



# Metis

## Study

### **Food and water scarcity – A key factor in future conflicts?**

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**Institute for  
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# Summary

**T**he extended concept of security means that many additional factors now influence security policy considerations. These factors include food and water scarcity and the interrelationship between this problem and existing conflict potential. The present study will address this issue in the context of the water-food-energy-climate nexus. It will outline global trends and, by focusing on the example of water

scarcity and a number of relevant cases, will show that conflicts do not necessarily have to be aggravated but can also be dealt with, to a certain extent, in a multi-lateral, cooperative way. Progressing climate change will lead to greater challenges in this area, but they will remain firstly humanitarian, development policy and climate policy challenges and only secondly security challenges.

## Food and Water as a Security Problem?

The fact that water and food scarcity is discussed today in a security context can be attributed to the extension of the concept of security in the 1990s. With the aim of extending the analytical range, “security” was redefined to include not only military but also ecological, social, economic and political factors. The boundary between internal and external security became fuzzy.

In contrast to the traditional security paradigm, in which threats can be identified from an actor, his intentions and the damage he could do, these three elements can rarely be defined precisely when using the broader concept of security. This extended concept deals less with specific threats and more with uncertain risks, which it nevertheless attempts to render manageable. In this regard, the classical principle of countering threats is complemented, and sometimes replaced entirely, by the principle of crisis prevention.

The advantage of the new security concept is that it has a much broader analytical range and enables interministerial, forward-looking action, in particular with regard to cross-border challenges. It does, however, involve the risk of placing too many expectations on military instruments and of losing sight of the core activity of security policy, which is to counter threats.

Against this background, the answer to the question of whether food, water and energy scarcity is relevant to security is both yes and no. The still occasionally debated

causal hypothesis that water scarcity is a primary cause of conflict in what are referred to as “water wars” was in fact disproved years ago in the literature on conflict research. Nevertheless, there are numerous examples of how water scarcity and other types of deprivation do have an exacerbating effect on conflicts. In a globalised world, in which climate change can lead to drought, drought to migration, migration to conflict and conflict, in turn, to radicalisation and violence, security policy cannot completely ignore these connections, even if they are only indirect in nature. Global food and water scarcity thus has second order implications for German security policy. From a security perspective, it is therefore crucial to maintain an overview of such a complex situation, even while meeting the challenges that this implies cannot be a task primarily for security policy.

## The water-food-energy-climate nexus

The production of food, water and energy is interconnected. By 2030, global demand for all three commodities is expected to rise by up to 50%.

According to the Global Food Security Index (GFSI) of the Economist Intelligence Unit, global food security began to improve during the past decade. Yet global economic fluctuations, social inequality, political instability, forced migration and, in particular, the effects of climate change are now reversing this positive trend. The achievement of one of the most important UN Sustainable



Development Goals, the eradication of world hunger by 2030, is at stake, especially as a further 100 million people now face the threat of poverty and food insecurity. Africa will be hit the worst if this trend continues, since this is where most of the 30 weakest states out of a total of 113 states on the GFSI are located (see Table 1).

Food production is responsible for around 70% of global water consumption. The production of one calorie's worth of grain, for example, requires one litre of water.<sup>1</sup> Meat production requires ten times more per calorie. Global per capita consumption of water for agriculture is between 3,000 and 6,000 litres per day. This is in contrast to daily drinking water consumption of only 3 to 4 litres and a few hundred litres for hygiene purposes and industrial production. The production of biofuels represents an additional increase of water consumption in agriculture – producing one litre of biodiesel requires 9,100 litres of water.

In addition, the food supply chain uses approximately 30% of the energy produced worldwide, causing greenhouse gas emissions that contribute to climate change, which in turn poses a threat to harvests, fish stocks and freshwater reservoirs.

The latter can be seen most clearly in the case of Lake Victoria, the world's second-largest freshwater lake. This lake provides a source of living for more than 30 million people, not only in the three bordering states of Kenya, Tanzania and Uganda, but also indirectly in Rwanda, Burundi, South Sudan, Sudan and Egypt due to water flowing into and out of the lake. Its function as a source of food and fresh water and as a transport route and source of hydroelectric power is threatened not only by over-fishing and over-fertilisation but also by the continuously rising surface temperature caused by climate change. In the medium term, this carries the risk of destabilising the regional climate and, in particular, precipitation patterns, with disastrous consequences for local agriculture.

### Water governance instead of water conflict?

It can be seen from the example of water, as a basic necessity for life, that there is only an indirect link between scarce resources and conflict, as suggested at the beginning of this study. In fact, there are many places where a risk to water quantity and quality is counteracted by means of multilateral, cooperative conflict prevention and conflict resolution schemes instead of by the violent enforcement of interests. Lake Victoria is also an example of this. Kenya, Tanzania and Uganda established the Lake Victoria Environmental Management Project (LVEMP) to regulate fishing, coordinate environmental management

<sup>1</sup> Such data can vary considerably depending on regional climate, cultivation area, irrigation efficiency and other factors.

83	Uganda	43.3
85	Cote d'Ivoire	42.5
86	Kenya	42.2
87	Cameroon	41.6
88	Rwanda	39.8
89	Bangladesh	39.7
90	Benin	39.6
91	Mali	39.4
92	Nigeria	38.4
93	Togo	37.2
94	Tajikistan	35.9
95	Tanzania	35.4
96	Sudan	34.8
97	Guinea	34.0
98	Mozambique	33.7
99	Ethiopia	33.3
99	Syria	33.3
101	Angola	33.2
102	Burkina Faso	33.1
102	Laos	33.1
104	Zambia	32.4
105	Malawi	31.3
106	Niger	29.5
107	Haiti	29.1
108	Yemen	28.8
109	Sierra Leone	28.7
110	Chad	28.3
111	Madagascar	27.2
112	Congo (Dem. Rep.)	25.5
113	Burundi	25.1

**Table 1** GFSI/100 (Economist Intelligence Unit)

and generally work towards a sustainable use of the lake. The scope of the LVEMP is limited, however, and agreements frequently fail as a result of national interests.

Another example is the wider region along the Mekong, in which the six bordering states of China, Myanmar, Laos, Thailand, Cambodia and Vietnam share river management. China is currently investing in a large number of dam projects in countries such as Laos and Cambodia. This is causing a significant power imbalance that Beijing is deliberately trying to increase even further. China now controls a large part of the freshwater supply via these dams and is thus able to exert pressure on downstream countries. Vietnam, Thailand, Laos and Cambodia, themselves members of the Mekong River Commission, have virtually no means with which to oppose China's water hegemony.

The third example, the Israeli-Palestinian Joint Water Committee, presents a similar picture. Disputes about





(fair) access to the shared water resources of the region have always been an element of the Middle East conflict. A cooperative solution could improve Palestinian water supply and especially sewage disposal. In turn, Israel could alleviate suffering in the Gaza Strip and, in addition, would be able to expand its seawater desalination activities, which have to be suspended time and again because of sewage in coastal waters. There is clearly a power imbalance in this case too, and cooperation is usually only possible if it is in Israel's interests.

The fourth and final example, the relationship between Israel and Jordan, demonstrates, however, that cooperation is not entirely determined by the more powerful party. The water issue was addressed in the Israel-Jordan peace treaty of 1994 and Jordan has since been able to partially compensate the power imbalance with Israel in the context of water diplomacy. Unlike in the Palestinian case, Israel's cooperation with Jordan is more like a win-win situation than a zero-sum game.

Political practice therefore shows that water can be an object of or even a political lever in existing conflicts, while at the same time water governance, though having a variable success rate, can help to counteract conflict aggravation. Constellations of this kind are not unusual, as can be seen from the current situation in the Arctic, where developments likely to aggravate conflict, such as military shows of force, co-exist with functioning multilateral governance schemes.<sup>2</sup>

The example of water clearly shows that given the connection between food, water, energy and climate, multilateral conflict prevention schemes are generally beneficial and should be supported in order to mitigate or prevent conflict. Their scope and effectiveness must not be overestimated, however.

## Conclusions

Food production requires a lot of energy and fresh water. Quantities of fresh water vary, however, at global and regional level. At present, seawater desalination is only possible by using an immense amount of energy. In general, energy production releases CO<sub>2</sub>, contributing to climate change, which in turn has negative effects on food production and freshwater resources. It is obvious that until this chain of cause and effect can be broken by, for instance, a globally available, climate-neutral energy supply, only a careful balance can minimise the conflicting objectives in this system. Germany is already pursuing a strategy in development cooperation to achieve such a balance, for instance by specifically combining the promotion of renewable energies with sustainable agriculture and water management. Furthermore, Germany and the EU are right to focus on Africa, as this continent is particularly susceptible to water and food scarcity – and its consequences – caused by climate change. Lake Victoria once more serves as an example in this case. If the current trend of global warming continues, 60 million people in the region could be affected by water scarcity in the long term, which would aggravate conflict and lead to migration on a vast scale.<sup>3</sup>

The progression of climate change will thus tip the scales in the delicate balance between conflict prevention and conflict aggravation in the interconnected system of food, water and energy. But for the foreseeable future, the challenges in this area will be firstly humanitarian, development policy and climate policy challenges and only secondly security challenges. 🐾

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<sup>2</sup> See "Die Auswirkungen des Klimawandels auf die Arktis" ("The Impact of Climate Change on the Arctic"), Metis Study No. 2 (March 2018).

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<sup>3</sup> Approximately 7 million people are now also affected by food insecurity around Lake Chad, which has diminished in size by 90% since the 1960s. Many other examples could be cited.

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