Chapter 6

The role of the government in
improving agriculture innovation

This chapter draws a number of conclusions regarding the governance of Agricultural Innovation Systems (AIS) and the coherence of policies that affect innovation in agriculture and the agri-food sector. It suggests a framework to analyse the role of governments to improve agriculture innovation.

Innovation is key to improving the social, economic and environmental performance of the agri-food sector. Agricultural innovation systems (AIS) need to be strengthened to improve cost-effectiveness and responsiveness to multiple demands.

A number of conclusions regarding the governance of AIS and the coherence of the various policies affecting innovation in the agricultural and agri-food sector can be drawn from the analysis presented in this report. First of all, it is important to develop a national agriculture innovation strategy that takes account of changes in the sector and AIS and the nature of future challenges and opportunities in terms of sustainability, climate change and food security. This strategy for agriculture should be integrated into the wider national innovation strategy and take account of the whole range of policies and regulations that affect the capacity all sectors to create and adopt innovation. It should also include the development of indicators to explore impacts and evaluation criteria.

Innovation, and innovation strategies should be broadly defined and encompass the whole range of policies that can provide incentives or dis-incentives for greater innovation. For example, some measures can shape a long-term environment favourable to innovation (such as health, education, and other structural policies), and others can encourage the private sector to invest in innovation (such as transparent and predictable regulatory frameworks and open and efficient output and input markets). On the other hand, governance and institutional weaknesses or unreliable infrastructure systems discourage investments, including in innovation.

Innovation policy, and in particular investment in R&D, should remain at the centre of national innovation strategies. Public R&D still plays a major role in innovation systems, in particular AIS policy also encourages activities in the private sector, including by fostering knowledge markets through IPR protection, providing information and sharing the outcomes of public research (spill-overs), and providing direct or indirect financial incentives.

In the case of agriculture, sector specific policies should be an integral part of the agricultural innovation strategy. In many cases, particular attention should be paid to the importance of agricultural education and extension in facilitating adoption of innovation by farmers.

Policy coherence is essential to improve the performance of AIS and the agricultural and agri-food sector. In particular, objectives for the sector should be set clearly to improve the design of both agricultural policy and agricultural innovation policy, and to ensure consistency between them. Government should first identify and remove impediments to innovation. Improving the enabling environment would include ensuring a stable macroeconomic environment, open and well-functioning trade, investment and labour markets, setting appropriate regulations in a transparent way, and fostering human capital. Agricultural policies would facilitate farm-level innovation if impediments such as distortions in input and output markets and measures slowing structural adjustment were removed. Measures that facilitate investment, including property rights protection and appropriate risk management tools, would also be beneficial. Regulations should be simplified and based on scientific evidence through a clear decision-making process. Unnecessary regulations should be removed. Regulations and incentives should be technology neutral, 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. Overall, improving the competitiveness of the sector is crucial to attract young innovative people.

Government should continue to play a major role in AIS, in particular the provision of knowledge infrastructure, and the financing of basic research, and research with long-term and public good aspects. 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. Improvements to the institutional design of national

AIS would include strengthening strategic planning and regular monitoring and evaluation mechanisms. Improving measurement and evaluation of innovation is crucial to identify market or system failure and improve performance. Efforts should be made to develop and facilitate access to information systems: databases, modelling and forecasting tools, gene banks, etc. Improving measurement and evaluation of innovation is crucial to identify market or system failure, and areas with regional or global public good characteristics. It would thus help define more clearly the respective roles of the public and private sectors, and identify areas for co-operation.

Co-ordination at the national, regional and international levels becomes crucial given the increasing number of actors in AIS, the complexity and the costs of innovation, and the common global interest in improving agriculture productivity growth rates and using scarce land, water and biodiversity resources more efficiently. Co-ordination between national and sub-national levels, and between the European Union and its member states, is also essential. Consolidation of institutions is an option with long term benefits, but most important is the need to establish stable and flexible co-ordination mechanisms. A combination of institutional and project funding is needed in agricultural research. Countries should consider introducing competition and output-driven projects. To strengthen linkages between public and private partners, governments can support the creation and functioning of networks; change reward systems in public research; and participate in public-private partnerships (PPPs). PPPs are attractive because they make the system more responsive to users' demand, encourage co-innovation, and harness private resources to address issues with some public goods aspects. Specific attention should be paid to making agricultural education and extension more effective. Governments should in particular foster competition in extension services and focus public efforts on public goods aspects. Improving IPR protection and Sanitary and PhytoSanitary (SPS) regulations would be crucial to fostering private sector's contributions to innovation. International co-operation is increasingly needed to tackle global challenges, such as climate change, green growth, food security, price volatility, and agricultural development, and transboundary issues such as pest and disease, and water management.

There is no "one size fits all" design for an efficient national AIS. Policy needs to be customised to different context, forms of innovation and phases of development of the AIS. However, sharing information on the performance of different systems would provide useful insights. In this regard, providing platforms for dialogue between AIS actors and policy-makers across-country would be beneficial.

The structure of this report suggests a framework for analysis of the role of governments in improving agriculture innovation, which in turn would contribute to more efficient use of natural and human resources and improved productivity performance (Box 6.1).

Drawing on theory and available evidence, the impact of specific measures on agricultural innovation would be examined. All through this report, boxes include a number of questions and possible related indicators that could be used to review policy incentives and disincentives. Table C.1 also suggests a number of innovation indicators to benchmark policy efforts and outcomes across countries and over time. The framework also considers governance issues, such as co-ordination, priority setting, measurement, monitoring and evaluation. Finally, it aims to assess policy coherence and provide suggestions for improvement.

Developing this framework provided an opportunity to review information on innovation efforts and outcomes available on a comparable basis across countries, and on the impacts of policies on innovation. A preliminary conclusion is that efforts should be made to improve existing indicators for the agri-food sector, to explore impact analysis at macro- and micro-economic levels and to develop evaluative criteria reflecting the diversity of policy objectives. This could be done when applying this framework to more indepth country reviews.

**Box 6.1. Framework for analysing the role of the government
in agri-food innovation**

Economy-wide policies and innovation

    Macroeconomic policies

    Governance systems

    Regulatory systems

    Financial markets

    Tax policy

    Competition policy

    Trade and investment policies

    Infrastructure and rural development policies

    Labour and land market policies

    Consumer and environmental policies

    Industrial policy and business regulations

    Health, education and information policies

Agricultural policies and innovation

    Policy objectives

    Domestic agriculture policy

    Agricultural trade policy

    Agriculture regulations

Innovation policy and agricultural innovation systems

    Innovation objectives

    Governance of innovation systems

    Investing in innovation

    Fostering knowledge flows: the role of networks and markets (IPR)

    Facilitating knowledge flows and linkages within national AIS

    Strengthening international co-operation on agricultural innovation