Executive summary

This report reviews recent trends in Agricultural Innovation Systems (AIS) and discusses the impact of a wide range of policies on the creation and diffusion of innovation in the agricultural and agri-food sector. It suggests a framework for analysing the role of governments in fostering increased innovation, with a view to helping to identify practical actions that governments could take to improve productivity growth, sustainable use of resources, and resilience to future market developments in national and global agriculture and agri-food systems.

The agriculture and agri-food sector is expected to provide healthy, safe and nutritious food for a growing and wealthier world population, feed for increasing farm animal populations, and fibre and fuel for a growing range of industrial uses without depleting available land, water and biodiversity resources. On current trends, these goals will not be met. Greater attention will need to be paid by governments and by the international community more generally to re-invigorate innovation, broadly defined, in the agriculture and agri-food sector.

AIS face many challenges — budget constraints, conflicting information on research priorities, very long time lags between research, adoption, and results — but also many opportunities. Commodity markets are strong, increasing the incentives for investment in agriculture, and international attention is re-focusing on the need to address global food insecurity in a sustainable way. A number of countries are engaging in reforms to increase the cost-efficiency and responsiveness to social needs of their AIS. Reforms have generally improved integration of AIS into general innovation systems, governance structures, priority setting and funding allocation mechanisms, the functioning of Intellectual Property (IP) markets, and opportunities for partnerships and cross-country co-operation.

Economy-wide policies can contribute to enable innovation, either because they directly create long-term conditions conducive to innovation (e.g. health, education, infrastructure, and other structural policies) or because they encourage the private sector to invest in the creation and adoption of innovations (e.g. transparent and predictable regulatory frameworks, and open and efficient output and input markets).

Agricultural policies are prevalent in many countries and can be particularly important for agricultural innovation. Removing distortions in input and output markets and measures slowing structural adjustment would foster farm-level innovation. Measures that facilitate investment, including protection of property rights, would also be beneficial. Agricultural regulations should be reviewed and where possible simplified. Regulations and incentives should be technology neutral and based on outcomes rather than processes. Improving rural and marketing infrastructure and the provision of services in rural areas is also important for agricultural innovation. In addition, as most innovations are created outside farms, particular attention should be paid to agricultural education and extension, and their role in facilitating timely adoption of innovation by farmers.

Innovation policy is central to improving AIS. The public sector plays a major role in the provision of knowledge infrastructure (e.g. communication technology, databanks, centres of

technology convergence) and the financing of basic research, or research with long-term and public good aspects, in particular for agriculture and natural resource management. The public sector remains a major funder and performer of research and development (R&D) for agriculture. Governments also encourage innovation activities in the private sector, including fostering knowledge markets through IPR protection, engaging in public-private partnerships (PPP), providing information and sharing the outcomes of public research (spill-overs), and providing direct or indirect financial incentives.

The governance of national AIS could be improved both with better integration within the general innovation strategy, and with stronger co-ordination of the various AIS actors and related policies. It is particularly important to define clearly the respective roles of the public and private sectors, and areas of mutual interest and possible co-operation. Improvements to the institutional design of national AIS would include strengthening strategic planning and regular monitoring and evaluation mechanisms. Efforts should also be made to develop and facilitate access to information systems: databases, modelling and forecasting tools, gene banks, etc. Policy coherence at the national level is fundamental to improving the performance of AIS. In particular, objectives should be set clearly to improve the design of domestic and trade policy and regulations that can impact agricultural innovation.

International co-operation could also contribute significantly to improving the cost-efficiency of national AIS with the sharing of resources and outcomes, even allowing for some specialisation. In addition, co-ordinated efforts are increasingly needed to tackle global challenges and trans-boundary issues.

From:

Agricultural Innovation Systems

A Framework for Analysing the Role of the Government

Access the complete publication at:

https://doi.org/10.1787/9789264200593-en

Please cite this chapter as:

OECD (2013), "Executive summary", in *Agricultural Innovation Systems: A Framework for Analysing the Role of the Government*, OECD Publishing, Paris.

DOI: https://doi.org/10.1787/9789264200593-2-en

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