

**IV BOTIN FOUNDATION WATER WORKSHOP
RE-THINKING WATER AND FOOD SECURITY PARADIGMS
(SANTANDER 22 TO 24TH SEPTEMBER 2009)**

WATER IN THE FOOD AND VALUE CHAIN INCREASING THE BENEFICIAL USE OF WATER

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ISSUES

- **Food supply historically high**
- **Drivers and implications**
- **Carryover stocks of water or food?**
- **Supply and value chain**

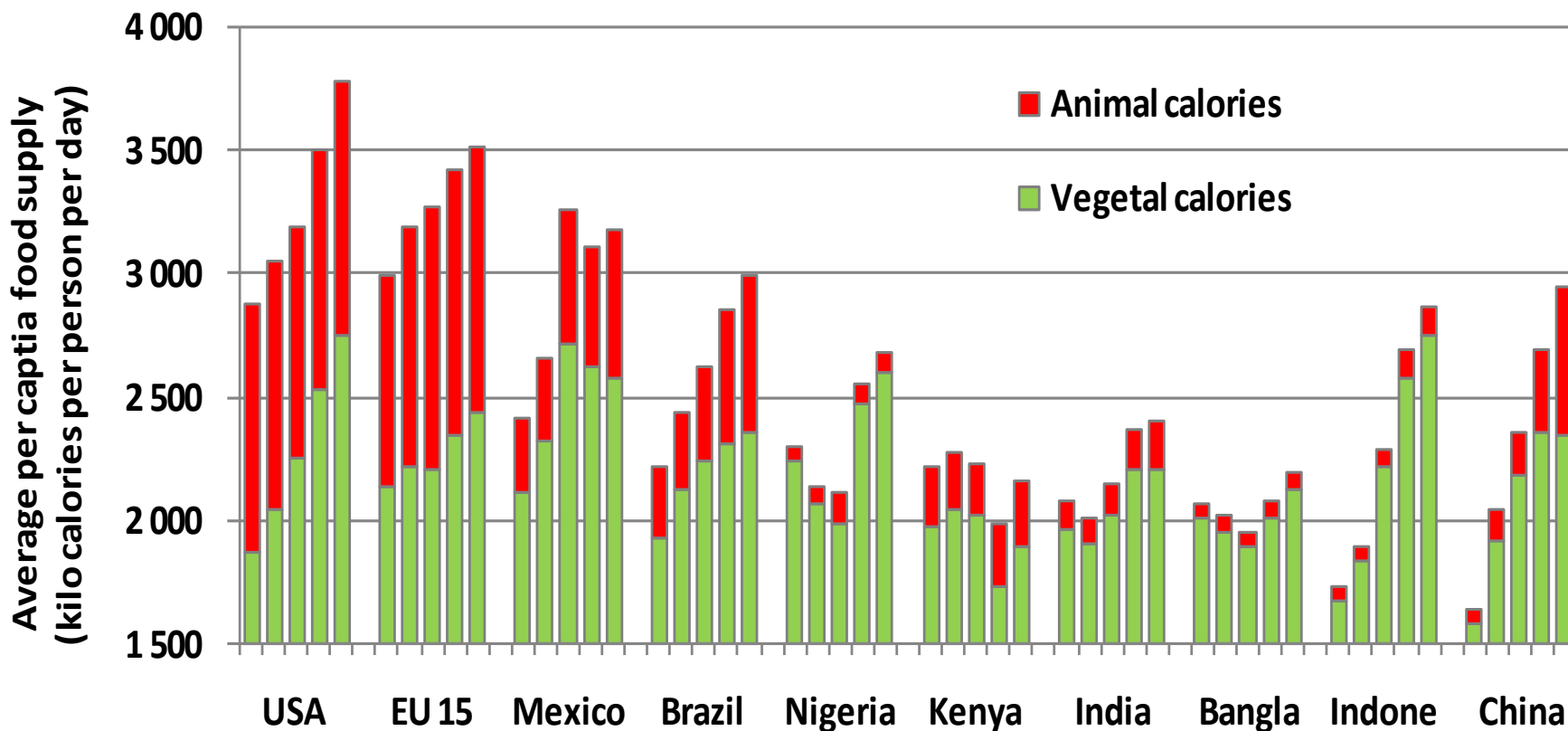
Take home message

Food and water security cannot be achieved with a sole focus on production and supply

Reduce losses and waste in the food/value chain is sensible & doable

Reduce risk for farmers

CHANGES IN FOOD SUPPLY, 1961 – 2001

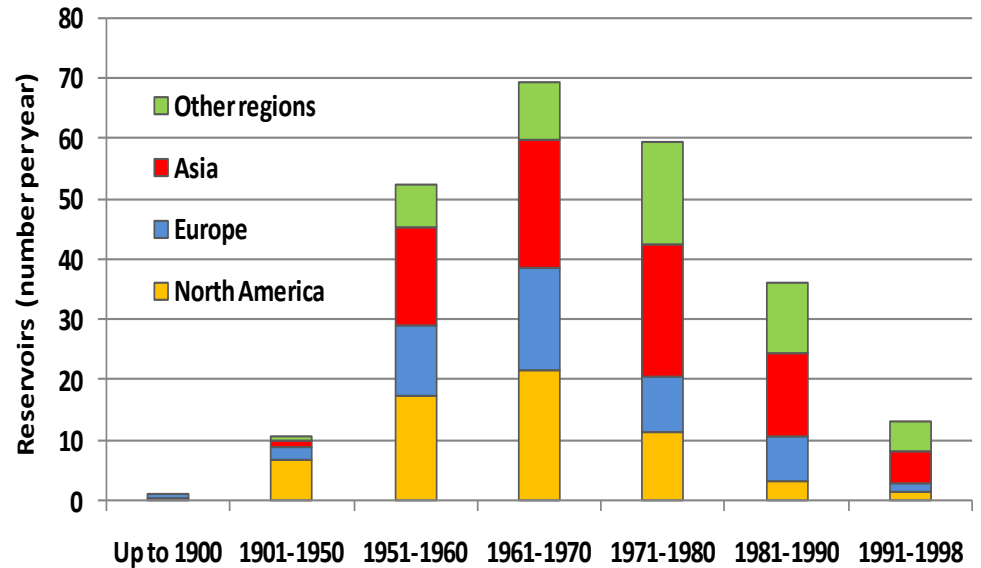


For every country the columns represent: 1961, 1971, 1981, 1991 and 2001

Between 2007 – 2008, world food supply increased by 7% (a new record)
Parallel with this, the number of undernourished increased by 100+ million

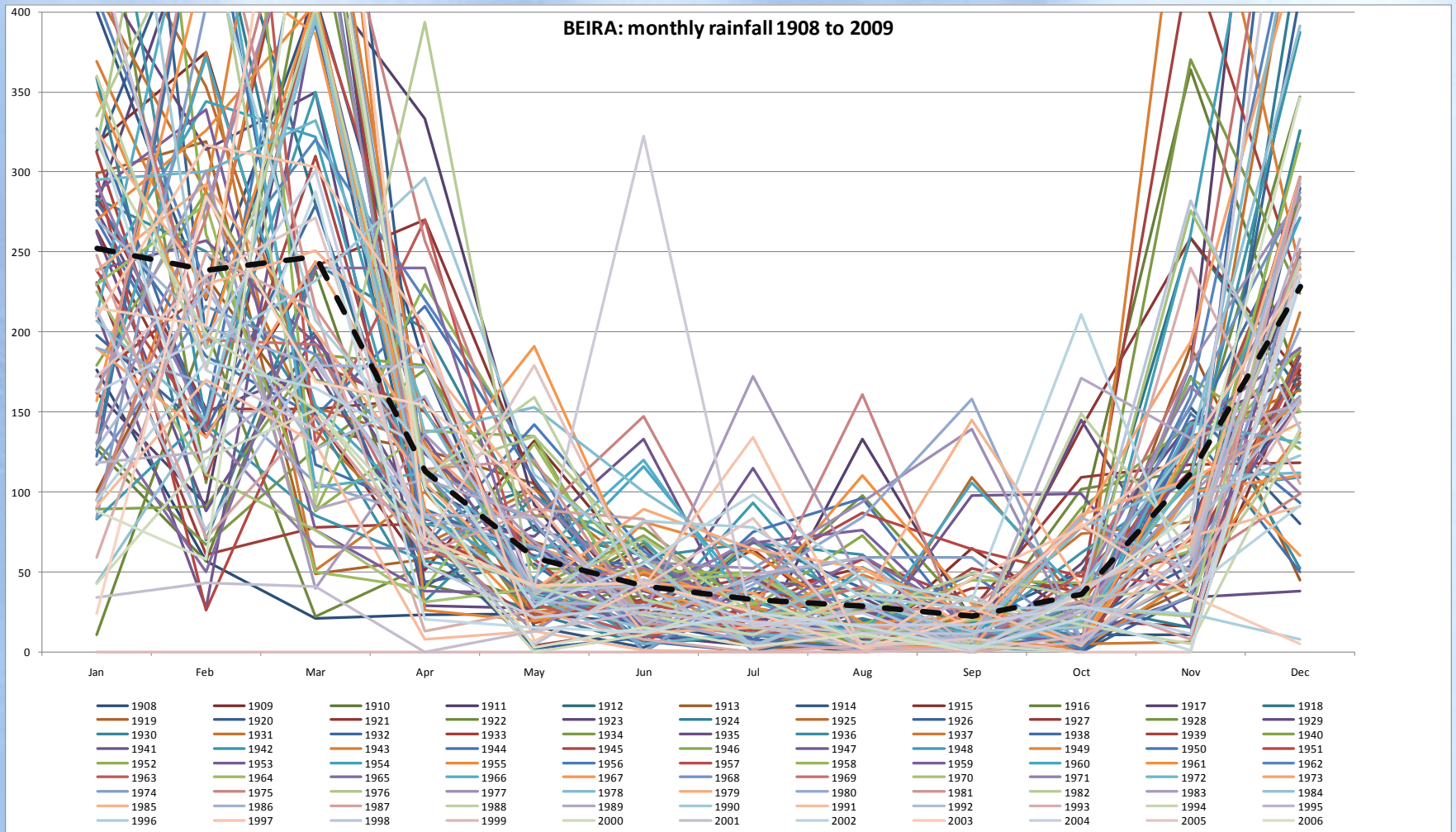
Source: Mats Lannerstad, Linköping

Additional storage peaked in the 70s



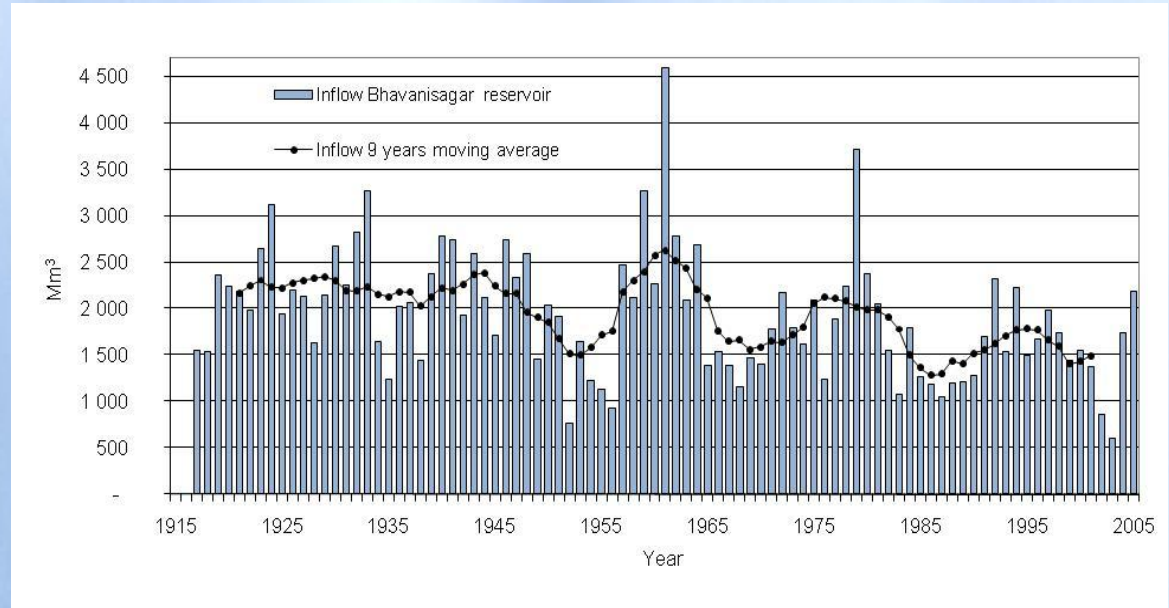
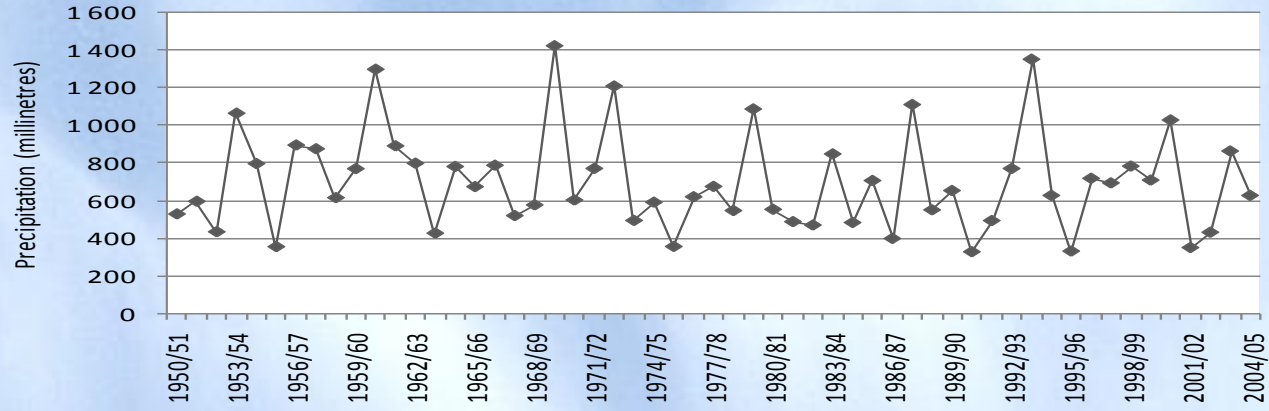
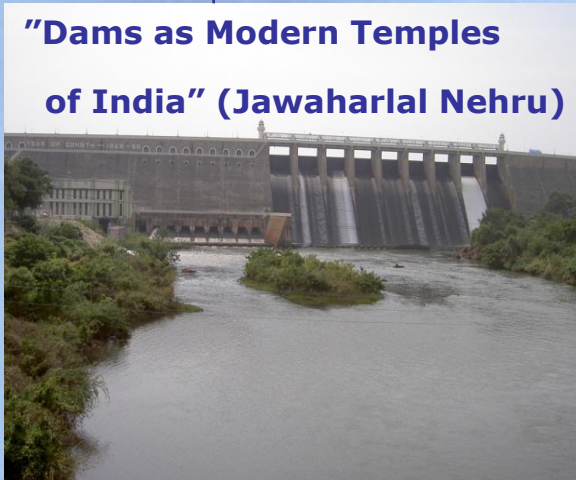
Source: Mats Lannerstad

Variability of rainfall in Beira - one hundred years



Source: JeanMarc Faures, FAO

There is no Such Thing as an Average (Bhavani basin and dam/reservoir, India)

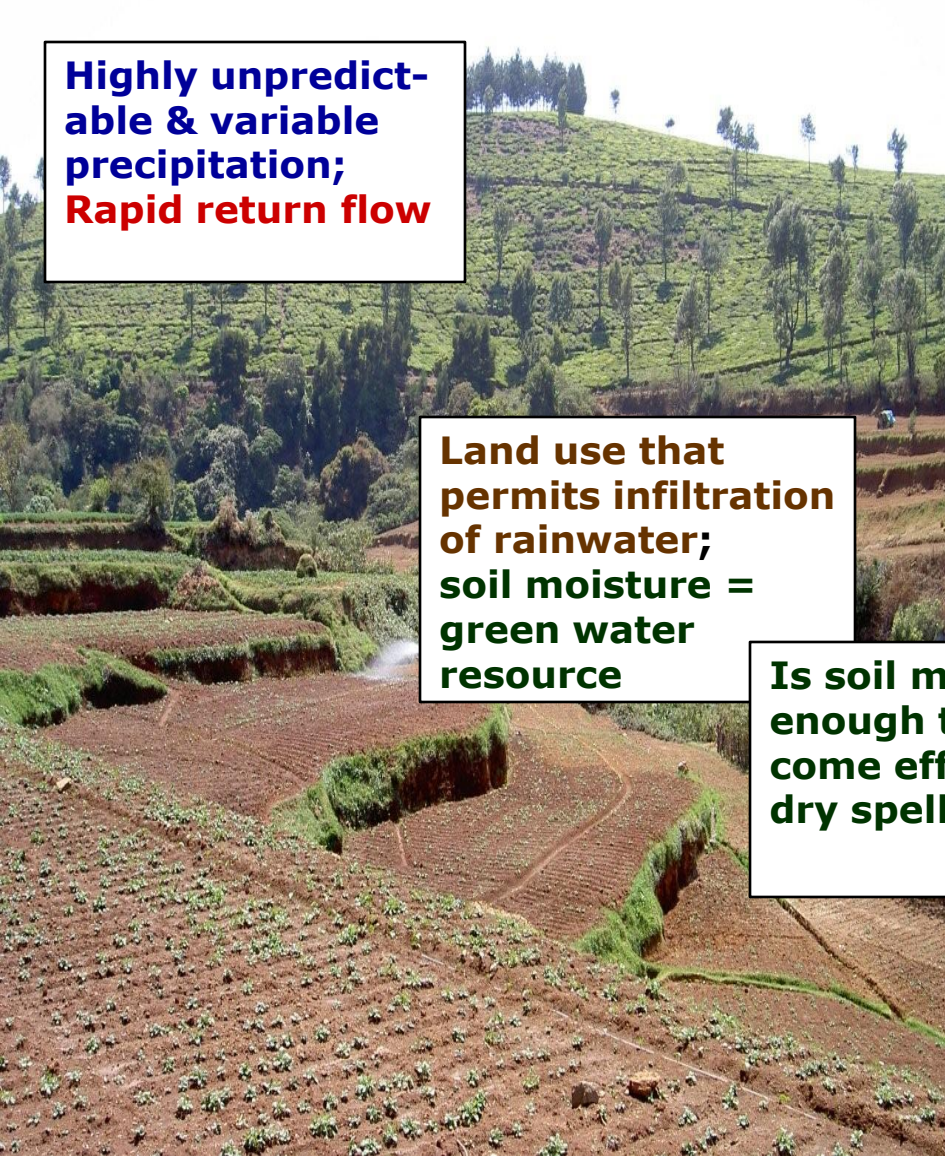


Source: Mats Lannerstad, Linköping University

Ground water – if you have the means



Rainfed agriculture; green water augmentation & management



Highly unpredictable & variable precipitation;
Rapid return flow

Land use that permits infiltration of rainwater;
soil moisture = green water resource

Is soil moisture enough to overcome effects of dry spells?



OPTIONS FOR FOOD SECURITY

- **Storing water**
- **Storing food**
- **Procuring food**

What about the "one-acre farmer"?
- Food crops?
- Other?

A view on the world water situation:

“...we have enjoyed a series of water ‘bubbles’ to support economic growth over the past 50 years or so..... We are now on the verge of water bankruptcy in many places with no way of paying the debt back”.

World Economic Forum, January 2009

Population, GDP and water requirements

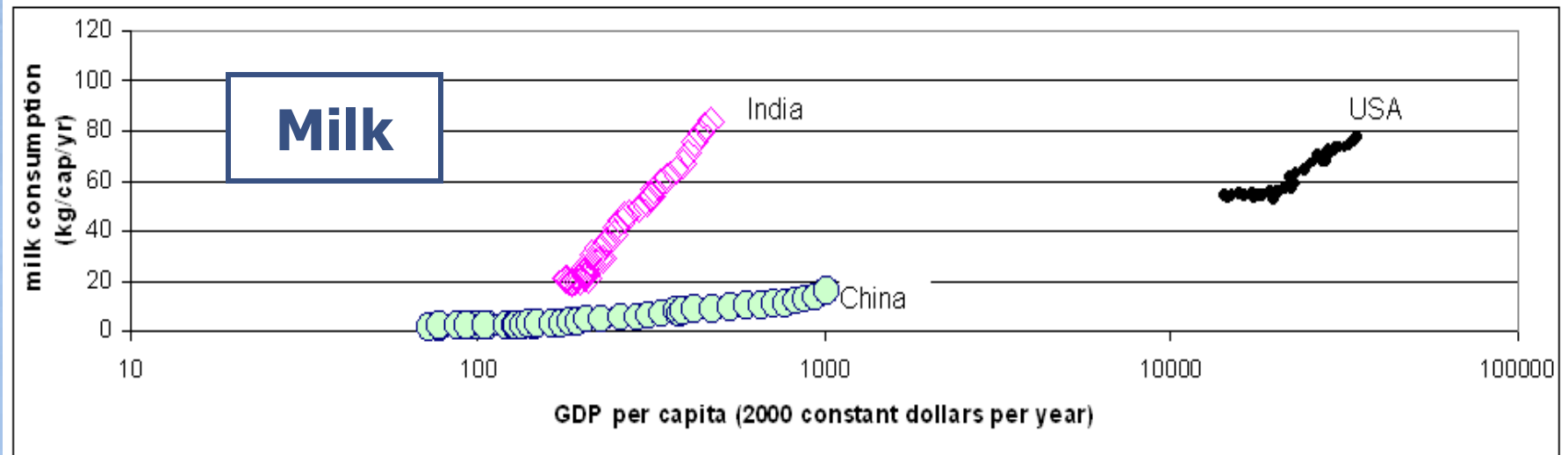
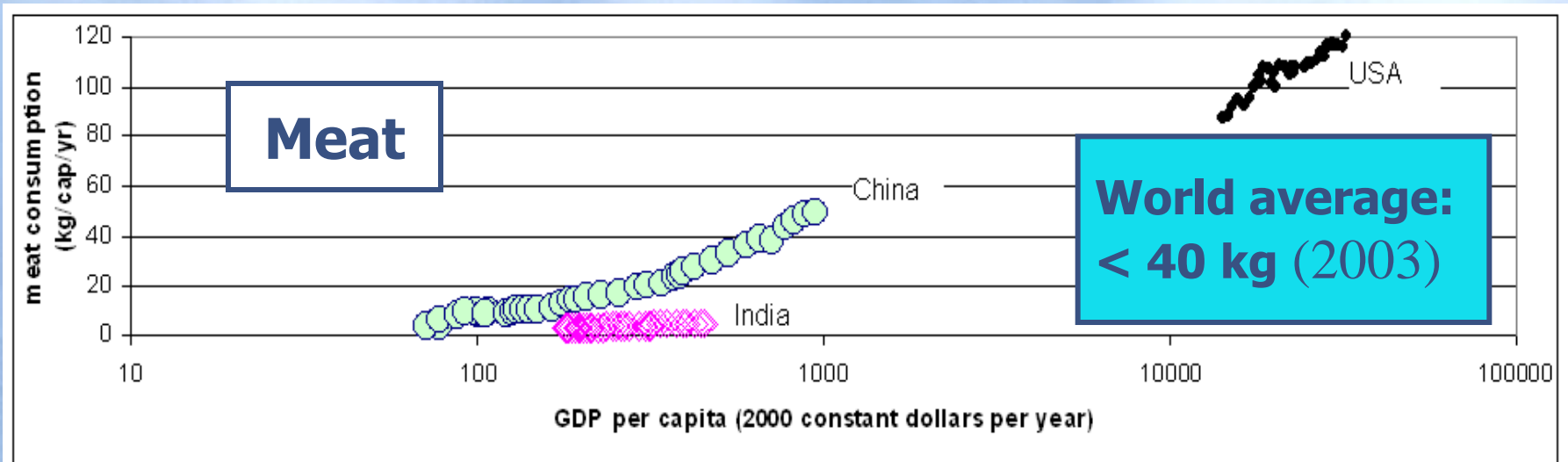
	population (billion)	GDP (billion \$, 2005 ppp)*	water withdrawals (km ³)
1800: (T. R. Malthus)	< 1	913 (1820)	
1900:	1.65		700
1950: just after WWI	2.5	7,006	
2000:	6	56,593 (2005)	3,500
2050:	9.2 – 9.5	193,318**)	?

Garry Becker: 1980 – 2007: World Real Gross Domestic Product grew by 3.4% annually on average

*) Hillebrand, E. 2009. "Poverty Growth, and Inequality over the next 50 years" Expert meeting on how to feed the World in 2050, FAO

***) Trend Growth projection

Meat and milk demand/supply & GDP growth, 1961-2000



Source: Charlotte de Fraiture, IWMI

Another 2-3 billion in a generation

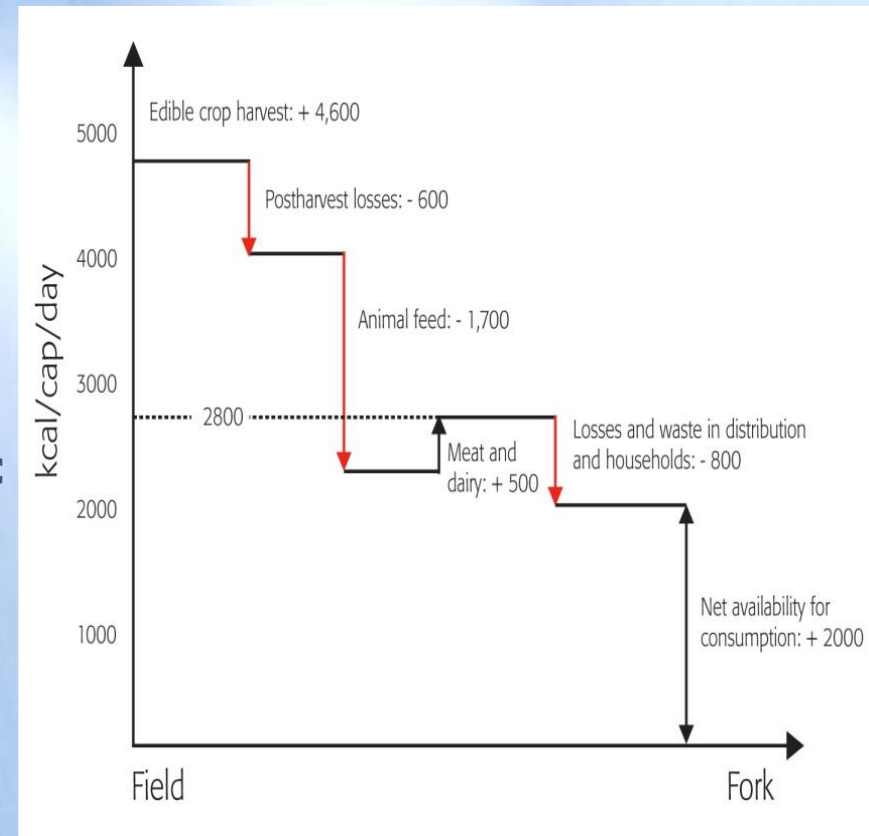
- with dreams
- want/demand/right to sense development



What Food for What Food/Nutrition Security?

- **Food production:** The amount in the field
- **Food supply:** The amount available on the market; production minus losses before market, conversion
- **Food demand:** The amount bought/procured by households, public institutions and other social entities
- **Food consumption:** the intake of food, i.e. the amount of food eaten

Losses, spoilage, conversions and wastage along the food chain



Losses & waste at a high cost

Monetary

US – estimated US \$100 billion annually

UK – calculated £ 10 billion annually of household waste (retail value)

Water - all food produced consumes water

Green house gas emission – from production throughout the supply chain, incl disposal

Income and security

Food prices, new demands and climate change



World Food Summit, Rome, June 2008:
"Boost production to ease the food crisis, says UN chief
Food production needs to rise by 50 per cent by 2030 to meet rising demand,"
Ban Ki-Moon

Climate change may reduce potential yields in SSA and SA by 30% by 2030 (Lobell *et al.* 2008 in *Science*)
Temperature increase may reduce yields of corn, soya beans and cotton by 30 – 46% in the US in a century (Schlenker & Roberts, *PNAS*, 2009)

"One Country's Table Scraps, Another Country's Meal",
NYT, May 18, 2008



112 pounds of food waste per month for a family of four

Given:

- Scarcity/bubbles/bankruptcy/stochastic character/...
- Competition for water and land for non-food supply
- Very high energy input agriculture is not replicable
- High rates of losses and waste of food
- Environmental implications of food production....
- Overeating >>undernourishment

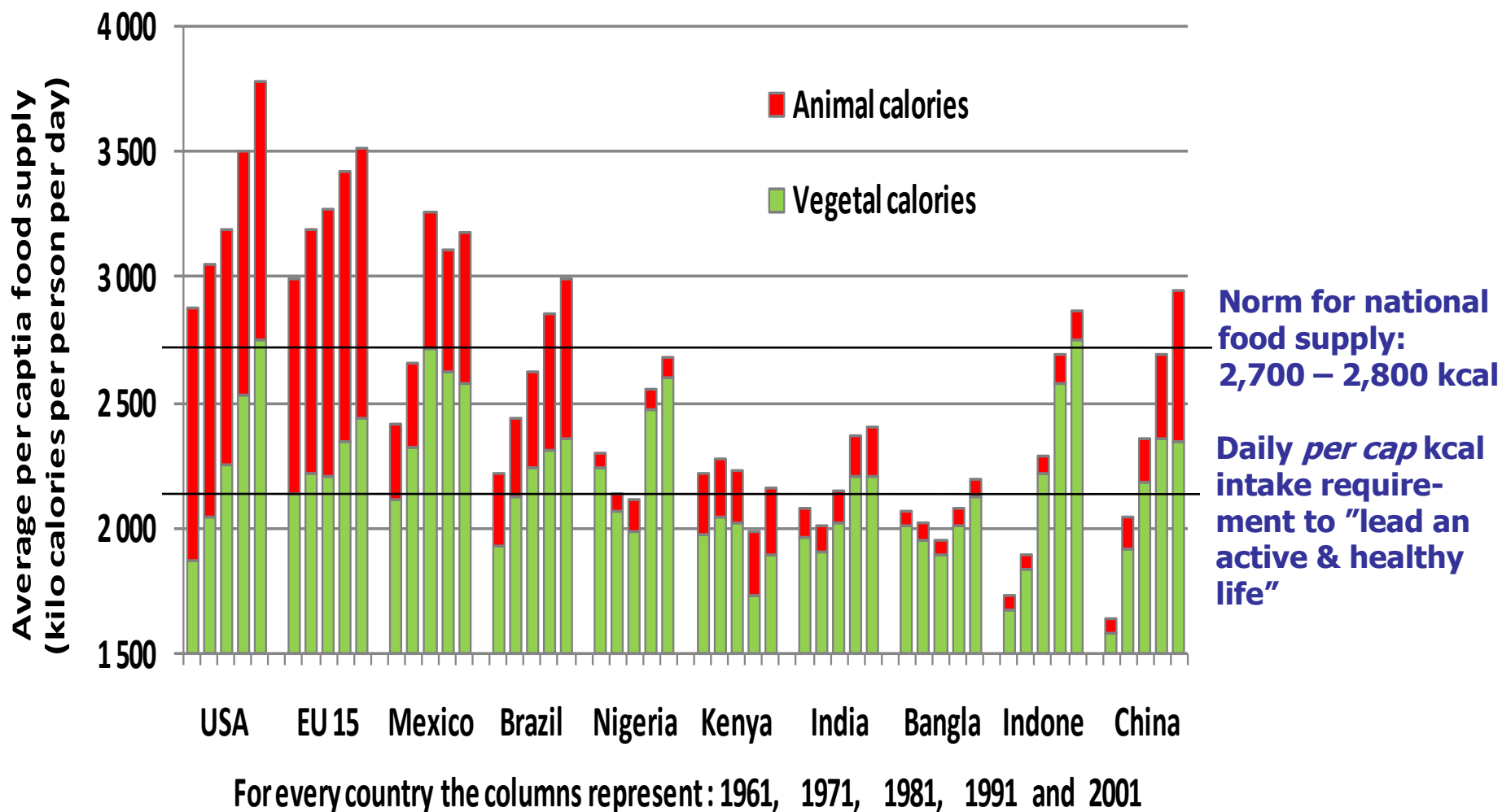
What is a sensible strategy for water and food security?

"Enough is enough – tonight, the bonus bubble burst"

(Swedish Prime Minister Fredrik Reinfeldt on

behalf of 27 EU Heads of State, September 16, 2009)

WIDENING GAP: FOOD SUPPLY - FOOD INTAKE REQUIREMENTS



Source: Mats Lannerstad, Linköping

Food Security ...

" ...exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life" Rome Declaration (FAO, 1996)

- How much is "sufficient"?

2,000 – 2,200 kcal/person, day on average

- What to do when preferences deviate from "sufficient"?





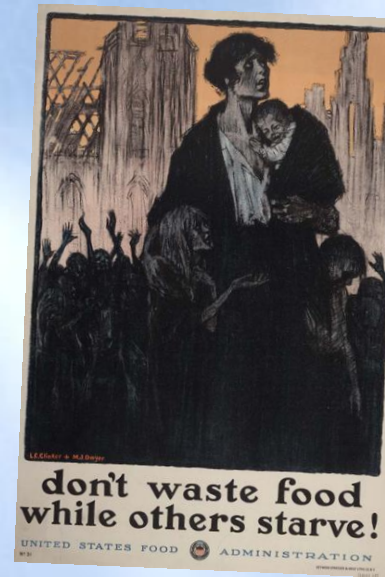
Value of water and value of food

A dollar could buy

- 1,200 kcal of potato chips
- 875 kcal of soda
- 250 kcal of vegetables
- 170 kcal of fresh fruit

More expensive to keep thin and to go for a healthy diet

Another perception and policy a generation or two ago



WRAP study (UK): HHs throw away 1/3 of the food they have bought, 60% of which is "perfectly fit for consumption"

Swedish school children throw away more of the food they like

Who will push the new agenda to deal with bubbles?

Scientists?

Politicians/policy makers?

The person in the street?

The corporate sector?

The young/next generation?

Media?

Keeping in mind:

- Doers
- Investors
- executing complex and unpopular decisions
- mobilise support & compliance

Increased efficiency of the rains
Better seeds, fertilizers & tools
Harvest and post harvest techn.

Food processing, value added
"Contract" farming
Reduce losses and waste
Consumption "adjustments"

A long, straight asphalt road stretches into the distance in a desert landscape. The road is flanked by dry, brownish-yellow terrain. In the background, there are low hills and a clear blue sky. The road has a dashed white line down the center and solid white lines on the edges. The overall scene is a vast, open desert under a clear sky.

Where is
the road ahead?