Climate Security

Subjects: Environmental Studies
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Climate security refers to the protection of countries and societies from conflicts and riots caused by climate change. As climate change becomes more apparent, climate security has been vigorously debated in the international community.

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1. Introduction

It is becoming apparent that human impacts have warmed the atmosphere, oceans, and land. According to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC), which summarizes the latest scientific findings on climate change, the global average temperature for the most recent decade (2011–2020) has already increased by 1.09 °C compared to the late 19th century (1850–1900). Abnormal weather events have also become increasingly severe around the world in recent years. The frequency and increase in intensity of extreme temperature events, heavy 1-day precipitation evemts, and droughts that occurred once in 10 years on average in a climate without human influence now likely occur 2.8 times, 1.3 times, and 1.7 times as often, respectively [1].

Such anthropogenic climate change has caused widespread adverse impacts and related losses and damages to nature and people beyond what would otherwise have occurred due to natural climate variability. Global warming, reaching 1.5 °C in the near-term, would cause unavoidable increases in multiple climate hazards and present multiple risks to ecosystems and humans such as impacts on water scarcity, food production, health, wellbeing, settlements, and infrastructure. According to the IPCC's simulations, Asia, for example, is expected to experience damage to urban infrastructure due to flooding, reduced fishery resources due to rising sea levels, reduced precipitation, rising temperatures, and risks to food and water security [2].

As climate change becomes more apparent, there is growing interest in its economic and social impacts. The risk of conflict and violence between groups or nations caused by climate change (climate security risk) has been vigorously debated in the international community for more than a decade. For example, the United Nations (UN) Security Council has been discussing the security implications of environmental issues such as climate change since 2007 [3]. The European Union (EU) has also recognized that climate change is a remote cause of many conflicts around the world in the European Commission's 2008 report on climate change to the European Parliament and, more recently, in its Common Foreign and Security Policy document [4]. In the United States, the Republican administration of George W. Bush in 2007 was the first to backtrack on the issue of climate change, but the Biden–Lugar Resolution, adopted by the Senate Foreign Relations Committee by future President Joe Biden

and others, noted the potential impact of climate change on US national security interests [5]. Later, in 2010, when the Obama administration came to power, the Quadrennial Defense Review (QDR) also made a direct reference to the national security threat posed by climate change [6]. Against the backdrop of this growing debate on the policy side, the number of papers dealing with climate security in the academic community increased dramatically after 2007.

Discussions on climate security have also been conducted in East Asia. In Japan, the Ministry of the Environment published a report on climate security in 2007 [7]. The Ministry of Defense launched a new “Climate Change Task Force” in May 2021 and began to study the impact of climate change on security. In China, as early as 2015, Professor Zhang Haibin of Peking University published “The Impact of Climate Change on China’s National Security: A Perspective of the Overall National Security Outlook” in the Journal of International Studies [8]. Subsequently, Liu Changsong and Xu Huaqing of the Climate Change Strategy Center of the Ministry of Ecology and Environment published a paper on insights and suggestions for climate change and national security in 2017 [9]. PLA-Daily, the official newspaper of the Central Military Commission of the Chinese Communist Party, carried an essay on climate security risks in 2020 [10].

Despite all of this, it cannot be said that climate security risks are widely discussed in East Asia. Although East Asian countries had officially acknowledged the importance of tackling climate change, discussion of climate security were almost nonexistent among governmental officials, politicians, and academics with very few exceptions, cited above, until recently. Taking Japan as an example, climate change had not been discussed in the context of “cause of conflict and violence”, while “long-term irreversible planetary changes” and “short-term abrupt risks to individuals” of climate change had been considered previously [11].

2. Temperature and Precipitation Change

Changes in weather, such as temperature and precipitation, can have psychological or physiological effects on people such as discomfort, and can trigger violence [12]. For example, higher temperatures are more likely to cause urban riots [13] and political unrest [14] such as coups d’état. Changes in temperature also affect various forms of interpersonal violence such as murder, assault, rape, robbery, and sports brawls [15]. One study predicted a 6% increase in homicides worldwide for every 1 °C rise in the average global temperature [16].

Global conflicts have also been correlated with temperature. For example, Burke et al. of Stanford University found a strong correlation between temperature rise and the occurrence of civil war in sub-Saharan Africa between 1981 and 2002, and predicted that, if greenhouse gas emissions continue at the current rate, the incidence of civil war will increase by approximately 50% by 2030 [17].

However, some previous studies have rejected any direct correlation between temperature and conflict. Buhaug of the International Peace Research Institute in Oslo, for example, pointed out that the abovementioned study by Burke et al., which affirmed the correlation between rising temperatures and civil wars, was biased in its sample of periods and countries, and lacked consideration of social and geopolitical factors. His analysis found no correlation

between temperature and civil wars in Africa [18]. In response to Buhaug's criticism, Burke et al. also modified their regression model and reanalyzed the results; while they still found a correlation between temperature rise and conflict occurrence, they reported that the correlation had disappeared since 2002 [19].

Similar to the analysis of temperature change, mixed positive and negative results have been reported on the relationship between changes in precipitation, such as extreme high or low rainfall, and conflict. With regard to precipitation, analysis has shown that civil wars of a relatively large scale are likely to occur in developing countries in years of high precipitation [20]. In Africa, the correlation of rainfall with conflicts and riots has been pointed out. For example, inter-group conflicts often occur during periods of extreme rainfall and extreme drought in East African countries, such as Ethiopia, Kenya, and Uganda [21].

While some of these analyses acknowledge the relationship between changes in precipitation and conflict, a few studies deny that any correlation exists. For example, studies that deny a correlation between drought and the start of civil wars can be found in Asia [22] and Africa [23]. Another study in East Africa suggested that extremely high rainfall might reduce the risk of violence [24].

3. Natural Disasters

Climate change will increase the frequency and severity of natural disasters such as storms and floods. Natural disasters damage infrastructure and harm crops and livestock. Existing empirical studies suggest that floods may prolong civil wars. Floods destroy public infrastructure and reduce government revenue, thereby reducing the government's security capacity, which in turn tends to prolong civil wars [25].

Studies dealing with the relationship between natural disasters and conflict point to the difficulty and uncertainty of predicting them. Agricultural societies have always coped with such unpredictable and uncertain disasters. As climate change increases these uncertainties to levels never before experienced by humans, however, coping strategies that have worked in the past may no longer function [26].

Some have suggested that sudden, short-term disasters such as cyclones and storms may be more likely to cause conflict than gradual changes such as sea level rise [27]. If the change is gradual, society has more time to cope with the new environment and it is relatively easier to avoid situations that could lead to outbreaks of violence and conflict. Sudden disasters, on the other hand, do not give people time to adapt [28].

Alternately, other studies report a negative relationship between natural disasters and conflict [29][30]. Some studies even suggest that disasters may promote peace rather than conflict. This may be the case in situations where disasters have made continued fighting impossible [31].

4. Sea Level Rise

Sea level rise poses an existential threat for some small islands and some low-lying coasts. Global mean sea level increased by 0.2 m between 1901 and 2018. The average rate of sea level rise was 1.3 mm per year between 1901 and 1971. It increased to 1.9 mm per year between 1971 and 2006, and further increased to 3.7 mm per year between 2006 and 2018 [1].

As sea levels rise due to climate change, many people will be forced to leave their familial lands. This displacement, called climate migration, may cause conflict, as explained below [29]. Globally, population change in low-lying cities and settlements will lead to approximately one billion people projected to be at risk from coastal-specific climate hazards in the mid-term beyond 2040. The population potentially exposed to a 100-year coastal flood is projected to increase by about 20% if global mean sea level rises by 0.15 m relative to 2020 levels. This exposed population doubles at a 0.75 m rise in mean sea level and triples at 1.4 m without additional adaptation. By 2100, the value of global assets that could be lost in a 1-in-100-year coastal flood is projected to range from US$7.9 trillion to US$14.2 trillion [2].

5. Insufficiency of Resources Such as Water

The effect of resource scarcity has long been a focus of attention as a mechanism by which climate change causes conflict. In other words, it is argued that when freshwater, arable land, forests, fisheries, and other resources become scarce due to climate change, competition and conflict over these increasingly scarce resources intensify [32]. In developing countries in particular, it has been pointed out that when water shortages occur due to reduced rainfall and rising temperatures, farmers and nomads may come into conflict over limited water resources [33]. It is also said that conflicts and disputes tend to occur between nations that jointly use water, such as rivers and lakes, especially between upstream and downstream nations, over their water resources [34].

However, the argument that resource scarcity causes conflict has been subject to no small amount of criticism, both theoretical and empirical [35][36][37]. To economists, for example, scarcity is a surmountable problem. They would say that investment, innovation, and trade would be made to conserve or replace scarce resources, as long as efficient markets are functioning [38]. However, markets cannot function without stable governance and institutions. In this regard, some political scientists point to poor governance, widespread corruption, and inefficient institutions as important factors that link resource scarcity and conflict [39].

6. Climate Migration

As sea levels rise, weather conditions change, and water and food shortages become more severe owing to climate change, many people may be forced to leave their familial lands. The resulting influx of large numbers of “climate immigrants” can be a burden to their host societies and can lead to conflicts with the indigenous population [40]. For example, migrants and indigenous people will compete for land, jobs, resources, healthcare, education, and other social services. Furthermore, if the influx of climate migrants disrupts the ethnic balance of the host region, it could increase political tensions between ethnic groups, resulting in conflicts [41]. The combination of

extreme weather conditions that cause migration and the influx of migrants that create conflicts in receiving areas can already be seen in Bangladesh [42] and Kenya [43]. In the early days of the conflict in Darfur, people moved from villages with poor water resources and vegetation to those with abundant water resources, leading to competition for resources at the destination [35]. Similarly, it has been reported that riots are more likely to occur in India when the number of internally displaced people increases due to erratic rainfall [44].

7. Decline in Crop Harvest/Food and Price Crisis

Extreme weather and natural disasters can have a serious impact on crop yields and livestock rearing, causing farmers to lose income and food prices to rise. If they become destitute, some may even resort to violence to survive. This is because the loss of income and economic opportunity lowers the opportunity cost for participating in insurgency and riots [45]. Opportunity costs refer to the potential benefits that an individual misses out on when choosing one alternative over another. For example, when farmers participate in a riot or a war, they may lose the future agricultural income they would have gained. Reduced farmers' incomes due to extreme weather events and natural disasters lowers opportunity costs of leaving agriculture. Thus, the reduction in agricultural income due to climate change will provide the conditions for more farmers to participate in conflicts. This may affect the incidence, duration, and intensity of conflict. Similarly, for urban residents who do not have easy access to alternative food sources, destitution induced by higher food prices is likely to lower the opportunity costs for participating in demonstrations, protests, and riots [46][47].

It has been reported that temperature extremes during the high season for maize cultivation in sub-Saharan Africa reduce the yields of those crops and increase the incidence of civil conflict [48]. Similarly, another study analyzing data from 1997 to 2011 for 46 African countries found that extreme weather events during the growing season of a region's major crops were more likely to lead to conflict than extreme weather events at other times of the year [49]. An analysis of the Syrian Civil War also indicated that droughts during the growing season of major crops are more likely to trigger riot outbreaks [50]. In addition, higher food prices due to extreme weather events and natural disasters have also been correlated with urban riots in African countries [51] and global social unrest [52].

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