Global trade or regional cooperation: A perspective from the Nile

In the period 2007-2008, failed harvests in two major grain exporting nations, the United States and Russia, stoked fears of an era of increasing global food insecurity. Work done under the research programme Global Food Security demonstrated that the political rationale of major grain exporters has been to impose restrictions on the exports of their wheat stocks to import-dependent regions whenever there is a rise in food prices (Rutten et al., 2013); in times of food scarcity, trade rules become biased towards the interests of exporting regions (Bureau 2013). As a result, delivery contracts for grain were breached and the food security situation in developing countries was severely affected. Sharp increases in staple food prices contributed to civil unrest and the toppling of regimes in the Middle East and North Africa.

One of the countries in the midst of all this turmoil was Egypt, a country with a burgeoning population, highly dependent on the Nile for its very existence. Despite, its geographic location and history, its set of options is very similar to those of other developing countries – cling to an increasingly unrealistic food self-sufficiency paradigm, remain dependent on global grain markets or strengthen its regional cooperation with countries affected in part by conflict. The possibility for strengthening regional cooperation with other countries in the Basin in order to promote a greater level of regional self-sufficiency is explored in this chapter.

The Nile Basin – looking for solutions

Historically, Egypt's food security and the Nile have been inextricably linked – low flows have meant meagre years, while high flows have led to times of abundance. The building of the Aswan High Dam has decreased river fluctuations, but with all of the downstream flow fully utilised, the fear of future structural shortages remains. Upstream of the Dam, the situation is different – in large parts of the Basin, there is abundant, though irregular, rainfall during most of the growing season. Here, the Nile was first of all a meandering river, carrying off excess water, rather than as a source of irrigation water.

Figure 1 Map showing the Nile Basin countries

Shifting political influence, increasing economic clout of countries upstream and growing populations are, however, rapidly changing the status quo. With more food needed, upstream countries are increasingly keen to utilise the waters of the Nile for hydropower and food production (Waterbury 2002). The tension this creates has even led to concerns about the threat of 'water wars' in the future. But is the traditional way of thinking about the Nile, as the sole source of food security for riparian countries, still valid? Why is there so much focus on 80 km^3 of Nile water, when in fact the Basin receives 2,000 km^3 of water per year in the form of rain? Is it possible that there are other solutions to a food secure future for the Basin and countries like Egypt?

It is against this backdrop that scientists at Wageningen UR developed a novel approach to assess where and how food production can be increased in the Basin and whether food self-sufficiency can be realistically achieved by 2025. With WaterWise, a hydro-economic model developed by Wageningen UR that integrates yields from both rainfed and irrigated agriculture in combination with the yield from hydropower, they explored various food self-sufficiency and regional cooperation scenarios for the Basin. The scenarios included the possibility for: national food self-sufficiency, upstream countries (Sudan, Ethiopia) developing their irrigated agriculture potential to the maximum, and regional cooperation where food and hydropower are produced where it is most cost effective. The model consists of three modules on water flows, crop production and hydropower and an optimisation routine to select the most suitable land use and hydropower options, given a certain level of investment. The latest FAO data on soils, land use and crop production, including the costs and benefits of each crop production type, were used to calibrate and validate the model.

Results clearly show that self-sufficiency is not an option for countries like Egypt and Rwanda (Table 1), but that future food security within the Nile Basin is possible if countries cooperate with each other. The researchers found that the key to solving the Basin's food puzzle lies in the development of climate-smart rainfed agriculture (defined as developing the technical, policy and investment conditions to achieve sustainable agricultural development for food security under climate change (FAO 2013)) in the south – in the now war-torn regions of South Sudan and northern Uganda. Here, the potential for the much needed increase in food production is still considerable. Expansion of large-scale irrigation systems upstream, on the other hand, would mostly shift production between countries rather than increase the total production of the Basin and reduce, at the same time, total hydropower production.

Table 1 Food production as a percentage of required production under three scenarios

	National Food Self-Sufficiency	Upstream Hegemony	Regional Basin Cooperation
Egypt	85%	57%	78%
Ethiopia	100%	80%	80%
Sudan	100%	237%	223%
Uganda	100%	111%	111%
Other (including Rwanda)	66%	96%	98%
Basin	92%	103%	107%

Challenges: Regional cooperation or global dependence

If the scenario of regional cooperation were to materialise, it would require a new level of cooperation and integration of the economies within the Basin, to make the most of the comparative advantage of individual countries. It would mean that South Sudan and the Equatorial Lake regions would focus on producing food, Ethiopia would generate hydropower, while Egypt would provide agro-industry capital and access to urban markets in Egypt itself and in Europe, Russia and the Middle East. The integration of energy grids shows that cooperation in the region is possible, although for food more effort would be required, such as the revival of old trading routes via rail, road and river, the removal of trade restrictions and, probably most importantly, the building up of trust.

Nile barge transporting food

Despite all the immediate challenges, mistrust and misconceptions – strengthening regional production and cooperation among the Nile Basin countries is a way forward that will allow for diversification and reduce dependency on volatile global food markets, lessening the exposure to global food price hikes. But regional cooperation alone is not the solution; a reliance on regional production implies a vulnerability to regional climate extremes. Even though the Nile Basin is vast and diverse in climate, droughts or floods are likely to affect food production in parts of the Basin simultaneously. And countries like Egypt will become exposed to regular, but smaller, regional water and food scarcity shocks. However, during such periods of scarcity, the region would still have a safety net, the global market. If the region were to rely on the global market in the first place, it would mean that the safety net would no longer exist.

This study showed the possibilities and limitations of a first set of scenarios under current climate conditions. The optimum balance and mix between local, regional and global cooperation, self-sufficiency and dependency – especially within the context of an uncertain future involving climate change – will need to be explored further.

References and further reading materials

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