Water and Africa's Development Agenda

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

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Delft

Water and Africa's Development Agenda

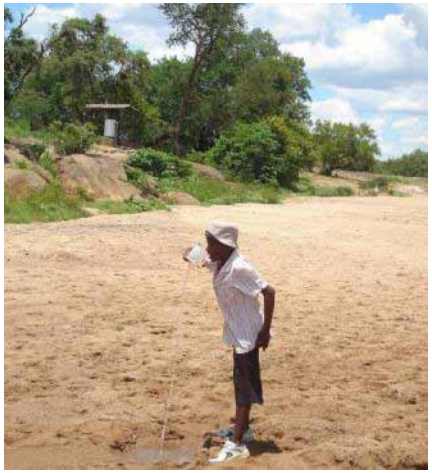


Photo: David Love, 2009

- 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!

Water and Africa's Development Agenda

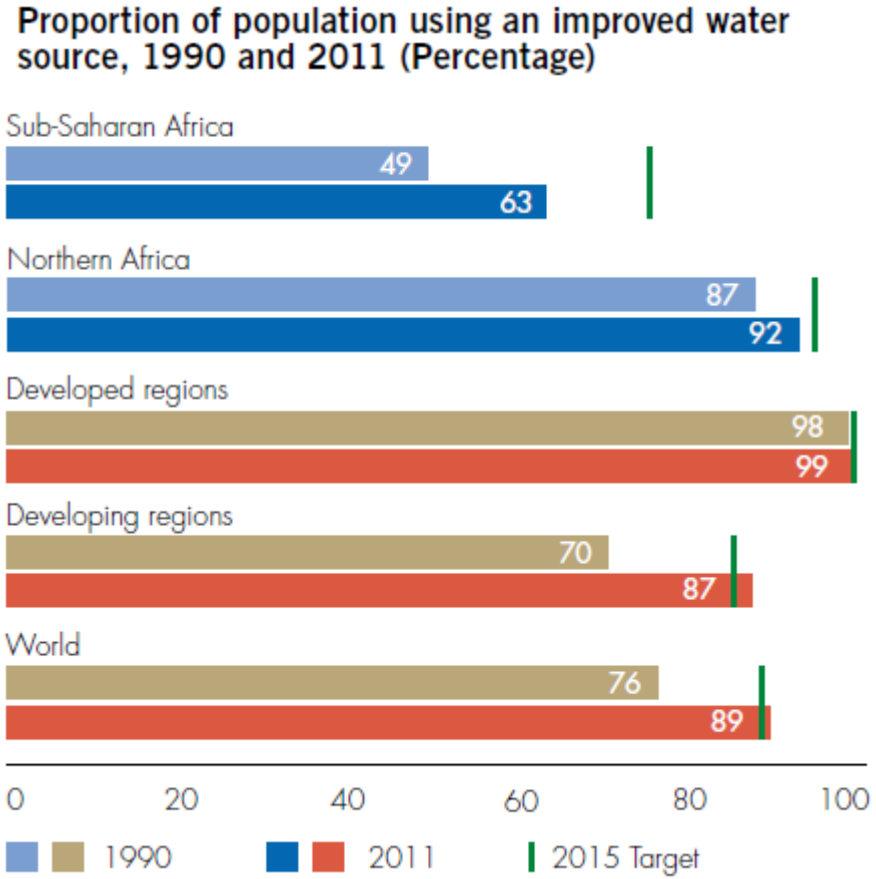
Introduction Three critical challenges:

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

Conclusion

Water and Health

Access to clean water

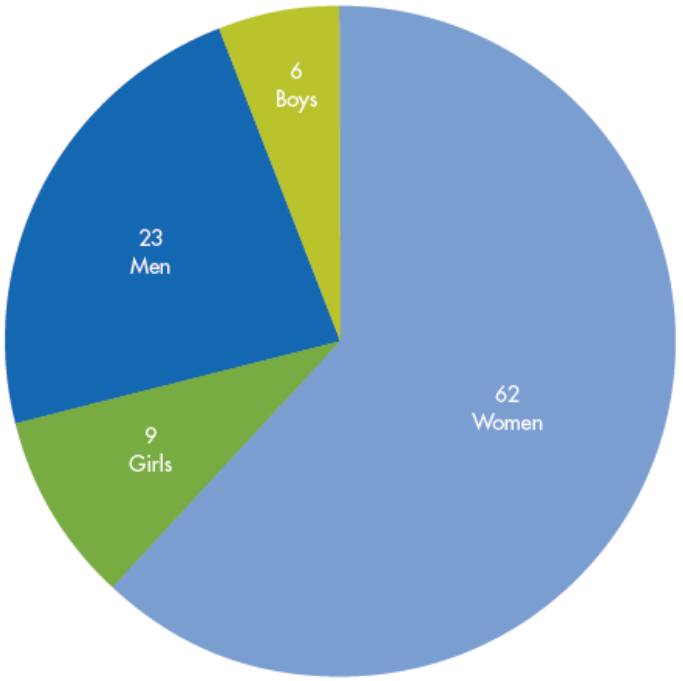


Source: Millenium Development Report 2013

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)

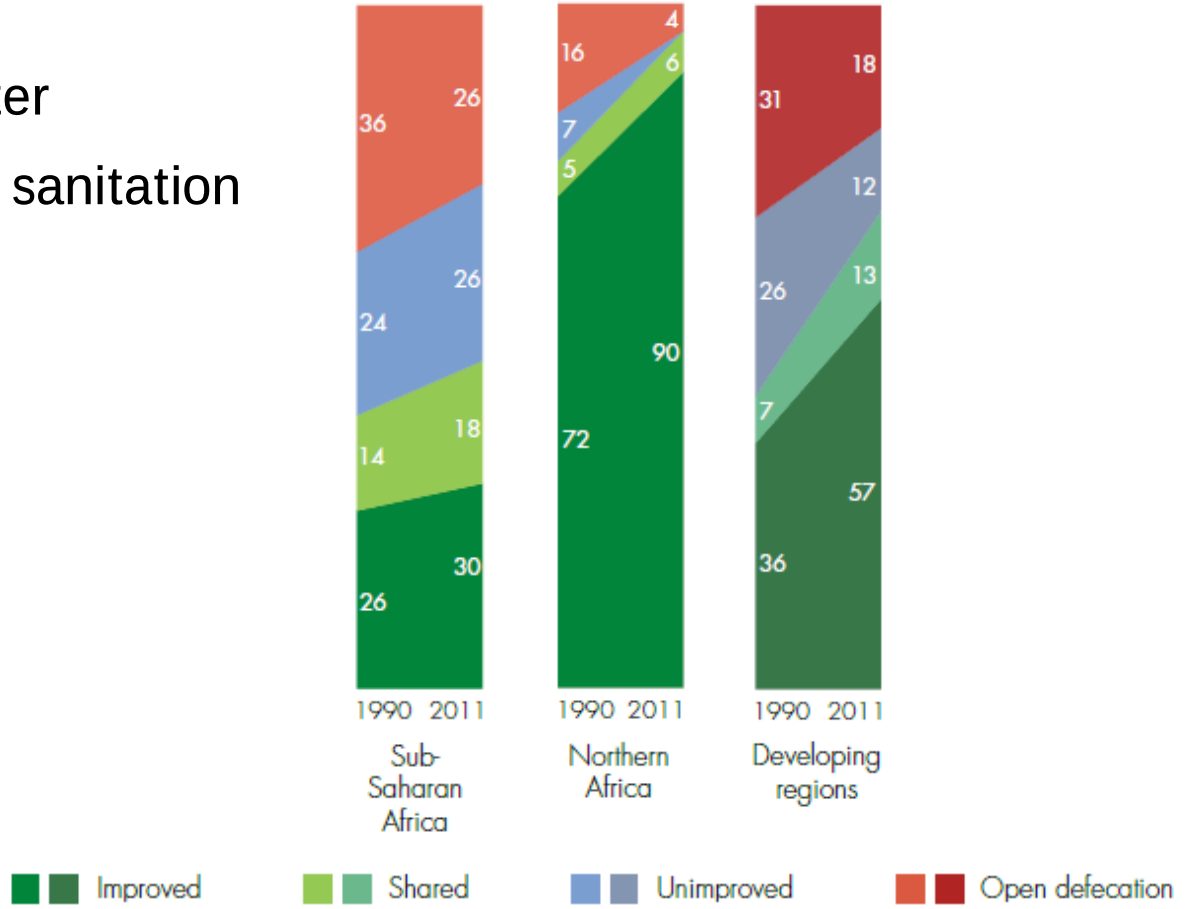
Source: Millenium Development Report 2013

Water and Health

Access to clean water

Access to improved sanitation

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



Source: Millenium Development Report 2013

Water and Health

Access to clean water

Access to improved sanitation

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)

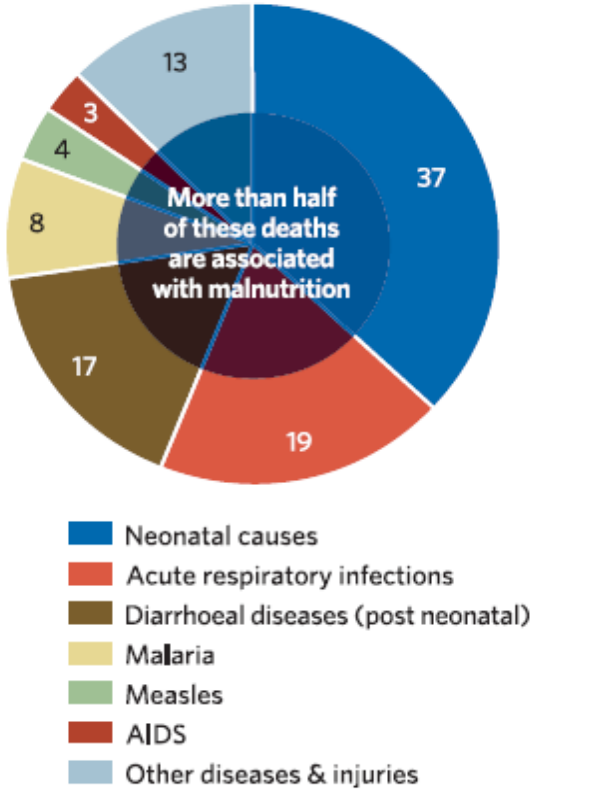
Access to clean water

Access to improved sanitation

Reduction of water borne diseases

Malaria

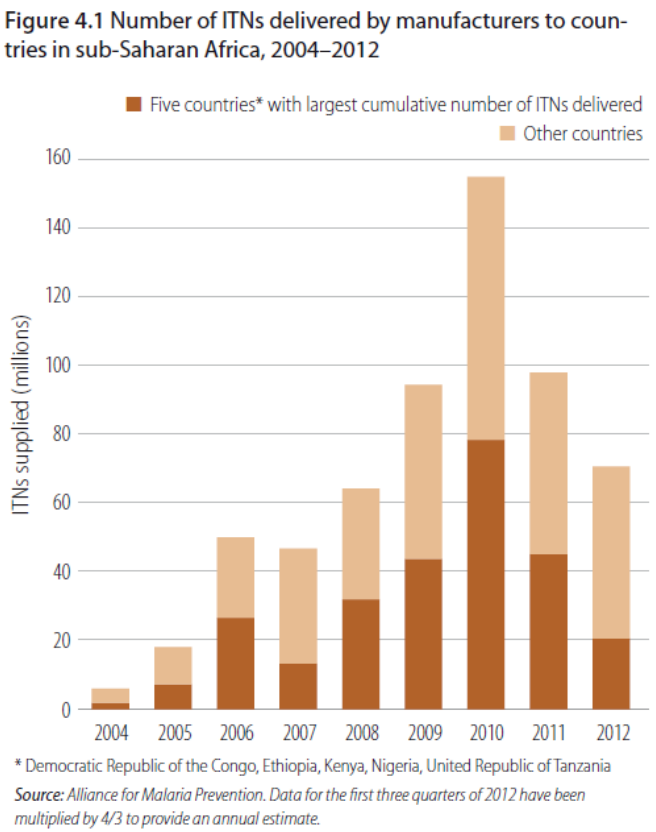
Diarrhoeal diseases



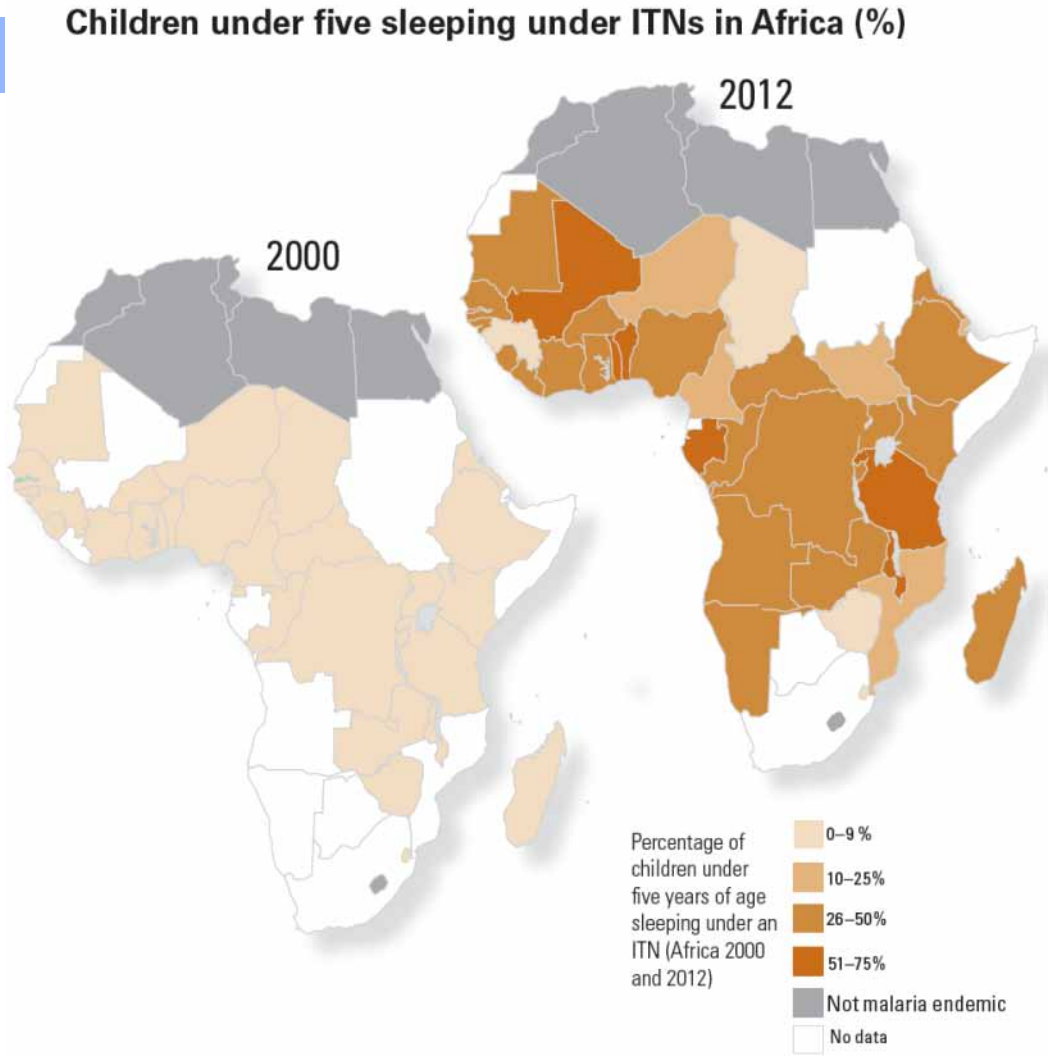
Causes of deaths among children under age five, 2000–2003 (Percentage)

Child mortality under 5 deaths per 1,000	1990		2011
Developing world:	97	à	57
Sub-Sahara Africa:	178	à	109

Water and Health



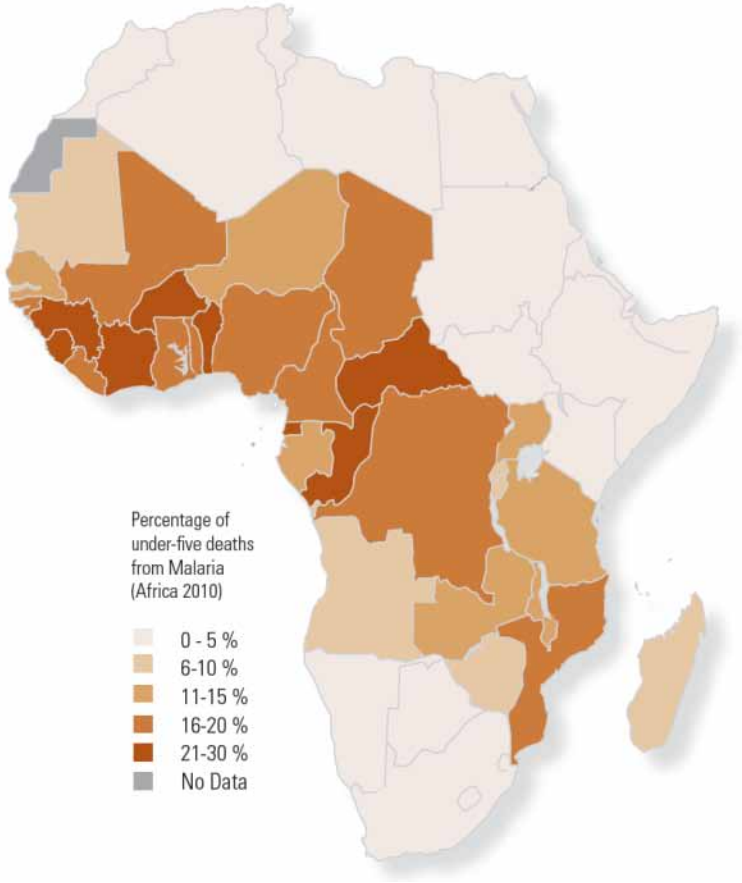
Source: World Malaria Report, WHO, 2012



Source: UNICEF, 2013

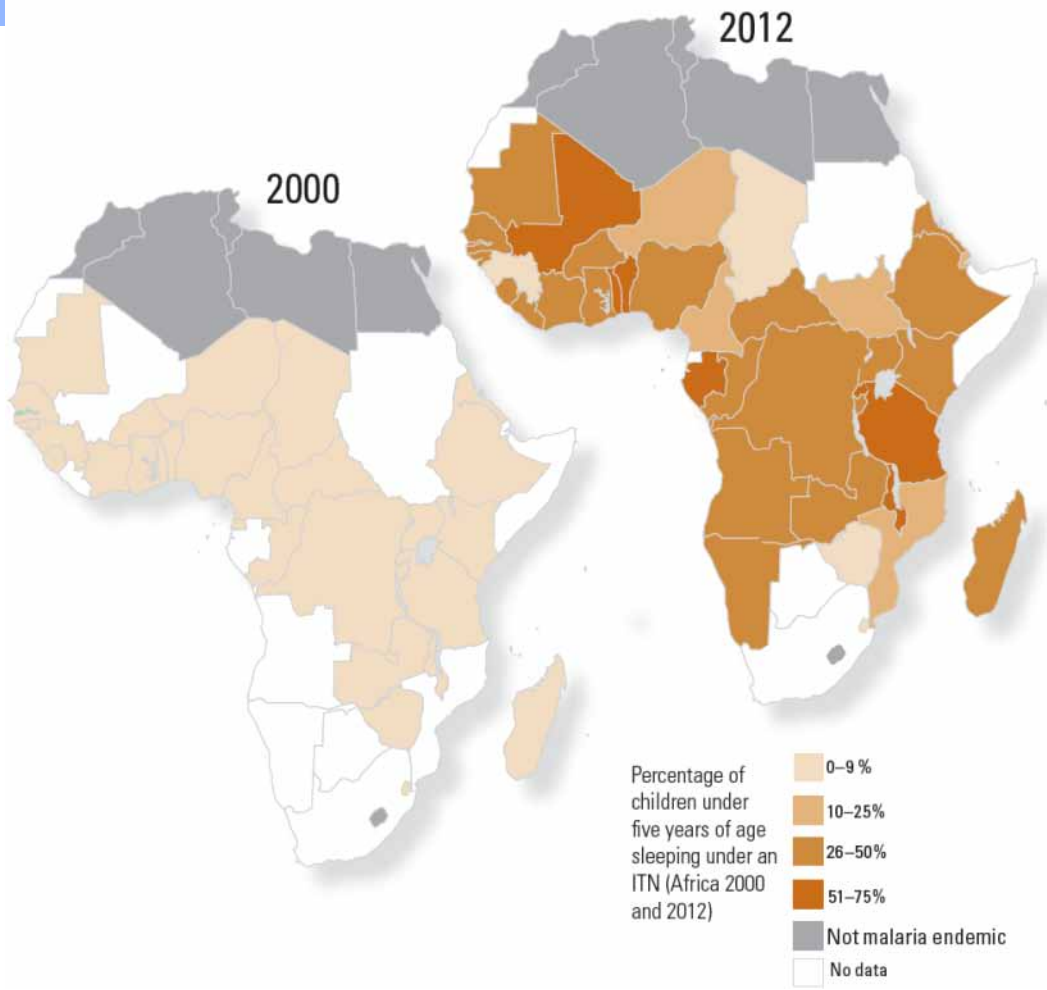
Water and Health

Malaria deaths among children under five in Africa (%)



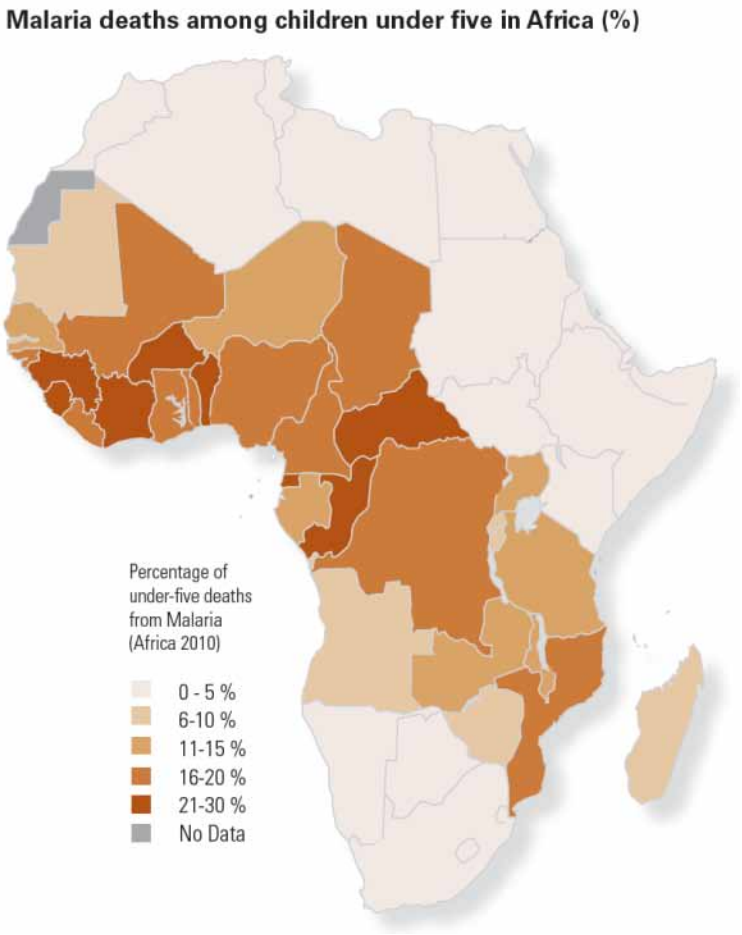
Source: UNICEF, 2013

Children under five sleeping under ITNs in Africa (%)

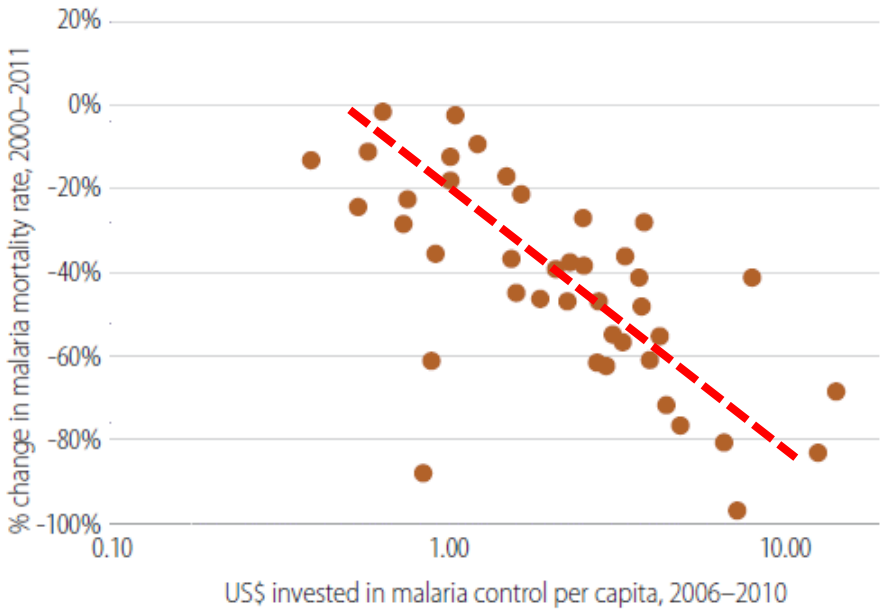


Source: UNICEF, 2013

Water and Health



Source: UNICEF, 2013



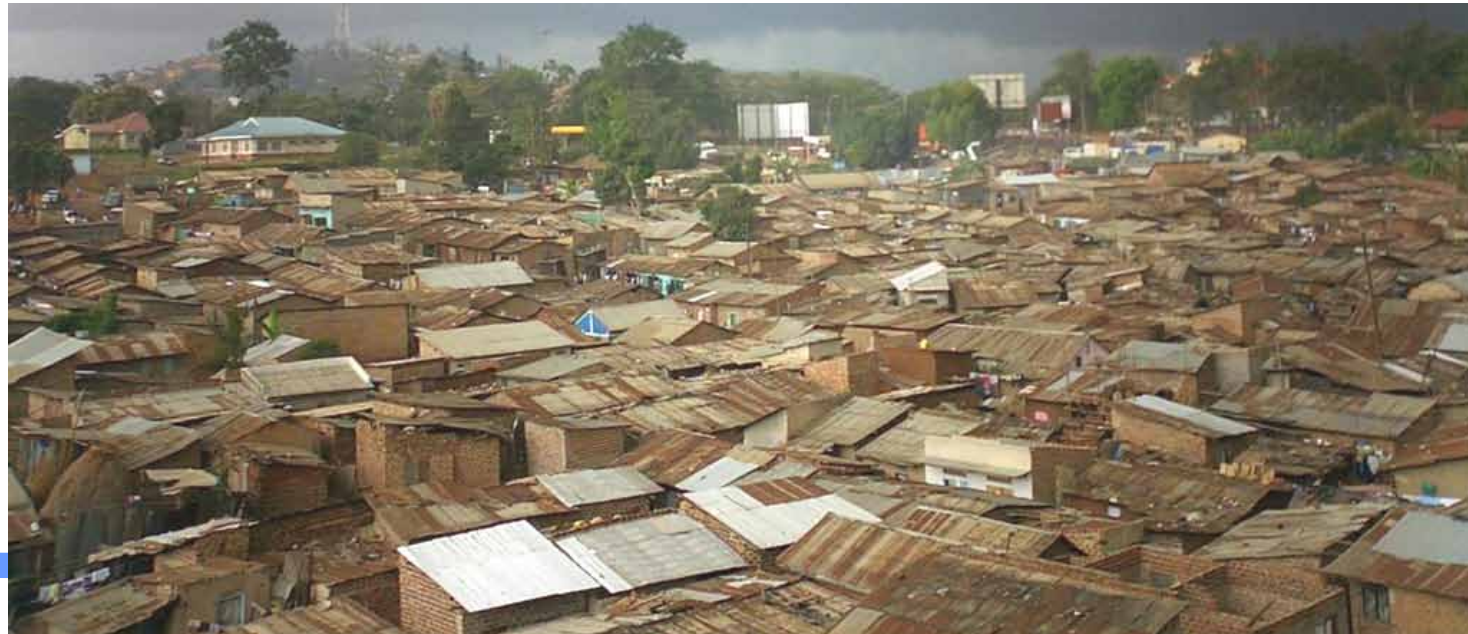
Change in malaria mortality in Africa, 2000-2011 in relation to investment in malaria control

Source: World Malaria Report, WHO, 2012

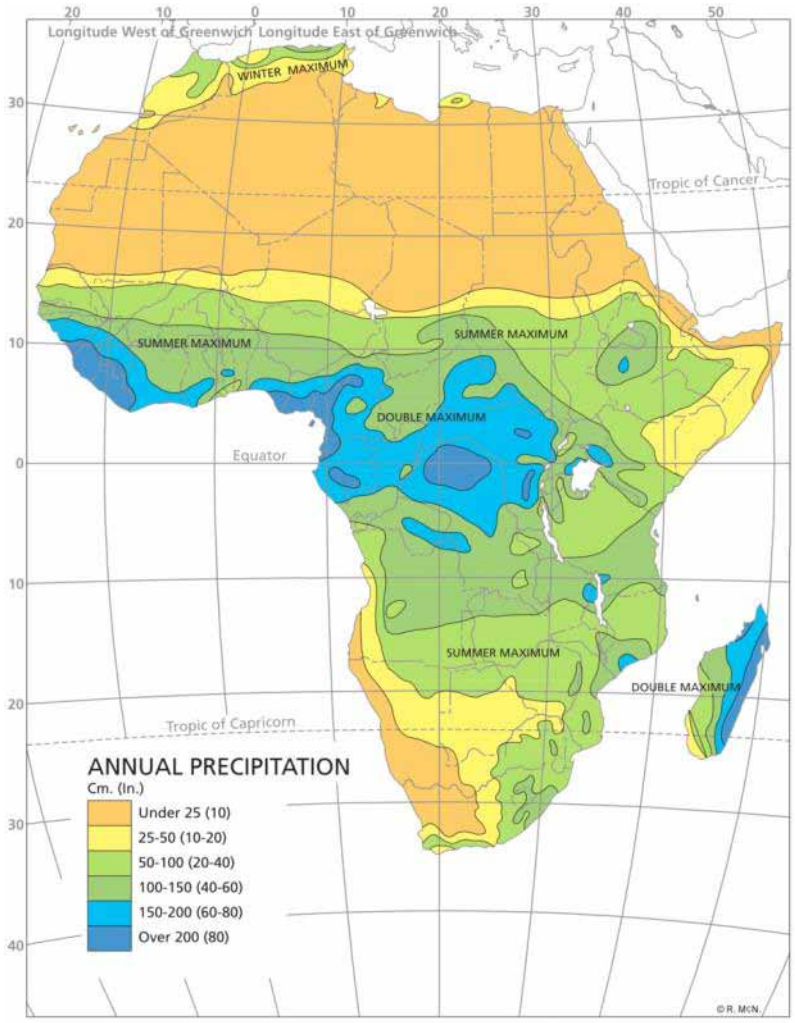
Water and Health

Lessons:

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

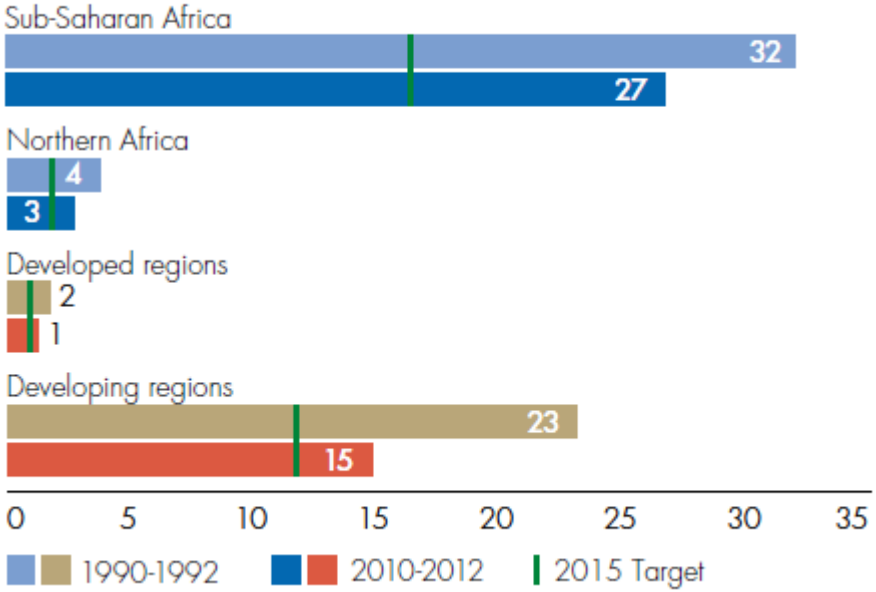


Water and Food



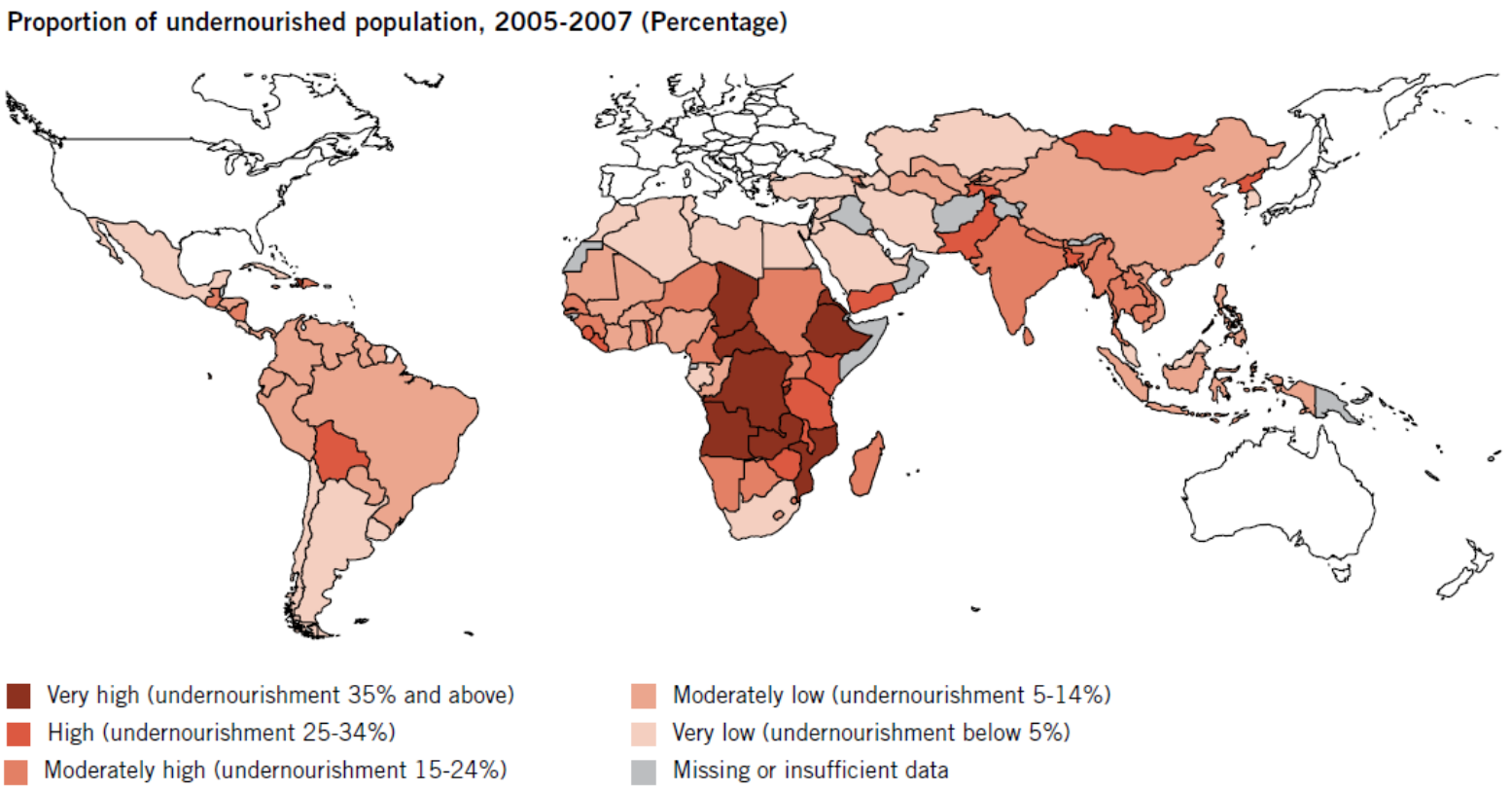
Water and Food

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



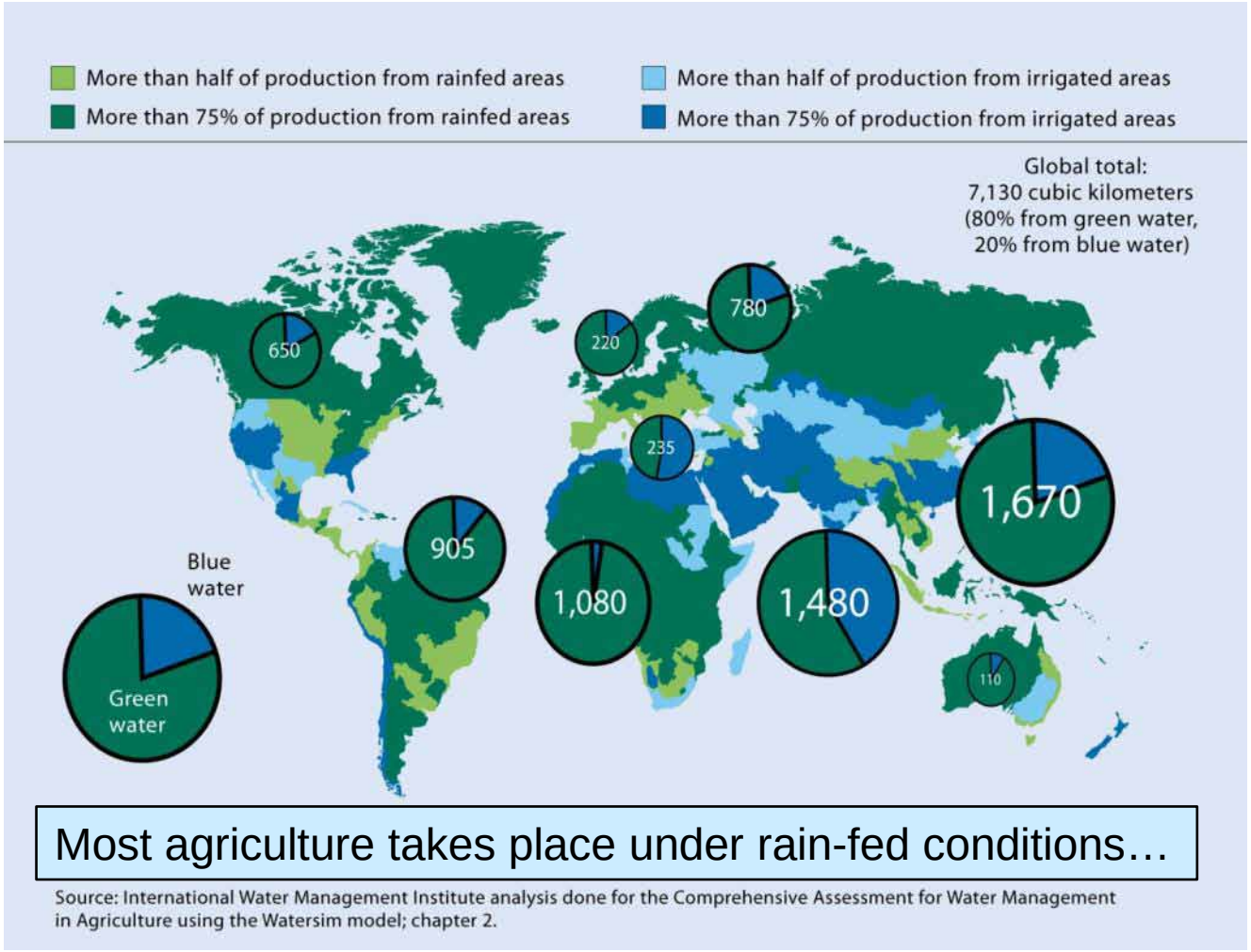
Source: Millenium Development Report, 2013

Water and Food



Source: Millennium Development report, 2011

Water and Food



Source: De Fraiture et al., 2009

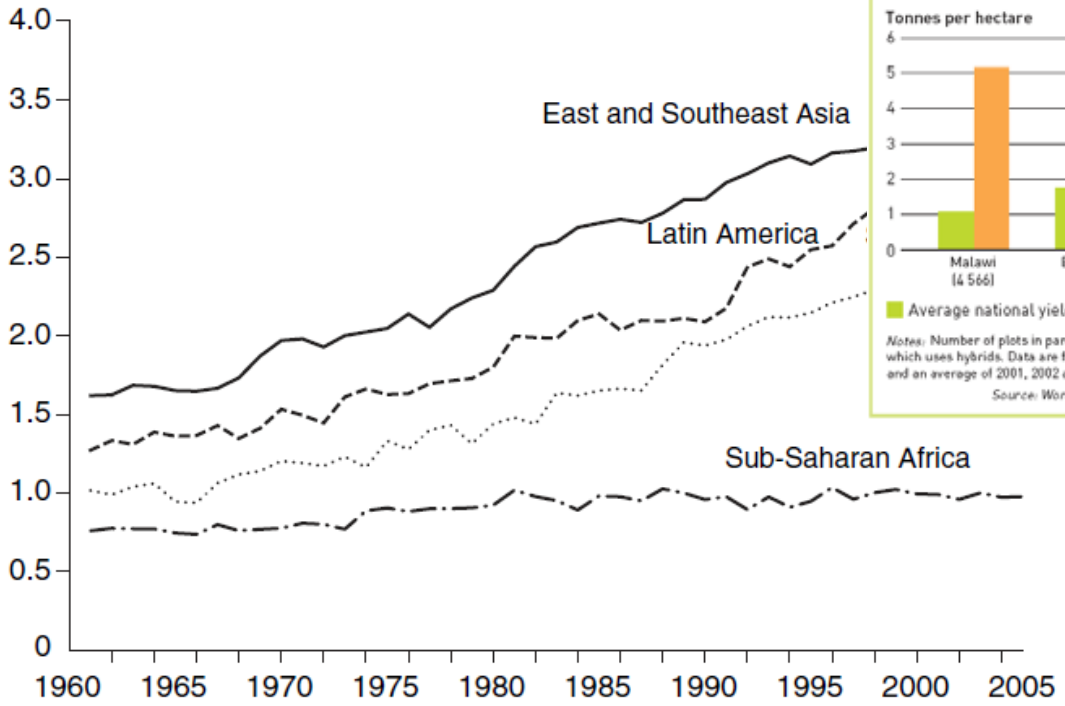
Water and Food

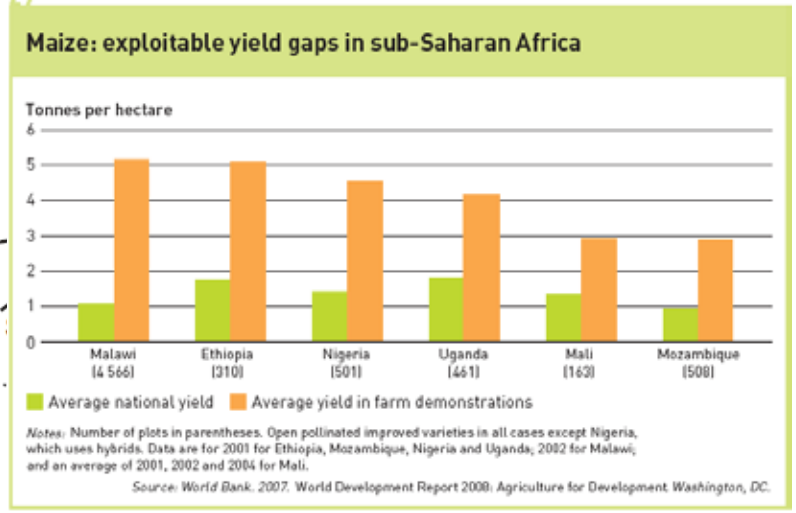
Average maize yield (ton/ha)

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])

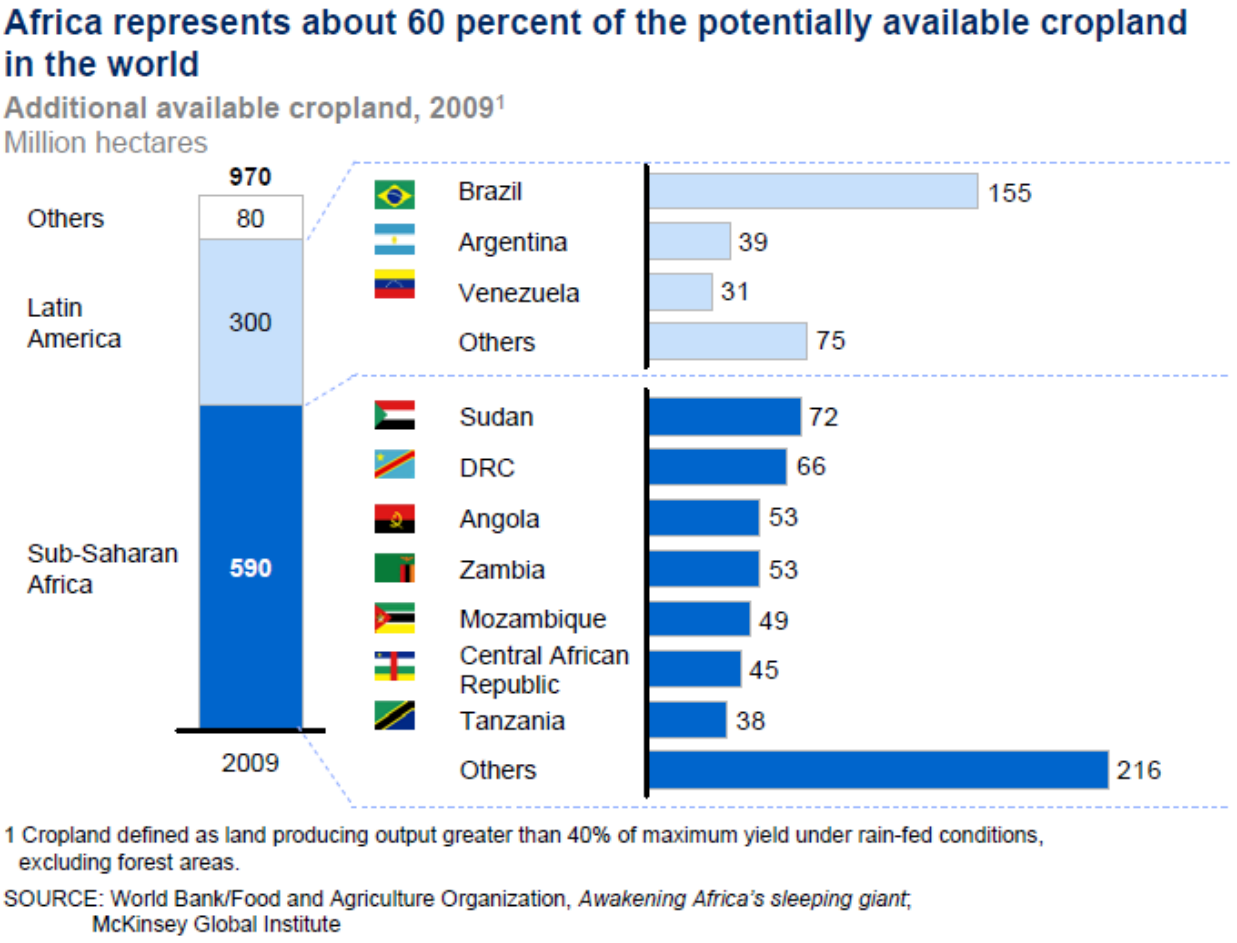




Source: FAO Food Security report, 2008

Source: World Bank, 2007; based on FAOSTAT

Water and Food

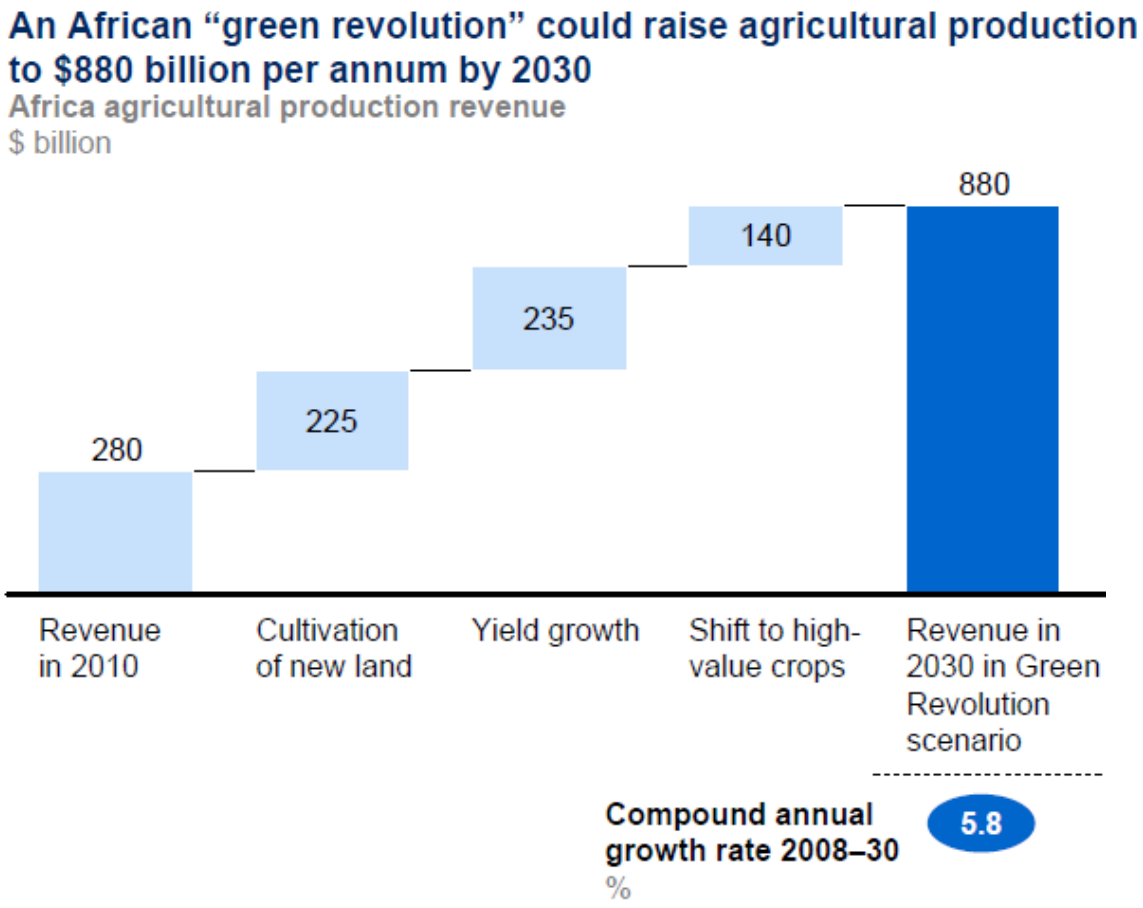


Source: McKinsey Global Institute, 2010

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



Source: McKinsey Global Institute, 2010

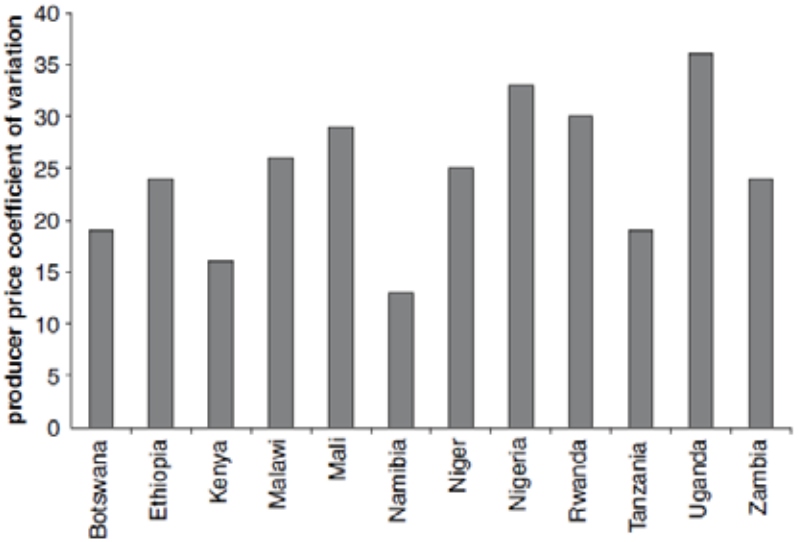
Water and Food

"Hot spots"

Nutrients – Water – Energy – Markets

Photoos: Eric Ofosu

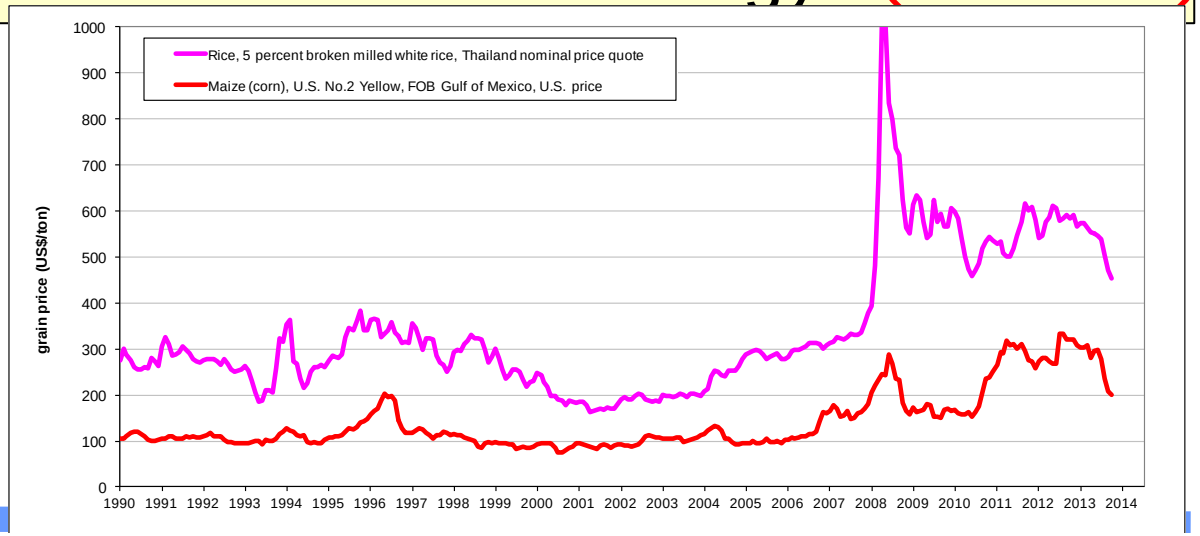
Water and Food



Source: World Bank, 2007

Coefficient of Variation of maize producer prices, 1971-2002

Nutrients – Water – Energy – Markets



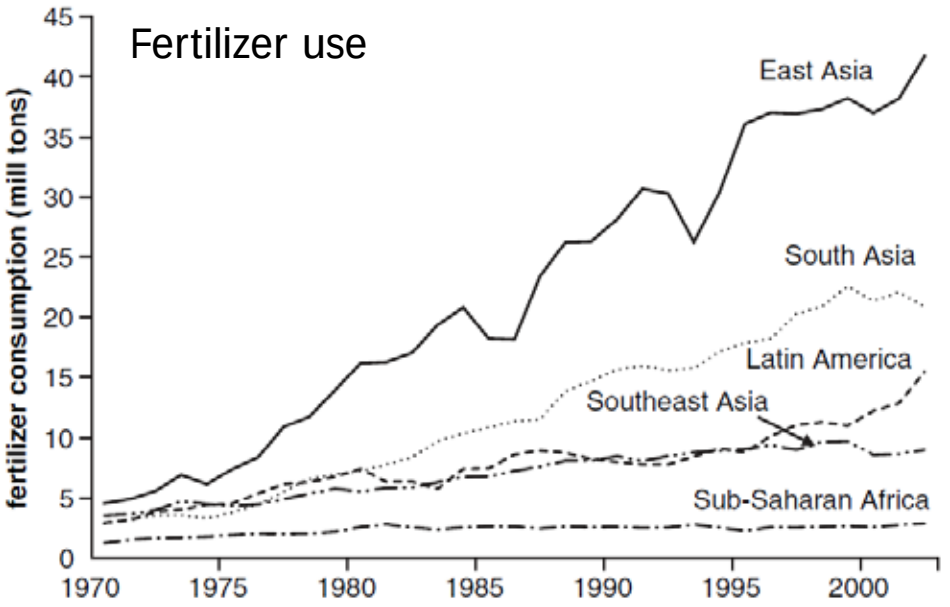
Source: IMF Primary Commodity Prices November 2013; http://www.imf.org/external/np/res/commod/index.asp

UNESCO-IHE Water Education

Water and Food

Nutrients – Water – Energy – Markets

Water and Food

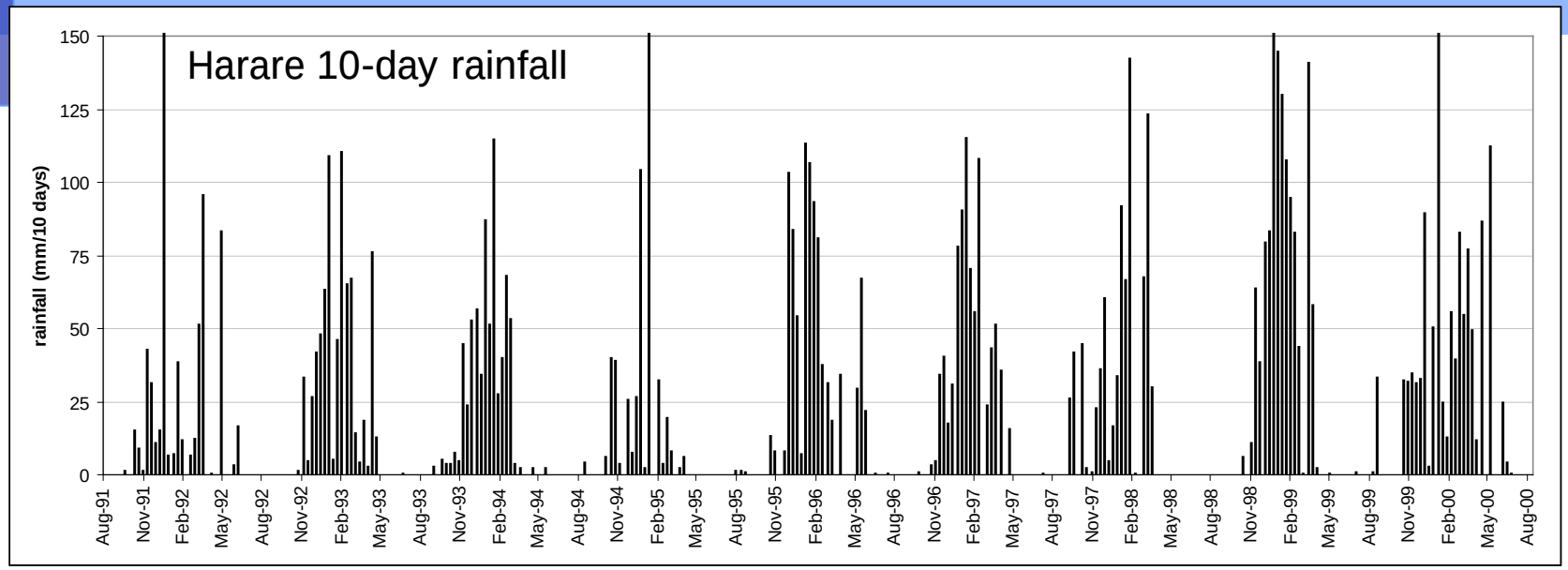


Source: World Bank, 2007; based on FAOSTAT

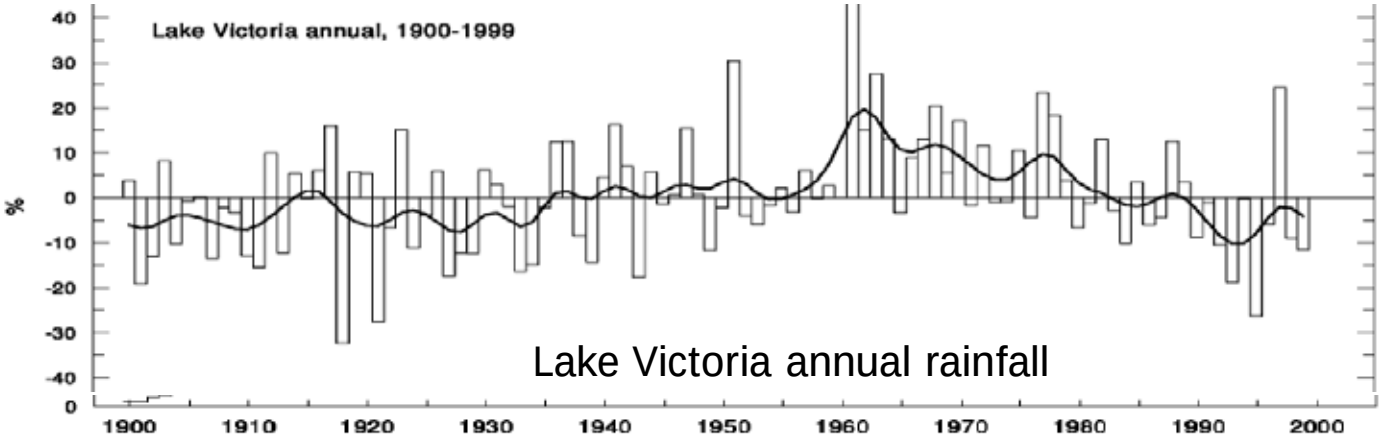
Nutrients – Water – Energy – Markets

Why low fertilizer use in Africa?

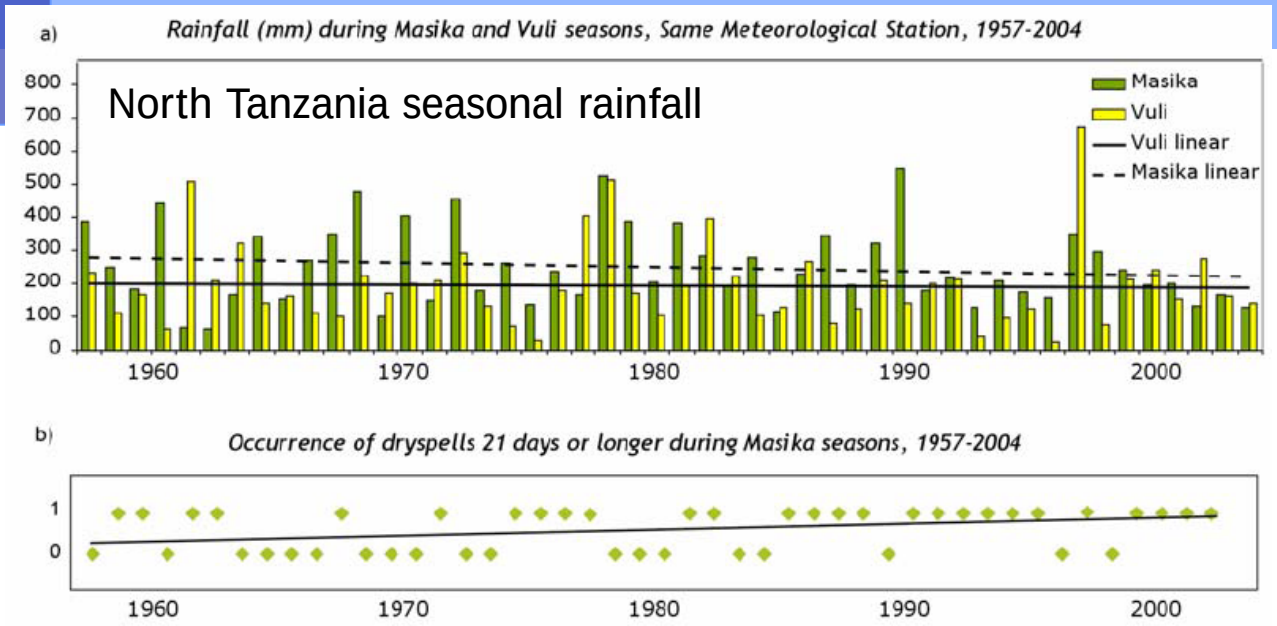
- Relatively expensive
- Lack of knowledge of specific fertilizer requirements
- Uncertainty about the return of this investment due to water & markets



Nutrients – Water – Energy – Markets

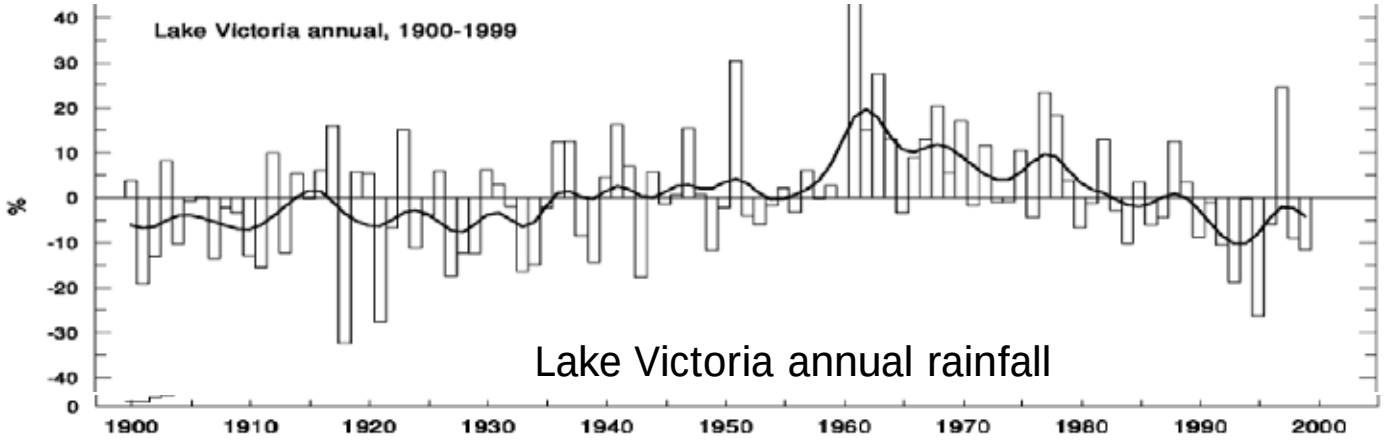


Source: Conway, 2005



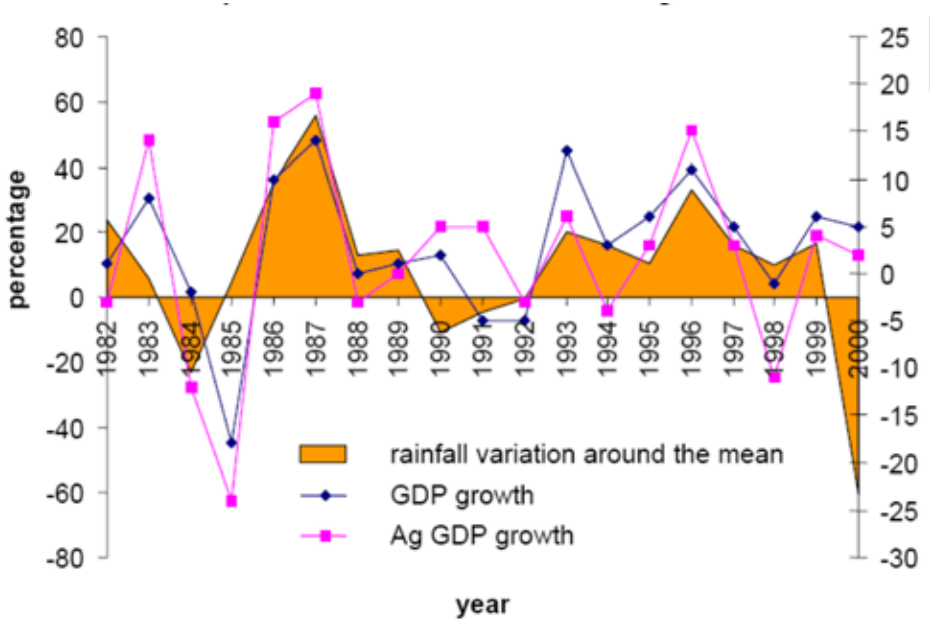
Source: Enfors and Gordon, 2007

Nutrients – Water – Energy – Markets



Source: Conway, 2005

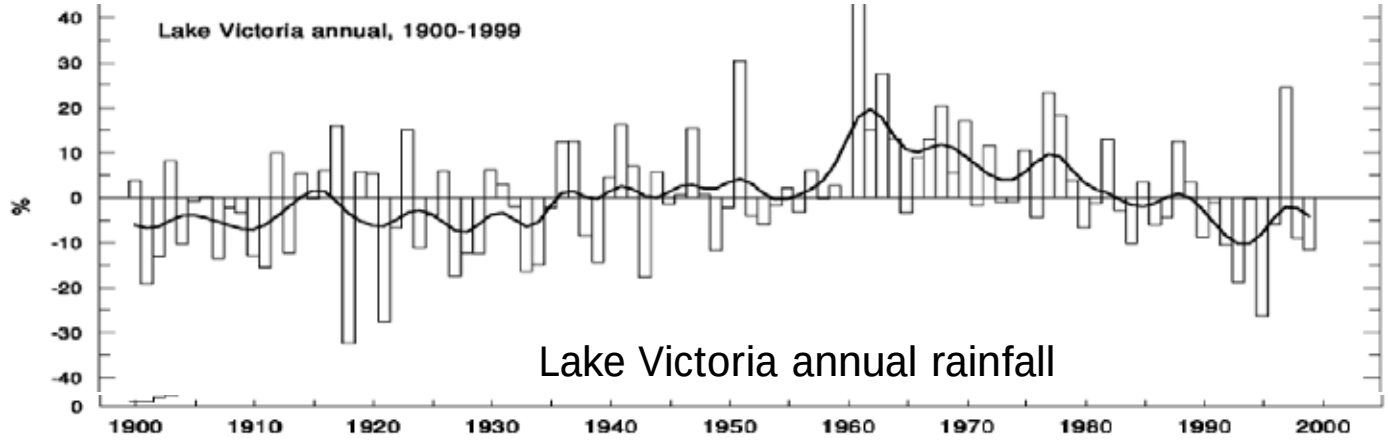
Water and Food



Source: Grey & Sadoff, 2006

Ethiopia annual rainfall and GDP growth

Nutrients – Water – Energy – Markets



Lake Victoria annual rainfall

Source: Conway, 2005

farming systems more resilient to variability of rainfall and water access

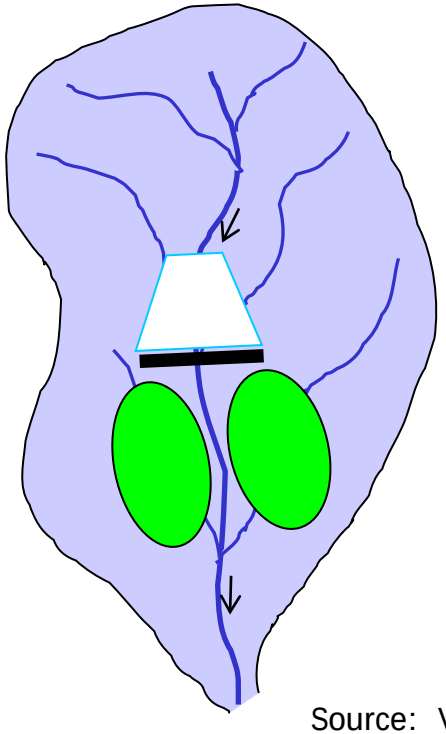
to bridge dry spells
increase buffering capacity
and control over water

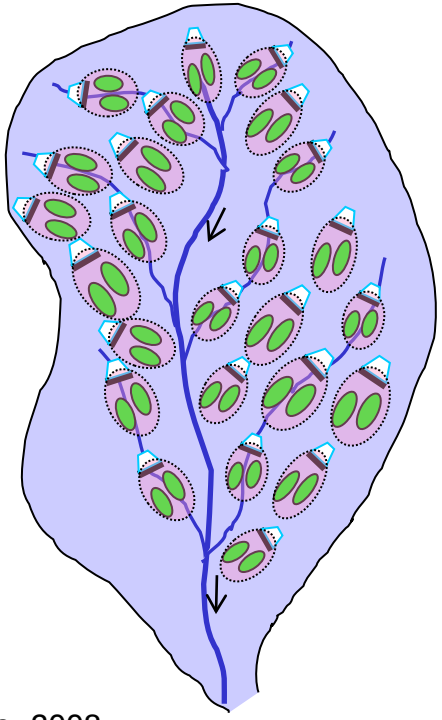
Nutrients – Water – Energy – Markets

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

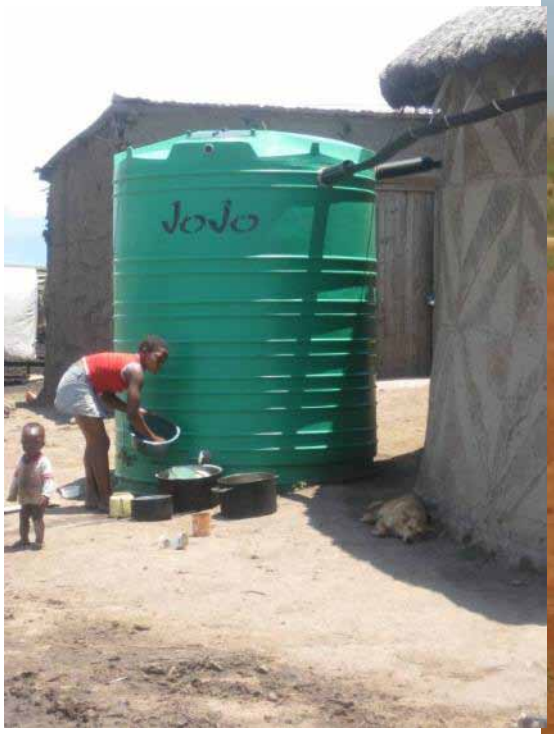




Source: Van der Zaag and Gupta, 2008

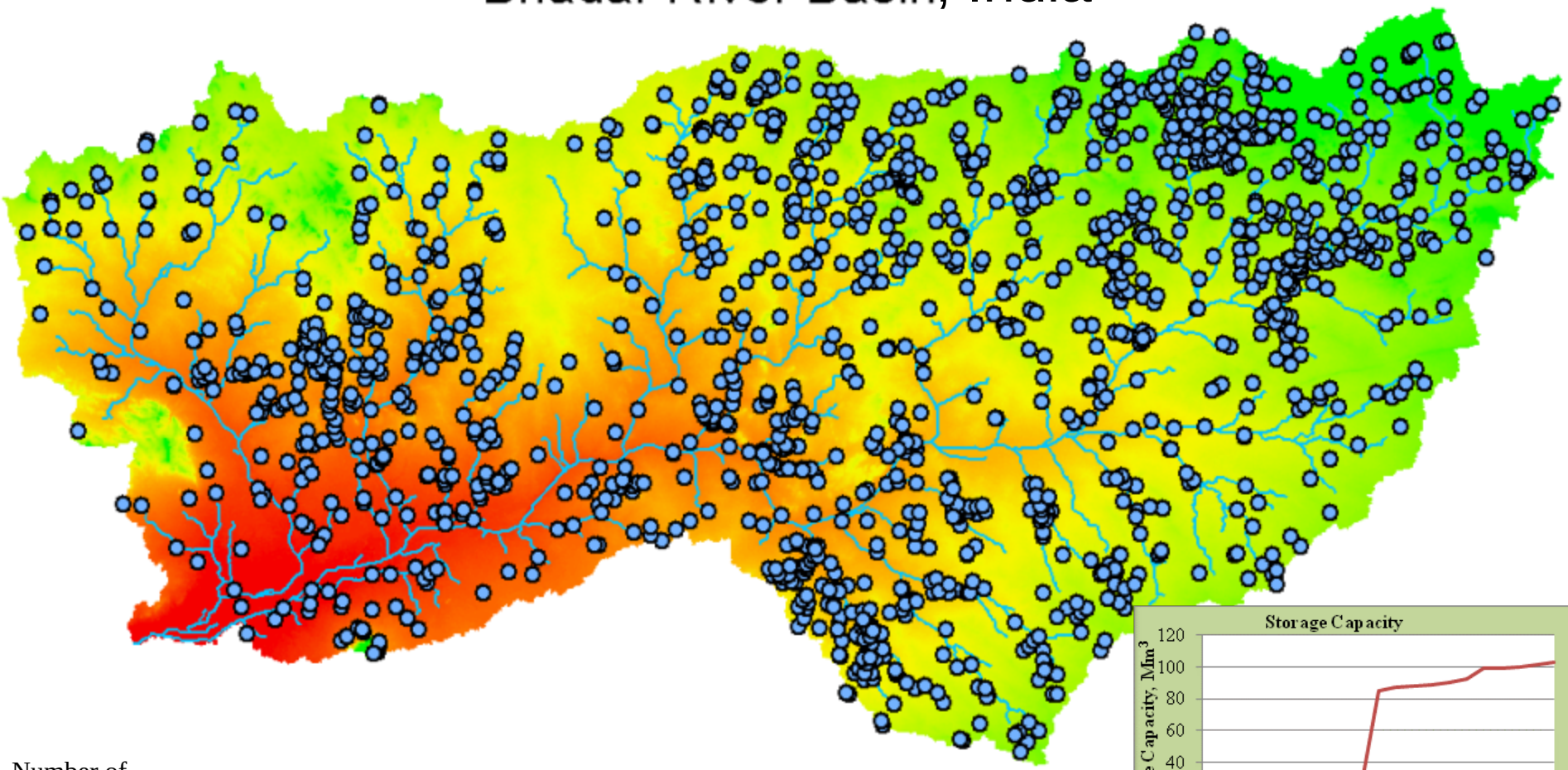
Water and Food

Water storage – centralised or distributed?



Small reservoirs (check dams) in

Bhadar River Basin, India



Number of
check dams = [redacted]

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

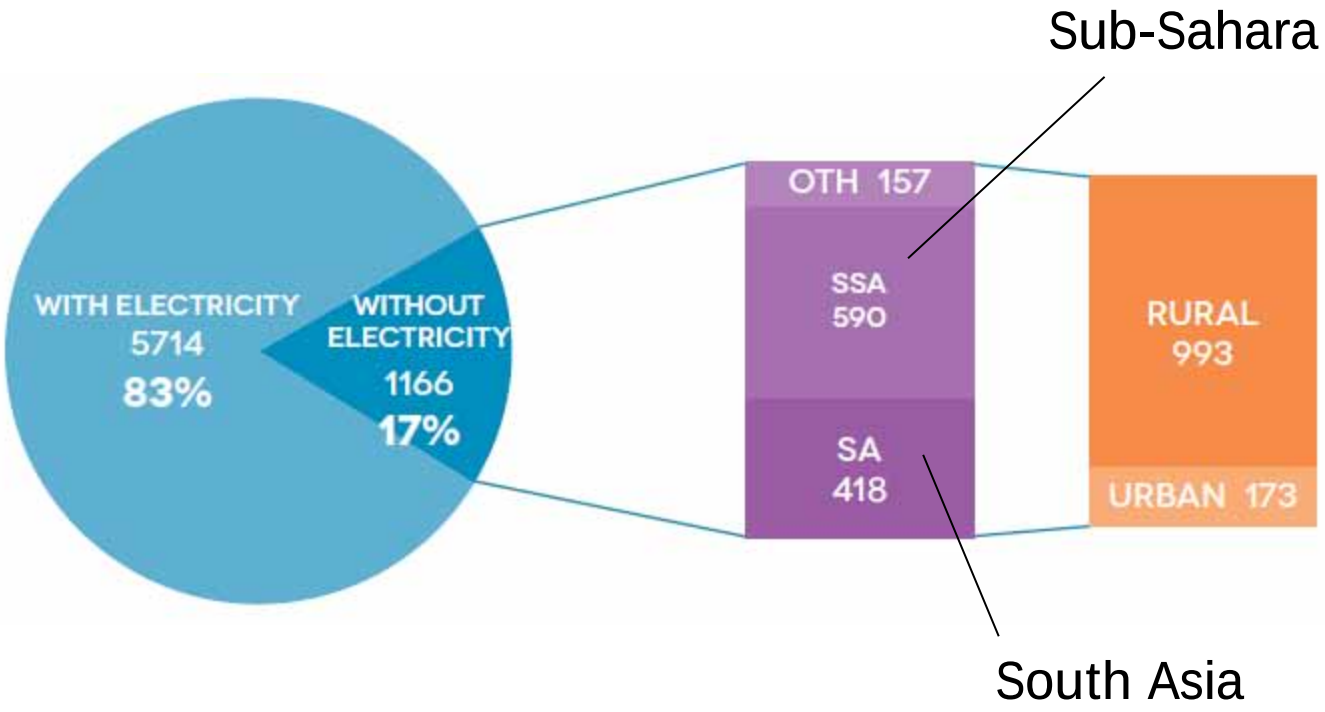
Africa: 150 kWh/year

Netherlands: 6,500 kWh/year

Africa is energy challenged...

... despite a generous natural energy endowment

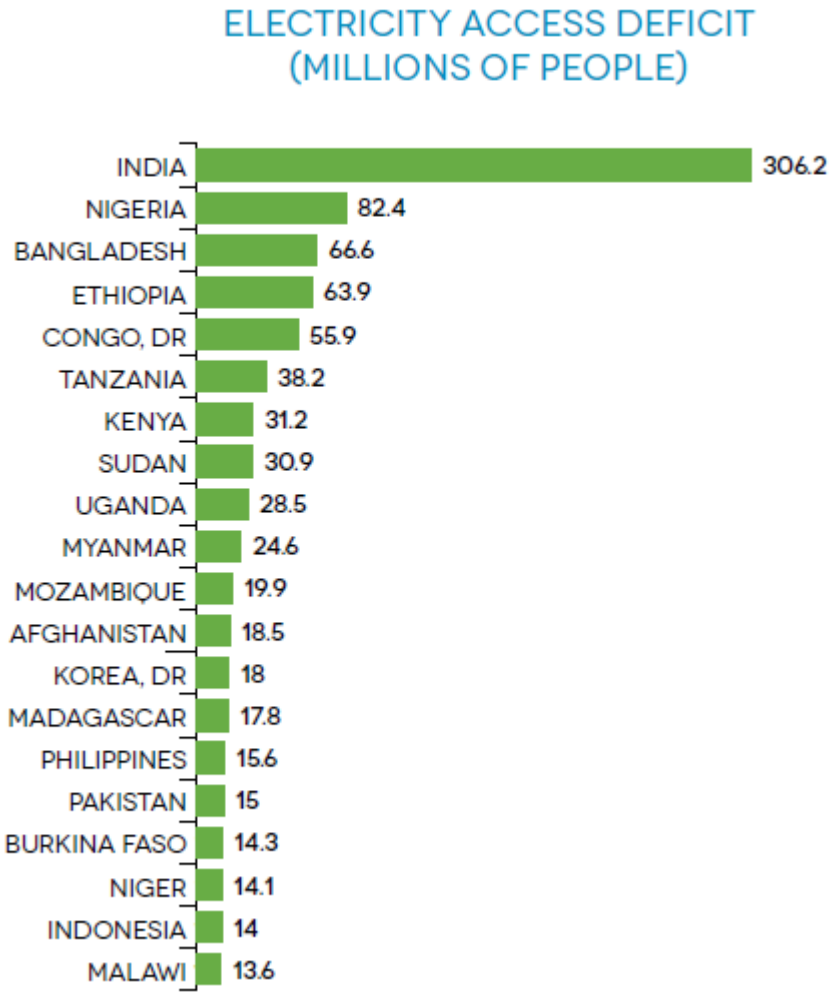
Water and Energy



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

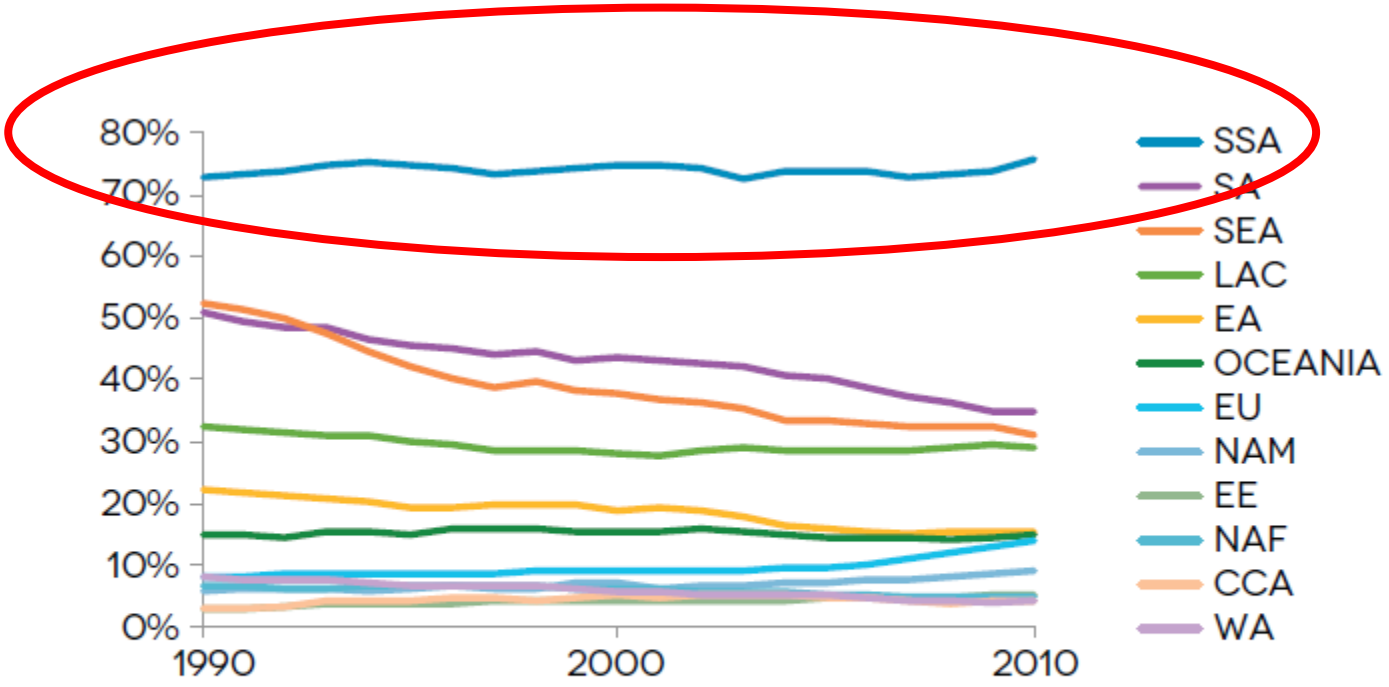


FIGURE O.22 **EVOLVING RENEWABLE ENERGY SHARE BY REGION, 1990–2010 (PERCENTAGE OF TOTAL FINAL ENERGY CONSUMPTION)**

Source: SE4All, World Bank, 2013

Water and Energy

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

Required in 2030: +250 GW

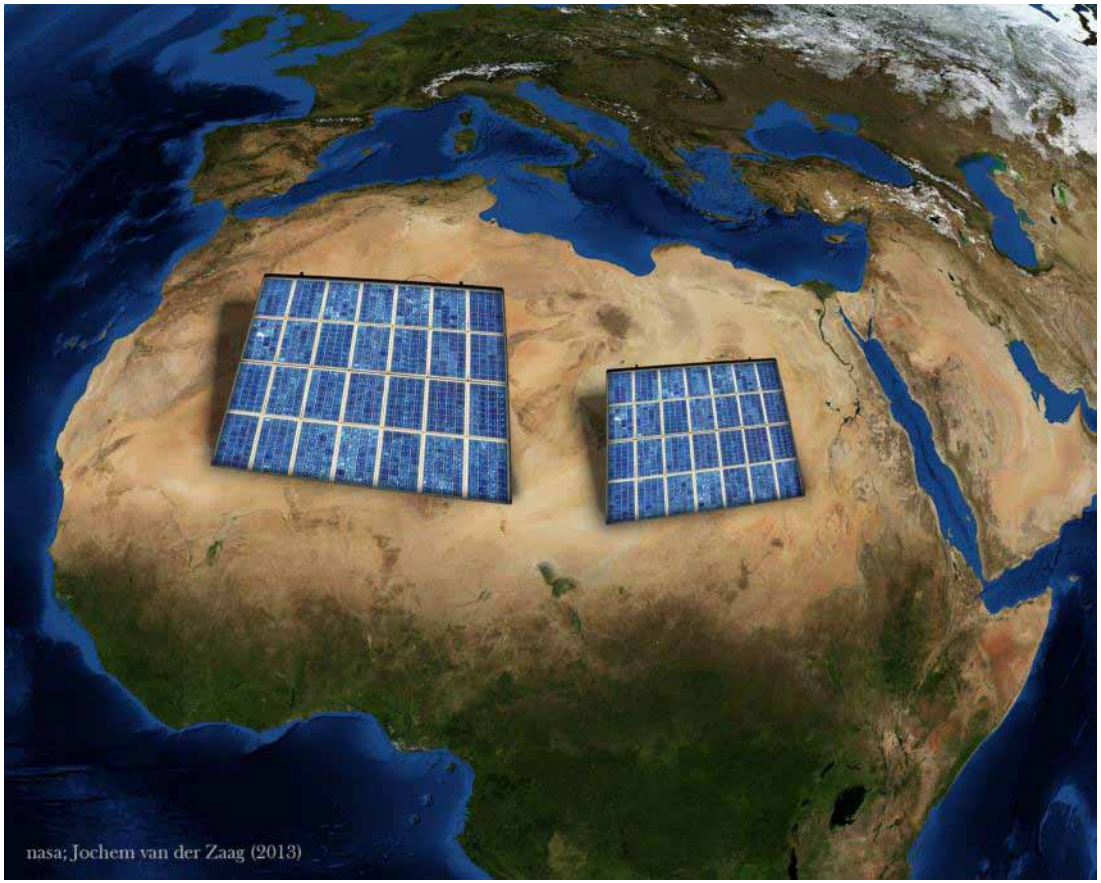
Blue Nile: >+7 GW

Congo: +40(?) GW

Zambezi: >+5 GW

Water and Energy

Africa can light ROW



Water and Africa's Development Agenda

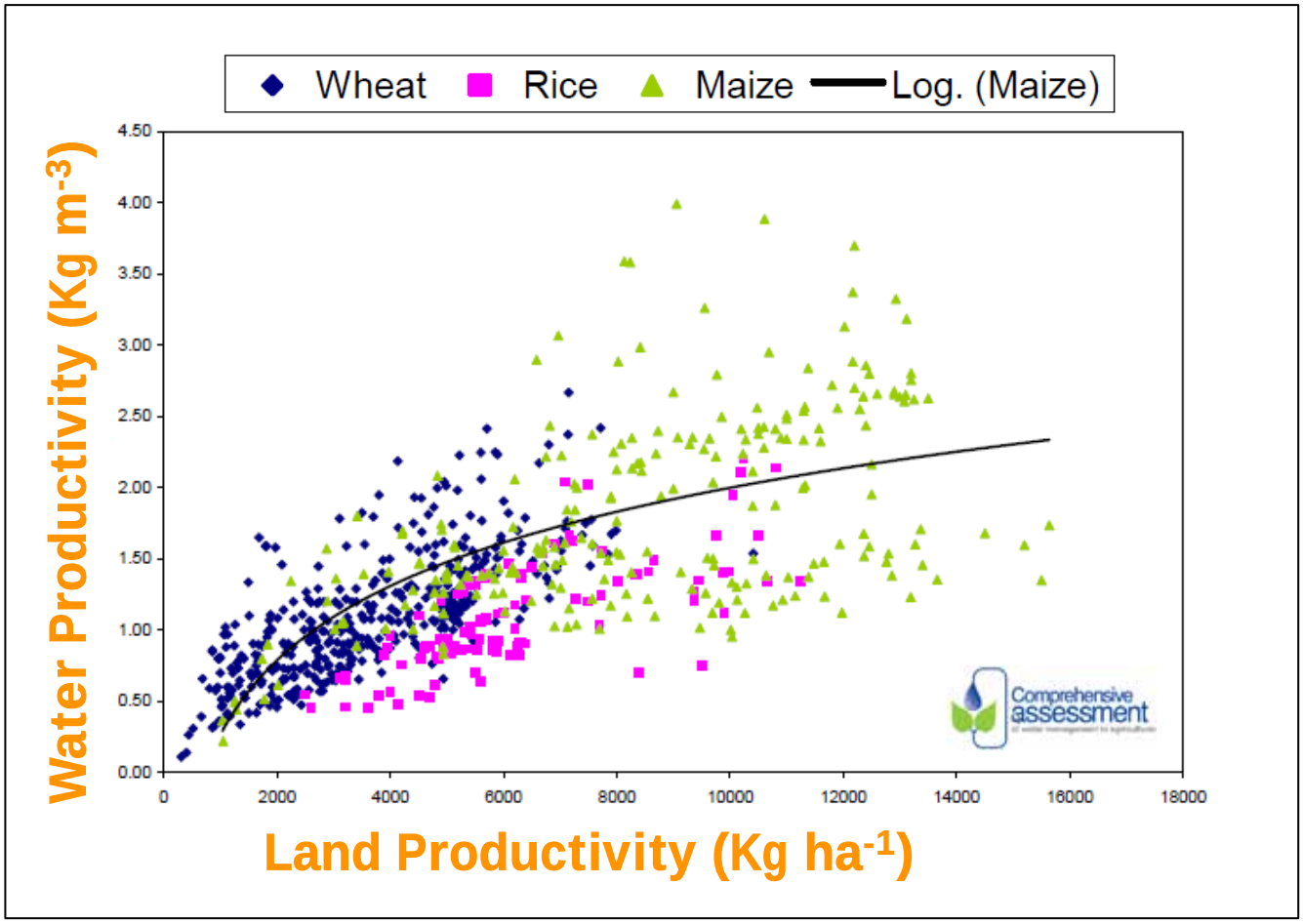
1. Water and Health: Africa should not wait but act
2. Water and Food: Africa can produce surplus food for ROW
3. Water and Energy: Africa can generate sufficient renewable energy, perhaps even for ROW

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