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

Pr Jean-Louis Rastoin
jean-louis.rastoin@supagro.fr
Evolution?

<= Observation

Explanation? =>

CHRISTOPHER DOMBRES: DEAD END The road to nowhere.
The 5 food transitions of *Homo sapiens*

**Fire Control**
Cueillette et chasse

Number of years since today

300 000 years

1 year

**Domestication of plant and animal species**
Agriculture

12 000 years

18 days

**Work Division**
Artisanat et commerce alimentaires

5 000 years

4 days

**Industrial Revolution**
Agroindustrie

150 years

4 hours

**Biotechnic and digital Revolution**


Source: adapted from Malassis, 1997
Menu

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

1/ People & Governance

2/ Planet

3/ (Profit) Economy

Crédit photo : © Pierre-Emmanuel Rastoin.
“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

*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

- Demography and jobs threats
### Ranking by Obese Adults %, Countries > 10 M. inhabitants, 2017

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

*Source: [https://renewbariatrics.com/obesity-rank-by-countries/](https://renewbariatrics.com/obesity-rank-by-countries/) 10 March 2019*
Population 2017 – 2050 : + 2,2 Billion (+ 29 %)
Africa (+ 1,3 B., x2) + Urbanization + Ageing

THE CRITICAL QUESTION OF THE WORKING FARMING POPULATION

H1 (Système agroindustriel)  H2 (Système alimentaire territorialisé)

1980:
Farming Population: Working Population = 51% (961 millions)

2013:
Farming population/ Working population = 39% (1.3 billion)

2050 (H2): FP = 15%  640 million (division / 2)

2050 (H1): FP = 2.5%  107 million (division / 12)

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

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

http://ciesin.columbia.edu/data/climate/
Temperature increase reduces global yields of major crops in four independent estimates

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.

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

STAGNATION SINCE 2011

USD Billion

- **World**
- **European Union (28)**
World food systems forecast
Food System: « complex network of interdependent actors »

Non-food Agro-resources

Renewable and Not Renewable Resources

INPUT INDUSTRY AGRICULTURE

DISTRIBUTION CHANNELS

HANDICRAFT & FOOD INDUSTRY

CONSUMERS

AREA: GLOBALIZATION vs TERRITORIALIZATION

PUBLIC & PRIVATE REGULATIONS

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.»

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

---

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

Founder:
Godfrey NZAMUJO
Bénin, 1983

« Eat Well, Live Well »

IG and Terroir enterprises strategies

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

*Malatya Kayısı
Aydıncırcı
Antep Baklavaşı/Gaziantep Baklavaşi
7 PDO & 7 PGI Requested

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

Without Wines: 2906 GI

Source: EU Database DOOR, UE, 07 Feb 2019
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%

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