REGIONS IN AGRICULTURAL DEVELOPMENT:

NARRATIVES FROM THE FIELD

Petr Blizkovsky
Director
Council of the European Union

“Region in the development of society”, October 23th, 2014
OUTLINE

1. The challenge of modern agriculture

Regional narratives:

2. Mato Grosso, Brazil: Ramping up productivity

3. Australia: The R&D imperative

4. Land Baden Württemberg, Germany: A biomassive success

5. Conclusions
1. The challenge of modern agriculture

- Modern agriculture has to feed more and richer people, who demand additional calories and meat, with scarcer resources, less productive land and fewer emissions

  ➔ How can this be tackled in a regional context?
WORLD CENTRE OF GRAVITY MOVING SOUTH-EAST

Source: Author’s own
### Why does global food demand for food keep on increasing?

<table>
<thead>
<tr>
<th>Year</th>
<th>World Population</th>
<th>Per Capita Income</th>
<th>Calorie Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>6.5 bn.</td>
<td>$7,029 per capita per year</td>
<td>2,750 kcal/per capita per day</td>
</tr>
<tr>
<td>2050</td>
<td>9.15 bn.</td>
<td>$12,652 per capita per year</td>
<td>3,130 kcal/per capita per day (+13.8%)</td>
</tr>
</tbody>
</table>

**Source:** FAO 2012

© DW
PROTEIN DEMAND WILL SOAR…

**Meat on the menu**

Global food demand, 1961=100

- Meat
- Dairy
- Cereals
- Starchy roots

**Forecasts**

Source: Food and Agriculture Organisation

**Demand for animal protein is increasing.**

- Other Countries
- India
- China
- The United States
- EU-15

Source: Kastner et al 2012
REQUIRING MORE RESOURCES

The ecological footprint of food

Sources: WaterFootprint, UK DEFRA, National Geographic & USDA
Total factor productivity (TFP) is a measure of an economy’s long-term technological progress.

- TFP accounts for growth in total output not caused by growth in inputs (labor and capital).
- TFP measures the efficiency with which inputs are used.
- TFP may account for up to 60% of growth within economies.
- TFP cannot be measured directly but is estimated.

Source: Fuglie (2012)
TOTAL FACTOR PRODUCTIVITY IMPROVEMENTS

Average annual growth rates in agricultural TFP between 1995 and 2009

Source: Fuglie, Wang and Ball (2012)
2. Mato Grosso, Brazil: Ramping up productivity
THE MAKINGS OF AN AGRICULTURAL REVOLUTION

- Importing US technology until the 1970s did not improve Brazilian agriculture

- The Brazilian Agricultural Research Corporation (EMBRAPA) set up in 1973:
  - Agricultural subsidies dismantled during oil crisis
  - Some of the money saved funnelled into EMBRAPA

- Transformed Brazilian agriculture through 4 main initiatives:
  1. Turning the vast but inhospitable cerrado savanna areas green by de-acidifying soils with lime → creating new farmland
  2. Cross-breeding African grass variety to improve yields, making efficient → beef herd expansion
  3. Cross-breeding soybeans to tolerate acidic soils and tropical climate
  4. Encouraging new operational farm techniques, e.g. “no-till” agriculture
Mato Grosso (MG) is Brazil’s third largest state

Long isolated and economically underdeveloped

Today Brazil’s largest producer of soy, cotton and cattle

Soy production has grown at an average annual rate of 9.5% since 1990

MG alone supplies 7% of the world’s soy
INCREASING OUTPUT WHILE CONSERVING LAND

- During 1996 to 2005, MG accounted for 39% of Amazon deforestation
- Since 2005, major efforts to reverse this trend

Today, only 0.4% of MG’s soy is produced in the Amazon

74% of MG’s soy is produced in the cerrado

(Brazilian Agricultural Research Corporation)
In 2009, Mato Grosso launched its own plan to prevent and control deforestation. The target was to curb deforestation in its forest area by 89% by 2020 compared to 1996-2005.

**Multiple stakeholder approach:**
- Agricultural sector representatives
- Researchers / EMBRAPA
- Business leaders
- Environmentalists

**Initiatives:**
- Continue ramping up productivity
- Greater “no-till” farming
- Registering 100 percent of soybean farms in environmental licensing system by 2010
- Creation of environmental education program for farmers
- Land management technique that produces crops for 1-2 years and raises livestock the third...
LESSONS FOR SUSTAINABLE DEVELOPMENT

- The Brazilian state of Mato Grosso has moved from an isolated, backward region to the edge of the agricultural frontier in two decades.
- Output multiplication without increase in land use attributable to R&D.
- Multi-stakeholder approach to sustainable development is key.
3. Australia: *The R&D imperative*

- Australia has as a major agricultural nation historically been at the forefront of agricultural R&D, with the public sector as the dominant provider.
- Yet while spending on agricultural R&D grew by 4.43% per year from slowed to on average 0.81% per year.

*Agricultural R&D spending growth rates*

*Sources:* Pardey et al. (2006), Alston et al. (2009) and Mullen (2010).
RURAL RESEARCH & DEVELOPMENT CORPORATIONS

- The Australian government’s primary funding bodies for rural R&D
- 15 bodies covering all the agricultural industries
- Government-industry partnership (joint funding)
- Based on identified needs, RDCs commission targeted agricultural research on a competitive basis amongst public and private research providers
- Competitive advantage of RDCs:
  - Demand-led approach – Australian rural industries have greater influence on public R&D spending
LESSONS FOR MOVING FORWARD

- Developed-country investment in agricultural R&D has slowed, despite persistent high returns → productivity slowdown

- **High agricultural R&D investment rates to be preserved**
  - Public-private partnerships like the RDCs in Australia can help sustain investment by ameliorating non-excludability issue
4. Land Baden-Württemberg: A biomassive success

- Reasons for successful biomass production implementation in German agriculture:
  - New economic perspectives (future-oriented market)
  - Forms of public financial incentive tools (support programs)
  - Compatibility with farmers cultural patterns (production-oriented)
  - Psychological aspects

- Decentralized on-farm plants benefit:
  - Farmers more independent
  - Farmers participate in the added-value
  - Opportunity to dispose of crop residues + waste → reduces methane emissions

“Biomass is the greatest resource that we actually have and an important perspective for our national economy”

Gerd Sonnleitner
Former President of Germany’s National Farmers’ Union
By 2050, Baden-Württemberg plans to obtain 80 per cent of its energy from renewable sources.

To achieve this, “Our goal is to reduce energy needs by 49 per cent and to meet 78 per cent of the remaining need with the help of renewables.”

“First policy statement by Minister-President of Baden-Württemberg, Winfried Kretschmann, when elected in 2011”
Baden-Württemberg adopted the Biomass Action Plan (BAP) in 2010

Emphasis on waste from agriculture, forestry, municipal and industrial waste

Currently, almost 1000 biogas plants provide 7.5% of primary energy consumption in Baden Württemberg

Plans to expand capacity much further
LESSONS FOR BIOENERGY PRODUCTION

- Biomass production has been successfully implemented in German agriculture – with the support of farmers.
- The state of Baden Württemberg has been particularly progressive in adopting a Biomass Action Plan.
- **Biomass production can have a positive effect on employment creation and investment in rural areas – particularly with smaller on-farm plants.**
Agriculture has to feed more and richer people, who demand additional calories and meat, with scarcer resources, less productive land and fewer emissions.

Lessons of regional narratives to meet the challenge of modern agriculture:

- A multi-stakeholder approach to sustainable development is key
- High agricultural R&D investment growth rates should be preserved
- Biomass production can have a positive effect on employment creation and investment in rural areas – particularly with smaller on-farm plants
- EU approach - EIP Agri and RD, combining Horiyon and CAP funds