

National Coordination and Governance of Agricultural Innovation

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SYNOPSIS

Many countries could benefit from better coordination of agricultural innovation at the national sectoral level, where broad science and innovation policies, strategies, and activities are defined. This note describes the potential benefits and elements of an organization that successfully coordinates national innovation in agriculture. Ideally, a nationally mandated but independently governed agricultural innovation council or committee (consisting of diverse stakeholders) coordinates the development of a strategic vision for agricultural innovation. It also coordinates and formulates the corresponding agricultural innovation policy (to be increasingly integrated into general science-innovation policy), designs agricultural innovation priorities and agendas, and monitors and evaluates innovation programs and their impact. In theory responsibilities for policy making, financing, and implementation should be separate, but experience varies in practice. Many innovation councils are advisory and policy-making bodies with no mandate to channel funds, whereas others have been more effective at inducing coordination of policy when they control innovation funds. This note reviews lessons emerging from the three commonly applied modes of coordinating innovation for agriculture at higher levels to date: the national agricultural innovation council or committee, competitive innovation/research funds, and coordination by theme or subsector. New approaches could make all three options more effective at contributing to coordination and implementation of agricultural innovation policies, strategies, and agendas.

BACKGROUND AND CONTEXT FOR INVESTMENT

Many countries are gradually addressing challenges to coordinating innovation within specific agricultural subsectors. Even so, far greater impetus is needed at the national level to

address coordination and collective action for agricultural innovation as part of the wider sphere in which science and innovation policies, strategies, and activities are defined. Ideally, interventions to improve national coordination and governance of the AIS seek to improve the participation of stakeholders, including end users such as producers and enterprises; improve the transparency and openness of decisions related to funding and priorities; improve responsiveness and accountability to stakeholders; build consensus; and develop consensual, coherent policies, strategies, and activities that reflect a strategic vision of innovation for agriculture.

The lack of appropriate coordination and governance for agricultural innovation at the national level is a chronic problem for many countries. As pointed out in the module overview, most efforts to coordinate agricultural innovation at the national level have focused on establishing formal apex research councils, as in Australia, Brazil, Ghana, India, and Mexico, to govern multi-institutional national agricultural research systems. They develop national research strategies and plans; link research to broader agricultural policy discussions; channel funds to priority research areas and thus coordinate research across institutions; promote collaboration and exchanges among the various parts of the national agricultural research system; and coordinate external links (Byerlee and Alex 1998). In several cases, though, design of the councils has reduced their impact. For example, Brazil's national (and most important) agricultural research organization, EMBRAPA,¹ is also the formal head of the national agricultural research system and transfers resources from its budget to other research organizations. Because of these multiple roles, several stakeholders in the AIS do not see EMBRAPA as an unbiased coordinator. For many years Mexico's office for coordinating national agricultural research and extension systems² had no instruments to induce coordination, and its attributions and roles had not been defined clearly; not surprisingly, it was largely ignored by the actors it was supposed to coordinate.

Despite their presence, national innovation councils and agricultural research councils rarely operate as true *agricultural innovation organizations or councils*, with a mandate to coordinate and prioritize investments in agricultural innovation at the highest level. This thematic note discusses measures that enable coordination processes to improve, adapt to changing circumstances, and rely on the growing array of stakeholders to improve the governance and impact of agricultural research and innovation. It begins by reviewing the characteristics and norms shaping a “true” organization for national coordination and governance of research and innovation (mandate and management structure, resources, and operating practices and values). The potential benefits of such an organization, the policy issues that impinge on its successful operation, and the many lessons emerging from previous efforts are all discussed in the sections that follow.

INVESTMENT NEEDED

An organization to foster national (sectoral) coordination and governance of agricultural innovation would be nationally mandated but independently governed. The general outlines of the mandate, governance structure, activities, resources, and practices of an effective national coordinating organization are presented next to provide an idea of the kinds of investment needed.

Organization and mandate

The coordinating organization would be formal and independently governed and managed as defined by its bylaws. The effectiveness, legitimacy, relevance of, and confidence in a coordinating organization depend on how effectively it reaches out to stakeholders from diverse areas of the economy. The composition of the organization should reflect the diversity of its stakeholders. The range of stakeholders in matters of agricultural policy such as innovation is likely to be very wide, including farmers and other actors associated with agricultural innovation (research, education, extension, and farmer organizations; private firms; and NGOs), rural territories, and consumers. Representatives from outside the agricultural sector can add diversity and value to discussions. All should have a voice and be included in decision-making concerning agricultural innovation strategies and programs.

A skilled management team (a secretariat, for example) would execute the activities identified by the organization’s board. A typical mandate and set of activities would be the following:

- Coordinate the development of a strategic vision for agricultural innovation.³
- Coordinate and formulate agricultural innovation policy, which will be increasingly integrated into general science-innovation policy.
- Link agricultural innovation to broader agricultural policy and science-innovation discussions.
- Continue to contribute to the development of a strategic vision of the agricultural sector.
- Coordinate and design agricultural innovation priorities and agendas.
- Coordinate the division of labor and channeling of funds⁴ to priority innovation areas.
- Monitor and evaluate innovation programs and their impact.
- Promote collaboration and exchanges among the various parts of the innovation system, including external linkages.

Ideally, innovation policy making, innovation financing, and implementation are separate functions. Agricultural innovation councils or committees should not be responsible for executing innovation programs, which is the task of science, technology, and innovation organizations.⁵

Funding, infrastructure, and capacities

Formal, dedicated structures with set agendas do not in themselves guarantee effective coordination of—and action by—actors. At a minimum, coordinating organizations will need operating funds, physical infrastructure, and communications infrastructure (ICTs, for example) to enable transparent and open communication and support effective coordination and governance. Coordinating organizations will also need to build capacity among actors and encourage them to address issues collectively. Box 1.9 summarizes the capacities and skills needed for innovation coordination and governance to be effective at a higher level.

Operational practices

The practices of an organization that coordinates national agricultural innovation will be guided by such values as transparency, responsiveness, accountability, consensus, and coherence within and between the organization’s activities.

Transparency is achieved if all information regarding decisions on funding, priorities, and operations is open and freely available. This openness implies that central and regional governments and agricultural development agents

Box 1.9 Capacities and Skills Needed in Coordination and Governance of Agricultural Innovation

Governance capabilities are defined as the ability to

- Recognize system characteristics (strengths, weaknesses, problems, development potential)—which requires facilitation and analytical skills.
- Define the focus and the topics for political action (agenda setting)—which requires skills in communication and consensus-building.
- Encourage diverse players (through consultation and participation) to coordinate their activities in

and beyond their policy field—which requires skills in facilitation, negotiation, and consensus-building.

- Implement these policies—which requires policy capacity.
- Learn from previous experience (such as evaluation results)—which requires learning, intelligence, and accountability.
- Make adjustments over the complete policy cycle.

Source: Adapted from Ohler et al. 2005.

will actively communicate and deliver key messages to stakeholders about what they do and the decisions they take. They should use language that is accessible to the general public. Openness also implies that potential beneficiaries such as farmers and processors have equal access to information and funding opportunities (Hartwich, Alexaki, and Baptista 2007).

Those who govern organizations and societies, as well as the institutions and processes they establish, must be *responsive* to stakeholders. They must prove in some way that they are acting in response to stakeholders' priorities and generating outputs that meet their needs. *Accountability* means that the organization will be fiscally responsible and use efficient mechanisms to avoid corruption. Regular reporting on the efficient and effective use of project and program funds, along with evaluations of outputs and impacts, will help to prove that funds are used in the best and most correct way. In complex innovation systems, many actors are involved in setting priorities and using funds, but generally the agents that disburse the funds are held accountable (Hartwich, Alexaki, and Baptista 2007).

Differing interests need to be taken into account to balance regional and subsectoral development, and the institutions involved in agricultural innovation need to reach a broad *consensus* on which tasks are of general interest and who will play what role in those tasks. Now that the range of tasks required to achieve innovation-led growth in agriculture has grown so large, the need for *coherence* among those tasks has become more pronounced. Coherence aids in coordinating and forming critical masses for innovation, and it also enables innovating agents to be competent—to

focus on their own clearly defined share of the work. Coherence requires strong and effective leadership to ensure that roles and tasks are articulated, understood, and shared as agreed (Hartwich, Alexaki, and Baptista 2007).

Australia has developed a multistakeholder, multidisciplinary agricultural research and development council with a focus on agricultural innovation (box 1.10). Chile's FIA plays the roles of innovation coordinator, promoter of innovation, and technological broker, interacting with several actors in the AIS, including farmers, private firms, financial institutions, technological institutes, and universities (IAP 3). Despite Chile's competitiveness and innovativeness, its agricultural sector currently is not fully aligned with the rest of the national innovation system and associated policy coordination.

POTENTIAL BENEFITS

The reasons commonly cited for AIS actors to interact and address issues collectively include improved identification of opportunities and challenges related to innovation, better leveraging of human and capital resources, better learning and information sharing, improved implementation and results, and economic benefits. Coordination may also improve the design and implementation of innovation policies. Stronger coordination induces all actors, especially public research and extension organizations, to be more aware of and responsive to the needs and concerns of other actors, especially resource-poor households. More actors in the innovation system can voice their needs and concerns in the process of designing and implementing innovation

Since 1994, the Government of Australia has developed rural research and development priorities that reflect the national understanding of critical needs for investment in agricultural, fisheries, forestry, and food industry research and development. A shared approach to priority setting among state and territory governments, industry, and research funders and providers enables issues of common concern to be explored in a coordinated, cost-effective way.

The priorities complement national research priorities and guide Australia's Rural Research and Development Corporations and Companies (RDCs). As the government's primary vehicle for funding rural innovation, RDCs are partnerships between government and industry, created to share funding, strategic planning, and investment in research and development and the subsequent adoption of outputs (see TN1 in module 4). The RDCs significantly influence the work of research providers and investors in related fields.

The Rural Research and Development Council was appointed in 2009 by the Minister for Agriculture,

Fisheries, and Forestry to be the government's independent, strategic advisory body on rural research and development. Its principal goal is to provide high-level advice and coordination to improve the targeting and effectiveness of government investments in rural research and development. The Council's 10 members represent research, academia, farmers, and the private sector. The Council works closely with RDCs, industry, research providers, state and territory jurisdictions, and government agencies to strengthen rural research and development through improved collaboration, facilitation, and prioritization of investment and performance measurement and reporting.

Given its recent establishment, the council's effectiveness has yet to be rigorously evaluated. Even so, the enhanced focus on research and development at the national level is expected to improve the productivity, profitability, sustainability, and global competitiveness of Australia's agricultural, fisheries, forestry, and food industries, with benefits for individual rural businesses, the environment, and the wider community.

Source: Rural Research and Development Council (<http://www.daff.gov.au/agriculture-food/innovation/council>).

policies, resulting in more inclusive policies and faster diffusion of innovations.

POLICY ISSUES

The policy issues involved in developing an organization responsible for coordinating agricultural innovation on a national level resemble the policy issues that apply to coordination more generally. They include policies to promote the organization's sustainability and effectiveness and to reflect the needs of all stakeholders, including marginalized groups.

Beyond the creation of formal coordinating bodies, effective coordination of stakeholders depends on stable financing and incentives for participating organizations and employees. Careful attention must be paid to developing stakeholders' capacity to contribute to shared goals, influence the organizations they participate in, and benefit from their participation in ways that encourage them to continue participating. Effective and relevant coordinating organizations will include a wide swathe of stakeholders, differing by geographical location, subsector, gender, and type of institution (public, private, and civil society).

To enhance transparency, it is better for the functions of innovation policy making, financing, and program implementation to reside in different organizations. Policy making is ideally the mandate of coordination and policy-making bodies, such as councils, whereas financing is the mandate of ministries and special agencies, leaving the implementation of innovation policy programs to research-innovation entities such as research organizations, universities, and private companies, among others.

Formal coordinating organizations at the national level may be set up or facilitated by public, private, or civil society actors. In practice, the public sector often takes the lead. It is essentially in the public interest to guarantee that society's resources are allocated to priority issues, identified collectively.

LESSONS LEARNED AND RECOMMENDATIONS FOR PRACTITIONERS

The lessons and recommendations emerging to date center on three commonly applied modes of coordinating

innovation for agriculture at higher levels. The first is the national agricultural research council or committee. The second is the establishment of competitive or noncompetitive project-based innovation/research funds, with their associated governance and management structures. The third involves coordination by theme or subsector, which can be effective at generating innovations that reflect users' needs and government policies and strategies.

Research councils: too many roles, too few stakeholders, and stark funding and capacity needs

Most research councils or forums play an important role in research, development, and policy design, and they often collect large parts of public budgets for research. It is important to separate the design of policy from the implementation of agricultural research and innovation, but experiences and practices related to funding vary among research and innovation councils. In practice few apex councils function independently of the ministry in charge of agriculture and the agricultural research system. Many have become large research institutes in themselves. In still other cases, apex councils are advisory bodies without a mandate to channel funds, following the principle that ministries and agencies allocate funds (box 1.10). Both arrangements typically lead to failure (Byerlee and Alex 1998). However, some organizations have been more effective

at inducing collaboration and coordination when equipped with control over incentives, such as innovation funds (IAP 3 and module 5, TN 2). The Indian Council of Agricultural Research (ICAR) functions as a national agricultural research council and executes research as well, as outlined in box 1.11. Although it has operated as a typical research-oriented council, it is transforming itself to operate more effectively as part of the wider Indian agricultural innovation system. With the state agricultural universities, it is implementing the National Agricultural Innovation Project (NAIP) and pursuing specific activities to catalyze and manage change in India's agricultural research system:

- Strengthening communications ability and information capacity (enhancing dialogue and interaction with the public at large, the farming community, and the private sector, as well as among all key functionaries in the ICAR system).
- Forming business development units and offering intellectual property rights (IPR) management.
- Undertaking systemwide organizational and management reforms, including improvements in monitoring, evaluation, and financial management.
- Undertaking visioning, technological foresight, and policy analyses.
- Renewing links with the state agricultural universities, which have tended to be isolated from ICAR's research.

Box 1.11 Structure and Mandate of the Indian Council of Agricultural Research

The Indian Council of Agricultural Research (ICAR), established in 1929, is an autonomous organization under the Ministry of Agriculture. With 97 institutes and 47 agricultural universities, ICAR is the national apex body for coordinating, guiding, and managing research and education in agriculture. The members come entirely from the public sector. ICAR has two bodies: (1) the General Body, the supreme authority of ICAR, headed by the Minister of Agriculture and (2) the Governing Body, the chief executive and decision-making authority of ICAR, headed by the Director-General, ICAR. The correspondingly broad mandate of ICAR includes:

- Plan, undertake, aid, promote, and coordinate education, research and their application in agriculture,

Source: <http://www.icar.org.in/en/aboutus.htm>; World Bank 2006c.

agroforestry, animal husbandry, fisheries, home science, and allied sciences.

- Act as a clearinghouse of research and general information in its areas of competence through its publications and information system.
- Institute and promote transfer of technology programs.
- Provide, undertake, and promote consultancy services.
- Look into the problems relating to broader areas of rural development concerning agriculture, including postharvest technology, by developing cooperative programs with other organizations such as the Indian Council of Social Science Research, Council of Scientific and Industrial Research, Bhabha Atomic Research Centre, and the universities.

Many councils consist of representatives from government or research agencies, with few other stakeholders. It has been challenging to ensure representation of the wide spectrum of developing country farmers, which includes large-scale farmers or plantations producing traditional export products, small-scale farmers that supply supermarkets and fast-food restaurants (usually the better-off members of this group), large-scale farmers who sell through local or wholesale markets, and small-scale farmers who produce for their own consumption or sell a small surplus in local markets. *These groups operate in innovation systems that barely intersect.*

This lesson is being learned, however. A movement is underway to broaden the representativeness of governance bodies (by stakeholder group, geographical location, and discipline), improve the transparency of decision making, reduce bureaucracy, and use more rigorous and diverse prioritization tools. Box 1.12 describes mechanisms and processes to integrate additional stakeholders, particularly producers, in research priority

setting and planning, based on an example from Uruguay. A related lesson is that effective agricultural research councils recognize that they are major stakeholders in, and must form an integral part of, national innovation councils.

The effectiveness of many councils is limited not only by a narrow constituency but by a lack of resources. Scarce financial resources restrict councils' influence on stakeholders, the policy process, and the way that research is conducted. For councils to be more than formal constructs, they must command resources, have continuity, be seen by other actors in the AIS as honest brokers, and those actors, especially top government officials, must be willing to listen to their advice. Coordination at the highest levels of the AIS has been hampered by the fact that formal coordinating structures (research and innovation councils) generally operate in an environment that gives other organizations in the AIS no complementary incentives to foster innovation. Government directives and agreements reached among organizations often cannot be

Box 1.12 Mechanisms to Articulate Producers' Needs in Uruguay

Producers have a significant role in the financing, governance, and research priority setting of Uruguay's main agricultural research institute, the Instituto Nacional de Investigación Agropecuaria (INIA). Formal mechanisms foster producers' participation in identifying, prioritizing, and planning research: Producers are active members of the board of directors, regional advisory councils, and working groups. They are involved in planning primarily through wide participation in identifying and analyzing problems. Specific mechanisms to articulate producers' demands and transfer technology have been developed as well, such as experimental units for validation and demonstration.

The five regional advisory councils, set up in 1990, act as "antennae" for capturing local demands in the area served by each experiment station. The councils are an important forum for regular exchanges of views and close contacts between producers and INIA staff. INIA also created working groups for major commodities at each regional experiment station to strengthen farmers' role in guiding commodity research. In these groups, INIA staff and farmers discuss research plans and results for specific commodities and production

systems. Meetings are open to all producers interested in attending, as well as other stakeholders (extensionists, representatives from industry, and policy makers). The working groups have become a very useful mechanism for formally incorporating inputs for research planning, monitoring, and evaluation.

INIA also has close links with its clients through a specialized unit for diffusing technology. For instance, INIA has a long-term agreement with a producer association to demonstrate new intensive cropping and livestock production technologies. The arrangement has validated promising technologies at the commercial level, facilitating their transfer and providing feedback to reorient research, and it has been expanded to support new technological developments in extensive livestock production.

Round tables are a third means of incorporating producers' demands into national research programs. Composed of specialists from INIA, other public research institutes, the university faculty of agronomy, and representatives from different stages in the agroindustrial chain (from producers to consumers), the round tables operate as self-directed work groups to identify relevant vertically integrated problems.

Source: Allegri 2002.

implemented because the representatives of national organizations cannot force provincial or local chapters to change their behavior when the only tool at their disposal is reasoning.

Another vital lesson is that capacity-building programs are often needed to build skills in collaboration, competition, and negotiation, particularly among individuals who lead the coordination and governance process. For details, see the module overview.

Project-based research and innovation funds: governance and management issues

The introduction of project-based (including competitive) funding schemes for agricultural research and technology transfer has in many instances been associated with changes in the governance of national agricultural innovation systems. At one time, national agricultural research agencies received an all-inclusive lump sum based on a broad research mandate and could set research priorities quite independently. More recently, priority-setting responsibilities have shifted owing to major changes in how society views science and to the introduction of competitive science and technology funding schemes.

The extent to which a project-based fund influences priority setting differs greatly between agriculture-specific and general project-based funding schemes. Specific, project-based science and technology funds tend to define agricultural research needs up front, before calling for proposals, whereas general science and technology funds are somewhat more open. For general science and technology funds, it is usually academic relevance that matters most in the selection procedure; in specific, project-based schemes, it is economic relevance (World Bank 2006b). Project-based funds can contribute positively as well as negatively to the governance of agricultural research (box 1.13).

The good practice for governing and managing project-based research funds is to maintain separate units for policy setting, technical evaluation, management, and governance. The main governing responsibility in project-based research funds should reside with a governing board that ideally consists of a distinguished group of senior decision makers. The good practice for appointing members to the board is to strike a balance among the stakeholder groups pertinent to the grant scheme and the wider innovation system. At a minimum, the board should consist of representatives from government, research organizations (including universities), extension, farmers, and the private sector. All too

often, boards can be taken hostage by one interest group that dominates discussions and skews decisions in favor of its constituency at the expense of others. Similarly, boards can be held hostage by politicians. This practice is particularly damaging given the complex and multisectoral nature of funding for agricultural innovation systems. A governing board is typically supported by a technical advisory committee mandated to provide technical input for planning programs and setting priorities and a technical review panel mandated to evaluate, score, and rank proposals and make funding recommendations. A secretariat manages programs and carries out daily operations. Table 1.3 summarizes the principal characteristics of project-based competitive science and technology funds (many of which are closed) in five countries. For further details on innovation funds, see module 5, TN 2.

In Latin America, many science and technology funds specific to agriculture—especially funds focusing on adaptive agricultural research and technology transfer—have acknowledged the need to improve client orientation and participation. These funds have adopted strategies that involve farmers in identifying and prioritizing innovation needs and in developing, selecting, implementing, and funding subprojects. To reach their clients, funds have adopted decentralized strategies or are in the process of doing so. Although stronger client participation and orientation are generally considered positive, they may also have drawbacks (such as a bias toward short-term research, a lack of equity, and significant transaction costs).

Thematic or subsectoral coordination: the value of delegating to networks

Owing to the difficulties involved in establishing effective national coordination of agricultural innovation, many countries have implemented formal structures to coordinate actors at different levels of the AIS. The module overview mentions several examples, including associations, commodity boards, and networks. The delegation of research governance to networks is increasingly seen as a means of resolving problems endemic to traditional research funding processes. It can reduce the state's direct influence on funding policies, respect the independence of scientific institutions, foster vigorous scientific institutions, and ensure scientists' strong commitment to users' interests. One example of this new type of research-innovation council is Bioconnect, a research-oriented, multistakeholder network for organic agriculture in the Netherlands (box 1.14).

Competitive funds can contribute positively to governance, leading to

- *Improved identification and prioritization of agricultural research needs*, particularly with the more specific, competitive funds. (Note that general science and technology funds, in contrast, usually do not prioritize research needs beforehand. Because these funds leave much of the initiative of selecting research topics to individual researchers, the agricultural research agenda may not take into account the needs of AIS actors or emerging opportunities for innovation.)
- *Improved formulation of research project proposals*. The introduction of competitive funding schemes requires a strong project culture within agricultural research and technology transfer agencies; some take time to adjust to the new rules and regulations. Universities seem to have more experience with competitive funding schemes.
- *More transparent selection of agricultural research projects*. All project proposals are reviewed by external reviewers. Research projects that are approved and selected for financing are listed publicly. Many competitive funds have project databases that can be consulted online.
- *Improved monitoring and evaluation (M&E) of project implementation*. In most agricultural research and technology transfer agencies, M&E has long been a weak spot. Internal reporting mechanisms are rare, and sanctions are seldom applied for failure to report on progress. Competitive funding schemes, with their more stringent reporting requirements, have introduced innovations in M&E.

Source: World Bank 2006b.

Competitive funds can also lead to governance problems:

- *By lacking sufficient objectivity*. Particularly in small science communities, it can be very difficult to organize impartial reviews of research project proposals. A solution may be to mobilize foreign reviewers, but this alternative remains quite costly to organize and manage without good access to ICTs.
- *By using a limited time horizon and funding only operational costs*. Competitive science and technology funding schemes, which usually fund only short-term projects (two to four years), are not necessarily the best instrument for funding long-term agricultural research activities, such as plant breeding and strategic research. The same problem arises because most project-based funds do not finance researchers' salaries or investments in equipment and infrastructure.
- *By being relatively inflexible in adjusting project proposals and implementation*. Strict adherence to selection transparency and procedures can jeopardize efficient selection and implementation of agricultural innovation projects. Simple mistakes in budgets or incomplete documentation sometimes result in outright rejection of project proposals.
- *By not fitting within existing bureaucratic procedures*. Government agencies often find it extremely difficult to administer a research grant within their bureaucratic procedures. For example, resources often cannot be transferred to the next financial year. A way to avoid this problem is to administer the research grant through a nonprofit foundation. Although this procedure adds to the overall administrative costs of an innovation project, timely and undisrupted disbursement of research resources may create some savings as well. In most countries, this legal construct is widely accepted.

Through Bioconnect, all actors in the organic agriculture value chain, organized by product workgroups, have decision-making authority in research funding, utilizing public funds from the Ministry of Agriculture. Early results

suggest that this model can induce more interactive and inclusive ways of working, given that the interaction of researchers and users is built into the system and is a prerequisite for obtaining funding.

Table I.3 Client Orientation and Participation in Science and Technology Funds That Are Competitive and Specific to Agriculture in Select Latin American Countries

Country and competitive fund	Client orientation and participation
<i>Brazil</i>	
PRODETAB	The fund's steering committee (mainly government), in consultation with stakeholders, formulates and prioritizes innovation needs. Private sector involvement in project development and implementation is an important criterion for funding. The selection of projects for funding is a centralized process managed by experts. Special attention is given to ensuring geographic equity.
FNDCT Agribusiness	The private sector has a majority vote on the board. A consultancy firm produced the priority-setting document. Project selection is centralized and managed by experts.
<i>Chile</i>	
Several funds managed by FIA	FIA recently initiated regional consultation of farmers and other stakeholders to formulate regional priorities. It also started to issue regional calls for proposals in addition to a national call. A few small information offices have been opened to improve FIA's regional presence. Project selection is centralized and managed by experts. Most projects, depending on their particular objective, involve farmers.
<i>Colombia</i>	
PRONATTA	PRONATTA has about 20 local nodes throughout Colombia to assemble local researchers, extension agents, farmer representatives, government officials, and other interested stakeholders. The nodes identify and prioritize local research needs and develop project profiles, which are submitted to one of five regional coordination units. Projects are selected in two stages, first by a regional panel and ultimately by a national panel (consisting of the chairs of the regional panels). In both cases, a scoring method is used. Only the highest-scoring projects are funded. PRONATTA strongly favors farmer participation in the implementation of projects.
<i>Ecuador</i>	
PROMSA	Research priorities are based on past studies and refined at a workshop, where a scoring approach is used to develop priorities in a three-way matrix of commodities, agroclimatic regions, and thematic areas. Farmers' participation in priority setting has been low. Project selection is centralized and managed by experts, but each project has a reference group consisting of direct beneficiaries (farmers) and other stakeholders (other researchers, extension staff, agribusiness, and so on). Ideally the reference group participates in project design, planning, implementation, monitoring, and evaluation.
<i>Mexico</i>	
CONAFOR/CONACYT	The forestry sector is asked to submit its research needs, which form the basis for the call for proposals. Project selection is centralized and managed by experts.
SAGARPA/CONACYT Produce Foundations	Produce Foundations, set up in all 32 states, strongly involve farmers at all levels. Farmers have a majority vote on the boards of the foundations and provide the board chair. The identification of innovation needs and selection of projects are decentralized to production chains at the state level. Farmers are required to cofinance (usually in kind) technology transfer projects. Project selection is centralized and managed by experts.

Source: World Bank 2006b.

Note: CONACYT = Consejo Nacional de Ciencia y Tecnología (National Council of Science and Technology); CONAFOR = Comisión Nacional Forestal (National Forest Commission); FIA = Fundación para la Innovación Agraria (Agricultural Innovation Foundation); FNDCT = Fundo Nacional de Desenvolvimento Científico e Tecnológico (National Fund for Scientific and Technological Development); PRODETAB = Projeto de Apoio ao Desenvolvimento de Tecnologias Agropecuárias para o Brasil (Agricultural Technology Development Project for Brazil); PROMSA = Programa de Modernización de los Servicios Agropecuarios (Agricultural Services Modernization Program); PRONATTA = Programa Nacional de Transferencia de Tecnología Agropecuaria (National Agricultural Technology Transfer Program); and SAGARPA = Secretaría de Agricultura, Ganadería, Desarrollo Rural, Pesca y Alimentación (Ministry of Agriculture, Livestock, Rural Development, Fisheries, and Food).

Bioconnect is a new type of research “council” for organic agriculture, one that is able to induce an inclusive way of working.

Supportive government policy. To support knowledge development and exchange in organic agriculture, the government allocates the subsector 10 percent of its budget for policy support research and statutory research tasks (€9.6 million in 2008). In 2005, the government delegated responsibility for setting the research agenda for organic agriculture to stakeholders by creating Bioconnect. The goal is to determine whether delegating research governance to networks in which users allocate research funding can work for other areas of publicly funded, applied agricultural research. Farmer-driven research planning exists in the Netherlands but has not always forged broader linkages within the innovation system.

Bioconnect. Through product workgroups (dairy, glass house horticulture, and so on), the users of research (farmers, agrifood supply and processing companies, civic advocacy organizations representing consumers) unite with researchers, consultants, and policy makers to determine how to use public research funding. Working within themes established by the government, workgroups propose topics based on broad demand among their constituencies. They discuss and prioritize the topics with research coordinators to align research with sector needs. Research is contracted on the basis of proposals, which are selected through a review by the users and funding body and not solely through peer reviews of scientific merit. Bioconnect facilitates the participatory research arising from the priority setting and links it to legislative and

market developments in an effort to ensure that research innovations have an impact.

A *knowledge manager* is the group’s facilitator, streamlining information flows and mediating between actor groups. A *theme coordinator* informs researchers about workgroup results to ensure that proposals correspond to government funding guidelines. The knowledge managers embody the management of the network; a Knowledge Committee oversees the broad research themes and seeks to maintain consistency throughout the program.

Early results and challenges. Despite the reluctance of some researchers, the model does initiate learning about more interactive ways of working. Similarly, despite their strong commitment to users’ interests, delegation systems also allow government to determine the macro priorities within which users can maneuver. As an intermediary in all aspects of the research process, from priority setting to disseminating results, Bioconnect occupies a pivotal but neutral position—one that is not easy to maintain. The position of such an intermediary depends on whether it promotes institutional learning with regard to the new roles of the actors involved and helps their goals to converge. Bioconnect must constantly balance the interests and gain the trust of the range of stakeholders for whom it mediates and on whom it depends for its resources (social and operating capital). As part of this balancing act, Bioconnect has to convince research contractors of the value of setting research priorities through a single, multiactor platform; balance the strategic interests of the research contractors; and urge government to achieve cohesion across ministry directorates with respect to budgets, macro priorities, and processes for monitoring the network.

Source: Klerkx, Hall, and Leeuwis 2009; Klerkx and Leeuwis 2008.