

The background of the slide is a photograph of a building, likely the Rijksmuseum Volkenkunde in Leiden, with a flag flying on a tall pole in front of it. The entire image is overlaid with a semi-transparent blue filter. The title 'Water and Africa's Development Agenda' is written in a large, white, serif font across the upper middle of the image.

# Water and Africa's Development Agenda

NVAS Afrikastudiedag "Everyday Africa"  
Rijksmuseum Volkenkunde Leiden, 23 November 2013

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# Water and Africa's Development Agenda

- African countries are among the fastest growing economies of the world!
- Interesting hotspots of endogenous economic development are emerging in many places.
- A new generation of Africans is connecting and connected!
- In a world where footprints are getting larger and resources scarcer, interdependencies start to manifest themselves more clearly.
- The Rest of the World realises it can no longer ignore Africa!
- But Africa has still some homework to do!



Photo: David Love, 2009

# Water and Africa's Development Agenda

Introduction Three critical challenges:

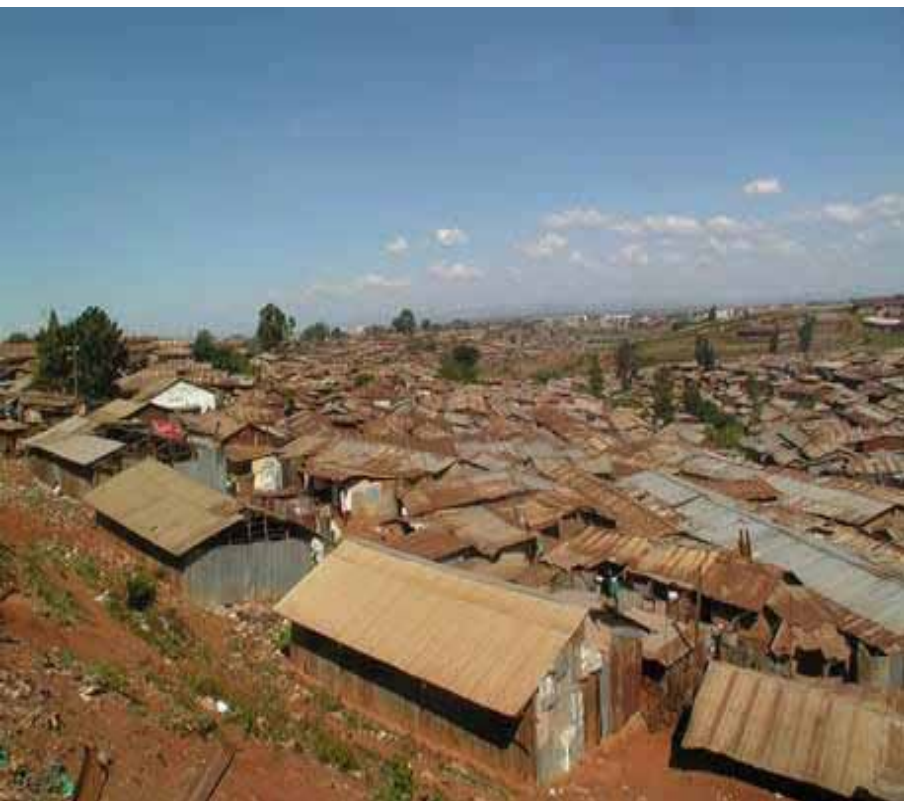
1. Water and Health
2. Water and Food
3. Water and Energy

Conclusion

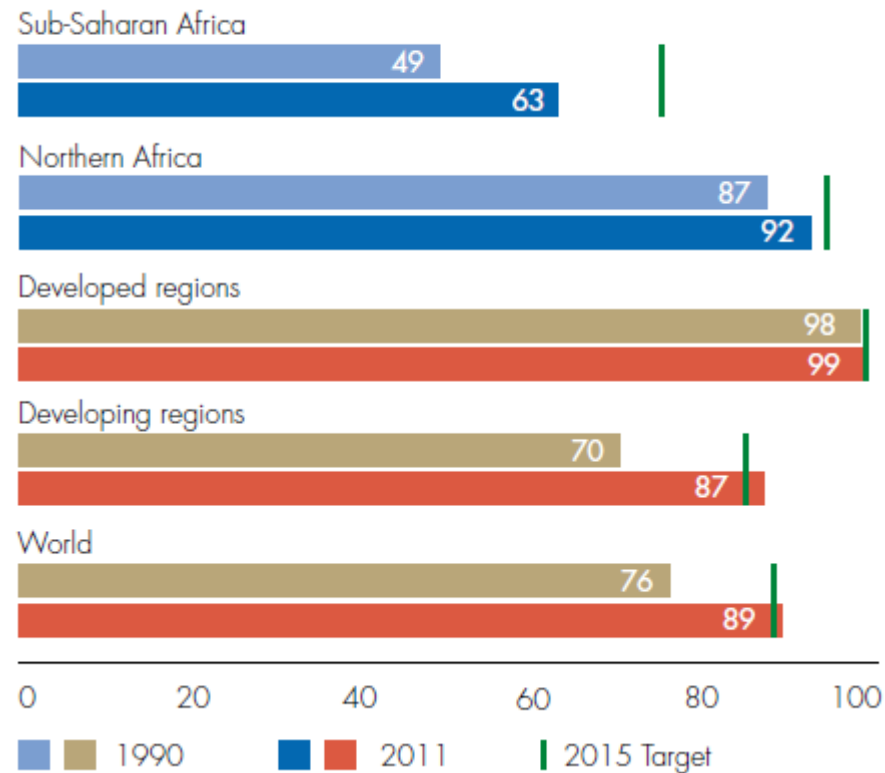


# Water and Health

Access to clean water



Proportion of population using an improved water source, 1990 and 2011 (Percentage)



Source: Millenium Development Report 2013

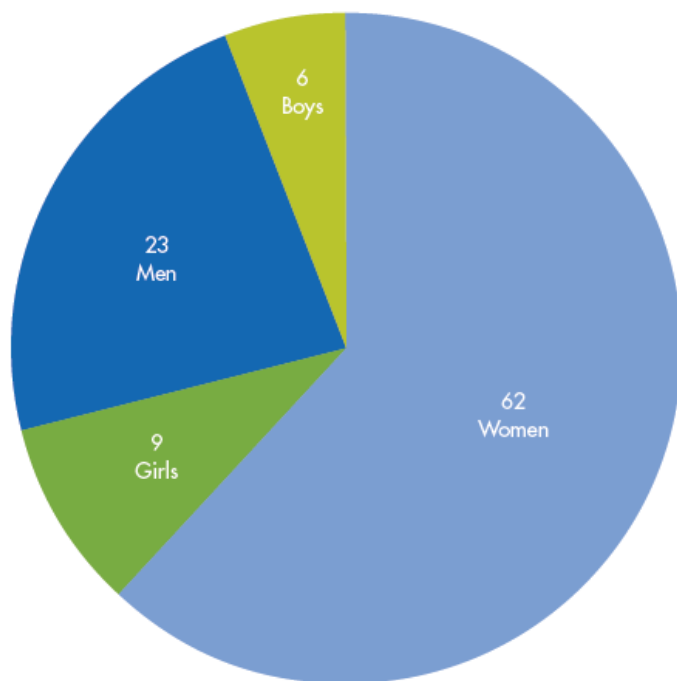




# Water and Health

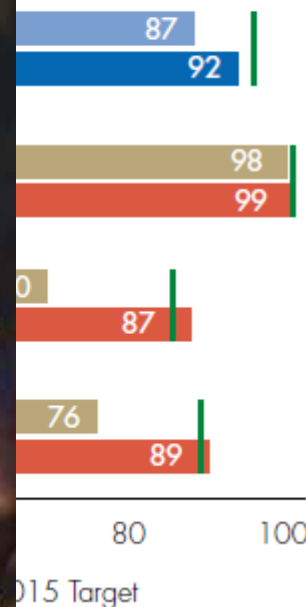
## Access to clean water

Distribution of the water collection burden among women, children under age 15 and men, in households without piped water on premises, sub-Saharan Africa, based on population-weighted averages from 25 countries, 2006/2009 (Percentage)



## Proportion of population using an improved water source, 1990 and 2011 (Percentage)

Sub-Saharan Africa



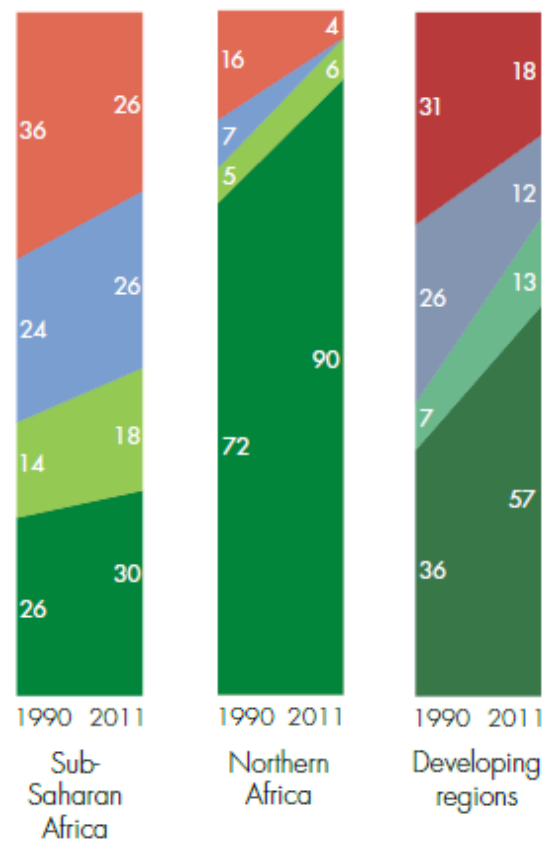
Source: Millenium Development Report 2013

# Water and Health

Proportion of population by sanitation practices, 1990 and 2011 (Percentage)

Access to clean water

Access to improved sanitation



Improved

Shared

Unimproved

Open defecation

Source: Millenium Development Report 2013

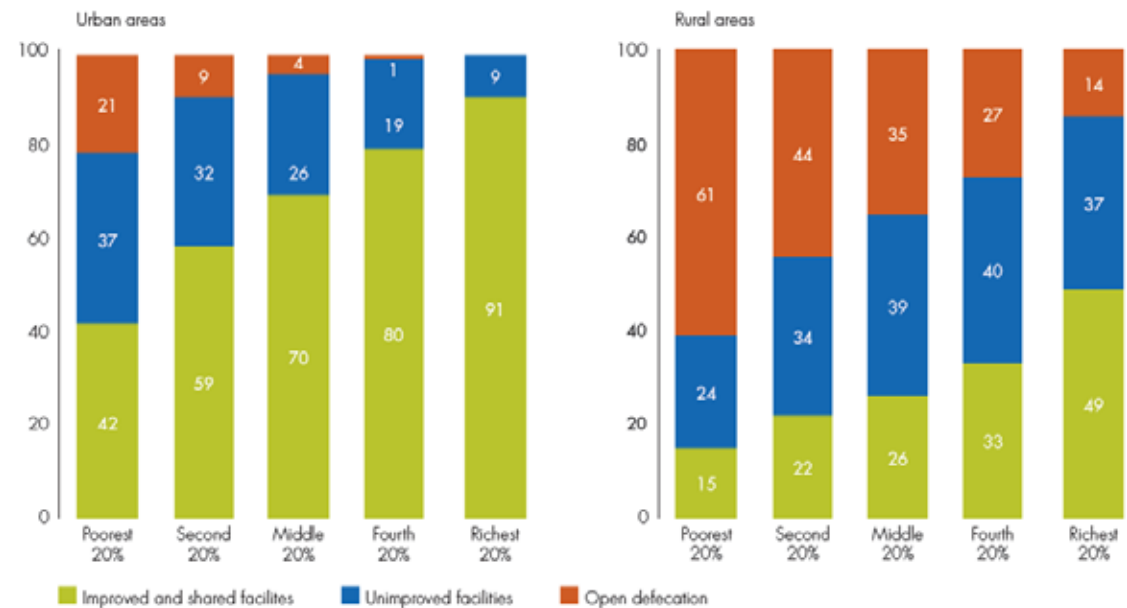
# Water and Health

Access to clean water

Access to improved sanitation



Proportion of population by sanitation practices and wealth quintile, urban and rural areas, sub-Saharan Africa, based on population-weighted averages from 35 countries (Percentage)



Source: Millenium Development Report 2013

# Water and Health

2011: 6.9 million children died before their 5<sup>th</sup> year  
(down from 12.5 million in 1990)

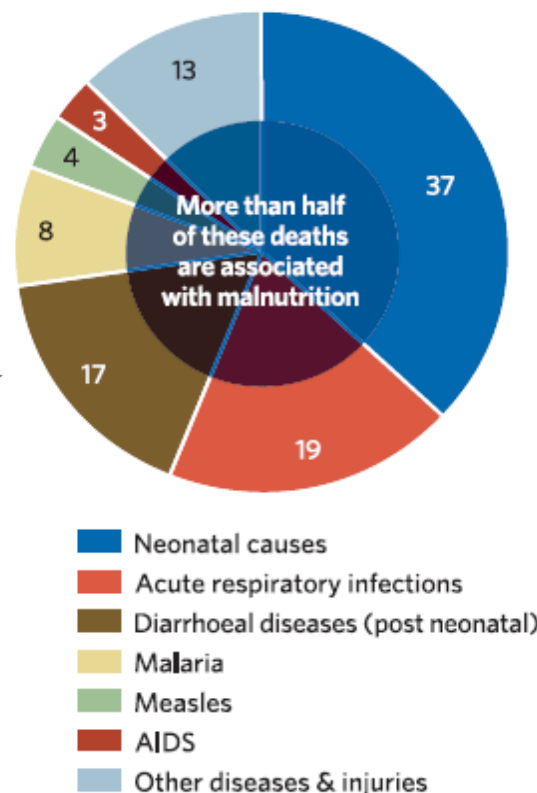
Access to clean water

Access to improved sanitation

Reduction of water borne diseases

Malaria

Diarrhoeal diseases



Child mortality under 5 deaths per 1,000	1990	2011
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Developing world:	97	à 57
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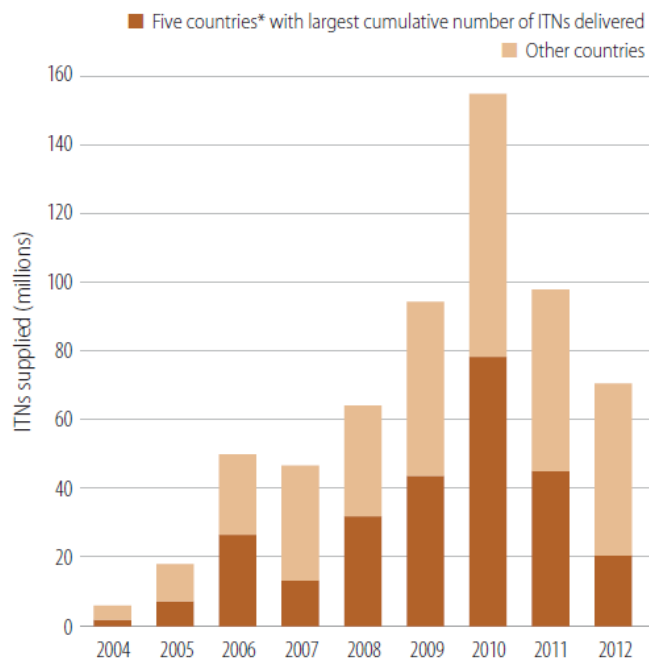
Sub-Sahara Africa:	178	à 109
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Causes of deaths among children under age five, 2000-2003 (Percentage)



# Water and Health

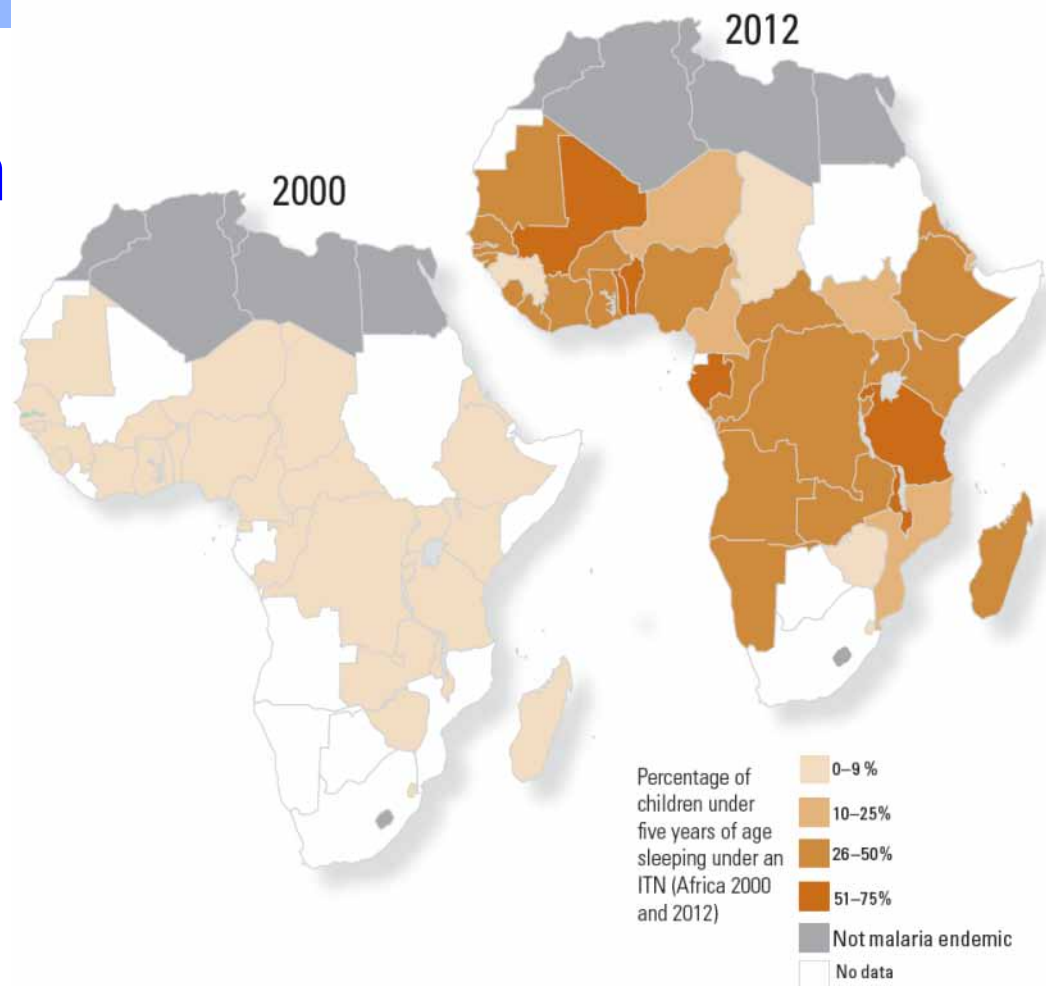
Figure 4.1 Number of ITNs delivered by manufacturers to countries in sub-Saharan Africa, 2004–2012



\* Democratic Republic of the Congo, Ethiopia, Kenya, Nigeria, United Republic of Tanzania

Source: Alliance for Malaria Prevention. Data for the first three quarters of 2012 have been multiplied by 4/3 to provide an annual estimate.

## Children under five sleeping under ITNs in Africa (%)

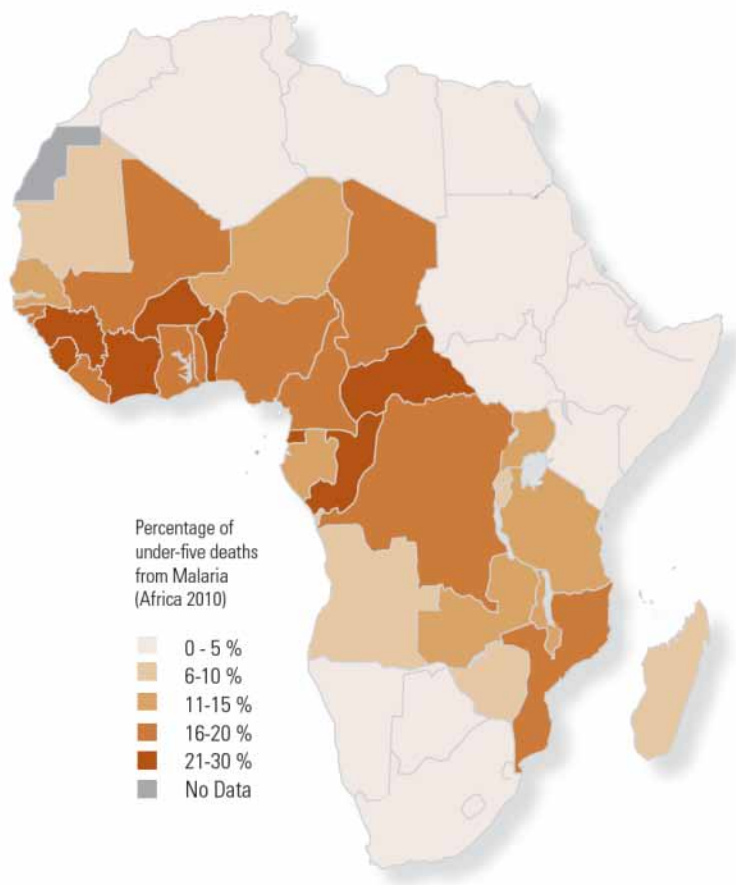


Source: World Malaria Report, WHO, 2012

Source: UNICEF, 2013

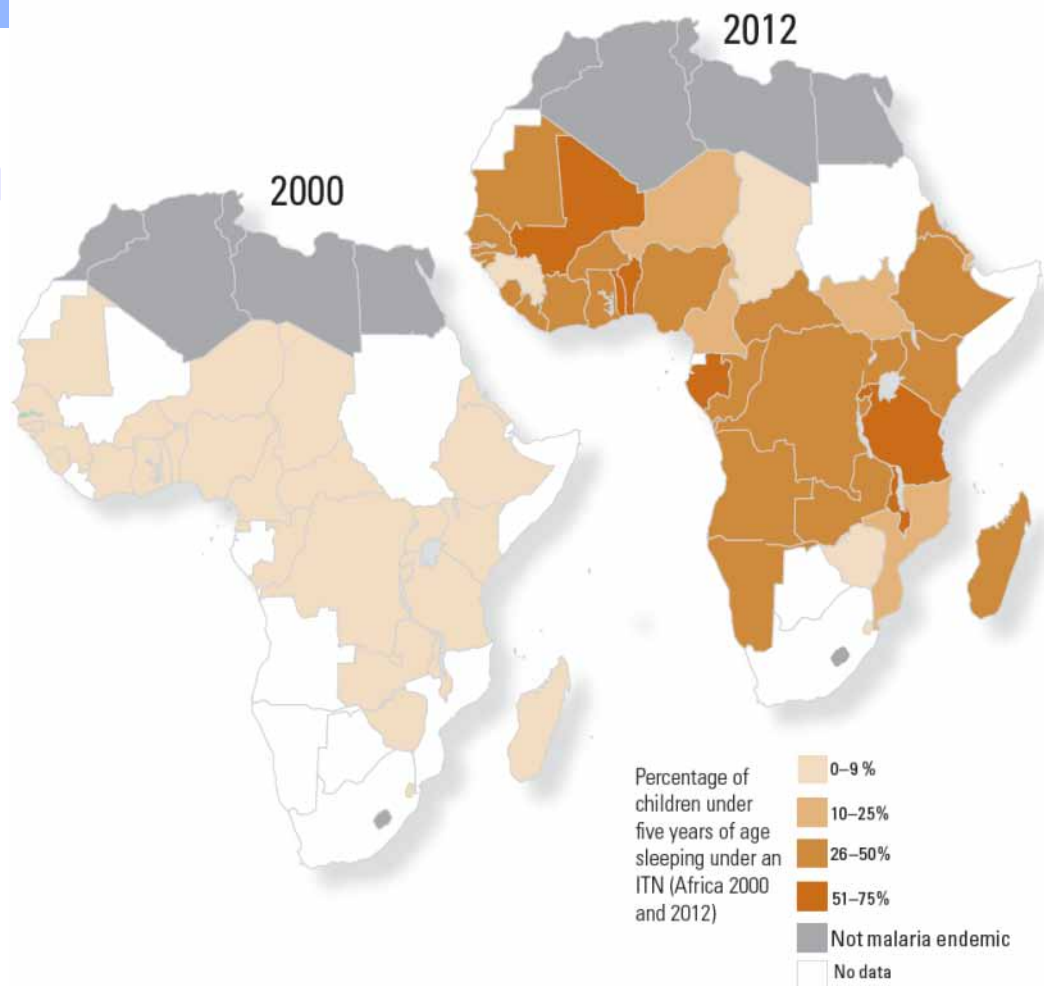
# Water and Health

Malaria deaths among children under five in Africa (%)



Source: UNICEF, 2013

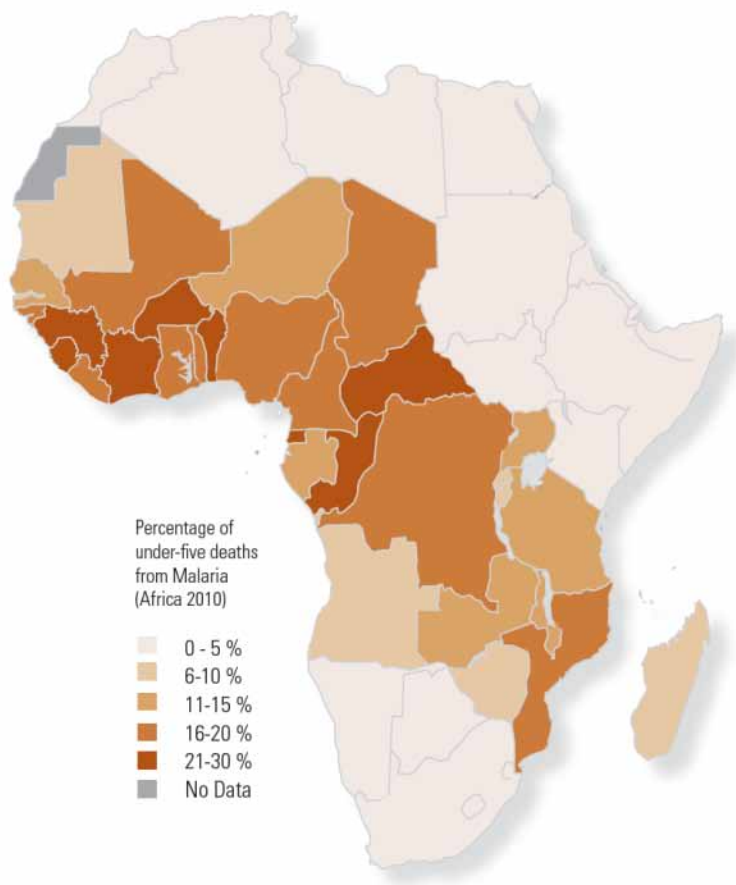
Children under five sleeping under ITNs in Africa (%)



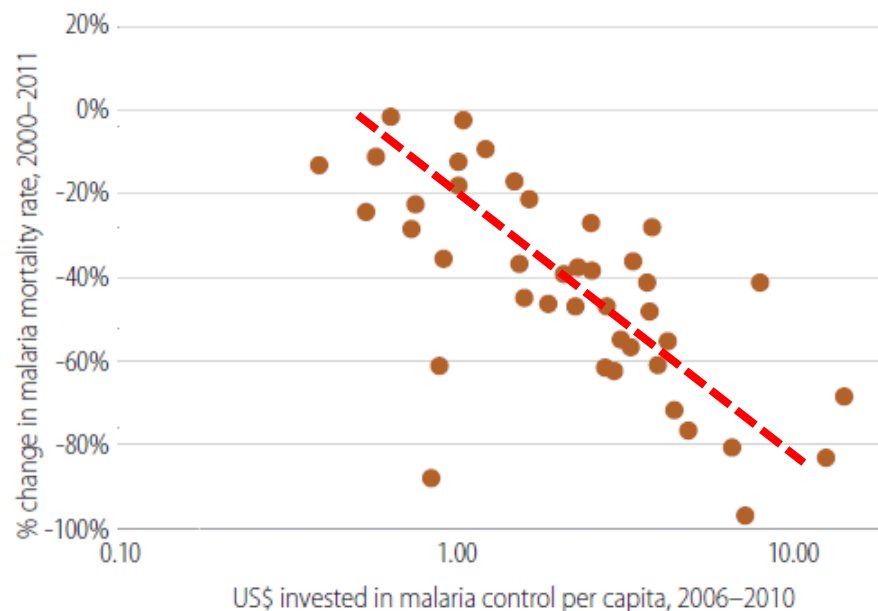
Source: UNICEF, 2013

# Water and Health

Malaria deaths among children under five in Africa (%)



Source: UNICEF, 2013



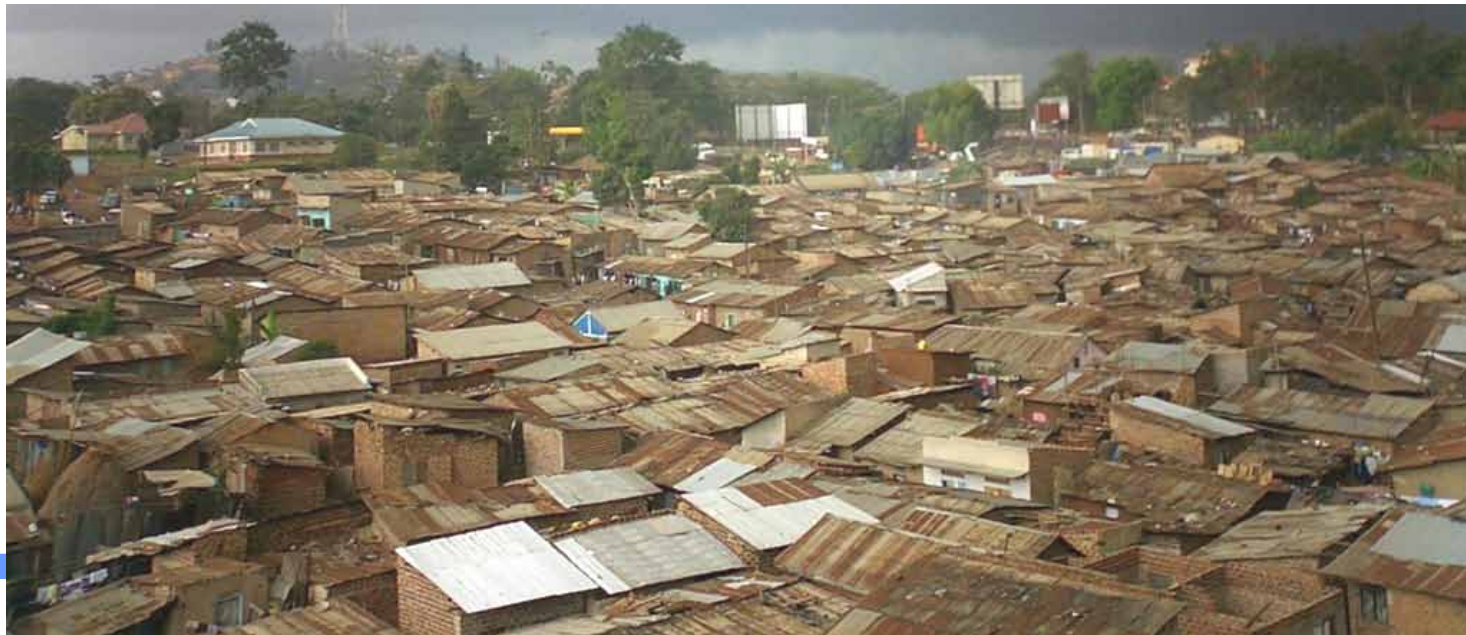
Change in malaria mortality in Africa, 2000-2011  
in relation to investment in malaria control

Source: World Malaria Report, WHO, 2012

# Water and Health

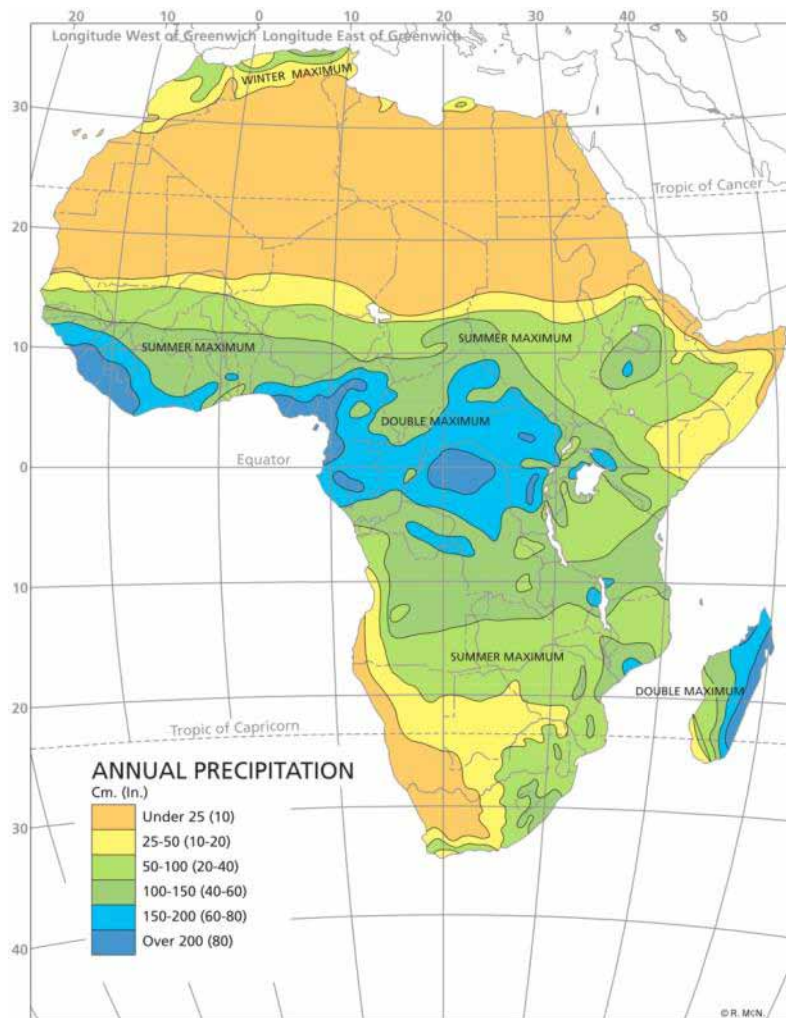
Lessons:

- Much progress has been made
- But much more has to be done
- A matter of political priority setting



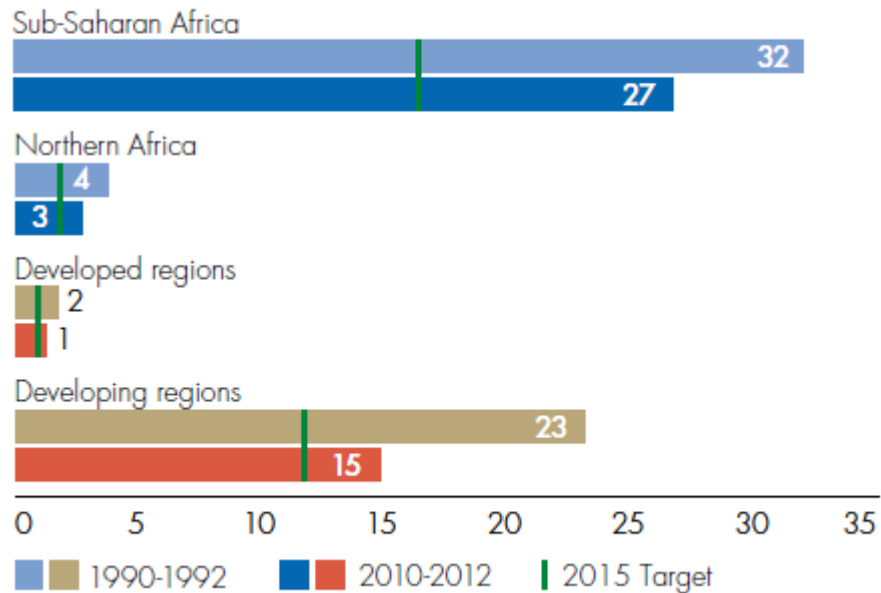


# Water and Food



# Water and Food

Proportion of people who are undernourished,  
1990-1992 and 2010-2012 (Percentage)

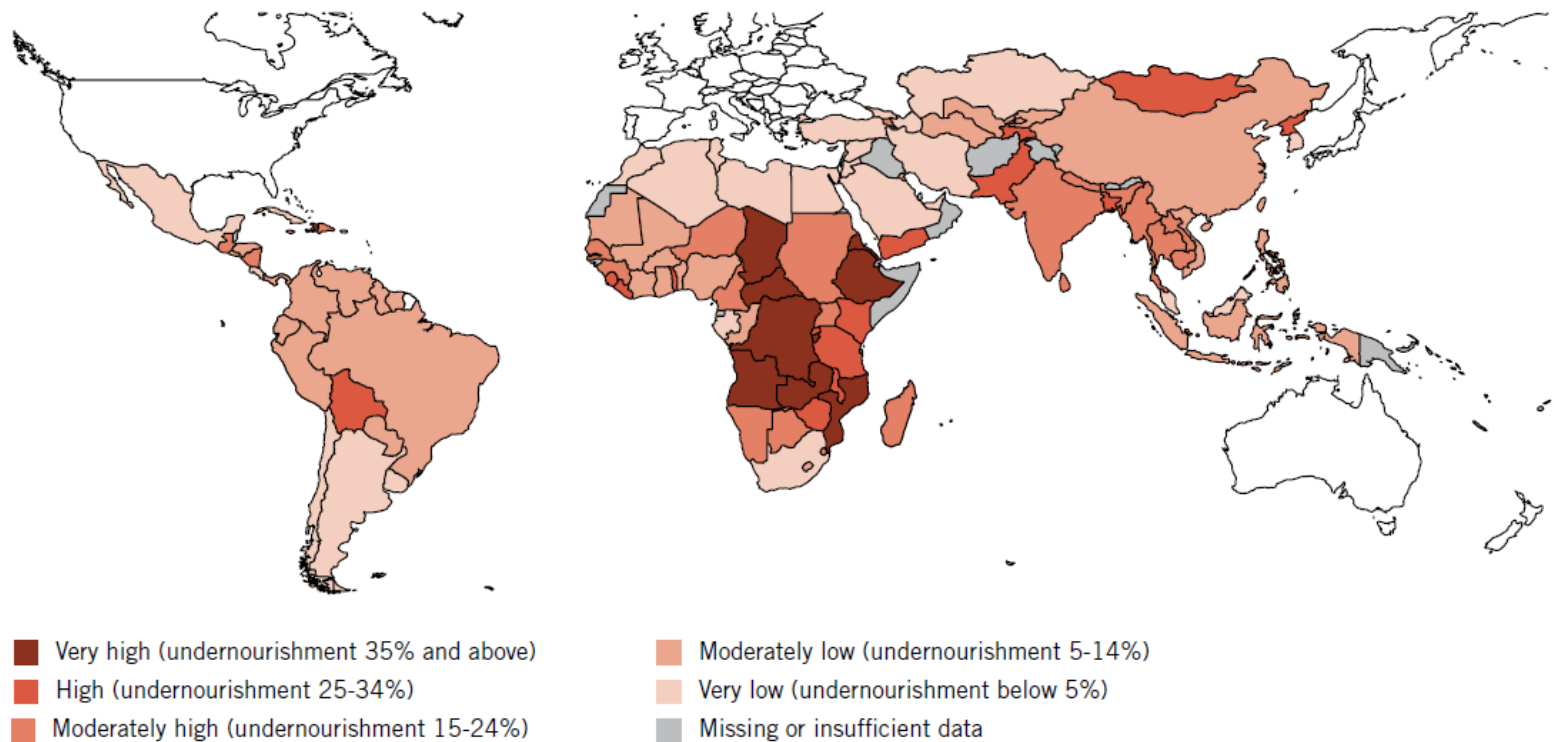


Source: Millenium Development Report, 2013



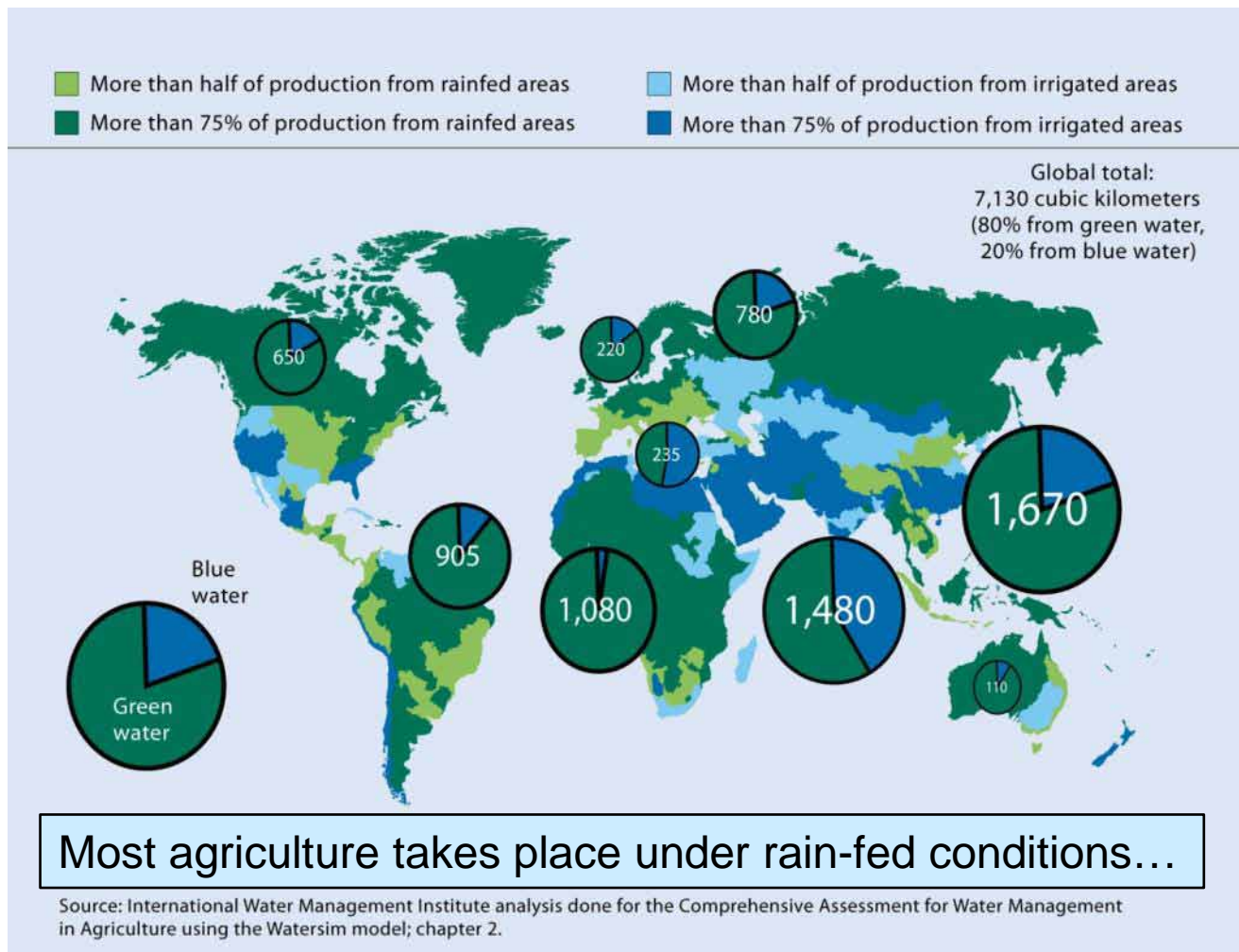
# Water and Food

Proportion of undernourished population, 2005-2007 (Percentage)



Source: Millennium Development report, 2011

# Water and Food



Source: De Fraiture et al., 2009



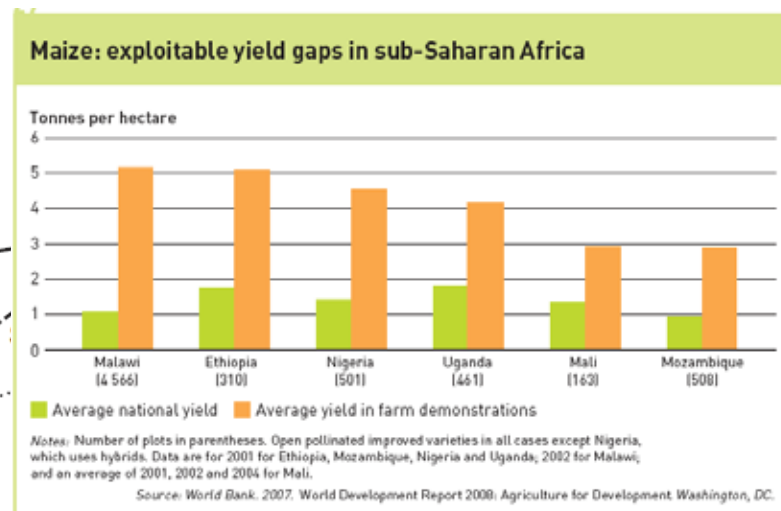
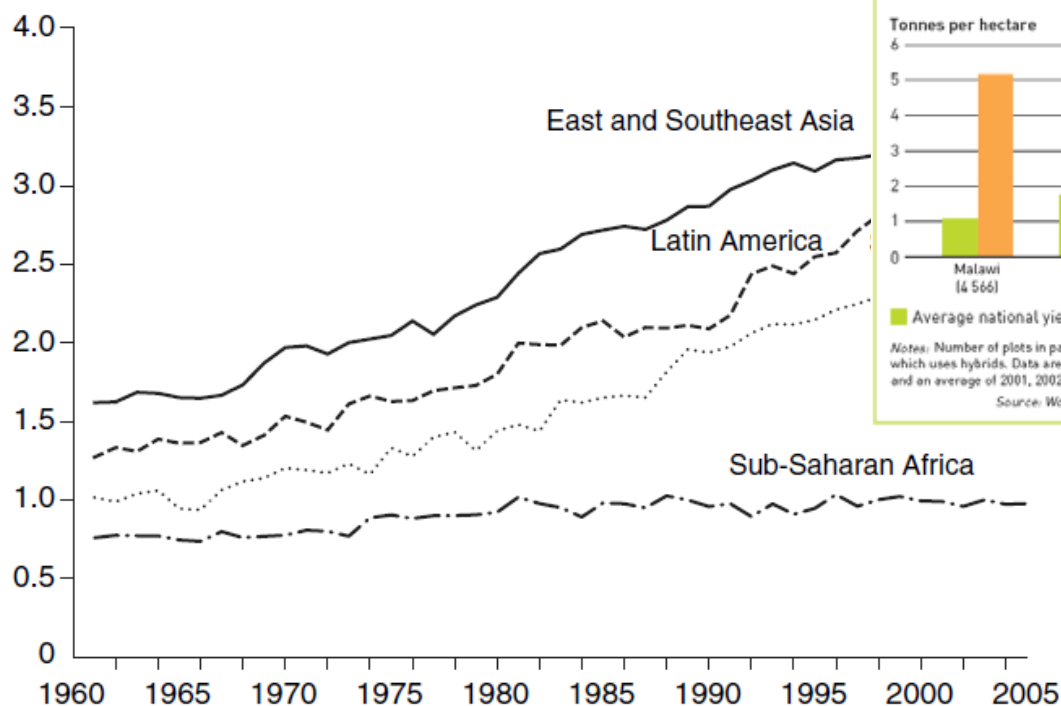
# Water and Food

Average maize yield (ton/ha)

Commodities	Country Groups	Yields					
		1961-80 Avg	1981-00 Avg	2001-05 Avg	2006	2007	2008
Maize (tonnes/ha)	World	2.54	3.77	4.63	4.75	4.97	5.11
	Africa	1.26	1.51	1.72	1.74	1.70	1.82

Source: FAO, 2011

(Average cereal yields [MT/ha])



Source: FAO Food Security report, 2008

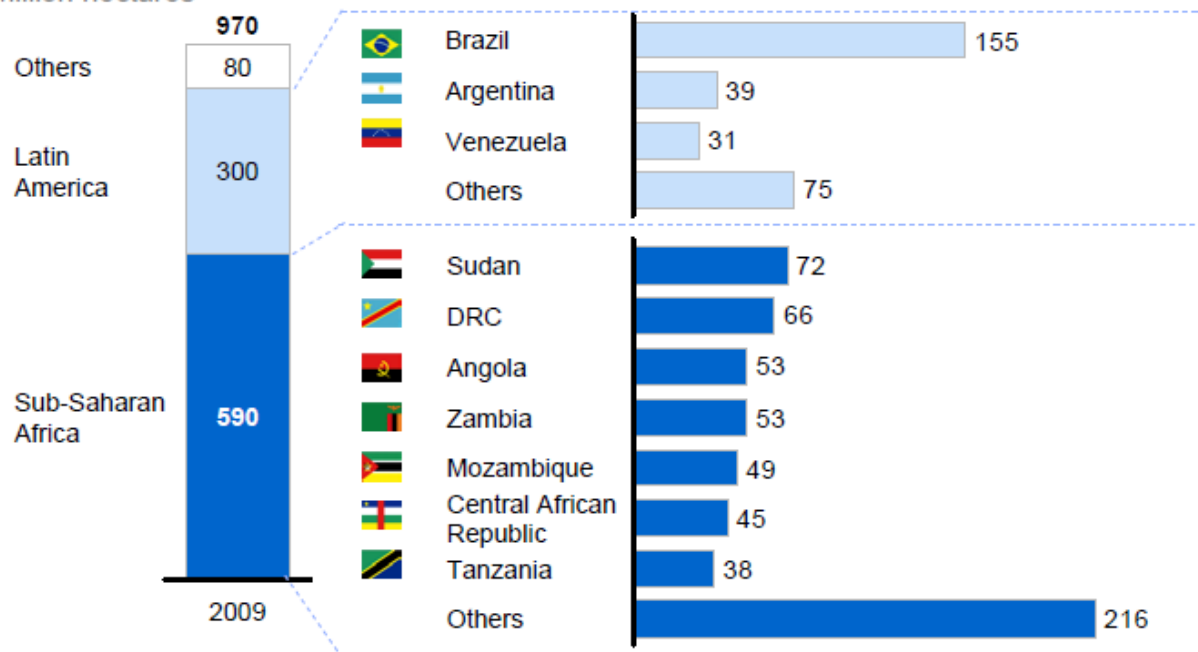
Source: World Bank, 2007; based on FAOSTAT

# Water and Food

**Africa represents about 60 percent of the potentially available cropland in the world**

Additional available cropland, 2009<sup>1</sup>

Million hectares



<sup>1</sup> Cropland defined as land producing output greater than 40% of maximum yield under rain-fed conditions, excluding forest areas.

SOURCE: World Bank/Food and Agriculture Organization, *Awakening Africa's sleeping giant*, McKinsey Global Institute

Source: McKinsey Global Institute, 2010

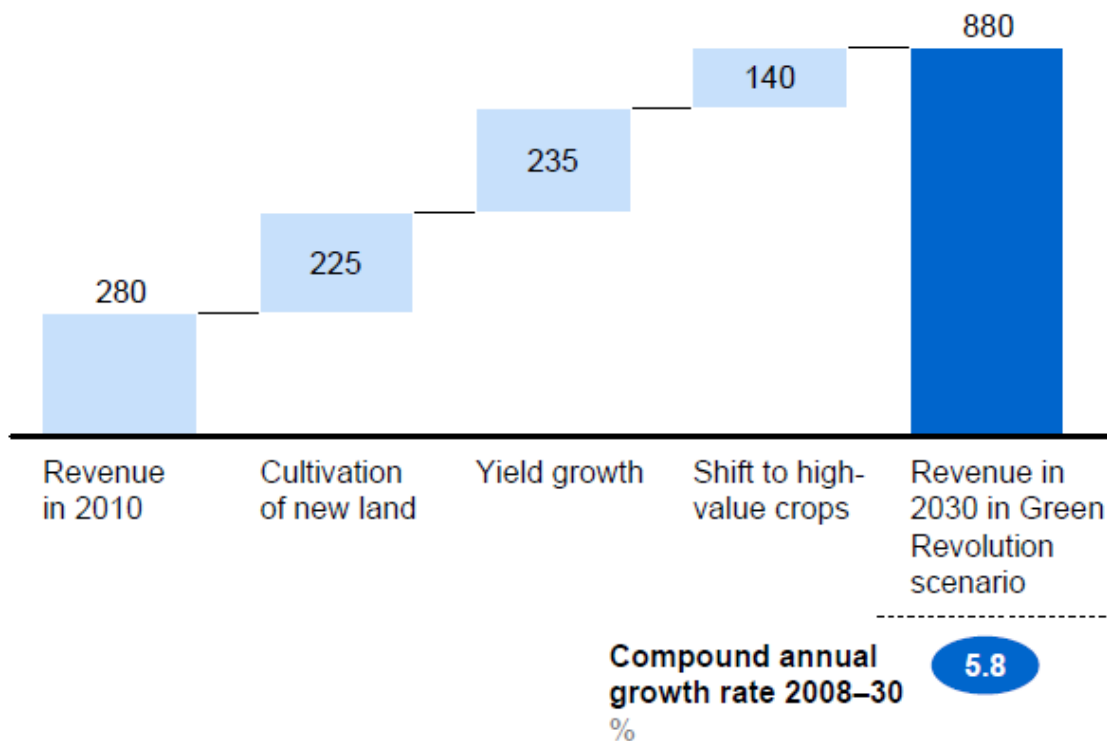
# Water and Food

- cereal yields in Africa are currently less than 50% of those in Asia or South America
- Africa accounts for 60% of the world's uncultivated arable land

# Water and Food

**An African “green revolution” could raise agricultural production to \$880 billion per annum by 2030**

Africa agricultural production revenue  
\$ billion



Source: Food and Agriculture Organization; McKinsey Global Institute analysis

Source: McKinsey Global Institute, 2010



# Water and Food

“Hot spots”

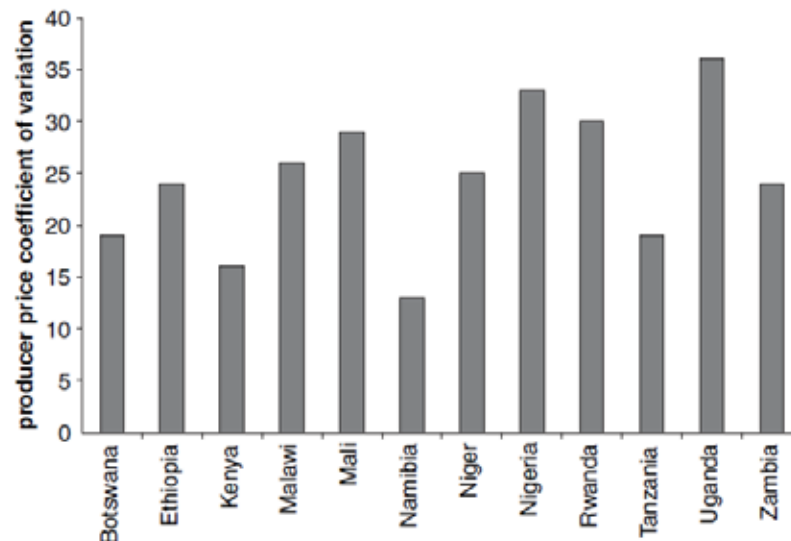


Nutrients – Water – Energy – Markets



Photos: Eric Ofosu

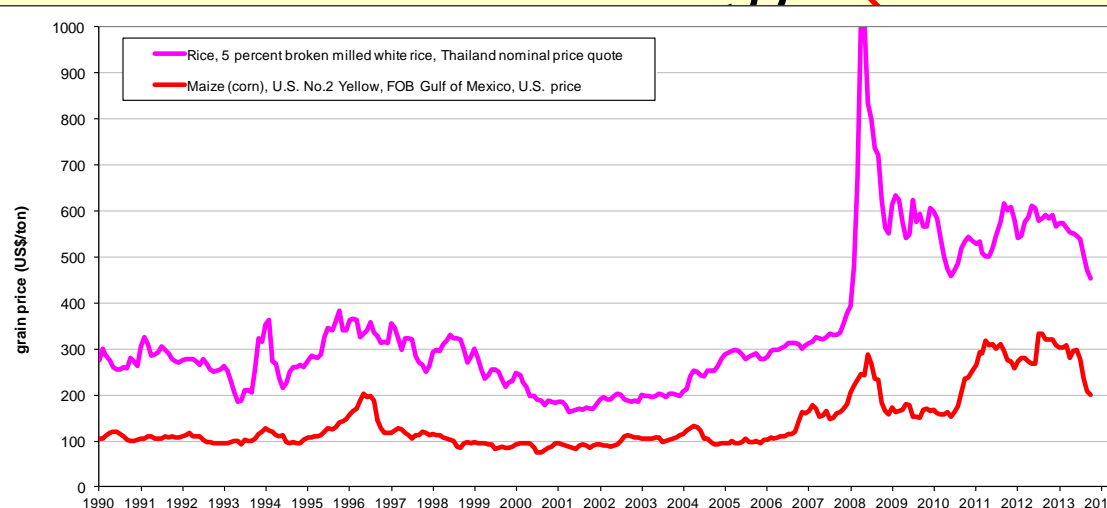
# Water and Food



Source: World Bank, 2007

Coefficient of Variation of maize producer prices, 1971-2002

## Nutrients – Water – Energy – Markets



Source: IMF Primary Commodity Prices November 2013; <http://www.imf.org/external/np/res/commmod/index.asp>

# Water and Food

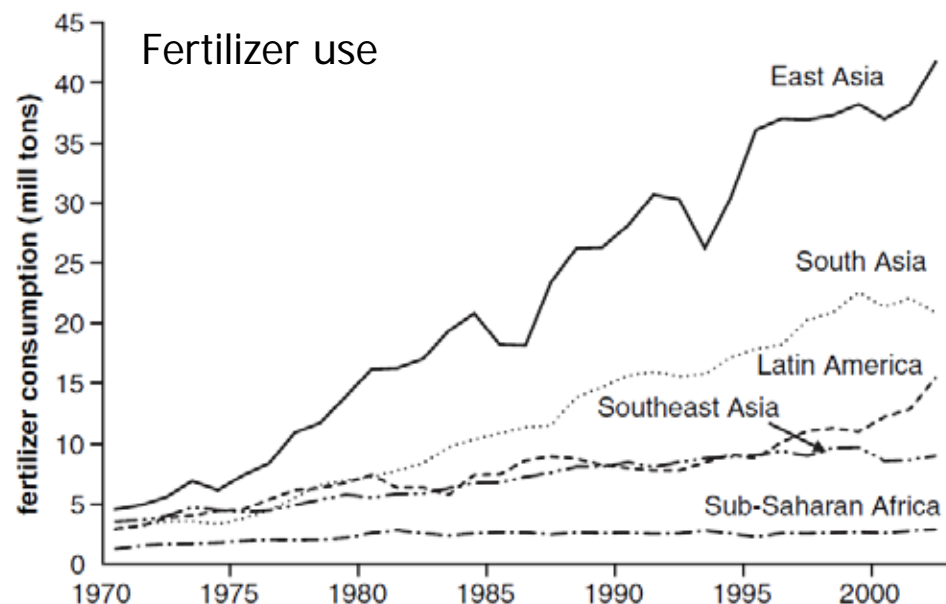


Nutrients – Water – Energy – Markets





# Water and Food

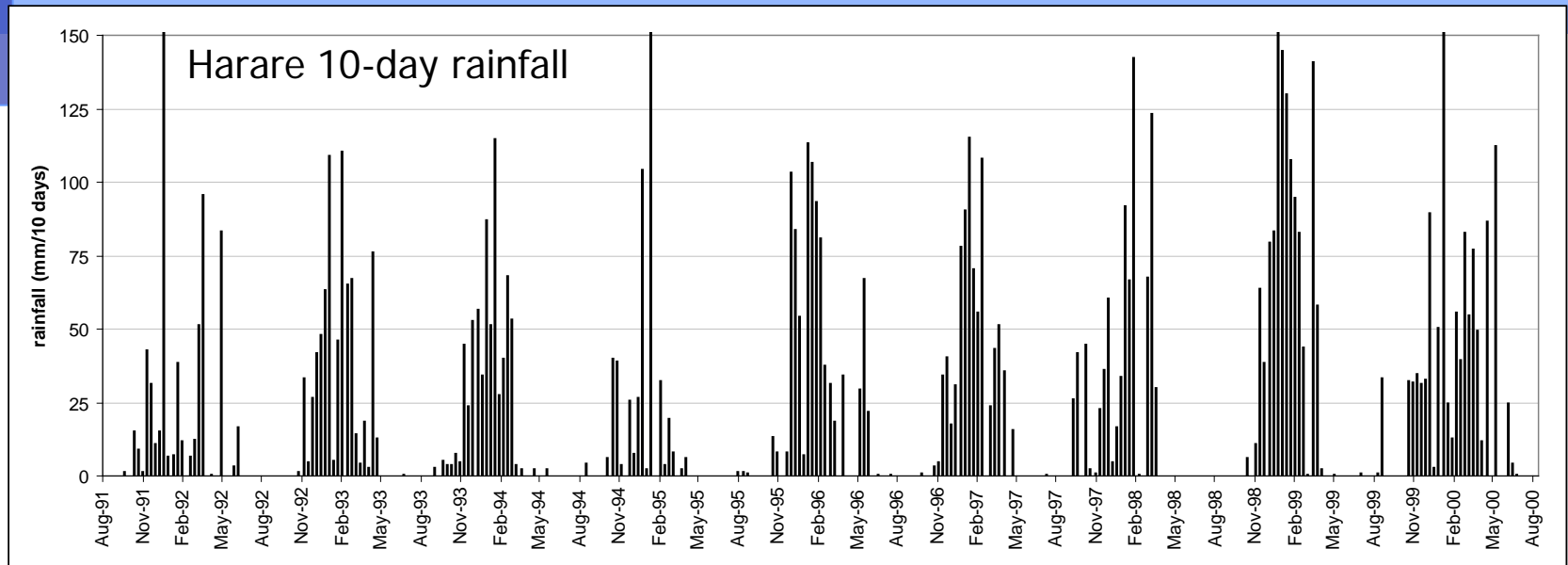


Source: World Bank, 2007; based on FAOSTAT

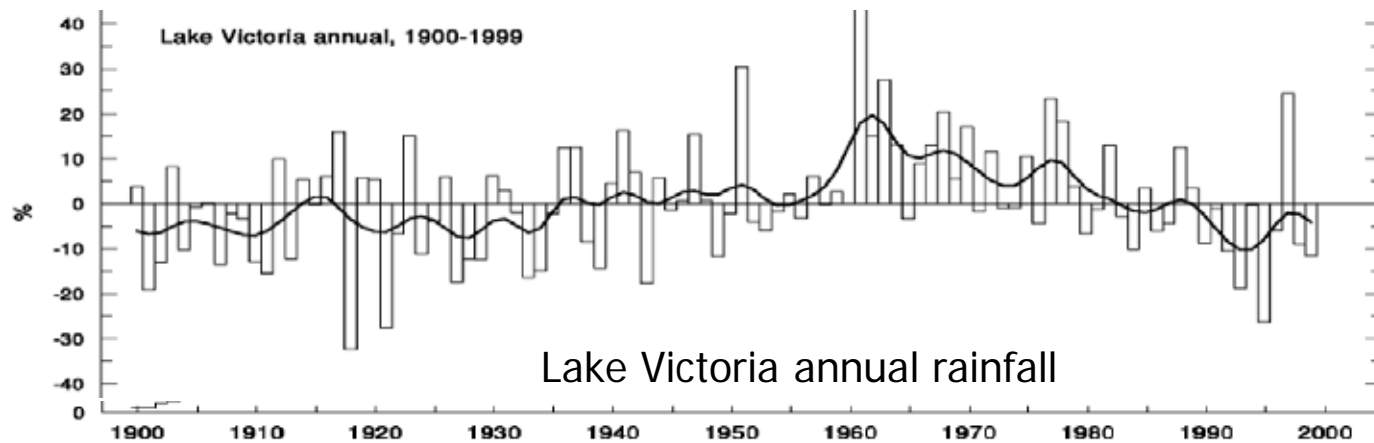
## Nutrients – Water – Energy – Markets

Why low fertilizer use in Africa?

- Relatively expensive
- Lack of knowledge of specific fertilizer requirements
- Uncertainty about the return of this investment due to water & markets

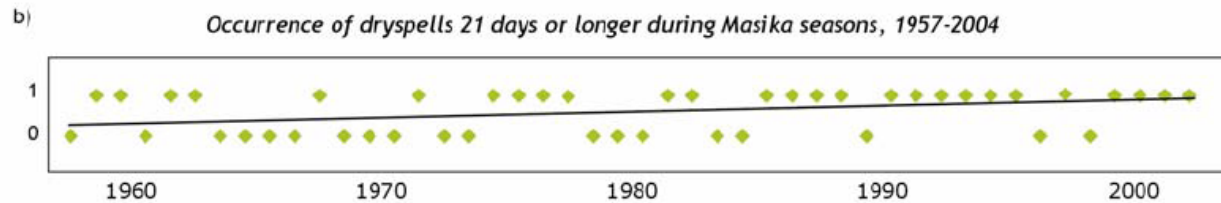
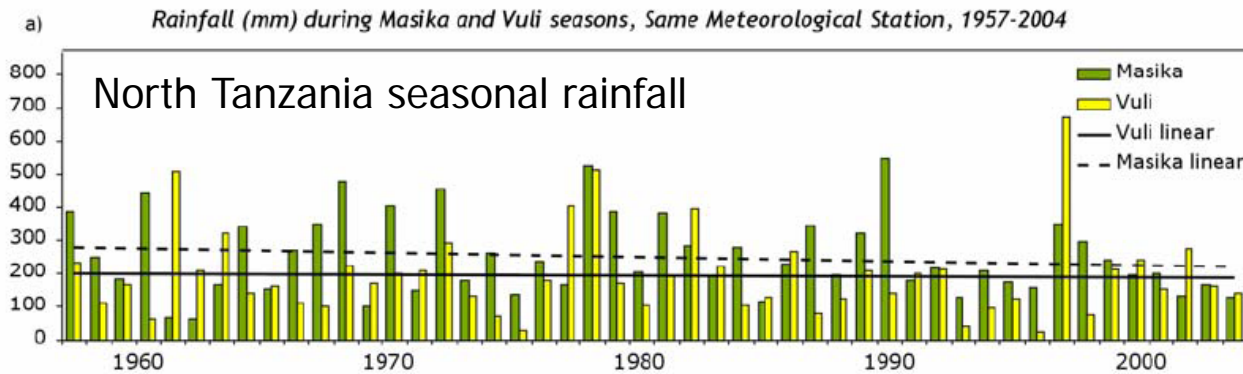


Nutrients – Water – Energy – Markets



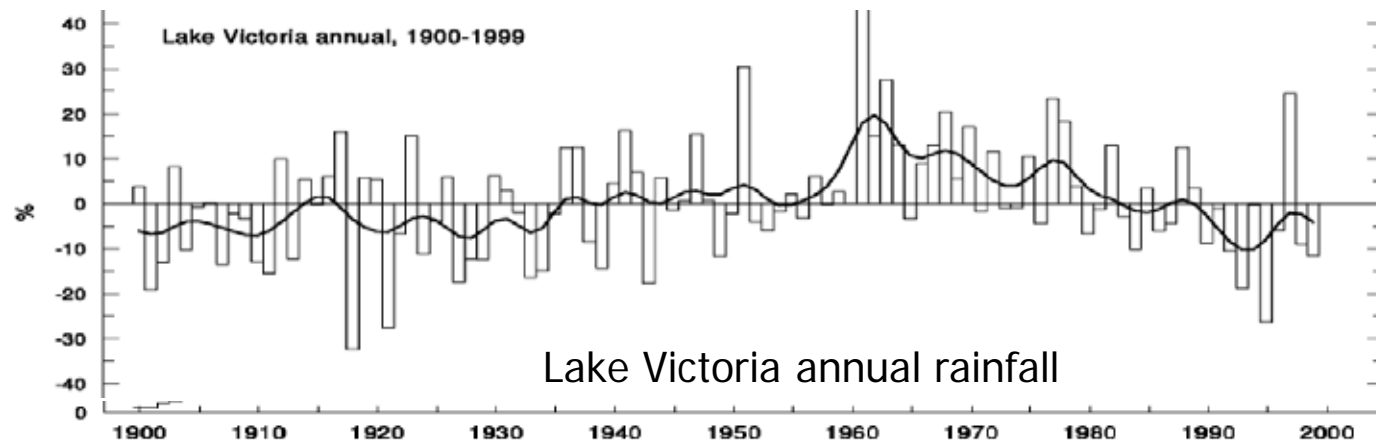
Source: Conway, 2005





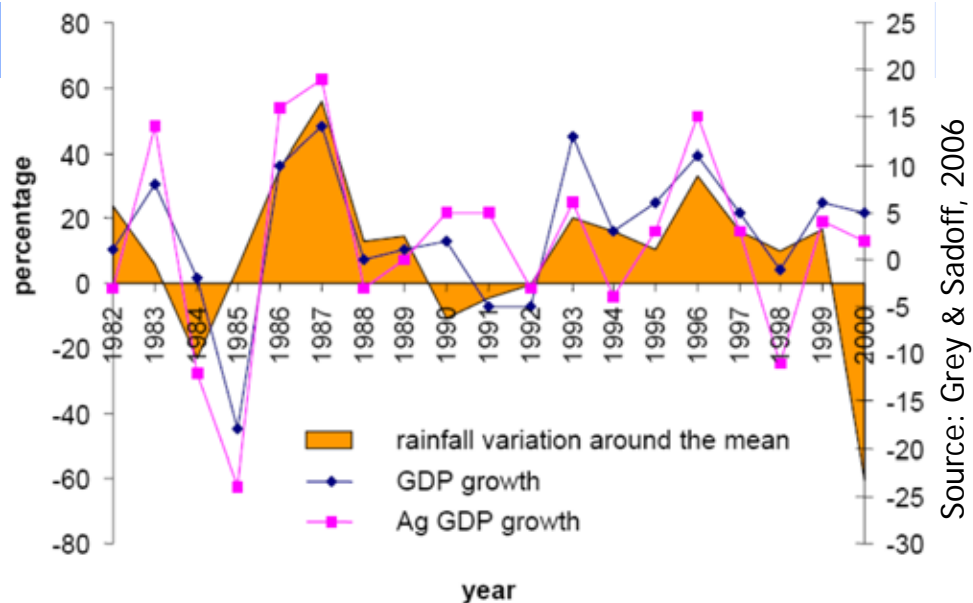
Source: Enfors and Gordon, 2007

Nutrients – Water – Energy – Markets



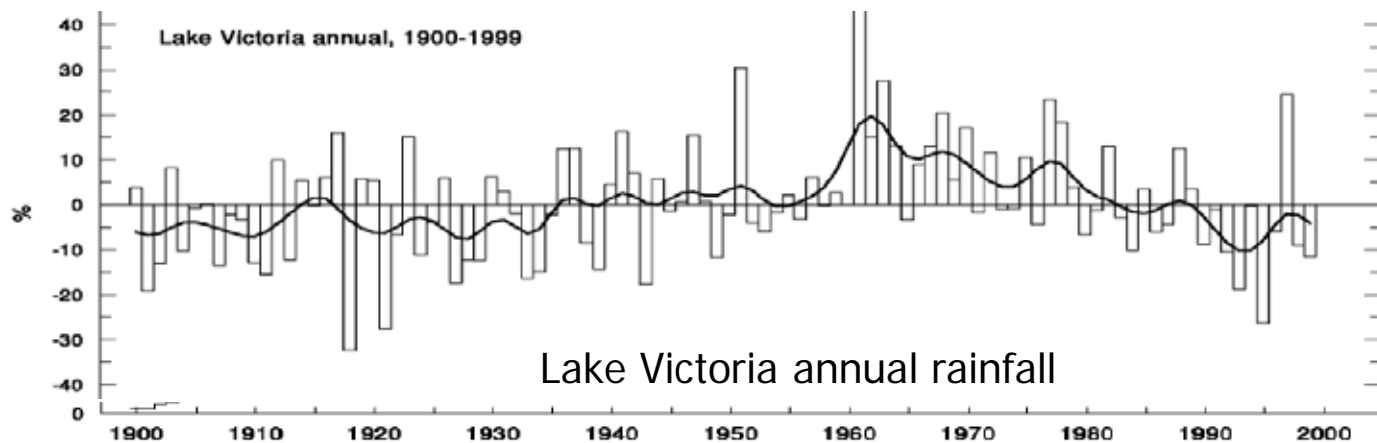
Source: Conway, 2005

# Water and Food



Ethiopia annual rainfall and GDP growth

Nutrients – Water – Energy – Markets



Lake Victoria annual rainfall

Source: Conway, 2005

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graph BT; A["Nutrients – Water – Energy – Markets"] --> B["to bridge dry spells<br/>increase buffering capacity<br/>and control over water"]; B --> C["farming systems more resilient to variability<br/>of rainfall and water access"];
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farming systems more resilient to variability  
of rainfall and water access

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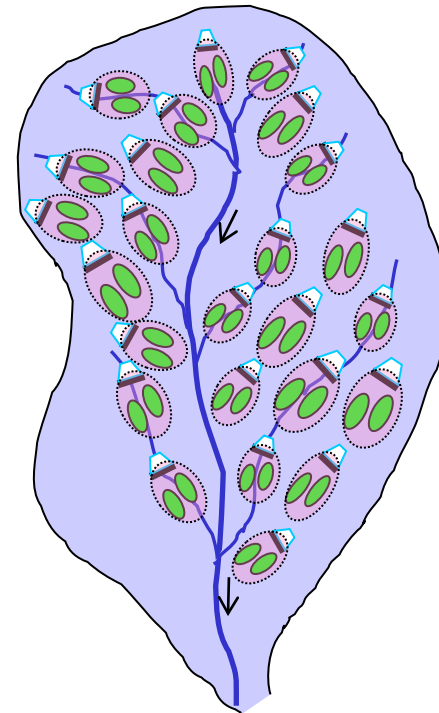
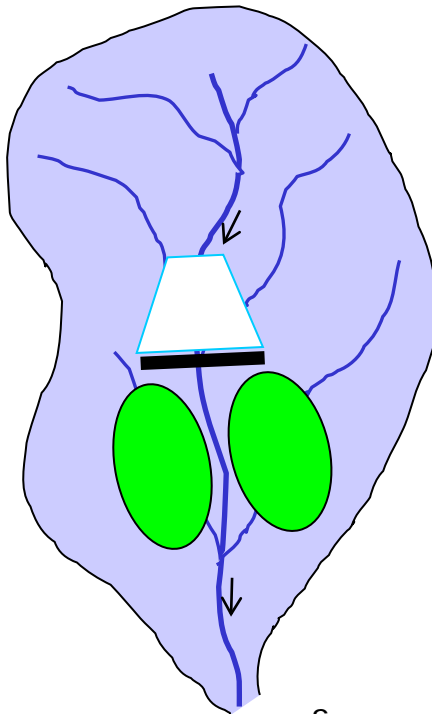
Nutrients – Water – Energy – Markets

Buffering rainfed systems against dry spells  
requires only some **100 mm** of additional water storage capacity:

- increase soil moisture storage capacity
- if insufficient, add supplementary irrigation from rainwater harvesting



distrib



Source: Van der Zaag and Gupta, 2008



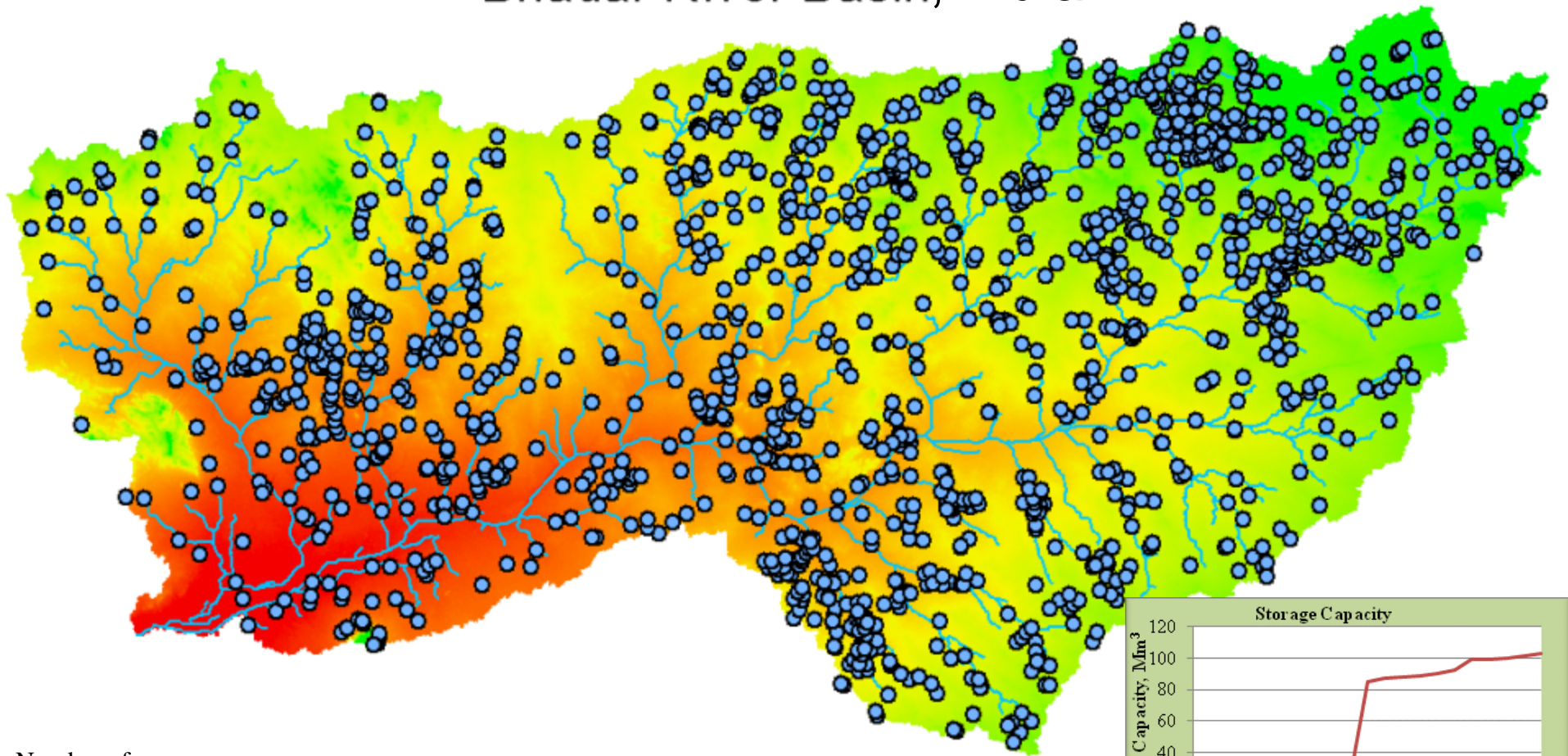
# Water and Food

Water storage – centralised or distributed?

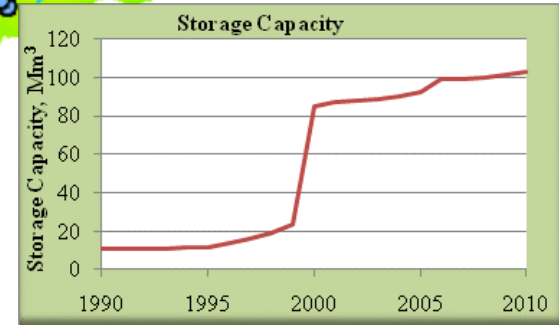




# Small reservoirs (check dams) in Bhadar River Basin, India



Number of  
check dams = 3000



1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010



# Water and Food

## Lessons

- A Green Revolution in Africa is possible!
- Grain yields can **triple**
- Start with water – i.e. neutralize the uncertainty factor first
- Increased soil moisture availability is possible and feasible
- Invest in small scale *distributed* storage
  - will increase the resilience of farming systems and improve livelihoods
  - will be “no regret” investments, whatever the future will bring
- Negative (downstream) externalities will remain small

# Water and Energy

Per capita electricity use

Africa: 150 kWh/year

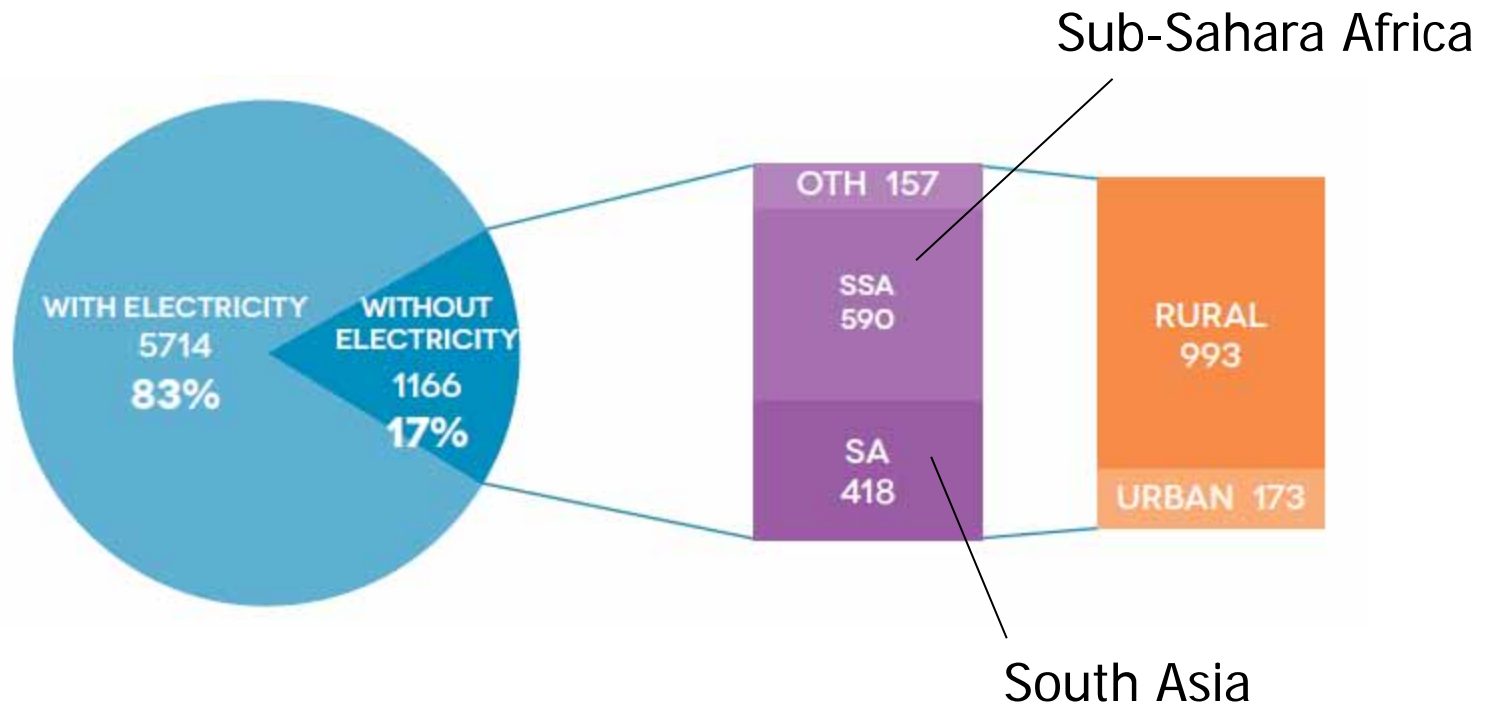
Netherlands: 6,500 kWh/year



Africa is energy challenged...

... despite a generous natural energy endowment

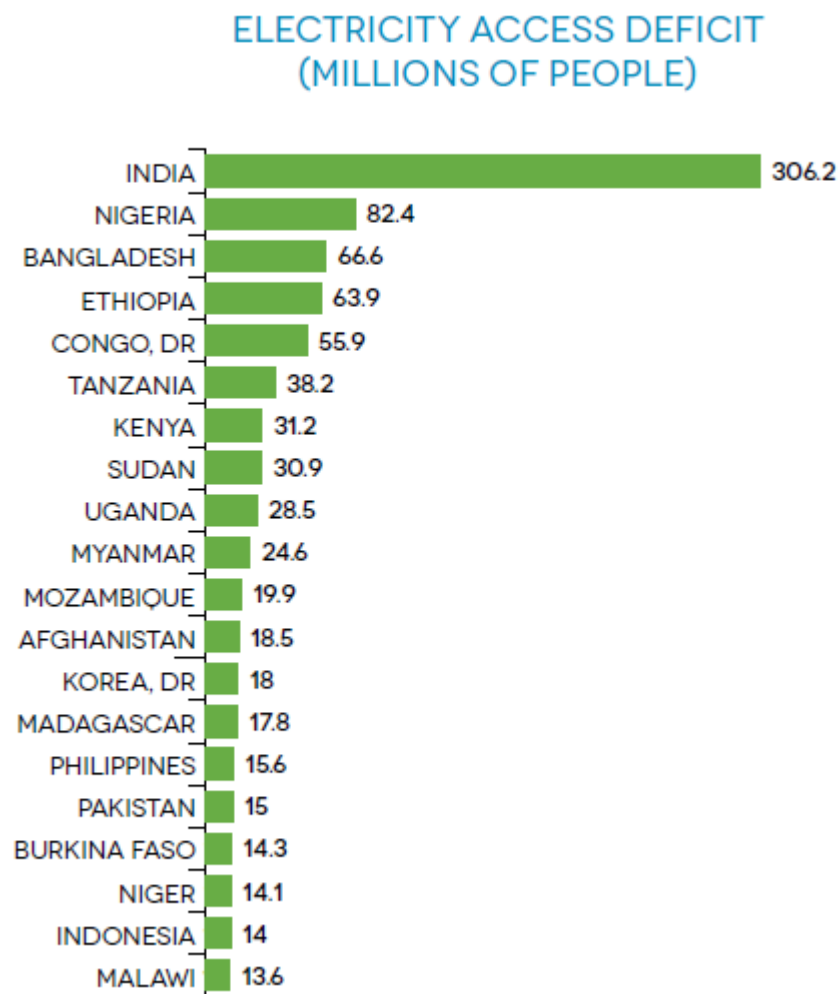
# Water and Energy



Source: SE4All, World Bank, 2013

# Water and Energy

Of the 20 countries with the highest deficit in access to electricity in 2010, 12 are African



Source: SE4All, World Bank, 2013



# Water and Energy

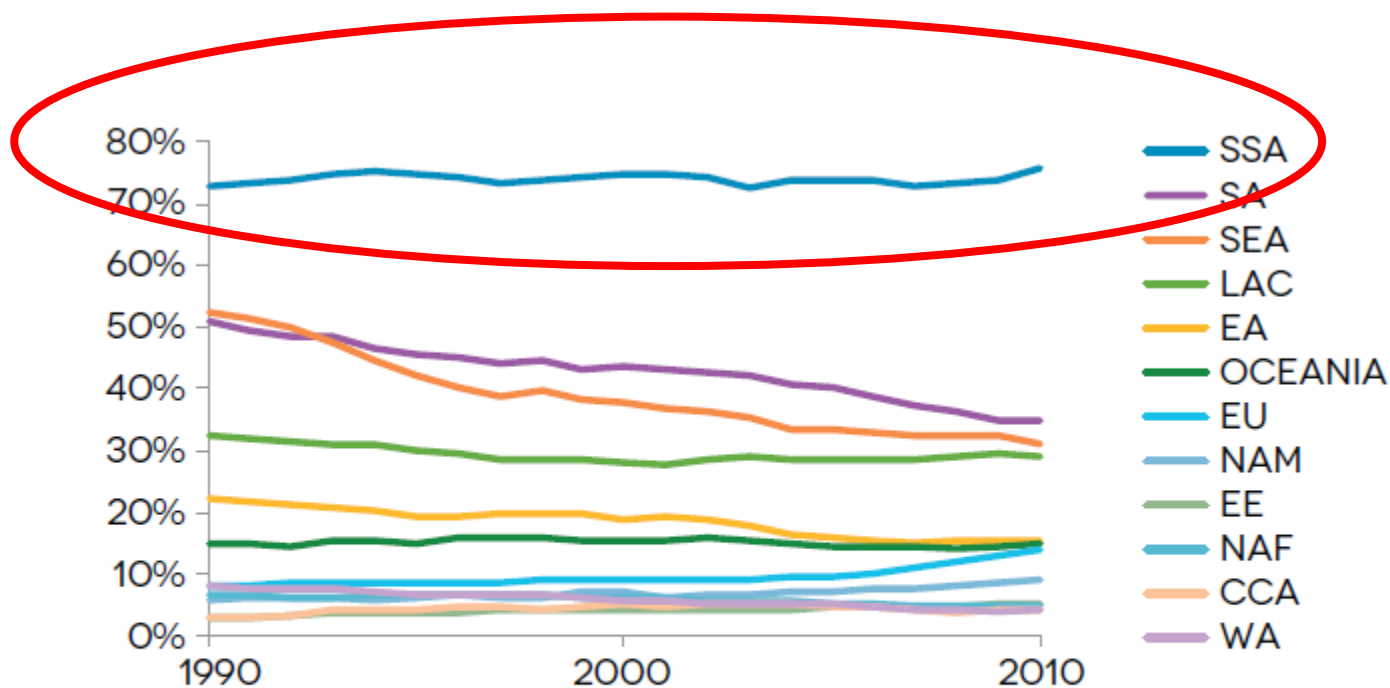
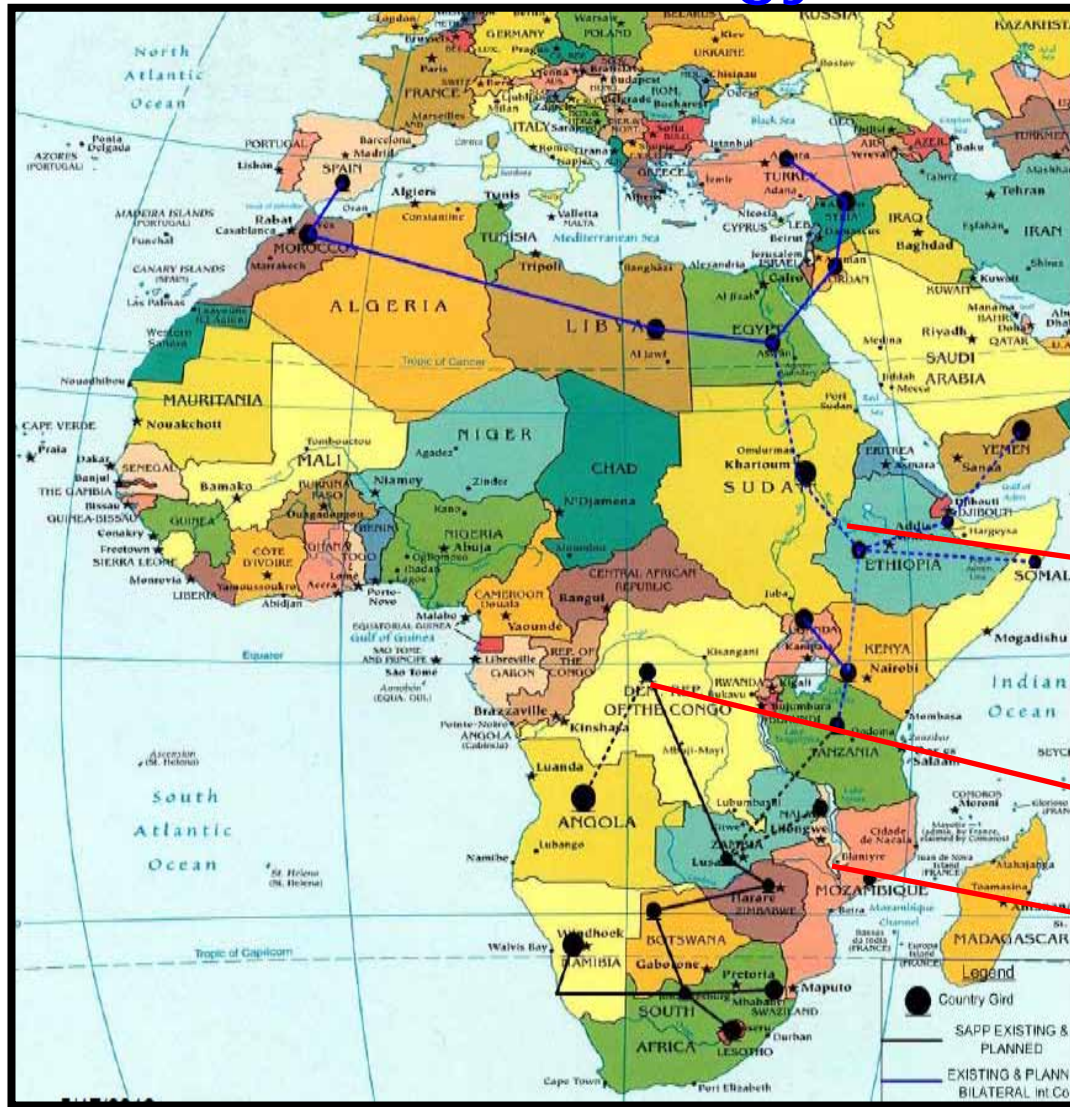


FIGURE O.22 EVOLVING RENEWABLE ENERGY SHARE BY REGION, 1990–2010  
(PERCENTAGE OF TOTAL FINAL ENERGY CONSUMPTION)

Source: SE4All, World Bank, 2013

# Water and Energy



Current capacity: 147 GW  
(of which hydro: 26 GW)

Required in 2030: +250 GW

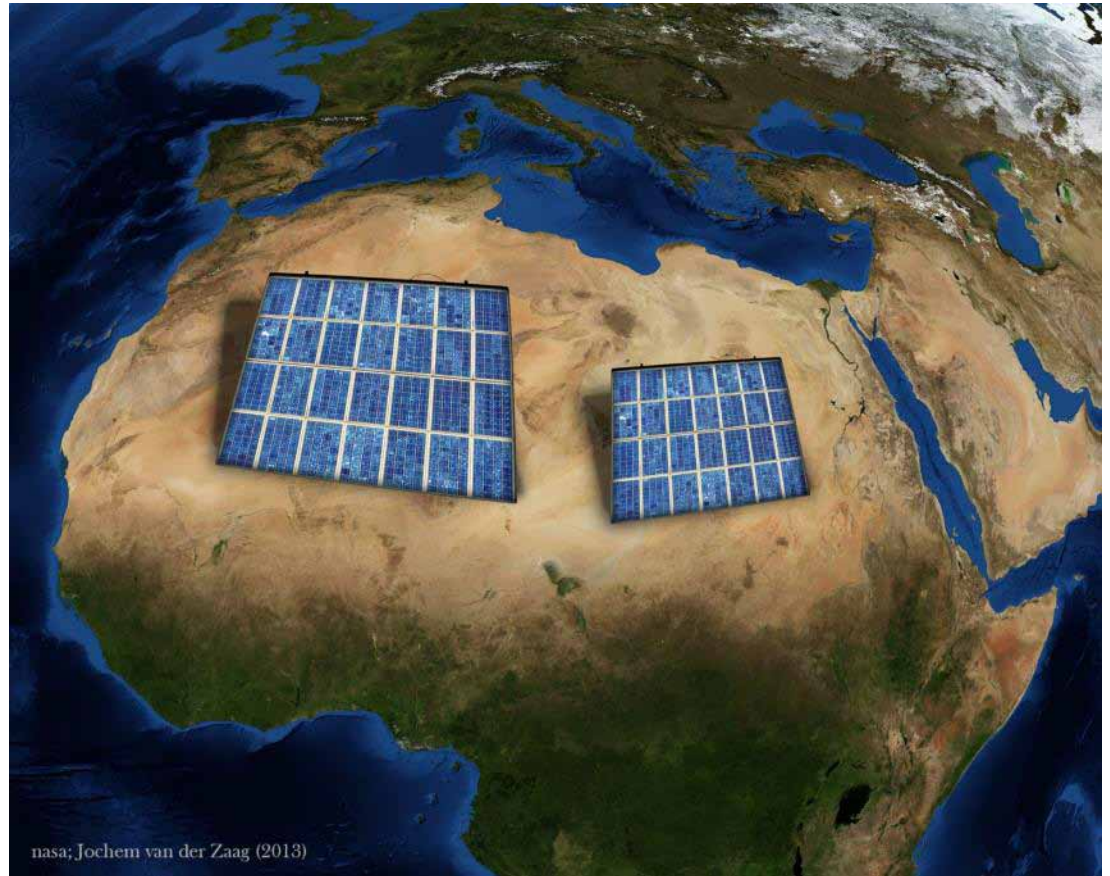
Blue Nile: > +7 GW

Congo: +40(?) GW

Zambezi: > +5 GW

# Water and Energy

Africa can light ROW



# Water and Africa's Development Agenda

1. Water and Health: Africa should not wait but act
2. Water and Food: Africa can produce surplus food for ROW
3. Water and Energy: Africa can generate sufficient renewable energy, perhaps even for ROW

The rest of the world needs Africa!



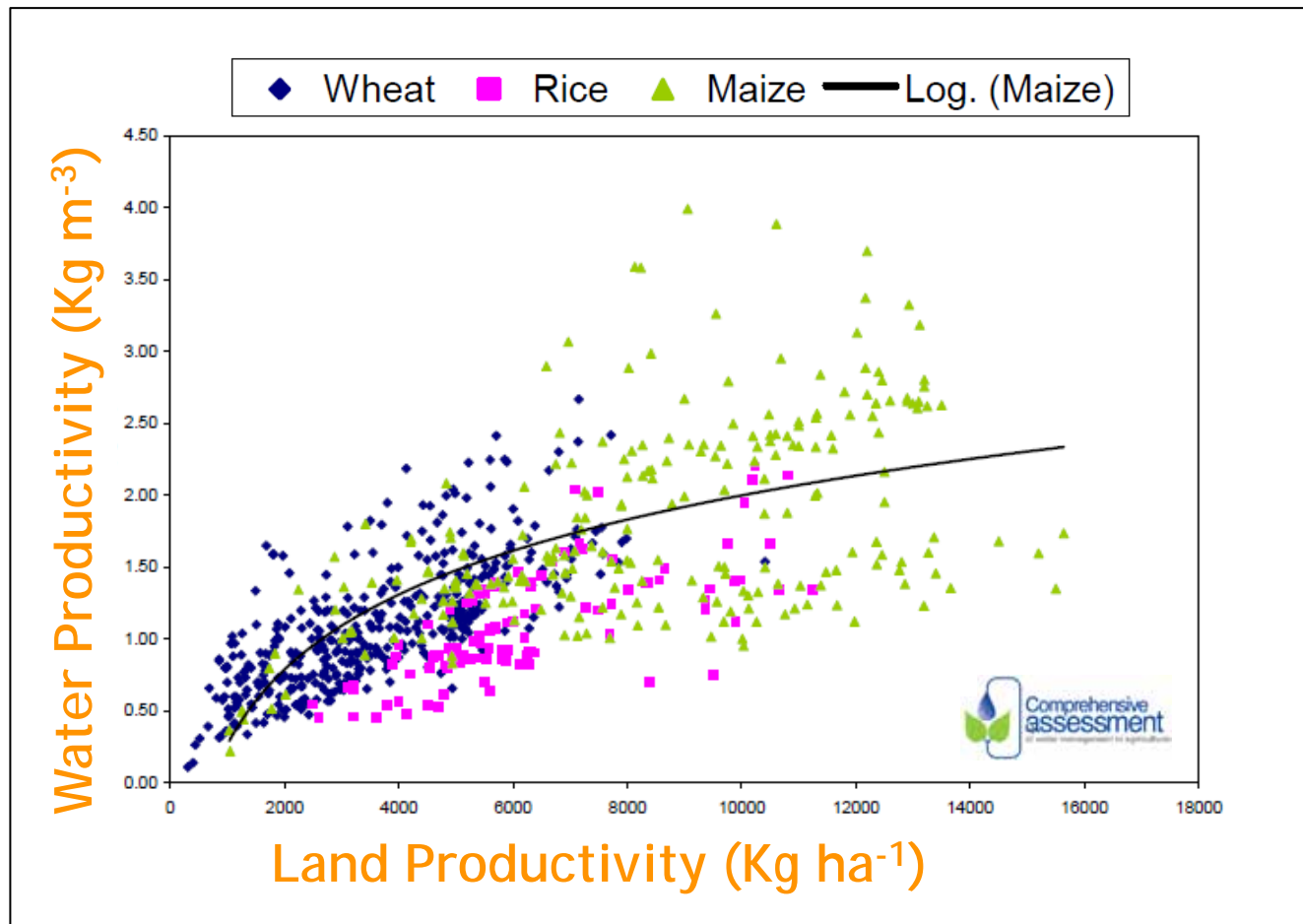
Thank you!



[www.unesco-ihe.org/pieter-van-der-zaag](http://www.unesco-ihe.org/pieter-van-der-zaag)



# Water and Food



Source: Pasquale Steduto (FAO), Delft, 18 Oct 2012