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The sustainability and resilience of global water and food systems: Political analysis of the interplay between security, resource scarcity, political systems and global trade ☆

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ABSTRACT

This article looks at the interrelationship between water and food security. More specifically, it examines the resilience and sustainability of water and food systems to shocks and stresses linked to different levels and intensity of conflict, global trade and climate change. The article makes four points: (1) that resource scarcity as a driver of conflict is inconclusive especially at regional and national levels (2) most insecurities surrounding water and food are explained by political power, social and gender relations; (3) global trade has enabled national food and water security, but that is now threatened by increasing food prices, food sovereignty movements and land 'grabbing' (4) and that water and food security will face major challenges under conditions of climate change.

Introduction

This article examines current and potential stresses on water and food systems in order to ensure water and food security. Such stresses are induced by a range of factors (including war/conflict, economic crisis and climate change). This article highlights the long-term dynamics of global water and food systems in terms of sustainability and resilience. However, in contrast to Hanjra & Qureshi (2010) here the emphasis is on possible tensions between global concerns relating to security, allocation, resource scarcity and international trade on the one hand and local coping strategies, power, social and gender relations and right based social movements on the other.

The complementary analysis of global food and water systems is essential in the light of the fact that 70% of global freshwater is used for agricultural purposes. "Water for food" has become an important slogan in the current debates on poverty reduction and climate change in Sub-Saharan Africa (SSA). Recommendations from international commissions (e.g. Commission for Africa), think tanks, national climate change adaptation plans and also from President Obama call for increased investment in irrigated agriculture in SSA to improve food production, livelihoods and resilience of communities to climate variability and change. However, emerging research suggests that the current evidence base on water availability for agricultural production in SSA is inadequate for decision making. Knowledge of basin-scale natural water storage (soil moisture, groundwater, surface water) is typically based on inconsistent and incomplete datasets and there is a lack of integrated, evidence based frameworks for evaluating the impact of development policies, climate and land-use change on environmental water flows essential to the function of catchment ecosystems. This constitutes just one illustration of the water–food nexus.

This article is divided into three parts. The first looks at the question of resource scarcity, conflict and war. The second section seeks to understand how global trade and technological innovations can provide solutions to water and food security while at the same time highlighting their limits in addressing inequality. Finally, the last section looks at short and long term challenges linked to climate change for global and food water security.

Water/food resources, war and conflict

The question of resource scarcity has led to many debates on whether scarcity (whether of food or water) will lead to conflict and war. The underlining reasoning behind most of these discourses over food and water wars comes from the Malthusian belief that there is an imbalance between the economic availability of natural resources and population growth since while food

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production grows linearly, population increases exponentially. Following this reasoning, neo-Malthusians claim that finite natural resources place a strict limit on the growth of human population and aggregate consumption; if these limits are exceeded, social breakdown, conflict and wars result. Nonetheless, it seems that most empirical studies do not support any of these neo-Malthusian arguments. Technological change and greater inputs of capital have dramatically increased labour productivity in agriculture. More generally, the neo-Malthusian view has suffered because during the last two centuries humankind has breached many resource barriers that seemed unchallengeable.

Lessons from history: alarmist scenarios, resource wars and international relations

In a so-called age of uncertainty, a number of alarmist scenarios have linked the increasing use of water resources and food insecurity with wars. The idea of water wars (perhaps more than food wars) is a dominant discourse in the media (see for example Smith, 2009), NGOs (International Alert, 2007) and within international organizations (UNEP, 2007). In 2007, UN Secretary General Ban Ki-moon declared that '*water scarcity threatens economic and social gains and is a potent fuel for wars and conflict*' (Lewis, 2007). Of course, this type of discourse has an instrumental purpose; security and conflict are here used for raising water/food as key policy priorities at the international level.

In the Middle East, presidents, prime ministers and foreign ministers have also used this bellicose rhetoric. Boutrous Boutros-Gali said; '*the next war in the Middle East will be over water, not politics*' (Boutros Boutros-Gali in Butts, 1997, p. 65). The question is not whether the sharing of transboundary water sparks political tension and alarmist declaration, but rather to what extent water has been a principal factor in international conflicts. The evidence seems quite weak. Whether by president Sadat in Egypt or King Hussein in Jordan, none of these declarations have been followed up by military action.

The governance of transboundary water has gained increased attention these last decades. This has a direct impact on the global food system as water allocation agreements determine the amount of water that can used for irrigated agriculture. The likelihood of conflicts over water is an important parameter to consider in assessing the stability, sustainability and resilience of global food systems.

None of the various and extensive databases on the causes of war show water as a casus belli. Using the International Crisis Behavior (ICB) data set and supplementary data from the University of Alabama on water conflicts, Hewitt, Wolf and Hammer found only seven disputes where water seems to have been at least a partial cause for conflict (Wolf, 1998, p. 251). In fact, about 80% of the incidents relating to water were limited purely to governmental rhetoric intended for the electorate (Otchet, 2001, p. 18).

As shown in The Basins At Risk (BAR) water event database, more than two-thirds of over 1800 water-related 'events' fall on the 'cooperative' scale (Yoffe et al., 2003). Indeed, if one takes into account a much longer period, the following figures clearly demonstrate this argument. According to studies by the United Nations Food and Agriculture Organization (FAO), organized political bodies signed between the year 805 and 1984 more than 3600 water-related treaties, and approximately 300 treaties dealing with water management or allocations in international basins have been negotiated since 1945 (FAO, 1978, 1984).

The fear around water wars have been driven by a Malthusian outlook which equates scarcity with violence, conflict and war. There is however no direct correlation between water scarcity and transboundary conflict. Most specialists now tend to agree that the major issue is not scarcity per se but rather the allocation of water resources between the different riparian states (see for example Allouche, 2005, 2007; Rouyer, 2000). Water rich countries have been involved in a number of disputes with other relatively water rich countries (see for example India/Pakistan or Brazil/Argentina). The perception of each state's estimated water needs really constitutes the core issue in transboundary water relations. Indeed, whether this scarcity exists or not in reality, perceptions of the amount of available water shapes people's attitude towards the environment (Ohlsson, 1999). In fact, some water experts have argued that scarcity drives the process of co-operation among riparians (Dinar and Dinar, 2005; Brochmann and Gleditsch, 2006).

In terms of international relations, the threat of water wars due to increasing scarcity does not make much sense in the light of the recent historical record. Overall, the water war rationale expects conflict to occur over water, and appears to suggest that violence is a viable means of securing national water supplies, an argument which is highly contestable.

The debates over the likely impacts of climate change have again popularised the idea of water wars. The argument runs that climate change will precipitate worsening ecological conditions contributing to resource scarcities, social breakdown, institutional failure, mass migrations and in turn cause greater political instability and conflict (Brauch, 2002; Pervis and Busby, 2004). In a report for the US Department of Defense, Schwartz and Randall (2003) speculate about the consequences of a worst-case climate change scenario arguing that water shortages will lead to aggressive wars (Schwartz and Randall, 2003, p. 15). Despite growing concern that climate change will lead to instability and violent conflict, the evidence base to substantiate the connections is thin (Barnett and Adger, 2007; Kevane and Gray, 2008).

Water, food insecurity and civil wars

At sub-national scales (i.e. the intra-state level and the local level), the link between scarcity and conflict is more complex. At the intra-state level, recent research on civil wars shows that countries suffering from environmental degradation (soil degradation, deforestation and freshwater supply linked to high population density) were indeed more likely to experiance civil war, but that the magnitude of the effects was secondary to political and economic factors (see for example Urdal, 2005; Hauge and Ellingsen, 1998). The same is true for hunger and food insecurity as a cause of conflict. The work of Collier and the US State Failure Task Force seems to suggest a possible correlation between food insecurity and civil wars. Collier found a strong relationship between indicators of deprivation (such as low per capita income; economic stagnation and decline; high income inequality; and slow growth in food production per capita) and violent civil strife (Collier, 1999). The US State Failure Task Force found that infant mortality, a surrogate measure of food insecurity and standard of living, was one of three variables most highly correlated with civil war (Goldstone et al., 2003). However, a number of specialists have challenged the notion that food insecurity is a proximate cause of conflict and prefer to emphasize ethnic and political rivalry (Paalberg, 1999). Nonetheless, most analysts would agree that structural conditions of inequality and hunger are among the underlying causes of conflict. But again, 'physical resource scarcity' is not in most cases the result of insufficient production or availability but is usually linked to the politics of inequality.

Resource scarcity and human insecurity

At the local level, there is some evidence that the lack of clean freshwater has occasionally led to intense political instability and that, on a small scale, acute violence can result. In rural settings, the recurrent conflicts between pastoralists and farmers over

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water access and use in agriculture have been well documented. In Africa's Sahel region, desertification is reducing the availability of cultivatable land, leading to clashes between herders and farmers. In Northern Nigeria, Sudan and Kenya, the state is unable or unwilling to contain and manage the conflicts and these clashes have become violent (Hussein et al., 1999). The local level may provide more support for the resource-conflict nexus. This is especially true in dryland, pastoral environments. For pastoralists, drought and famine are constant hazards and for many, conflicts are an accepted reality, a long-standing feature of social relations (Lind, 2003). However, according to most experts, the major change in the modern era is: (1) the extent and duration of the famines pastoral communities are experiencing and (2) the increasing numbers of people exiting pastoralism and the fact that they have livelihoods that are deeply insecure, meaning that they struggle to meet their food needs even in 'good' years. Natural disasters are not new in these arid regions – a rule of thumb was at least seven major droughts per century – but these extreme conditions are becoming more frequent due in part to large-scale deforestation and increased climate variability (Keller, 1992). Besides environmental change, raiding practices are also seen as an important structural driver that limits the capacity of herders to cope with famine. In their analysis of famine cycles in the Turkana district in Kenya, Hendrickson et al. (1998) show how raiding has slowly evolved from a cultural practice that had a redistributive role (reallocating pastoral resources between rich and poor herders) to a predatory activity with criminal motives involving actors from outside the pastoral system (i.e. armed military, bandit groups and 'economic entrepreneurs'). In this regard, Hendrickson et al. (1998) demonstrate how raiding has become closely associated with famine and chronic food insecurity.

At the same time, Ostrom's work (1990) shows how local people cooperate in times of scarcity. Refuting Hardin's (1968) pessimistic 'tragedy of the commons', her publications have highlighted a variety of conditions under which collective action in resource management operates effectively, such as when there are clear resource boundaries and relative socio-economic homogeneity among users.

What seem to be emerging, in fact, is that geographical scale and intensity of conflict are inversely related. However, water-related conflicts are caused more by the way in which water use is governed than by water scarcity (see for example the ongoing tensions between landowners and poorer peasants in the Chittoor District, India, over the lowering of the water table). The outcome of local conflicts tends to reflect societal problems. The evidence that countries engage in wars specifically over water is poor but there is little doubt that water conflicts are common at the inter-sector, inter-community, inter-farm and inter- (and intra-) household levels. Access and control over water, political power, and social and gender relations are the major drivers causing water crises, especially at the local level (see for example Mehta, 2005).

The risks of water-related conflicts are at the level of human security. As suggested by Gleick (2009), these risk can be reduced if: (i) basic human needs for water are met as a way to ensure, if not absolute justice, at least some semblance of equity, (ii) effective peace-keeping operations at the United Nations are developed when resource disputes cannot be resolved locally, and (iii) diplomats have a better understandings of the connections between water and conflict so that they can apply the tools in other conflict situations to reduce water disputes.

Armed conflict, post-conflict societies and emergency food and water insecurity

Armed conflict is the main cause of emergency food insecurity in the world today (FAO, 2000) and, hunger is routinely used as a weapon or a political tool during conflicts. In Ethiopia for example, the government attempted to deny food to rebel forces and their supporters – livestock, farms and food stores in Tigre and Eritrea were systematically bombed (Keller, 1992, p. 620). More generally, it has been estimated that approximately 24 million people in 28 countries across the world are hungry and in need of humanitarian assistance due to war (Messer et al., 2001). The most affected people are usually refugees and internally displaced persons of which women and children are a large majority. The impact of armed conflict on food production and food availability is important especially in the African context where most people earn at least a part of their livelihood through agriculture or livestock keeping. One study estimated that food production in 13 war-torn countries of Sub-Saharan Africa during 1970–1994 was on average 12.3% lower in war years compared to peace adjusted values (Messer et al., 1998). In another study covering all developing countries the FAO estimated that from 1970 to 1997 conflict induced losses of agricultural output totalled $121 billion in real terms (or an average of $4.3 billion annually) (FAO, 2000).

These impacts are not just on food production but there is also a devastating human dimension in terms of hunger and malnutrition. So far the emphasis has been on the impacts of armed conflict on food security but there is also an important post-conflict dimension. A number of studies have shown how violent conflict in Africa plays a decisive role in the creation of conditions leading to famine (de Waal, 1990, 1993; Macrae and Zwi, 1994), and point to the changing nature of the relationship between conflict and vulnerability to famine. As highlighted by a recent FAO study (2008), food shortages linked to conflict set the stage for years of long-term food emergencies, continuing well after fighting has ceased. These situations can be characterized as chronic entitlement failures where communities, households and individuals who have had their assets stripped through conflict, lack the income and livelihood resources to access food and assure their food security, even where food is available (see Macrae and Zwi, 1994).

The impact of war on water is also a serious issue. Ensuring safe water and decent sanitation for civilians in conflict zones is crucial in the sense that diseases have an even large impact in terms of mortality than military casualties during conflicts. The provision of water and sanitation is of utmost priority in post-conflict states. Unsafe water equates directly with poor health, but the lack of adequate public revenues, government capacity, and investor interest often results in failure to re-establish access to basic infrastructural services (Allouche, 2010).

Overall, it seems clear that perceived resource scarcity is not an adequate explanation for war at the international level. At the national level, water and food insecurity are relatively important factors in the causes of civil wars. At the local level, water scarcity and food insecurity may lead to local political instability and sometimes violent forms of conflict. Armed conflict creates situation of emergency food and water insecurity and has a long-term impact on post-conflict societies. In the near future, it seems that despite climate change, international resource wars are unlikely and resource allocation will be settled through diplomatic negotiation and perhaps most importantly international trade as will be discussed in the next section.

Global water and food systems and international trade

Debates on resource scarcity and conflict have ignored the role of trade in both causing and addressing local and regional shortages. In the case of food and water, this has led to conclusions that are highly questionable. Indeed, food security has essentially been addressed through national water availability and ignores the spectacularly successful benefits of international trade, in this

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particular case food imports (Allan, 2001). Water availability is often hidden in international trade. Countries with more water are able to trade water-intensive goods for export. Water embedded in traded crops has been termed 'virtual water' and trade in virtual water has been suggested as a way to alleviate water shortages. However, the limit of this logic should be recognized in that global trade is based on broader political and economic factors rather than on water.

Through global trade, one can observe an overall increase in terms of food security between 1970 and 1990. The greatest improvements were in North Africa and the Middle East, moderate change in Asia and Oceania and Latin America, and a decline in Sub-Saharan Africa. A number of specialists emphasize the need for free international trade in order to assure global food security, as it enables supply and demand to be balanced across regions (Godfray et al., 2010). Global trade therefore is seen as a solution to the 'equality' problem as it enables food security as defined by the FAO (namely when "all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life" – as defined at the 1996 World Food Summit, FAO, 1996). Although it has been acknowledged that free markets usually penalize the poorest who have the least influence on how global markets are structured and regulated (see Anderson, 2009 and Aksoy and Beghin, 2005), alternatives have usually been dismissed.

Technology is often evoked as a means to ensure resource abundance but technology can have important social, health and environmental costs. A new 'blue revolution', greater irrigation capacity in Africa and the crop biotechnology revolution are often portrayed as the ideal solutions for scarcity ignoring distributional and demand management issues (Mehta et al., 2007). Although there is renewed interest in alternative technologies, there is also a 'crisis of innovation' and troubling complacency around technology solutions that simply do not work as promised (Gleick, 2003; Thomas and Ford, 2005; Thompson et al., 2007).

International trade and technological solutions for water and food security have clear limits. The 'land grabbing' issue is an interesting example in this regard. Food importers are no-longer counting on global trade to meet food needs. One must consider how this apparent waning faith in the international food market could affect global food security in the years ahead. Some governments and investors, mainly the Gulf States, China and South Korea, are buying or leasing land in other countries to support food security (Mackenzie, 2008). The International Food Policy Research Institute estimates that 15–20 million hectares of farmland have been subject to negotiations or transactions over the last few years. According to a joint study by the FAO, the International Institute for Environment and Development, and the International Fund for Agricultural Development, there have been since 2004 nearly 2.5 million hectares worth of 'approved land allocations' in just five African countries: Ethiopia, Ghana, Madagascar, Mali and Sudan (Cotula et al., 2009). The main driver is concern over food security associated with world food prices but also energy security (biofuels production) and a new safe investment opportunity (Kugelman and Levenstein, 2009). Current research has largely ignored the fact that these actions are fundamentally about water. Indeed, land grab concerns particularly agriculturally deficient, water short nations that depend on food imports to meet rapidly growing domestic demands. Investing countries for the most part lack arable land and, especially, sufficient water to grow what they need domestically. Saudi Arabia has chosen to remove the subsidy on water use by its citizens and instead use the water of Pakistan embedded in food grown specifically for Saudi Arabian consumption, as food security through desalinisation is too costly. Yet the risks associated with those displaced, or those whose water has been diverted to the highest bidder, have been largely ignored.

The food sovereignty movement is another interesting example of public questioning of the 'global trade food/water security' logic. The last decades have seen the rise of global social movements such La via Campesina, which regroups family farmers, peasants, the landless, rural workers, indigenous people, rural youth and rural women. Under the banner of 'food sovereignty' they advocate for the use of agro-ecological technologies, fair prices for farmers and greater emphasis on local production (Patel, 2009). Here the emphasis is firstly on domestic production of food, with land being made available first and foremost to small farmers and their families. In this regard the movement is in line with Jean Ziegler, the former UN Special Rapporteur for the Right to Food, who argued that besides the right to food, there is a corollary right to land, and that rural peoples even have a 'right to produce' (Ziegler, 2002, 2004). In relation to equality and equity issues, the movement highlights the injustice and non-sustainability of impoverished people being unable to afford to buy the food that is grown in their local areas.

The 'global trade food/water security logic' relies too much on the availability assumption (namely that increased food supply will automatically reduce hunger or that increased supply of water will improve access to water). Sen (1981) shows that resourceful households rarely go hungry despite aggregate food shortages and that the poor are often hungry even when food supply is plentiful. World hunger is generally not a question of sudden starvation but rather of chronic under nutrition that leaves populations vulnerable to disease and their members unable to lead active and productive lives. A lagged panel analysis of food supply and child hunger rates (1970–1990) shows that food supply has only a modest effects on child hunger rates (Craig Jenkins and Scanlan, 2001). Furthermore food availability and access do not determine the more substantive issue of malnutrition or nutrition insecurity at the individual level (Smith and Haddad, 2000).

The crucial issue for food security is not whether food is 'available' but whether the monetary and nonmonetary resources at the disposal of the population are sufficient to allow everyone access to adequate quantities of food. The most recent food riots are a good illustration, with rising prices for staple foods (i.e. maize, rice, wheat) and soybeans provoked riots in more than 20 countries (e.g. Mexico, Morocco, Indonesia, Uzbekistan, Yemen, Guinea, Burkina Faso, Mauritania, and Senegal) and non-violent demonstrations in at least 30 more (Benson et al., 2008; FAO, 2008; von Grebmer et al., 2008). These events actually led to the creation of a UN High-Level Task Force on the Global Food Security Crisis 2008. In 2008, at the World Economic Forum in Davos (Switzerland), World Bank President Robert Zoellick argued that *'increased food prices and their threat—not only to people but also to political stability—have made it a matter of urgency to draw the attention it needs*.' Sir John Holmes, the former UN undersecretary general for humanitarian affairs, echoed this argument. The causes of the recent rapid rise in food prices are still being debated (Piesse and Thirtle, 2009). The growing demand for food from rapidly developing countries (in particular China), the high price of oil, and the conversion of many crops to biofuel – all of which create pressure on the demand side – are highlighted by some analysts (Royal Society, 2008). For others, weather-related poor harvests, flawed food and development policies, speculation in global financial markets and the legacy of 'food wars' were also important factors (see Messer, 2009).

Finally, an important issue in WTO trade negotiations is whether further liberalization of trade and agricultural policies may help or hinder food security in WTO member countries, especially developing countries. The impact of trade liberalization on the poor is a topic of current study, but there is an emerging consensus that they should be protected from negative impacts through the implementation of safety nets (Mahendra Dev et al., 2004).

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Overall, global trade and technology provide the basis for dealing with resource scarcity and security. However, the land grabbing issue, the food sovereignty movement, increasing food prices all show the limits of the current system in ensuring the stability, sustainability and resilience of global food and water systems. Furthermore, inequality, which constitutes the major barrier for food/water security, is not only related to international trade but also to political systems. Increased food supply alone is not sufficient to reduce hunger. In poor dualistic societies, general restrictions on political freedoms are more important than increasing the food supply. A number of studies have shown that political democracy is positively correlated with improved physical quality of life, basic needs fulfilment and lower income inequality (Sorensen, 1991; Wickrama and Mulford, 1996). The combination of domestic investment and political democratization are important factors in ensuring food (and water) security (Craig Jenkins and Scanlan, 2001). Food/water security is a political problem and must be addressed through political change especially political democratization, restriction on arms trade, and the reduction of generalized violence.

Global water and food systems scenarios

What about the future? It is clear that water and food management will face major challenges due to increasing uncertainties caused by climate change and fast changing socio-economic boundary conditions.

Hydro meteorological records and climate change scenarios provide evidence that water resources are vulnerable with strong consequences for human security. Five hundred million people worldwide currently live in countries where supply is chronically short; the Intergovernmental Panel on Climate Change (IPCC) predicts these numbers will rise as climate change affects surface water levels that depend on rainfall and glacial melting (Bates et al., 2008). Heatwaves and water shortages will have an adverse impact on safe drinking water and sanitation, with disproportionate effects on the poorest and most vulnerable.

According to studies by the Feinstein International Center, the number of people affected globally by natural disasters (including droughts and floods) has been increasing steadily, by an estimated 50,000–60,000 people per decade, since the early 1970s. The number of reported disasters has also increased year on year, from an average annual total of 90 in the 1970s, to a figure close to 450 per year in the present decade. The data and projections by the Feinstein International center suggest a 20% increase in extreme event frequency (Mackinnon et al., 2009). In relation to the water–food nexus, as climate temperature extremes are predicted to increase in frequency and intensity in future, droughts and floods may become more severe and more frequent and this could potentially dramatically reduce crop yields and livestock numbers and productivity especially in semiarid areas. This means that the poorest regions with high levels of chronic undernourishment will also be exposed to the highest degree of instability in food production.

Climate change may affect food systems in several ways ranging from direct effects on crop production (e.g. changes in rainfall leading to drought/flooding or warmer/cooler temperatures leading to changes in the length of growing season) to changes in markets, food prices and supply chain infrastructure. Most studies found that climate change will have a highly negative impact for developing countries in terms of crop productivity and increase risk of hunger, especially in Sub-Saharan Africa. (Rosegrant and Cline, 2003). Most of the research up to now has been on the bio-physical aspects of production (land suitability, crop yields, pest regimes – Gregory et al., 1999). The possible impact of climate change on food accessibility and utilization has been neglected. Recent research by Gregory et al. (2005) and Schmidhuber and Tubiello (2007) seeks to understand how climate change could also impact on the food system including distribution and access. Recommendations by Gregory et al. (2005) include: (i) reducing food system vulnerability by increasing food production (essentially through intensification and genotypes that utilize limited supplies of water stored in soils), (ii) reducing food system vulnerability by improving food distribution (essentially through investment in infrastructure) and (iii) reducing food system vulnerability by increasing economic access to food.

Interestingly, while intensification is viewed as a strategy to reduce food vulnerability in the light of climate change, intensification via high-input technologies has in some cases resulted in detrimental environmental consequences such as reduced biodiversity and water pollution. The challenge is therefore to move towards intensive systems that are both high yielding and more environmentally benign.

Conclusion

This article has provided an overview of the current and future challenges in terms of global food and water systems. The major focus of the argument has been on how resource scarcity is a contested and subjective concept which cannot fully explain conflict, political instability or food insecurity. The politics of inequality and allocation are much more important variables in explaining water and food insecurity. This is particularly true for conflicts. Although resource scarcity has been linked to international wars, the current data shows that most conflict over water and food are much more local. But there again, although resource scarcity can be linked to malnutrition, hunger and water insecurity, in the majority of cases, water and food insecurity are rarely about competition over resources but rather reflect the politics of allocation and inequality. In this respect, war and conflicts aggravate these insecurities not just on the short term but also on the long term.

At the global level, food security has considerably improved and provides the means to address these insecurities. Trade can certainly be seen as a way to address access for countries that are under severe stress in terms of food and water and provides logical grounds for questioning the various water and food wars scenarios. Although global trade and technological innovation are key drivers in providing stable and resilient global systems, the most destabilizing global water-related threat is increasing food prices and hunger. Overall, decision-makers should show greater concern for the human beings who make their living in agriculture, so that those at risk of livelihood and food-security failures, especially under anticipated scenarios of climate change, will be less deprived. Current debates linked to global food security and climate fail to address the political dimension of resource scarcity which is primarily linked to the politics of inequality, gender and power.

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