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Working Party on Agricultural Policies and Markets

**SUMMARY RECORD OF THE OECD CONFERENCE
ON AGRICULTURAL KNOWLEDGE SYSTEMS, 15-17 JUNE 2011**

This document has been revised to take account of comments made by delegates at the 14-16 November 2011 meeting of the Working Party on Agricultural Policies and Markets, and the list of participants has been added in Annex C.

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SUMMARY RECORD OF THE OECD CONFERENCE ON AGRICULTURAL KNOWLEDGE SYSTEMS, 15-17 JUNE 2011

Introduction

1. An OECD Conference on Agricultural Knowledge Systems (AKS) was held in Paris, on 15-17 June 2011. The purpose was to explore how to foster development and adoption of innovations to meet global food security and climate change challenges.
2. The conference was organised under the auspices of the Committee for Agriculture and was one of the events to celebrate its 50th anniversary. The Cooperative Research Programme (CRP) of the OECD co-sponsored the Conference¹ and asked an expert, Michel Dodet, to perform an independent evaluation presented in Annex B.
3. The conference was organised as part of an OECD project on innovation systems mandated in the Programme of Work and Budget of the Committee for agriculture for 2011-12; the outcomes of the Conference will provide valuable inputs for this project. They will in particular help design the analytical framework, and identify policy issues and country experiences that deserve closer attention for future work.
4. The agenda of the conference is included in Annex A and the list of participants in Annex C. The agenda, list of participants and presentations are posted on the conference web site, as well as the responses we received to the AKS questionnaire prepared as background material for the conference.² Proceedings are being prepared and the publication is planned for end of February 2012.

Summary of the discussion

5. The conference provided a good opportunity to discuss a large range of experiences and approaches to AKS, considering in particular developments in institutional frameworks, public and private roles and partnerships, regulatory frameworks conducive to innovation, the adoption of innovations and technology transfers, and the responsiveness of AKS to broader policy objectives.
6. The conference demonstrated a wide diversity in approaches to AKS, with each responding to different agro-economic, social and institutional challenges, and each with a different history. Most strikingly, all of these approaches are currently evolving from a linear AKS to more integrated innovation systems. The question is whether these developments will successfully address the challenges identified at this conference — namely, those arising at the nexus of food security and climate change. Some speakers have emphasized public approaches, while some have emphasized private. Many talked about co-development and networks, including the speakers who focused on biotechnology. The importance of local

1. See www.oecd.org/document/38/0,3746,en_2649_33903_44427430_1_1_1_1,00.html on the CRP web site www.oecd.org/agriculture/crp.

2. See www.oecd.org/document/20/0,3746,en_2649_37401_47217428_1_1_1_37401,00.html on the innovation project web site: www.oecd.org/agriculture/policies/innovation.

traditional knowledge has been mentioned by several speakers. Finally, many have emphasized the shift from research and development (R&D) to innovation in products and processes.

7. It emerged from the discussion that no action is not an option: AKS throughout the world will have to adapt to meet future needs in food and agriculture, in a context of limited natural resources and additional pressure from climate change. Current evidence in many high-income countries points to a slowdown in the rate of agricultural productivity growth and to public under-investment in agricultural R&D — especially R&D oriented to enhancing farm productivity, despite estimated high rates of return. This underinvestment in high income countries is attributed, among other factors such as incomplete information, to long lags between making R&D investments and reaping the benefits at farm level.

8. **Improving the effectiveness** of AKS and reinforcing multidisciplinary co-operation at national and global levels is all the more important in the current context of budgetary austerity in many countries. The need to have a "wholistic" approach to innovation was mentioned. Examples of innovative approaches to increase the effectiveness of existing AKS include increased private sector involvement to leverage public resources through the provision of matching funds for agricultural R&D; the reorientation of public resources to areas with strong public good elements and long-term benefits; the creation of centres of excellence to concentrate available R&D competency; the expansion of international collaboration to exploit synergies; and the use of information technologies. When discussing approaches to **secure long-term funding for R&D**, the use of levies charged on the value of agricultural output was presented as particularly relevant where the private benefits from research are high and the payoff to beneficiaries is rapid and highly visible. A better understanding of R&D benefits and future needs for innovation would also help.

9. **Institutional design** of AKS was also considered important. Experiences with AKS revealed large diversity corresponding to different country contexts. At the same time, changes implemented in the last decade indicate a general movement from the traditional linear and top-down approach – from research to innovation to adoption – to an innovation systems approach, which is more reactive and interactive, and where agents contribute together to finding innovative solutions, while avoiding duplication of effort. The involvement of farmers and the industry was mentioned as crucial, in terms of innovation creation and adoption. Networking and partnerships can play a vital role in leveraging scarce resources and in allowing for a continuous process of adaptation and reorientation. The suggestion was made that “innovation brokers” would help enable the adoption of innovation, in developing customised solutions. The need to pay more attention to the adoption of innovation was a recurrent theme and the subject of a session, with large emphasis on developing countries and technology transfer.

10. There was shared understanding that with increasing demands upon scarce public resources in many countries, the **private sector** was to play a larger role in AKS, but that incentives needed to be in place for it to generate, develop and diffuse new technologies. One of the key issues discussed was the protection of Intellectual Property Rights (IPRs) and the difficulty to define a scope and duration of IPR that provides enough incentive for private investment in AKS, without compromising the interest of society that knowledge is shared and further innovations are simulated. The two forms of Intellectual Property (IP) protection in plant breeding were discussed: patents and International Union for the Protection of New Varieties of Plants (UPOV) system. The key role of public-private partnership was underlined to facilitate the transformation of public sector technologies into products commercialised by the private sector. Developments in IPR protection in plant breeding under UPOV were highlighted. The assessment of risk when new varieties are introduced was also discussed with two regulatory systems being presented. An important issue is how much regulation is needed and what criteria to apply so that the public is adequately protected but the process of innovation is not retarded.

11. A call for **policy coherence** among science, education, agriculture and development concluded the conference. The development and application of new technologies in agriculture and the food system in OECD countries takes place within the context of a set of existing agricultural policies. Those policies pursue a wide range of objectives, such as improving agricultural productivity and sustainability, the supply of food at reasonable prices, the improvement in farm competitiveness, and the preservation of natural resources, environmental quality and rural viability, and priorities are changing over time. At the same time, other policies affect the agricultural sector and it is particularly important to ensure coherence between agricultural, innovation, environment, trade and development policies. It will be a considerable challenge for the AKS to provide the innovations needed for agriculture to pursue the multiple objectives assigned to it.

Implications for OECD work in the short and long terms

12. At the end of the conference, the OECD Secretariat envisions three key areas in which future work would focus: Benchmarking, policymaking and networking. Some aspects are already part of ongoing or planned work mandated in the 2011-12 Programme of Work and Budget of the Committee for Agriculture, in particular as part of the innovation project scoped in [TAD/CA/APM/WP(2011)19], and work on long-term scenarios in the agro-food system. Others can be envisaged with a longer-term perspective.

13. Based on the conference outcomes, the independent expert, which evaluated the conference for the CRP, suggests a number of areas for future co-operation between the Committee for Agriculture and the CRP (in Section 5 of Annex B). Examples of areas and questions that could be jointly addressed are presented below. One issue he identifies, the productivity challenge, is making the top of the policy agenda in the context of G20 discussion on food security. The G20 Cannes summit final declaration³ states that "Increasing agricultural production and productivity is essential to promote food security and foster sustainable economic growth." In the declaration, G20 Ministers "commit to sustainably increase agricultural production and productivity." In this regard, they "decide to invest in research and development of agricultural productivity." G20 governments are interested in how to improve agricultural productivity growth sustainably in both developed and developing countries: what institutions, regulation and policies would best ensure that technologies and innovations enhancing productivity growth in the agri-food system are developed and adopted? They acknowledge the urgent need, in particular, to bridge the productivity gap between developing and developed countries.

Concluding remarks on future OECD work at the conference

14. Stronger and broader benchmarking, supported by information and data, would allow us to gauge the output of AKS, while measuring institutional features, as well. Measurement of AKS must be multi-dimensional. There has already been significant work devoted to characterizing what goes into the system (R&D, etc.), but few have measured the output and results of these systems. These are areas worth exploring.

15. As with other projects and as outlined in the scoping of the "innovation project", providing policy advice would be a major component of future OECD work in this area. However, more work is first required to define appropriate frameworks for analysis. As we have learned from this conference, there is probably not a one-size-fits all solution. Rather, the solution will likely be multi-faceted. Future work would allow us to identify the appropriate boundary between private and public sectors, while constructing appropriate incentives for private actors to address the global common issues that have been identified

3. www.g20-g8.com/g8-g20/g20/english/for-the-press/news-releases/cannes-summit-final-declaration.1557.html.

during this conference. The broad approach envisaged in the innovation systems project should also encompass a well-balanced system of IPR protection. We have had significant discussions of IPR during this conference, but we only addressed the breadth of the protection, rather than the duration (depths) of the protection.

16. As this conference has demonstrated, the OECD has a particularly useful role to play in networking, and in the development of strategic intelligence. We must explore opportunities to leverage these kinds of events to provide a platform for strategic thinking. We are already conducting work on long-term scenarios in the agro-food system, which could also be a part of this endeavour. With more than 40 countries regularly attending our meetings, we can reach out to policymakers in OECD countries and emerging economies, while mobilizing people and resources. Network facilitation is an area that could be explored much more, and one that merits further work, considering the lack of exchange and the wide diversity in approaches to AKS in OECD countries and emerging economies.

Suggestions for future coordinated actions between the Committee for Agriculture and the CRP

17. The independent expert, Michel Dodet, draws on the conference's outcomes to suggest an agenda of coordinated actions between the Committee for Agriculture and the CRP. Areas and questions that could be jointly addressed include:

- How to deepen the debate on the various concepts of knowledge/innovation systems?
- Optimisation and protection of IPR and alternative procedures to combine the necessary dynamism of both research and innovation;
- How to use foresights as a piece in AKS?
- Shifting paradigms in agricultural research and in AKS; and
- The productivity challenge.

Annex A.

**Agenda of the OECD Conference on Agricultural Knowledge Systems:
Responding to Global Food Security and Climate Change Challenges**

Wednesday 15 June 2011	
9:30-9:45	<p>Session 1. Context and purpose of the Conference</p> <p>Introductory speech by Mr. Ken Ash, Director of Trade and Agriculture (TAD), OECD</p> <ul style="list-style-type: none"> • Welcome • Purpose of the Conference: Explore 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. The conference will look at developments in AKS institutions and relationships between the different components at national and international level, discuss whether they are functioning and are responsive to emerging issues. It will review incentives and disincentives to both public and private activities in the AKS, and will look at policy coherence and best practices. • Background questions: What are the global challenges related to food security and climate change? What is expected from AKS? What technological and organizational solutions are available or being developed? How can they contribute to meeting those global challenges? • Outline of the Conference: Description of the various components of AKS, their relationships and their functioning; Are they responsive to new challenges (Session 2)? What can be done to improve the situation (Session 3)? How do they respond to broader policy objectives? (Session 4) • Context of the Conference: The OECD has organized two AKS meetings in the past; A recent OECD Symposium identified a number of challenges for the food and agricultural sector; The Ministerial Communiqué outlined the importance of innovation to tackle food security and climate change issues, The outcomes of the Conference will provide valuable inputs into the OECD project on innovation systems in the Programme of Work and Budget of the Committee for agriculture for 2011-12; The Conference will be one of the events organized to celebrate the 50th Anniversary of the Committee for agriculture; There are a number of links with recent or on-going OECD work in TAD and other Directorates and elsewhere. The Conference is organised in collaboration with the OECD Co-operative Research Project (CRP). <p>Presentation of the OECD Co-operative Research Project by Dr. Leena Finér, Finnish Forest Research Institute, CRP theme co-ordinator.</p>

9:45-13:00	Session 2. How well do AKS respond to new challenges?
	<p>Chair: Mr. Yvon Martel, Chief Scientist, Agriculture and Agri-Food Canada</p> <p>Questions</p> <ul style="list-style-type: none"> • How do AKS function? How are they organized? What are the relationships between the different components: education, R&D and extension; private and public sectors, agricultural production and other food chain elements; national/international? Who does what? How do national and international institutions and the public and private sectors (research, education, extension) work together? How have they evolved to respond to new challenges in the past? • How do they respond to new challenges? How are priorities defined and implemented? How well do AKS react to new challenges? Do they provide the innovations needed on time? Are technologies adapted and accessible to those who need it? What incentives work? What disincentives do they face? Can we identify best AKS practices? <p>Keynote speakers:</p> <ul style="list-style-type: none"> • Global and U.S. trends in agricultural R&D in a global food security setting, <i>Pr. Julian Alston, UC Davis, United States</i> • Agriculture knowledge and innovation systems in transition - Findings from the EU SCAR Collaborative Working Group on AKIS, <i>Mr. Krijn Poppe, Chief Science Officer at Ministry of Economic Affairs, Agriculture and Innovation, the Netherlands</i> • Australia's approach to rural research, development and extension, <i>Mr. Allen Grant, Executive manager, Agricultural Productivity Division, Department of Agriculture, Fisheries and Forestry (DAFF), Australia</i> • China's Agricultural Innovation System: Issues and Reform, <i>Pr. Ruifa Hu, School of Management and Economics, Beijing Institute of Technology, and Jikun Huang, Center for Chinese Agricultural Policy, Chinese Academy of Sciences, China</i> • Agricultural R&D in Africa: Investment, human capacity, and policy constraints, <i>Mr. Gert-Jan Stads, program coordinator of the Agricultural Science & Technology Indicators (ASTI) initiative at the Rome office of the International Food Policy Research Institute (IFPRI)</i> <p>Discussant: Ms. Leticia Deschamps, Inter-American Institute for Cooperation on Agriculture (IICA)</p> <p>General discussion</p>
13:00-14:30	Lunch Break

	<p>Session 3. Improving the responsiveness of AKS</p>
	<p>Theme: How can the functioning of AKS, the coherence between the different components and the responsiveness of the whole system to food security and climate change challenges be improved? What kind of national and international, private and public institutions, regulatory framework, and incentive/disincentive structures can facilitate the development of adapted solutions and their adoption by producers and consumers? What specific role for governments and international organisations?</p> <p>A range of issues are discussed in successive sub-sessions.</p>
14:30-18:00	<p>Session 3.A. Institutional Framework</p>
	<p>Chair: Pr. James Fraser Muir, International development and research advisor and evaluator, Professor Emeritus, University of Stirling, Scotland, United Kingdom</p> <p>Questions:</p> <p>How to strengthen linkages between components and dimensions of AKS (education, R&D, extension; public, private and other institutional sectors; national/regional/international levels, along the food chain; technological/institutional and marketing innovations)? And improve coherence in the whole system?</p> <p>Keynote speakers:</p> <ul style="list-style-type: none"> • Experience with CGIAR reorganisation, <i>Mr. Lloyd Le Page, Chief Executive Officer of the Consultative Group on International Agricultural Research (CGIAR)</i> • Institutional reforms of AKS in New Zealand and International Networks in AKS, <i>Ms. Karla Falloon, Counsellor (Science and Technology), New Zealand Ministry of Science and Innovation, New Zealand Mission to the European Union, Brussels</i> • Innovative institutional approaches for agricultural knowledge system management in India, <i>Dr. V. Venkatasubramanian, Assistant Director General in Indian Council of Agricultural Research (ICAR), New Delhi, India</i> • Transmission of agricultural knowledge: from agricultural extension to "Internet platforms, <i>Mr. José Abellán Gómez, Deputy General Citizen Information, Documentation and Publications, Ministry of Environment and Rural and Marine Affairs, and Mr. Jaume Sió Torres, Deputy-Director of Rural Innovation within the Agriculture, Livestock, Fisheries, Food and Natural Environment Department of the Catalan Regional Government, Spain</i> • Responses of the French AKS to new challenges, <i>Dr. Pascal Bergeret, DGER, MAAPRAT, France</i> <p>General discussion</p>

Thursday 16 June 2011	
9:30-11:00	<p>Session 3.B. Public/private roles</p> <p>Chair: Mrs. Eva Blanco Medio, Agricultural Councillor, Permanent Delegation of Spain to the OECD</p> <p>Questions: What role for private and public sector in education, R&D and extension? What defines the boundaries: market failures, public goods? How to strengthen complementarities between private and public sector?</p> <p>Keynote speakers:</p> <ul style="list-style-type: none"> • IPRs and the role public and levy funded research: Some Lessons from International Experience, <i>Pr. Richard Gray, University of Saskatchewan, Canada</i> • Public/ Private roles, <i>Mr. Phil O'Reilly, CEO of BusinessNZ, New Zealand</i> • Partnerships in Agricultural Innovation Systems: Who puts them together? And what comes next?, <i>Dr. Andy Hall, UNU-MERIT, Netherlands</i> <p>Discussant: Dr. Laurens Klerkx, Communication and Innovation Studies Group, Wageningen University, The Netherlands</p> <p>General discussion</p>
11:30-13:00	<p>Session 3.C. Regulatory framework conducive to innovation</p> <p>Chair: Dr. Nordine Cheikh, Director, Regulatory Sciences, Monsanto Company</p> <p>Questions: What are best practices regarding regulations about Intellectual Property Rights (IPR) and authorisation of innovations?</p> <p>Keynote speakers:</p> <ul style="list-style-type: none"> • EU system for health and consumer protection, <i>Mr. Niall Gerlitz, EU Commission, Directorate General for Health and Consumer Policy</i> • The U.S. approach for fostering new biological technologies and assuring their safety, <i>Dr. Michael Schechtman, Agricultural Research Service, U.S. Department of Agriculture, United States</i> • “Breeding Business”: Plant Breeder’s Rights and Patent Rights in the Plant Breeding Business, <i>Mr. Hans Dons, Management Studies Group, Wageningen University, The Netherlands</i> <p>Discussant: Mr. Dominic Muyldermans, Senior Legal Consultant to CropLife International</p> <p>General discussion</p>
13:00-14:30	Lunch Break

14:30-18:00	Session 3.D. Facilitating adoption of innovations and technology transfers
	<p>Chair: Ms. Eija Pehu, World Bank</p> <p>Questions:</p> <p>How to encourage innovations that are needed? How to facilitate adaptation and adoption? How to reduce the gap between demand and needs?</p> <p>Keynote speakers:</p> <ul style="list-style-type: none"> • Participatory plant breeding: A successful example of local technology innovation and adoption by combining knowledge of traditional farmers and modern scientists, <i>Dr. Masa Iwanaga, President, Japan International Research Center for Agricultural Sciences (JIRCAS)</i> • Experience with biotech crops in South Africa, <i>Mr. Jaco Minnaar, South Africa</i> • Latin America. Public Agricultural Advisory Services, <i>Mr. Matthew McMahon, consultant</i> • Agricultural innovation and challenges in promotion of knowledge and information flows in agrifood systems in Brazil, <i>Dr. Maurício Antônio Lopes, R&D Executive Director, EMBRAPA, Brazil</i> <p>Discussants:</p> <ul style="list-style-type: none"> • Mr. John Preissing, Senior Officer for Extension systems at the Research and Extension branch of FAO (OEKR) • Mr. Thomas Schäfer, Senior Director, Innovation Office, Novozymes <p>General discussion</p>

Friday 17 June 2011	
10:00-12:30	<p>Session 4. Responding to broader policy objectives</p> <p>Questions:</p> <p>How to improve the coherence of AKS with broader policy objectives? What incentives need to be put in place and disincentives removed?</p> <p>Recap of some issues raised in the meeting and the policy Agenda for OECD countries: Pr. David Blandford, The Pennsylvania State University, United States</p> <p>Panel discussion including high level government officials and representatives of R&D systems, including implications for the role and functioning of AKS in OECD and selected non-OECD countries.</p> <p>Panel members:</p> <ul style="list-style-type: none"> • Mr. Pascal Bergeret, DGER, MAAPRAT, France • Pr. Herman Eijsackers, Wageningen University, Netherlands • Dr. Pierre Bascou, DG-AGRI, EU Commission • Dr. Masa Iwanaga, President, JIRCAS, Japan • Pr. Roger N. Beachy, President Emeritus, Donald Danforth Plant Science Center, and Prof. Department of Biology, Washington University, St. Louis, MO; Former Director National Institute of Food and Agriculture, U.S. Department of Agriculture, United States • Dr. Kasdi Subagyono, Director Indonesian Center for Agricultural Technology Assessment and Development (ICATAD), Indonesia • Mr. Christophe Terrain, farmer, FNSEA administrator and president of ARVALIS, crop institute, France <p>General discussion</p>
12:30-13:00	<p>Concluding remarks by OECD</p> <ul style="list-style-type: none"> • Implications for OECD work

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Information on the workshop can be accessed at: www.oecd.org/agriculture/policies/innovation

Annex B.

External Evaluation of the CRP-Sponsored Conference

Executive summary

18. Everywhere in the world, in developed and developing countries, systems implemented in the second half of the previous century to foster innovation in agriculture are in crisis. New solutions are urgently needed to face the challenges of food security and climate change while productivity growth is widely decreasing. The OECD Conference on Agricultural Knowledge Systems (AKS), co-sponsored by the Committee for Agriculture and the Cooperative Research Programme (CRP), was very opportune in providing a wide and comprehensive overview of concepts and experiences that are dramatically changing the approaches and the instruments to support and foster innovation in agriculture. It showed that new implementation structures of AKS are developing in different ways according to the different national or international situations in response to that crisis. This new context involves research and researchers in large inclusive networks opening new opportunities but also new challenges. The Conference pointed out five major issues:

- diversity of concepts and implementation structures responding to the diversity of contexts;
- parallel evolution of Research and Development (R&D) and AKS paradigms under a new perception of the innovation process;
- productivity challenge;
- policy coherence; and
- necessity to secure resources to support effective AKS.

These issues are part of the mandate of the CRP and also constitute an incentive to enhance and develop cooperation with the Committee for Agriculture.

1. Introduction

19. The purpose of the conference was “to explore how to foster the development and the adoption of innovation at national and global level in order to meet global food security and climate change challenges”. To achieve these objectives, the conference “looked at developments in AKS institutions and relationship between the different components at national and international level, discussed whether they are functioning well and are responsive to emerging issues, reviewed incentives and disincentives to both public and private activities in the AKS and looked at policy coherence and best practices”.

20. This conference, which was one of the events organised to celebrate the 50th Anniversary of the Committee for Agriculture, took place in the context of a worldwide review of the links between knowledge production and its use to foster innovation. References to this review can be found in the two previous AKS meetings organised by the OECD (1995 and 2000), the 2010 OECD Ministerial Communiqué outlining the importance of innovation to tackle food security and climate change issues, the working group of the European Commission Standing Committee for Agricultural Research (SCAR) on

Agricultural knowledge and innovation systems (AKIS) following the conclusion of three foresight exercises and, to a certain extent, in the reform process engaged in the CGIAR (Consultative Group for International Agricultural Research).

21. This conference was therefore timely and an important contribution to the ongoing process of rethinking AKS worldwide. Its conclusions should help to design and adopt public policies based on a better understanding of the innovation processes in all their dimensions and taking into account specific contexts in which they have to develop.

2. The conference

22. In his introductory remarks, the Director of Trade and Agriculture of the OECD underlined the global challenges related to food security and climate change, the decrease of agriculture productivity growth in many high-income countries and the growing demand resulting from population growth and improvement in livelihoods in emerging economies. He pointed out the need for innovation (business as usual will not suffice) which is not as simple as adopting new technologies but requires a conducive environment. He also stressed the importance of improving international co-operation. The conference was a starting point for a potential programme on AKS.

23. The general organisation of the conference was around the discussion of the various components of AKS, their relationship and their functioning on the basis of national and international experiences. Three sessions were organised:

- How well do AKS respond to new challenges?
- Improving the responsiveness of AKS:
 - Institutional framework;
 - Public/private roles;
 - Regulatory framework conducive to innovation;
 - Facilitating adoption of innovations and technology transfers; and
- Responding to broader policy objectives

24. The first session was introduced by an economic analysis of agricultural productivity in a global perspective emphasising high rates of return to agricultural R&D, shifting patterns of public support for R&D and productivity (slowdown in high income countries but different patterns in Brazil and China) and their implications (enhance rates of research investment, restore productivity growth, reduce pressure on natural resources stocks).

25. A second keynote speech was delivered on the basis of the “Reflection paper on AKIS” from SCAR which developed some theoretical notions on innovation systems, AKIS, social innovation and some reflections (first findings) from the European working group illustrated by examples from the EU member states. The first findings emphasised in particular that, although being a theoretical concept, the AKIS approach is relevant to describe how different national or regional systems are, that AKIS components are governed by quite different incentives and that AKIS are governed by public policy; but consistent policies do not exist and monitoring is fragmented.

26. These keynote speeches were followed by case studies from Australia, China, Africa and Latin America in this session but also from New Zealand, India, Spain, France and Brazil in other sessions.

27. The second session explored the various aspects of AKS as systems to discuss, on the basis of national and international experiences, how to strengthen linkages between components and dimensions of

AKS. The four sub-sessions were a combination of key findings and presentations of national or international experiences.

28. Although not in the session devoted to institutional framework, the keynote speech on “Partnership in Agricultural Innovation Systems” argued that the shift from research to innovation in agriculture has taken place on the basis of increasing result-orientation among funders, an increasingly complex agenda (food, environment, poverty reduction, energy, changing consumer demand, etc.), the emergence of new players and a greater prominence of the private sector, and an improved understanding of how ideas and technology come into use. The key ideas developed included that innovation seems to emerge from a network of formal and informal alliances, that research is part of a wider process, that its importance differs over time, that context matters and implies a diversity of innovation configurations, that alliances with the private sector are important (local firms, not necessarily multinationals) and that innovation includes adaptation of an enabling environment. It called for the recognition of the key role of “innovation broker”, “a role that is neither involved in the creation of knowledge nor in its use in innovation, but one that binds together the various elements of an innovation system and ensures that demands are articulated to suppliers, that partners connect and that information flows and learning occurs”.

29. Experience with CGIAR re-organisation and institutional reforms in New Zealand showcased the role of international cooperation in the building of AKS.

30. Concerning public/private roles, the discussions were introduced by an economic analysis of intellectual property rights (IPR) and the role of public and levy funded research. It showed that IPRs can stimulate research as many aspects of R&D cannot be protected by IPRs, leaving an important role for taxpayer and levy based funding, and consequently giving voice to those who pay for and benefit from R&D. It observed that private research industries produce “toll goods” where market power and research fragmentation will be persistent issues that policy instrument can address (pricing, entry and knowledge sharing) as well as levy based R&D. Plant breeder’s rights and patents rights in the plant breeding business were cases for a discussion of this issue. Public/private partnerships are growing and their organisation as a piece of AKS is crucial to develop innovation as illustrated by the New Zealand case.

31. The regulatory framework was mainly discussed through US experience; the US case indicates that some recent regulatory actions have faced legal challenges and that there is a need for more dialogue among stakeholders with differing interests to enable further technology advances.

32. Facilitating adoption of innovation and technology transfer was highlighted by the Brazilian experience. The concept of participatory research has been put forward as one of the efficient tools in AKS as well as the role of indigenous/traditional/tacit technical knowledge (to be recognised and kept alive as a basis for innovation and/or innovation acceptance).

33. The last session broadened the debate to insist on the need for policy coherence to ensure that AKS can work as a system, on the necessity to reconcile the growth in productivity and sustainability (with the inescapable tradeoffs) and on the need to pay more attention to education (which is also a key for a better public understanding of the stakes and responses to the challenges).

3. Critical assessment

34. First and foremost, it must be acknowledged that this was an excellent conference where most of the presentations were of high quality (excellence and relevance). The critical assessment below aims to discuss issues that the Conference identified and that should/could be addressed in a future AKS Programme. It is also a way to demonstrate the richness of this Conference, providing a strong basis for deepening the concepts, their implementation and their contribution to develop relevant policies.

35. As underlined in the introduction, this conference was welcomed as an important piece in the reviewing process of AKS which is a global preoccupation and, as the conference showed very clearly, it was very useful to create an opportunity for the exchange of ideas and experiences on AKS among the OECD members and also to include non members that are key actors in this area, like China, India, Brazil, South Africa and Indonesia. It clearly showed a paradigm shift in the concept of AKS from a conception of innovation policy based on a linear model of innovation to an innovation policy based on the interaction of innovation process, networks and, as such, a systemic context-specific approach. It must be underlined that this paradigm shift is parallel to the research paradigm shift towards a more holistic approach to agriculture and related issues. It also showed that while this new concept of AKS (or AKIS) is progressively adopted by a range of countries, AKS sometimes seems to be locked into old paradigms. Moreover, the content and the understanding of the concept are not uniform: it can sometimes mean either Agricultural Knowledge and **Information** System or Agricultural Knowledge and **Innovation** System. In the first case, it means that knowledge management and dissemination will be mainly organised on the basis of Information and Communication Technology (ICT) tools (e.g. India, Spain). This approach is likely to be less systemic than the one which is embedded in the second case, emphasising innovation.

36. The reflection paper from the European Union SCAR highlighted the different notions and concepts that are covered by acronyms like AKS, AKIS, AIS (Agricultural Innovation Systems) and LINSAs (Learning and Innovation Networks for Sustainable Agriculture). Using one or another one of these terms, the discussion showed that the diversity of concepts and of their implementation may be linked to the diversity of contexts. This diversity should be questioned: do we need it or is it useful and relevant to think about unifying the concepts? This should be kept in mind for the future development of a programme on innovation systems. At this stage of the review of experiences to enlighten the evolution of thoughts about innovation process and the types of organisation that are or should be implemented to foster innovation, the distinction between those different notions was probably not instrumental.

37. Another grey zone in the AKIS understanding that could usefully be clarified is the notion of knowledge. A distinction must be made between the generation of knowledge (research) and existing knowledge (science) to which access has to be organised. There are different timescales involved in these two aspects of knowledge: existing knowledge that has to be mobilised in an innovation process is more short term (a few month are probably necessary and sufficient), as opposed to when considering the creation of knowledge in a research process where the outcome is problematic and the delivery date undetermined, and often undeterminable. Innovation depends on both and it is important to consider both when delivering a continuous flow of innovation in a long term vision of AKIS. For a shorter term vision, existing knowledge is certainly a more appropriate answer. The conference did not enter into this distinction, the participants focussing more on the long term process. With regards to policy recommendations, the organisation and monitoring of AKIS should nevertheless differ considering these timeframes. This point is also related to the issue of strategic intelligence and foresight which are inescapable components of AKIS and which have been too rarely mentioned.

38. It should also be mentioned that R&D, as part of AKS, has a feedback effect as far as interaction in the system plays a role in the designing of research programmes that enable research to better fit the needs. This point could have been better stressed in the conference and could form an agenda to be worked out by the CRP in co-operation with the COAG.

39. The well balanced combination of theoretical presentations and national and international case study presentations was not only very appropriate in structuring the debate but also enriched it through the demonstration and illustration of the points highlighted by the theory, either on the strength or weaknesses of the new model of innovation, or on the diversity of solutions according to the variety of contexts. The conference would have gained in clarity if this combination had been more systematically pursued.

40. The general discussion was sometimes (three sessions or sub-sessions out of five) introduced by remarks of a discussant, which was very useful to launch the debate. In the absence of a discussant the Chair of the session undertook that role. Globally, discussions were useful to complete the presentations or to highlight points that were not developed or mentioned enough by the speakers (e.g. the need of basic research to nurture a continuous flow of innovation, the debate between dominant supply driven models vs. demand driven, the role of IPR, and differences in regulatory approaches). Many small groups started lively discussions during breaks.

41. More than 60 participants from research institutions, universities, administrations, industry, international organisations, all actively involved in AKS, attended the conference, among which 36 keynote speakers or session Chairs.

42. Regarding the specific aims of the CRP, the conference addressed more particularly the following objectives:

- To contribute to an informed public debate on current and emerging agro-food issues and to help resolve conflicting views in Member countries:

The sponsorship of the CRP for this conference organised primarily and mostly by the COAG was precisely aiming at strengthening the links between those two bodies around topics that are shared through the support of a debate between policy makers and science. The conference, that is part of a larger project “to explore ways in which public, private and public/private actions would improve innovation within the global food and agriculture system, with a view to increasing productivity growth, ensuring sustainable resource use, responding to demands from consumers and limiting waste” (Ministerial Communiqué in March 2010), responded to this objective and was fulfilled. Agricultural research and knowledge is a part of AKS and it was therefore appropriate for the COAG and CRP to co-organise a conference that clearly showed the major role research has to play, among many others, in the innovation process.

- To promote scientific understanding and standards between major regions of the OECD:

The combination of theoretical keynote speeches and the presentation of national and international experiences responded clearly to this objective and beyond it, with the participation of key countries outside the OECD, like China, India, Brazil and South Africa.

4. Messages to policy makers

43. Agriculture will become more and more the source of many food and feed products and is related/connected to many objectives and policies that are at the food security and climate change nexus.

44. Three major messages could be drawn from the debates in the conference:

- Securing public resources for AKS:

The implementation of an effective AKS, a large and complex system of interactions, needs long term commitments and continuity from all the public and private parties that compose the system. Securing public resources (including levy funding) is necessary even if difficult in a context of severe resource constraints. The conference showed that if the private sector has a role to support AKS (consistently with business objectives), government policy is complementary to the private sector. “Innovation brokers” that appear to be a requirement for an effective functioning of AKS could be from the private sector or civil society but often, if not always, need the support of public money. AKS deliver public goods (non private, non local benefits) whose funding can only rely on public funding; R&D, and specifically basic research that is the key of a continuous

flow of innovation, is definitely concerned in this respect. Last but not least, governance in a multi-stakeholder arrangement is certainly a key issue.

- Change in the institutional design of AKS:

The shifting concept of AKS implies putting in place organisations that are able to articulate the activities of various stakeholders in a network of organisations, enterprises and individuals. Those organisations must be inclusive, flexible and based on sectoral involvement (not just farmers as in the linear model) clearly embedded in and adapted to the local/national context (“one size fits all” solutions do not work). Partnership is an important strategy. In those networks, more attention should be paid to education in general, in developed countries as well as in developing ones. Expanding the role of the private sector is already developing and should be supported. Public/private partnership should be encouraged (not only with multinationals but also with local firms). Protection of IPR is a key issue as well as the level, conditions and criteria of regulation. International partnerships have to be developed to broaden exchange of experience and to enable access to different technologies.

The main challenge is to make the AKS work as a functional system and not as a collection of isolated institutions. The concept of “innovation broker” is central in the implementation of a new institutional design of AKS and effective communication strategies are needed. Once again, governance is a major challenge.

- Policy coherence

“Nowadays AKIS relates to the world beyond agriculture which is entering with new actors, new interests, new values and new expectations. In this situation, AKIS has to cross traditional borders.” (SCAR Reflection paper). In this moving context, AKS is confronted with various agendas which may lack coherence. It could therefore be underlined that while AKS are governed by public policy, consistent AKS policies do not exist. Changing agricultural policy, education, research, environment and even innovation policies are governed by different (if not divergent) agendas, evaluation criteria and performance indicators that are hampering the enhancement of a system performance. How to ensure policy coherence is definitely a critical question

5. A future programme of coordinated actions between the Committee for Agriculture and the CRP?

45. This very fruitful conference and the sound basis it offers for future reflections and recommendation on innovation policies in agriculture was a good illustration and outcome of what a closer cooperation between the Committee for Agriculture and the CRP can provide.

46. The above remarks and comments on the conference’s outcomes could be used as material for an agenda of coordinated actions between the two bodies. Examples of possible areas and questions that could be jointly addressed include:

- How to deepen the debate on the various concepts of knowledge/innovation systems?
- Protection of IPR and alternative procedures to combine the necessary dynamism of both research and innovation;
- How to use foresights as a piece in AKS?
- Shifting paradigms in agricultural research and in AKS; and
- The productivity challenge.

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