

# The New Geopolitics of Virtual Water in East Africa

Martin Keulertz



# Investing countries' water poverty as key driver of 'land grabs'

- High population growth and decreasing water resources increase pressure on agriculture and thus food security
- Potential alternatives are located in overseas investments.
- 'Virtual water' either traded or grabbed as the key concept to understand land grabs

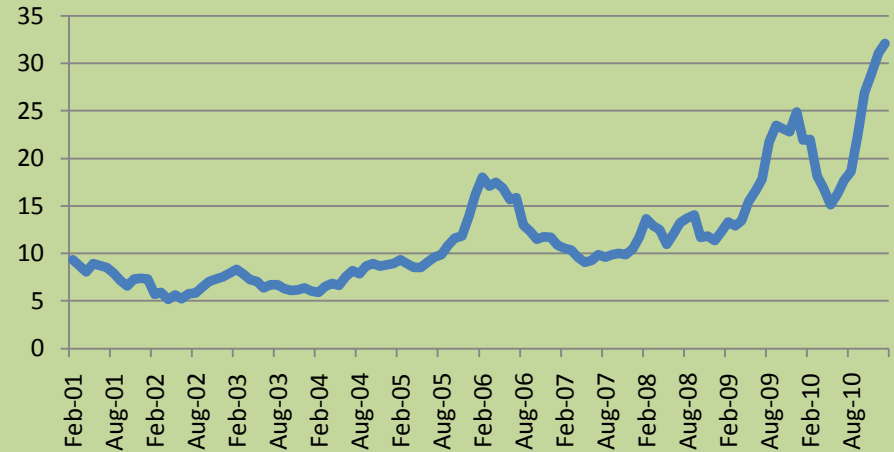


# Staple food prices per ton since 2001

## Soybeans (US Dollar per metric ton)



## Sugar (US Dollar cents per pound)



## Wheat (US Dollar per metric ton)



## Beef (US Dollar cents per pound)



# WATER FOOTPRINT

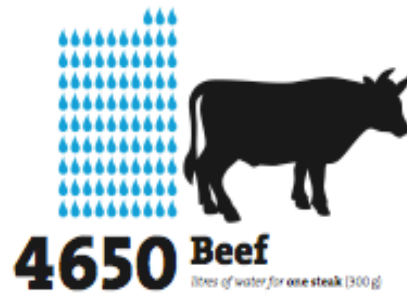
Virtual water embedded in products

→ For the full poster featuring many more products and in-depth information, visit: [www.virtualwater.eu](http://www.virtualwater.eu)

**ONE DROP** (shown in the illustration) is equivalent to **50 litres of virtual water** (production site definition). All figures shown on this poster are based on **exemplary calculations** and may vary depending on the origin and production process of the product.

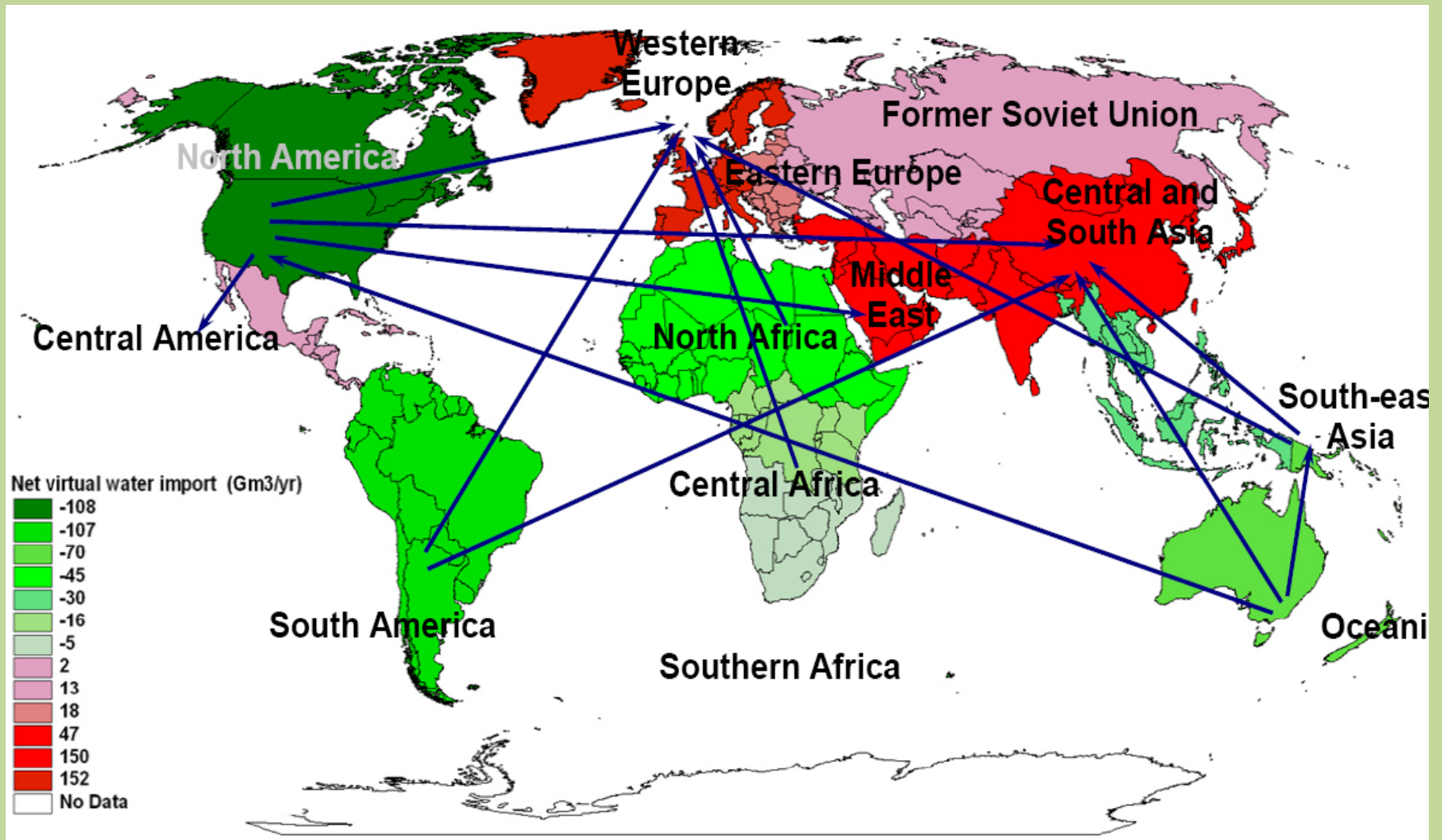
The **water footprint** of a product (a commodity, good or service) is the **volume of freshwater used to produce the product**, measured at the place where the product was actually made. It refers to the amount of the water used in the various steps of the production chain.

**DATA:** Hoekstra, A.J.; Chapagain, A.K. (2008) Globalization of water: Sharing the planet's freshwater resources. Blackwell Publishing, Oxford, UK. [www.waterfootprint.org](http://www.waterfootprint.org)  
**DESIGN:** Timon Kokeritz, [www.virtualwater.eu](http://www.virtualwater.eu)  
**TEXTBACK:** Thebas and Thérèse, Luciel de Groot



Source: [www.waterfootprint.org](http://www.waterfootprint.org)

# Global 'Virtual Water' flows



# Pragmatic responses to meet Middle Eastern 'virtual water' demands

- European consumers are highly dependent on 'virtual water' flows from Latin America and Africa
- Middle East imports roughly 70-90% of their water needs in the form of commodities from overseas
- Middle Eastern economies are still highly dependent on Western wheat imports
- Investment banks have discovered commodity trading as a means to create revenues
- Dependence on global market supply is a risky strategy at a time of new powers emerging in East and South Asia and unforeseen events such as Russian fires in 2010.
- Supply-side increases required


# The picture from South Sudan



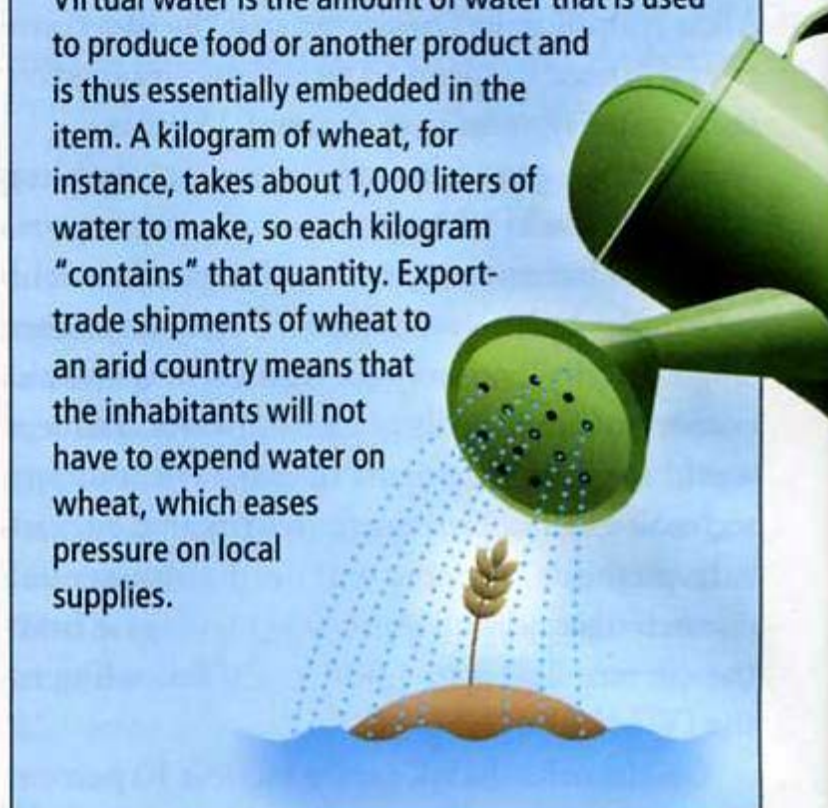
# The opportunities

- The Sudd could potentially become a major 'breadbasket'
- Cheap availability of land
- Water productivity could be increased
- The Arab water question could be solved by virtual water imports

**[PROXY TRADE REMEDY]**

 **Ship "Virtual Water"**

Virtual water is the amount of water that is used to produce food or another product and is thus essentially embedded in the item. A kilogram of wheat, for instance, takes about 1,000 liters of water to make, so each kilogram "contains" that quantity. Export-trade shipments of wheat to an arid country means that the inhabitants will not have to expend water on wheat, which eases pressure on local supplies.



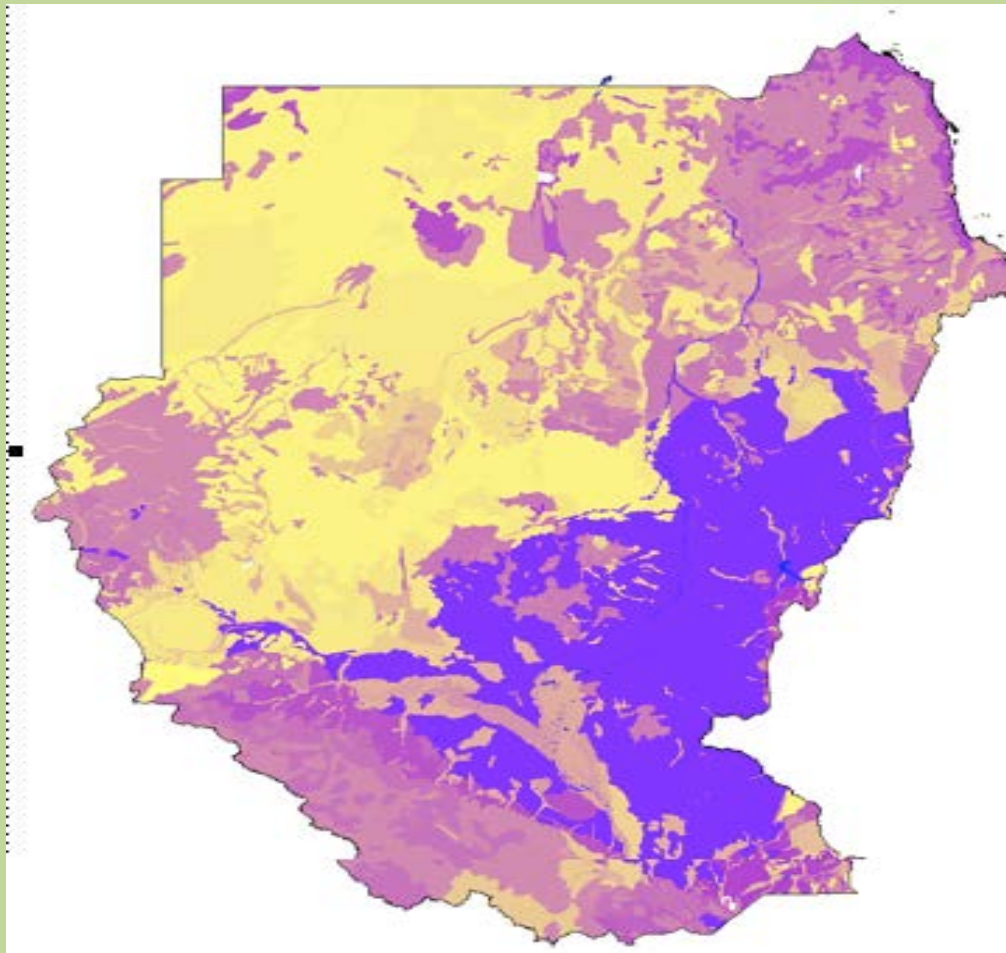


# Cultural and social investment risks (in water-rich Southern Sudan)



- Subsistence farmers are used to enforce customary law through their Kalashnikovs
- Cows are an economic exchange good for women
- Frequent tribal clashes over land and water issues
- Local workforce is untrained and traumatised after 50 years of civil war
- Hardly any operational infrastructure
- Very few projects are operational and if so place emphasis on green water management

# The soil predicament on the case of Sudan



ACh	Haplic Acrisols
ALh	Haplic Alisols
ARb	Calcic Arenosols
ARc	Calcic Arenosols
ARh	Haplic Arenosols
ARl	Luvic Arenosols
CLh	Haplic Calcisols
CMc	Calcic Cambisols
CMd	Dystric Cambisols
CMe	Eutric Cambisols
CMg	Gleyic Cambisols
CMo	Feralic Cambisols
CMv	Vertic Cambisols
CMx	Dystric Cambisols
FL	Fluvisols
FLc	Calcic Fluvisols
FLe	Eutric Fluvisols
FLu	Umbric Fluvisols
FFh	Haplic Ferralsols
GLE	Eutric Gleysols
GLu	Umbric Gleysols
GYp	Petro Gypsisols
HSf	Fibric Histosols
LPd	Dystric Leptosols
LPe	Eutric Leptosols
LPq	Lithic Leptosols
LV	Luvicols
LVh	Haplic Luvicols
LVv	Dystric Luvicols
LD	Ferac Lixisols
LDh	Haplic Lixisols
LDg	Stagnic Lixisols
NTh	Haplic Nitisols
NTu	Humic Nitisols
PH	Luvic Phaeozems
RGc	Calcic Regosols
RGe	Eutric Regosols
SDh	Haplic Solonchaks
SDn	Sodic Solonchaks
SNh	Haplic Solonets
SNv	Calcic Solonets
Swa	Swamps
VRd	Dystric Vertisols
VRe	Eutric Vertisols
	Missing data

Source: FAO

# Tropical soils as a major hindrance for agricultural investments

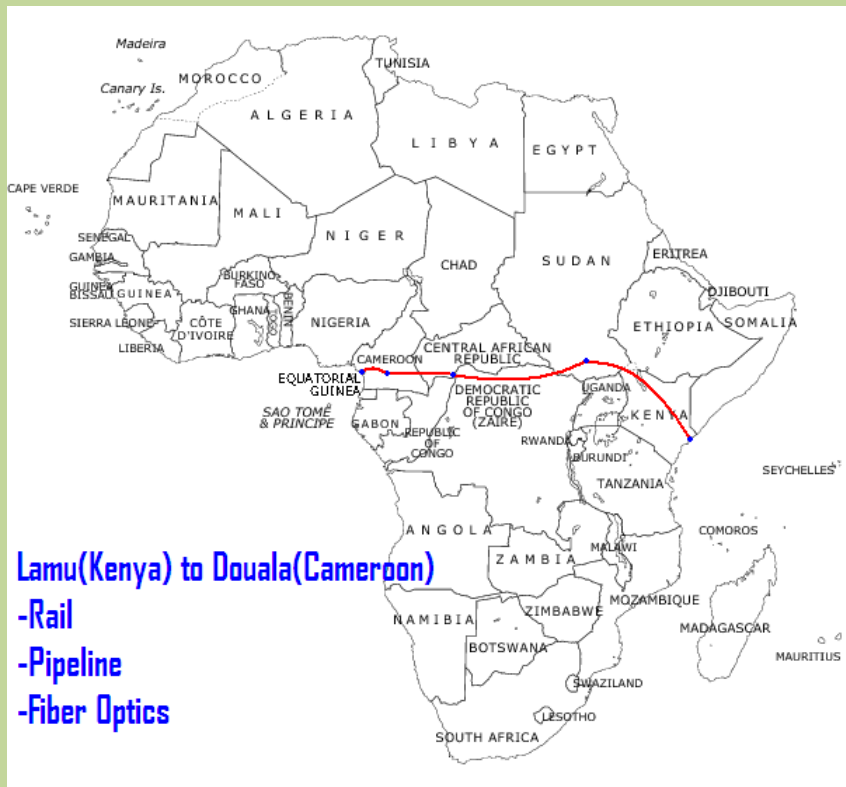
- Intensive farming through 'blue' water irrigation as a high risk strategy for soils
- 'Green' water or root-zone water management more sustainable but once again high risk
- Required commodities can only produced at high economic and environmental costs
- Possible cropping is economically unattractive (paddy rice)
- 'Serious' investors in land and agriculture choose Eastern Europe, Turkey, US or Latin America as their investment areas

# Geopolitical factors

- The African 'shatter belt' is currently in a state of reshaping
- virtual extension of the investors' *Lebensraum*
- South Sudan crucial for regional, Eastern and Western infrastructure plans
- Costly mega-investments are contested between global powers
- 'Hidden agendas' (mainly agriculture-oil nexus) prevail

# The 'new great game' in Africa

## Lamu port



## Gwadar port



# Satellite Sensor Based Global Map of Rainfed Cropland Areas

Version 1.0

## Legend

Class No. and Name	BIB1-NDVI	%Cropland
01 Rainfed croplands, fallowlands	0.39	79.73
02 Rainfed croplands, grasslands	0.43	49.43
03 Rainfed croplands, shrublands/grasslands	0.43	65.45
04 Rainfed croplands, mixed savannas	0.43	50.34
05 Rainfed croplands, natural vegetation	0.27	67.48
06 Rainfed croplands, woodlands	0.32	65.25
07 Rainfed croplands, forest lands	0.32	89.90
08 Grasslands, rainfed croplands	0.58	29.90
09 Shrublands, rainfed croplands	0.26	18.51
10 Savannas mix, rainfed croplands	0.43	26.75
11 Woodlands, rainfed croplands	0.58	37.15
12 Savanna forest mix, rainfed croplands	0.34	47.69
12 Forest grassland mix, rainfed croplands	0.45	15.22
13 Forests mix, rainfed croplands	0.24	20.33
14 Forests evergreen, rainfed croplands	0.58	19.95
15 Forests boreal, rainfed croplands	0.52	18.28
16 Rainfed/supplemental croplands, natural vegetation	0.27	37.83
17 Rainfed croplands, wet areas	0.47	38.10
00 Other area and ocean		



Scale

1 : 45000000

# Conclusions

- FDI in Sub-Saharan agriculture is a high-risk strategy
- ‘Root-zone’ water management economically less costly but high-risk
- Blue-water management economically unfeasible
- Required crops such as wheat cannot be grown in East Africa
- ‘Food and land bubbles’ may burst
- Virtual land grabs prevail

**Many thanks!!!**

