Agricultural economics and development with implications to the Central Highlands

Philippe LEBAILLY (GxABT-ULg)

Ban Me Thuot, 23th December 2016

Gembloux Agro-Bio Tech
Université de Liège

Learning to serve, serving to learn

Looking forward to a dynamic future in:

Crop production and protection

Animal science

Forestry and land management

Environment and natural ressources

Rural engineering and water management

Food science and biotechnology

Rural economics

Rural economics is the study of rural economies, including:

- **farm and non-farm activities;**
- **economic growth, development, and change in rural areas;**
- **size and spatial distribution of production and household units;**
- **regional and interregional trade;**
- **land use;**
- **migration and (de)population;**
- **finance;**
- **government policies;**
- **rural-urban income disparities.**

GxABT/ULg

Department of Economics

&

Rural Development

Staff

- **P**rofessors and **A**ssistants **15**
- **PhD S**tudents
  - **graduated since 2000** **40**
  - **ongoing** **25**
- **G**raduate & **P**ost graduate **S**tudents **30**/year

MC en Développement, Environnement et Sociétés;

MC en Economie et Sociologie rurales;

International Master in Rural Economic.

2. Teaching activities

Main topics

- **A**gricultural **M**arkets and **P**olicies
- **M**icro & **M**acro **E**conomics
- **A**ccounting and **M**anagement
- **M**arketing
- **E**conometrics
- **E**conomics of **D**evelopment
- **P**CM - **E**conomic & **F**inancial **A**nalysis of **P**rojects
- **R**ural and **E**nvironmental **E**conomics
- **R**ural **S**ociology & **L**aw

3. Research activities

Economics of development

- **R**ural **E**ntrepreneurship
- **R**ural **D**evelopment and **P**overty **A**lleviation
- **A**grarian **D**ynamics
- **V**alue **C**hain **A**nalysis
- **S**oft **C**ommodities
- **M**arket **L**iberalisation & **L**ocal **F**arming **S**ystems

3. Research activities

Agricultural Economics

- **A**gricultural **A**ccounting and **A**gricultural **I**ncome
- **E**valuation of **P**rojects and **P**olicies
- **A**griculture – **A**gro-**P**rocessing – **F**ood

Market analyses and agricultural food chains

- **A**gricultural **D**iversification and **S**pecific **Q**uality **P**roducts
- **T**ransformation & **V**alorisation of **A**gricultural **P**roducts
- **P**romotion of **I**nternational **T**rade

4. Our Website : http://www.fsagx.ac.be/eg/

gembloux agro bio tech

Economie & Développement rural

Accueil | Personnel | Formation | Consommation alimentaire | Coopération internationale | Economie agricole et agro-alimentaire | Ruralité

Détail des cours

- Années de Baccalauréat
- Années de Master et Master complémentaire

Détail des formations spécialisées

- Master complémentaire en Economie et Sociologie rurales – MC ESRU
- Master bioingénieur en Economie et Développement – Master EDEV
- Master complémentaire en Développement, Environnement et Sociétés – MC DESO
- Master international en Economie et Sociologie rurales - PFS
- Doctorat

Fonctions

- Home
- Rechercher
- Plan du site

Formation

L'Unité d'Economie et Développement rural assure la charge du cursus universitaire de la seconde à la cinquième année d'études conduisant au Master bioingénieur en sciences agronomiques. Parmi les cours enseignés figurent notamment les cours suivants :

- économie politique et sociale
- comptabilité générale et analyse des bilans
- gestion des entreprises
- économie internationale
- économie des filières alimentaires et agro-alimentaires
- politiques et stratégies agro-alimentaires
- économie du développement
- conception et évaluation de projets
- gestion des conflits, problématique foncière et environnement
- instabilité des marchés intégration régionale et gestion du risque : application aux projets agricoles et agro-industriels
- séminaires d'économie et de sociologie rurales
- cycle du projet et économie des productions
- économie environnementale
- sociologie générale et rurale
- études de marché et marketing
- techniques de communication
- marchés tropicaux
- économie rurale
- politique agricole etc.

4. Our Website : http://www.fsagx.ac.be/eg/

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Economie & Développement rural

Accueil | Personnel | Formation | Consommation alimentaire | Coopération internationale | Economie agricole et agro-alimentaire | Ruralité

Cooperation internationale

- Coopération internationale par thème
- Coopération internationale par pays
- Publications

Cartes

- Monde
- Afrique de l'Ouest
- Afrique équatoriale
- Asie du Sud Est

Fonctions

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Les projets internationaux de l'Unité

L'Unité d'Economie et Développement rural participe à un grand nombre de projet de développement rural à l'international. Comme vous pourrez le voir sur les cartes interactives, les régions où l'EDEV est particulièrement active sont l'Asie du Sud Est, l'Afrique de l'Ouest et l'Afrique Equatoriale.

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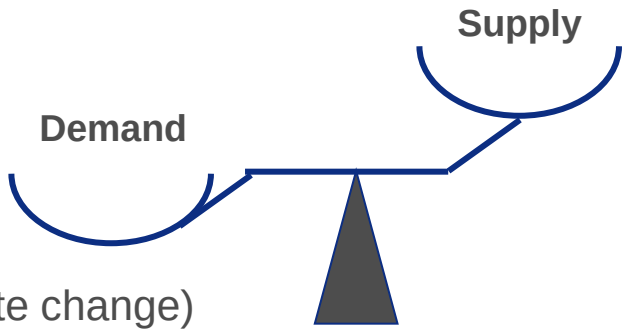
New challenges in rural economics

GLOBAL OVERVIEW

Growing imbalance (structural & cyclical?)

Increase of demand:

- Population growth
- Increase of revenues
- Change on consumption model
- Different use of land➔ biofuel

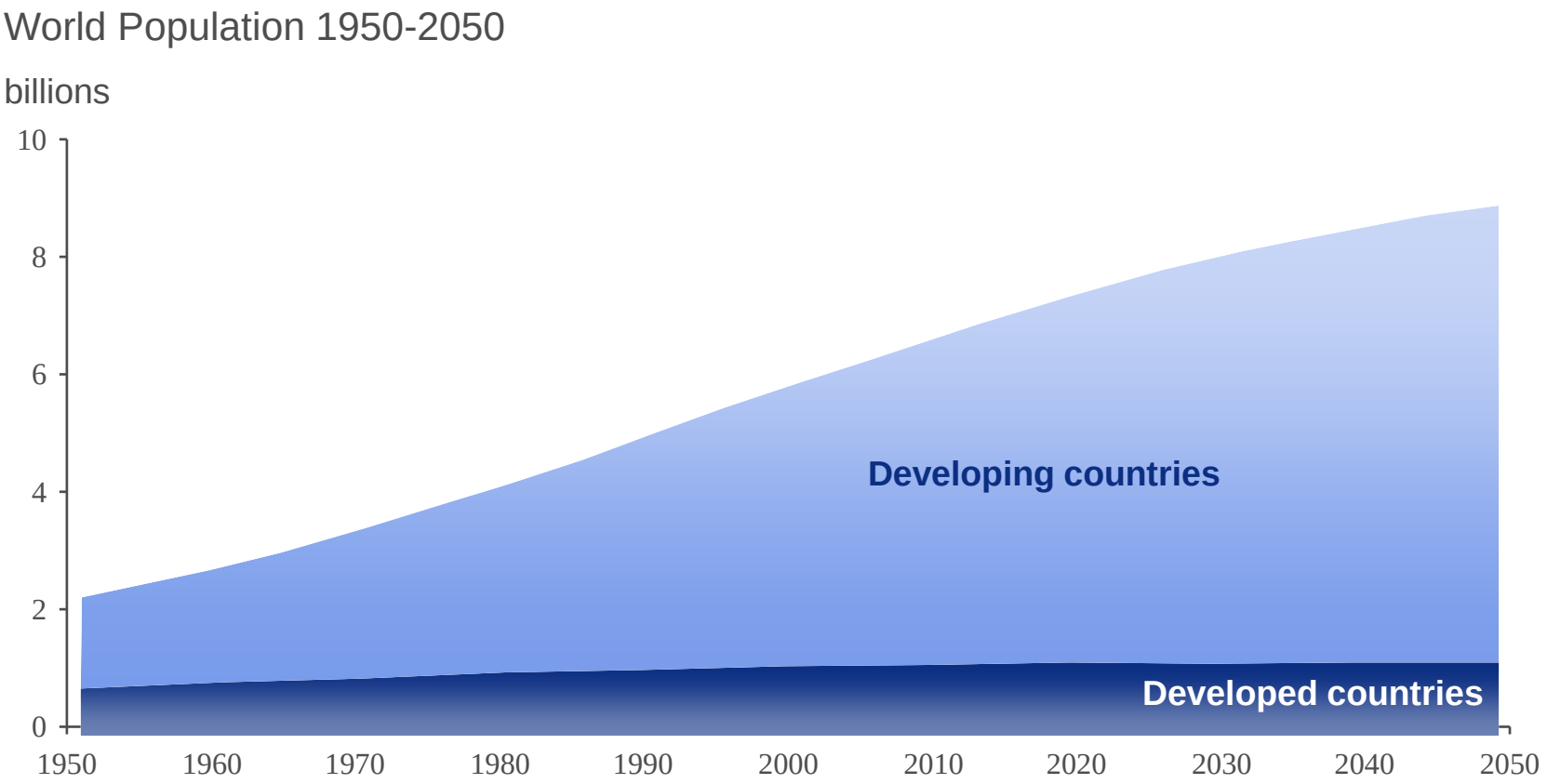


Supply - side:

- Decrease of ressources (water, desertification, climate change)
- Urbanisation
- Reduction of the yield growth

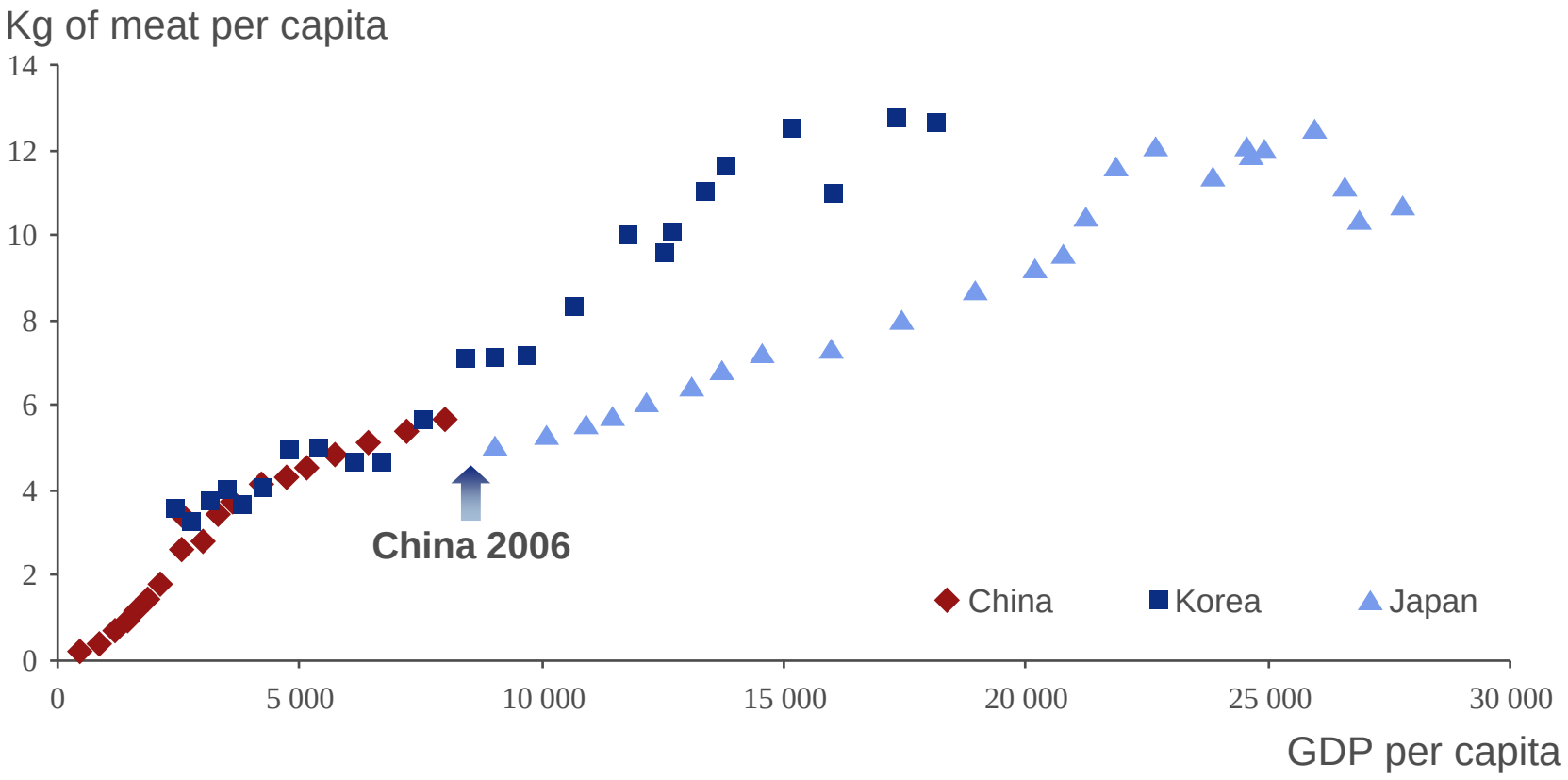
These factors can modify the prices of agricultural raw materials

Population growth



Growth of revenues

Change on meat consumption in link with revenues

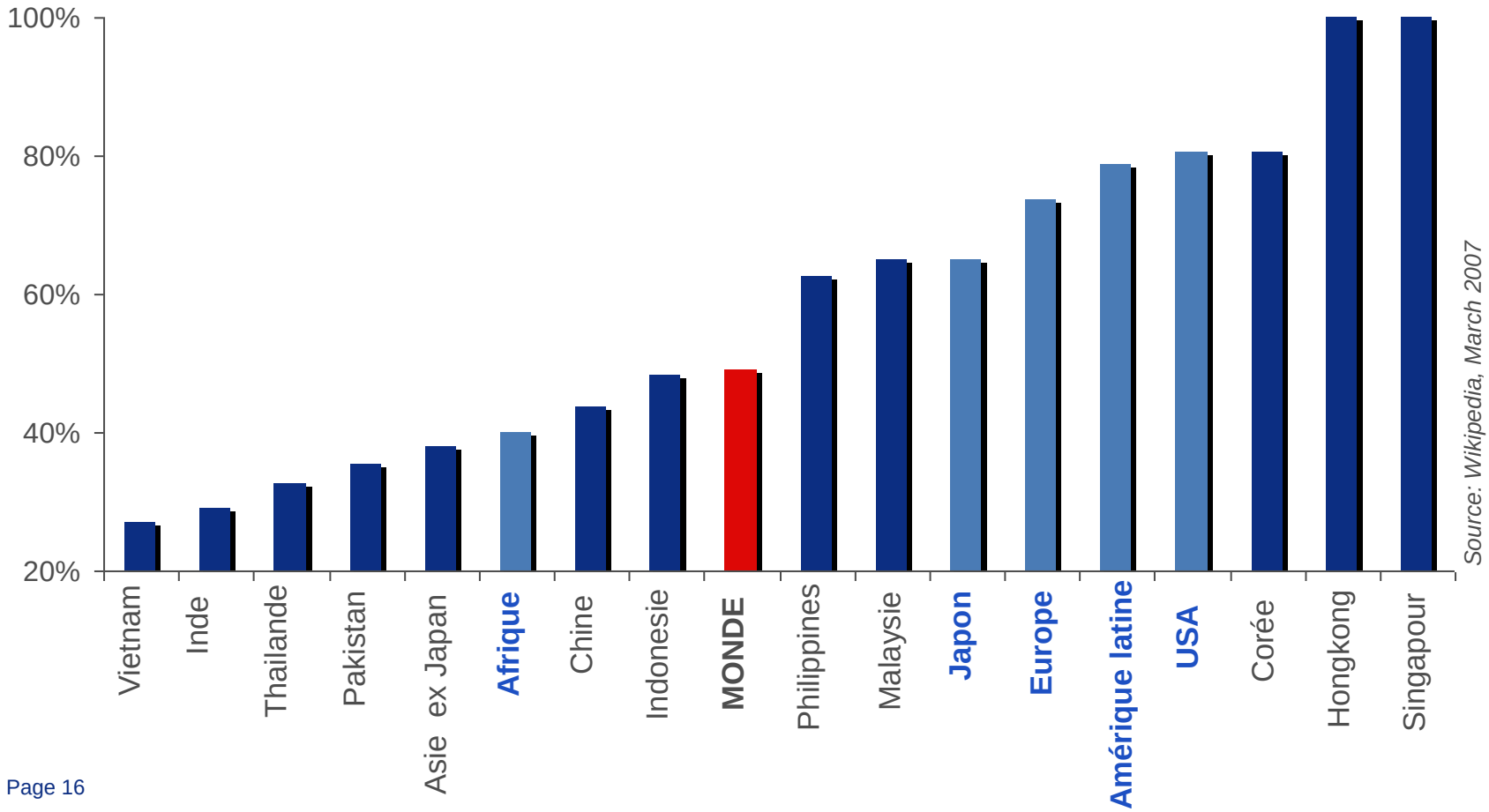


Source: USDA

Growth of urbanization

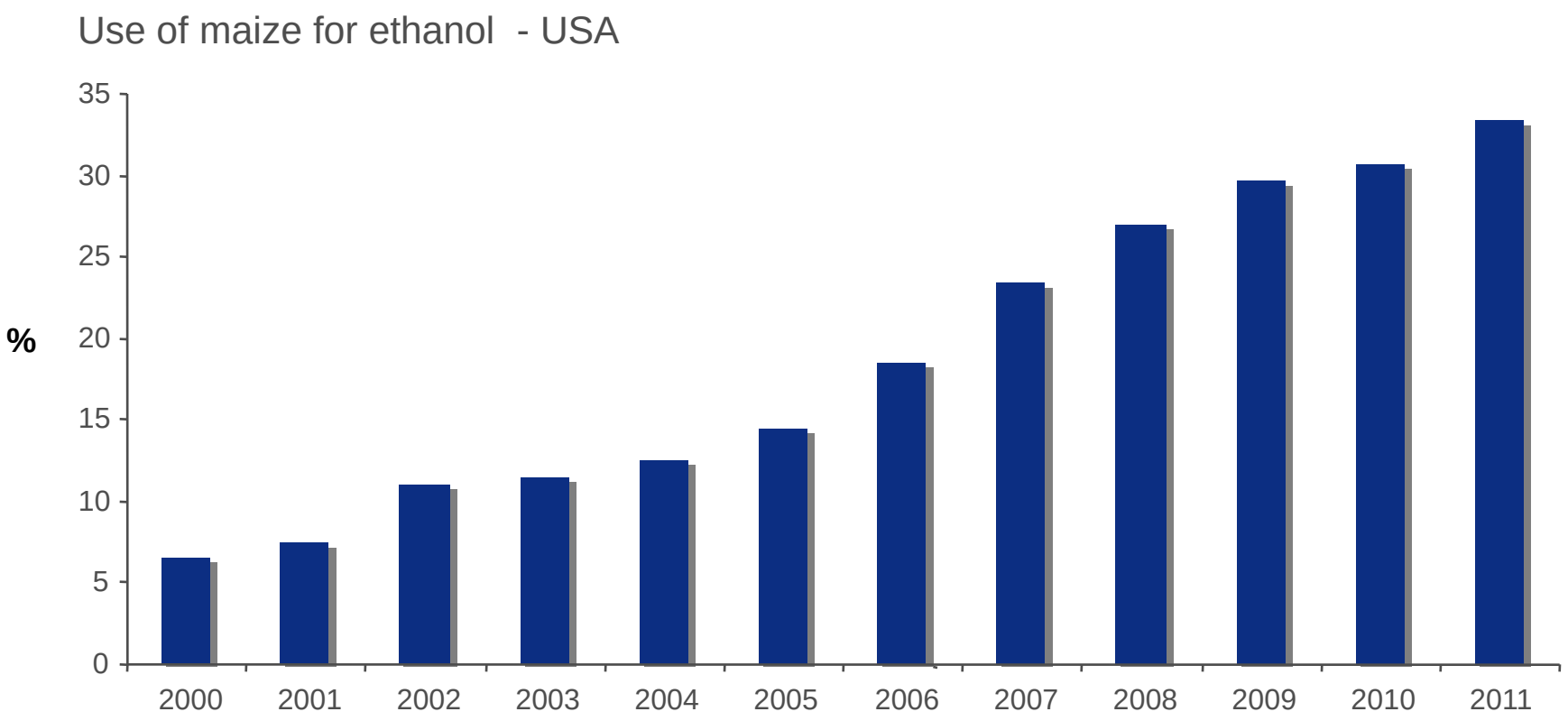
33 millions of persons (4x New York) move every year to the asian big cities

Percentage of métropolitans vs total population



Biofuels

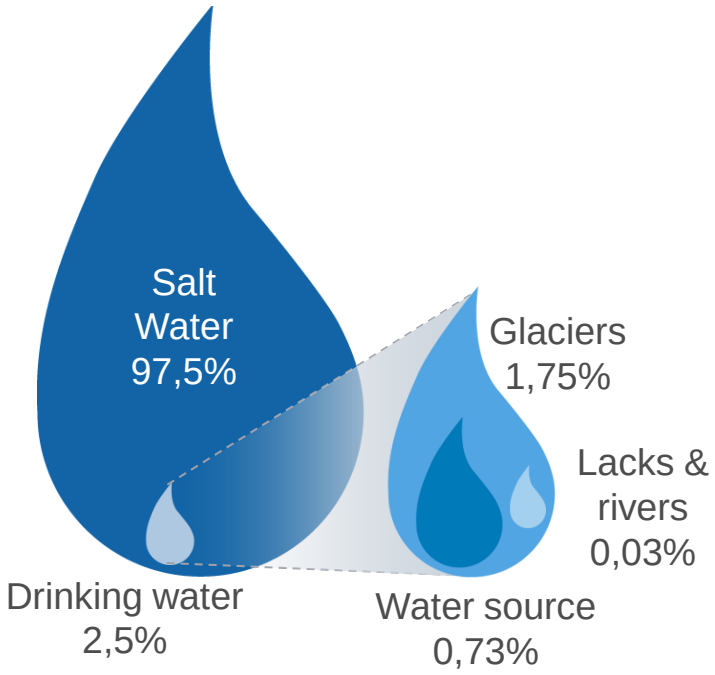
Growth of biofuels demand



Source: USDA, DB Global Markets Research

Water : « blue gold»

- 75% of the globe is covered with water
- 70% of the consumption➔ agriculture
- 100 last years:
  - Consumption x 7 but:
  - population x 4
- Problems in the distribution ➔ big losses
- With climate change, the differences between North and South are highest



Répartition of water

Source: United Nations World Water development Report 2003

Urbanization

Extension of cities caused damage of environement and decrease of arable land

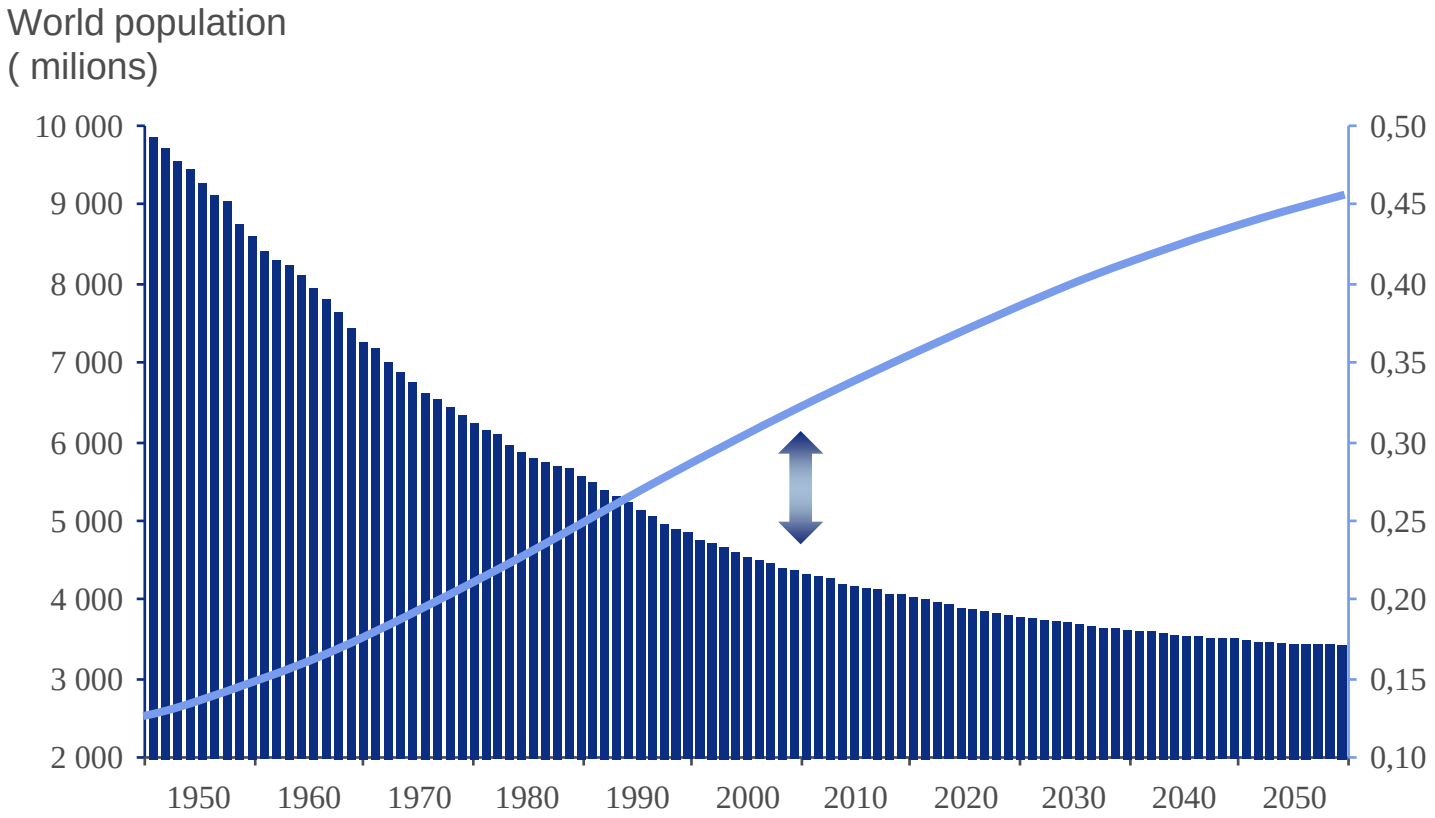
Example: Kuala Lumpur - 1974

Example: Kuala Lumpur - 2005

Source: Wikipedia, Mars 2007

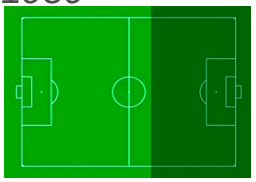
Avaibility of land

Decrease of the area of arable land.

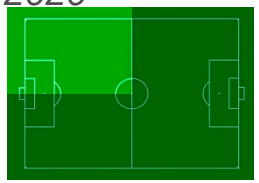


Source: U.S. Census Bureau, FAOSTAT, CSFB estimates

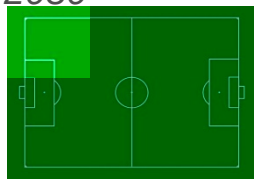
1950



2020



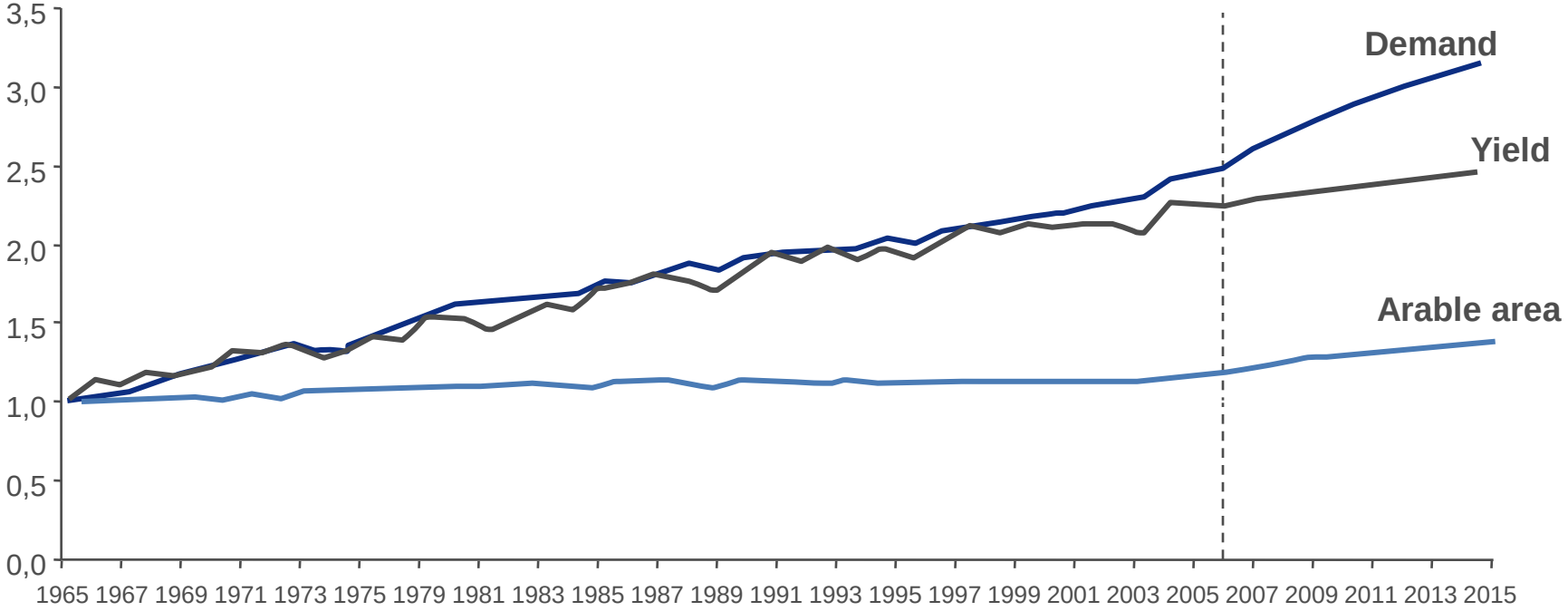
2050



Avaibility of land

Yield growth by hectare of arable land decreases progressively

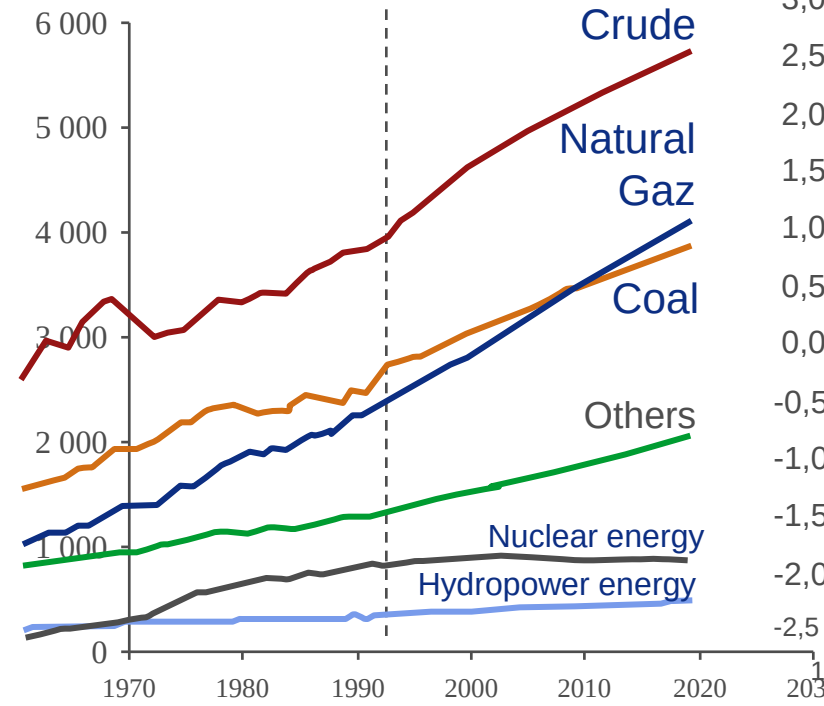
Demand on agriculture, yield and area
from1960 to 2015.
Index 1960-100



Source: USDA, FAO, Goldman Sachs research estimate

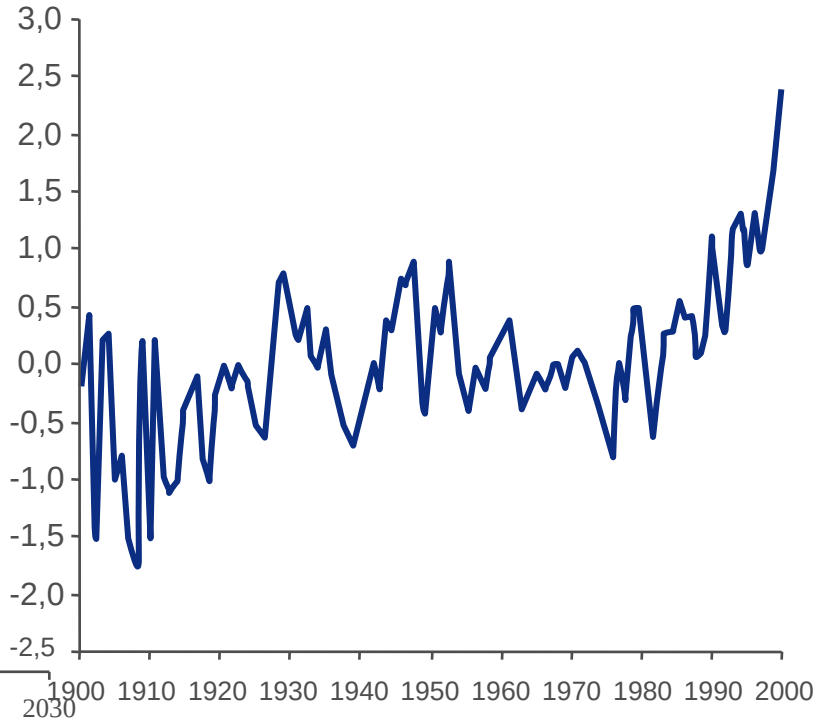
Climate change probably in link with the growth of energy

Production
Millions of tons



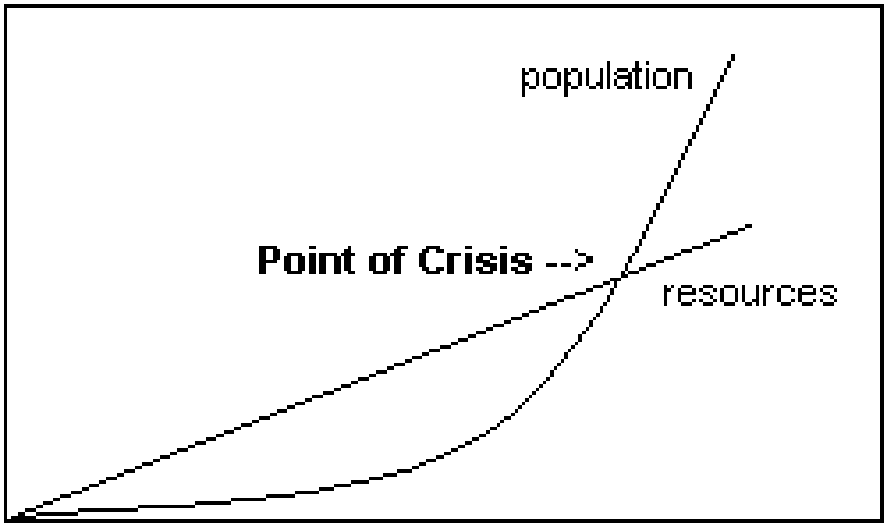
Source: International Energy Administration (IEA)

Variation de °C depuis 1900

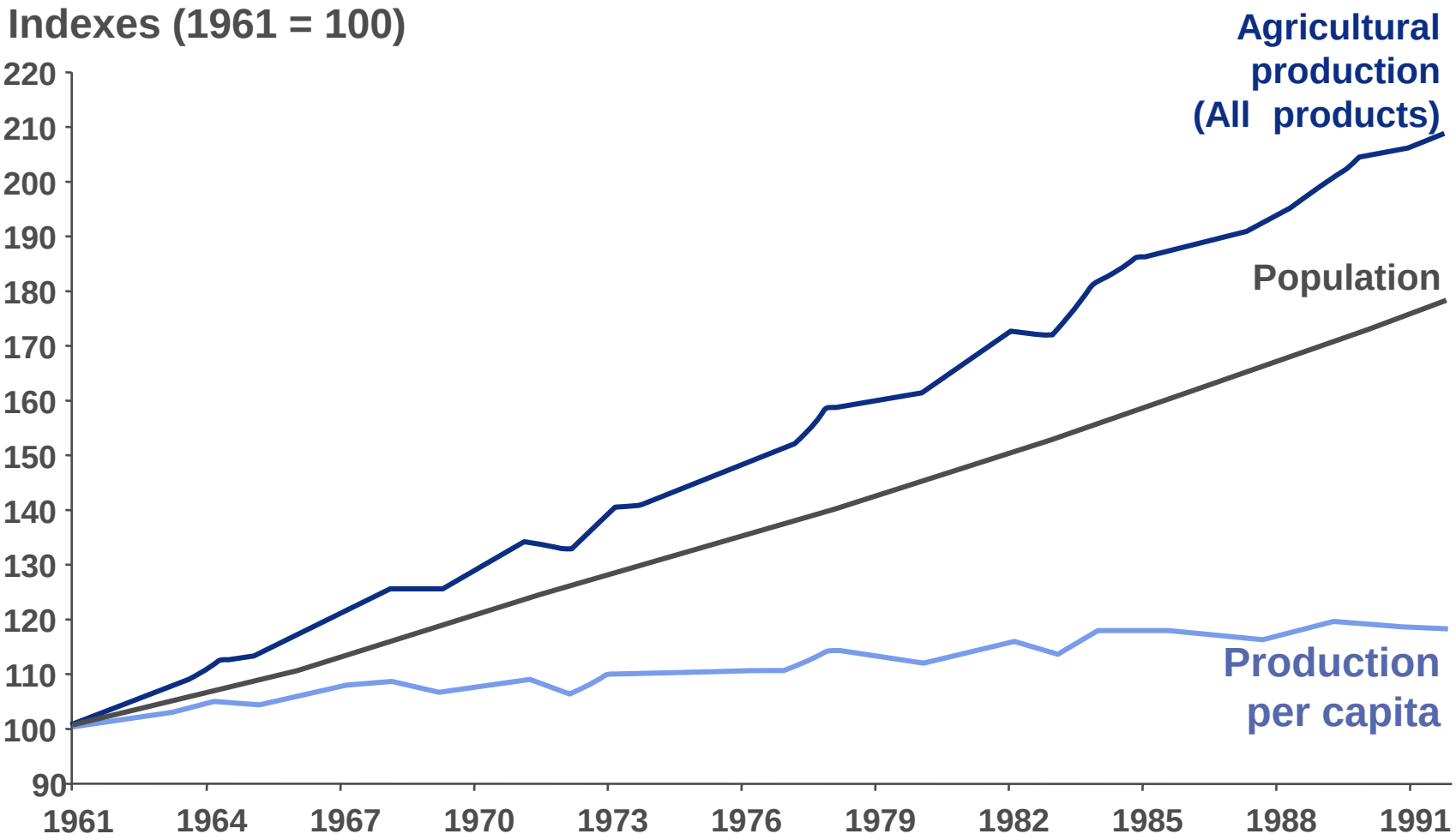


Source: Hadley Centre

Malthusianisme ?

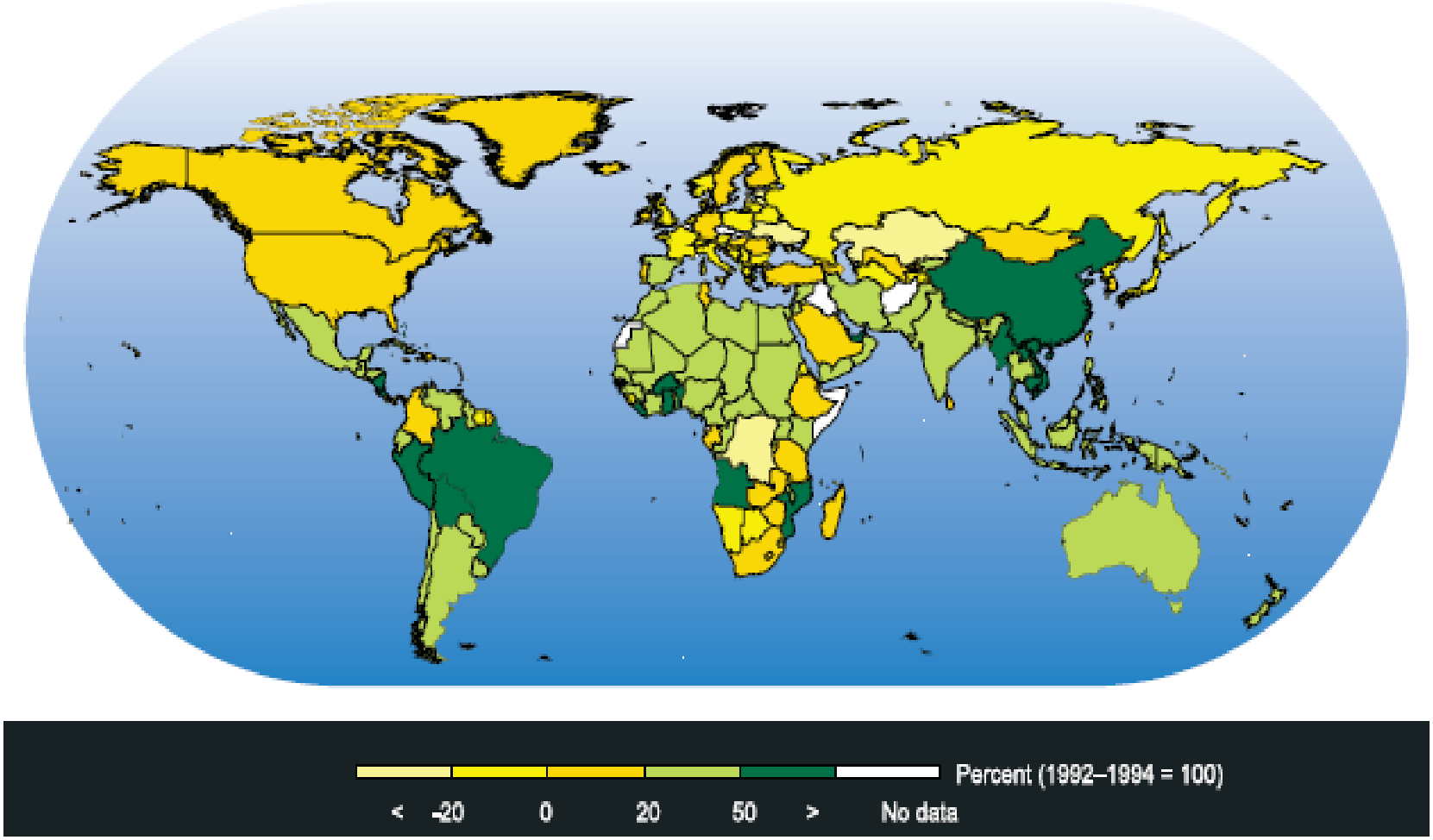


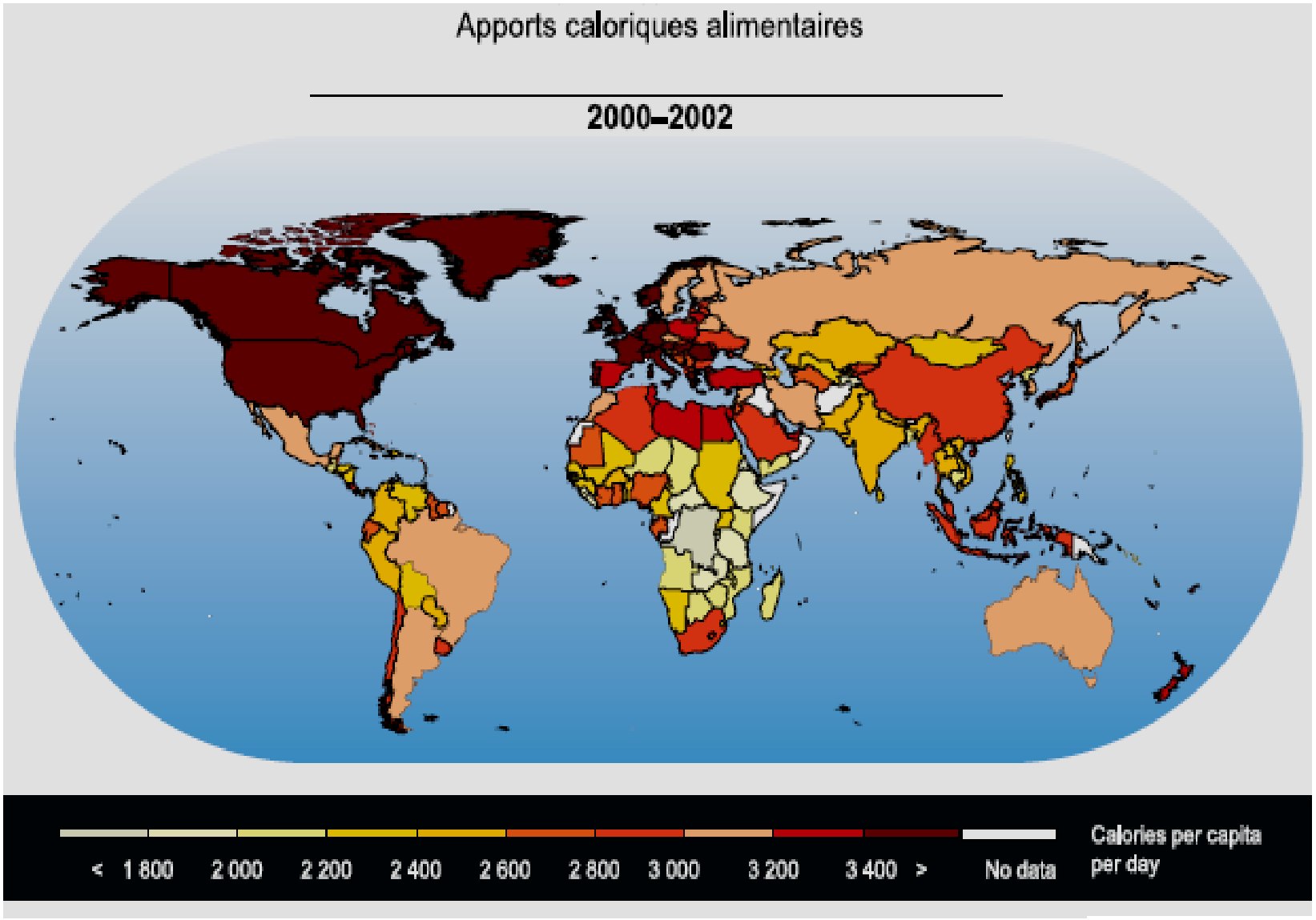
Malthus' Basic Theory


Indexes (1961 = 100)
Agricultural production (All products)
Population
Production per capita
220
210
200
190
180
170
160
150
140
130
120
110
100
90
1961
1964
1967
1970
1973
1976
1979
1982
1985
1988
1991

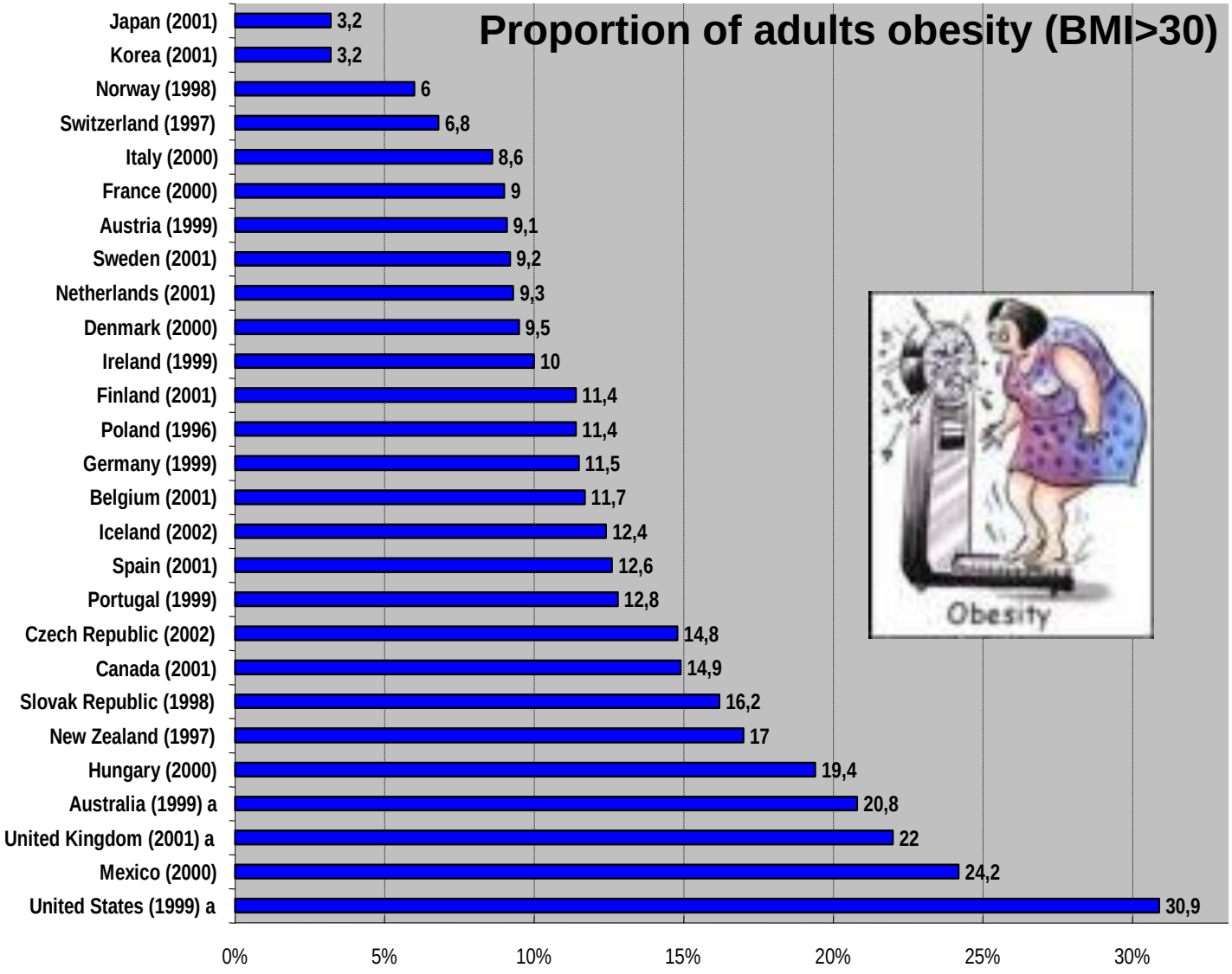
Croissance de la production agricole (par habitant)

1993–2003

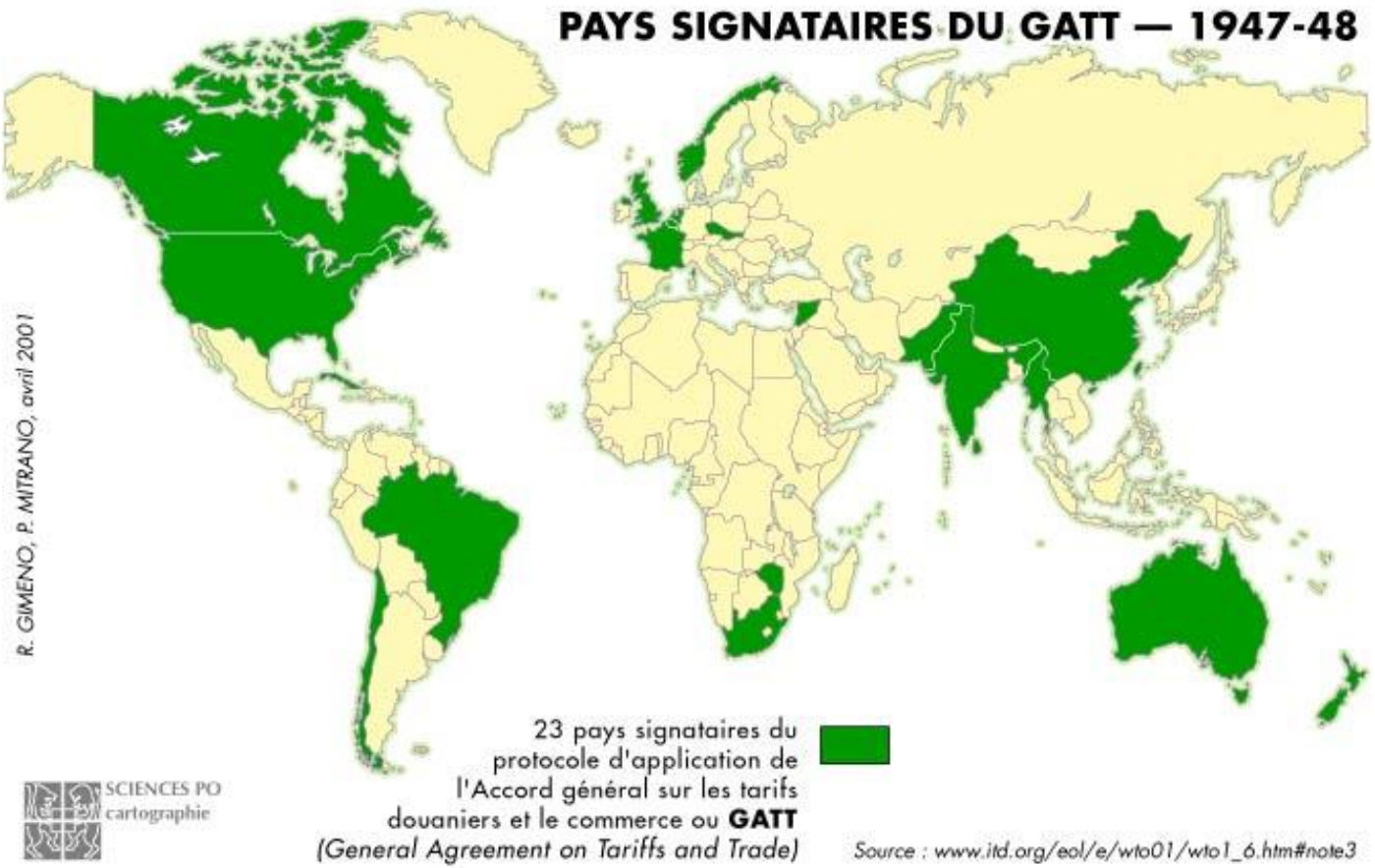



Apports caloriques alimentaires
2000–2002
< 1 800
2 000
2 200
2 400
2 600
2 800
3 000
3 200
3 400 >
No data
Calories per capita per day

Proportion of adults obesity (BMI>30)



Trade and development


PAYS SIGNATAIRES DU GATT — 1947-48
R. GIMENO, P. MITRANO, avril 2001
SCIENCES PO
cartographie
23 pays signataires du protocole d'application de l'Accord général sur les tarifs douaniers et le commerce ou GATT
(General Agreement on Tariffs and Trade)
Source : www.itd.org/eol/e/wto01/wto1_6.htm#note3

Principals cycles of negociations

Le cycle de Genève (1947)	→	23 pays
Les cycles d'Annecy, de Torquey et de Genève (1949 - 1956)	→	26 pays
Le cycle Dillon (1960 – 1962)	→	26 pays
Le cycle Kennedy (1963 – 1967)	→	62 pays
Accords multi-fibres (1974)		
Le cycle de Tokyo (1974 – 1979)		
Le cycle d'Uruguay (1986 – 1994)	→	123 pays

http://www.wto.org/

Location: Geneva, Switzerland
Established:1 January 1995
Created by: Uruguay Round negotiations (1986-94)
Membership: 164 countries on 29 July 2016
Budget: 197 million Swiss francs for 2014
Secretariat staff: 634
Head: Roberto Azevêdo (Director-General)

https://www.wto.org/english/thewto_e/minist_e/minist_e.htm

- **Ministerial Conferences**

- > Nairobi, 15-19 December 2015
  > Bali, 3-6 December 2013
  > Geneva, 15-17 December 2011
  > Geneva, 30 November - 2 December 2009
  > Hong Kong, 13-18 December 2005
  > Cancún, 10-14 September 2003
  > Doha, 9-13 November 2001
  > Seattle, November 30 – December 3, 1999
  > Geneva, 18-20 May 1998
  > Singapore, 9-13 December 1996

Changing challenges


À BAS LE GATT!
PRODUCTEUR AMERICAIN
ON LA REFAIT J'AVAIS D « EN ANGLAIS
PLANTU

UE ET USA : DEUX MODÈLES D'AGRICULTURE

Production
en milliards de dollars

UE (15) 197
Etats-Unis 190

Nombre d'exploitations
en millions de fermes

7,37
2,06

Surfaces de terres agricoles
en millions d'hectares

134
425

Taille moyenne des exploitations
en hectares

18
207

Subventions
(soutien à la production)
en milliards de dollars

90,2
49

Subvention par agriculteur
en dollars

14 000
20 000

Laurence Saubadu AFP *source : UE, OCDE 100504*

CAIRNS

Afrique du Sud
Argentine
Australie
Bolivie
Brésil
Canada
Chili
Colombie
Costa Rica
Guatemala
Indonésie
Malaisie
Nouvelle Zélande
Paraguay
Philippines
Thaïlande
Uruguay

G 20

Afrique du Sud
Argentine
Bolivie
Brésil
Chili
Chine
Cuba
Egypte
Guatemala
Inde
Indonésie
Mexique
Nigéria
Pakistan
Paraguay
Philippines
Tanzanie
Thaïlande
Venezuela
Zimbabwe

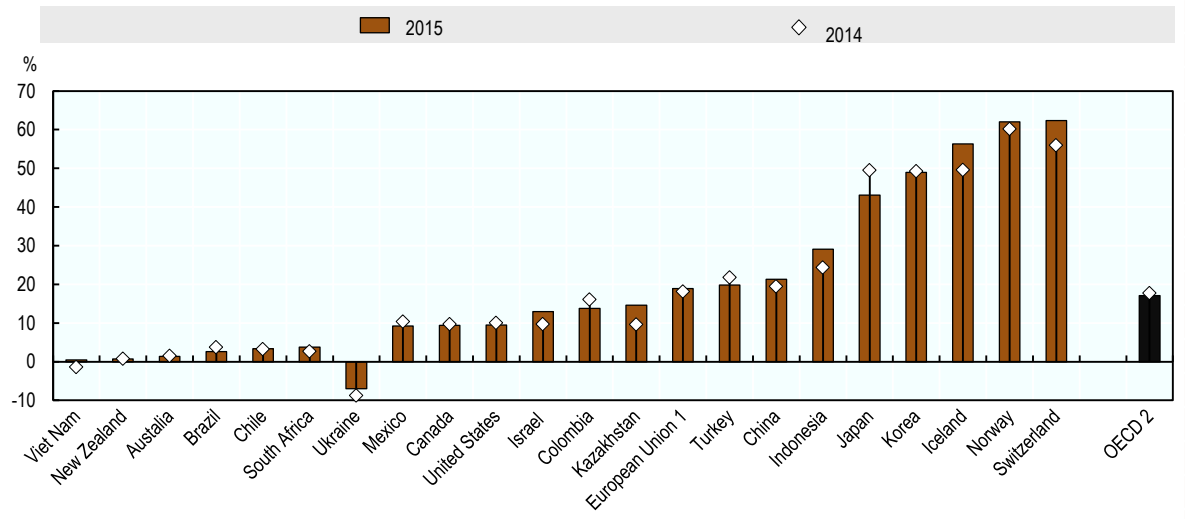
2001	TOTAL GDP	GDP AGRIC.
G-20	12.6 %	20.9 %
US	32.3 %	6.8 %
EC-15	25.4 %	7.4 %
CAIRNS	8.0 %	7.5 %

2001	Pop. Total	Pop. Agric.
G-20	56.8 %	70.0 %
US	4.7 %	0.2 %
EC-15	6.1 %	0.6 %
CAIRNS	9.2 %	4.9 %

2001	EXPORT[1] AGRIC.	IMPORT[1] AGRIC.
G-20	26.2 %	18.2 %
US	18.9 %	14.1 %
EC-15	18.9 %	17.2 %
CAIRNS	31.4 %	11.3 %

1.Ormis le commerce intra-EU agricole

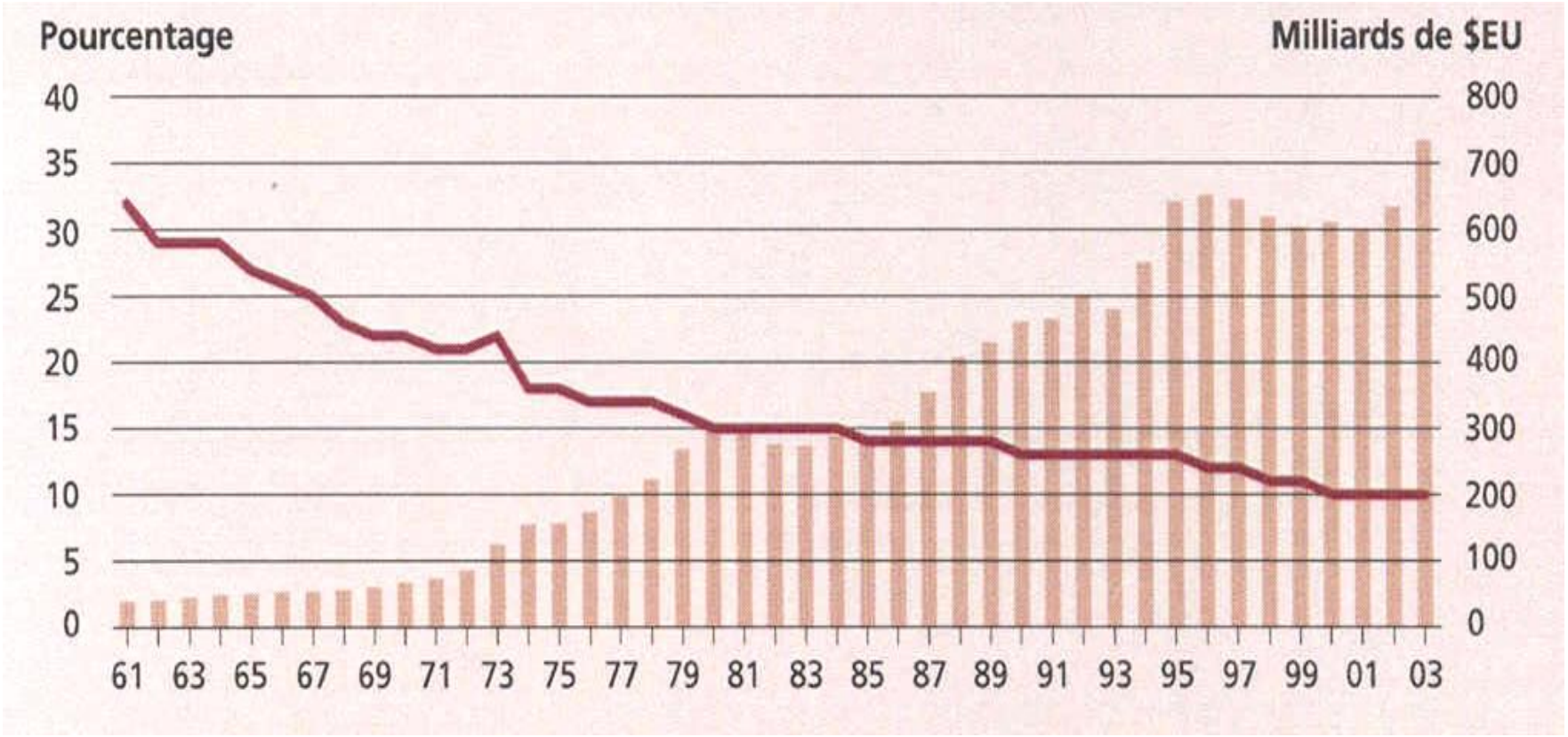
Figure: Producer Support Estimate by country, 2014 and 2015
Percentage of gross farm receipts



Source: OECD (2016), "Producer and Consumer Support Estimates", OECD Agriculture statistics (database).

Prices and declining terms of trade

Total world agricultural exports and their share in merchandise exports



Share of agriculture in total merchandise exports

Total agricultural exports

Declining terms of trade

Example : coffee

incomes of coffee producers countries

Beginning of years90

10 à 12 billions USD

Today

5 à 6 billions USD

-50%

Retail Sales

Beginning of years 90

30 billions USD

Today

70 billions USD

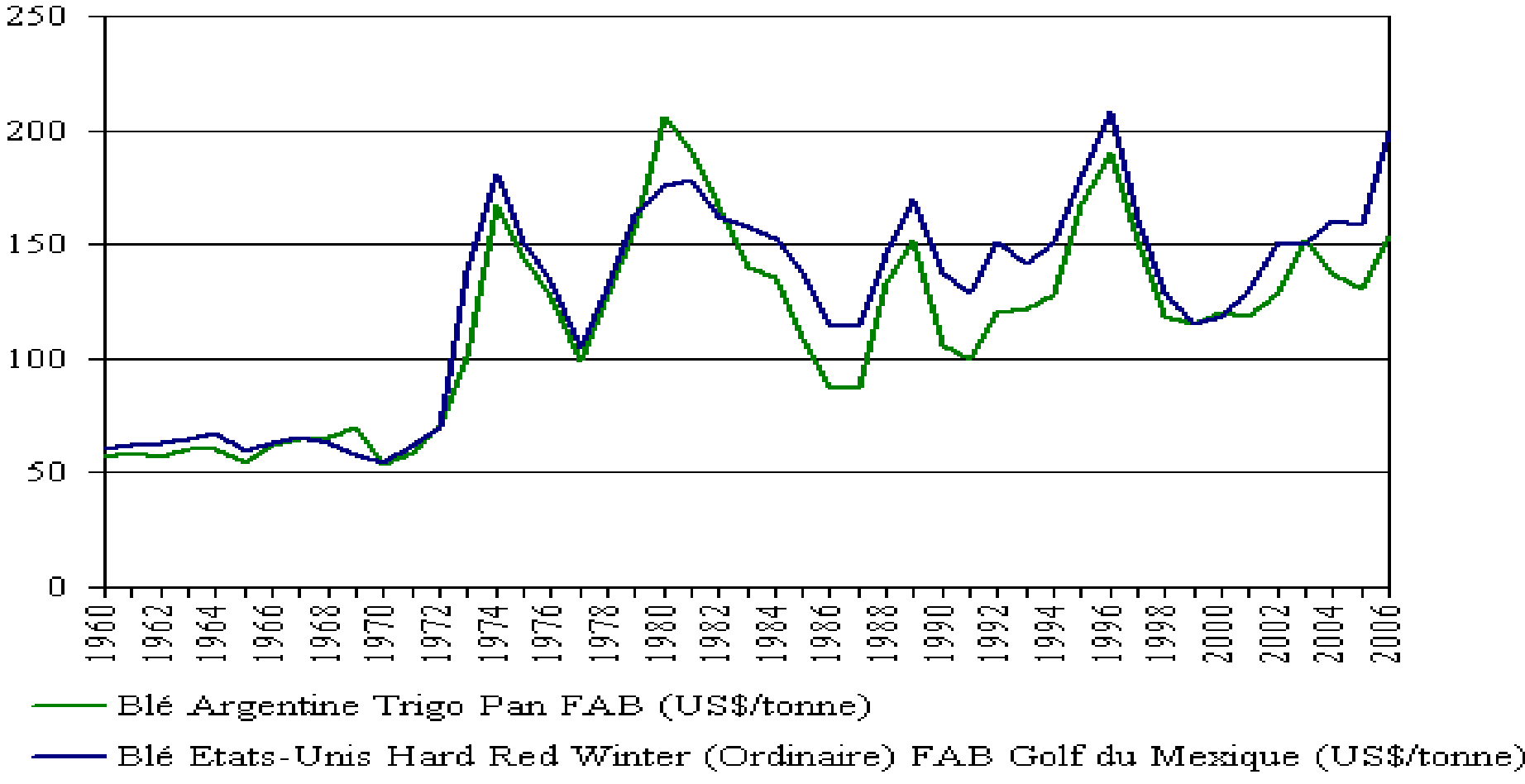
+133%

The volatility of world markets for agricultural products

KING effect

« Any change in agricultural supply, resulting deficit or surplus, determines a further change in the price»

Comparison between wheat prices (Argentine Trigo Pan F0B & USA Hard Red Winter (FOB) Mexico Golf from 1960 to 2005, USD/tons



THE MARKETS FUTURES FOR AGRICULTURAL PRODUCTS:

THE INSURANCE OF A PRICE BUT NOT A GUARANTEE OF A REMUNERATIVE PRICE



Commodity Futures Price Quotes For Coffee (ICE Futures)

	Open	High	Lowt	Last
Dec'16	138.85	139.00	138.20	138.20
Mar'17	142.85	143.20	140.80	142.45
May'17	144.85	145.50	143.10	144.80
Jul'17	147.70	147.70	145.50	147.00
Sep'17	149.65	149.65	147.25	148.80
Dec'17	152.15	152.20	150.05	151.65
Mar'18	152.70	154.25	152.70	154.25

CENTRAL HIGHLANDS SPECIFICITIES

Demography

THE CENTRAL HIGHLANDS TOTAL POPULATION:

5,460,400 (GSP, 2013)

WITH NEARLY 20 ETHNIC GROUPS,
OF WHICH:

KINH (3,310,000),
GIA RAI (409,000),
EDE (304,000).

Demography

A LARGE NUMBER OF KINH PEOPLE MIGRATED TO THE REGION FROM THE NORTHERN AND CENTRAL PROVINCES OF VIETNAM

SINCE THE 1990S RESULTING IN A REMARKABLE POPULATION GROWTH OF 485% IN 1999.

Population growth has since resulted during the same period, intensifying resource use, including water.

Much of the increased agricultural production has been based on cropping, with deforestation providing cropping land and increasing water use.

Vietnam is the second largest coffee producer in the world, and approximately forty percent of national coffee output originates from Dak Lak Province.

In recent years coffee production in Dak Lak has been significantly constrained by dry season water shortages, and the sustainability of smallholder coffee production in the region has been questioned.

“Coffee smallholders in the Dak Lak Plateau are technically and allocatively inefficient irrigators,
meaning they can both reduce the amount of irrigation water input use per tree per season, and can also reschedule irrigations to achieve higher output using the same amount of water input”.

Cheesman, J., Son, T. V. H. and Bennett, J. W., 2007. Valuing irrigation water in coffee production in Viet Nam’s Dak Lak Plateau: a marginal productivity analysis, Managing Groundwater Access in the Central Highlands of Viet Nam Project Research Paper 6, Canberra.

Reforestation should be promoted in specific areas

Proposed changes would make specific farmers efficient forest managers

Typical monocultures in the Central Highlands could be replaced with diversified cropping systems, which vary agricultural products (both cultivation and livestock).

These diversified systems engender multiple sources of household income and promote resilience to climate change and extreme weather events.

Farmers have already developed effective adaptation practices with their accumulated experience and knowledge against the effects of drought.

For instance, a common practice among farmers in the province of Dak Lak is integrating trees (e.g. fruit and timber trees) with agriculture crops.

However, no standard guidelines are in place for such practices since intercropping designs vary from farm to farm.

So, excellent research question for Phan Thi Thuy, PhD Student!

Other research topic:

Vietnam National University of Agriculture (VNUA) is currently working with USSEC to research and development of a new fish production model.

The intensive pond aquaculture (IPA) technology enhances management control to yield greater fish production at lower per-unit cost through improved fish survival and feed conversion.

The zero exchange system captures nutrients for use as a crop fertilizer and requires minimal use of drugs and chemicals to ensure food safety (Cremer, M. and al., 2014).

http://pdf.gaalliance.org/pdf/GAA-Cremer-Jan14.pdf

New Aquaculture System

With 13,900 ha of water surface for aquaculture, total aquaculture production (mainly fish) was 29,156 tons,
with capture fishery producing about 4,600 ton.

Among the five Central Highlands provinces, Dak Lak has the largest aquaculture area (7,800 ha) and produces 50% of the total fish production in the region.

Q & A

Thank you for your attention!

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philippe.lebailly@ulg.ac.be