education organization research

"WORKING TOGETHER TO FEED THE WORLD"

World's Poultry Science Association

WPSA

established 1912

Trends and challenges in the poultry industry

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Secretary General WPSA

General aspects

World's population growth and the need for animal protein and consequences of increase of poultry meat and egg consumption, worldwide

Aspects: *climate change*, *water and land availability*, *diseases*, *food safety and security*

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General aspects

Spectacular success of the poultry industry in efficient production of poultry over the past 60 years have made poultry meat and eggs among the cheapest and plentifull forms of high quality animal protein. Achieved through the application of research-derived scientific principles of breeding, nutrition and management.

General aspects

Many demographical changes have taken place in the last 30 years and continue to change. These changes include increases in absolute wealth in countries in the Middle East, South-East Asia and South America and are largely the result of economic factors including free trade policies and freedom of companies to move their site of production. The outcomes of these changes have been good on a global scale with more people world-wide being raised from poverty than ever before.

General aspects

One consequence of this increase in wealth is that the population increasingly consume meat and eggs as an important component of their diet. As an example the world poultry meat consumption increased by 200 % since the year 2000.

The expansion of the poultry industry in many countries with expanding economies brings unique problems and issues. In countries where the ambient temperature may be high for much of the year, limitations in hygiene and infection control may arise from the fact that for economic reasons open-sided housing is frequently used instead of enclosed housing.

General aspects

In other countries, although large companies may control much of the commercial production, actual poultry rearing is done on small back-yard farms.

Rapid expansion in poultry meat production also influences the way of processing the birds. Countries with traditional “wet markets” change to highly mechanized and automated processing procedures.

Pathogen control, welfare and general management may be severely restricted and antibiotic resistance in bacteria and re-assortment in viruses has the potential to become a real risk to the nations production and the rest of the world.

Issues of concern, trends in agriculture

Commercialization : agricultural production is merging with agribusiness and operating at ever-increasing scales with greater efficiency and profit

Globalization : science and technology driven agriculture is critical for survival and success. Biotechnology will be part of the solution to deal with issues such as food safety and food security

Environmental protection : excessive use of chemical fertilizers and agrochemicals, pesticides, weed killers antibiotics, are increasingly problematic to the environment and consumer health.

Large scale production has negative impact on land, air and water availability and quality.

Agricultural energy production : in 2008 the price of o came above $100 a barrel and the discussion on global climate change started. The use of fossile fuels decreased, a reinvestment started in clean and renewable energy as ethanol, biodiesel and biogas. The agricultural system supplied cost- effective solutions

Summary of concerns

Diseases and food safety

Welfare of animals

Environmental impact

Natural resources

Loss of biodiversity

Impact on small producers

Impact of IPR and patents

Concentration of ownership

Climate change

General aspects

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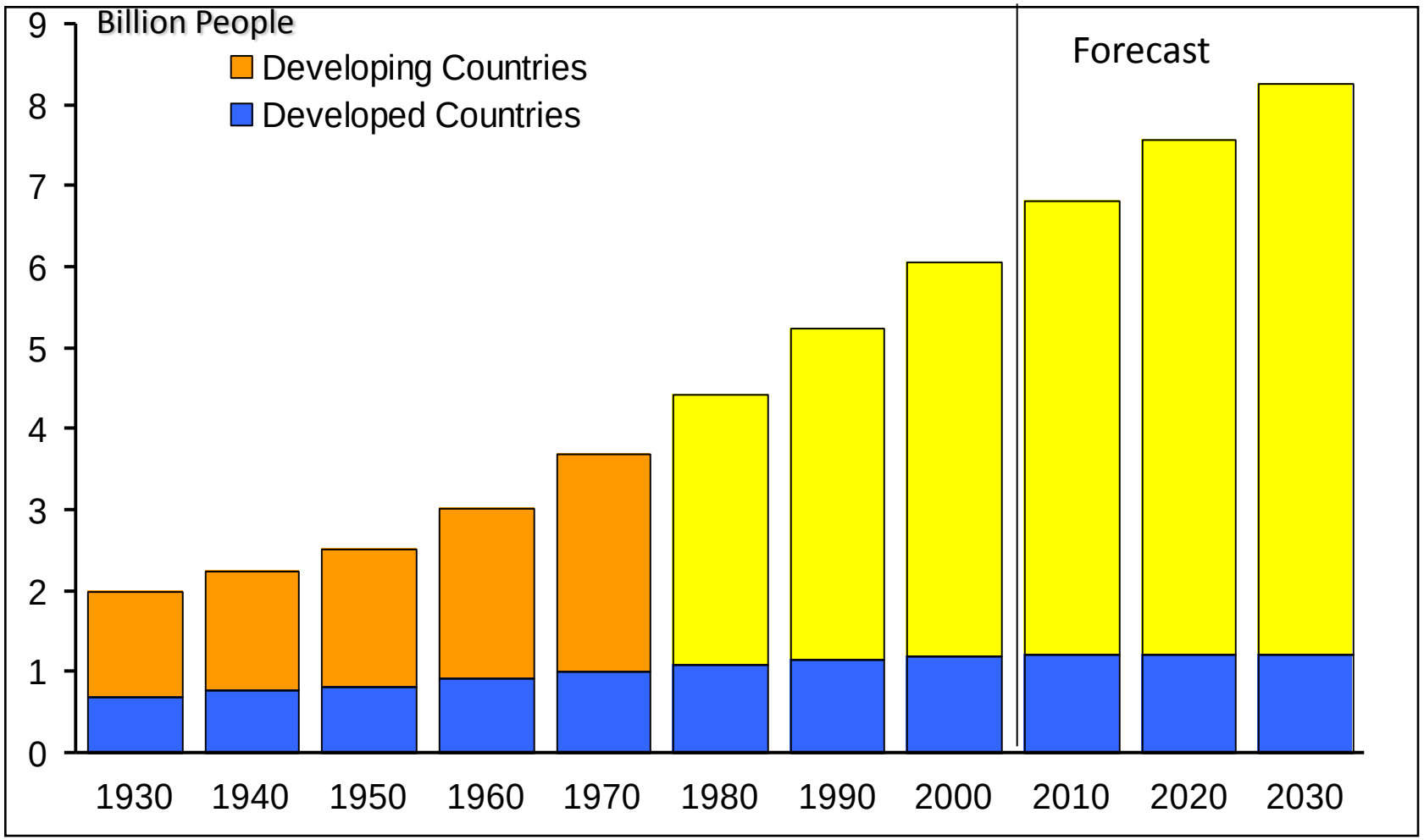
World Population Growth



The impact of climate change

- Global temperature to rise by 2-3 °C by 2050
- More heat waves
- More short term weather events
- Less precipitation in arid areas
- Major sufferers are developing countries, and within a country, the poor

The impact of climate change

- 3°C rise will cause extensive biodiversity loss
- 9,3 billion people to feed by 2050
- All need full and adequate nutrition
- 70% of population will live in global cities by 2130
- 570 million farms – 500 million are smallholders – 87% in Asia
- 72% under 1 hectare, 1% over 50 hectares

- Middle class will grow from 500 million to 1,7 billion in Asia
- Generally speaking more people demand more animal protein
- 45% of the production growth will come from Asia

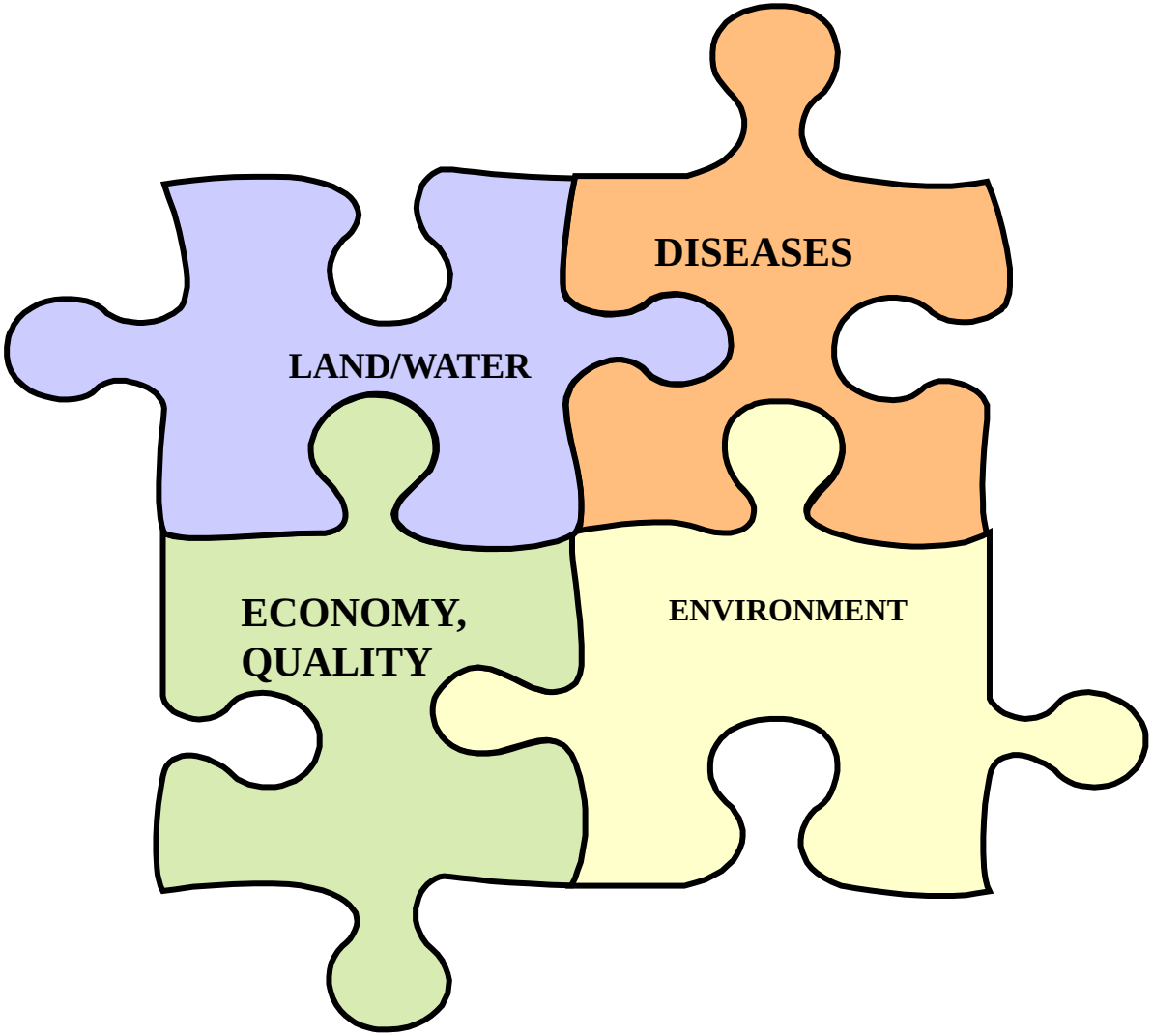
The challenges

Feeding the world with animal protein

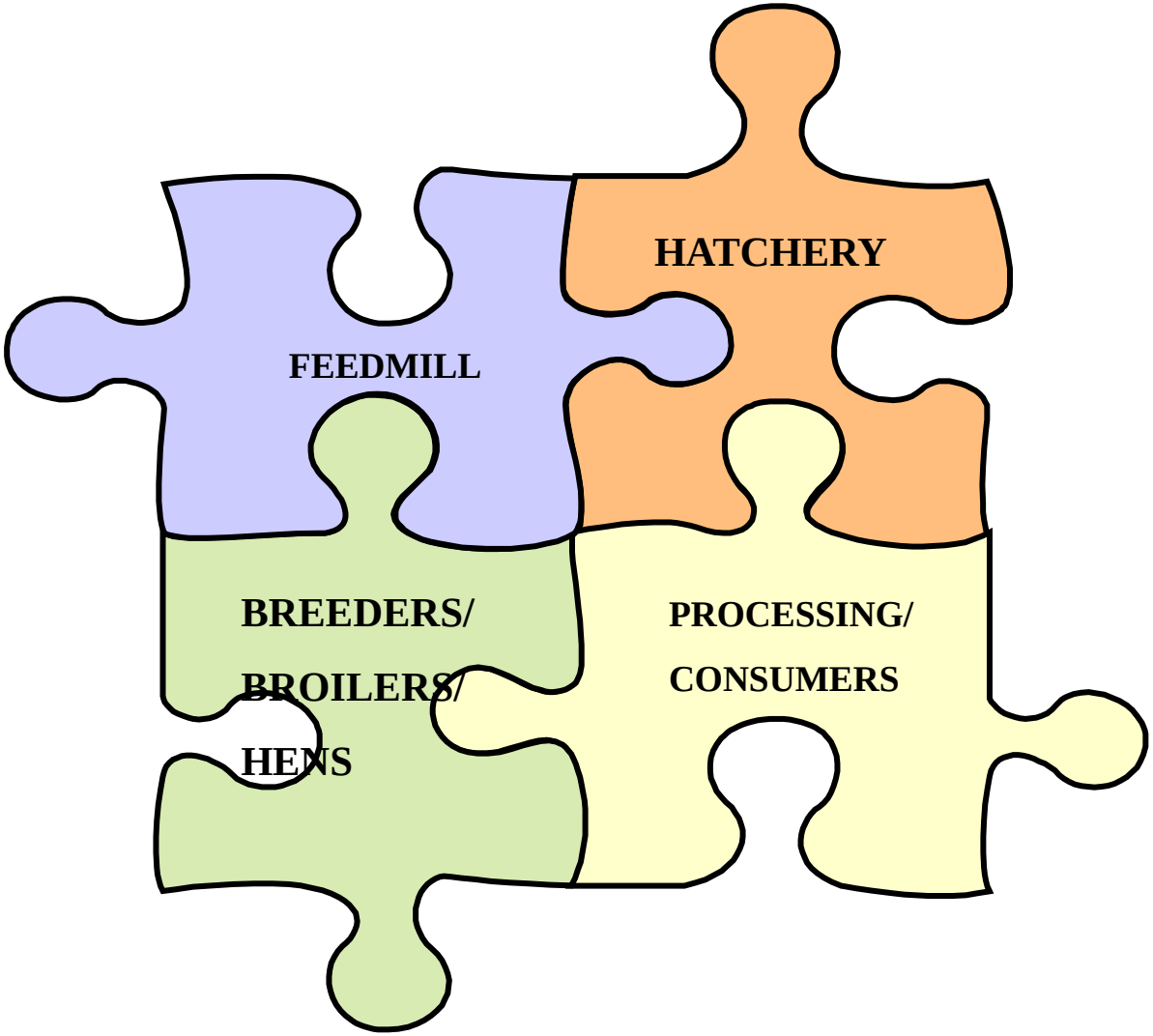
and

Sustainability of poultry production

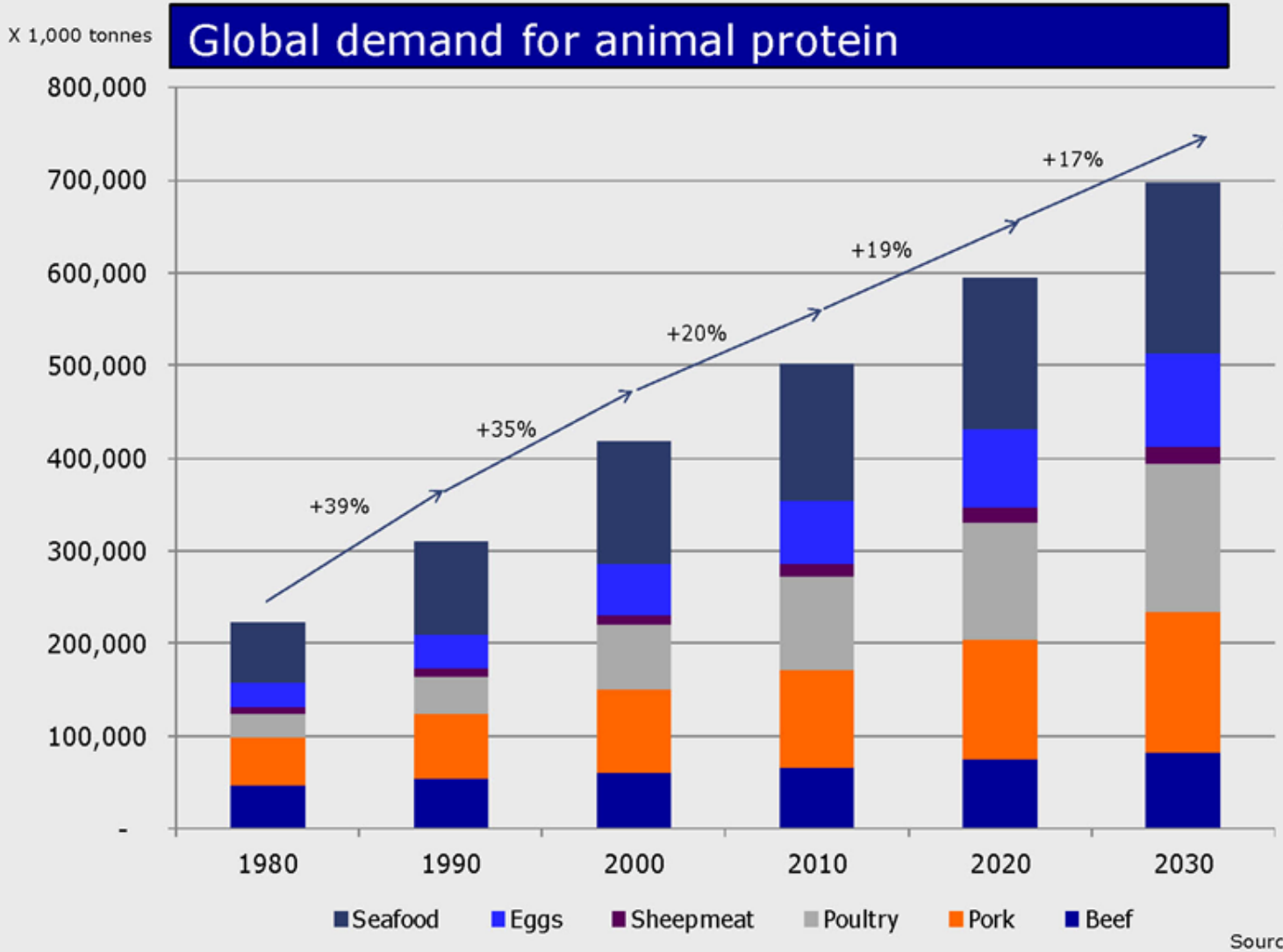
The challenges



The challenges



Fast growth in animal protein: 45% more in 2030



Change:30/10

Seafood: +25%

Eggs: +48%

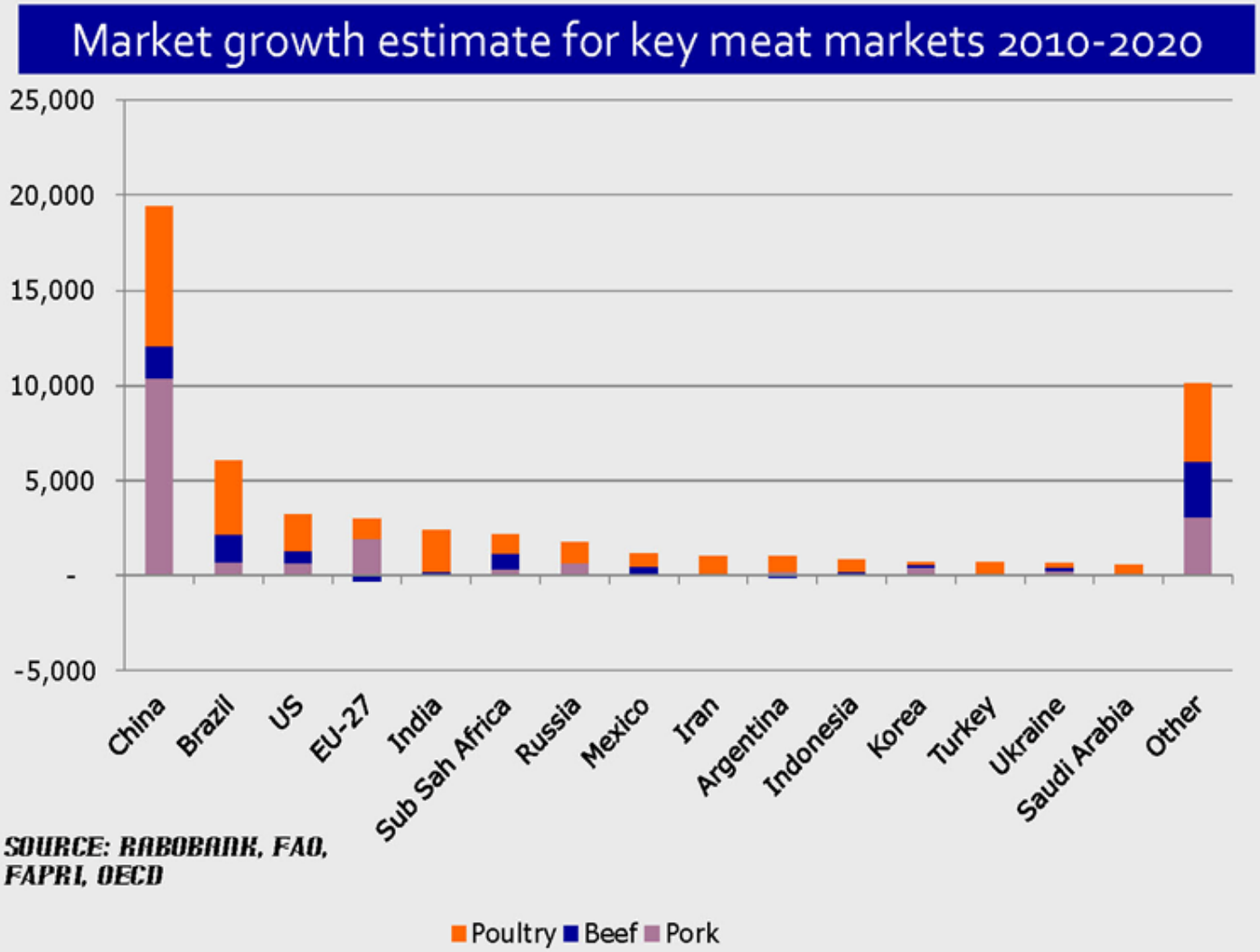
Poultry: +60%

Pork: +42%

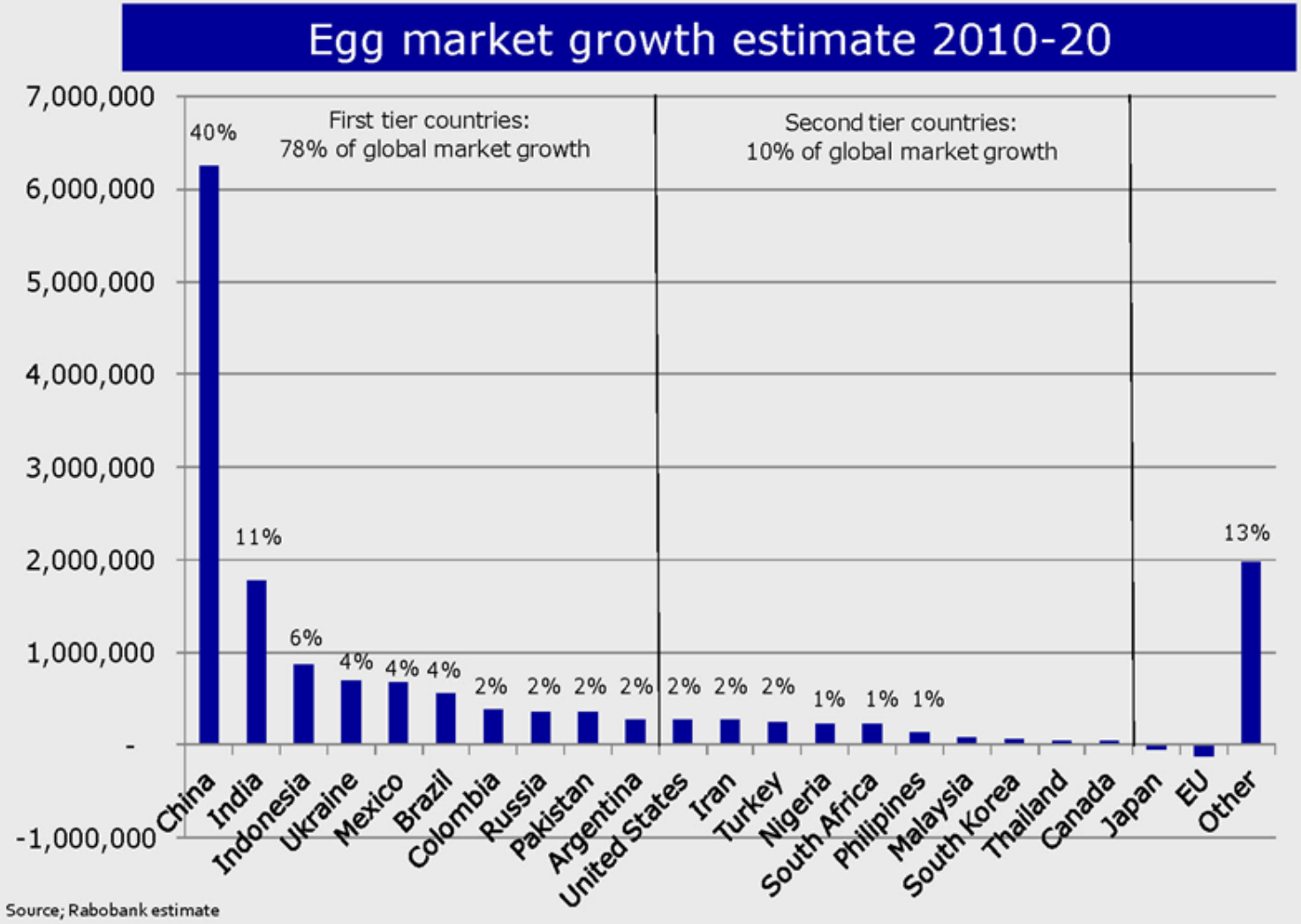
Beef: +25%

Source: Rabobank, FAO, OECD, FAPRI

Meat: more than 85% of growth in emerging markets, mainly Asia



Eggs: Almost 100% of growth in emerging markets



Source; Rabobank estimate

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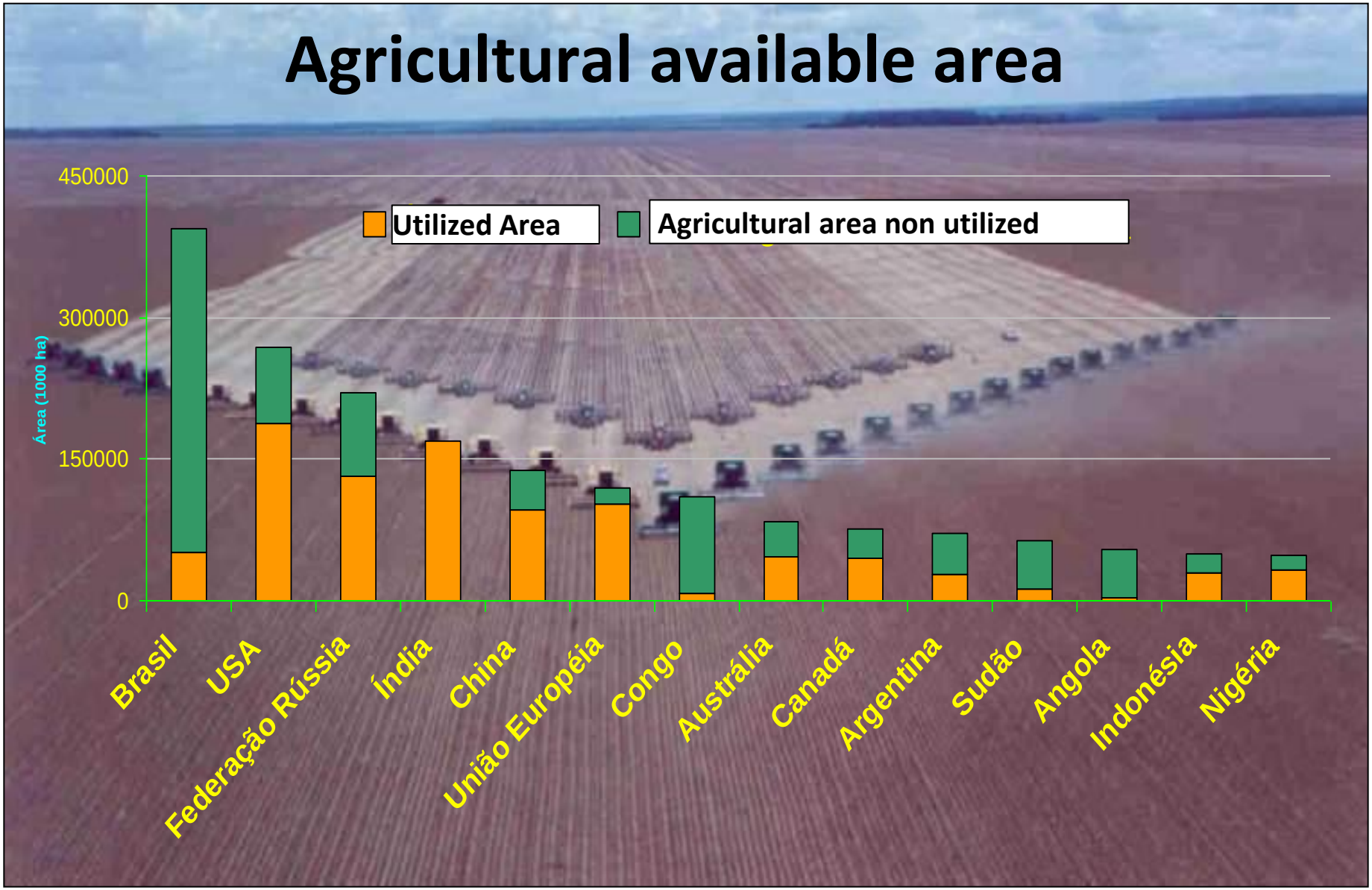
The impact of climate change

Desertification and soil degradation

More than 110 countries have dry/degraded land

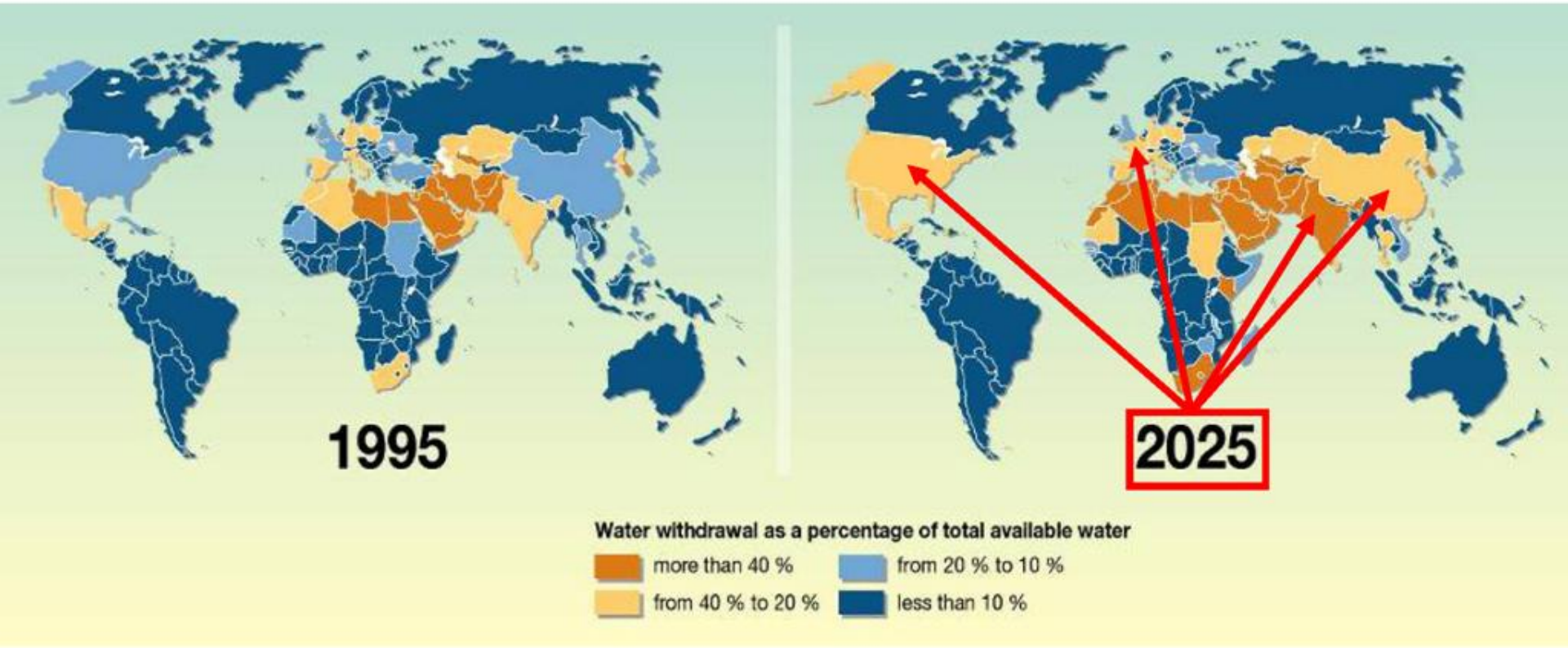
Dry land 41,3% of the global terrestrial area, and is the home of 34,7% of the global population

Agricultural available area



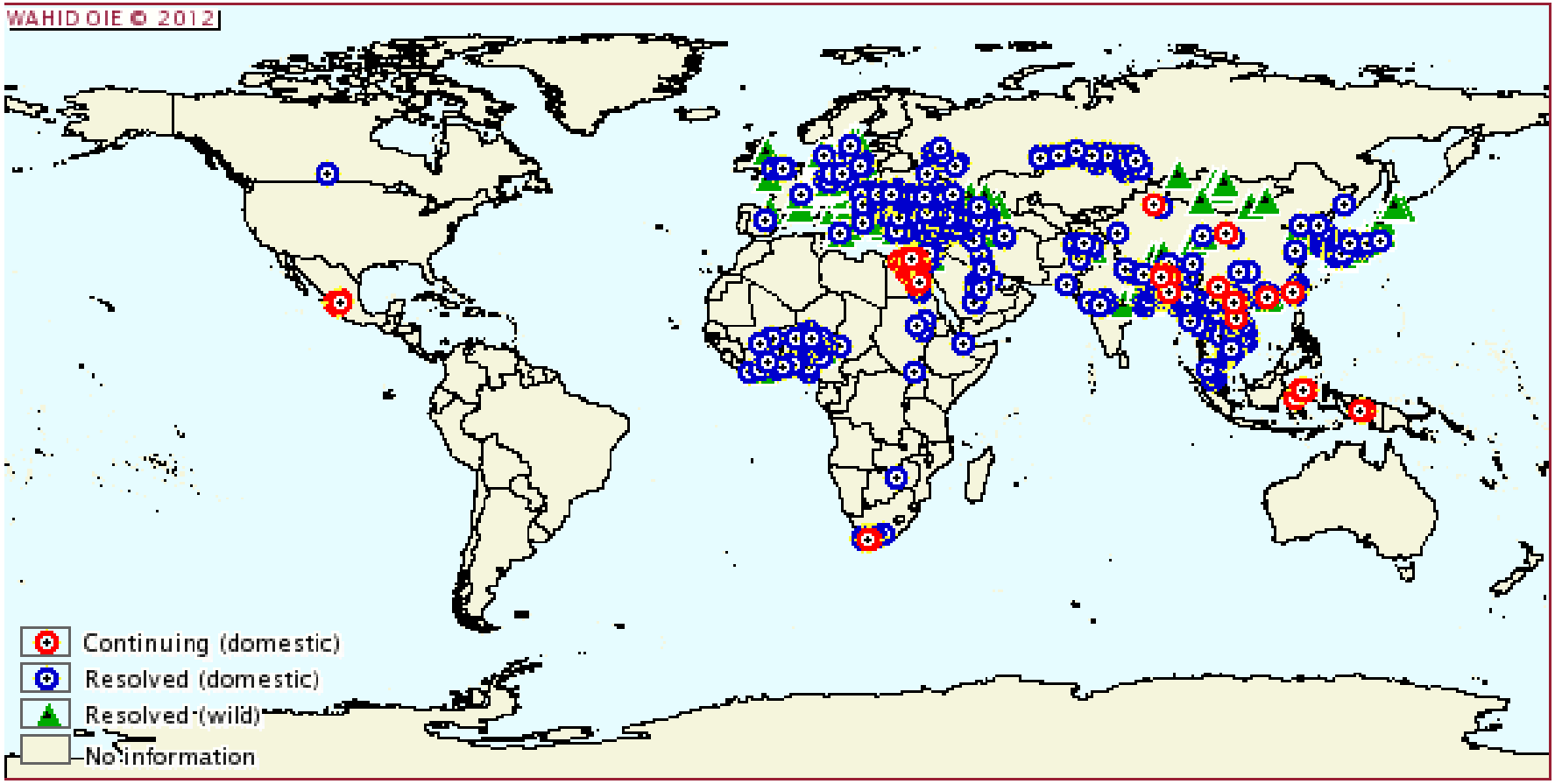
Adapted from Luciano Roppa, 2007

Change in Water Scarcity and Stress



Avian Influenza Map

January 2005 to June 2012



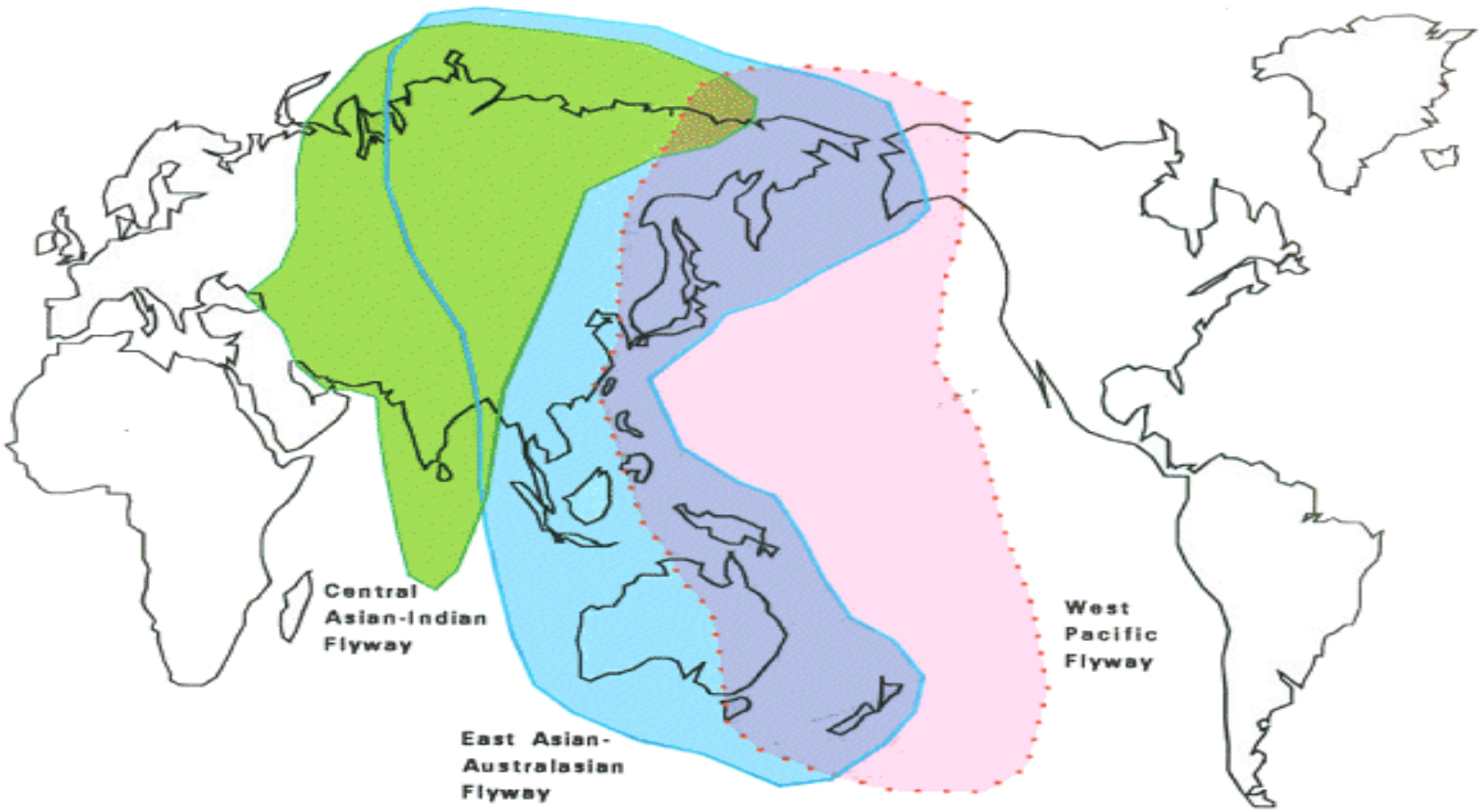
Adapted from http://web.oie.int/washis/public.php?page=disease

H7N7 in The Netherlands 2003

- 241 infected farms : 6 million birds
- Positive farms by serology 17: 73.000 birds
- 1086 farms with preventive killings : 19.5 million birds
- 109 farms with " welfare" killings : 4.5 million birds
- 16.500 hobby farms : 175.000 birds

- Total 17.953 farms with 30.3 million birds (30% of the total poultry population)
- **2014** H5N8 in The Netherlands, Germany, UK, Canada

Flyways Asia



Antibiotic resistance

A new variant of livestock associated MRSA emerged in 2003. Reservoir in pigs, veal calves and chickens. Mainly people in direct contact with live animals are affected. 40% of new human MRSA cases in The Netherlands are LA-MRSA.

Extended Spectrum Beta Lactamase ESBL

Rapid increase in postive hospitalized patients

Since 2005

Mainly community – acquired infections

Transmission in hospital is rare

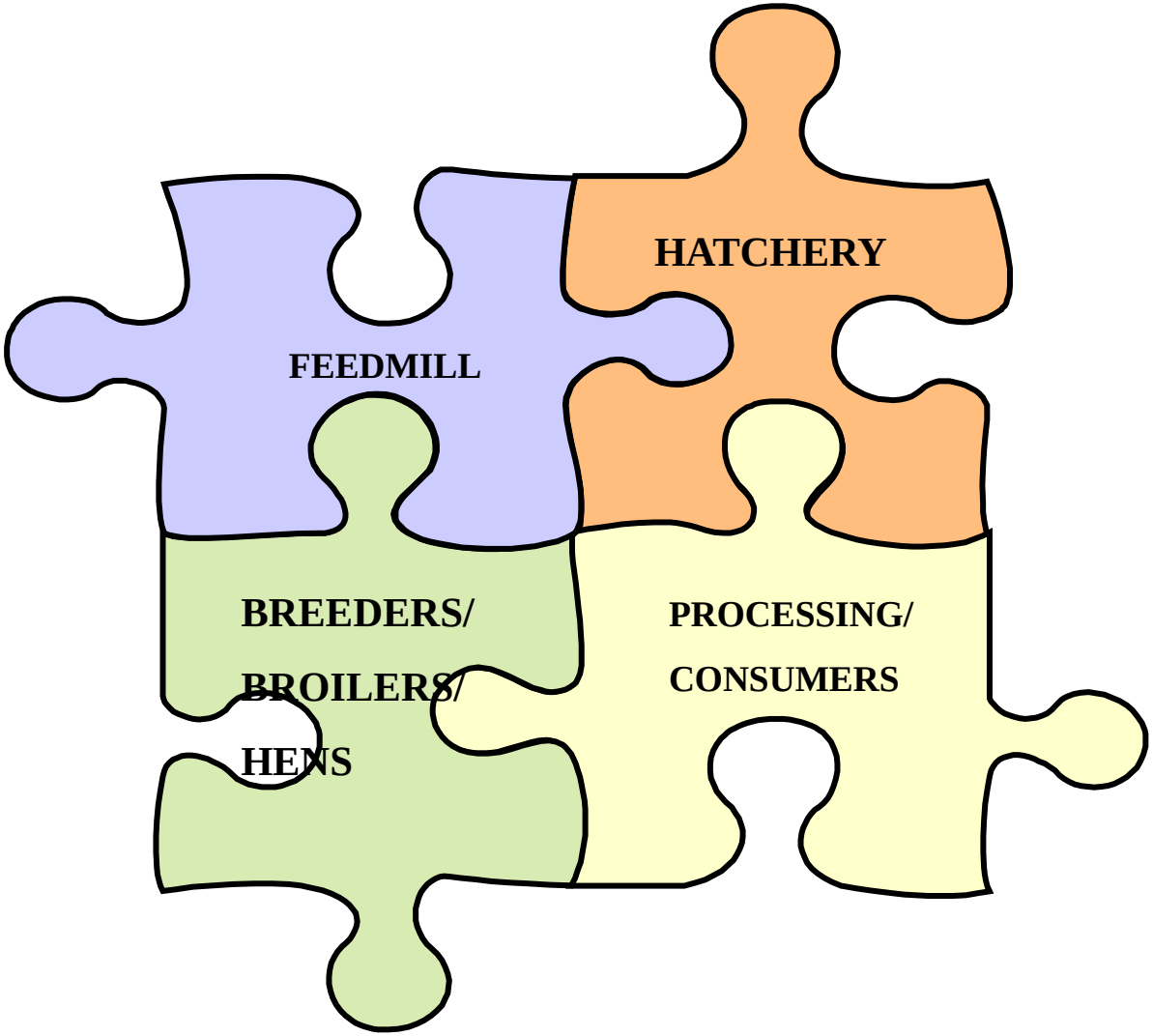
Main suspect outside the hospital: chicken

ESBL prevalence is increasing everywhere in Europe and all over the world

Solutions

Working together and implement innovations

The challenges

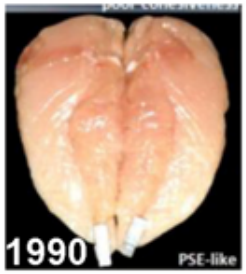


The role of genetics

Genetic selection traits

Genetic selection focuses on the efficiency of growth performance and improving feed conversion rates.
Example: genetic improvement in Cobb 500 broiler chickens over the last 30 years resulted in 10% increase in carcass yield, 11% in relative breast weight and 0.60 reduction in feed conversion (25% less feed per unit gain). Also improvement in broiler well being, and metabolic diseases.

Selection and breast meat quality abnormalities

Year	1940	1960	1980	1995
Main form of commercialization	live bird	whole carcass	cut-up	cut-up processed products
Selection criteria	live performances …	live perfomances carcass yield ….	live performances carcass yield cut-up yield …	live performances carcass yield breast yield meat yield …
Meat quality abnormalities			 Deep pectoral miopathy (DPM)	 Pale, soft and exudative (PSE-like)	 White striping Wooden breast

Genetics and climate change

Global warming: productivity impairs thermotolerance

Genes involved in thermotolerance, protection against heat stress and facilitates repair of degradation of damaged proteins.

Innovation in nutrition

Feed ingredient availability:

•Feed accounts for ~65% of production costs under confinement rearing and feeding

•Feed ingredient costs increasing rapidly in response to loss or use of arable land from urban spread, biofuel production, and climate change.

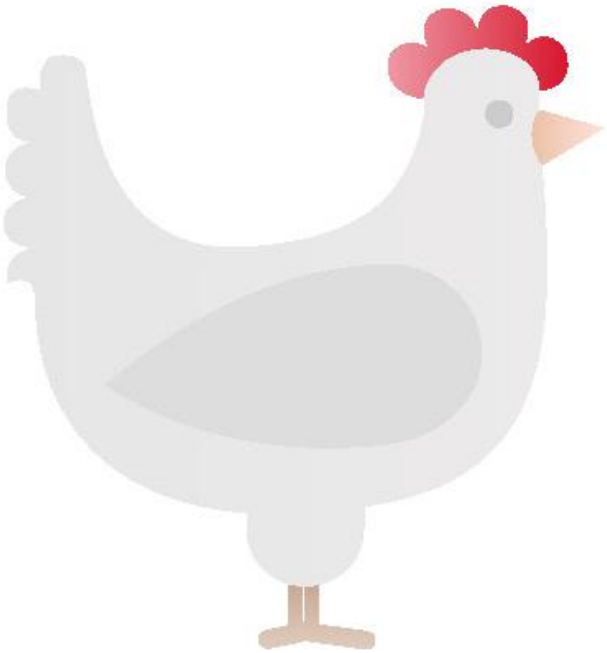
•Many countries not or only barely able to provide grain and plant protein products to meet the need of the human population.

•A critical element in the development of a viable and sustainable poultry industry, is the country's capacity to produce **sufficient quantities of suitable feed ingredients** at affordable prices which are either not used for human nutrition or which are surplus to those needs.

How to improve production output?

Example from the egg industry

The Production Opportunity



Instead of adding more hens, another path to meet global demand is to help each hen produce more eggs.
How many eggs?

Just ONE more egg per hen per year[3]

This would create a new trend toward having **enough eggs to meet demand.**

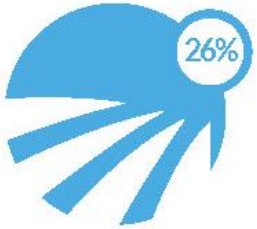
Using innovation, not adding hens, would save:

Feed

113 million
tons of feed[3]

or

Approximately enough
feed to fill 132 Empire
State Buildings



Land

65 million
acres of land[3]

or

Approximately
the size of Colorado

Water

74.4 billion
gallons of water[3]

or

Household water use for
2x the size of Philidelphia.
Est. population: 1,547,607

Solutions

Innovation

Choice

Trade

The way we fill the gap and balance enough food for the planet without using too much of our valuable resources is by **combining innovation, choice and trade.** This is our vision for a food secure 2050 and it's how we'll ensure enough for all.

Conclusions

The poultry industry can provide enough affordable protein for the growing world population, despite the problems with land and water availability, as influenced by climate change. A sustainable poultry production is possible, taking care of animal welfare and environmental challenges, diseases and general economical circumstances.

Conclusions

The example of increasing the egg output without increasing the number of hens shows that working together and implementing technological innovations in the whole production chain will contribute to this success.

Thank you for your attention

Also thanks to all who have provided and shared the data presented

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