

Metropolitan Food Security (MFS)

SOUTH ASIAN HORTI CONGRESS

Latest technologies in Horticulture Crop
Linking market, research, processors and technology

Ir. Jan Hak

Co-Facilitator and supporter of Platform MFS
Entrepreneur, CEO QuaTerNes/Hak&Partners
President GMV: Association of Dutch food processing and packaging machinery manufacturers



Metropolitan Food Security (MFS)

Position

In 2050, the world population is estimated to reach 9.2 billion

Most of this growth will occur in urban areas of less developed countries

In 50 years, the world has to produce twice as much food with half the resources



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Climate Change

- **Length of growing period declines by 5% or more**

Across a broad area of the global tropics

Incl. Mexico, Brazil, Southern and West Africa, the Indo-Gangetic Plains and Southeast Asia

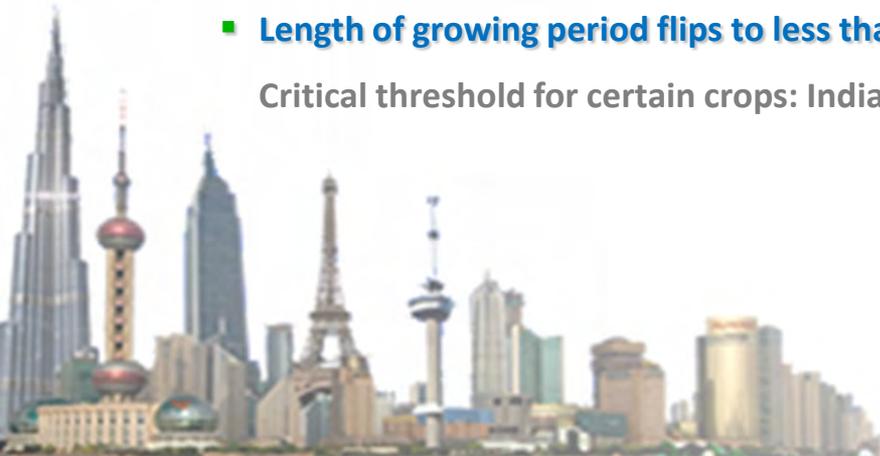
- **High Temperature stress (above 30 ° Celsius) will be widespread**

In east and southern Africa , north and south India, Southeast Asia, northern Latin America and Central America

- **Length of growing period flips to less than 120 days**

Critical threshold for certain crops: India, Mexico, Northeast Brazil, Southern and West Africa

(CCAFS report, 2011)



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Agenda

- **MFS, the challenge**
- **MFS , an introduction**
- **Food Security**
- **The M of MFS: urbanization trends**
- **Platform MFS: chain approach**
- **Performances in processing technology and products**
- **Ambitions with market led approach**
- **Innovations in cooperation, research and education**



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The Netherlands as 'Food Valley'

Home country of World Leading Food Technology companies

- EUR 67 billion turnover (2011) in agri-food products and EUR 58 billion in horticulture
- World leading country in food production
- 4.150 Companies - 137.000 staff (2008)
- One of every six employees works in the food-industry
- 80% Turnover comes from large companies
- An average business consists of 26 labour years and a turnover of EUR 13 million



Metropolitan Food Security (MFS)

The Netherlands as 'Food Technology Valley'

Home country of World Leading Food Technology companies

EUR 5,3 billion turn-over (2011) in agri -
technology processing equipment and
research

- 80% Poultry systems
- 70% Cheese systems
- > 50% Potato systems
- Etc.



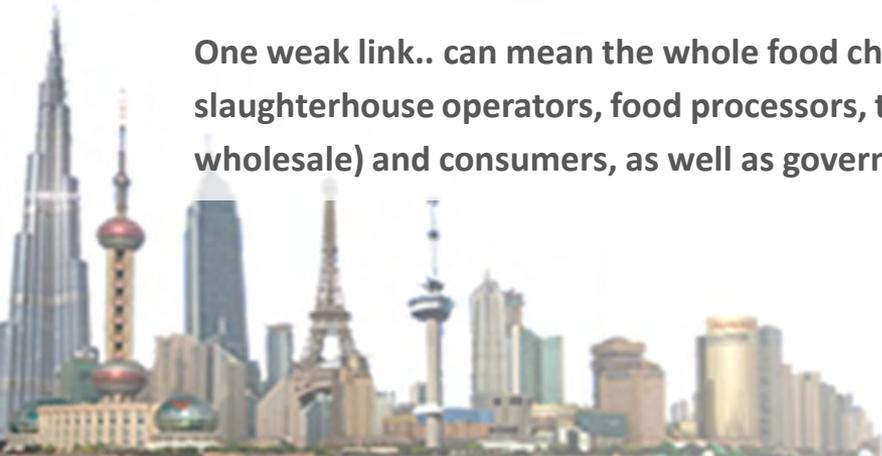
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MFS, the challenge

***In 50 years, the world has to produce
Twice as Much Food with half the Resources***

The challenge is to strengthen each and every link in the complex process of food reaching the consumer – from the way it is grown or raised, to how it is collected processed, packaged, sold and consumed.

One weak link.. can mean the whole food chain collapsing. Stakeholders include farmers, fishermen, slaughterhouse operators, food processors, transport operators, distributors (both retail and wholesale) and consumers, as well as governments obliged to protect public health' (FAO)



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MFS, an Introduction

Food Security defined:

(1996 World Food Summit)

“A situation exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life”.



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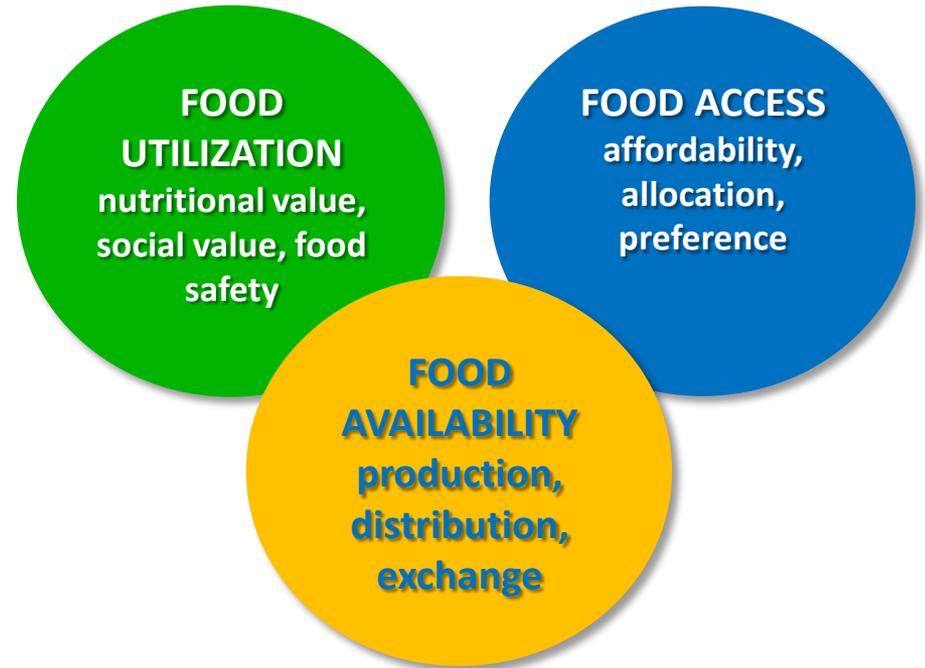
Food Security

Rests on:

(Barret, 2010)

“Starvation is the characteristic of some people **not having enough** food to eat. It is not the characteristic of there **being not enough** food to eat. While the latter can be a cause of the former, it is but **one of many possible causes.**”

(Nobel Laureate Amartya Sen, 1981)



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The M of Metropolitan

Over 50% of the world population lives in cities.

In 2050 it will be over 70%. The “endless city”: world’s megacities merge into “mega regions” home to more than 100 million people

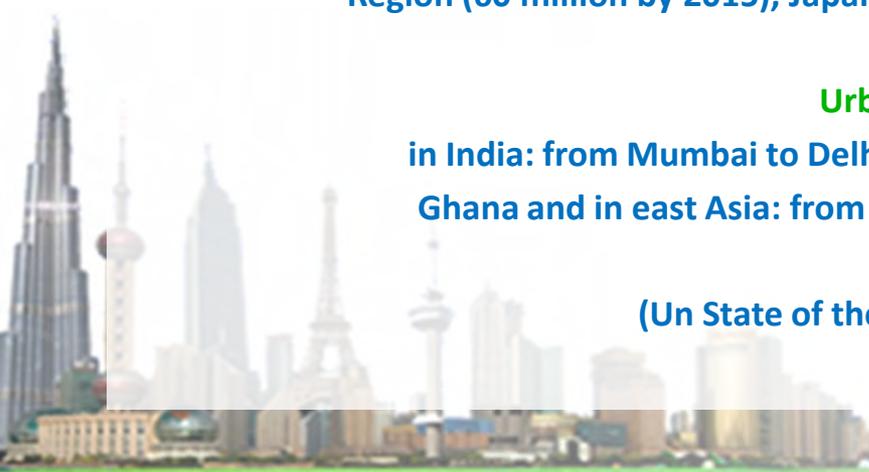
Mega Regions:

Hong Kong-Shenzhen-Guangzhou region (120 million), China Nagoya-Osaka-Kyoto-Kobe Region (60 million by 2015), Japan Rio de Janeiro – Sao Paulo (43 million), Brazil

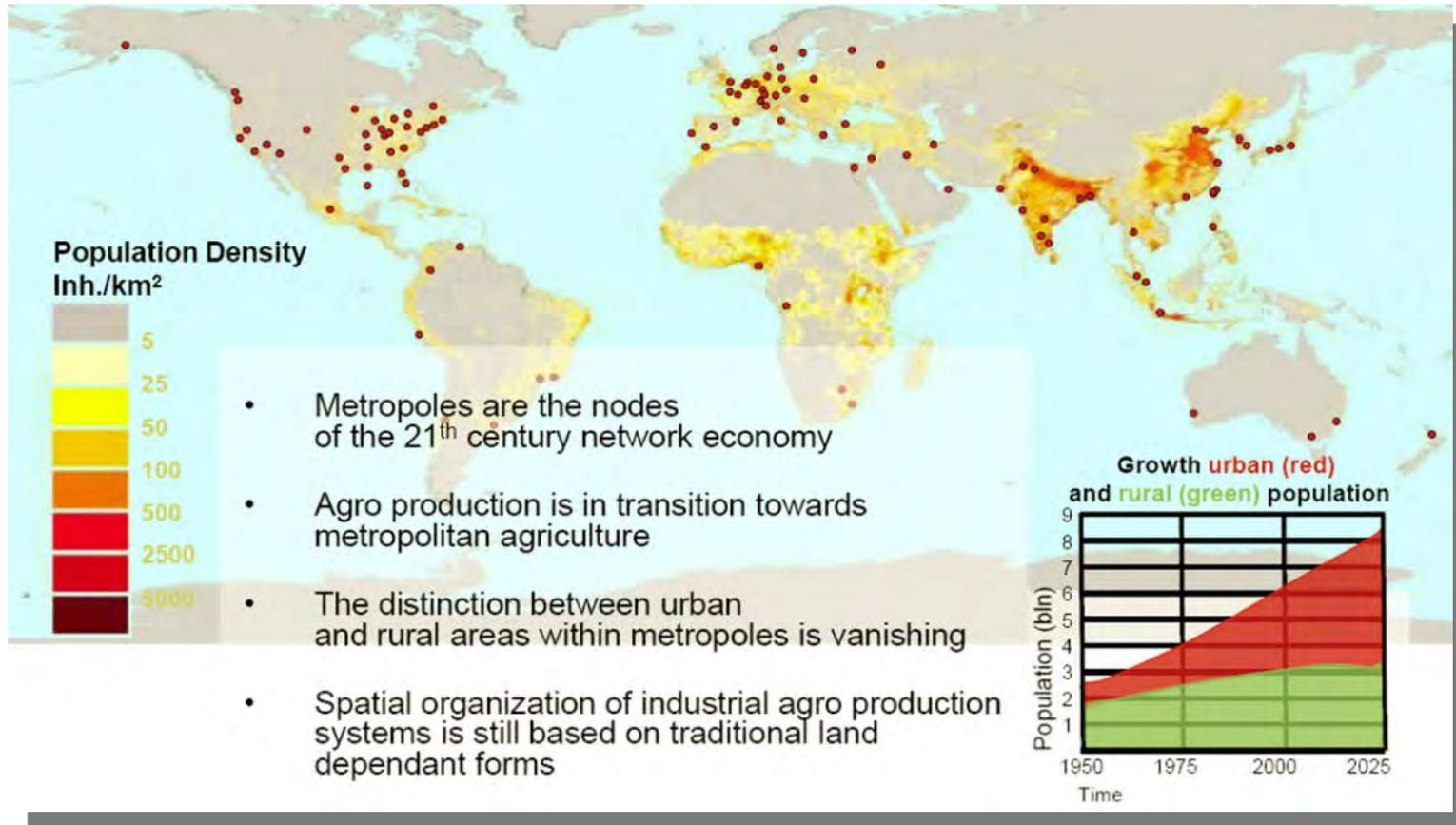
Urban “Corridors”:

in India: from Mumbai to Delhi, in West-Africa: Nigeria, Benin, Togo and Ghana and in east Asia: from Beijing to Tokyo via Pyongyang and Seoul

(Un State of the World Cities report, 2010)

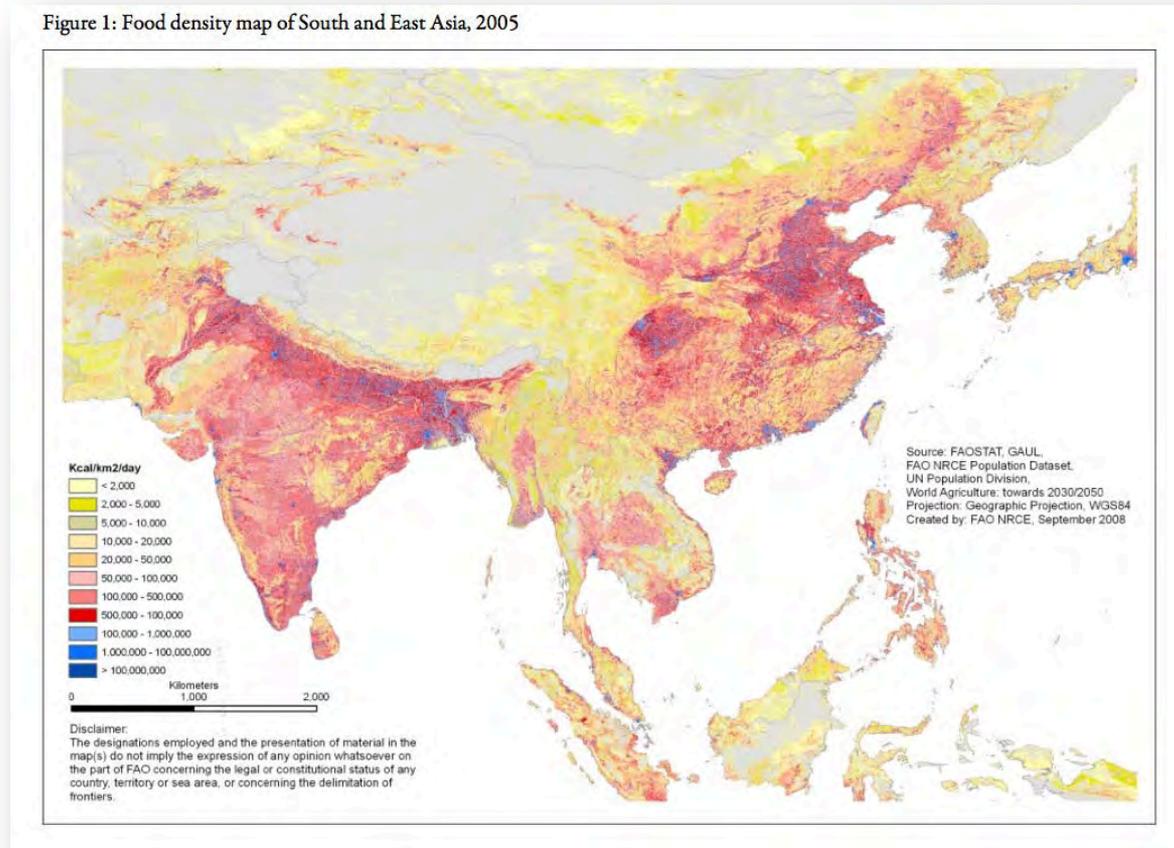


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Food Density map (Kcal / km² / day), 2005



Source: FAO (2009)

Metropolitan Food Security (MFS)

Food Density map (Kcal / km² / day), 2005

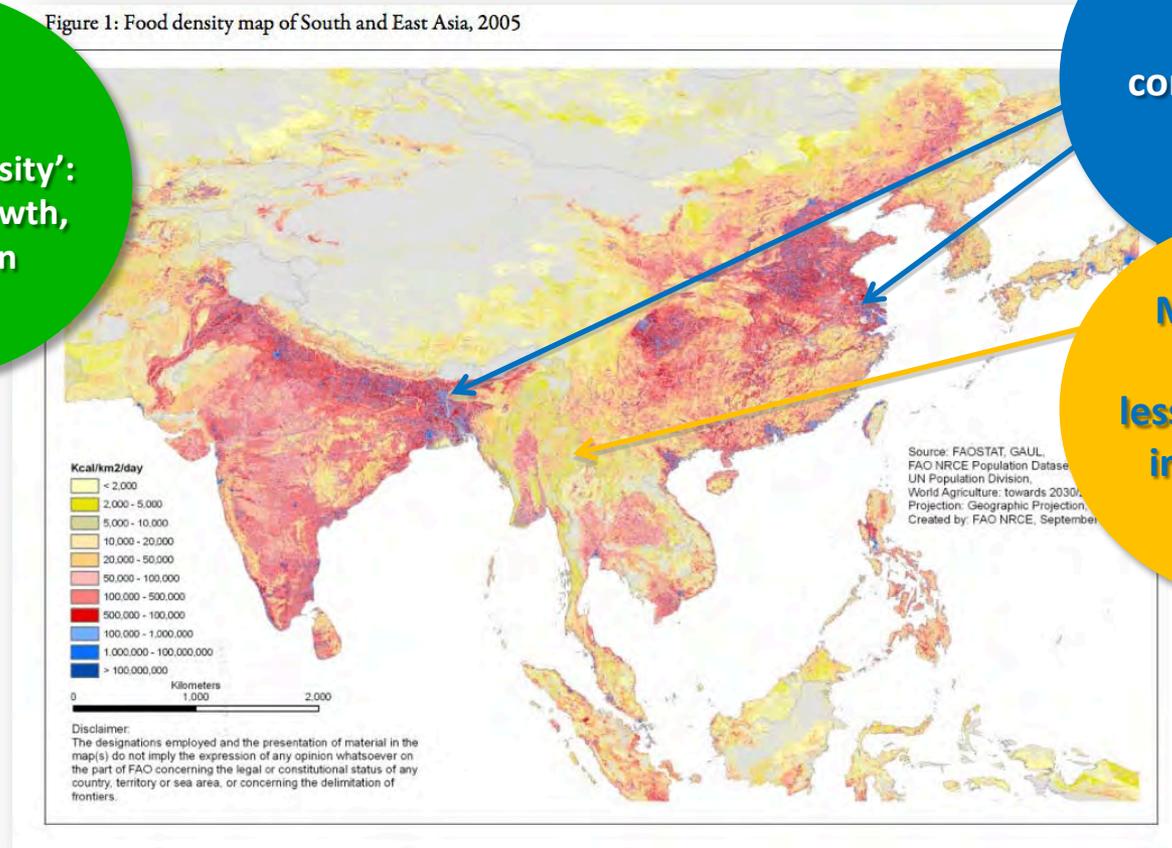
Figure 1: Food density map of South and East Asia, 2005

In 2050 :

High 'Food Density':
population growth,
urbanization

More blue:
concentration in
cities

More yellow:
less consumption
in the country



Source: FAO (2009)

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Cities and Food Security

The cities of the developing world are spectacularly ill-prepared for the explosion in urban living

(Van Ginkel, H., 2008 in FAO, 2009)



- Cities thirst for water: has to come from far places > pressures distant ecosystems, increases amount of dry zones in soils > increase migration to cities.
- Agriculture: Prime agricultural land converted into residential or industrial areas.
- Transport: more and more food will have to be transported to and distributed within cities > infrastructure insufficient > stable supply can be jeopardized.

(FAO, 2009)

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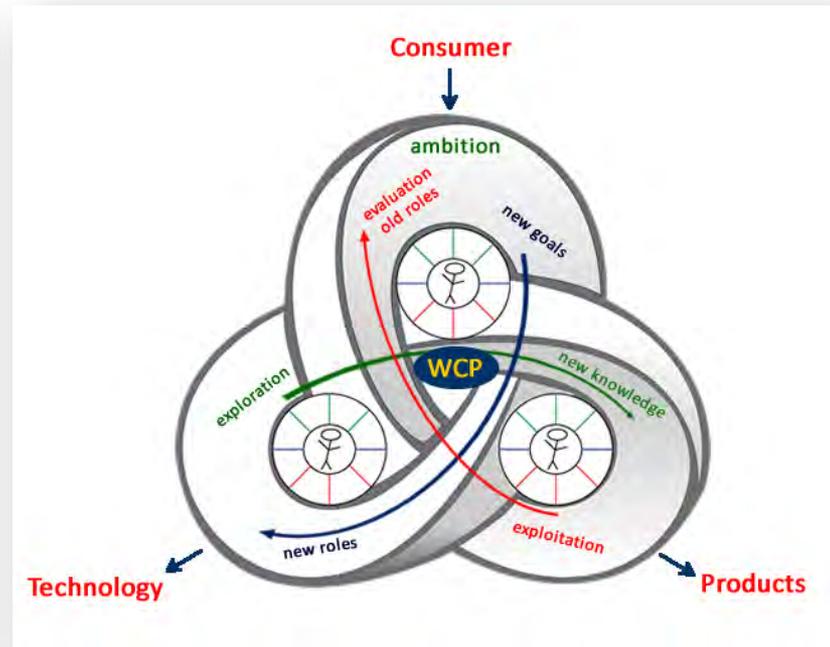
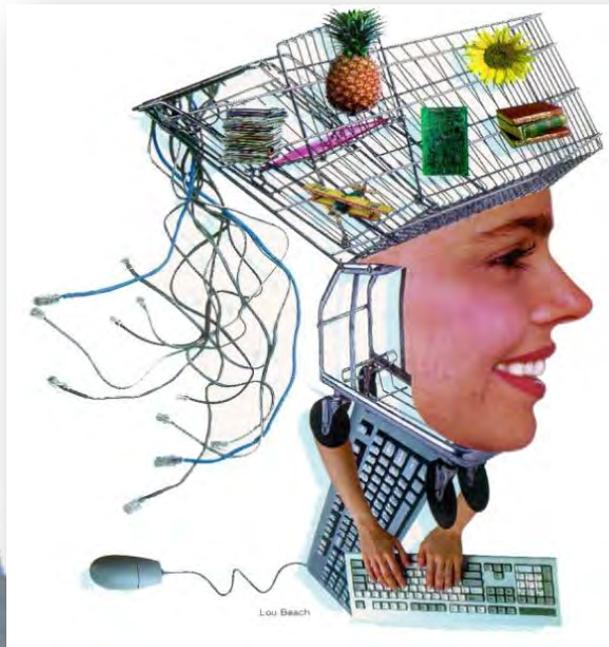
Cities and Food Security



- 60% of City growth is due to Natural growth; 40% is rural-urban immigration and expansion (Montgomery, 2008 in FAO, 2009)
- To feed a city of about 4 million inhabitants, food requirements average about 3.000 tons a day: two three-ton trucks would have to enter the city every three minutes (if supply is combined in only two trucks)
- In urban areas food is increasingly consumed outside the house, especially among poorer population segments > in developing countries food stalls lack adequate refrigeration, water and sanitation > cause gastrointestinal infections > child mortality
- In cities in developing countries, inhabitants buy more than 90 percent of their food. The poor spent de largest share of their income on food purchase > dependency on price and efficient market.

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Market-led approach



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Diversification of demand in Metropolises:

from food to fashion to pharmaceuticals



Pharmaceuticals
Functional foods,
pharmaceuticals

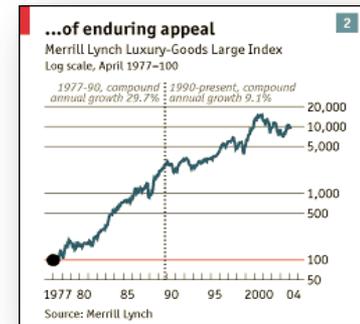


Fashion
Flowers, flavors, fragrances

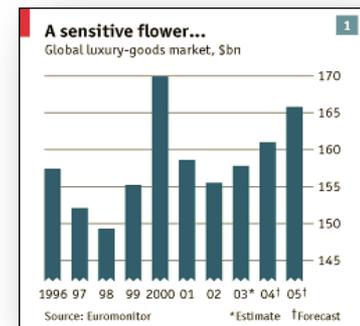


Food
Fodder, food crops,
vegetables, fruits

Energy and building
Fuel, fibers



Which is a 100-fold increase
between 1977 and 2005

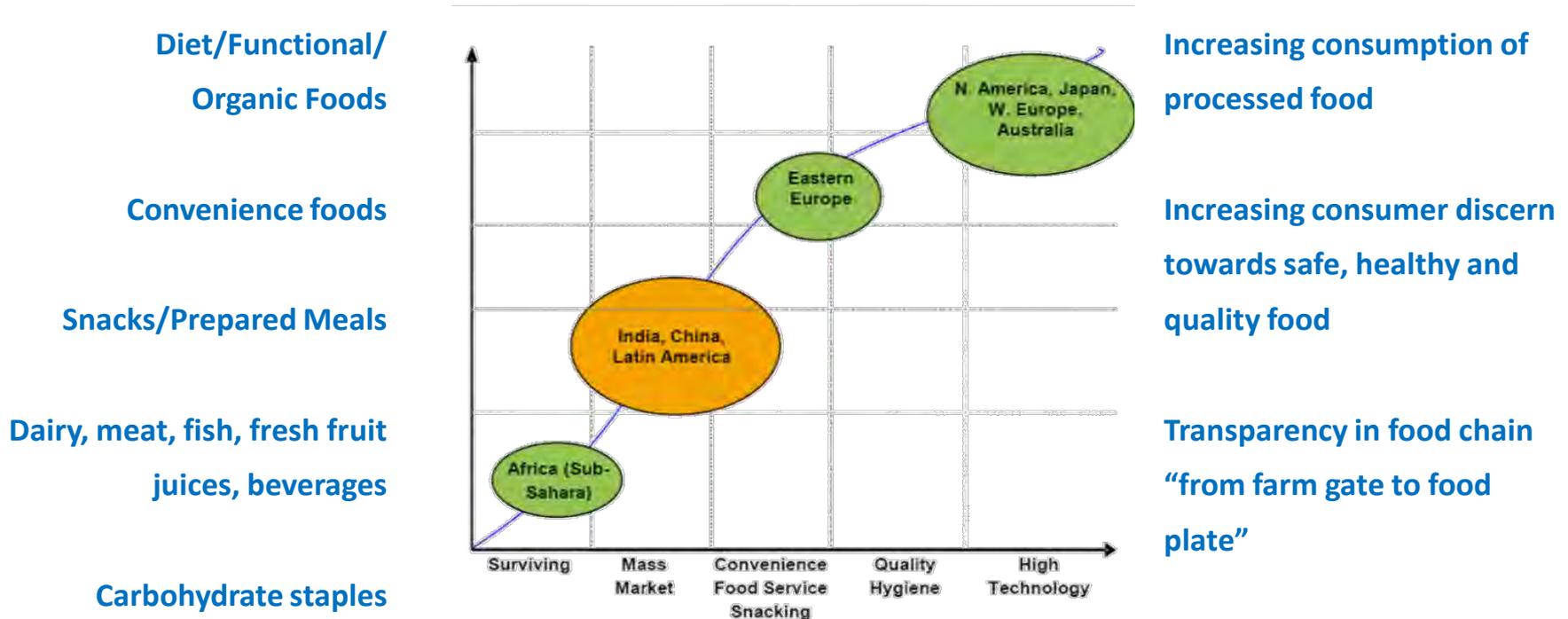


World spending on luxury goods in
2005: US\$ 165 bln

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Shift in Consumption Basket

(Rich) Urban population has more purchasing power



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Strategic outlook



Society:

- Ageing population
- Growing high(er) income population
- Wealth of choice
- Increasing incidence of chronic non-communicable diseases like:
Obesity, Cardiovascular diseases, Hypertension, Diabetes mellitus and various cancers

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Megatrends

In society, according to Wim Lageweg (MVO -2011)

Needing social cohesion (and safety)

- Especially older generation
- In more individualistic world



Increasing suspicion (decreasing authority)

- Especially young generation
- Towards: institutions, banks, large corporations



Metropolitan Food Security (MFS)

Megatrends

In society, according to Wim Lageweg (MVO -2011)

Needing “Roots and Wings” (and origin)

- Especially cultural “creatives”, self determination
- Regional identify, interest in origin and process



Stressing sustainability

- Especially awareness of scarcity



Increasing transparency

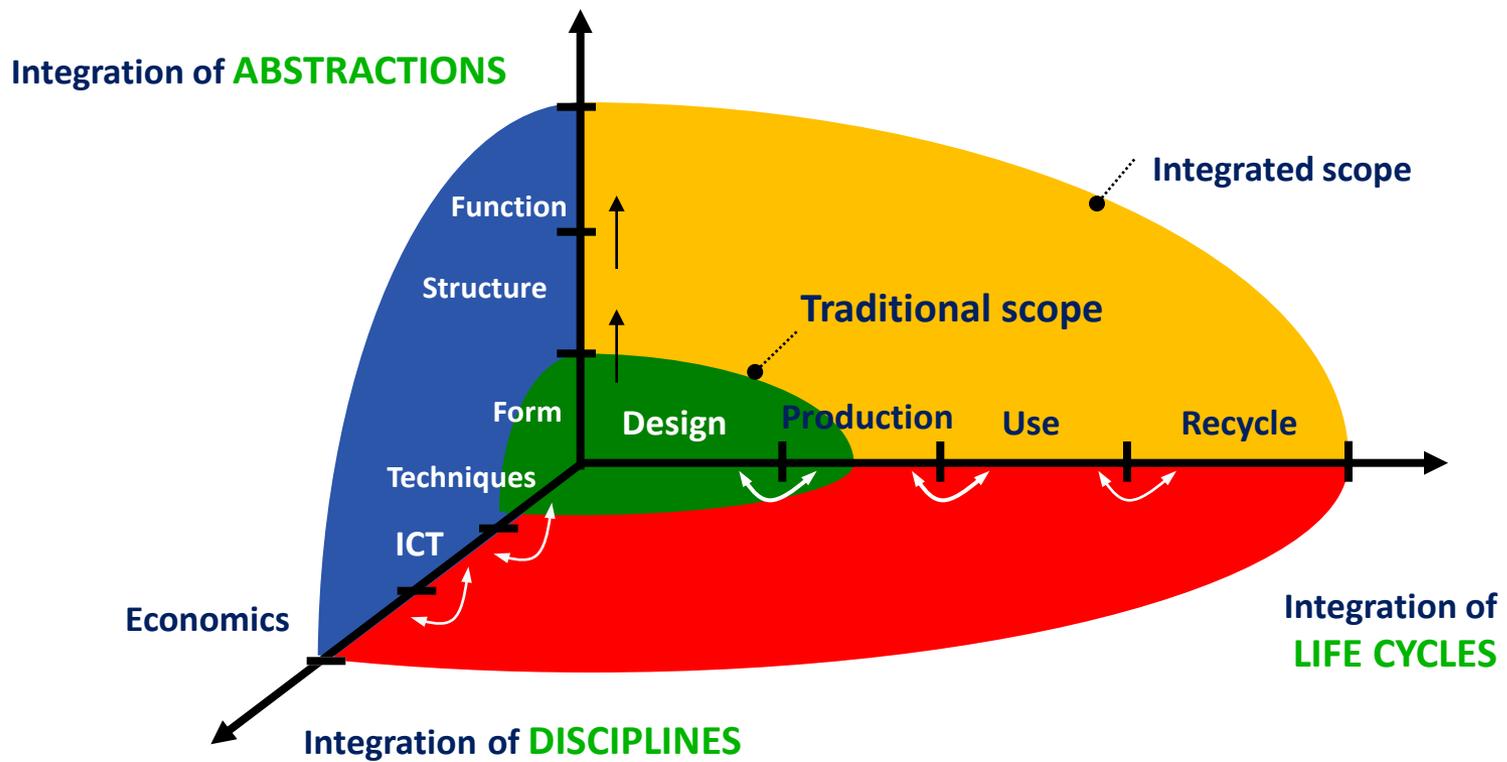
- Especially sharing knowledge
- Pressure on media, social media



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Integrated approach

to product and process development

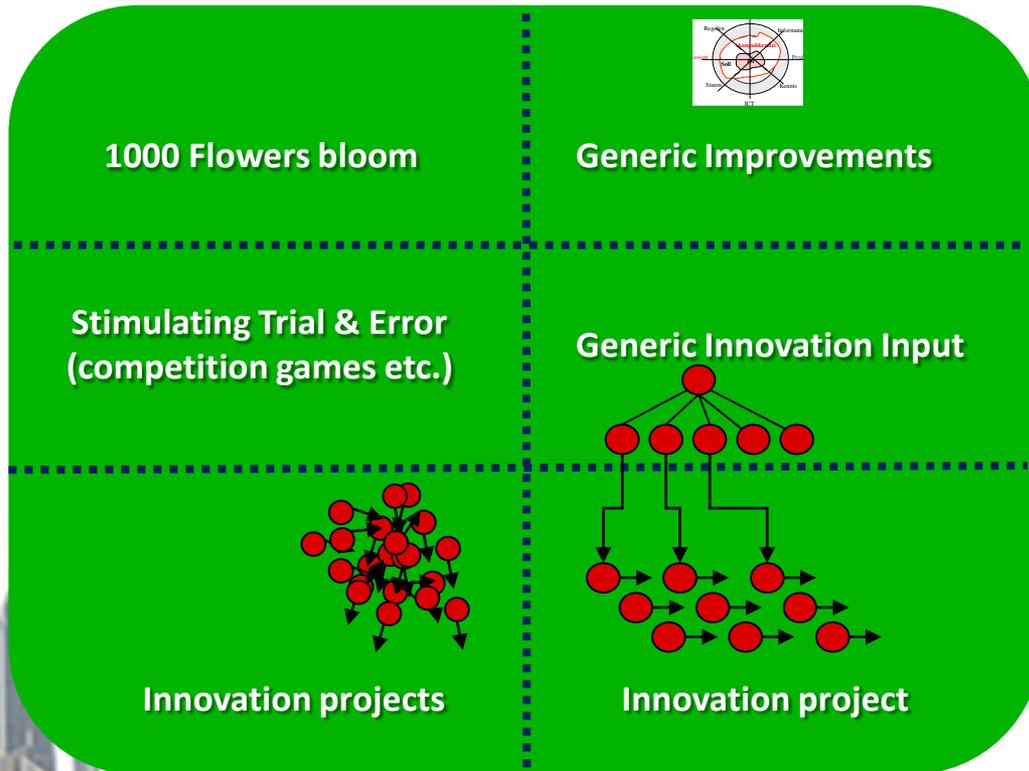


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From
Laissez-faire

To Innovative
Goal Regulation

INNOVATION



Strategic level

Definition level

Tailor level

Innovation Knowledge

Market

Pressure

Purchasing power of retailers
Very short lead times
High service levels
7 Day supply
Quality / food standards
Competition

Requirements

Increased use of EDI
Support wide range of products
Shorter shelf life products
Reduction in use of stabilizers / additives
Product traceability

Manufacturing

Pressure

Integrated systems structure
Variable batch sizes
Effluent / waste reduction
Lowest cost production
Just in time operation

Requirements

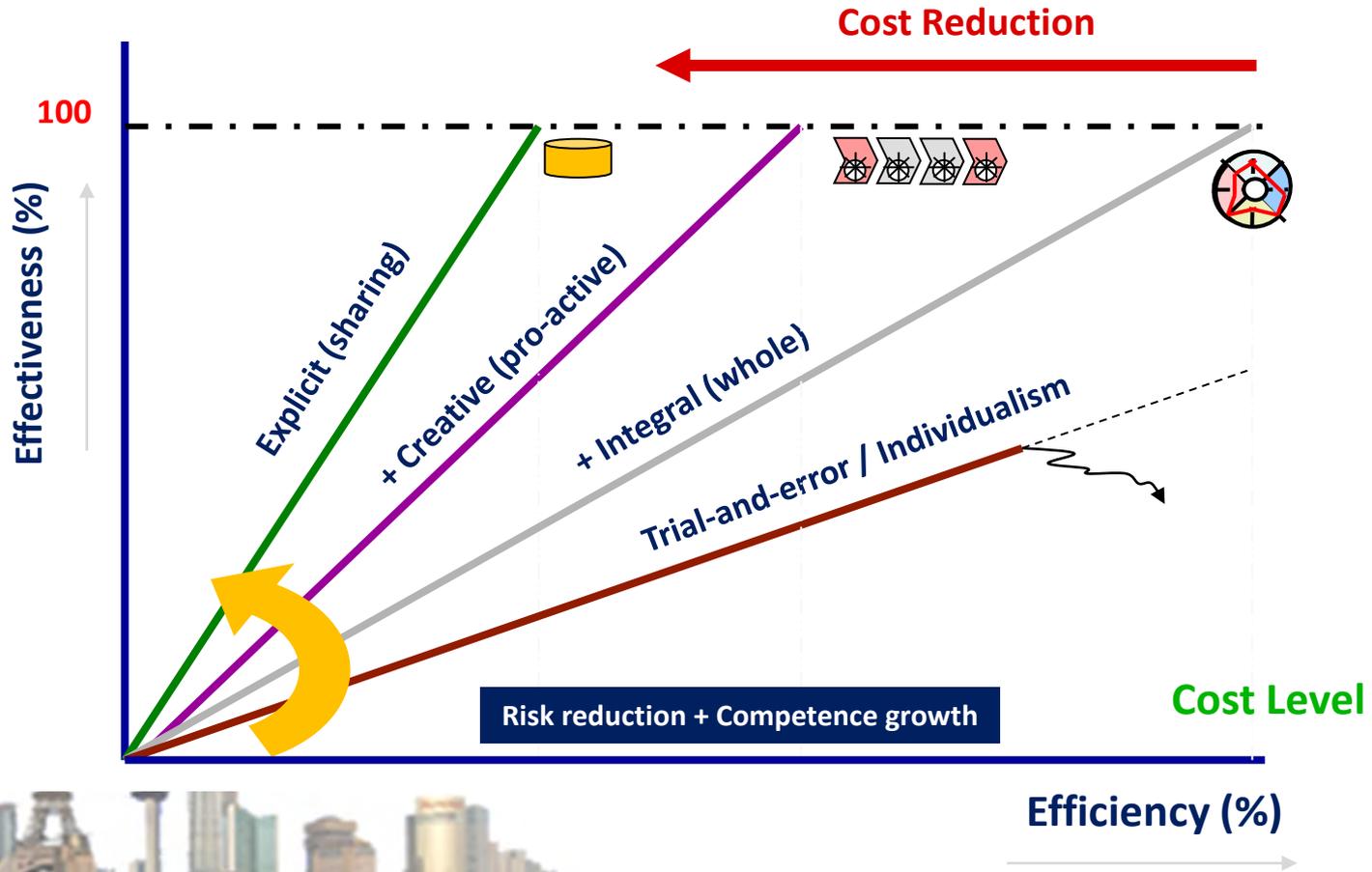
Forecasts of requirements
Reduced dependency on people
Plant flexibility
High speed changeovers
Scheduling production and maintenance
Product recovery systems
Detailed records of production

Trends and Needs

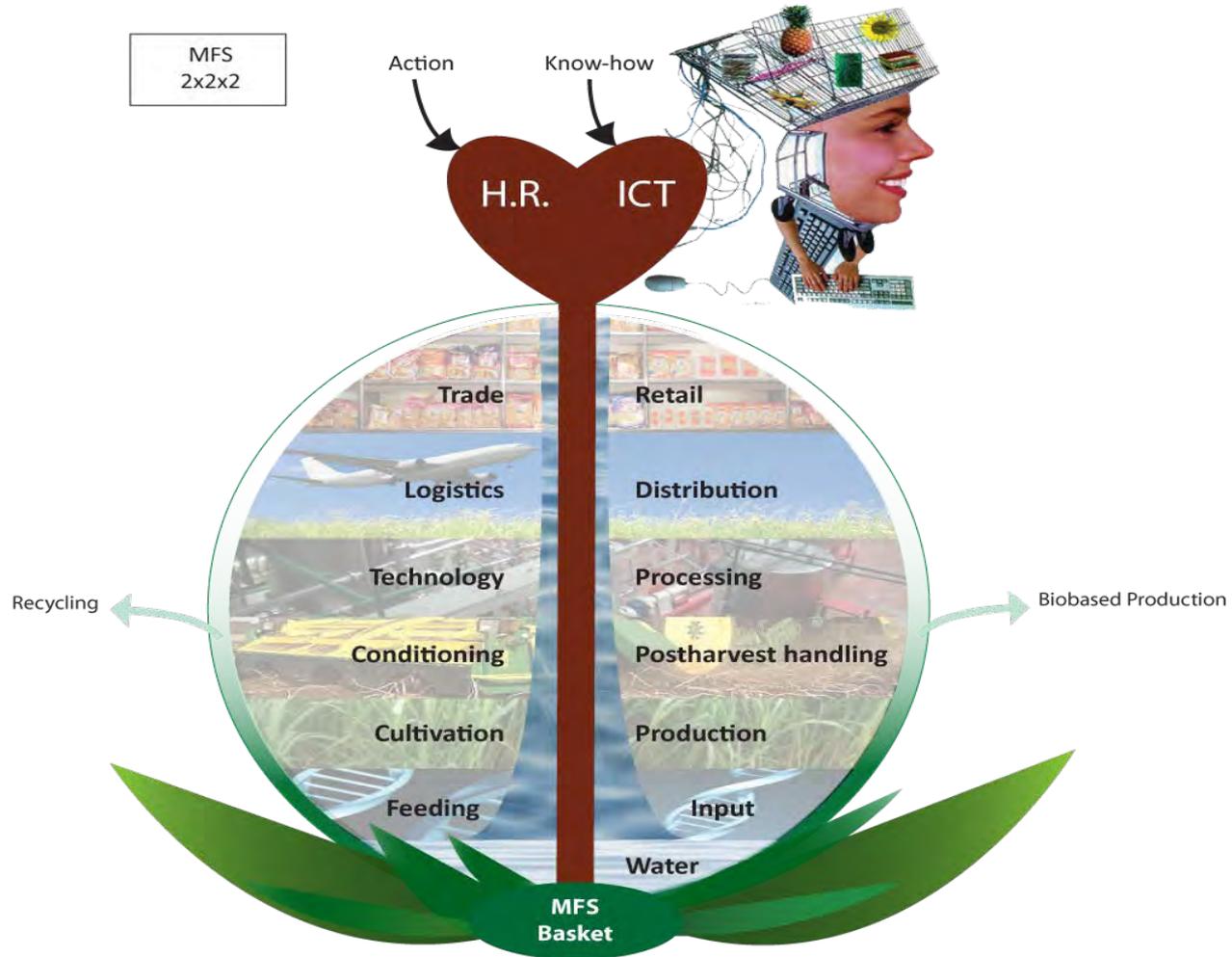
Market	Organization	Product	Information
decisive	flexible	added value	fast
cost reduction time to market product flexibility	head-tail co-development self regulating	product support maintenance control	design tools 3d models configuration management
t r e n d s			
n e e d s			
enterprising market-oriented methodic communicative	project engineering marketing / innovation cost engineering it knowledge	life cycle analysis and design design optimization	
problem solving	multi-disciplinary	integralist	
Attitude	Knowledge	Profile	

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Result Level

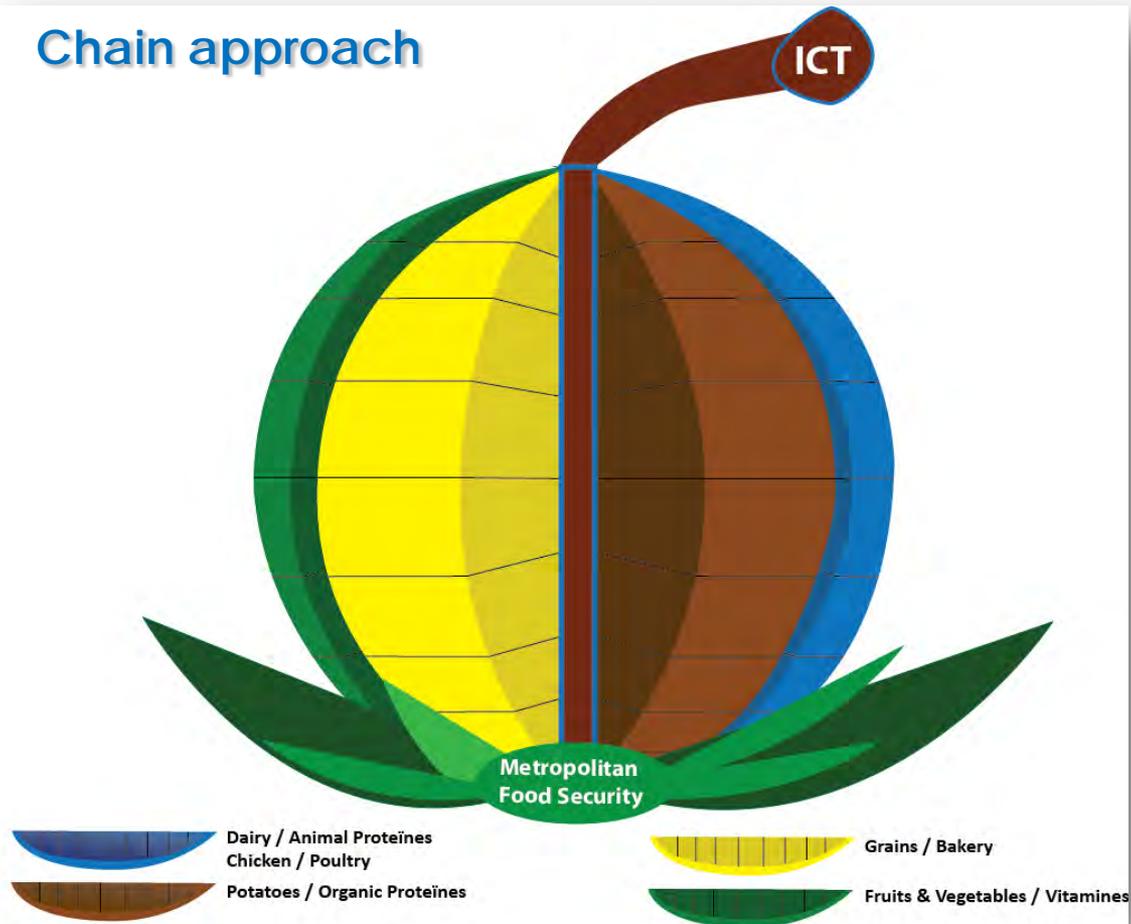


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Chain approach



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Innovations in the Potato – Chain



Seed Potatoes, genomics

Clean room technology, gen manipulation



Cultivating

Drip irrigation, crop rotation in (semi) arid areas



Harvesting

Low damage lifting and handling



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Innovations in the Potato – Chain



Storage

Optimal storage, conditioning



Processing, packaging

Starch, flakes, french fries, etc.



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Innovations in the Fruit and Vegetable – Chain



Fruit and vegetables, genomics

New varieties, gen manipulation



Cultivating

Drip irrigation, crop rotation in (semi) arid areas



Storage

Optimal storage, conditioning, ULO



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Innovations in the Fruit and Vegetable – Chain



Processing

Fresh handling, freezing, heat preservation, dehydration, infusion, pressure preservation, etc.



Packaging and Logistics

Controlled atmosphere, handling automation, ICT



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Improving supply



WAL★MART



Carrefour 



Shift of power to retailers and food service sectors:

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

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Improving supply



Supply management

Continuous Replenishment / Flow Through, Changing Logistics Systems, Cross Docking, Bar Coding, Consumer Focused P.R., Business To Business, Biggest Opportunity , Cutting Out Middle-man, Market Led Approaches, Food Supply Chain, Intelligent Automation

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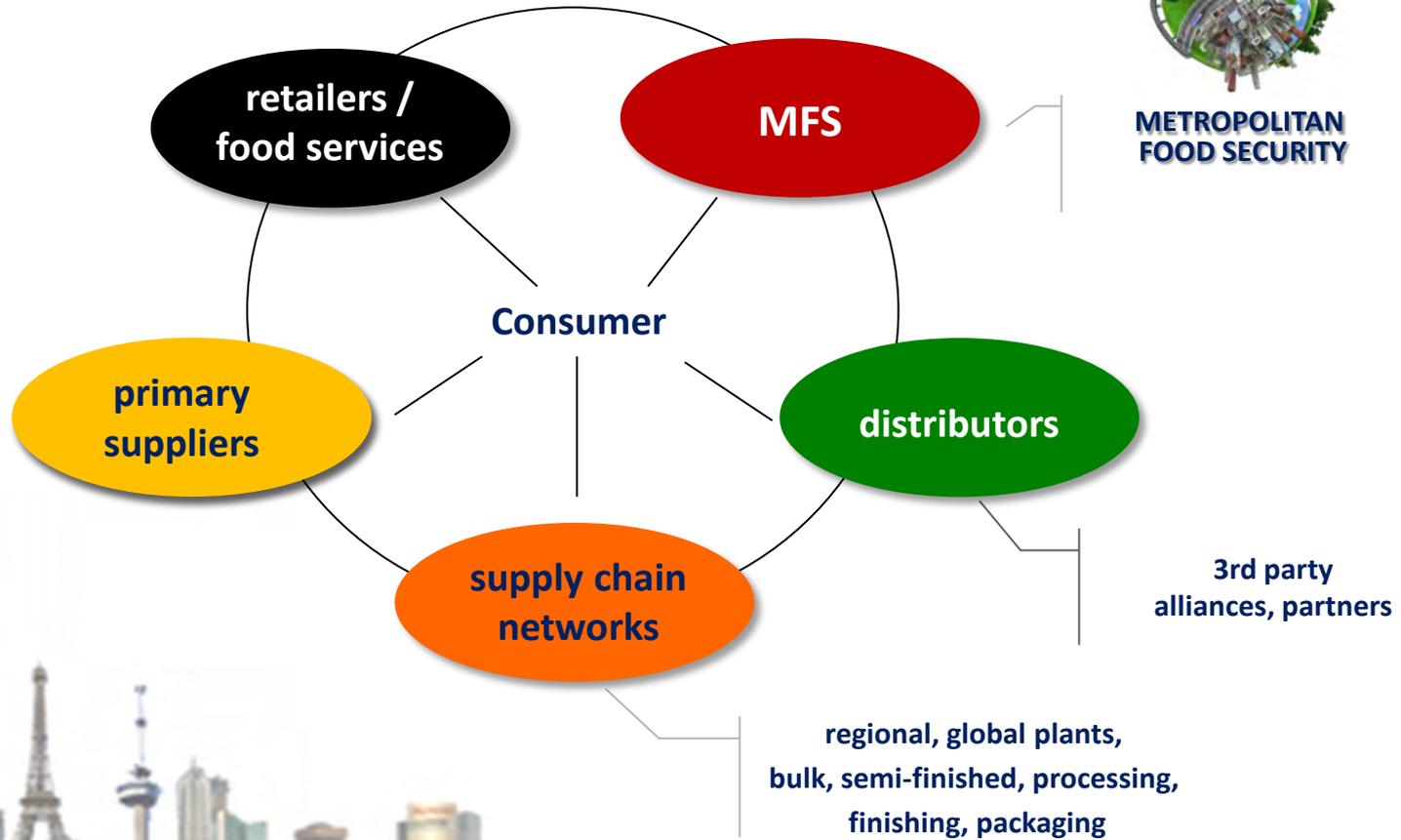
Strength – Weakness Matrix

Flow / Know-how	Input	Production	Processing	Logistics	Trade	Consumer
Hardware						
Software						
Org. ware						

IN = India / NL = The Netherlands

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Supply system



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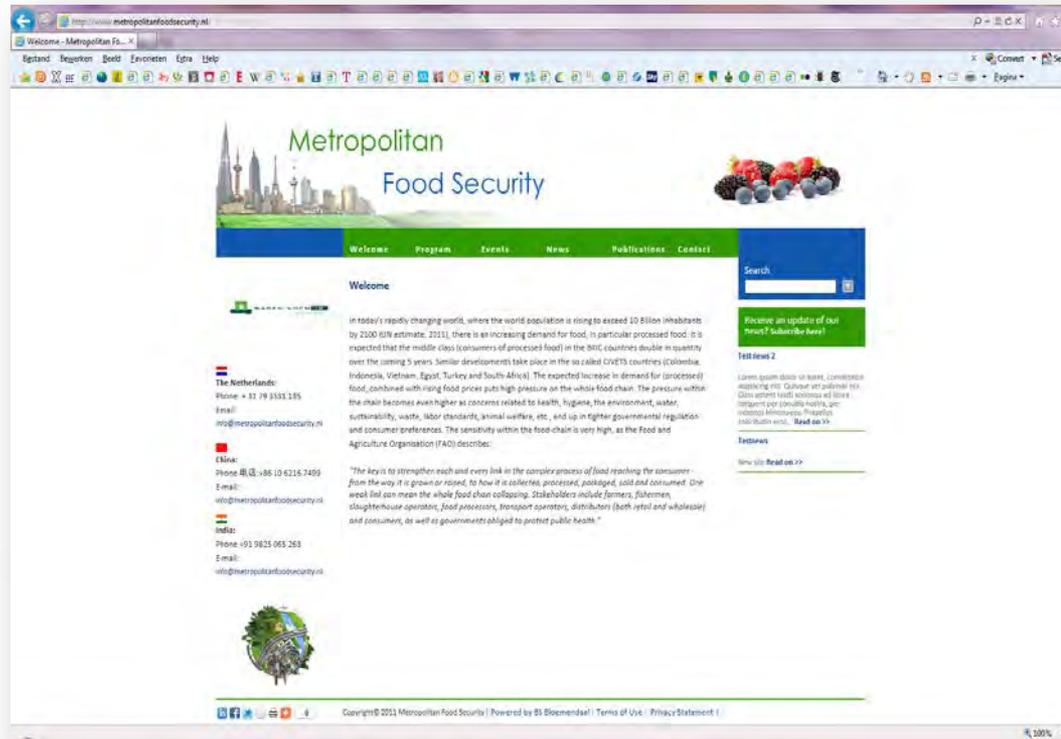
7 P's for Success:

1. **People**
2. **Professionals**
3. **Plan**
4. **Pro-active**
5. **Performance**
6. **Planet**
7. **Prosperity**

More information?

www.metropolitanfoodsecurity.nl

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