

Competitive Funding of Agricultural Research in the World Bank: Lessons and Challenges

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Introduction

Competitive funding has emerged in the late 1990s as an important component of World Bank support to agricultural research systems. This paper outlines the role of competitive funding against a back ground of changing strategies for financing agricultural research. The bulk of the paper is devoted to a synthesis of lessons learned, and ongoing challenges in successful use of competitive funding. The paper concludes that competitive funding can be an important mechanism for financing agricultural research and stimulating institutional reform. However, it should complement but not substitute sustained long-term core funding of public research organizations.

The World Bank and Agricultural Research

Investment by both governments and donors in agricultural research in developing countries grew rapidly from about 1970. However, since 1985 there has been a sharp drop in public funding in many countries, especially in Latin America and Africa. Meanwhile, the size of research systems, measured by the number of scientists, continued to expand, resulting in reduced expenditures per scientist and a critical shortage of operating funds for research. This acute scarcity of public funding for research combined with the poor performance of many national agricultural research institutes (NARIs) has led to a search for new paradigms for funding and execution of research in the 1990s (McMahon, 1992; Byerlee and Alex, 1998).

Since 1980 agricultural research has been considered a priority in the Bank's lending portfolio. At a time of overall reduced support for agricultural and rural development, the share of Bank lending for research has increased. Over the past 20 years, it has provided over US\$ 5 billion to agricultural research in about 100 countries. In recent years, annual commitments have averaged about \$450 million (Figure 1). The Bank's lending for agricultural research now accounts for a large share of all external support for agricultural research in developing countries. Many countries have had sequential agricultural research projects: in some cases, the Bank has supported agricultural research continuously for 15 years or longer.

Africa, Latin America, and East and South Asia each account for 25 percent or more of the total funding. Europe and Central Asia (ECA) and West Asia/North Africa have received only about 5 percent of total lending for agricultural research, although activity in ECA has recently increased (Table 1). Over the past two decades, there has been a major geographical shift in the share of lending from Latin America and East Asia to Africa and South Asia (Table 1), although lending to Latin America again jumped sharply in the late 1990s.

Table 1. Regional shares of World Bank loans for agricultural research (percent) ^a

Region	1981-84	1993-96	1997-99
South Asia	15	27	16
Southeast and East Asia	39	9	12
West Asia/North Africa and Europe/Central Asia	4	6	1
Latin America	36	8	27
Africa	6	50	42
Total	100	100	100

^a AKIS data files, World Bank

The focus of World Bank support to agricultural research has evolved over time. The emphasis in these projects can be broadly classified into three periods:

1. A period of expansion up to the early 1980s—the “bricks and mortars” phase—when the main emphasis was on increasing the size of public-sector research organizations through investment in experiment station and laboratory infrastructure, equipment, and human resource development.
2. A period of transition from the mid 1980s when more emphasis was placed on improving the *management* of existing research resources in the *public-sector research institutes* through better planning, improved financial management, greater accountability, and attention to increasing the relevance of the research program to its immediate clients, the farmers. However, as in the first period, most resources in project loans for agricultural research were provided for further expansion and rehabilitation of research infrastructure.
3. The period from the mid 1990s, when Bank projects began to emphasize measures to enhance the *institutional sustainability* of agricultural *research systems*, defined to include not only the governmental national agricultural research institutes (the NARIs) targeted earlier, but also universities, the private sector, research foundations, and some rural-based nongovernmental organizations (NGOs). In this period, there has been little emphasis on system expansion: in many cases the Bank has supported downsizing and consolidation of public research institutions.

Responding to recommendations from various internal reviews (Box 1), emphasis has now shifted to a focus on quality dimensions of agricultural research, especially management, incentive systems, and accountability, with conscious efforts in most cases to avoid further creation or expansion of public research organizations. The focus is now on building a more diverse NARS that incorporates a range of institutional options for conducting agricultural research and development (R&D) and a diversity of funding mechanisms that foster competition and improved articulation among the various participants in the expanded system (McMahon 1992). Lending for research also increasingly recognizes that the appropriate focus is the "agricultural knowledge system" or "innovation system," terms which explicitly recognize that extension and educational systems and user involvement are associated with effective research institutions.

Box 1: Common problems identified in reviews of World Bank support to agricultural research

- Lack of a consensus in-country on a strategic vision for public sector research institutions and the evolution of the NARS
- Ineffective national leadership for many research institutions, resulting in both internal management problems, as well as lack of political support, especially for funding research
- Continued emphasis on building NARIs, at the expense of fostering a more pluralistic system
- Difficulties in establishing institutional autonomy for research institutions to provide needed flexibility in management of financial, physical and human resources.
- Weak links between NARIs and other research providers, with clients and with technology transfer and developmental organizations
- Inadequate attention to sustainability—both financial and institutional—of research organizations, and
- Weak monitoring and evaluation systems for both research programs and assessing institutional changes.

Current Status of Competitive Funding in Bank Lending

Against this background of mixed success in supporting agricultural research, competitive funding offers a number of attractions in Bank lending support for research. Beginning in the mid-1990s, the use of competitive funding expanded rapidly within the research lending portfolio. Objectives for using competitive funding mechanisms have varied from project to project but usually include one or more of the following:

- To foster institutional pluralism by funding research providers, other than NARIs, such as universities, private firms, and NGOs.
- To provide much needed operating costs to better utilize the substantial investment in scientists and research infrastructure.
- To foster partnerships among research providers, by requiring that proposals be jointly prepared and executed.
- To promote reform of NARIs, by requiring them to compete for funding.
- To upgrade quality of research effort through rigorous screening of research proposals and monitoring of implementation.
- To promote a more demand-driven agenda by requiring that users and beneficiaries participate in proposal preparation and execution.
- To quickly address new and important research priorities, and,
- To attract new sources of funding through establishment of research funds set up on a competitive basis.

At present, the Bank provides significant support to agricultural research in 30 ongoing lending programs totaling nearly \$2 billion. Some 19 of these projects include, or have plans to include, a competitive funding component. In aggregate, total support through competitive funding amounts to about \$60 million per year.

However, the use of competitive funding varies substantially by region. It is most advanced in Latin America, where some projects now have up to five years of experience in using competitive funding, and several projects are largely based on competitive funding. Competitive funding is also beginning to be widely used in East Europe and Central Asia (ECA) as the main mechanism to support reform of research systems, although experience is still in its infancy. In other regions, competitive funding is usually only a small component of the total project loan.

These regional differences are very evident in Figure 2. In Latin America and ECA, 45% of support for agricultural research is channeled through competitive funding, compared to only 5% in other regions. The differences reflect the varying levels of infrastructural and human resources development, as well as the availability of a range of potential research suppliers. Latin America has also generally been a leader in implementing reforms to increase competitiveness and performance of the public sector.

The orientation and focus of the competitive funds also vary significantly from country to country and region to region. Many of the earlier funds were largely oriented to funding research in universities, especially somewhat more basic research. More recently established funds, especially in Latin America and ECA, have had a strong orientation toward applied and adaptive research, where funds flow directly to users, who may then contract an appropriate research provider. There has also been a growing trend toward the establishment of ‘technology funds’, which finance both research and extension activities.

Finally there have been important variations in the institutional framework within which the fund is established. In one model (Figure 3a), most widely used in Latin America and ECA, funding of research is divorced from research execution. Funds are administered by an apex board or research council established as part of the project in order to administer the funds, or sometimes by an ad hoc arrangement such as a project management unit. The challenge for this model is to find a sustainable “institutional home” for the fund. In the second model (Figure 3b), most widely used in Africa, the fund is connected to the NARI, although usually with some independence in terms of governance and screening of proposals. This model has the disadvantage of giving an appearance of conflict of interest (the NARI that administers the fund also receives funds), but avoids the establishment of new institutional structures. It is still too early to evaluate the relative success of these models, and in any event, success often depends on specific details on how the fund is established, rather than its ultimate institutional home.

Emerging Lessons for Success

The past five years of supporting competitive funding has been a learning experience both for the borrowers and the Bank. Some of the funds have now been operating for several years, and lessons are now emerging on key ingredients for their success. These can be summarized as follows;

1. *Ensure broad-based and independent governance:* Competitive research funds (CGFs) should be governed by an umbrella council or board or steering committee with strong private and non-governmental participation. The selection of competent and committed initial members of this council is critical. Members should be selected on the basis of outstanding professional skills and experience rather than on the

organizations or sectors that they represent. Orientation workshops and study tours can allow council or board members to see how established funds operate in other countries.

2. *Develop very specific priorities:* It is essential to identify specific priorities for initial funding to avoid a very dispersed portfolio. These priorities should be based on a combination of 'top down' versus 'bottom up' approaches (see below). Specific priorities also avoid the problem of receiving a large number of proposals on a wide range of topics that are costly to evaluate.
3. *Be pro-active in the development of proposals:* In order to ensure good quality proposals that address high priority farmer problems, considerable resources should be invested up front in capacity building in onfarm diagnosis, problem definition, socio-economic evaluation of potential solutions, and development of proposals. This may include workshops, field exercises and establishment of local networks with farmer organizations and extension.
4. *Implement rigorous and transparent review procedures from the start:* It is critical to establish rigorous standards and review mechanisms right from the beginning. An objective and anonymous panel of peer reviewers should be appointed to screen proposals against a set of criteria. Introduction of a CGF system should be accompanied by a detailed manual and appropriate training programs on procedures for soliciting, preparing and evaluating proposals, criteria for selecting proposals, and guidelines for monitoring and evaluation (see George, 2000).
5. *Start small and internalize initial experiences:* Even with the most careful planning, establishing a CGF is very much learning on the job. After one or two rounds, the CGF should be able to operate at full capacity. The approval rate should be low for the first rounds to ensure rigor and to allow the program to build experience.
6. *Establish ceiling on awards to a single institution:* In small- and medium-sized countries, there is often a single institution that may dominate CGF awards. In order to encourage participation of others, a provision should be included that no more than one half (or two thirds) of the proposals can be awarded to a single institution.
7. *Be explicit about plans for technology transfer:* For applied and adaptive research, proposals should specifically request the identification of the target farm population and plans for technology transfer, and this should be included as a criteria for evaluating proposals.
8. *Design and implement monitoring and evaluation (M&E) from the beginning.* Monitoring and evaluation need to be established not only to track progress and impacts of individual project that are funded, but also to track progress in reaching institutional development objectives of the fund. Given objectives for establishing the fund, criteria need to be agreed for assessing overall performance prior to implementation, and data collection initiated from the beginning.

Major Challenges and Tensions

While much has been learned, there are also a number of continuing challenges and tensions inherent in establishing an effective fund.

Local ownership versus political independence

A recurring theme is the tension between providing the fund maximum protection from political interference in order to ensure rigor and transparency in allocating funds, and developing local ownership in the political process to ensure sustainable public funding. Governments who finance competitive funds rightly need to ensure that funds are productively and efficiently used to address national priorities. However, they also have to understand that once priorities are set—a political process—the choice of the most efficient research provider is a technical decision, that should be divorced from the political process. At the same time, managers of competitive funds must recognize that government ministries are accountable to the funds that they provide, and fund managers must be willing and able to show how funds are addressing national priorities in an effective manner.

Balancing competitive funding and block grants

Some enthusiasts for competitive funding, both within the Bank and within borrowing countries, have seen competitive funding as the panacea for the deficiencies that so often plague public research organizations. Rather than seeing competitive funding as complementary to core funding, they would like to see all or most public financing pass through competitive mechanisms. Experience in Bank projects and in industrialized countries, suggests that competitive funding should be seen as a complement, rather than the main means for funding research. Many core research activities require long-term sustained support, that is difficult to provide through competitive funding (Echeverria, 1998). Core funding also facilitates the development of integrated research programs to address major problems, commodity needs, or geographical areas. Finally, for many core research activities, such as plant breeding, there is often only one research provider, so that competition for funding is not possible.

One compromise that is now being used (e.g., Australia and Senegal) is to move core funding to negotiated contracts, where the funding agency contracts with a specific research provider to produce agreed research products. This system embrace some of the strength of competitive funding by focussing on results and enhancing accountability.

Bottom-up versus national priorities

Several programs have moved toward very demand-driven and open approaches to soliciting proposals through farmer organizations and user groups. This creates two difficulties. First, there is a tendency to arrive at very dispersed research effort—both thematically and geographically—made up of independent projects that do not exploit potential complementarities. Second, there is no guarantee that national priorities and strategic objectives will be addressed by such an approach and important technological or market opportunities may be missed because of lack of information about the supply side. Also farmers, especially when they are cofinancing the activity, understandably tend to focus on activities with short-term payoffs, at the expense of needed long-term research, or research aimed at reducing negative external environmental effects.

There is therefore a good case for setting specific priorities based on national priorities and strategies and then requesting proposals based on bottom-up approaches (i.e., involving users). The setting of priorities will of course, lead to some tension between

demands being expressed from below, and national and regional priorities set from above. The challenge is to set priorities firmly enough to limit the scope of the competitive funding (and the number of proposals submitted), and at the same time allow for innovative demand-driven proposals.

Other mechanisms have been used to reduce fragmentation and arrive at a more integrated portfolio, including;

1. Work at the grass roots level to develop a coherent set of proposals through networks and workshops, prior to proposal submission. The networks can also be employed to enhance quality through prescreening exercises (e.g., Colombia).
2. Decentralize proposal screening to the regional level to enable regional bodies to set priorities relevant to their regions (e.g., Colombia).
3. Fund larger more integrated project that give special priority to collaboration among two or more complementary organizations, e.g. a research organization and an NGO with a good farmer base (e.g., Brazil).
4. Request that technical screening panels be pro-active in requesting changes to proposals that enhance their integration and complementarity with other selected proposals.

The small country problem

Competitive funding has proven to be more difficult to implement in small countries where there is a relatively small pool of scientists and a very few research providers. Problems arise because of the difficulty of ensuring objective peer review, and in receiving quality proposals, especially when priorities are tightly defined. Some programs have moved toward using international peer review, although this depends on either having a widely used language (e.g., French, Arabic, Spanish or English), or entails considerable costs of translating proposals. The relevance of competitive funding for small countries is still very much an open question.

Cost effectiveness

Overhead costs of administering the fund vary widely in Bank projects from about 3% to over 20%, against an international norm of about 5%. The high costs of some funds, reflect in part the start up costs as well as significant expenditures on institutional development to ensure quality proposals. Some funds are also largely staffed by contracted staff, recruited at competitive salaries. While there is clearly a need to ensure high quality staff, the sustainability of this strategy is open to question.

One area where competitive funding tends to be high cost is in monitoring and evaluation. The geographic dispersion and disciplinary fragmentation of some program portfolios greatly adds to the cost of onsite visits. Also impact evaluation is complicated by the relatively high cost of detailed field evaluation relative to the size of individual projects. This is being addressed in some programs through funding of larger multi-component projects, as well as through conducting impact evaluation jointly for a set of projects, grouped by theme or geographic area.

Sustainability

Last but not least is the issue of sustainability—both institutional and financial. Institutional sustainability relates to the need to find a stable well managed and governed “institutional home” that will guarantee its integrity and political independence, provide for continue high quality technical review and efficient fund management, and at the same time be responsive to key stakeholders, especially users. This is a tall order, especially given the often disappointing record of public research organizations in the recent past.

Institutional sustainability is a prerequisite for financial sustainability. At present, most funds are largely being financed from Bank loans and government grants, but it is clear that over the longer run, sustainability will require “buy in” from other potential funders, both public and private.

The experience in Bank-supported programs is still too short to evaluate longer run sustainability. However, it is clear, that a sustained effort will be required over many years to build a suitable institutional home, and seek diversified stable funding sources. The recent move toward adjustable program lending in several phases over a 10-15 year period is an important step in this direction.

Conclusions

Competitive grant funds (CGFs) have become popular in recent years in many NARSs, in part due to popularity among donors, including the World Bank. However, CGFs should not be the sole or even main mechanism for funding, but should be used to complement core funds from regular budget appropriations. Long-term research requiring continuity and integration, as well as the building and maintenance of research infrastructure are best funded through annual budget appropriations.

In countries with under-used research capacity, CGFs can be an efficient means for financing research, especially new research areas, demand-driven research reflecting user perspectives, and research and development that requires collaboration, such as public-private partnerships. They are most appropriate in mature and larger NARSs seeking to widen participation in the research process and provide incentives for increasing productivity. In small NARSs (less than 100 scientists), the high administrative costs and limited potential for competition reduces their value.

Management of a CGF scheme must have maximum flexibility and independence from political and bureaucratic interference. However CGF programs may become less effective over time, if research infrastructure (both human and physical) depreciates and if grant managers and recipients become “entrenched” so that the programs are less competitive.

Experience to date suggests that CGFs should be introduced on a pilot basis to fund selected priority areas, and then be evaluated for effectiveness to guide any expansion of the program and to refine procedures and institutional arrangements. More work is needed to define appropriate performance indicators for different types of funds, and more time will be needed to undertake a more indepth evaluation of experiences to date and to build long-term institutional and financial sustainability.

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Figure 1: Trends in World Bank Lending to Agricultural Research

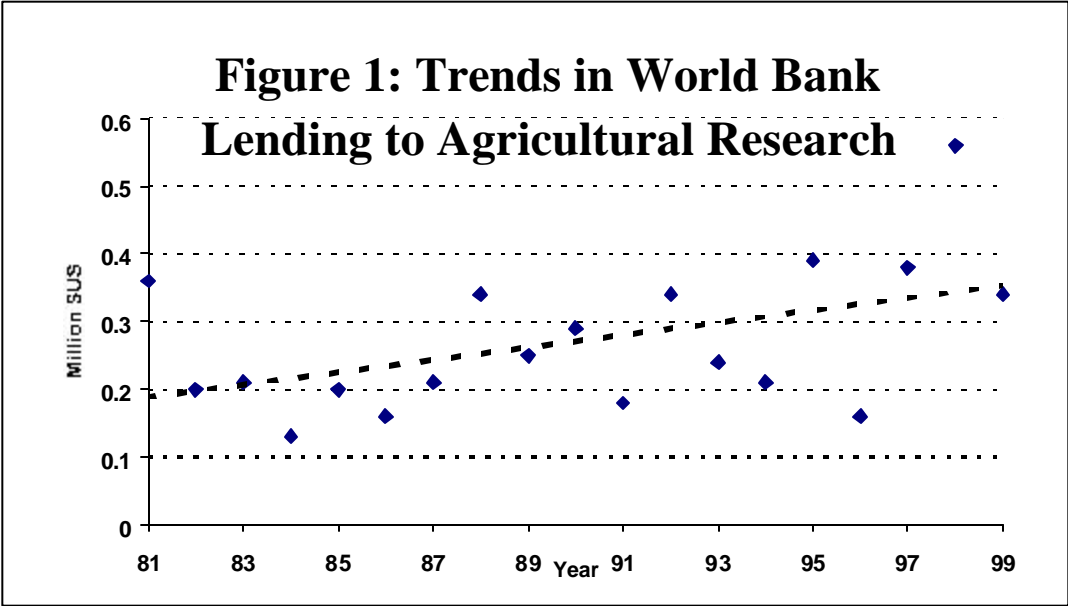


Figure 2: Support to Agricultural Research in the World Bank Portfolio

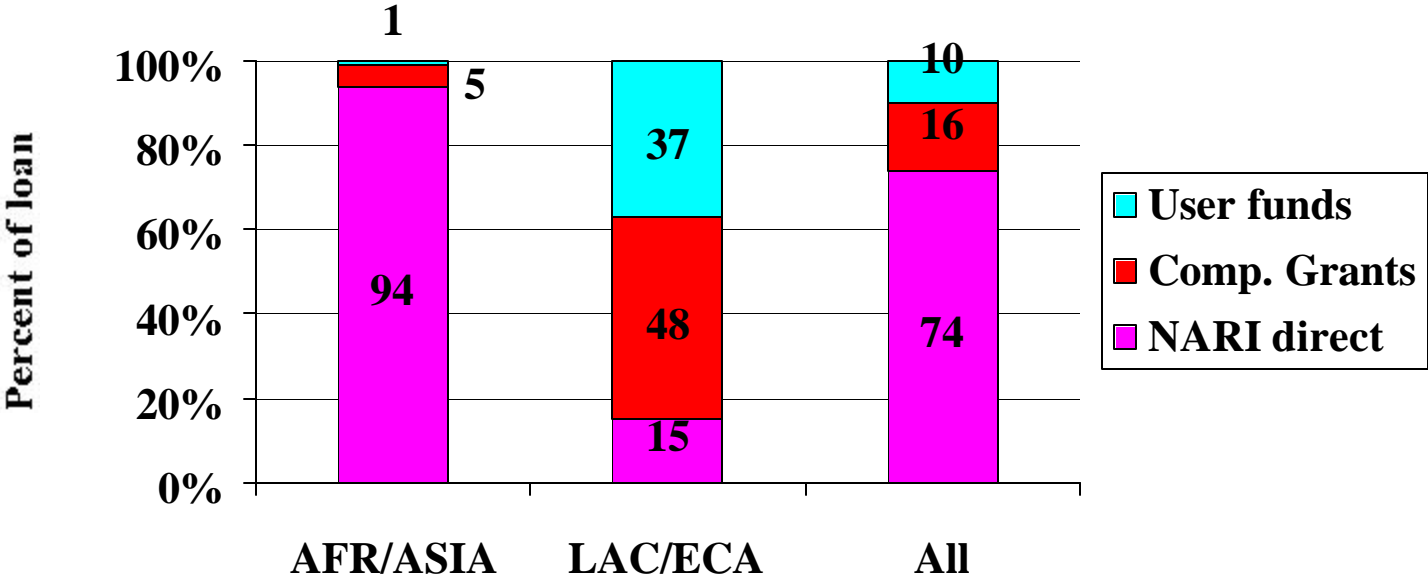


Figure 3a: Competitive Funding with Separation of Funding and Execution of Research

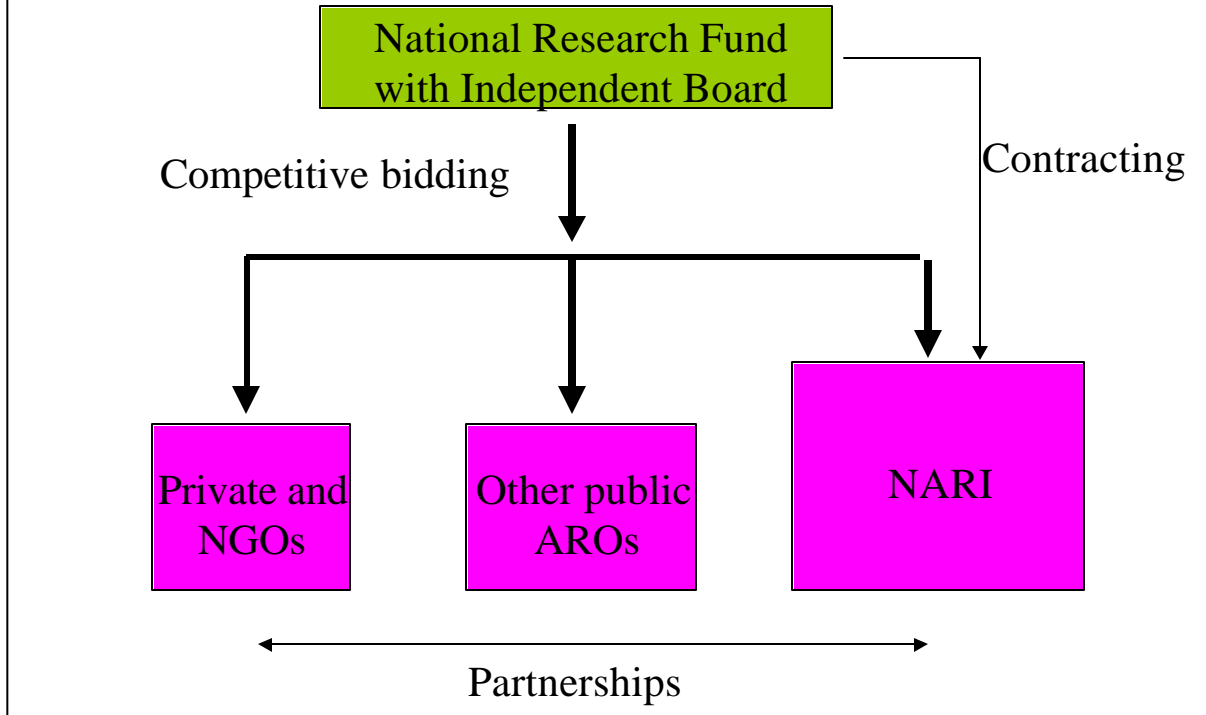


Figure 3b: Competitive Funding Attached to the NARI

