

Water and Africa's Development Agenda

NVAS Afrikastudiedag "Everyday Africa"
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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:

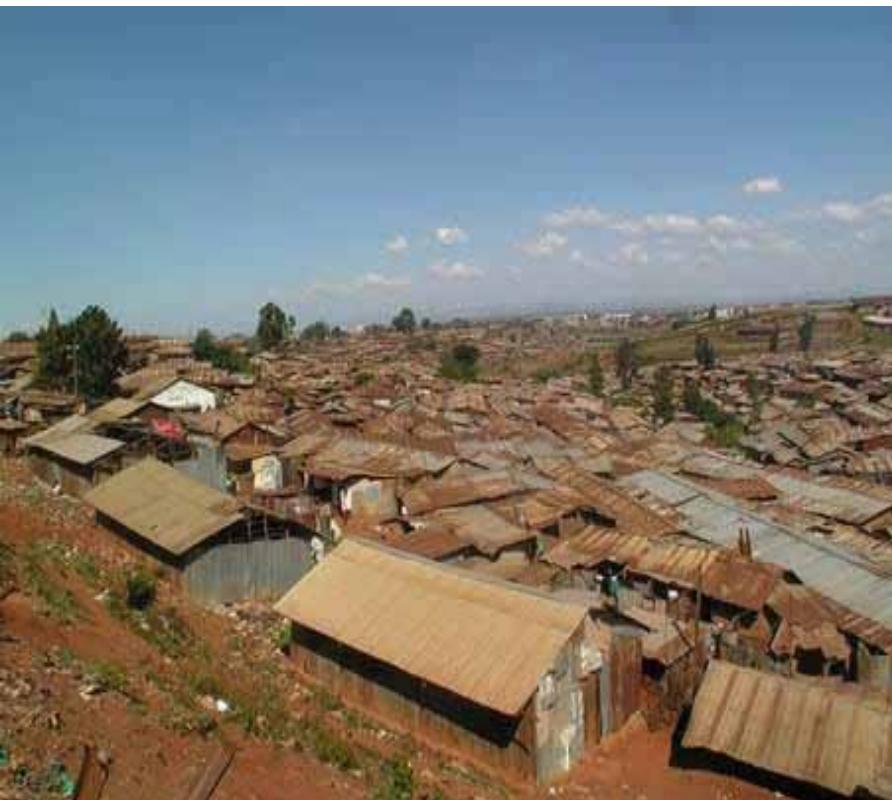
1. Water and Health
2. Water and Food
3. Water and Energy

Conclusion



Water and Health

Access to clean water



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

Sub-Saharan Africa



Northern Africa



Developed regions



Developing regions



World



1990

2011

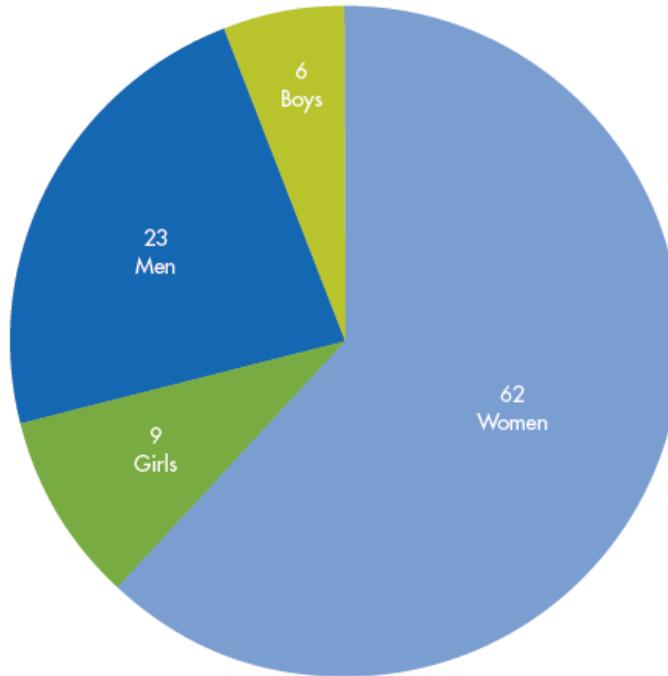
2015 Target

Source: Millennium Development Report 2013

Water and Health

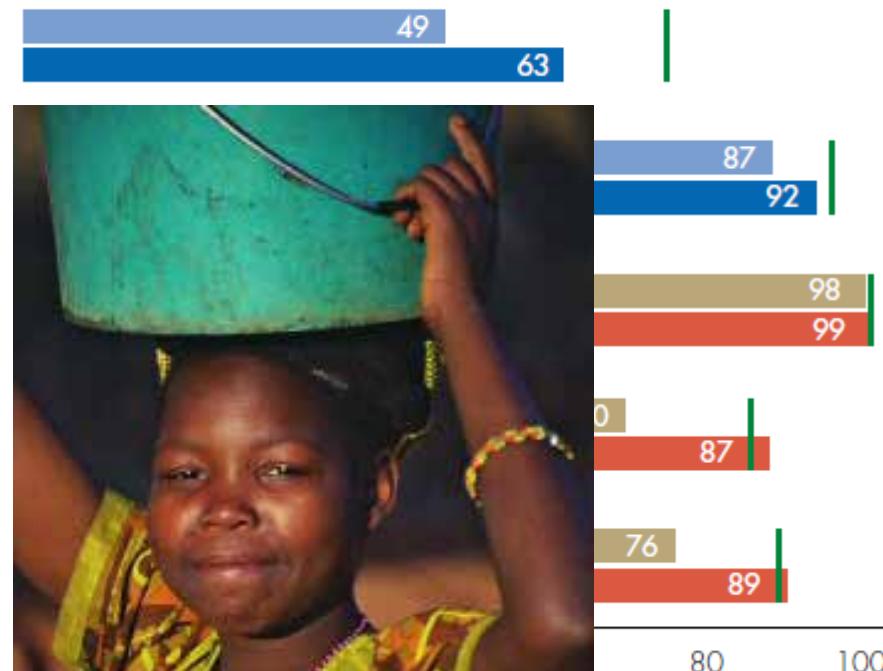
Access to clean water

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



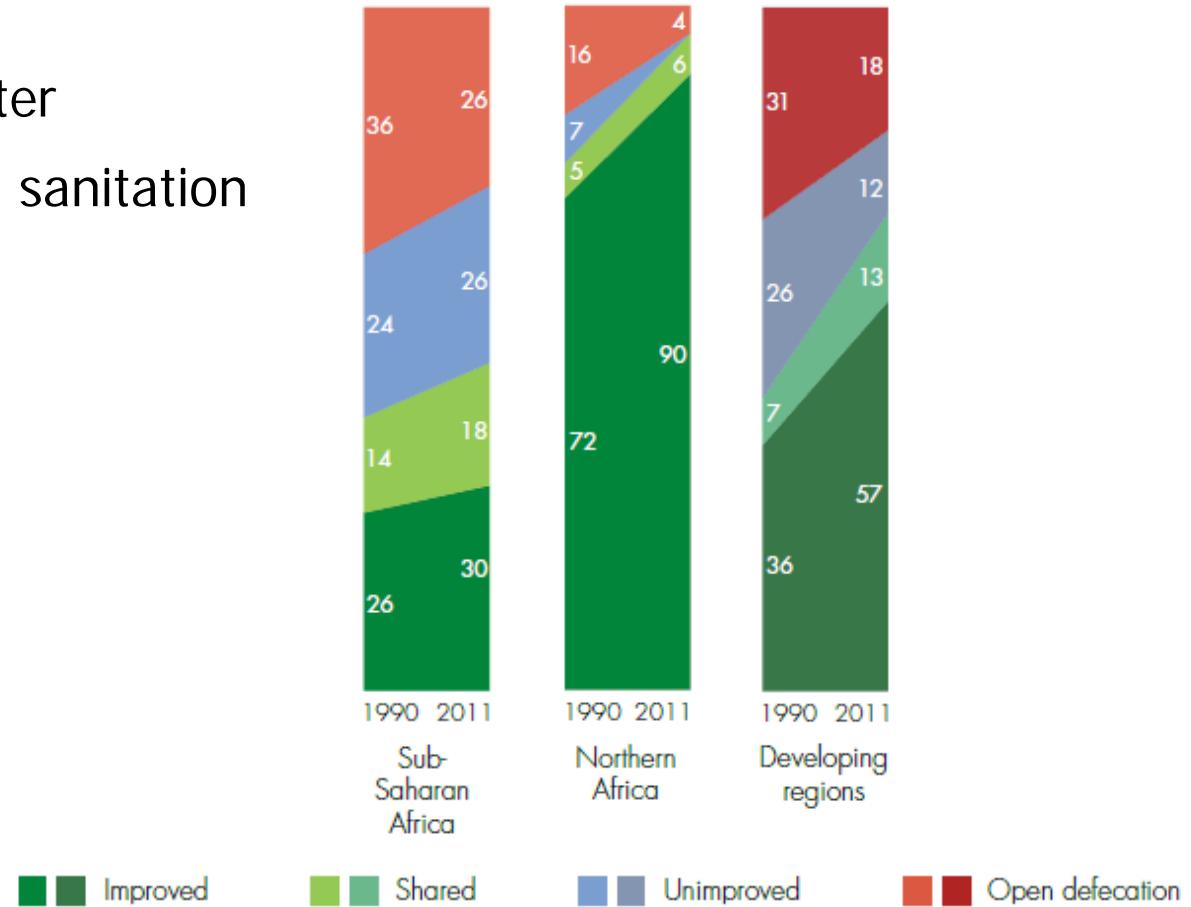
Source: Millennium Development Report 2013

Water and Health

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

Access to clean water

Access to improved sanitation



Source: Millenium Development Report 2013

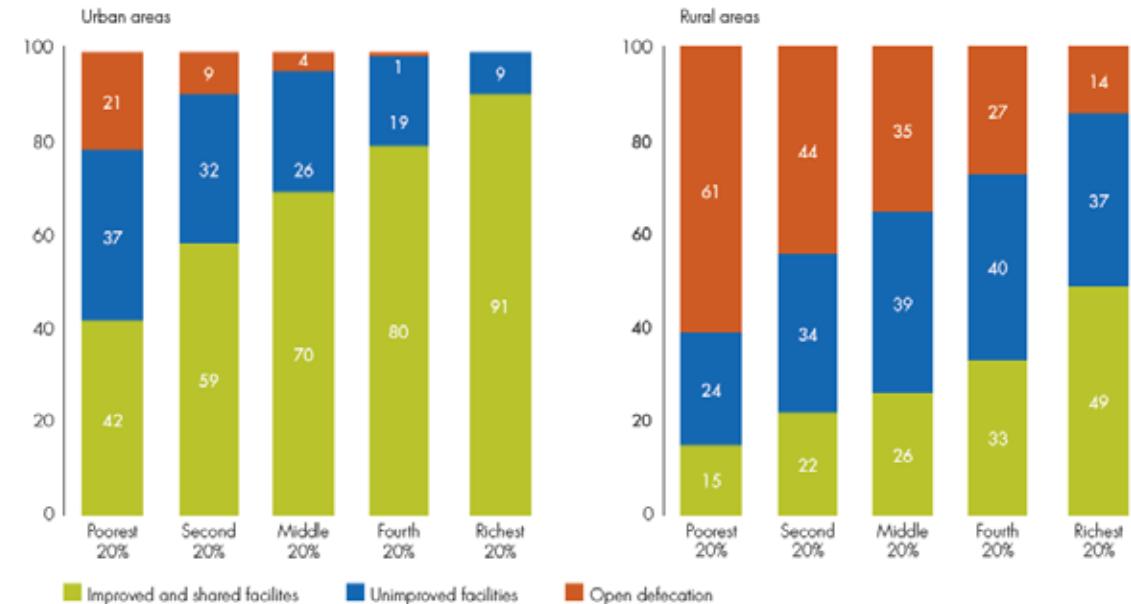
Water and Health

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 5th year
(down from 12.5 million in 1990)

Access to clean water

Access to improved sanitation

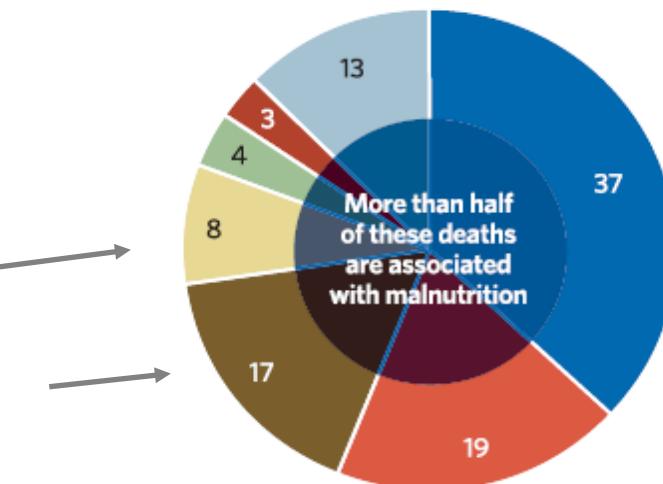
Reduction of water borne diseases

Malaria
Diarrhoeal
diseases

Child mortality under 5 deaths per 1,000	1990	2011
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Developing world: 97 à 57

Sub-Saharan Africa: 178 à 109

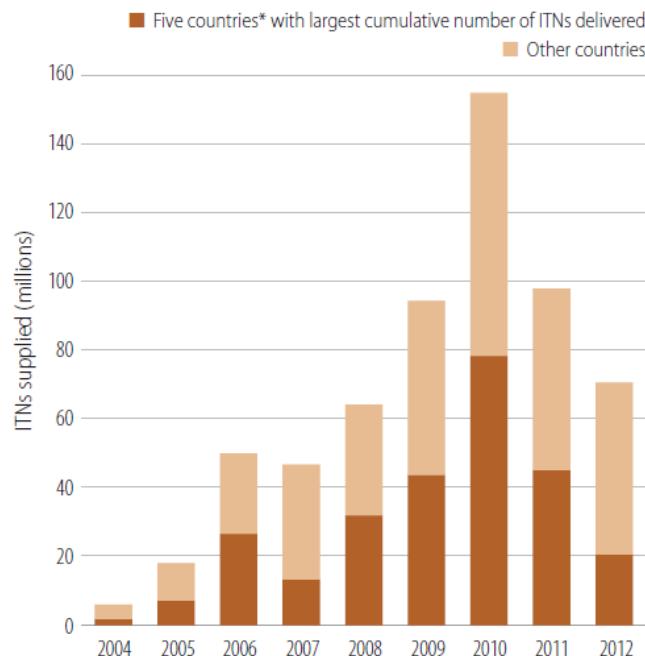


Neonatal causes
Acute respiratory infections
Diarrhoeal diseases (post neonatal)
Malaria
Measles
AIDS
Other diseases & injuries

Causes of deaths among children under age five,
2000-2003 (Percentage)

Water and Health

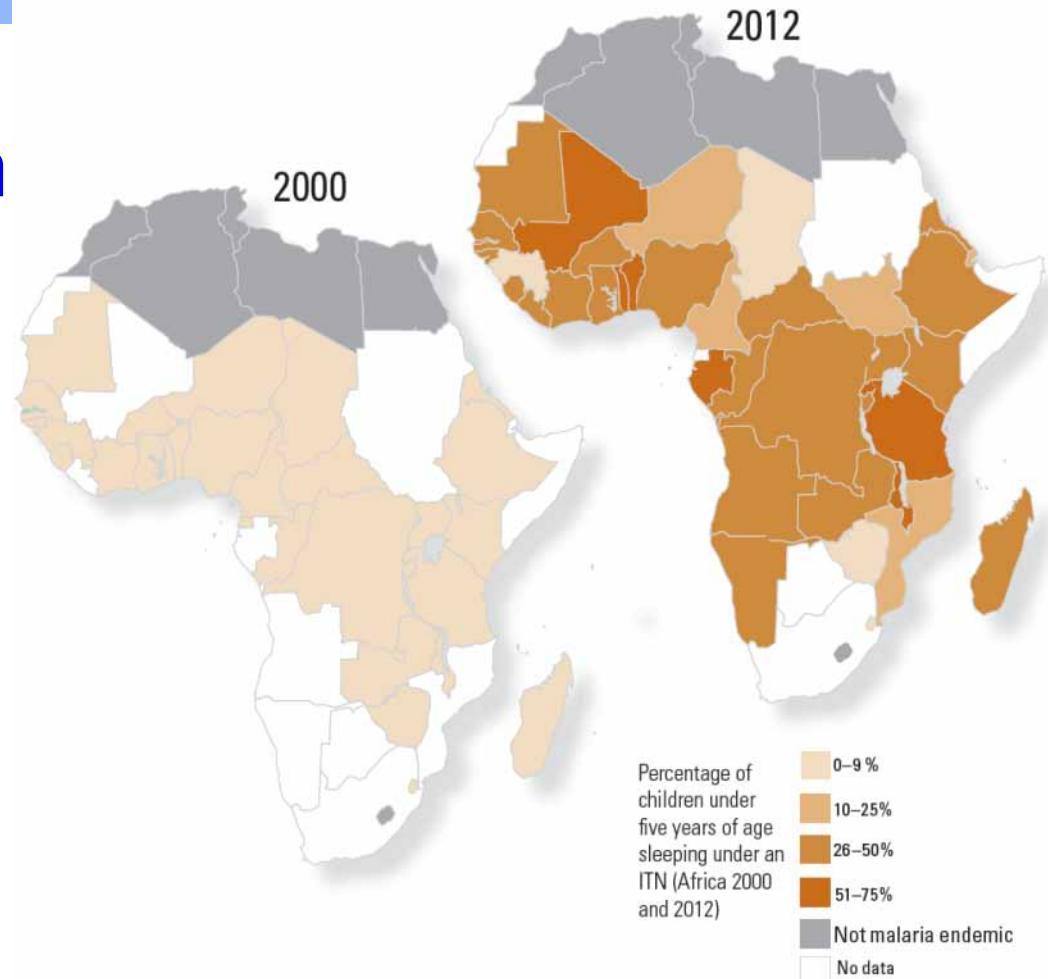
Figure 4.1 Number of ITNs delivered by manufacturers to countries in sub-Saharan Africa, 2004–2012



* 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.

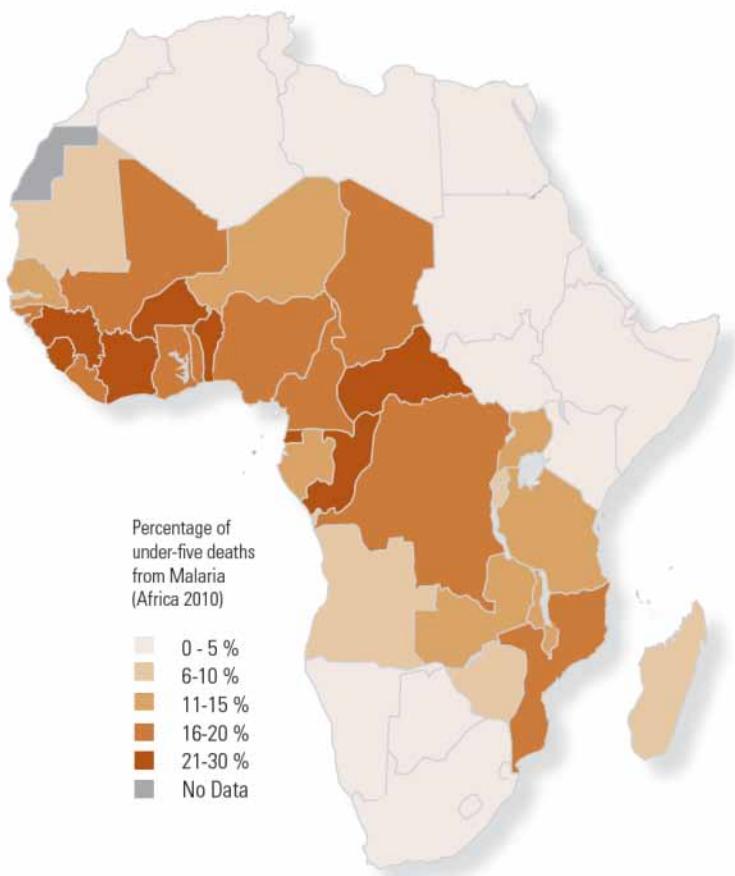
Source: World Malaria Report, WHO, 2012



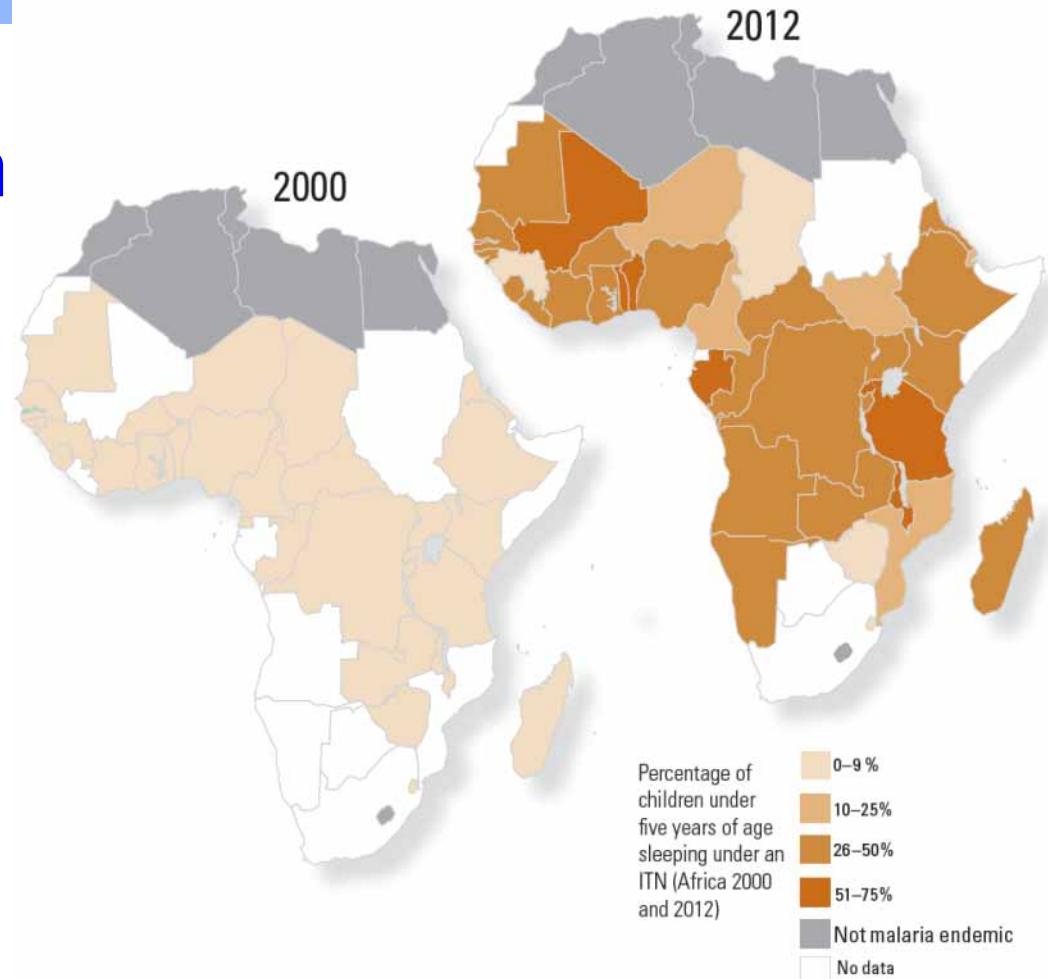
Source: UNICEF, 2013

Water and Health

Malaria deaths among children under five in Africa (%)



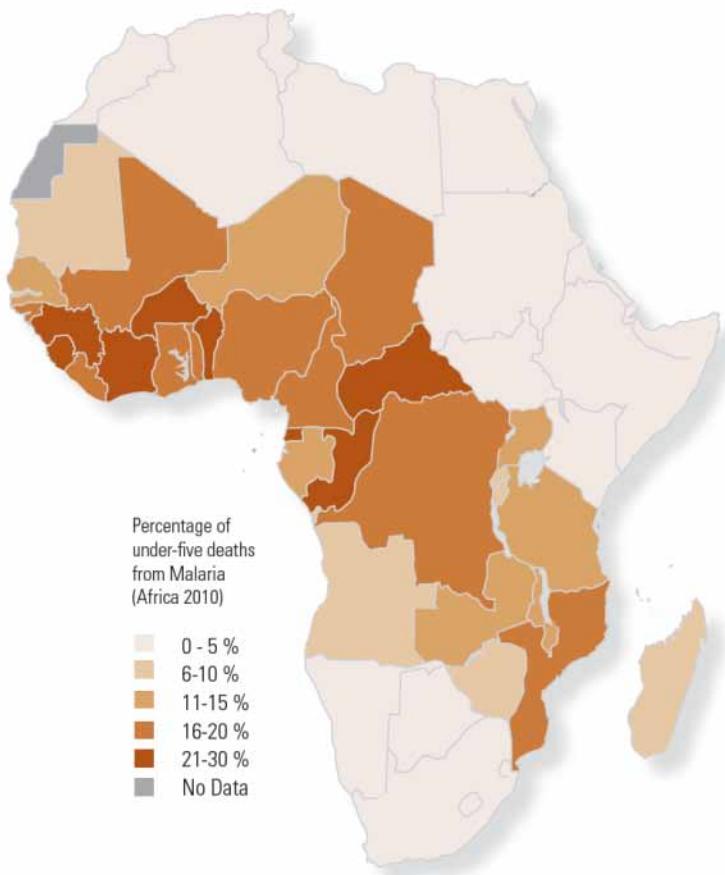
Source: UNICEF, 2013



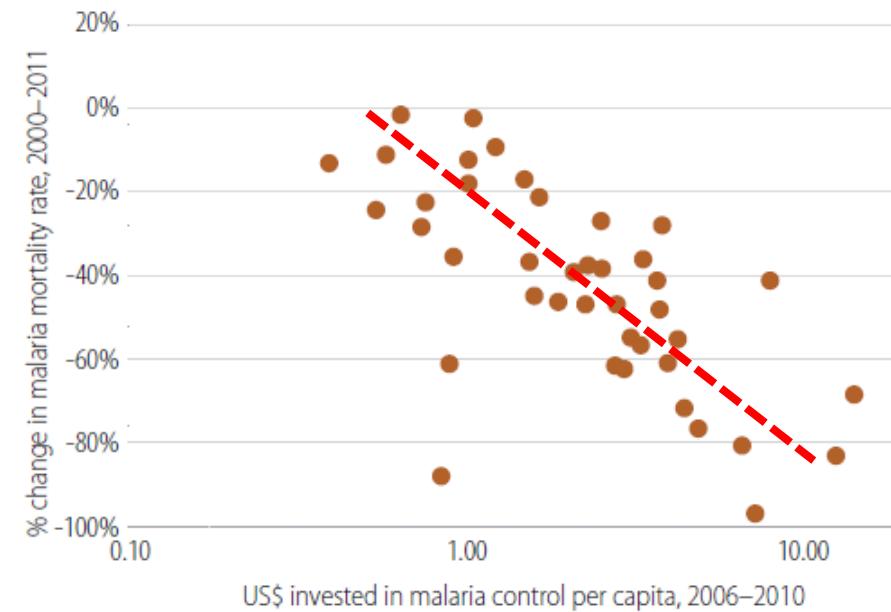
Source: UNICEF, 2013

Water and Health

Malaria deaths among children under five in Africa (%)



Source: UNICEF, 2013



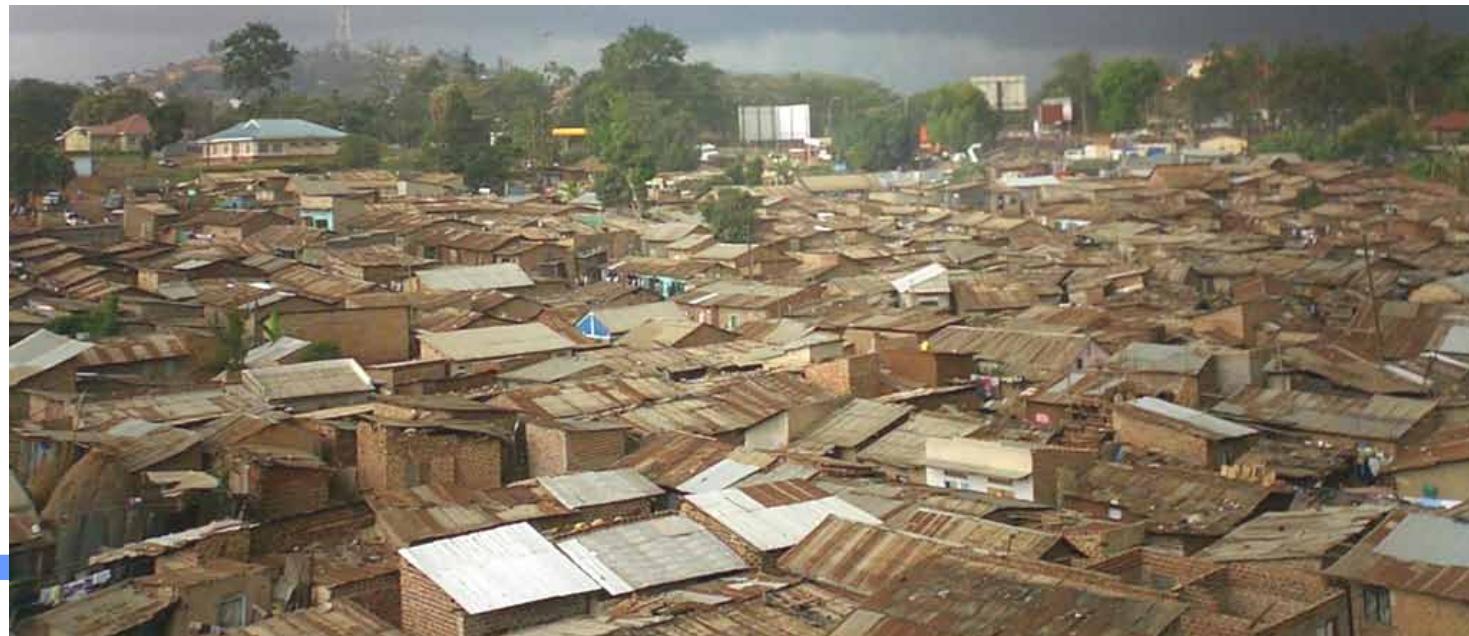
Change in malaria mortality in Africa, 2000-2011 in relation to investment in malaria control

Source: World Malaria Report, WHO, 2012

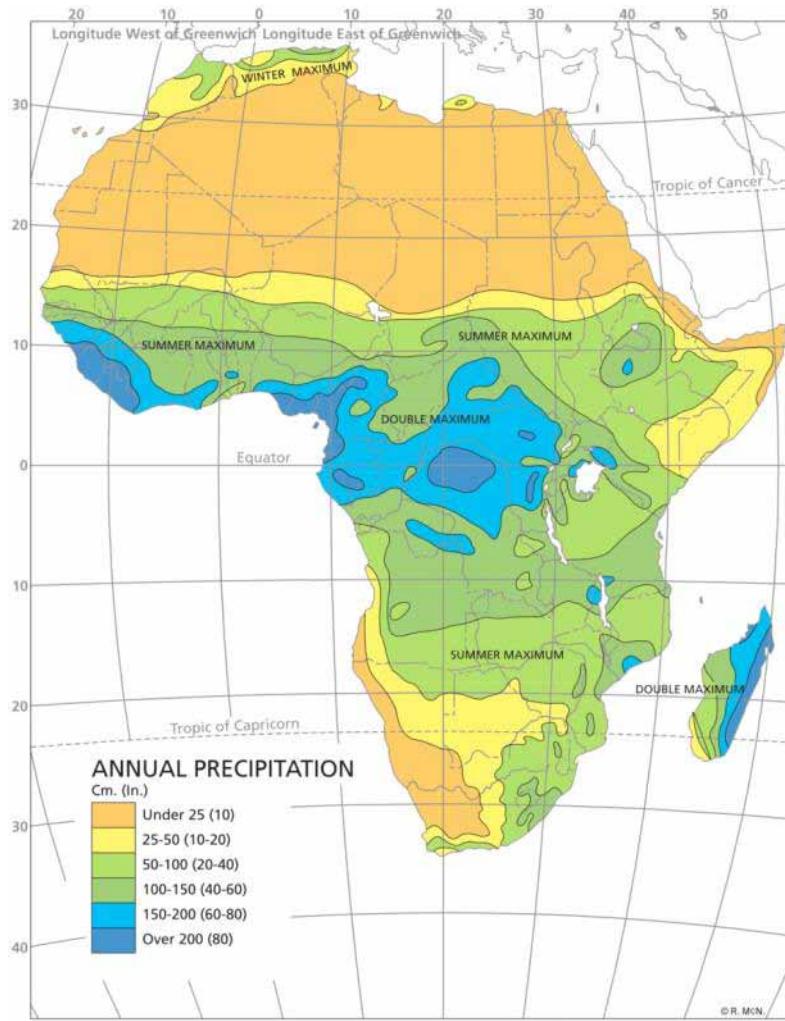
Water and Health

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)

Sub-Saharan Africa



Northern Africa



Developed regions



Developing regions



0 5 10 15 20 25 30 35

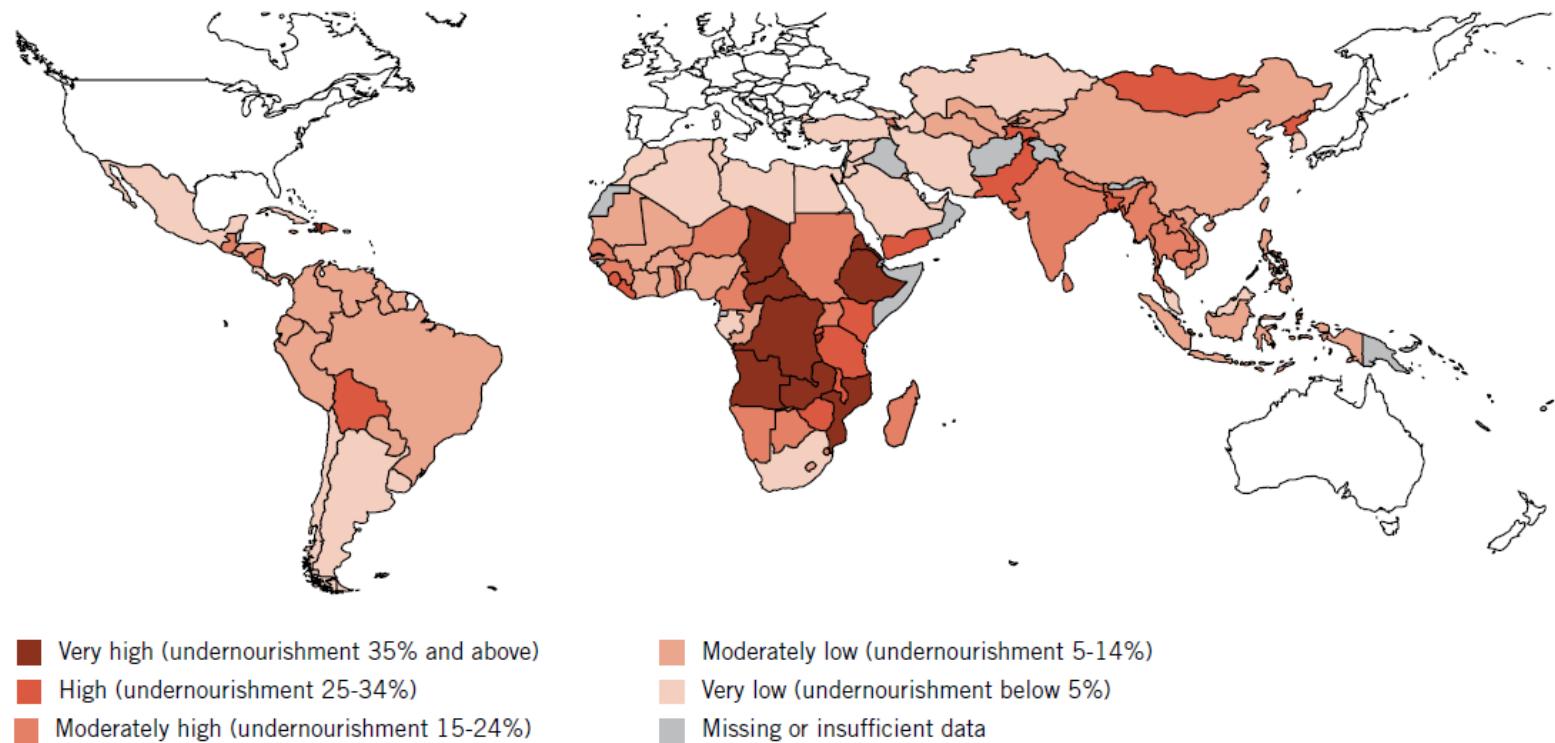
■ 1990-1992 ■ 2010-2012 ■ 2015 Target

Source: Millenium Development Report, 2013



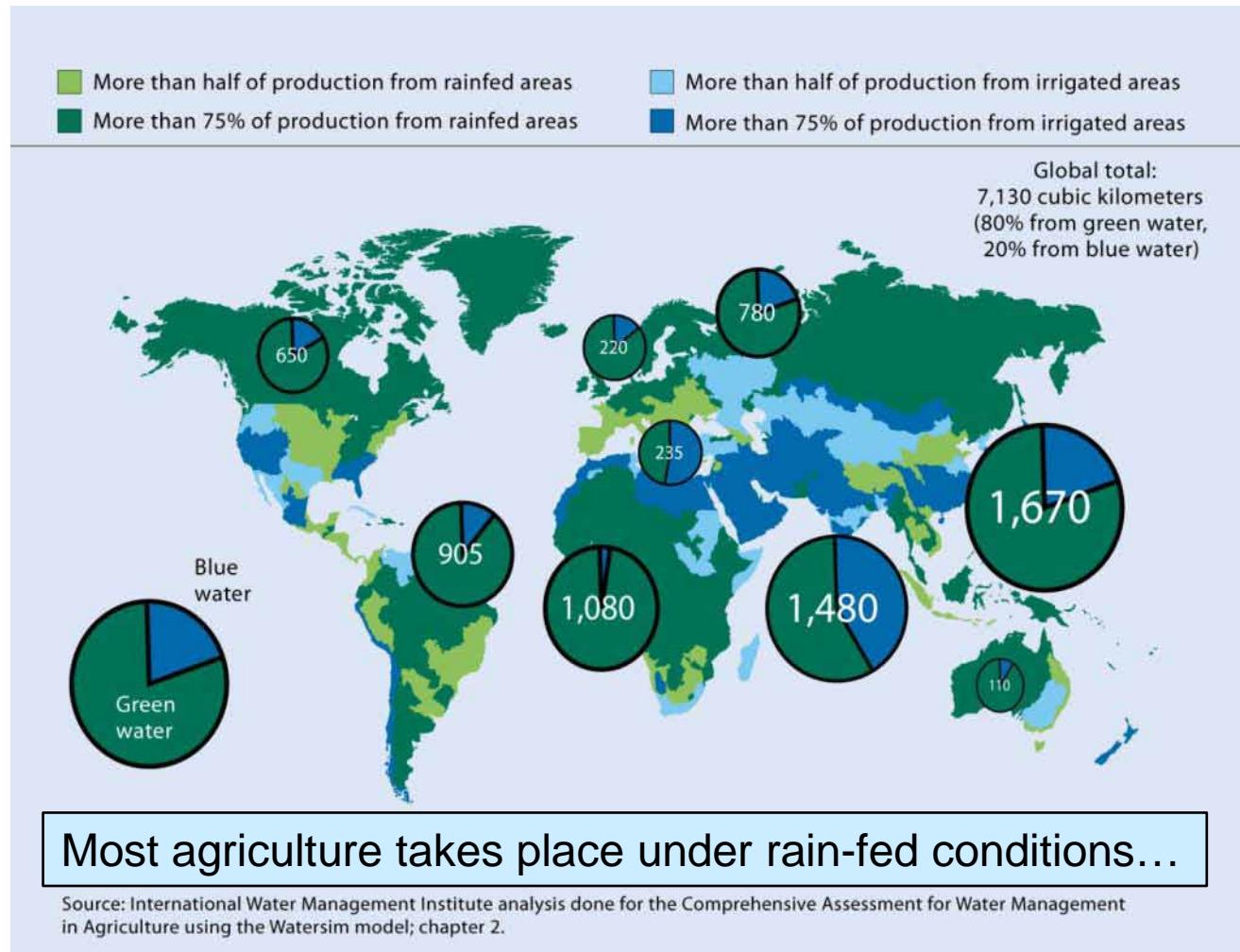
Water and Food

Proportion of undernourished population, 2005-2007 (Percentage)



Source: Millennium Development report, 2011

Water and Food



Source: De Fraiture et al., 2009

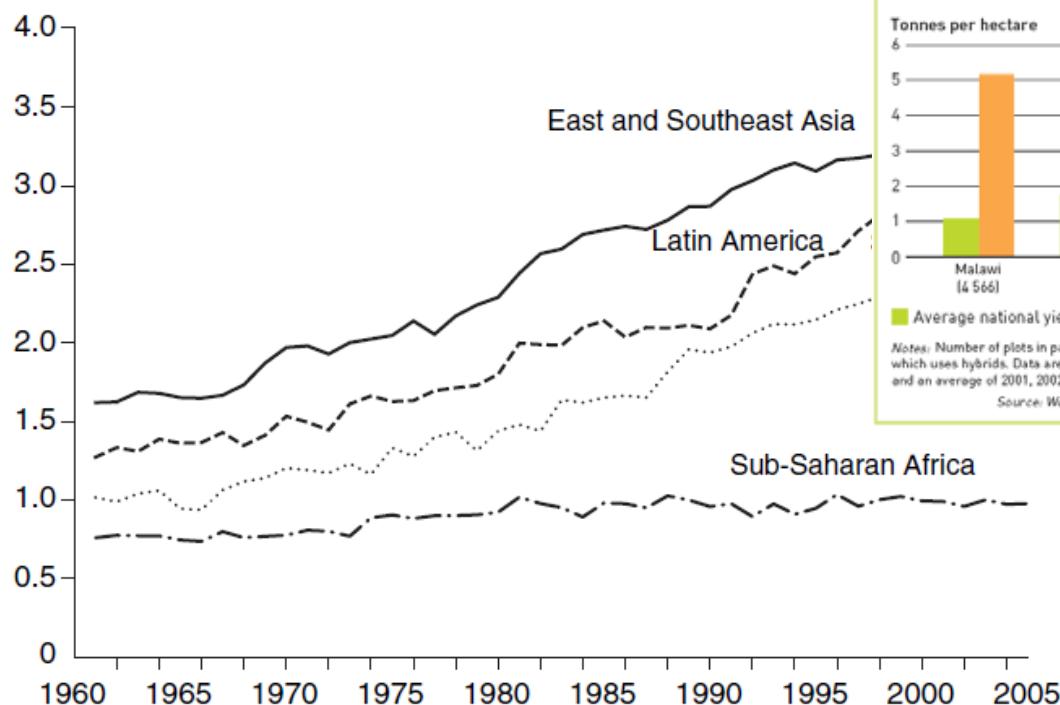
Water and Food

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

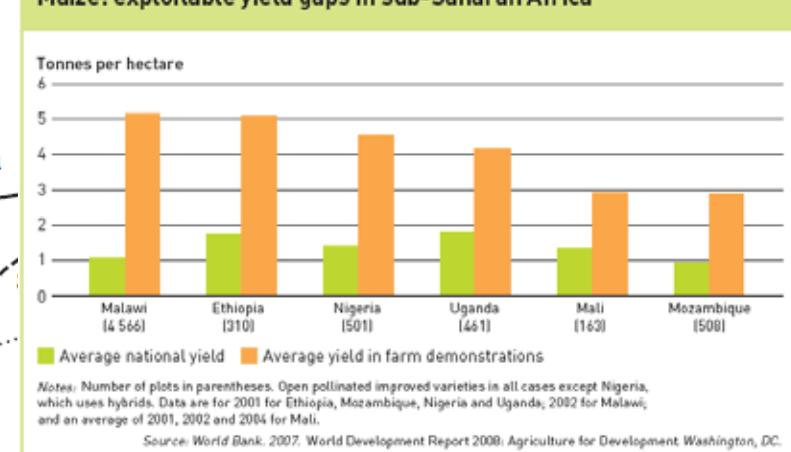
Source: FAO, 2011

(Average cereal yields [MT/ha])



Source: World Bank, 2007; based on FAOSTAT

Maize: exploitable yield gaps in sub-Saharan Africa



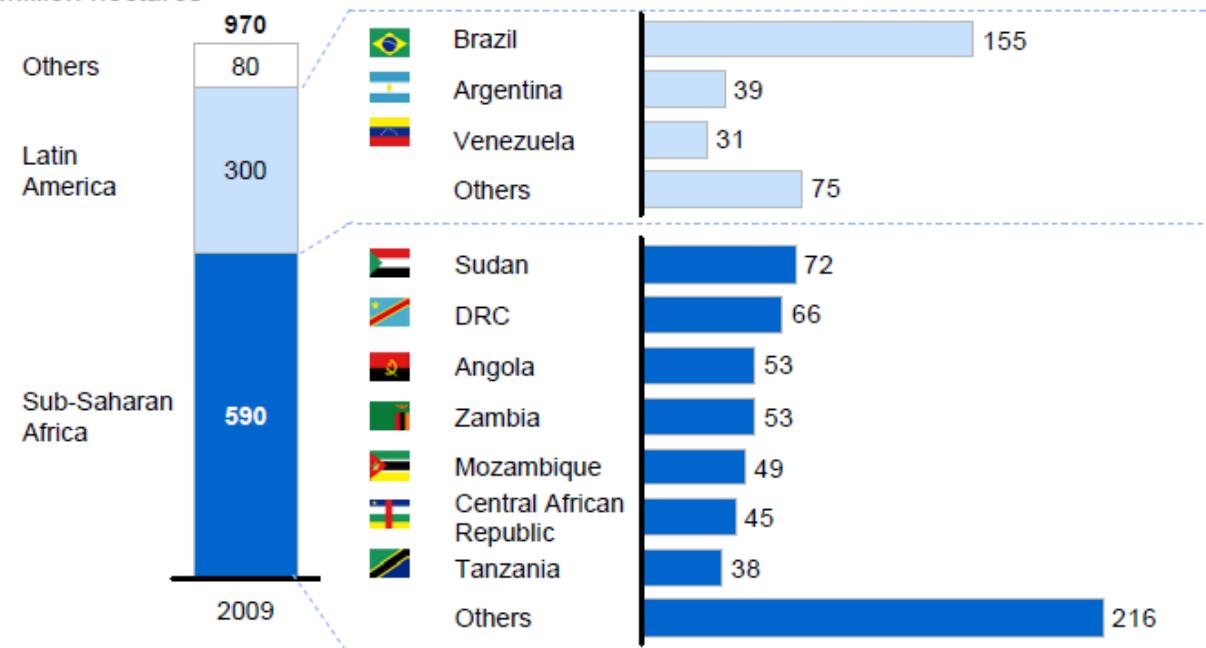
Source: FAO Food Security report, 2008

Water and Food

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

Additional available cropland, 2009¹

Million hectares



1 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

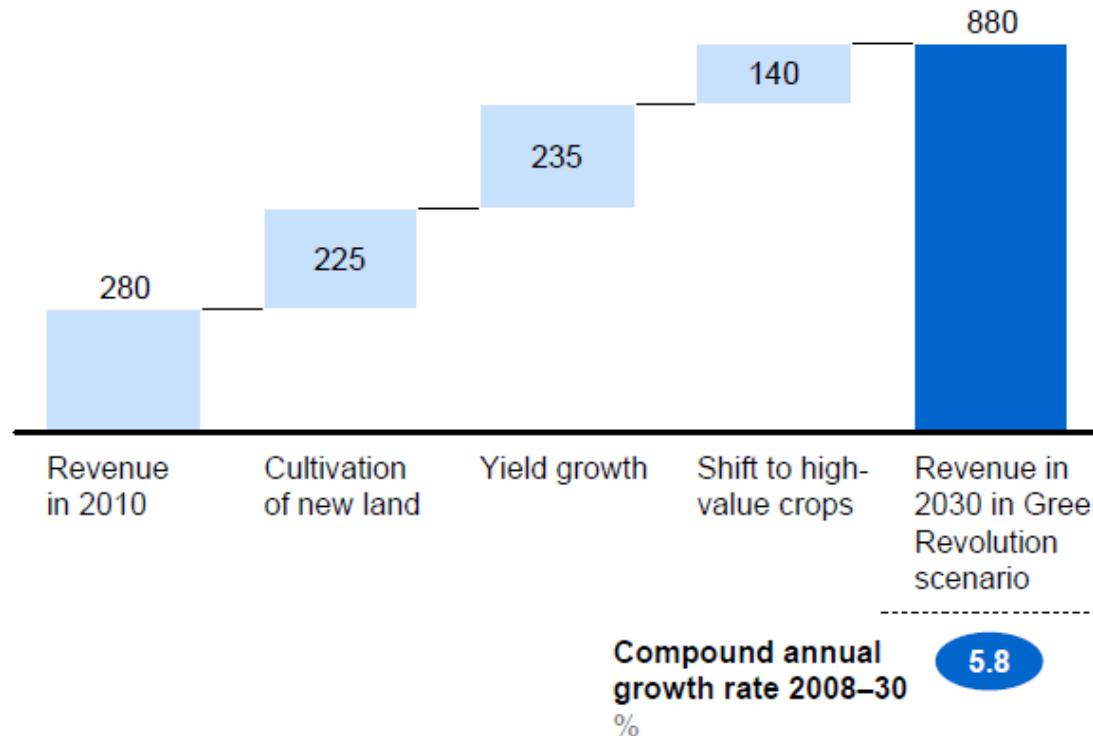
Water and Food

- 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”

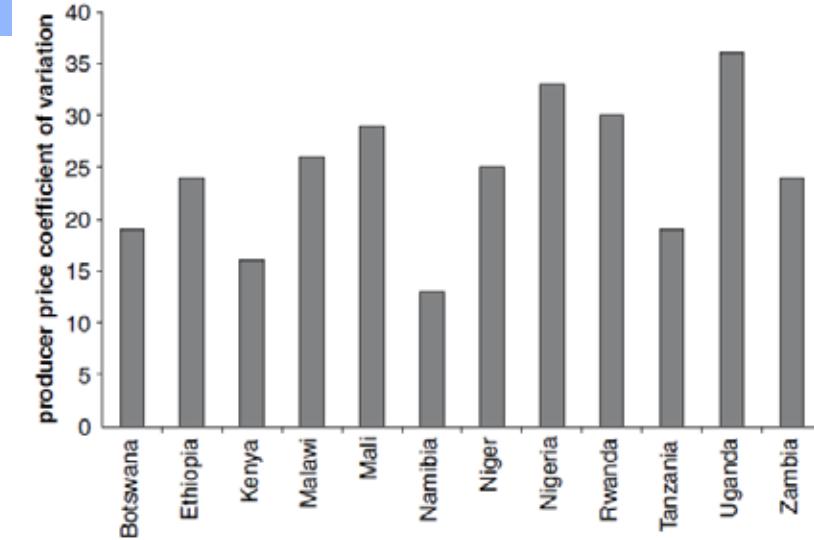


Nutrients – Water – Energy – Markets



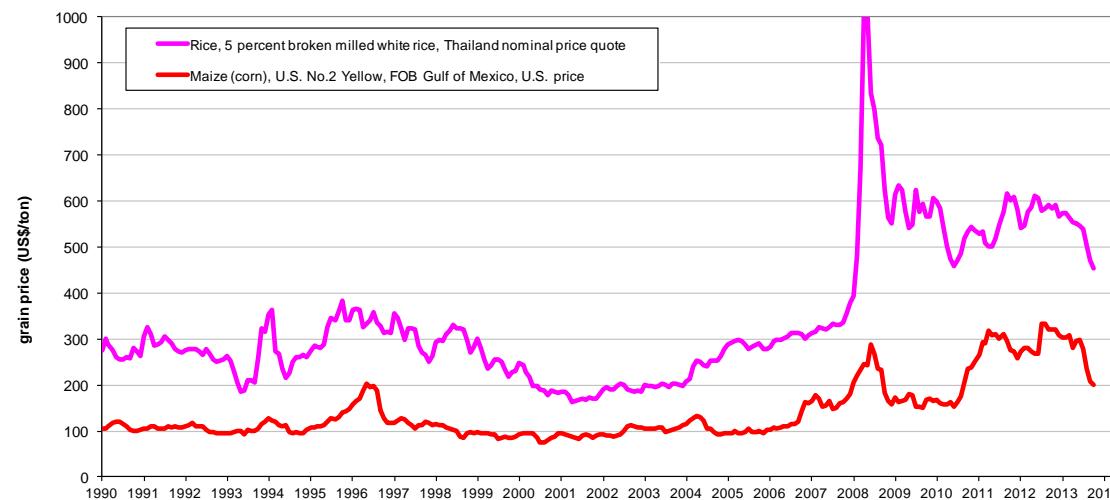
Photos: Eric Ofori

Water and Food



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/commod/index.asp>

Source: World Bank, 2007

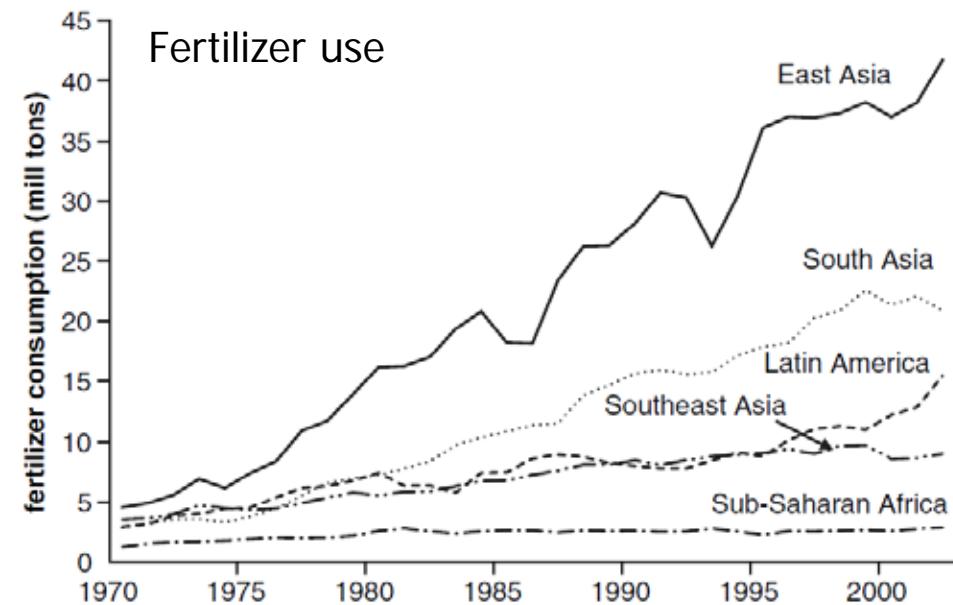
Water and Food



Nutrients – Water – **Energy** – Markets



Water and Food

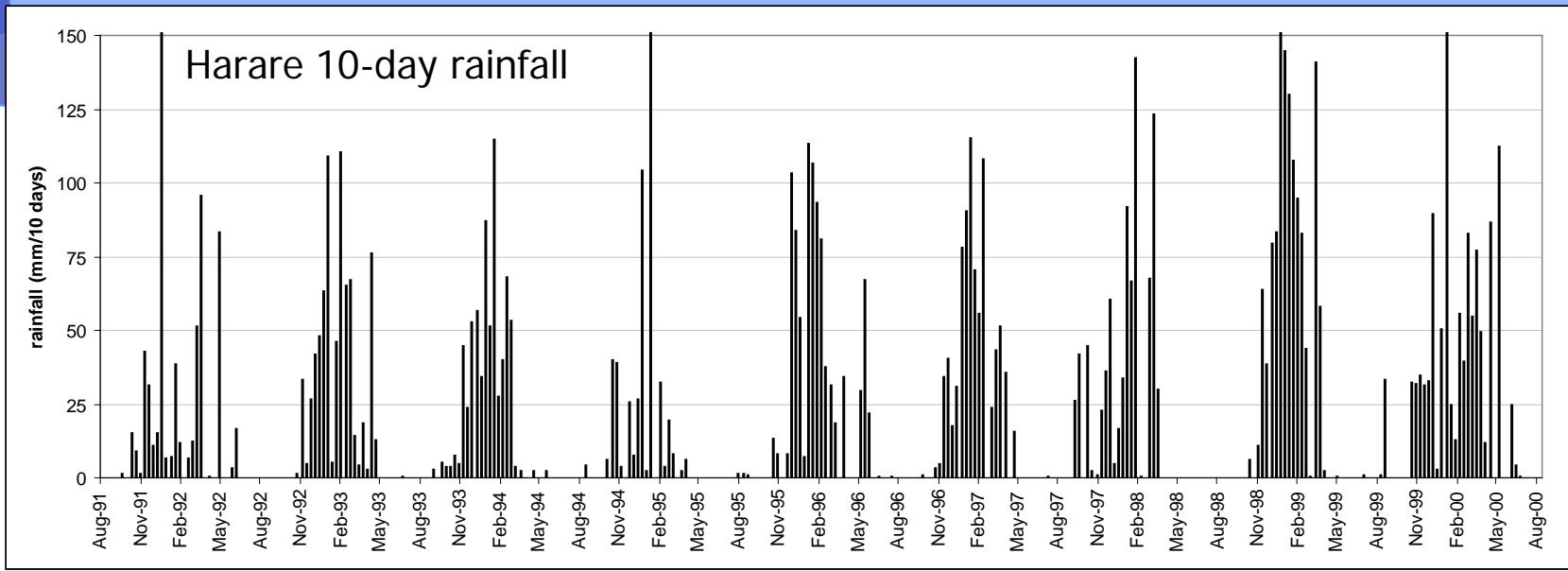


Source: World Bank, 2007; based on FAOSTAT

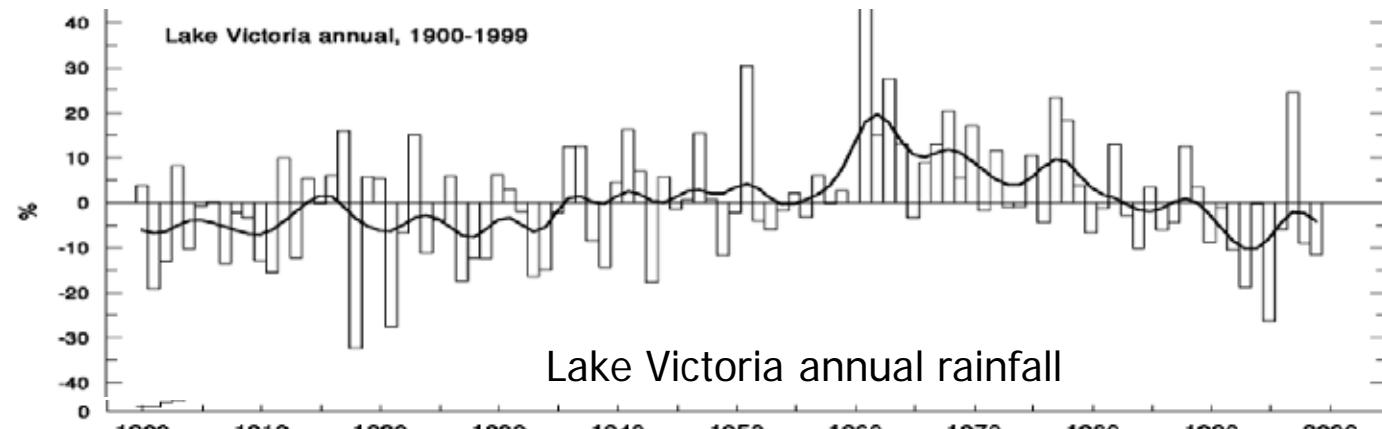
Nutrients – Water – Energy – Markets

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

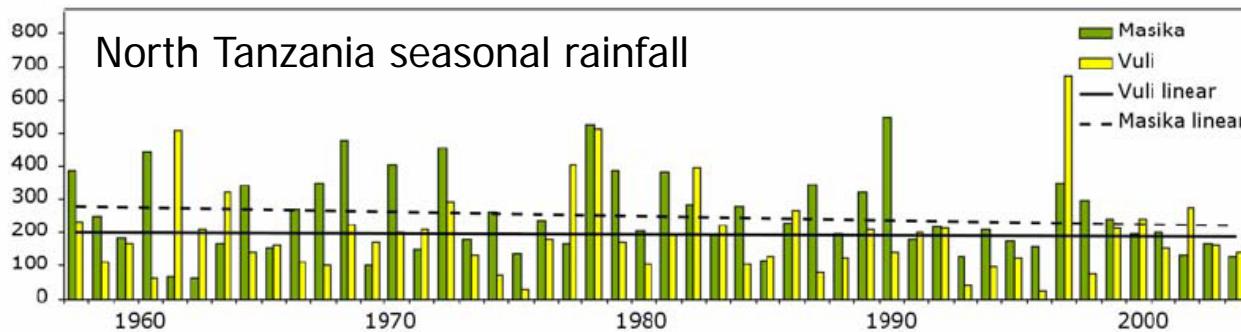


Nutrients – Water – Energy – Markets

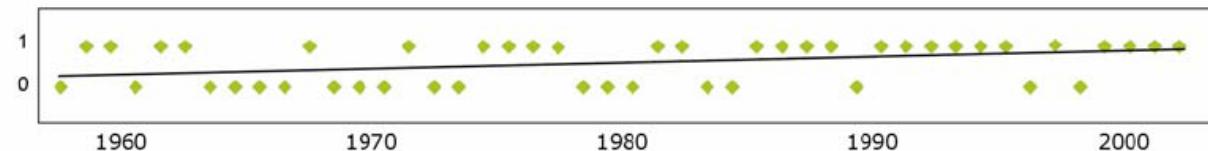


Source: Conway, 2005

a) Rainfall (mm) during Masika and Vuli seasons, Same Meteorological Station, 1957-2004

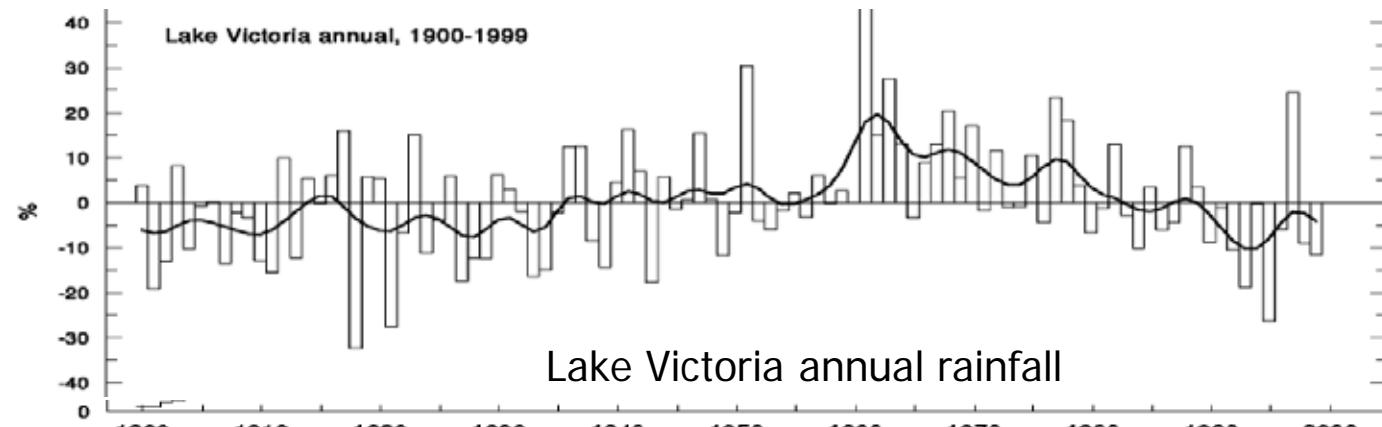


b) Occurrence of dryspells 21 days or longer during Masika seasons, 1957-2004



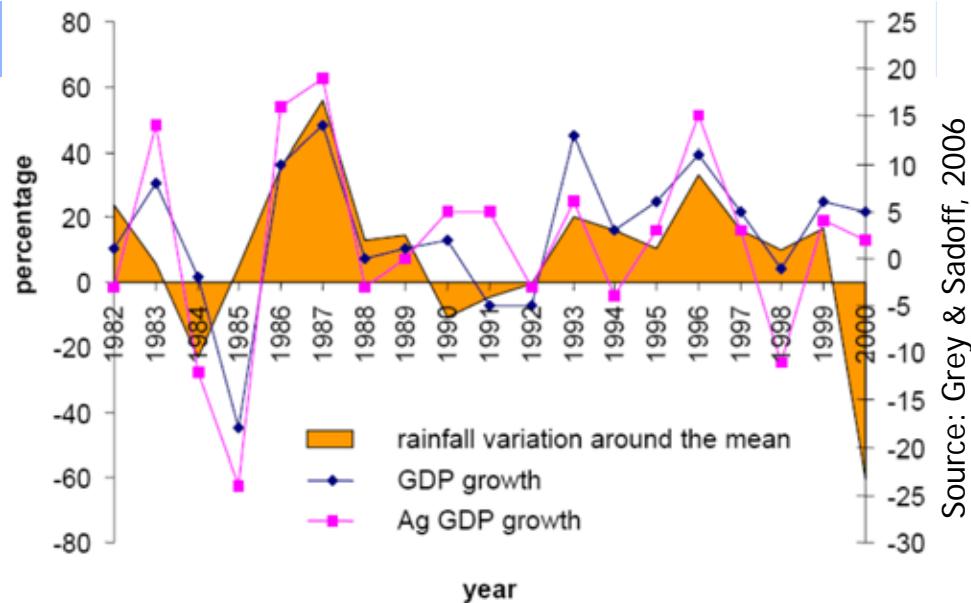
Source: Enfors and Gordon, 2007

Nutrients – Water – Energy – Markets



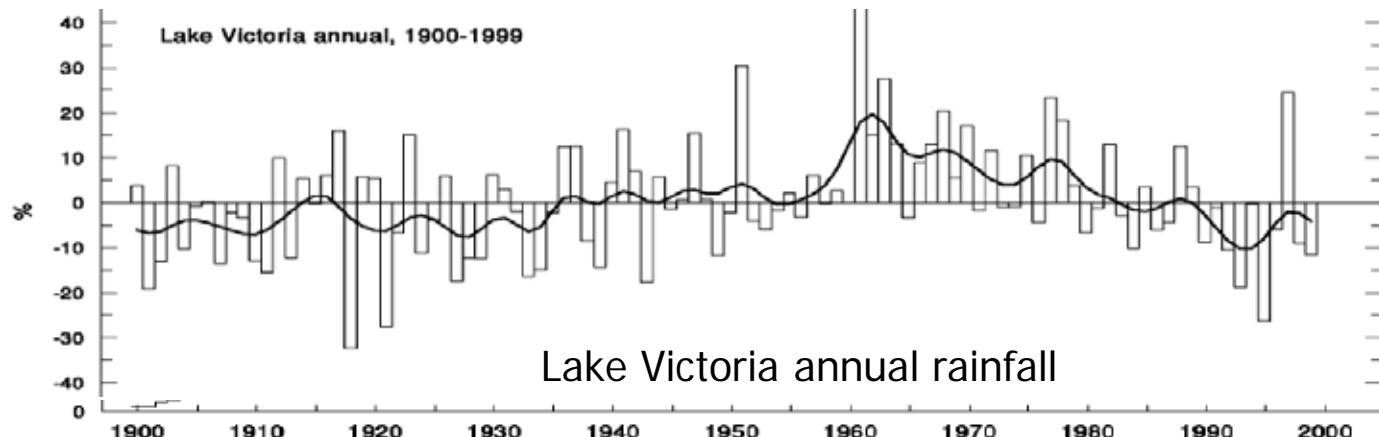
Source: Conway, 2005

Water and Food



Ethiopia annual rainfall and GDP growth

Nutrients – Water – Energy – Markets



farming systems more resilient to variability
of rainfall and water access



to bridge dry spells
increase buffering capacity
and control over water



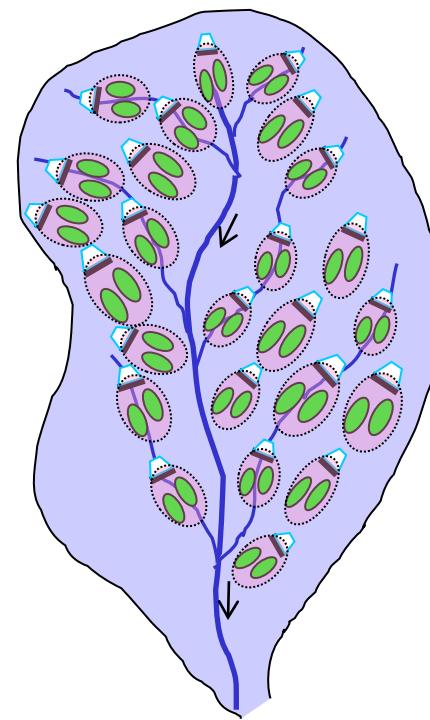
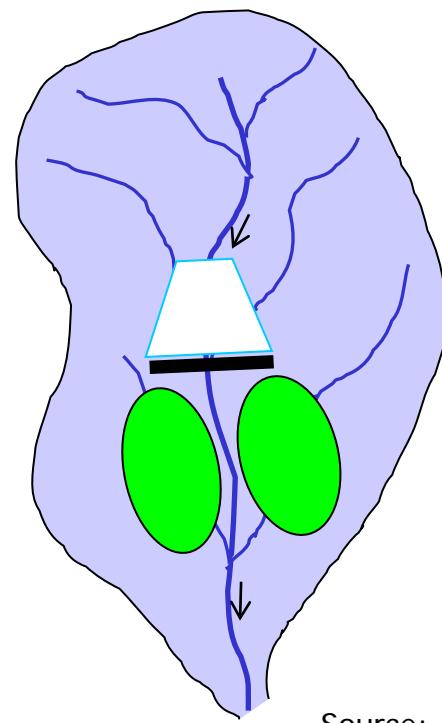
Nutrients – Water – Energy – Markets

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



distri



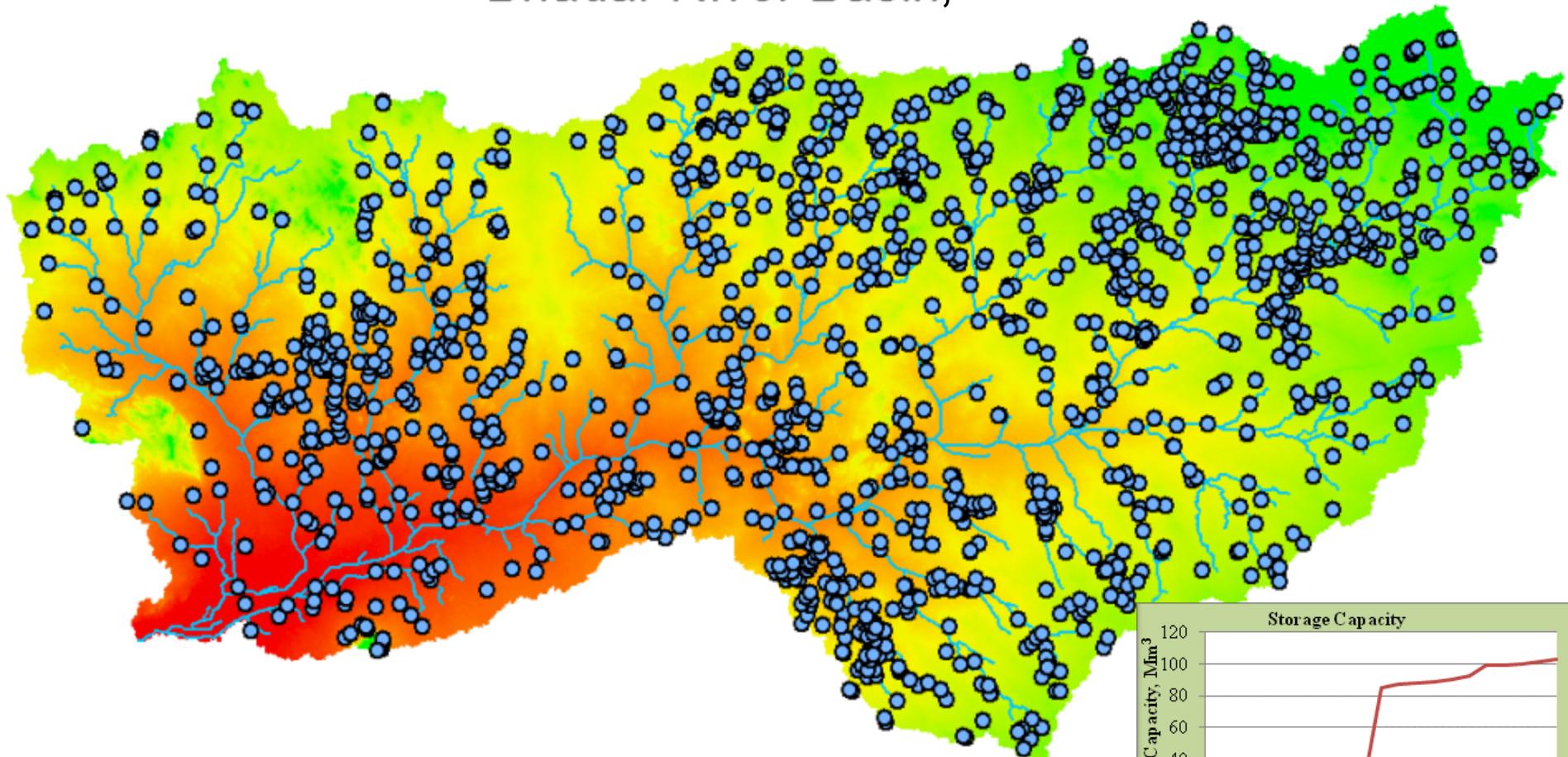
Source: Van der Zaag and Gupta, 2008

Water and Food

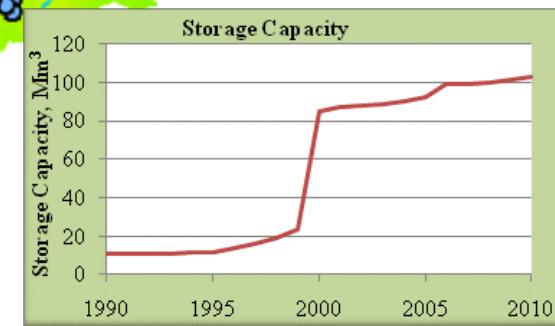
Water storage – centralised or distributed?



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



Number of
check dams =



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



Source: Kamboj, 2011

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

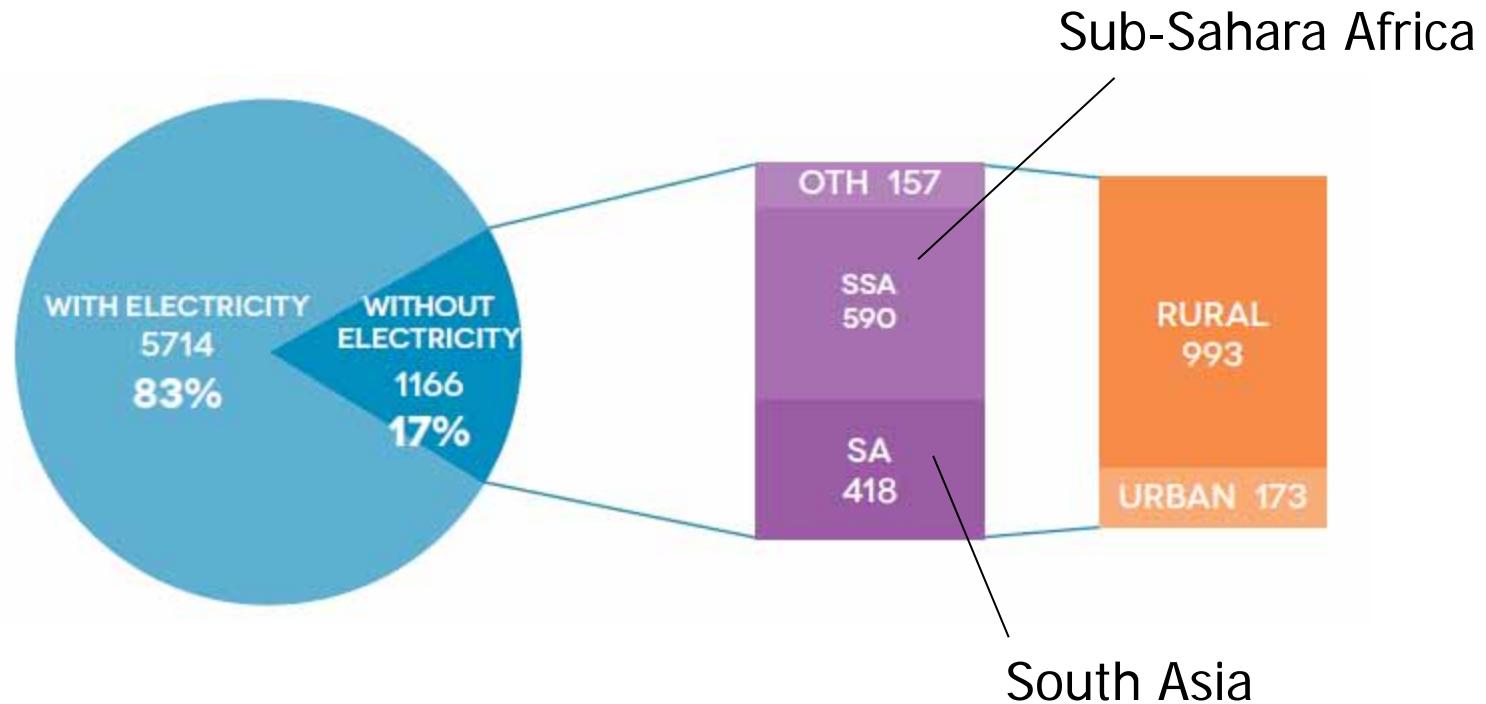
Netherlands: 6,500 kWh/year



Africa is energy challenged...

... despite a generous natural energy endowment

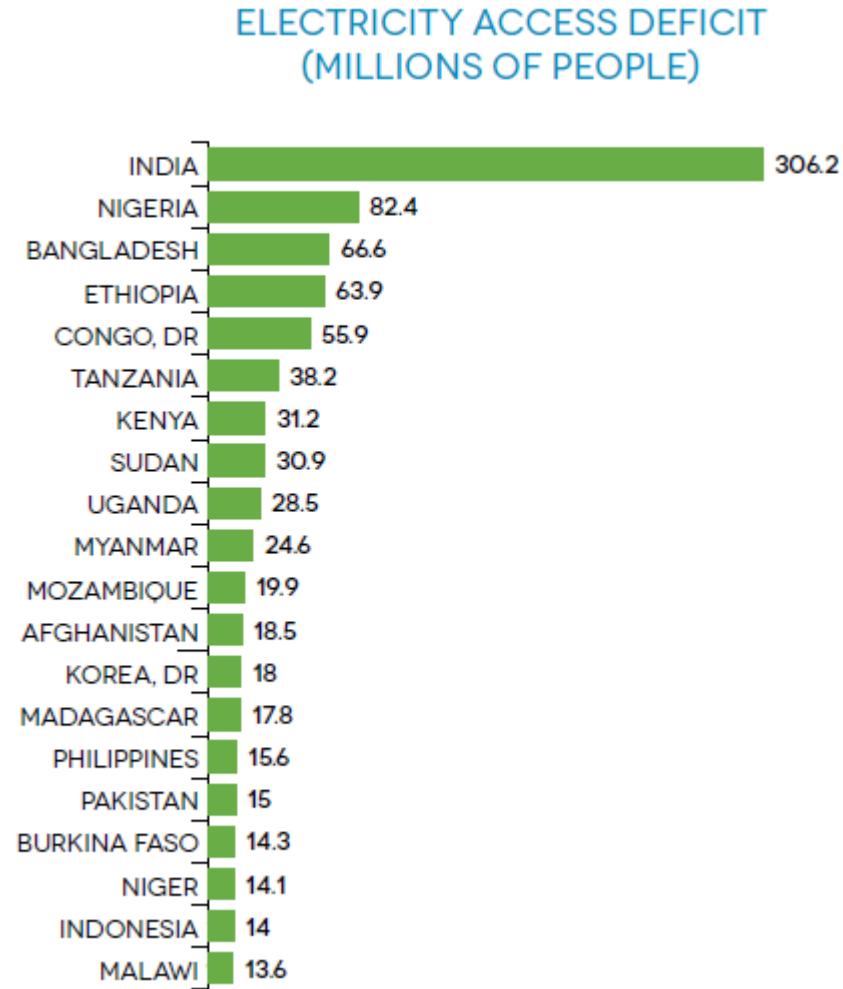
Water and Energy



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

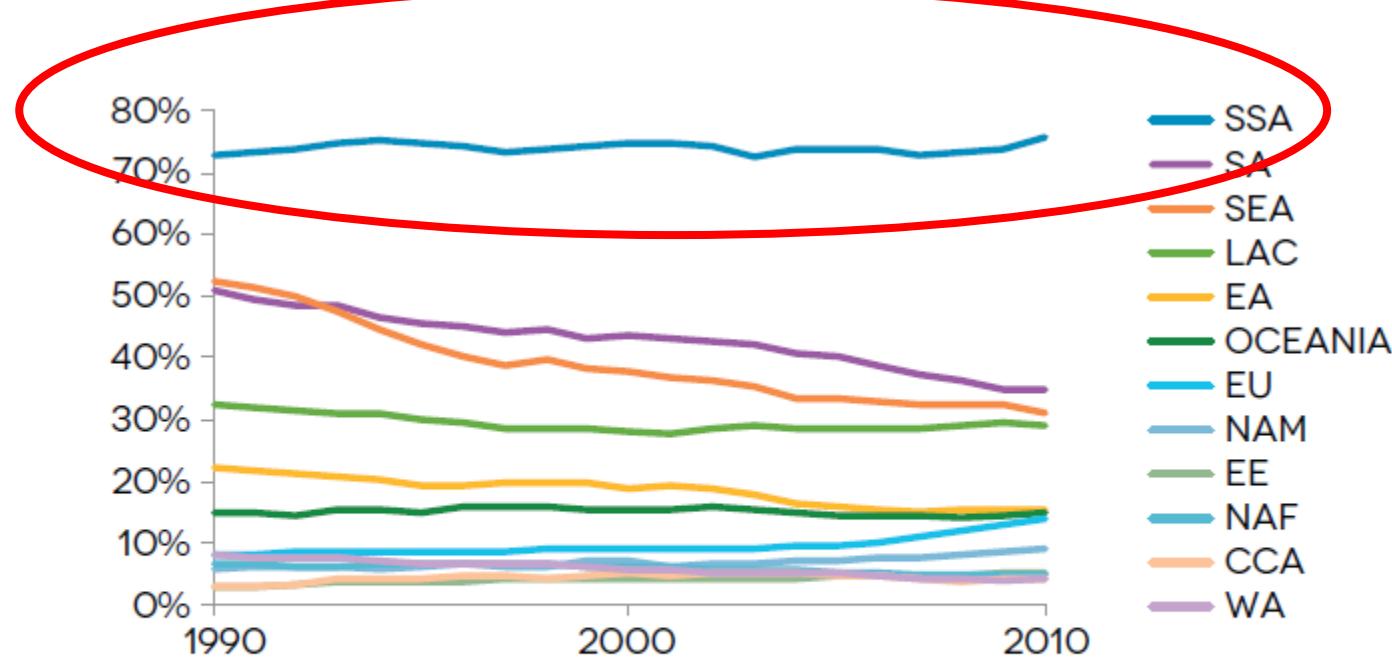
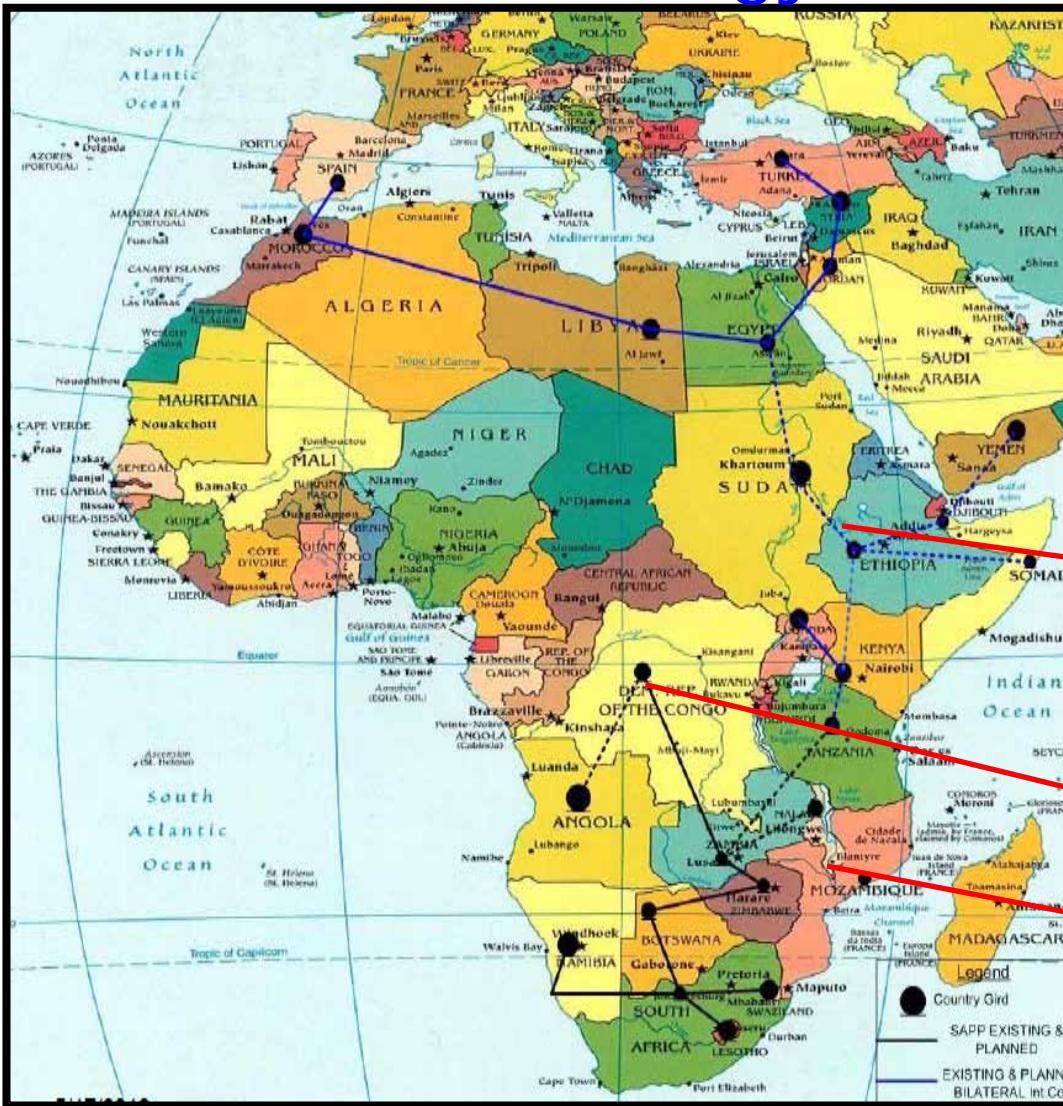


FIGURE O.22 EVOLVING RENEWABLE ENERGY SHARE BY REGION, 1990–2010
(PERCENTAGE OF TOTAL FINAL ENERGY CONSUMPTION)

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

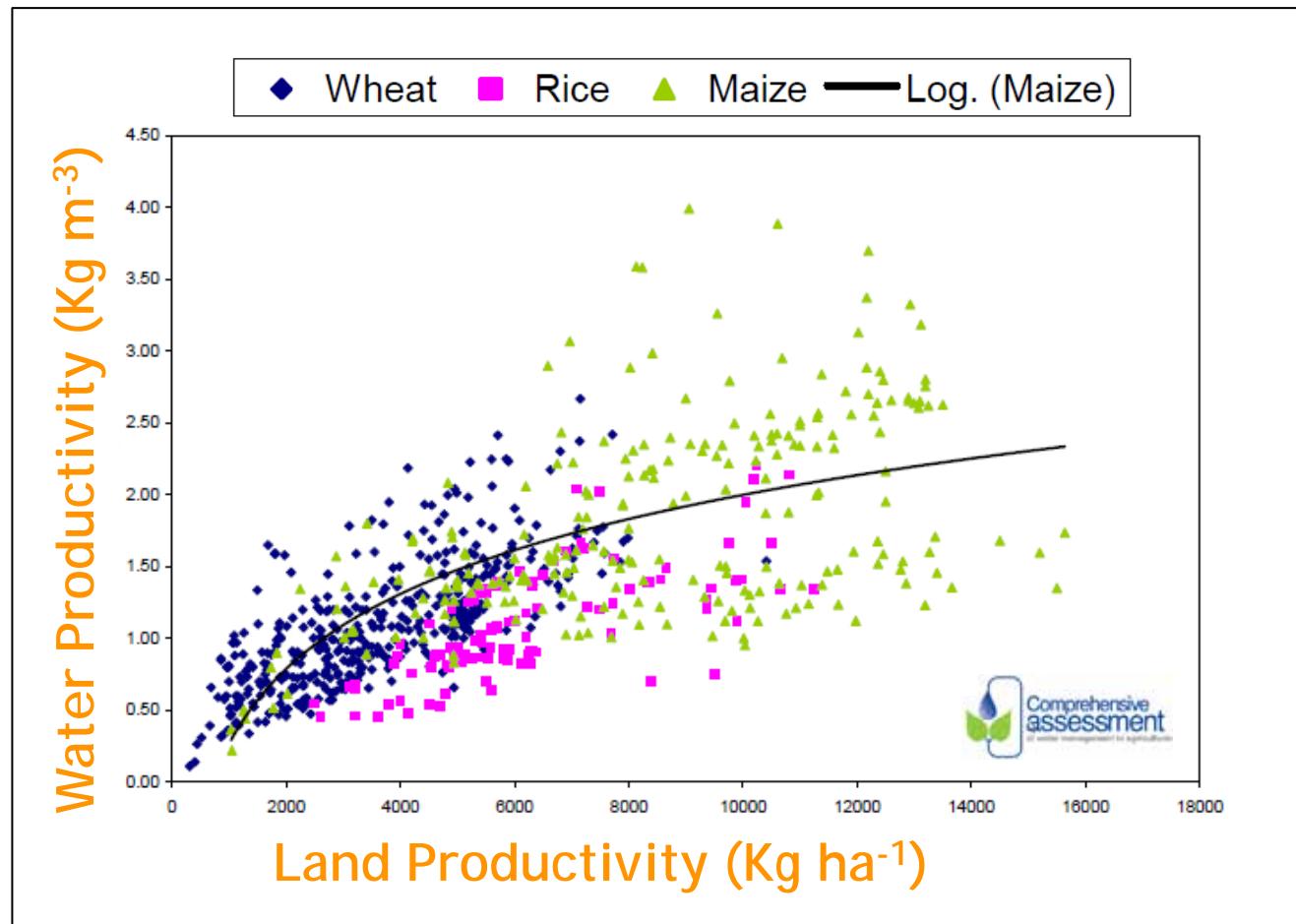
The rest of the world needs Africa!

Thank you!



www.unesco-ihe.org/pieter-van-der-zaag

Water and Food



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