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**CONGRESS ON
SUSTAINABLE LIFE**

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DOWNTOWN ANKARA



Territorialized food systems as a contribution to sustainable development of rural and urban areas

v

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Organisation
des Nations Unies
pour l'éducation,
la science et la culture



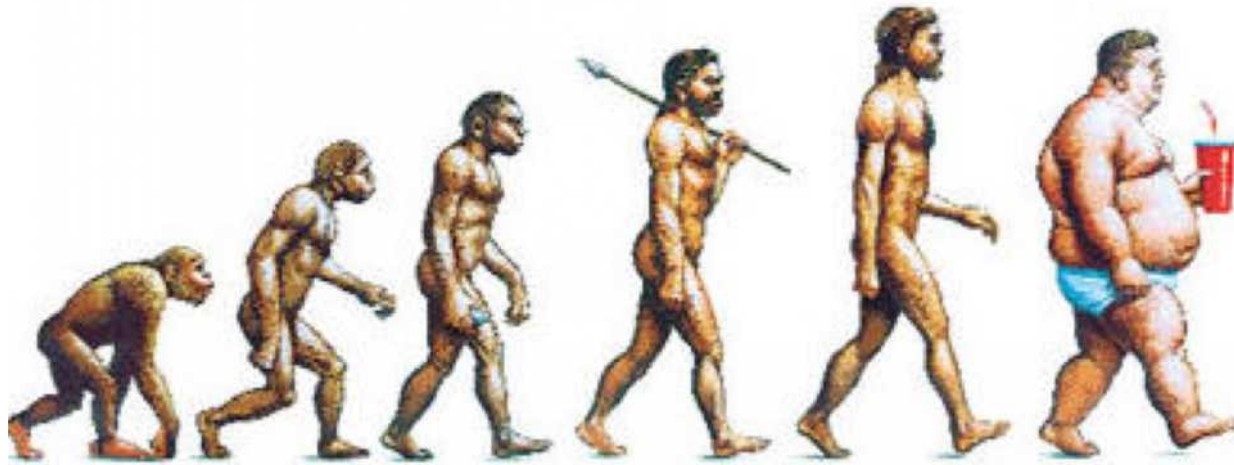
Chaire UNESCO
en alimentations du monde
France



Centre international
d'études supérieures
en sciences agronomiques



Evolution?



$\leq$ Observation

Explanation? $\Rightarrow$



CHRISTOPHER DOMBRES: DEAD END The road to nowhere.

The 5 food transitions of *Homo sapiens*

Fire Control

Cueillette et chasse

300 000 years

1 year

Domestication of plant and animal species

Agriculture

12 000

18 days

Work Division

Artisanat et commerce alimentaires

5 000

4 days

Industrial Revolution

Agroindustrie

150

4 hours

Biotechnic and digital Revolution

- 50 000 100 000 150 000 200 000
Number of years since today

Menu

- The 3 Food systems challenges
- Forecast of food systems
- Resource based strategies in territorialized food systems (TFS)
- Conclusion : What key success factors ?



1/ People & Governance



Crédit photo : © Pierre-Emmanuel Rastoin .

The 3 Food Systems challenges in XXIe century

2/ Planet

LES NOURRITURES TERRESTRES

Depletion of Natural Resources



LE RECHAUFFEMENT CLIMATIQUE

Climate Change



JL Rastoin-Ankara-160519

3/ (Profit) Economy

Productivity



Drone agricole, France © Dacosta / 123RF

*“The food we eat and how we produce it will determine the health of people and planet, and **major changes must be made** to avoid both reduced life expectancy and continued environmental degradation”*

Walter Willett* *et al.* (37 authors – 16 countries), 2019,
Food in the Anthropocene: the EAT–Lancet Commission on
healthy diets from sustainable food systems

www.thelancet.com Published online January 16, 2019
[http://dx.doi.org/10.1016/S0140-6736\(18\)31788-4](http://dx.doi.org/10.1016/S0140-6736(18)31788-4)

*Harvard Medical School

1/ People: Food insecurity is increasing (2016)

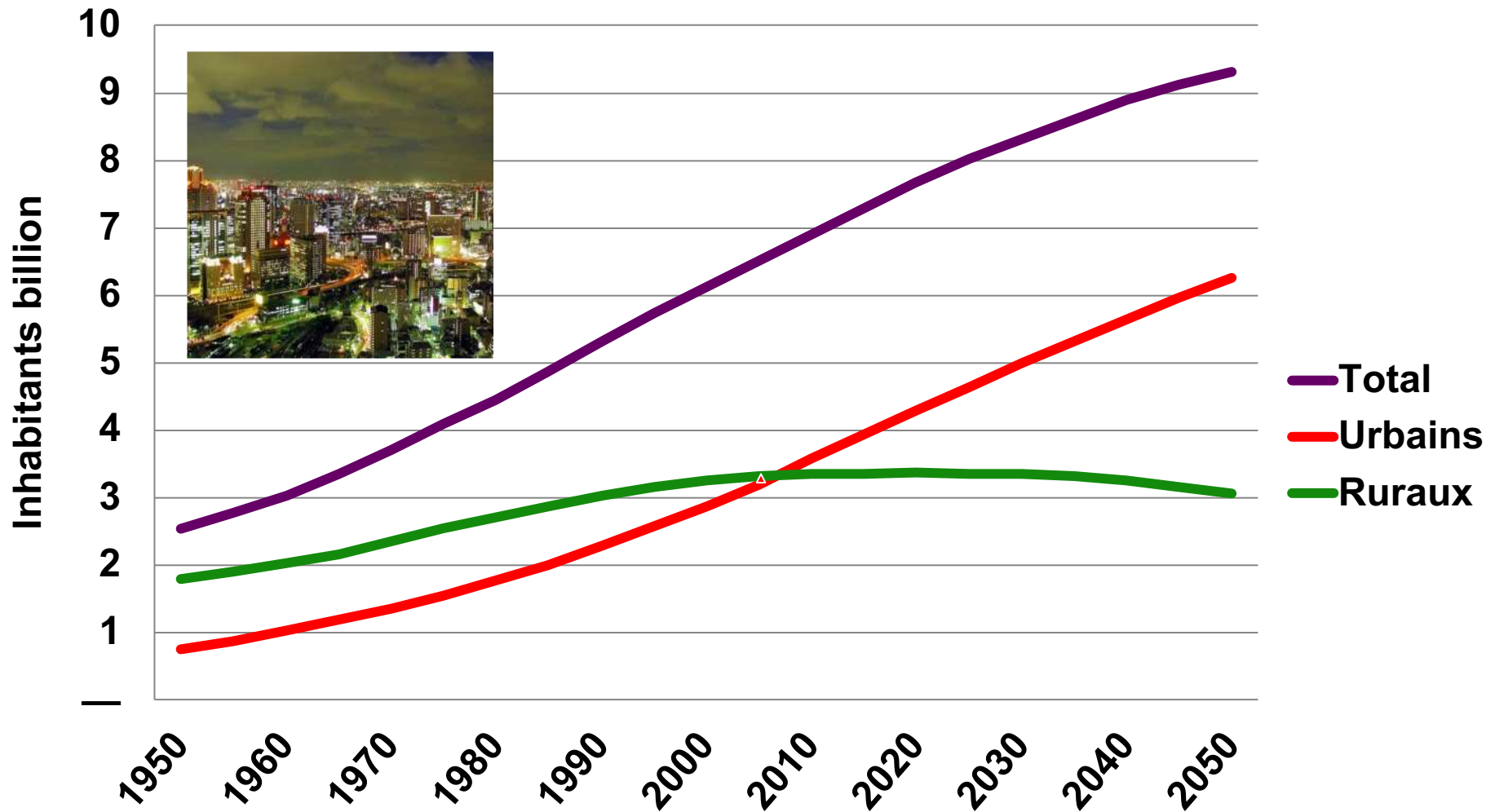
- Malnutrition:
 - > 3 Billion people in the world 1,5 B. by nutritional deficiencies, 1,5 B. by nutritional excess = 40% of total population)
 - Non communicable foodborne disease = 50% total mortality (*WHO*) – Cost: 4 à 5% World GDP (*Development Initiatives, 2017. Global Nutrition Report 2017*)
- Demography and jobs threats

Ranking by Obese Adults %, Countries > 10 M. inhabitants, 2017

Rank	Countries	Percentage Obese Adults	Obese Adults Population (Million)	Total Population (Million)
1	Saudi Arabia	34,7%	7,7	32,9
2	United States of America	33,7%	73,9	324,5
3	Turkey	29,5%	16,1	80,7
4	Egypt	28,9%	19,0	97,6
5	Australia	28,6%	4,7	24,5
6	Mexico	28,1%	24,5	129,2
7	United Kingdom	28,1%	12,6	66,2
8	Canada	28,0%	6,9	36,6
9	Chile	27,8%	3,4	18,1
10	Tunisia	27,1%	2,1	11,5
	Total Top 10	20,8%	171,0	821,7
	Total 192 countries	12,3%	622,7	7 503,3

Source: <https://renewbariatrics.com/obesity-rank-by-countries/> 10march2019

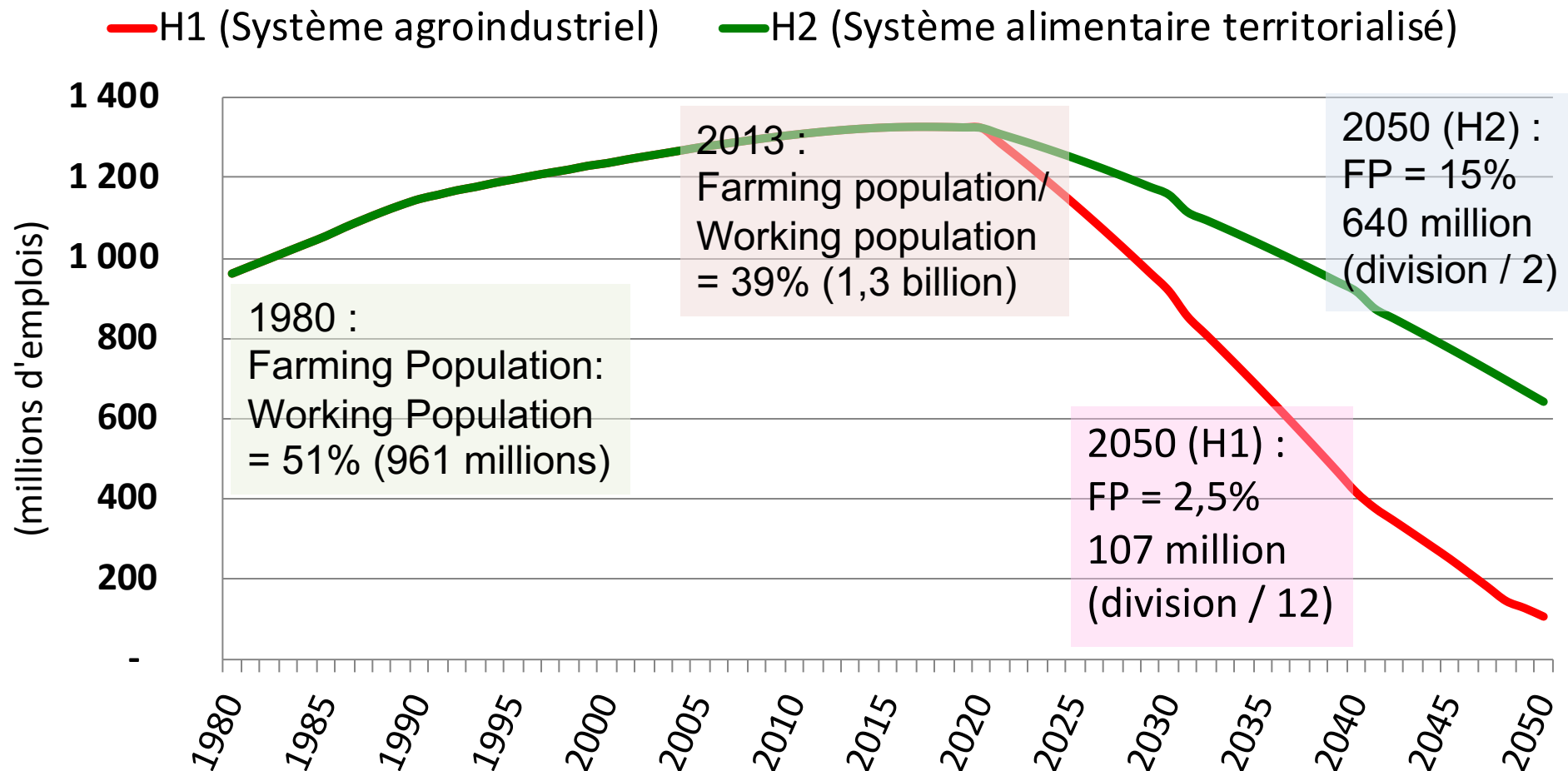
WORLD POPULATION EVOLUTION



Source: United Nations, Population Division, 2012. World Urbanization Prospects: The 2011 Revision

Population 2017 – 2050 : + 2,2 Billion (+ 29 %)
Africa (+ 1,3 B., x2) + Urbanization + Ageing

THE CRITICAL QUESTION OF THE WORKING FARMING POPULATION



Source : nos estimations, données Faostat (1980-2020)

2/ Planet “Earth”

- Soil degradation, various pollutions, natural resources exhaustion (land, water, phosphate, biodiversity)
- Climate change

Biodiversity global decline (-60% / 34 years) = destabilization of ecosystems, decrease in productivity and waste recycling capacity

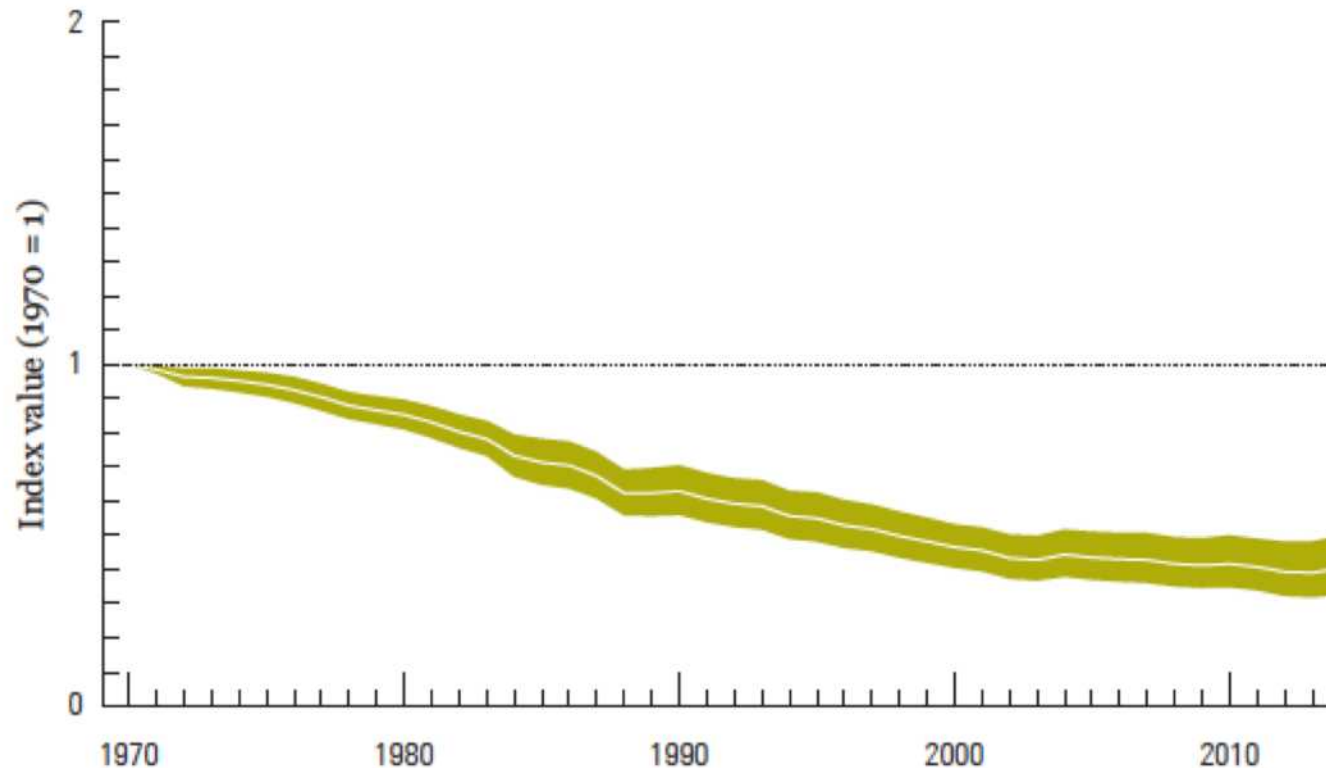


Figure 20: The Global Living Planet Index: 1970 to 2014
Average abundance of 16,704 populations representing 4,005 species monitored across the globe declined by 60%. The white line shows the index values and the shaded areas represent the statistical certainty surrounding the trend (range: -50% to -67%)¹.

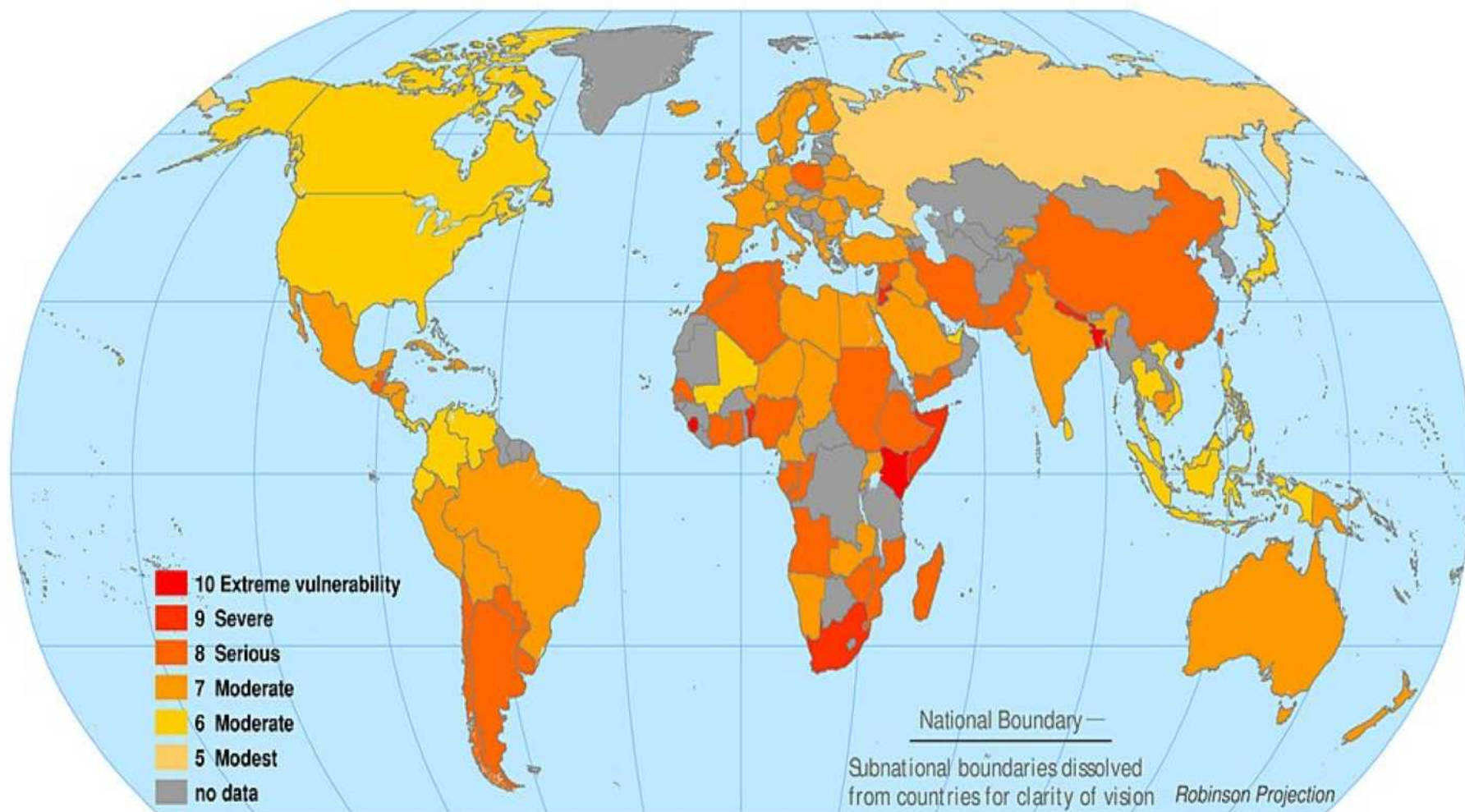
Key

- Global Living Planet Index
- Confidence limits

http://wwf.panda.org/knowledge_hub/all_publications/living_planet_report_2018/
27feb2019

Global Distribution of Vulnerability to Climate Change

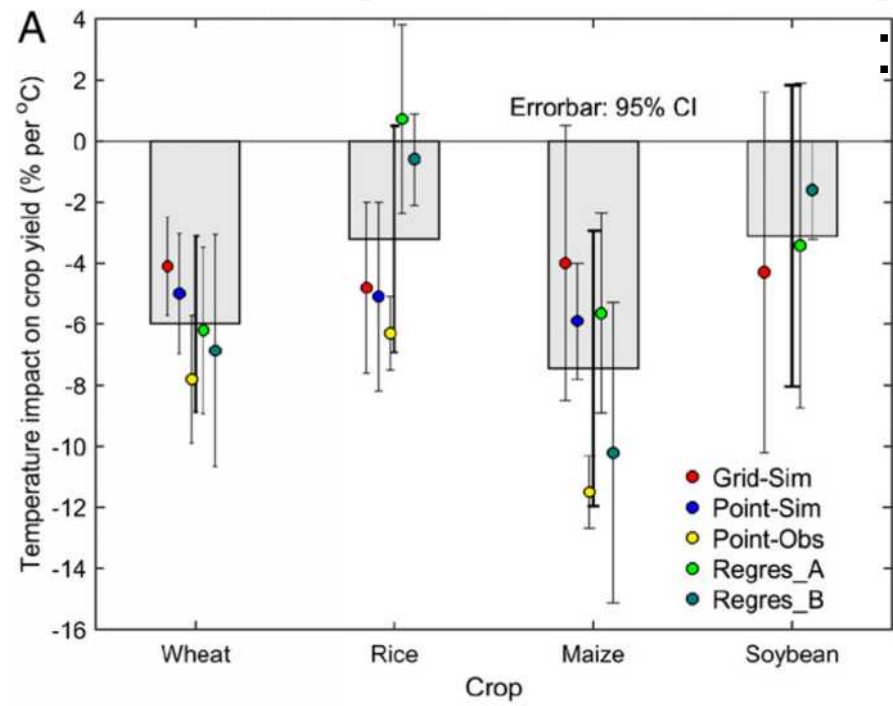
Combined National Indices of Exposure and Sensitivity



Scenario A2-550 in Year 2050 with Climate Sensitivity Equal to 5.5 Degrees C

Annual Mean Temperature with Extreme Events Calibration

Temperature increase reduces global yields of major crops in four independent estimates



Wheat : – 7% to – 22%
Rice : – 3% to – 25%
Corn : – 9% to – 50 %
Soya : – 4% to – 31%
Average : – 6% to – 39%

B

Scenario	Yield changes (%) due to temperature changes by the end of century				
	Wheat	Rice	Maize	Soybean	Mean
RCP2.6	-6.9 [-15.0, -1.4]	-3.3 [-9.2, 0.8]	-8.6 [-18.6, -1.8]	-3.6 [-11.2, 1.7]	-5.6 [-14.4, -0.1]
RCP4.5	-11.4 [-21.7, -3.9]	-5.5 [-13.8, 1.0]	-14.2 [-27.9, -4.9]	-5.9 [-17.0, 3.1]	-9.2 [-21.2, -0.3]
RCP6.0	-14.0 [-25.7, -5.1]	-6.8 [-16.8, 1.3]	-17.4 [-33.1, -5.8]	-7.2 [-20.2, 3.6]	-11.3 [-25.6, 0.1]
RCP8.5	-22.4 [-40.2, -8.5]	-10.8 [-25.3, 2.4]	-27.8 [-50.4, -9.7]	-11.6 [-31.0, 6.0]	-18.2 [-38.6, -0.7]

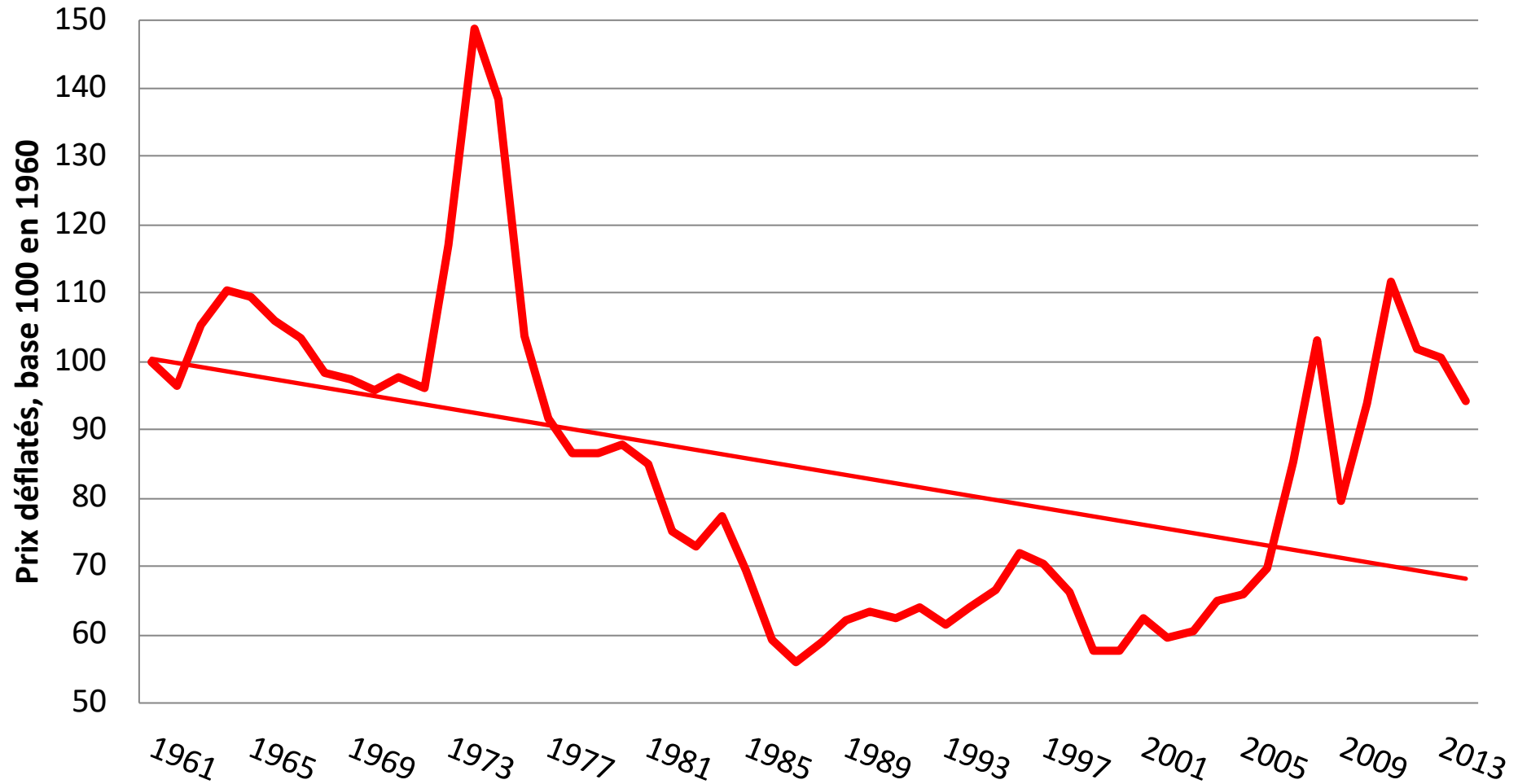
Chuang Zhao, Bing Liu, Shilong Piao, Xuhui Wang, David B. Lobell, Yao Huang, Mengtian Huang, Yitong Yao, Simona Bassu, Philippe Ciais, Jean-Louis Durand, Joshua Elliott, Frank Ewert, Ivan A. Janssens, Tao Li, Erda Lin, Qiang Liu, Pierre Martre, Christoph Müller, Shushi Peng, Josep Peñuelas, Alex C. Ruane, Daniel Wallach, Tao Wang, Donghai Wu, Zhuo Liu, Yan Zhu, Zaichun Zhu, and Senthold Asseng

Temperature increase reduces global yields of major crops in four independent estimates
PNAS 2017 114: 9326-9331.

3/ Economy

- 3/ Market instability (price volatility) :
 - Enterprises weakening
 - Consumer's purchase risks
 - External dependency by importations
- Asymmetries in value chain profit sharing
- Products information (opacity)

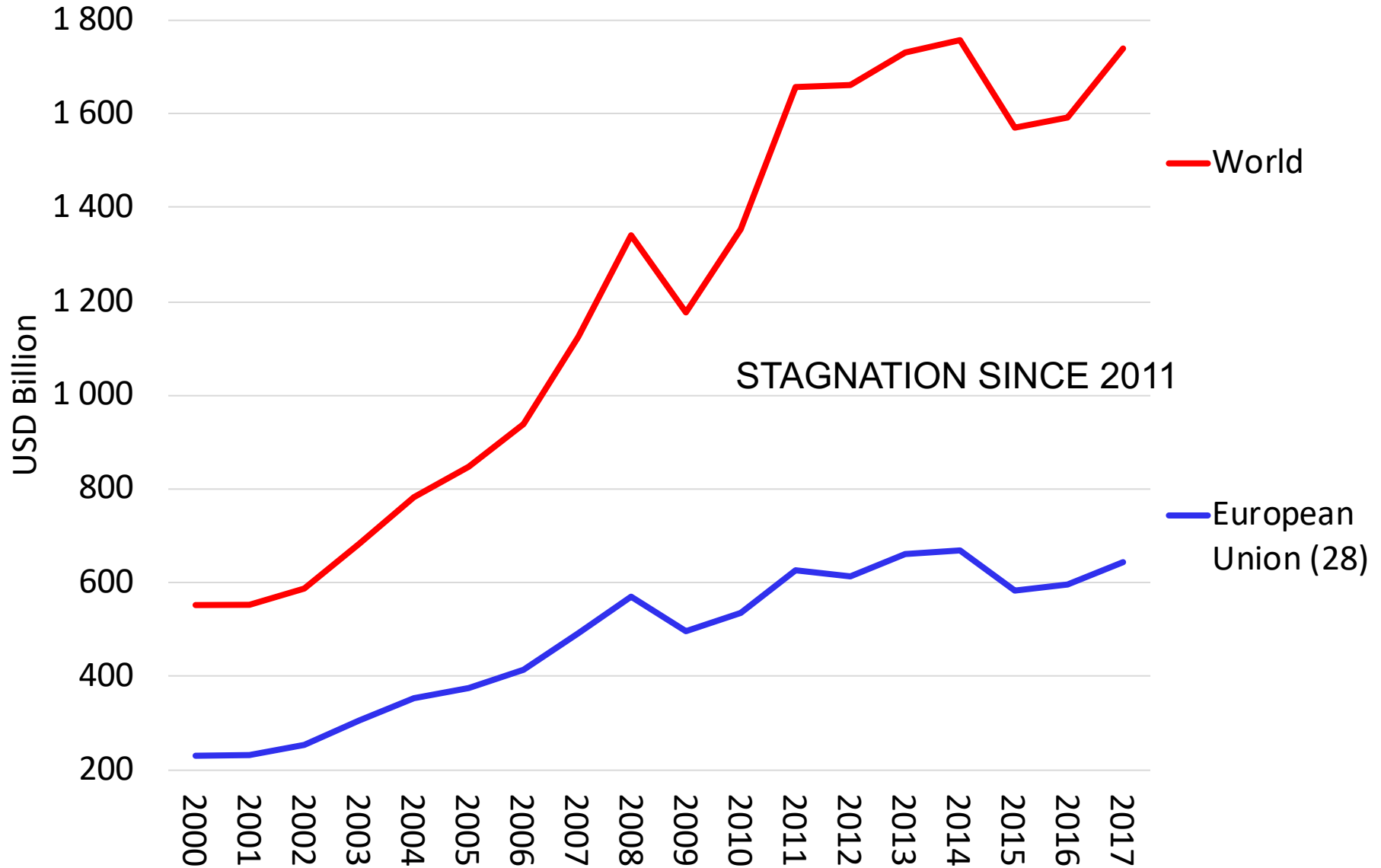
Food Commodities International Prices Indices



Source : Faostat, 2014

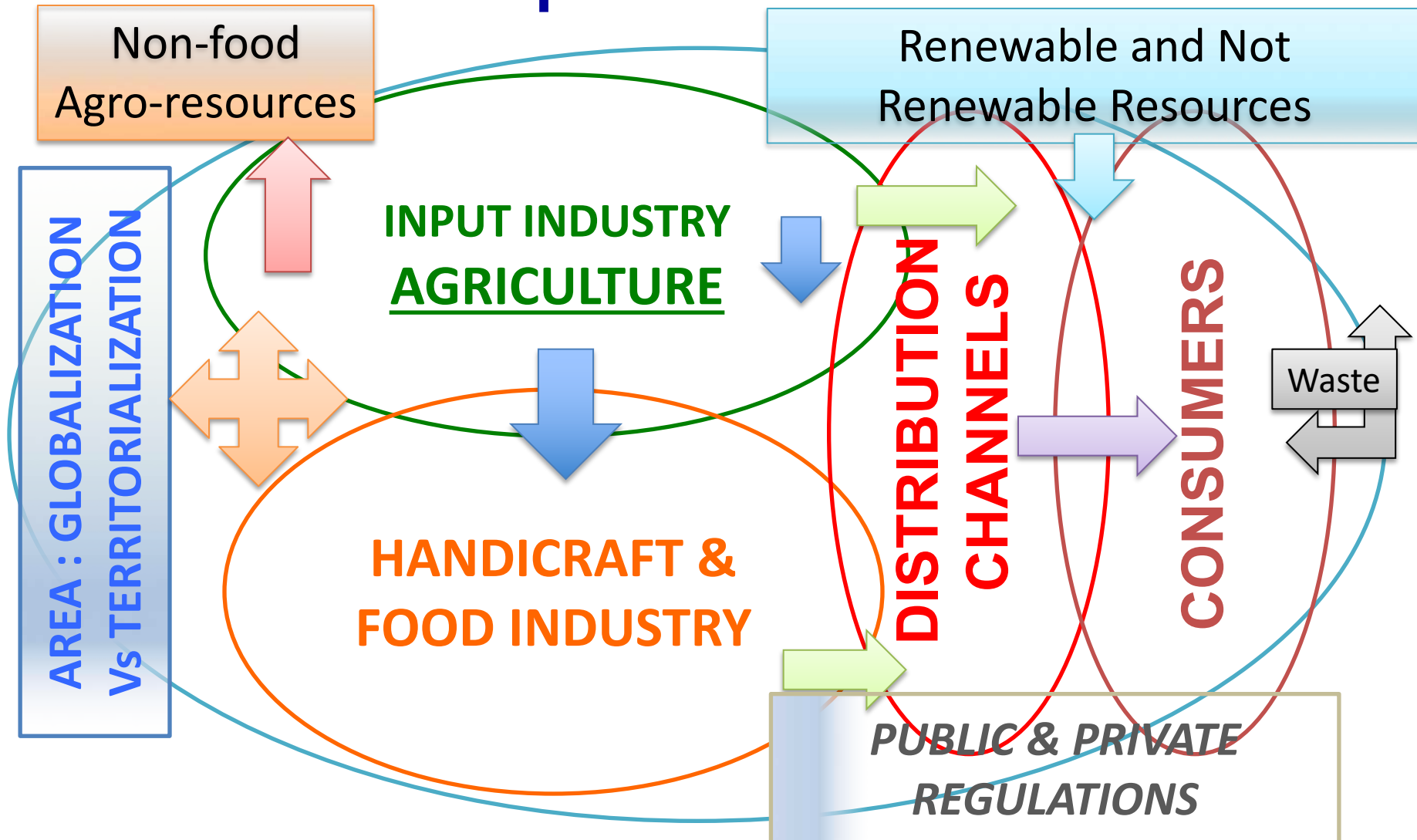
=> Real prices divided by 2 in 50 years, but strong instability

World and EU Exports of Agricultural & Food Products *(WTO, 2019)*



World food systems forecast

Food System: « complex network of interdependent actors »



Large diversity of food systems in the world

The World Food System, 2019

(Consumers : 7,7 Billions)



*Agroindustriel
Configuration*

3,9 Billions (51 %)



*Traditional
Configuration*

2,6 Billions (34 %)

*Lot of
intermediary forms
1,2 milliard (15%)*



Sustainable Food Systems (FAO, 2010)

«Systems with low environmental impacts which contribute to food and nutrition security and to healthy life for present and future generations,...culturally acceptable, accessible, economically fair and affordable; while optimizing natural and human resources.»

Source : FAO, 2010, rapport final Biodiversité et régimes alimentaires durables.
<http://www.fao.org/ag/humannutrition/biodiversity/fr/> (Protocole de Nagaya)

*Alternative scenario: “Territorial Food Systems” (TFS)**

New paradigm:

- *Sustainable development 3 values vs only market price value*
- *Food sovereignty vs foreign dependency*
- *Territories (proximity) vs globalization*

Products: « Total » Quality (*organoleptic, sanitary, **origin**, authenticity, patrimonial*) and food variety (Resources based strategic differentiation)

Techno: Triple performance by innovation (agroecology, industrial eco-conception, downsizing, short distribution networks)

Economy: Micro-enterprises and SME (circular bioeconomy clusters)

– Stakeholders governance: Social and co-operative economy

* https://chaire-diversite-alimentaire.ulaval.ca/wp-content/uploads/2016/08/declaration_de_quebec_finale.pdf

An example of a circular bio-economy cluster,
the basic element of a territorial food system



« Eat Well, Live Well »



Founder:
Godfrey NZAMUJO

Bénin, 1983

Multifunctionality
Proximity
Sustainability

Eco-Tourism

Bio-Energy

Forestry

Fish Farming

Agriculture

Breeding

Processing Workshops
Marketing (Women Co-op)

Waste management

IG and Terroir enterprises strategies

PGO, PGI and TSG (Regulation (EC) n° 510/2006): Mediterranean origin preponderant, 07 Feb. 2019



Countries / PDO, PGI, TSG	Registered
Italy	301
France	250
Spain	198
Portugal	139
Greece	107
Other EU Med countries (Slovenia, Croatia, Cyprus)	54
Turkey*	3
Total Med countries	1 049
Total all countries	1 457
Med countries / Total	72%



Without Wines:
2906 GI

**Malatya Kayısısı* PDO
Aydın İnciri PDO
Antep Baklavası/Gaziantep Baklavası PGI
7 PDO & 7 PGI Requested

Change of total
EU GI registrations
2009 – 2019 = + 77%

EU'GI Economic Size

- 2015 Sales : € 75 mds
- Market share: 6% (Italy, 10%; France, 15%)
- 2005-2010 Market Growth: + 12% (x 2 / all food products average)
- Gap in Price for Producers with GI / no Label Products: + 50%

Source : Cherver T. et al., 2013, *Value of production of agricultural products and foodstuffs, wines, products and foodstuffs, wines, aromatised wines and spirits protected by a geographical indication (GI)*, TENDER N° AGRI-2011-EVAL-04, Final report, European commission, Brussels: 87

Conclusion: Terroir enterprises

Key-success factors

4 « external » conditions for terroir enterprises emergence

- » **Consumers:** find memory again (Mediterranean diet) : research + education & training + strong communication
- » **Producers:** overtake conglomeral capitalism to go to social economy
- » **Institutional:** build up territorial food policies « de-compartmentalized » et « synergetic », coordinated at national and international level (legislative, juridical and fiscal tools)
- » **All :** the market, necessary but no sufficient condition for a responsive and sustainable food (ethics)

« *Diet is the better medicine* »
« *al-himya, ra's ad dawâ* »

Koran, from **Ibn Khaldoun**

Philosopher Yemeni emigrated to Andalusia, then to Morocco

Tunis, 1332 – Cairo, 1406

Speech on Universal History, Prolegomena – Al Muqaddima, 1377



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EU GI Products Applied by 07 February 2019, TURKEY

Designation		Type	Submission Date
Aydın Kestanesi	1	AOP	08/09/2015
Taşköprü Sarımsağı	2	AOP	04/01/2017
Antepfıstığı/Antep fıstığı	3	AOP	21/07/2017
Milas Zeytinnyagi	4	AOP	13/11/2017
Bayramiç Beyazı	5	AOP	01/02/2018
Edremit Körfezi Yeşil Çizik Zeytini	6	AOP	12/04/2018
Giresun Tombul Fındığı	7	AOP	26/04/2018
Afyon Pastırması	1	IGP	13/08/2012
Afyon Sucuğu	2	IGP	13/08/2012
İnegöl Köfte	3	IGP	17/09/2014
Kayseri Pastırması	4	IGP	22/05/2017
Kayseri Sucuğu	5	IGP	22/05/2017
Antep Lahmacunu	6	IGP	12/04/2018
Kayseri Mantısı	7	IGP	22/05/2017
S/TOTAL Turkey	14		
TOTAL Countries	217		