

# Metropolitan Food Security

SADC Ambassadors Lunch

Sanec

*Wittenburg, Wassenaar 23 rd of May 2013*

Ate Oostra  
Chairman MFS Foundation

Twice as Much Food – Twice the Quality  
Half the Resources



# Outline

- ▶ Global Food Security Challenges
- ▶ Introduction **Metropolitan** Food Security (MFS)
- ▶ **Netherlands AgroFood & Technology Centre (NAFTC)**
- ▶ **NAFTC's in AFRICA**



# Challenge 1: Scarcity of Food

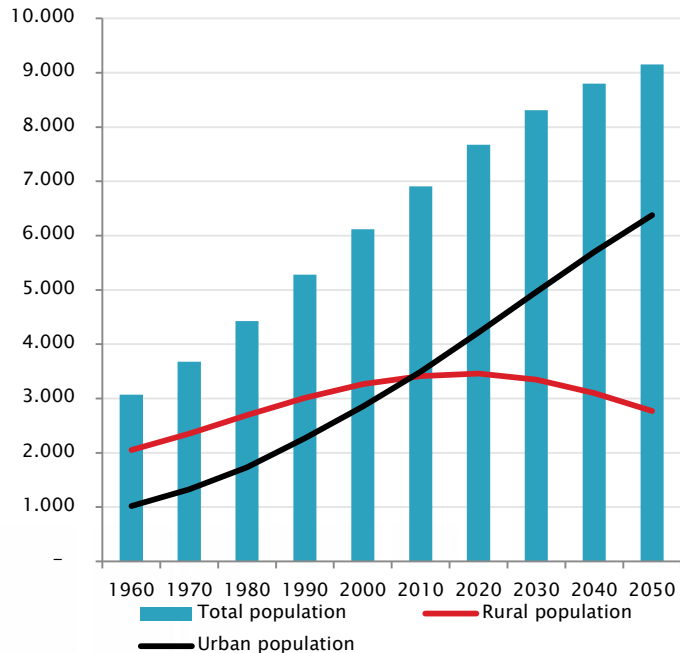
Globally, increasing demand puts higher pressure on local food systems

- ▶ Population Growth (9 billion inhabitants in 2050 ?)
- ▶ Growing purchasing power--> diet change in favor of (animal) proteins
- ▶ Climate Change (droughts, floods etc...) will enhance the need for sustainable food production practices.
- ▶ Cost and availability of raw materials, energy, water, and arable land will enhance the need for efficient food production practices

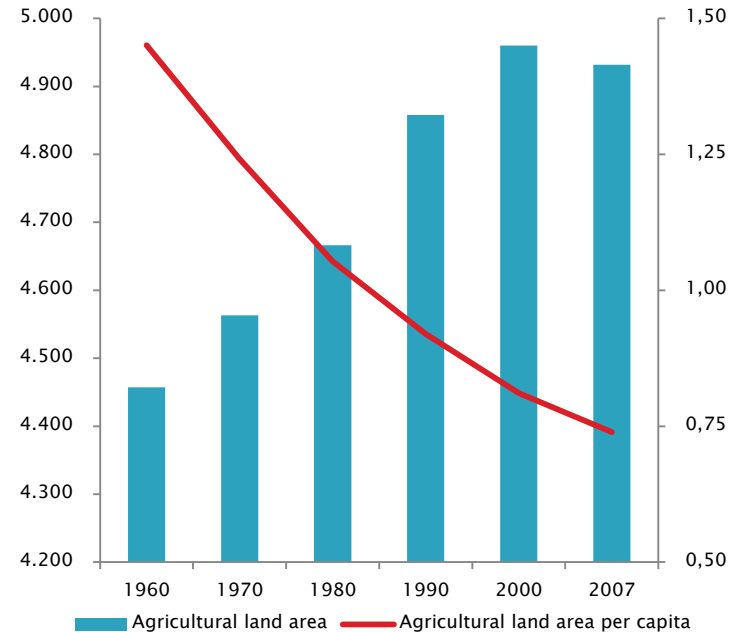


# More people, Less land

Global population (in millions)



Agricultural land (1,000 ha)

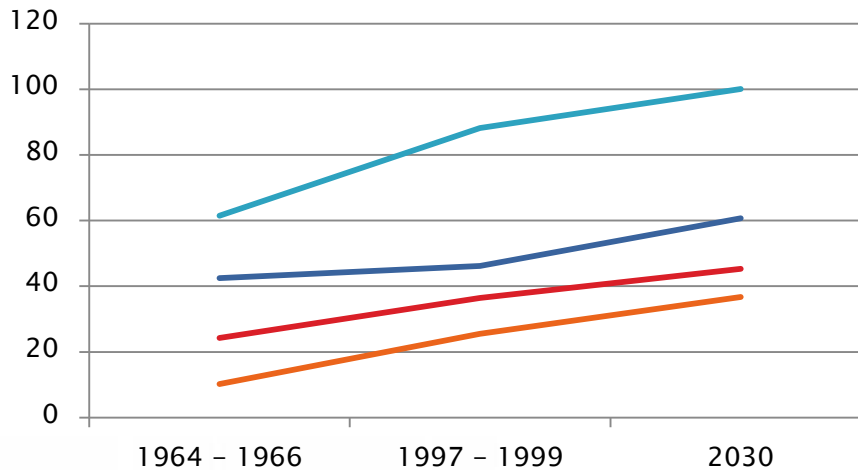


90% of population growth will occur in  
**Sub-Saharan Africa** (one billion or 49%)  
and Asia (900 million or 41%)

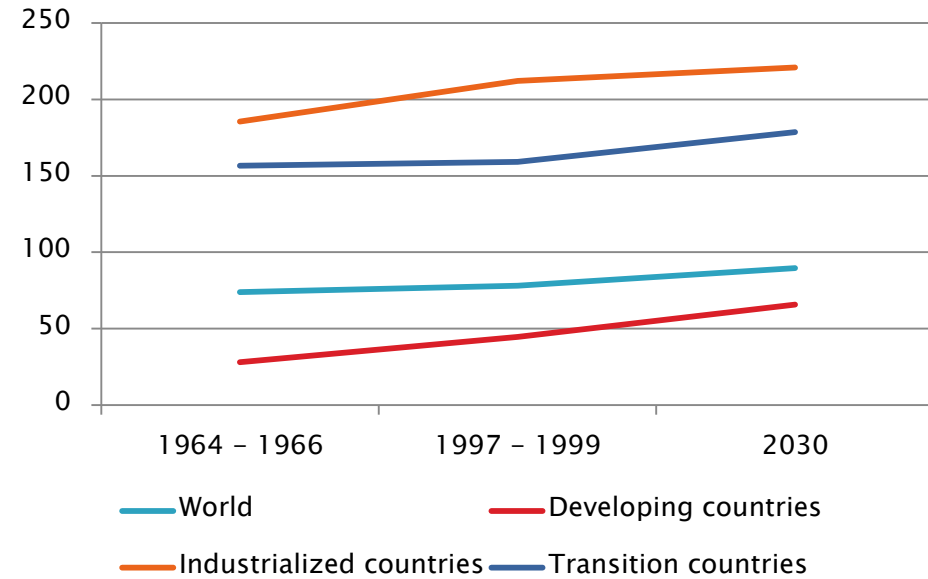


# Changing consumption patterns

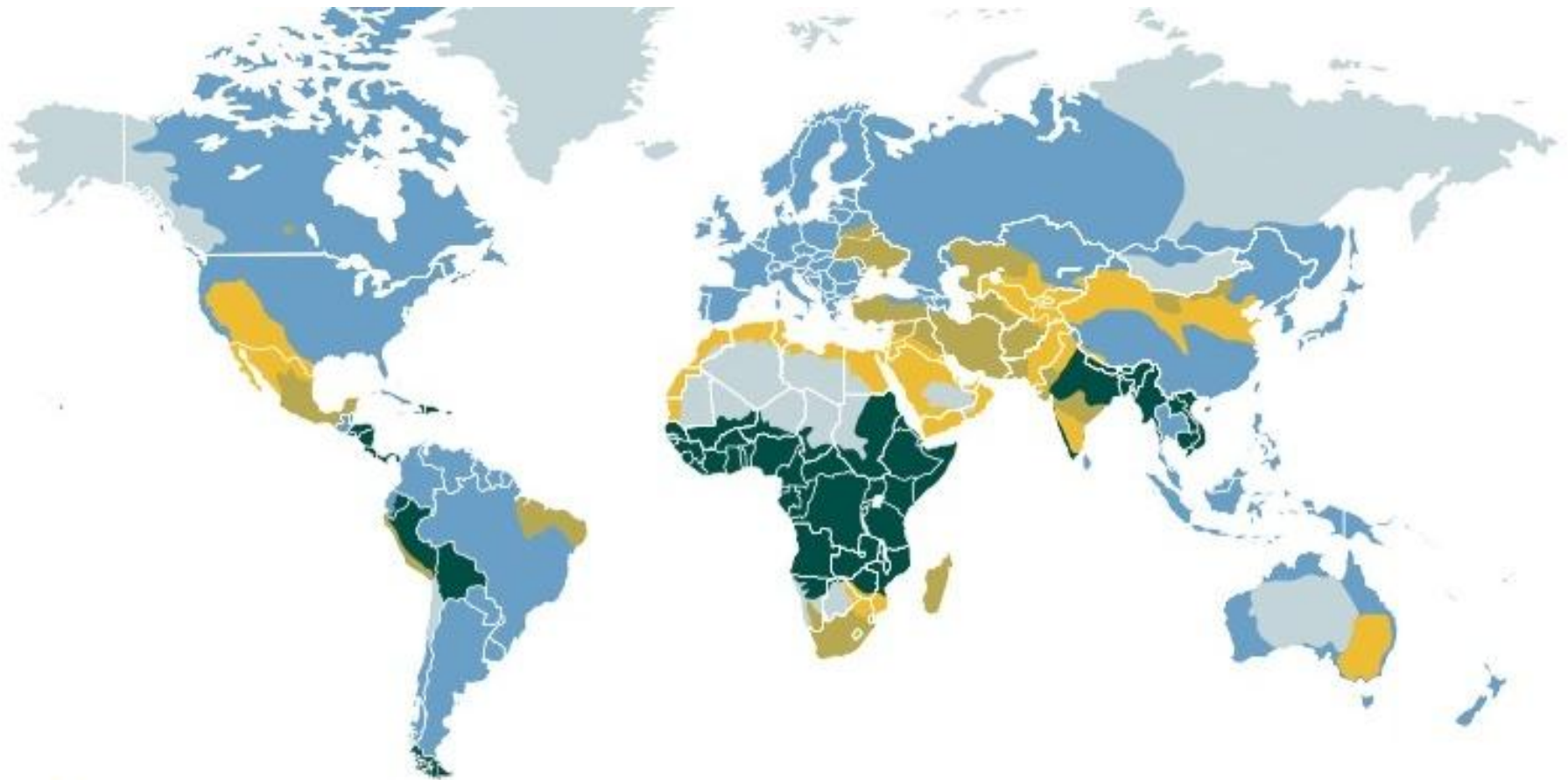
Per capita consumption meat (kg/year)



Per capita consumption milk (kg/year)



# Water, Ecology & Weather



- Voldoende water beschikbaar. (Dit betekent niet dat er geen tijdelijke droogte op kan treden.)  
Sufficient water available. (Temporary drought can occur)
- Water scarcity expected in the future (More than 60% of available water is being used)
- Physical water scarcity. (More is used than responsible. Future water supply in danger.)
- Economic water scarcity. (Sufficient water available, but men and means lack to make maximum use of it)
- No data known.



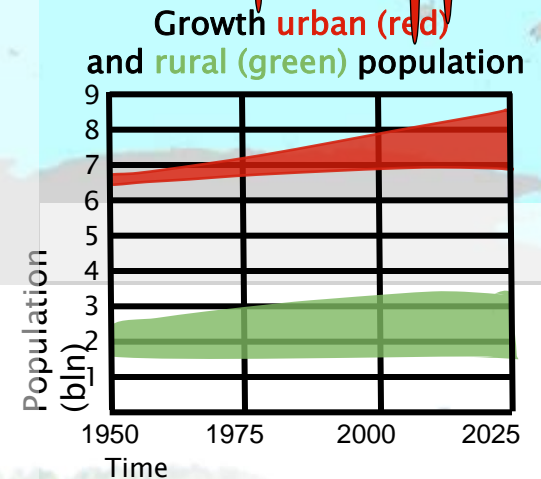
# The world is urbanising

Stichting Onderzoek Wereldvoedselvoorziening van de Vrije Universiteit

Population Density  
Inh./km<sup>2</sup>

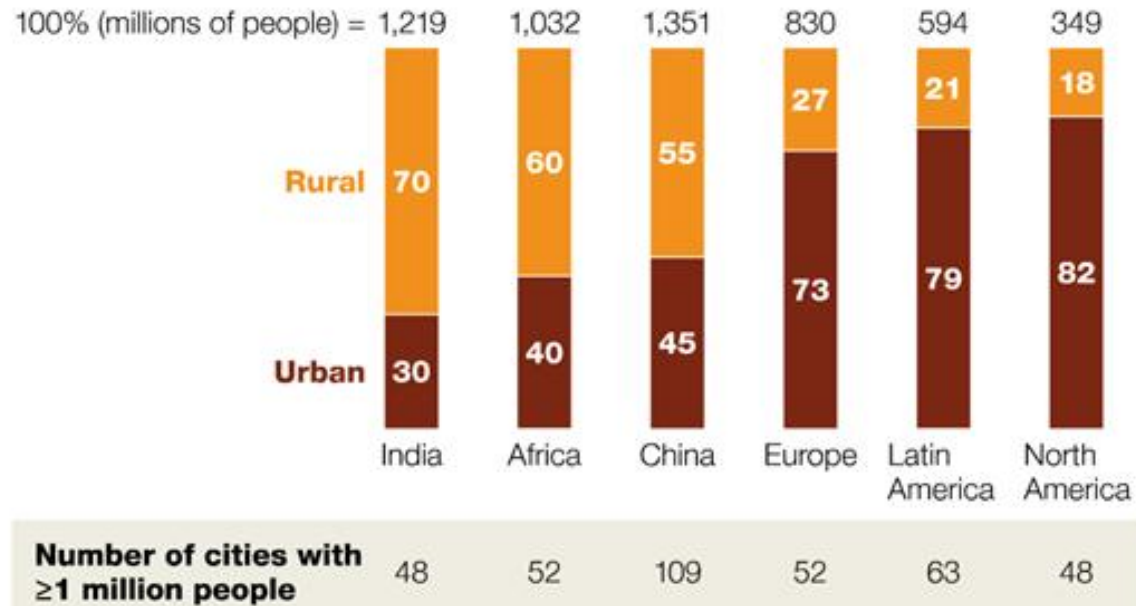


- Metropolises are the nodes of the 21<sup>st</sup> century network economy
- Agro production is in transition towards metropolitan agriculture
- The distinction between urban and rural areas within metropolises is vanishing
- Spatial organization of industrial agro production systems is still based on traditional land dependant forms



# The World is Urbanizing

Share of population by region, 2010, %



Source: United Nations; McKinsey Global Institute analysis

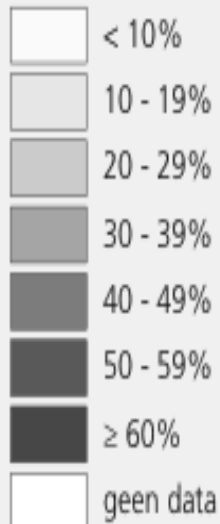




# The World is Urbanizing

## Urbanization level (%) in Africa

### urbanisatiegraad

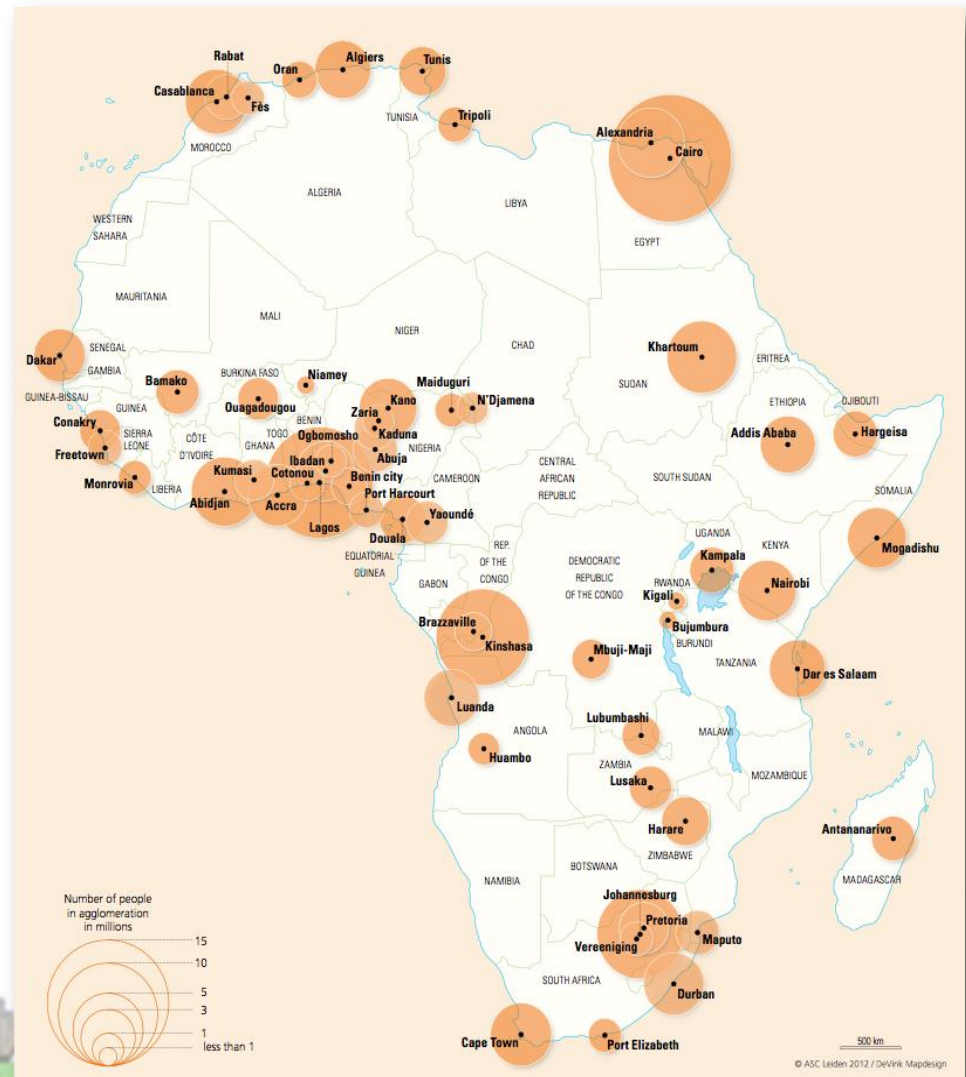


bron:  
1960: World Bank  
World Development Report 1983  
2007: World Bank  
World Development Indicators 2010

# The World is Urbanizing

## Africa

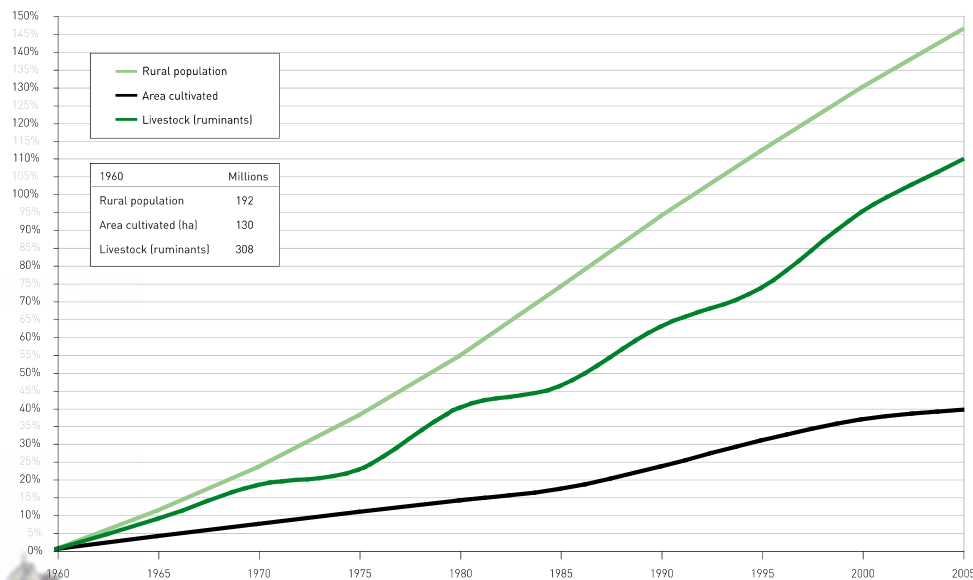
From a Continent of States  
to a Continent of Cities



# The Growing Wedge

## Agricultural growth lags behind on economic growth

Figure 2 Growth of rural population, cultivated and livestock in sub-Saharan Africa, 1960–2005



Note: Growth is expressed in percentage change from 1960.

Source: FAOSTAT (2007).

Rural  
population

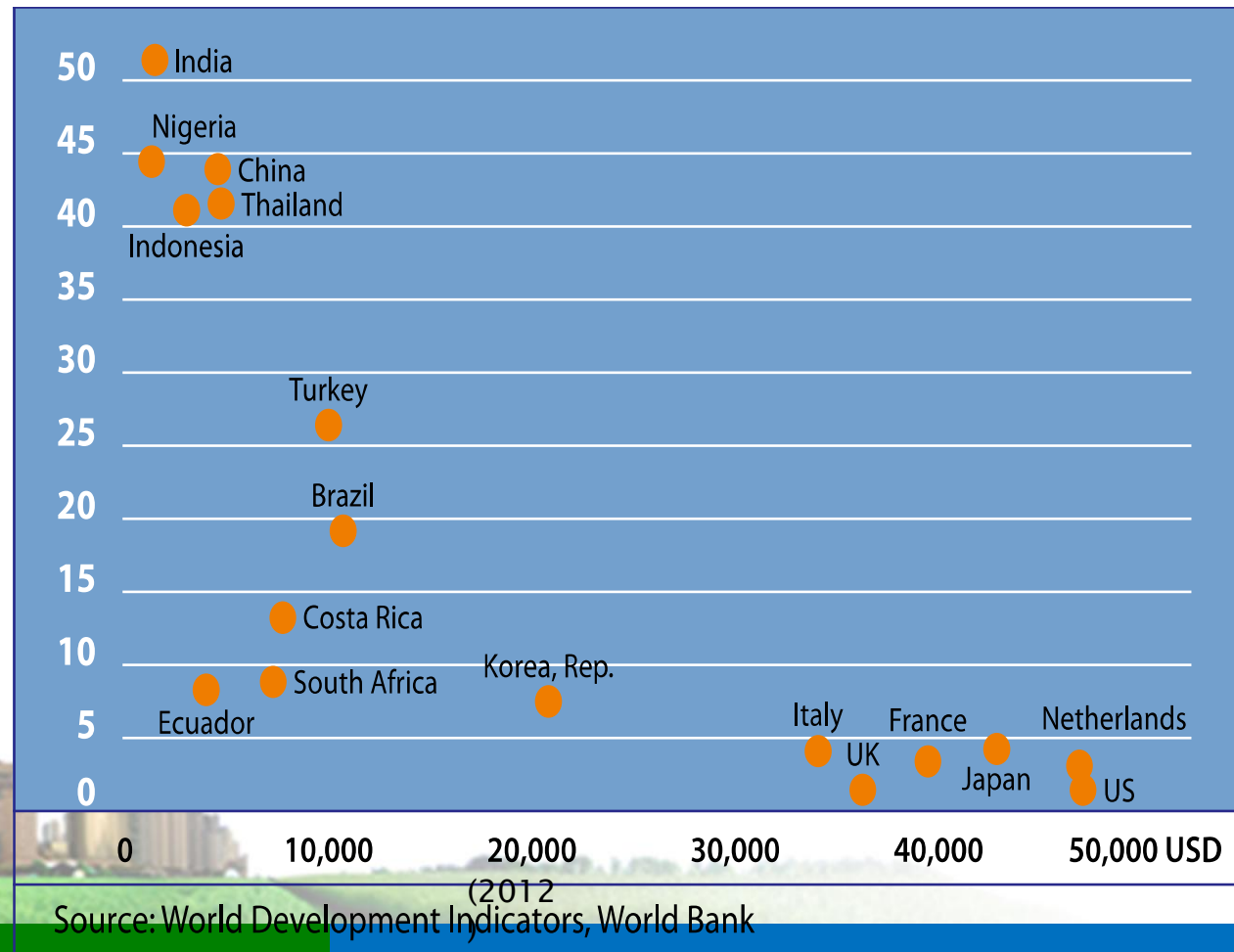
Area cultivated

Livestock  
(ruminants)

Jump in agricultural productivity is necessary to meet growing demand of middle class.  
Still, there will be growing import of agricultural products.

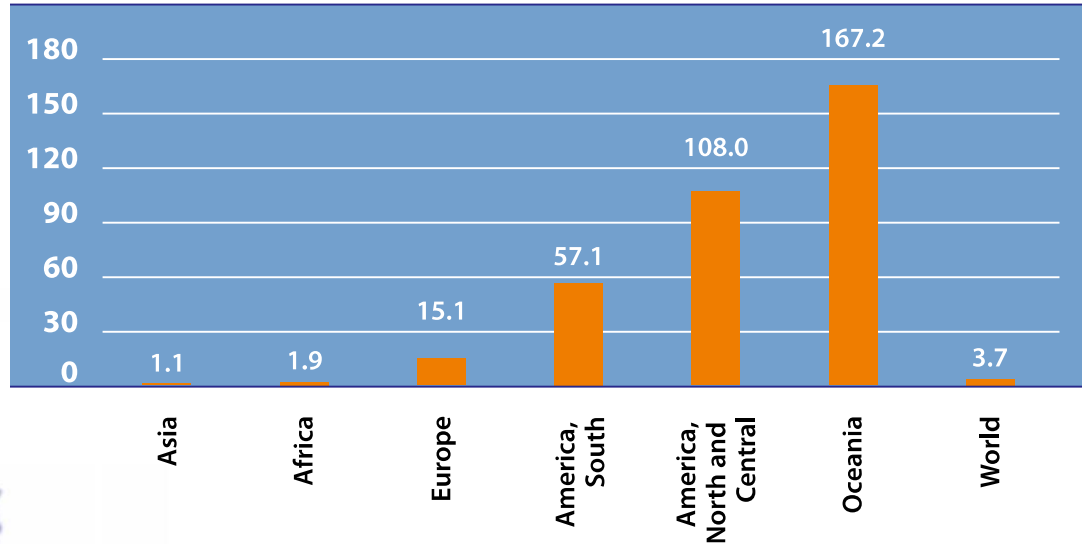
# Agricultural Employment

Employment (2007) in agriculture (% of total employment) (y-axis) and GDP per capita (x-axis); average 2007–2010



# Agricultural Business Development

## Average farm size by region (in hectares)



Source: 2000 World Census of Agriculture - FAO<sup>8</sup>

**Needed: Education, financing, technology and.. young entrepreneurs!**

# Social Transformation

## Social Transformation

- Rapid urbanisation > radical transformation of lives > driver and consequence of economic growth.
- Rural remoteness > urban centrality
- Breakdown of social & economic village structure(s) > frantic individual search for replacement > energy emerging in spaces left empty (not created) by government.
- Disappearing old rural networks > individual actors > “fend for yourselves” > surge for individual entrepreneurship (creating individual businesses)





# Economic growth for 75% result of performance emerging economies

## Emerging 440 cities are poised to deliver close to half of global GDP growth

Contribution to global GDP and GDP growth  
%

- Emerging 440
- Other emerging large cities
- Emerging small cities and rural areas
- Developed 160
- Other developed large cities
- Developed small cities and rural areas

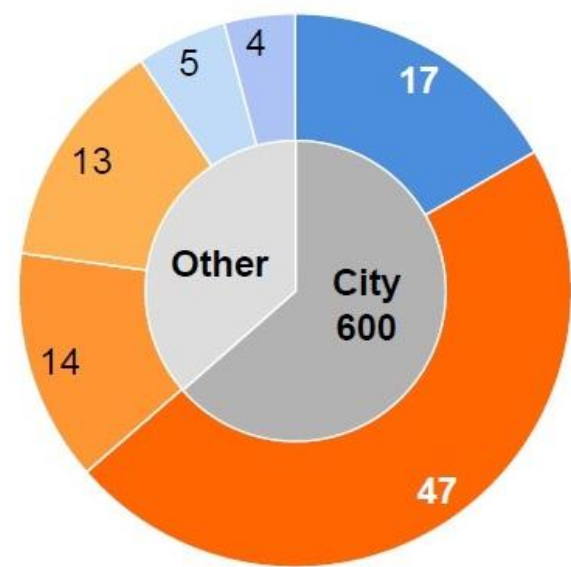
### GDP, 2010

100% = \$63 trillion RER<sup>4</sup>



### GDP growth, 2010–25

100% = \$50 trillion RER<sup>4</sup>



## Challenge 2: -deliver quality food to the consumer

- ▶ **Economic and demographic trends drive up food demand:**
  - Impact on water, land, natural resources
  - Environment
  - Social-political impact ('Arab spring')
- ▶ **Solutions**
  - Reduce inefficiencies and (post harvest) losses
  - Put sustainable food production centrally
  - Embrace technology to scale up production and enhance efficiency
  - Help city economy and hinterland to interconnect



# Consumer Preferences > Diversification

## Diversification of demand in Metropolises: From food to fashion to pharmaceuticals



### Pharmaceuticals

*Functional foods,  
Pharmaceuticals*

### Fashion

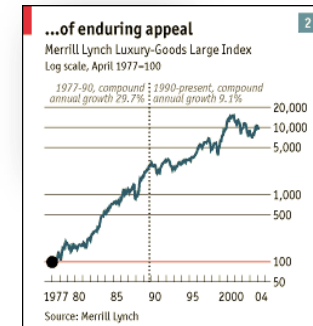
*Flowers, Flavors,  
Fragrances*

### Food

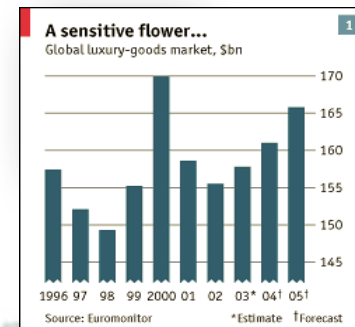
*Fodder, Food Crops,  
Vegetables, Fruits*

### Energy

*Fuel, Fibers*



*A 100-fold increase  
between 1977 and 2005*



*World spending on luxury  
goods in 2005: US\$ 165  
bln*

# Consumer Preferences > Function of Food

## Function of Food

- **WHAT**                      **Calories → "experience" → nutrition & health, variety**
- **WHEN**                    **Regular → grazing and snacking**
- **WHERE**                   **In-home → out-of-home**
- **WITH WHOM**           **Social → individual**
- **HOW PREPARED**      **From scratch → ready-to-eat, heat and eat**





# Agro-Food Essentials

Improving Retail and Food Service Supply

Shift of power to retailers and food service sectors:



WAL★MART



Carrefour



sodexo



Closest to the consumer, Multi-channel strategy, Vital marketing information, 70 – 80% Buying decisions at P.O.P., Co-marketing

# *Food imports, rural or urban production?*

## considerations:

### ▶ Imports:

- Trade barriers: customs duties – phytosanitary regulations – deviating standards – non-tariff barriers
- Lack of transparency in regulations

### ▶ Rural Production

- depending on land size, reliable infrastructure, respect for quality standards

### ▶ Urban Production:

- Close to consumer, dilemma: production push/demand pull
- From farm to fork or fork to farm?

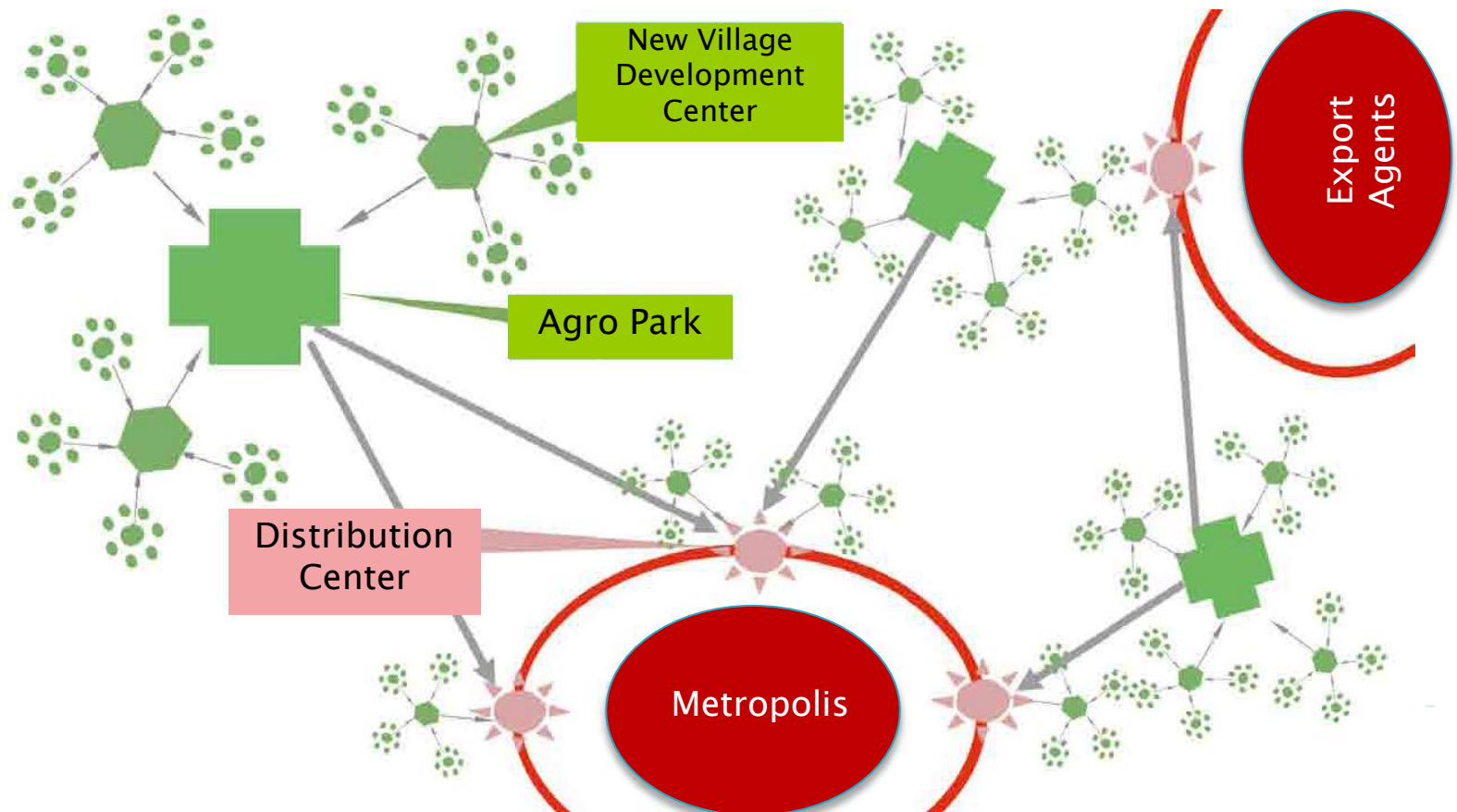




# Agro-Food Hub Essentials

Supply Chain Development & Integration

## Intelligent Agro Logistics Networks



Source: 'Agricultural Eco-Valley, Beijing China, Conceptual Master Plan, DHV - GMV - WUR (2011)

# Agro-Food Hub Essentials

## Freshpark Venlo



Source: 'Agricultural Eco-Valley, Beijing China, Conceptual Master Plan, DHV - GMV - WUR (2011)

### **Freshpark Venlo (The Netherlands):**

Consolidation centre of 120 ha with controlled storage space, cross-docking stations, processing facilities, service providers, auction halls. Here, over 100 enterprises are located.

# Challenge 3: position of the Netherlands

- ▶ **Worlds second exporter of 'green' products (after US) in terms of added value**
- ▶ **Destination: 60 % within competitive EU market**
- ▶ **Result of interaction between hardware, orgware and software**
- ▶ **In breeding (input materials), production, logistics and coherent supply of technology**



# Market lead

- ▶ Knowledge (Wageningen UR, Univ.Utrecht, Maastricht)
- ▶ Share in EU Framework Programme
- ▶ Seed production, genetics
- ▶ Propagation materials for animals, vegetables, potatoes
- ▶ Processing: widely known multinationals (Unilever, Heineken)
- ▶ Machinery and production equipment:
  - poultry processing, egg handling, potato handling and processing, bakery, cheese processing



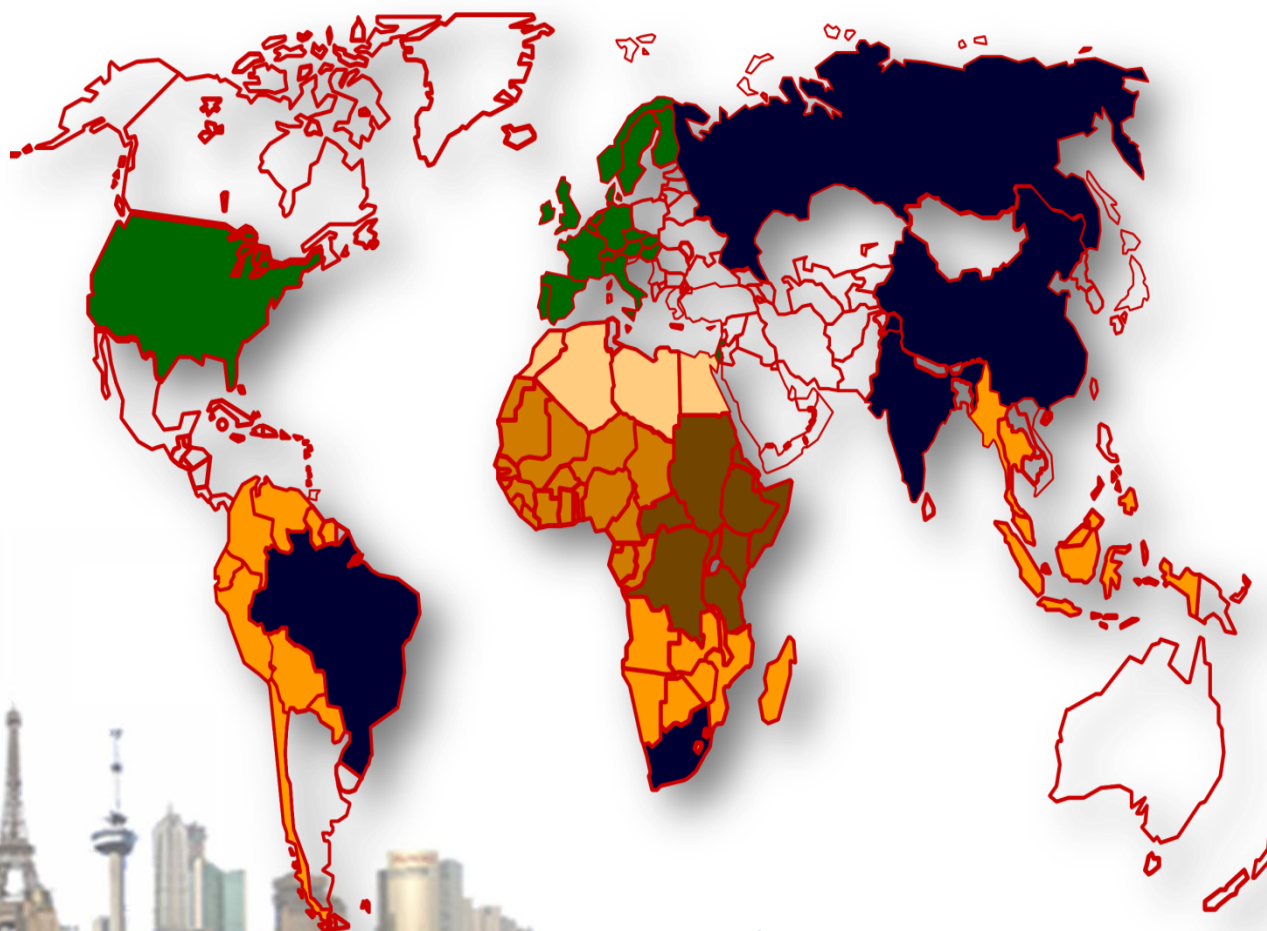


## Twice as Much Food - Twice the Quality - Half the Resources !

### International Organisation:

- Provision of input, know how and network access also locally by counterparts:
- Industries, Academia & Education system, Governments and Thematic organisations
- Working Groups:





- Emerging: Brazil, Russia, India, China, Southern Africa
- Frontier: Northern, Eastern, Western Africa, South East Asia, South America
- Innovation: Western Europe, USA, Israel

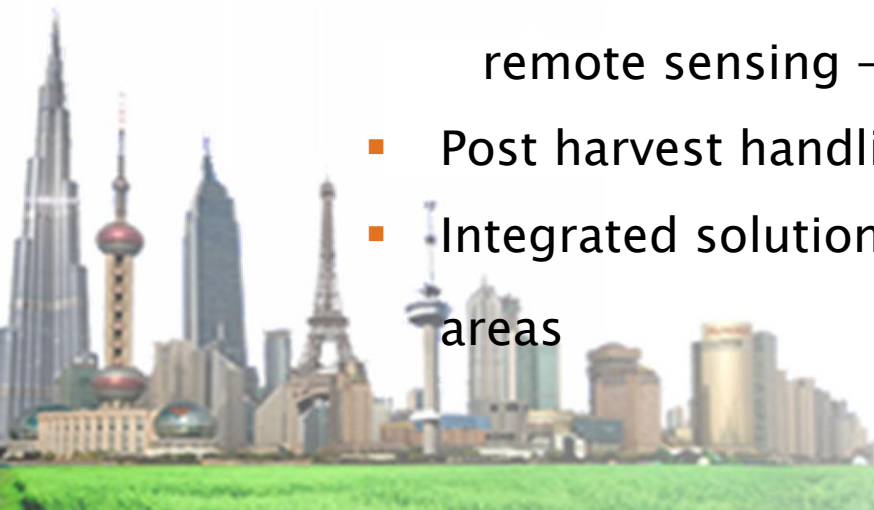


## 4 Offices

- Southern, Eastern, Western (possibly Northern) Africa

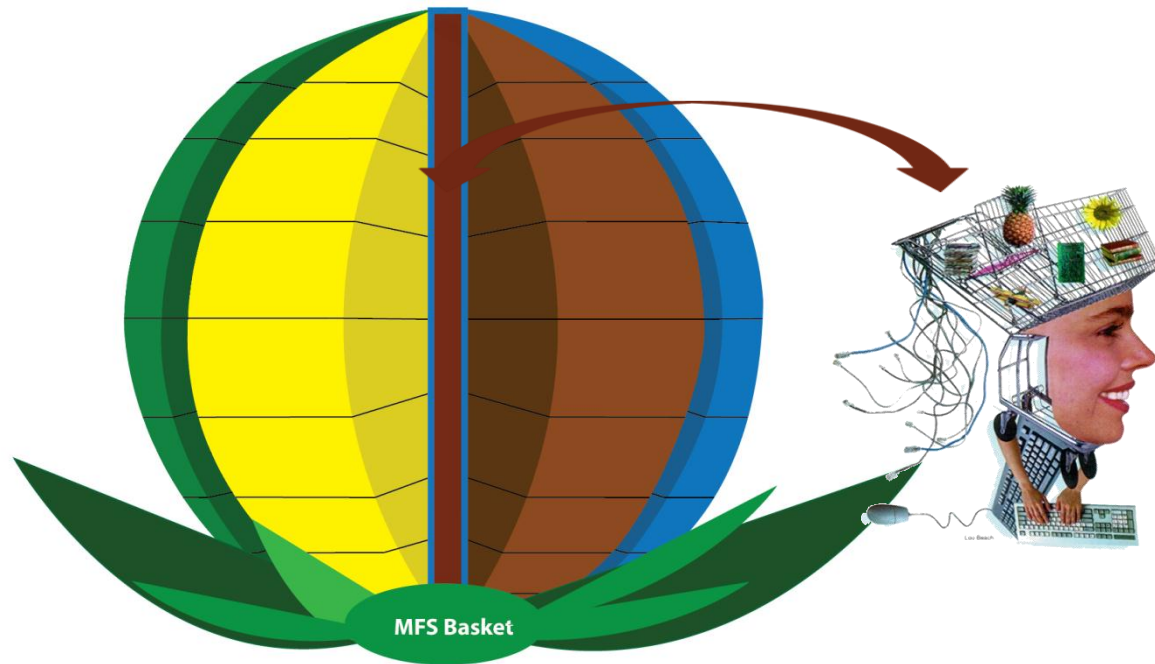
## 4 Focus Points

- Water, genetics and primary sector development  
("2x more, with 2x less")
- Hi-tech cultivation, open & closed systems  
remote sensing – crop management
- Post harvest handling, processing and logistics
- Integrated solutions for food security in rapidly growing urban areas



# Centers of Excellence

## Challenges for (Southern) Africa



Animal Proteines



Vegetable Proteines



Water



Carbohydrates



Vitamines



Ingredients

# MFS vision to approach food security

Hardware + Orgware + Software

POTENTIAL YIELD

- Education
- Training
- Coaching

ATTAINABLE YIELD

- Metropole
- Biobased Economy

ACTUAL YIELD

- Pest and diseases
- Entrepreneurial spirit
- Horizontal & vertical chain integration

AVAILABLE FOOD

- Post harvest losses
- Technologies
- Management
- Logistics

# Centers of Excellence

Hardware / Org.ware & Software

Hardware?	Orgware?	Software?
Contextual Relationships?	Implementation and Operation?	Knowledge management?
Infrastructure?	Business planning?	R&D?
<b>Centers of Excellence?</b>	Investment in Infrastructure?	Team development?
Trade facilities?	Types of consortia?	Management of emotions?
Production facilities?	<b>Stakeholders network?</b>	Communication?
Processing facilities?	External relations?	Marketing?
Industrial ecology?	Policy and Politics?	Branding?
Energy management?	Procedures and protocols?	Quality management?
Landscape and nature?	Licences and approval?	HRM?
Routing?	Supply chain management?	Education?
Design?	Project management?	<b>Capacity building?</b>
?	?	?
What can be held?	What can be organised?	What can be thought and felt?





# Conclusions

## Challenges in Africa

- Increase yields
- (Integrated) Supply chain approach
- Improve Market Value Chain
- Use technology (adapt mechanization for women and elderly)
- Create Brainports / Innovation Centers
- Private sector leading > farmers, food chain





# Conclusions

## Metropolitan Food Security

### Centers of Excellence:

- **Entrepreneurship:** Key to development and food security
- **Own experience:** Learning, building a sustainable knowledge base
- **Lead:** Private sector
- **Trust:** Power of Entrepreneurs
- **Concern:** Impact on small holders



► Thank You

