

Conflict and Competition over Changing Water Resources

How states react to water stress: recommendations for long-term strategic planning in a warming climate.

On Thursday, 23 July, at Arundel House in London, the IISS hosted a roundtable on 'How States React to Water Stress: Recommendations for Long-Term Strategic Planning in a Warming Climate'. The event included over 20 international representatives from government agencies, research and academic institutions, and NGOs. This report is a compilation and analysis of the proceedings of the roundtable discussion that ensued. The report begins by giving a summary of the major problems and unsolved areas of water security, it then moves into a synopsis of the four discussion sessions, each of which contains a brief set of recommendations for policymakers.

This workshop was the first of three scheduled as part of the IISS' Transatlantic Dialogue on Climate Change and Security, a programme funded by the European Commission. This dialogue seeks to provide a forum for experts from diverse backgrounds to explore the ways in which a warming global climate will affect global and regional security. The goal is to inform policy makers – particularly in the defense, security, and intelligence communities – on the security scenarios that a warming world will present. This format allows an open discussion of policy options for both mitigation and adaptation to the effects of climate change on water security.

Introduction

As the world warms, local, regional, and global climate changes will drive conflict and instability. The scientific consensus that the earth's climate is warming is clear. Climate and environmental change present a clear threat to global security. These changes affect a 'trinity' of sub-issues – water, food and energy – which are the foundation for modern human society. How climate change causes shortages in these areas will be the specific driver of this instability. The purpose of this workshop is to investigate how and where global climate change will affect the first part of this trinity – water – and to better understand what the impacts of water shortages on global security will be.

Water directly impacts food and energy. Water availability and quality has been a focus of governments, NGOs, and academics for many years, but water is only now beginning to be considered as a security issue. However, as climate change alters water supply patterns, water – particularly shortages and droughts in arid regions – will become the most obvious security manifestation of climate change.

Though this workshop seeks to provide policy recommendations, it is also important to identify the many areas that require greater study and research. For example, climate scientists have a basic understating of how precipitation and water availability will change at the global level,¹ but the understanding of water supplies at a regional, sub-regional and national level is less certain. In addition, social scientists acknowledge that there is a potential for water to exacerbate conflicts, but there is a need for more work to determine how to predict when water and resource shortages could precipitate conflict. International law regarding trans-boundary water resources is currently inadequate. Untested or unknown new technologies could mitigate the effects of water scarcity on agriculture, manufacturing, or energy production. Security policymakers are still formulating how nations should react to state failures caused by climate change, with massive humanitarian intervention as one option. Unfortunately, these issues have been largely neglected by politicians, who have focused on energy – not water or food – as the key point in the climate change debate. It is therefore the duty of the academic community, through workshops like this, to raise awareness of water insecurity, its potential effects, and solutions.

High Risk Regions and Cross Border Water Conflicts

The programme began with a discussion of what regions pose the greatest security risk from climate-induced water shortages. Among the regions discussed, Central and South Asia was identified as the most likely to suffer from water-related security conflicts because of a unique combination of: rural economies that are highly dependent on a single annual weather event (the monsoon), many cross-border rivers that flow from tropical glaciers (many of which are in retreat) in the Himalayas, and a rapidly growing human population. These environmental pressures are layered over a region with militarized borders, long-running national antagonisms, and a history of open conflict. Other places in the world are likely to suffer from water-stress caused by climate change, but in nowhere else does the combination mix into such a tight and dangerous package.

When a major river flows through an otherwise arid region, there is a heightened risk of interstate conflict between upstream and downstream countries. Countries controlling the headwaters have incentives to hoard water as a scarce and valuable resource, while downstream countries have incentives to enforce their will on weaker neighbours. Using these criteria, the Nile, the Tigris and Euphrates, the Mekong, and the Indus are areas of potential conflict. However, in most of these river basins, conflict is unlikely because one state – termed the basin hegemon in this workshop – is much more powerful than its neighbours. Of these four major basins, only the Indus is shared among two states that can be defined as strategic peers: India and Pakistan. Though many have persuasively argued that the Indus Water Treaty is a prime example of cooperation succeeding over conflict among neighbours, the possibility of the use of a ‘water weapon’ in a military confrontation between these two nuclear-armed states cannot be excluded. Pakistan – since before the partition in 1948 – has relied on the largest contiguous irrigation system in the world for its food production. The impact of global warming on agricultural production there could be dramatic: planners in the subcontinent estimate that every temperature increase of 1°C will correspond to a 10% decrease in

¹ See the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, 2007.

grain production. Climate change could also cause a reduced water flow from shrinking glaciers or a weakened monsoon. Expanding populations in both India and Pakistan will put great pressure on each nation to control the headwaters of the Indus. Though unlikely, a nuclear confrontation over water is plausible.

The concept of 'basin hegemony' was widely discussed. This is a way of conceptualising power asymmetry in a river basin. Increased basin hegemony – defined as one state having effective control over water resource allocation in a basin – should reduce the chance of interstate conflict. This power asymmetry will lead to asymmetric cooperation that is enforced by the hegemon. However, this raises the question of whose water security we are discussing. Enforced sharing of water resources raises the question of whose water security we are concerned about. For instance, water security for India, Egypt, or China can mean water insecurity for Bangladesh, Ethiopia, or Cambodia.

In agricultural countries, water is manifested economically as food production. This leads to the concept of the 'virtual water' trade, where water intensive crops are imported or exported as a substitute for the actual trade of water (which is mostly unfeasible). For instance, water scarcity in Egypt has contributed to a rise in food imports. In this way, buying food from France is akin to Egypt importing French water, and cheaper than *Evian*. However, a participant raised the question of why, then, the UK – a wet country – imports large amounts of Egyptian oranges. Could the UK's trade policies contribute to water conflicts in arid regions?

Solutions to preventing inter-state conflicts over water should be sought beyond water itself. First, countries should strive to share benefits of water, and when that is not possible, other benefits such as food and electricity could be shared. Secondly, nations sharing river basins should integrate politically as much as possible. Third, international water law should be strengthened to ensure equitable and reasonable ways to resolve disputes over water flows. One way to strengthen international law is the 1997 UN Convention on the Law of the Non-navigational Uses of International Watercourses, which, as of 2009, 17 states have ratified. Countries should use this convention as a means to address their disputes over water rights. Finally, better long-term drought prediction should help to highlight future trouble areas.

Overall, *water wars* – conflicts driven by water issues alone – are unlikely, but *water disputes* are already a reality today in arid regions. Climate change will put greater pressure on these disputes. Governments should seek to solve these disputes through mutual cooperation, and international institutions should seek to support cooperation to the greatest extent possible.

Civil conflicts

Climate change is on the security agenda because it will be a 'threat multiplier' that could lead to state instability and civil conflict.² Climate change is not happening in a vacuum: in many areas of the world it will be accompanied by rapid population growth, resource shortages, and energy price

² See *CLIMATE CHANGE AND INTERNATIONAL SECURITY* (2008), from the High Representative and the European Commission to the European Council, *NATIONAL SECURITY AND THE THREAT OF CLIMATE CHANGE* (2007), from the CNA Corporation, and *NATIONAL SECURITY IMPLICATIONS OF GLOBAL CLIMATE CHANGE THROUGH 2030* (2008), from the US National Intelligence Council.

increases. Analytically, it is difficult to separate the effects of water shortages from other factors, like food shortages, migration, ethnicity, or other issues that could drive violence. However, the impact of water over energy, development, agriculture, and livelihood should make it an important factor. When water insecurity is mixed with urbanization, migration, pollution, radicalization, and a proliferation of small arms, it is not difficult to see a scenario resulting in conflict. Recent examples of areas of high vulnerability descending into regional conflicts include Darfur, Yemen, Ethiopia, Burkina Faso, and Afghanistan-Pakistan. While no one factor (like water, ethnicity, or unemployment) can predict when these regions fell into conflict, a small change could tip the region over the edge. To better understand where that edge is, we need a closer knowledge of socio-political conditions in high-risk areas. Water shortages, or imbalances of water distribution can be driver of civil conflict in a marginalized society.

In terms of terminology, '*water riot*' is more appropriate than '*water war*'. Examples of small-level riots can be found among farmers in China, Ethiopia, Egypt, and Central America. These water riots can be expected to show similar characteristics to the food-related riots that erupted around the world in 2008. Areas of particular risk are those with strong ethnic or tribal divisions, and the effects of water riots may be to drive disaffected and marginalized parts of society away from areas of water stress. Migration will ensure that the effects are not restricted to poor countries; for example desertification in Mexico and Central America could put increasing pressure along the US-Mexican border.

The key to minimizing the chance of civil conflict over water insecurity is preventive action: funding and planning must be in place to adapt to climate change. Climate adaptation funding can have beneficial overlapping effects by funding much-needed traditional water resource management as well. By including funding and planning for climate change into the Copenhagen Process, the international community has set up an institutional way to plan for adaptation to climate change. This is an opportunity to address water security by pairing appropriate planning with dedicated funding.

Adaptation

Adaptation to climate change in the water sector is a complex problem. It will require initiatives at both the local and international level in order to provide long-lasting solutions based on sound practices and new technology. Very often the question is not the one of actual physical scarcity, but one of improper water management and poor water quality. This is often the missing dimension in many adaptation plans. There is a strong bias towards large, highly visible water distribution projects among international donors, like large dam projects. From a technical point of view, donors reproduce first world systems which are often ineffective in third world countries. In addition, the focus in the developing world has been on urban areas, especially capital cities, while provincial cities and rural areas are neglected.

At the national level, the adaptation process is guided by the National Adaptation Programmes for Action (NAPAs). These have been submitted to the UN Framework Convention on Climate Change (UNFCCC) by 38 developing countries, to date. NAPAs provide the outline of a plan for a country's adaptation to climate change. Importantly, 34 of the 38 NAPAs that have been submitted identified

water as a major adaptation issue. Participants noted that a notable shortfall of the NAPAs is that the UNFCCC has no methodology in place to promote the adaptation process in conflict areas. This is important because 16 NAPAs have been submitted by fragile states. The recommendation from participants was to create a participatory process that includes the most marginalized groups of society, along with a greater effort to support donors' coherence and cooperation.

Adaptation to climate change should not always be perceived as a mechanism that only relies on greater direct funding. Adaptation can be cost-effective and flexible. For example, a new adaptation mechanism has been launched based on 'index insurance'. This allows farmers, governments, and relief agencies to insure against weather and climate-related risk to livelihoods. Index insurance payments from droughts, rainfall, and humidity can be an important way to reduce short-term climate-related risk.³

Climate prediction – even in the short term – is an important part of adaptation to climate change. As predictions have gotten better, NGOs, farmers, and governments will be better able to plan their adaptation measures. The International Federation of the Red Cross has begun to use short-term climate predictions at the local, national, regional level to more effectively respond – and pre-empt – disasters. For example, the Red Cross for the first time has issued an appeal for flood-related funding in West Africa one month prior to the anticipated event.

NAPAs and other mitigation initiatives are often criticized. Participants at the workshop pointed out some of the many flaws. Donors should try to interface science and society to better address the needs on the ground. Water rights in NAPAs do not effectively take into account differences in seasons or droughts. There is often a top-down 'one-sized fits all' approach. Instead, efforts should be devised for sharing and disseminating indigenous information, technology and expertise from the bottom-up. NAPAs should include provisions for investments aimed at reducing poverty and encouraging development. The NAPA's stakeholders should be reassessed to include only the most appropriate ministries. Though there were many concerns about the NAPAs, participants agreed that it is an important process in beginning to focus on climate change. However, participants cited a lack of allocated funding from developed countries to implement these plans, and this could undermine support for the NAPAs and the UNFCCC from developing countries.

The strongest disagreement among the participants was between the prioritization of adaptation or mitigation. At the international level adaptation is not simply a technical discussion but is also a political one that requires a comprehensive framework and long-term perspective. Adaptation is often seen as a solution; however, mitigating actions are the best way to protect against the worst effects of climate change.

There are significant ways to improve the international effort to adapt to climate change. Overall, adaptation would benefit from stronger cooperation between the national, local, and international levels. Too often, plans are pushed from above, without local input. Financial support is important, but it is not the only way to help developing countries. Least developed countries have the most to gain from facing water-stress issues, even outside of climate change. Finally, adaptation measures

³ See *Index insurance and climate risk: Prospects for development and disaster management* (2009), Climate and Society Publication #2, from the International Research Institute for Climate and Society.

should recognize that climate change is a cross-border issue, and strategies should be regional: one of the best examples of the implementation of trans-boundary water cooperation is the Water Unites initiative in Central Asia.

When The Water Runs Out

Unmitigated climate change could quickly move beyond the point where adaptation alone is effective. Passing through some climate ‘tipping points’ could lead to rapid local changes in precipitation, sea levels, or temperatures, and the effects on local water supplies could overwhelm the ability of governments to react. Water stress would then become a central human rights issue, as droughts cause famine and disease. As discussed above, such a scenario could rapidly lead to conflict. In this scenario, the international community should be prepared to buttress vulnerable states, so that internal social instability does not lead to regional instability. The prospect of such an event shows that need for refocusing disaster management from reactive to preventive.

Large scale migration is the most likely by-product of water scarcity and will come at a high cost and will require the management of related health issues. In 2008, 20,000,000 were displaced due to floods and storms and about 40% of slums population is there after having left rural areas due to climatic concerns. In China, the government has begun forced migration from unviable regions to more viable areas – this has been smoothed by a strong job market for Chinese internal migrants. In However, would climate migration on a large scale would be similarly smooth?

Climate migrants will likely be permanent. How can the international refugee system – already strained – react to a large (and unknown) number of migrants: many nations have refused to accord climate migrants the official status of ‘refugee’? Certainly, the military will be expected to take up a new role as it is the only single institution with a large enough capacity to contain the effects of the crisis.

The solutions to how to manage a massive water-related climate crisis are not easy. Comprehensive water management policies, both within states and across borders should be adopted. Trends in waters usage would have to change. Recycling, together with non traditional sources, will have to be explored. New regimes of international financing should be established. International institutions will have to better predict water shortages and conflict/disaster management.

The most pressing solution, however, will be to prevent counterproductive solutions. Every country will be tempted to isolate itself from problems beyond its borders. However, resilience is built by stronger international cooperation: if every nation ‘raises the drawbridges’ then today’s international system will collapse. Today, we already see India building a fence along the Bangladeshi border. Such measures are counterproductive, and the international community will have to guard against that sort of adaptation.

Conclusions

Climate-induced water stress is one of the prime challenges of the 21st century. Addressing it requires a comprehensive approach. This includes better designed and more flexible treaties that take into account different levels of water insecurity and specific needs of individual countries. Also, it should comprise a mechanism to control the behaviour of basin hegemon and to protect weaker countries that lack the leverage to deal with the hegemon directly. This could be done by either influencing the hegemon's power to create a win-win solution and encourage leadership, or by challenging that power.

This new approach needs to change the current tendency to look at issues such as water security, carbon emissions, food supplies, energy, and conflict in isolation. Instead, we must acknowledge that these are a part of a complex system. Similarly, the international community should guard against countries that become inward-looking: such policy options can appear effective in the short term, but will only make the situation worse over the long term. Today, developing countries are the most vulnerable to climate change and water stress, but decisions are often made in developed nations. Ultimately, climate change is a global problem requiring truly global solutions. To fully address the security issues arising from climate change, including water security, there needs to be both greater cooperation throughout the international system and greater understanding of the interconnected nature of environmental, security, and economic issues.