

**OECD CONFERENCE ON AGRICULTURAL KNOWLEDGE SYSTEMS
RESPONDING TO GLOBAL FOOD SECURITY AND CLIMATE CHANGE CHALLENGES**

External evaluation of the CRP-sponsored Conference*

Held in Paris, OECD Conference Centre, 15-17 June 2011

Executive Summary

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 is widely decreasing. The OECD Conference on Agricultural Knowledge Systems, co-sponsored by the Committee for Agriculture and the Cooperative Research Programme, was very opportune in providing a large 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 R&D and AKS paradigms under a new perception of the innovation process
- productivity challenge
- policy coherence
- 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

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 Agricultural

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Knowledge Systems (AKS) institutions and relationship between the different components at national and international level, discussed whether they are functioning 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”.

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).

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

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 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.

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
- Responding to broader policy objectives

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).

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, AKIS 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.

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.

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.

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 emergency 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 whose importance differs over time, that context matters and implies a diversity of innovation configurations, that alliances with the private sector is 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”.

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

Concerning public/private roles, the discussions were introduced by an economic analysis of intellectual property right (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.

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

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).

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

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 strong basis for deepening the concepts, their implementation and their contribution to develop relevant policies.

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 of 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 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.

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.

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 months are probably necessary but 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.

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.

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.

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.

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.

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

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.

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?

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.

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
- The productivity challenge

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