turned to Mao in the 1940's, and in the early 2000s the Russian Federation turned to Putin after the collapse of the Soviet Union and rapid NATO enlargement. Following end time level events, many citizens may even turn to religious leaders for answers, possibly bringing a rise of theological based autocratic regimes. These theological regimes will likely link a climate disaster to religious prophecy, regressing democratic freedoms like abortion and gay rights as a sign of atonement in accordance with religious scriptures.

As cities and nations struggle to secure food and water, conflict for these resources will almost certainly increase. Conflict over water already exists in regions with inherent water scarcity such as the southwestern US and between nations like India and Pakistan. The increasing scarcity of these critical resources will likely drive nations to more extreme measures to ensure water and food security for their people. In particular Asia, which relies on the significantly declining glaciers for freshwater, will likely see increasing conflict over natural resources, exacerbated by already present political tension. Today, nations feel threatened when oil and other strategic resources diminish and take rapid precautionary actions to protect these critical assets, including war. In the future, nations will most likely take this same view when dealing with the base source of energy for civilization: food and water.

The reduction of key agricultural resources and increase of natural disasters will likely cause a decline in the global economy. The increased frequency and severity of natural disasters caused

by climate change will almost certainly force governments to invest more money into the prevention and recovery from events such as hurricanes, floods, and drought. When Hurricane Maria impacted the Caribbean in 2017 it became the 3rd costliest hurricane of all time, and recovery from hurricanes will almost certainly become more costly and more time consuming as storms with the intensity of Maria become more common. Additionally, ocean acidification and sea level rise will threaten economies that rely on tourism, fishing, and trade. These forces will likely significantly damage economies around the world, and force states less equipped to respond to natural disasters and changing agricultural conditions into economic turmoil.

A 3.2-degree increase will likely place new pressures on civilization through climate change and may possibly result in global societal collapse. Coupled together, rising sea levels, a major decline in food and water security, poor air quality, will all serve as major pressures on society and act as key economic and social disruptors. These disruptors will serve as a multiplier effect on society, exacerbating old problems and creating new ones as society deals with new environmental realities. This will likely increase stress on society and bring dangerous levels of competition between nations and people. As people flee no longer habitable cities, declining food and water resources that no longer support today's population, collapse of the global economy as nations can no longer produce goods, societal unrest due to fear of survival, and destruction of critical infrastructure and cities from natural disasters and rising sea levels, will all likely be too much for any nation to handle and possibly society itself.

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