ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

National Innovation Systems: the Players and Governance

Catherine Moreddu
Trade and Agriculture Directorate

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Outline

1. OECD relevant activities: general and agriculture-specific
2. OECD innovation strategy and governance of innovation systems
3. Actors and institutional trends in agricultural innovation systems
4. Challenges for agricultural innovation systems
5. OECD future work in this area

OECD relevant activities

- **STI activities on innovation:**
  - OECD Reviews of Innovation Policy
  - Main Science and Technology Indicators
  - Governance of Innovation Systems (2005)
  - Innovation Strategy (2010) [food security]
    www.oecd.org/document/15/0,3746,en_2649_34273_45154895_1_1_1_1,00.html
- **TAD activities**
  - 2009 Symposium and 2010 Ministerial meeting, Communiqué at:
    www.oecd.org/document/2/0,3343,en_2649_34487_44664898_1_1_1_1,00.html
  - OECD Cooperative Research Project www.oecd.org/agriculture/crp
  - 2011-12 Project on Innovation Systems, including AKS conference, Paris, 15-17 June 2011 www.oecd.org/agriculture/policies/innovation
  - Review of Agricultural Extension in Mexico (McMahon and Valdés, 2011)

OECD Innovation Strategy: R&D institutions

- Institutions for knowledge production and policy analysis are often linked to specific ministries and domains: this may reinforce a segmented culture and make it more difficult to produce coherent, policy-relevant knowledge
- Short/long term
- Public research to enhance excellence and create better links to other innovators and stakeholders
- More autonomy in funding public research to facilitate cooperation with private sector and multidisciplinary approaches, and respond to industry needs
- Competitive funding through projects
- Improve technology transfers: remove obstacles to co-operation, foster international co-operation, networks: need to define clear rules
- Improve measurement, evaluation: comprehensive data infrastructure (Oslo manual): need for monitoring and reporting systems, benchmarking
- Define best practices

Policy principles for innovation

- **Empowering people to innovate:** education and training, entrepreneurial culture, consumers
- **Unleashing innovations:** competition; mobilise private funding, open market, culture of creativity, risk-taking
- **Creating and applying knowledge:** public investment in research, coherence between sources of funding, knowledge infrastructure, regulatory framework, knowledge flow and networking
- **Applying innovation to address global and social challenges:** scientific and technological cooperation and technology transfers, predictable policy regime, innovation as a tool for development (here agriculture is mentioned)
- **Improving the governance and measurement of policies for innovation:** policy coherence by treating innovation as a central component of government policy, evidence-based decision making, co-ordination at local, regional and national level.

Challenges for the agro-food system

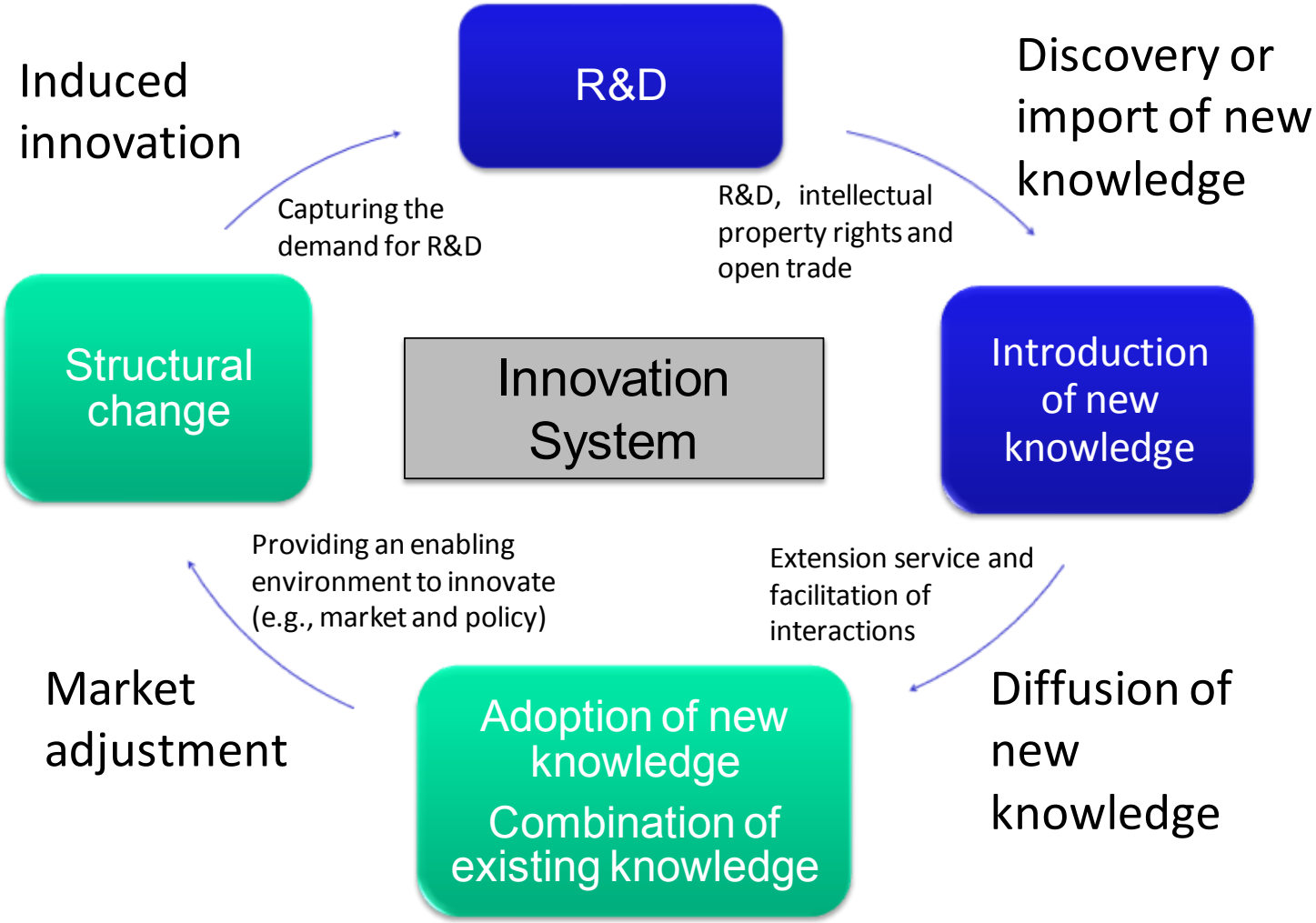
- **Growing population to be fed: Need for increased total factor productivity in the food and agricultural system, and for ecological, economic and social sustainability**
- **Scarce resources**
- **Climate change, changing environment**
- **Higher and more diverse demand**
- **Innovation and generation and diffusion of new technology are key factors for the future**
- **Better information needed on all these aspects**

Source: **OECD 2009 Symposium and 2010 Ministerial meeting.**

Agricultural Innovation System: Actors

- **Three groups**
  - **Agricultural Knowledge System (AKS):** R&D, extension and education
  - **Socio-economic actors:** farmers, agri-food chain, input suppliers, processing and retailing, cooperatives and producers' organizations, inter-professional bodies, media
  - **Users:** consumers, NGOs, communities, local authorities
- **Different models**
  - **Linear and vertical:** top-down from ministries
  - **Networks:** dynamic models of innovation, with various partnerships

Agricultural Innovation System: Relationships



Agricultural Knowledge System (AKS)

- Large differences across OECD countries, but common trends
- Higher education: dominated by public, regional institutions; but some private funding; agricultural specific or not, under education and research ministry, but sometimes also agriculture ministry (e.g. France).
- R&D: public and private at various degrees, public R&D in university and/or research institutes, dependant on agriculture ministry or science/research ministry, sometimes environment, health or co-operation/foreign affairs; national (federal) and regional; core versus project funding.
- Extension: Large diversity, generally regional and local, very diverse actors: public, education, upstream and downstream industries, NGOs, consultants, farmers' organisations, mixed organisations; Public funds to public or private institutions or farmers (vouchers), co-financing by farmers collectively (levies and taxes) or individually.

Advisory services in OECD countries

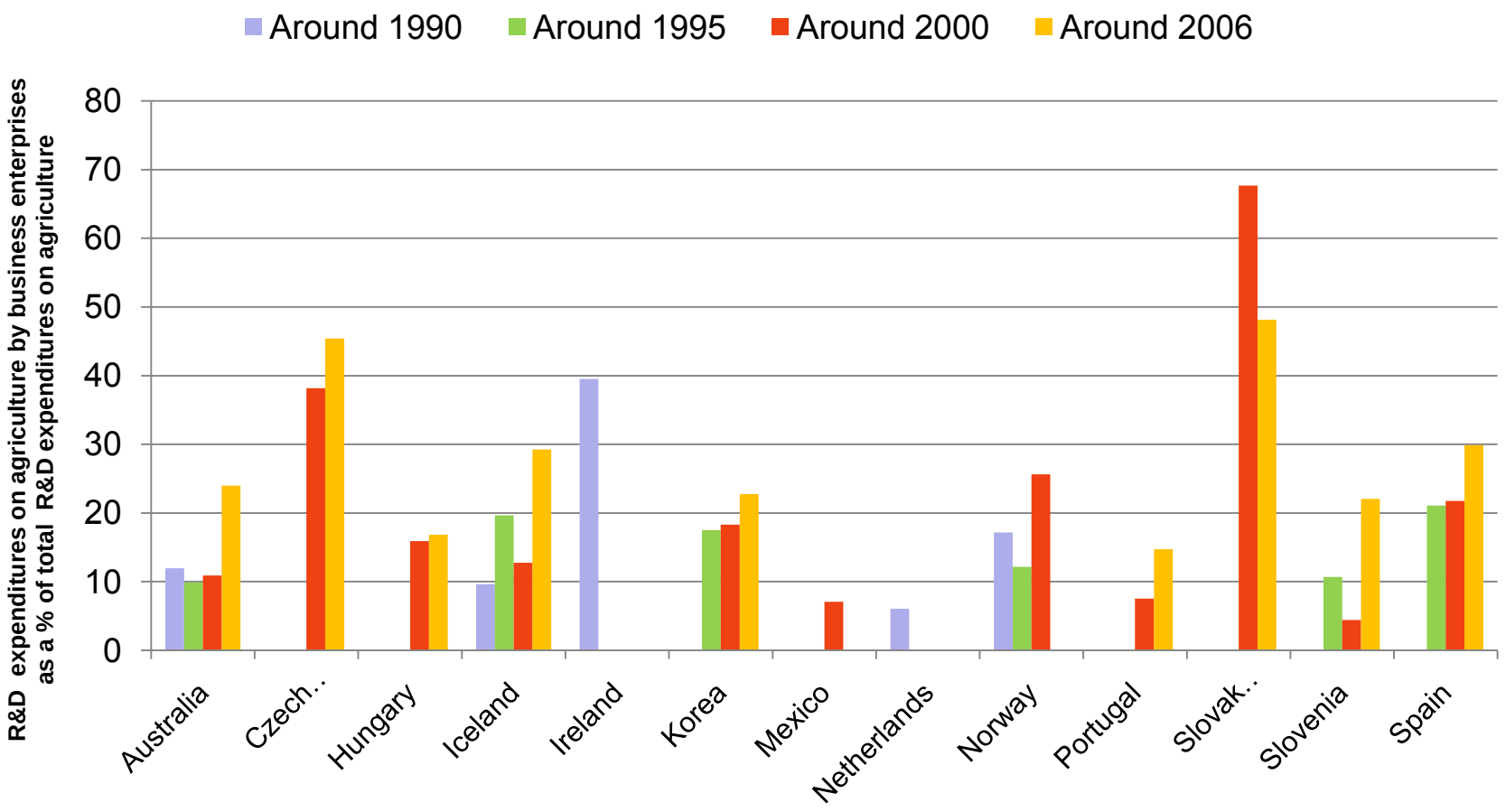
	Main Institutions	Source of funds	Countries
	Public Advisory Services		
State-run	Public organisations at regional and national level	Wholly financed from public funds	Belgium, Italy, Greece, Slovenia, Sweden, Germany's Southern regions, Spain, Portugal, Luxembourg, Japan, US
Public Private Service	Increasingly provided by private consultant firms	Farmers partly or wholly pay for services; centralised and decentralised	Ireland, Czech Republic, Poland, Slovak Republic, Hungary, Estonia, Australia, Chile
	Private Advisory Services		
Farmers Organisations	Farmers' organisations	Membership fees and payments by farmers	Austria, France, Denmark, Finland, North-West regions of Germany, Norway
Commercial	Commercial firms or private individuals	Payment through project implementation or grants	England, Netherlands, North-East regions of Germany, New Zealand

Source: Matthew McMahon and Alberto Valdes (2011), *Review of Agricultural Extension in Mexico*, Report to the OECD; responses to OECD questionnaire.

Institutional trends in agricultural AKS

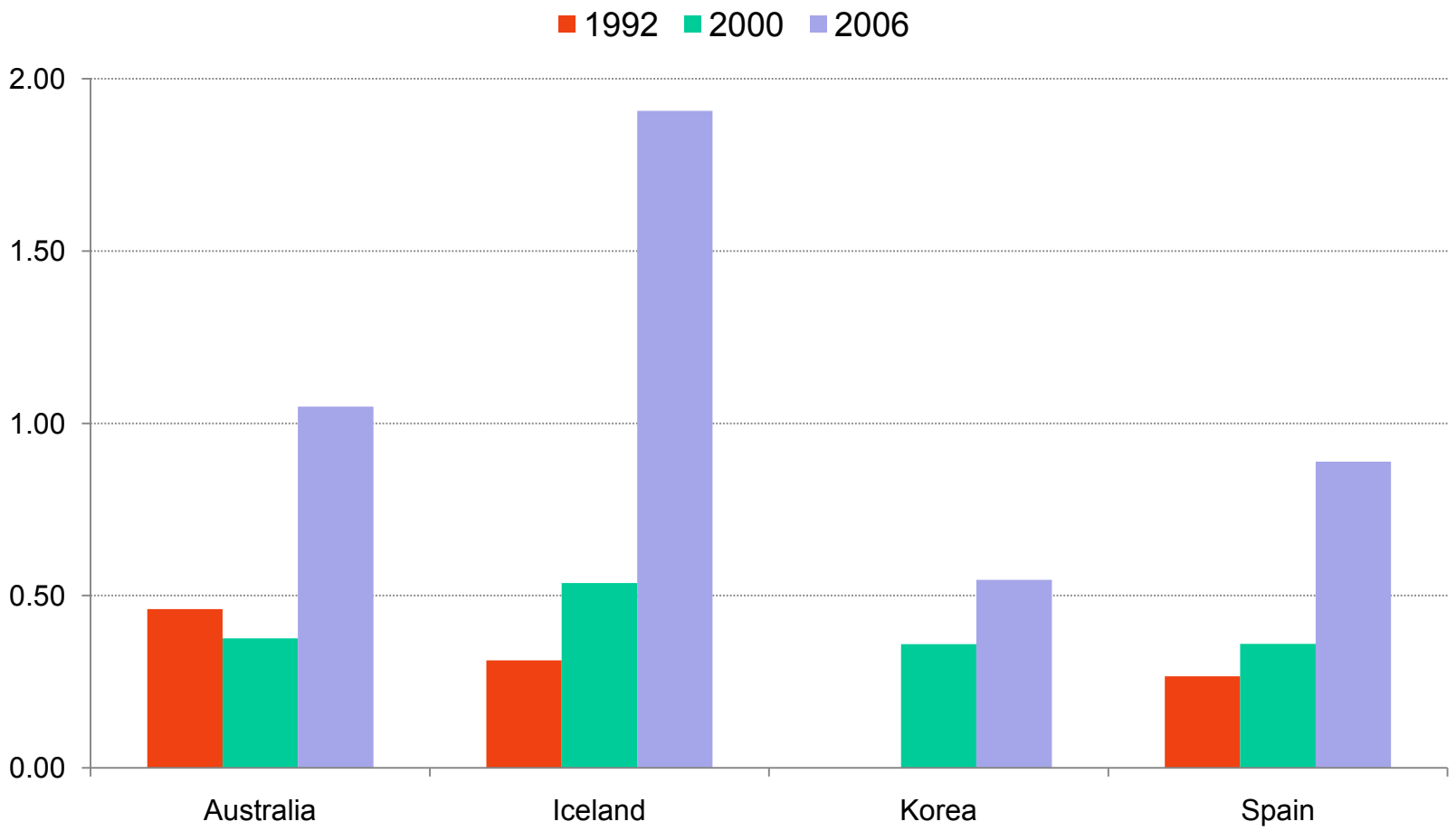
- **Consolidation to create regional poles grouping various institutions**
  - Stronger links with other sectors, *e.g.* medicine, veterinary, RD, general economics
  - Pluridisciplinarity
  - Stronger link between agricultural education and research (UMR INRA-schools)
  - Stronger link between universities and research institutes (NLD) or integration (DNK)
- **New institutions: Innovation agencies, networks**
- **Links research-government:** Increased demand from policy makers (evidence-based policies, accountability, evaluation); statutory or through projects
- **Stronger private/public integration**, including through projects
- **Increasing private research, but public funds still important**
- **Evaluation of AKS performance:** strategic plans, accountability

Business enterprises in R&D expenditures on agriculture



Source: OECD, R&D database

Public R&D expenditure on agriculture as a % of agricultural GDP



Source: OECD, R&D database

Trends in extension systems

- Need to adapt to a larger range of objectives and demands, including for technical assistance to elaborate projects to apply for funds or respect regulations (e.g. EU FAS and CC) and to the diversity of farmers and local situations.
- Priority setting has shifted to the local level.
- Extensionists need higher education levels and stronger and more diverse technical skills.
- Emergence of intermediary actors, and
- public-private partnership where the public sector finances and private sector agents implement the programme.

Proposals for a Mexican agricultural extension service (1)

- **Segregation of the service:**
  - commercial farmers who are responsible for their own technology and information needs,
  - organized small and medium farmers who have potential for incorporation into productive chains, and
  - subsistence farmers who are the subject of a service based on household welfare.
- **At the Federal level, policy, financing, regulation and evaluation are brought under the one body,**
- **with management of resources at the state level by farmers for both research and extension to strengthen linkages.**
- **At the state level, service managed by the farmer organizations and local government,**
- **with increased emphasis on accountability and increased funding coming from states, municipalities and farmers.**

Mexico - Review of Agricultural Extension

Proposals for a Mexican agricultural extension service (2)

- Strengthening the research component of the system by allowing the institutes to develop strategic research programs as well as have technology transfers and training programs that link them to extension and the farming community.
- Strengthening core funding to allow Mexican institutions build solid research programs and give them access to global research, technology and innovation.
- The proposed innovation system will be integrated and will have increased farmer control and increased funding at the local level

Mexico - Review of Agricultural Extension

Challenges for innovation systems (1)

- **Innovation is more than technology.**
- **Changing (conflicting) demands from society (environment, rural services) and from users (more diverse farms, e.g. pluriactivity).**
- **More complex issues: broader than commodity production towards provision of public goods and integrated rural approach…**
- **with a stronger local components and**
- **requiring multidisciplinary approaches.**
- **Need to improve linkages in the system: connect research and extension, two ways communication, strategic plans, national/regional integration, private/public synergies, and**
- **to integrate a larger range of actors: new institutions? innovation agencies, networks?**
- **Need to renew the skill base in science, attract young entrants and retrain staff when priorities change**

Challenges for innovation systems (2)

- Right incentives for innovation and adoption in different social, cultural and economic contexts
- Effective regulatory framework important:
  - Balance economic interests of innovator and potential hazards of new technologies;
  - Intellectual property regulation and data protection significant for investment in innovation
- Improving adoption:
  - Most innovations relevant to state-of-the-art technology in 2030 have already occurred
  - Innovation should focus not only on new products and services, but on issues of uptake, availability, acceptance, necessary skills
  - Public acceptance of innovation is crucial
  - Better balance between risk and benefits
  - Strengthen extension, technology transfer

Challenges for innovation systems (3)

- Innovation pipeline - very long in relation to policy-makers' horizon – uncertainties on future needs
- Short/longer term: balance between core funds and project funds
- Sharing of information, networking (NZ CC, EU)
- Translation of knowledge for users, policy makers and society
- Coherence with agricultural and economic policies

Source: 2009 OECD Symposium and responses to 2011 OECD questionnaires, EU collaborative working group on Agricultural Knowledge and Innovation Systems (AKIS)

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OECD future work

- **AKS conference on How to foster the development and adoption of innovation at national and global level in order to meet global food security and climate change challenges?**
  - **How well do AKS respond to new challenges: How are they organised? Who does what? Do they provide the innovations that are demanded? on time? What works and what are impediments? Best practices**
  - **How to improve the responsiveness: Institutional framework; Public/private role; Regulatory framework conducive to innovation; Facilitating adopting of innovations and technology transfers**
  - **Coherence of AKS systems with broader policy objectives**
- **Innovation project**
  - **Innovation framework**
  - **Farm-level analysis**
  - **Country case studies**
  - **Horizontal issues**

Thank You

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Visit our PSE/CSE website:

www.oecd.org/agriculture/policies/innovation

Contact us:

catherine.moreddu@oecd.org