Vulnerabilities, adaptive capacities and transboundary relations in the Nile River Basin in times of climate change

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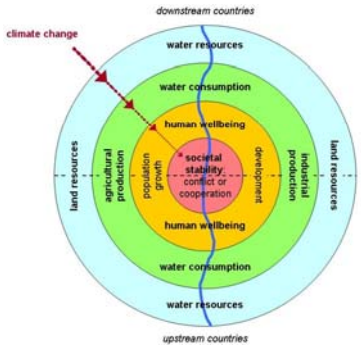
Water allocation issues in the Nile River Basin

The Nile River Basin is a region with a long cultural history that is tightly connected to the river itself, which has been serving as a lifeline for the entire region. In the past millennia, the peoples living in the catchment basin of the Nile River have adapted to life with and from the river. Because of the lack of alternatives, a sufficient water supply from the Nile River is critical for many of the countries in this region, with particularly large portions of the population relying on Nile waters in Egypt, Sudan, Ethiopia, and Uganda.

Population growth and the push for economic development are steadily increasing the pressure on the Nile River as a water resource, while the attempts to develop a basin-wide agreement on the Nile water use have not yet been successful and a situation of low-level conflict remains. In such setting climate change can act as an additional pressure factor and risk multiplier.



As the Nile riparians are highly vulnerable to changing water availability under climate change, their positions regarding the allocation of Nile water may shift, unilateral actions could be taken and the potential for conflict could increase. However, a decisive dimension of vulnerability is the adaptive capacity, the capability to respond to and prepare for resulting challenges. Therefore, another possible outcome is the joint increase of adaptive capacities through cooperation.

Vulnerabilities to climate change

The Nile River Basin is considered to be one of the climate hot spots, which means that this region is likely to be particularly affected by changes in environmental conditions due to anthropogenic climate change. However, climate change will not affect all parts of this region equally. Furthermore, the countries show differences in the degree to which they are able to deal with the challenges associated with climate change. Thus, the vulnerability to a changing climate varies quite substantially in the Nile Basin, augmenting differences already found between upstream and downstream states and therefore possibly altering their positions towards conflict and cooperation.

	# of events	# of people affected [millions]	# of people killed [thousands]	# of people homeless [thousands]	Economic damage [million US$]	Most common type of event
Egypt	21	0.2	0.9	53.2	156	floods, storms, extreme temperatures
Ethiopia	87	65.1	414.0	195.6	108	floods, epidemics, droughts
Sudan	78	32.2	160.7	1453.5	551	epidemics, floods, droughts
Uganda	59	5.8	2.0	320.7	2.7	epidemics, floods, droughts

Natural disaster statistics for the period from 1970-2011 (CRED, 2012).

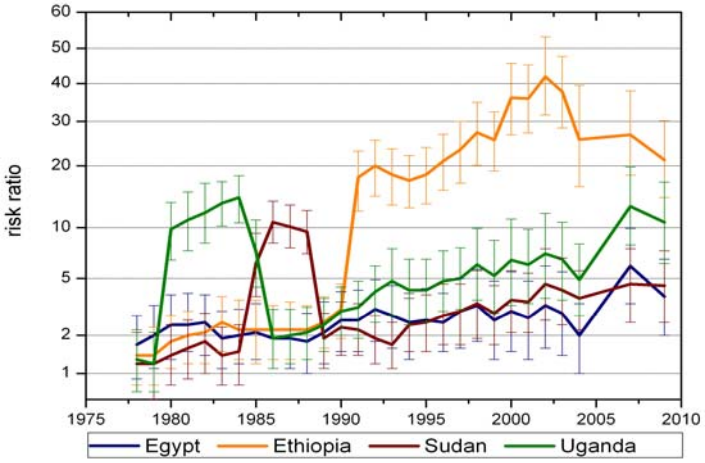
The current socio-economic system of the Nile countries is highly climate sensitive. This can be deduced from devastating effects of natural disasters like floods and droughts in the past decades. With respect to possible climate change effects in the future on the transboundary water resources of the Nile River Basin, the sensitivity of the countries is high as well. The main factors in that regard are the high dependency of most riparian economies on the agricultural sector, including already high levels of irrigation in some areas and high dependency on rain-fed agriculture in others, the increasing use of the Nile for energy generation through hydro-electric power (HEP), which is an important development factor, and in general the location of settlements and infrastructure along the river.

The water sector is sensitive to the increasing unpredictability with regard to precipitation and thus to the variability in the water levels and overall water availability. More erratic rainfall can already be observed in Sudan and frequent changes of water levels in lakes and reservoirs are the consequence. Climate change is also expected to increase the occurrence of extreme events like floods and droughts, to which the countries are very vulnerable.

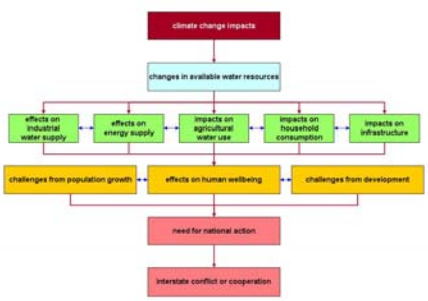
Adaptive capacities of the Nile Basin countries

The adaptive capacity of a country is an indicator of the degree to which a society is able to adjust to changes in environmental conditions. Dimensions of adaptive capacity are the availability and distribution of resources, the range of available technological options, human and social capital, institutional structures and information management.

A comparison of the available renewable water resources for the countries of the Nile Basin reveals substantial differences in resource endowments between the riparians. While resources in the upstream states appear to be more abundant, they are underutilized at this point due to low level of development, which are at least partly related to the high level of sensitivity of this region to climate change. An assessment of political stability in the past decades shows larger shifts in conflict risk in the 1980s, which can be tied to key historic incidences of conflict affecting political stability in some of the Nile Basin countries. All in all, the exposure and sensitivity of the Nile riparians to climate change is high while their adaptive capacity is currently rather limited.



Political instability in key countries in the Nile River Basin defined by a risk ratio, which indicates how likely an onset of conflict in this country is compared to the OECD countries . The error bars indicate the 95 percent confidence interval of the respective risk ratio (based on Hewitt *et al.*, 2012).



Can climate change affect the balance of power in the Nile Basin?

Assessments of the action pathways relating climate change impacts to societal stability allow for the deduction of scenarios leading to greater conflict as well as greater cooperation. This is due to the high but also variable vulnerability of Nile Basin states to climate change. While a direct link between changing climatic conditions and violent conflict is unlikely, the indirect effects are possibly more significant.

Cooperation can be hindered or facilitated by climate change. On the one hand, cooperation appears to be more important than ever, and efficient adaptation can probably only be reached under strong cooperation. While higher flows may reduce the barriers to cooperation, the situation would become more difficult for lower flows. Although the barriers towards cooperation are then increased, there is a concurrent higher need for cooperation to make most efficient use of available water resources. Cooperation is essential for a basin-wide increase of adaptive capacity and therefore a reduction of vulnerability to climate change. However, the most likely and immediate impact of climate change on the riparian relations appears to be its instrumentalization by a securitization of water.

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