



The material that follows has been provided by the [Overseas Development Institute](#)

Competitive Agricultural Technology Funds in Developing Countries

Gerard J. Gill and Diana Carney

Dissatisfaction with traditional mechanisms of funding agricultural research and dissemination (AR&D) in developing countries has led to the introduction of competitive agricultural technology funds (CATFs) in an increasing number of them. This model is now favoured by many donors, despite the fact that available information on its modalities and performance has been fragmentary. This paper reviews experience with ten such funds in very different national and institutional settings.

Policy conclusions

- Where there is sufficient AR&D capacity in-country to constitute an effective market, a competitive fund can stimulate competition and enhance efficiency. Where there is not, it is better for donors to concentrate on building up this capacity through institutional development across all sectors, not just in the public sector as in the past.
- Among smaller countries where this is impracticable an alternative worth investigating is the regional fund.
- Funds work best where government leads the institutional reform initiative, has a clear vision of priorities and is willing to put the necessary mechanisms and modalities in place.
- The best 'home' for a CATF is in an independent institution which does not bid for projects. Locating a fund within a traditional public sector AR&D institute minimises success prospects.
- Competitive funds are more expensive to administer than block grants, and the smaller the fund the higher the proportion of costs needed for quality administration. In the interests of setting up a pluralistic national system, funds should pay the overheads and staff costs of those from outside the public sector.
- Monitoring and evaluation should focus on impact on intended beneficiaries. There is as much to be learned from studying failure as from studying success.
- When setting up a fund, every effort should be made to draw on the 30 years of experience of developing this model in Latin America, including the adaptation of modalities, mechanisms, guidelines and pro formas.

- The governing body should be high profile, pluralistic and with no majority from any one stakeholder. Priorities should be set by this body in line with national policy priorities.
- Where there is commitment to institutionalised reform it may be appropriate to establish an endowment based on debt conversion, provided the government is prepared to make a significant contribution in local currency.

Introduction

Agricultural research and delivery systems have performed disappointingly in the least developed countries, particularly those of sub-Saharan Africa. In some developing countries in Asia and Latin America there has been a degree of success, especially in adapting ‘green revolution’ technology from centres under the umbrella of the Consultative Group for International Agricultural Research (CGIAR), and popularising it in agriculturally-favoured areas (i.e. those with favourable production potential and reasonably good market access). But even in these countries little has been achieved in risk-prone environments (i.e. those which rely on rainfed crops, have harsh environments with uncertain rainfall, and poor physical and social infrastructure), and little has been done to address problems that impact directly on disadvantaged farming communities.

Even public sector agricultural research and development institutions that were once relatively successful are failing to adapt to new demands, constraints and challenges (Echeverría et al., 1996). These include: declining levels of domestic and donor support for agriculture, economic liberalisation, structural adjustment and globalisation. A fundamental problem is that AR&D institutions are typically funded by block grants whose renewal is seldom linked to performance or impact. Without such a linkage, there tends to be:

- lack of client orientation;
- lack of prioritisation in line with national policy objectives;
- failure to allocate scarce resources efficiently;
- political interference in governance and management;
- lack of transparency and professionalism in project selection, management and evaluation;
- bureaucracy and over-centralisation.

Competitive agricultural technology funds

Efforts have been made in recent years to revitalise AR&D by relating funding more closely to performance. The establishment of competitive agricultural technology funds found increasing favour in this context, with both donor agencies and some national governments.

The model has been used to fund scientific research in developed countries for many decades, and for at least 30 years in Latin America. The fund is a pool of money designed to support the development of agricultural technology. When it is established a set of rules guiding its use, management and accountability arrangements are put in place in support of its objectives. The CATF can cover

research, technology delivery and uptake processes. There is advance identification of priority areas in which activities will be supported. The availability of funds in the agreed thematic areas is then widely advertised, and proposals are solicited. The key is open competition to work on sections of an agreed agenda for the development and delivery of agricultural technology.

Objectives

Specific objectives of the different funds vary, but Kampen (1997) has identified a number of aims that are common to many competitive agricultural research funds (Box 1).

Box 1 Ideotype of a CATF

- Autonomous or semi-autonomous status in relation to all stakeholders.
- Priority areas clearly derived from national policy priorities.
- Requirement of evidence that the proposed research is demand-driven.
- A set of rules that encourages the widest possible participation in the scheme.
- Wide advertisement of the programme and of conditions for application.
- Peer review procedures that are clear, transparent, professional and anonymous.
- A financial and administrative review process that balances priority and quality with cost.
- Adequate financial provision.
- Integrity, independence, accountability and quality of management.
- Non-intrusive monitoring of progress by competent reviewers, and institutionalised evaluation and impact assessment.

Adapted from Kampen, 1997

Some funds also have an equity focus that requires applicants to address the technological needs of the disadvantaged. Some have taken decentralisation as an objective, giving extra weight to applications from outside the major cities, the principal universities and the mainstream research organisations, with the aim of strengthening AR&D as an inclusive national system. In a recent review, Echeverría (1998) listed what are generally perceived as the advantages and disadvantages of CATFs. The major ones are listed in Box 2.

Box 2 Advantages and disadvantages of CATFs

The advantages include:

- increased effectiveness by directing resources by merit;
- increased efficiency by reducing costs, eliminating duplication, increasing accountability of research resources, and increasing utilisation of infrastructure by providing operating resources;
- closer alignment of AR&D with national research priorities;
- promotion of a demand-driven national system;

- strengthened links between research and extension organisations, agricultural production and agricultural policies;
- induced institutional change in the national innovation system;
- merit review and expert feedback.

The disadvantages include:

- lack of support for medium to long-term research agenda, human capital development or new research infrastructure;
- higher funding uncertainty;
- time required for applying, revising and reporting reduces time for research;
- low sustainability of funding when national constituency is weak and external funding sources dry up;
- in some countries there are too few potential providers to create a competitive market.

Based on Echeverría, 1998

Some commentators also detect a hidden agenda in such funds, arguing that where the public sector AR&D establishment is firmly entrenched and resistant to change, a CATF may be set up with the tacit objective of undermining the existing system by creating a parallel one that begins to produce results. The idea seems to be that when the two systems are then viewed side by side, the system that has consistently failed to deliver will either be forced to reform or will collapse.

Funding

There is an attractive hypothesis that CATFs can spur a virtuous circle of more relevant, demand-driven and cost effective AR&D and that this will in turn lead to increased sustainability of funding: once national governments, donors and the private sector are convinced that their priorities are indeed being better served through the establishment of these new funding mechanisms, they will increase their own support to the funds. However the difficulties can be great, particularly on the government side. Financial sustainability requires a strong and lasting political commitment to the idea that the public sector should retain a strategic role in AR&D, and this is often lacking, particularly in the finance ministries of countries undergoing structural adjustment.

Beginning to test this hypothesis was a major – though difficult to achieve – objective of the study reported here. At a general level, there is no compelling evidence that this virtuous circle is automatically generated by the establishment of CATFs; there are too many other difficulties that can get in the way, not least the fact that financially hard-pressed governments may accept donor-funding of CATFs as a means of reducing their own input. In any case it is almost certainly too ambitious to expect a single institutional mechanism to achieve this notoriously elusive goal.

Even if there is scope for increasing the overall productivity of the research system through the establishment of CATFs, there remains the problem of where the funding is to come from. In Asia and Latin America some funds are financed entirely from

domestic sources, so the answer is clear. At the other extreme, in sub-Saharan Africa bilateral donors and development banks have been amongst the major proponents of the competitive fund model, and have provided almost all the finance.

An approach with many proponents is that of drawing funds for the CATF from within the sector either through a tax on agricultural production (the cess) or through voluntary contributions ('checkoffs') (Gilles, 1997). A problem common to both is that the poorer the country and the more subsistence-oriented its agriculture, the less scope there is for raising revenue in this way. Nor can the least developed countries easily fund AR&D from general taxation because of their generally low domestic tax base. The cost of establishing and maintaining funds of the required size is high, and even if their introduction does succeed in raising cost-effectiveness, the benefits may not materialise in a form that generates either tax revenue, or revenue from producers' associations that can be ploughed back. This is especially true of funds with a strong focus on the problems of the most disadvantaged.

Continued donor funding is needed in poorer countries, but this too tends to be unreliable except within short-term horizons. Endowments are a further option, in which interest generated from an investment finances the fund (Weatherly, 1996). However, the initial investment must be large and few donor agencies are prepared to make such a commitment; many are prohibited by their own statutes from doing so. If these difficulties can be overcome, debt conversion could be used to endow a fund, but it would be important for the host government to demonstrate commitment by contributing some collateral investment (Dunn, 1997).

The case studies

The case study funds are listed in Box 3.

Box 3 The case study funds

- Africa Regional: ATTF/ASARECA: The Agricultural Technology Transfer Fund (ATTF) of the Association for Strengthening Agricultural Research in East and Central Africa (est. 1994 to support transfer of agricultural technologies; entirely funded by World Bank and USAID) (Sam Chema).
- Chile FONDECYT: Fondo Nacional de Desarrollo Científico y Tecnológico (The National Fund for Scientific and Technological Development) under Chile's National Commission for Scientific and Technological Research (est. 1981 under government science and technology development programme; 100 per cent government funded) (Julio Berdegue and German Escobar).
- Chile FONDEF: Fondo de Fomento del Desarrollo Científico y Tecnológico (Fund for the Promotion of Scientific and Technological Development) under Chile's National Commission for Scientific and Technological Research (est. 1991 with loan from Inter-American Development Bank, but majority (72 per cent) local contribution) (Julio Berdegue and German Escobar).
- Colombia PRONATTA: Programa Nacional de Transferencia de Tecnología Agropecuaria) (National Programme for the Transfer of Agricultural Technology) of the Ministry of Agriculture and Rural Development (est. 1989 as part of government's decentralisation programme; funded by World Bank

loan with government counterpart co-financing) (Julio Berdegue and German Escobar).

- India AHRS: The Ad hoc Research Scheme under the Agricultural Produce Cess Fund of the Indian Council of Agricultural Research (Cess est. 1940, scheme est. 1966 to fund basic and applied research in agriculture; 100 per cent funded by cess (tax) on agricultural produce) (Suresh Pal).
- India VBKVK: Agricultural Research Fund of the Vidya Bhavan Krishi Vigyan Kendra (Agricultural Science Centre) of Udaipur, Rajasthan State, India (est. 1995 with Ford Foundation support; no local contribution) (Suresh Pal).
- Kenya ARF: The Agricultural Research Fund managed by the Kenya Agricultural Research Institute (est. 1990 on initiative of national researchers: funded by DFID and USAID grants and IDA loans) (Sam Chema).
- Mali IER: Fund under the Institut d'Economie Rurale of the Comité National de Recherche Agricole (National Committee on Agricultural Research) (est. 1994 by World Bank and CNRA; World Bank funded) (Annie Dufaut).
- Senegal NRBAR: Fund under the Natural Resource Based Agricultural Research Programme of the Institut Sénégalais de Recherche Agricole (Senegal Institute for Agricultural Research) (est. 1991 by USAID and ISRA; USAID funded; local contribution in-kind only) (Annie Dufaut).
- Tanzania NARF: National Agricultural Research Fund of the Department of Research and Development, Ministry of Agriculture and Co-operatives (est. 1993; funded by loans from IDA and African Development Bank) (Sam Chema).

Note: The names of the case study authors are given in italics. The case studies are not individually published but can be viewed at two websites:

www.rimisp.cl/odiprinc.html and www.odi.org.uk/rpeg/compotech.html

They were chosen to provide: (a) geographic spread; (b) examples of both long established and relatively new funds; (c) examples of national, sub-national and regional funds; (d) examples from the technology development and technology transfer ends of the spectrum; and (e) examples of funds with and without donor involvement. The case study countries also represent wide diversity with respect to a number of development-related variables. A common framework of analysis was used throughout in order to maximise scope for comparison between the different funds. Greater detail can be obtained in Gill and Carney, (1999).

Evidence

The CATF promises a ready mechanism to make AR&D more efficient, effective, relevant and accountable. However the case studies suggest that fund performance, especially in the least developed countries, has in many cases been disappointing. Governments or donors wishing to set up a CATF should take the following considerations into account.

Competitive and collateral elements

When funds are established, two separate sets of characteristics are often confused.

The mere fact that researchers have to compete for funding implies certain benefits, at least in theory, including mechanisms for prioritising proposals most consistent with the fund's objectives.

Collateral objectives are not derived from the element of competition, but when included tend to make it more effective. They include improving the adequacy and dependability of funding, drawing upon the comparative advantage of a wide range of institutions, achieving greater synergy by enhancing networking and teamwork, and improving management structures by making them more decentralised, flexible, accountable and transparent. Other collateral objectives will make the end product more relevant and problem-oriented.

The Latin American case studies show that it is possible to have competitive mechanisms without any of the above collateral objectives. The latter can be achieved only if they are put into operation through appropriate eligibility, screening and prioritisation criteria, and if appropriate management procedures are followed throughout.

The context of a national system

Defining the CATF to include both competitive and collateral objectives implies that the grant-making process must be thrown open to competition from those outside the core public sector institute(s). Competition must not be blunted by eligibility and screening criteria that impose *de facto* entry barriers. Even broadly defined, however, CATFs can only ever be a component of the system. Many funds seem to have been established on the implicit assumption that other components such as appropriate skills, equipment and infrastructure were already in place. Where these have deteriorated or are outdated, they have to be regenerated before CATFs can function fully.

Management efficiency

Inadequate staffing levels, the prevalence of part-timers among senior staff, time-consuming procedures and inadequate training have been major management headaches in most of the smaller funds. Inadequate access to modern communications methods is found even in otherwise well-managed funds. Even the most efficient funds can have difficulty in handling changes in project specifications and in responding to changing circumstances. Reliance on volunteer inputs for functions such as pre-screening, peer review and proposal evaluation in countries where professional salaries are very low often leads to serious processing delays. A related issue is confidentiality in relation to the above processes, especially in small countries. There are clear diseconomies of scale in management and administration: while funds in the larger countries cost 5–6 per cent to manage, some of the smaller ones cost 36–43 per cent. Most funds advertise the availability of their grants openly and widely. Where this is not the case, examination of the distribution of awards supports suggestions that restrictive practices are in operation.

Monitoring and evaluation of funds concentrates on financial aspects. Technical evaluations tend to look only at task completion, not impact on intended beneficiaries. It is very rare for technical progress reports to be rejected or returned for amendment, and no case was identified of a project being terminated for poor technical performance.

Smooth inflow of resources to the funds has not always been matched by an equally smooth outflow to grantees. The reasons are over-centralised financial management systems, processing delays attributable to under-staffing, awardees' failure (in the eyes of fund managers) to properly account for advances and extreme caution in disbursement, fed by fear of fraud.

The provision of clear guidelines at all points in the project cycle is widely appreciated and where there is a well thought-out pro-forma, grantees do not seem to find application and reporting requirements unduly burdensome. In this as other respects, more attention needs to be paid to learning from the experience of already established funds, especially, for instance, from Latin America's lengthy experience.

Quality and relevance

The governing bodies of CATFs are usually public sector dominated. Where there is provision for a pluralistic board some positions allocated outside the public sector often remain unfilled, or participation in meetings is low, suggesting perceived inability to influence decisions. Priorities emerging from such boards are not likely to be balanced. Nor, however, can priority setting be left to scientists alone.

Most funds urge beneficiary participation in proposal preparation, but firm evidence of this is rarely required. Scoping grants are not used in any case study fund. A number of funds require a cash contribution in order to demonstrate demand drive and hence relevance, but this tends to exclude the poor. Farmers were rarely involved in the initiation phase, and even more rarely at subsequent stages. Where commercialisation is a fund objective, 'demand drive' has to come from consumers, at least as much as farmers. A sensible balance must be struck between the views and interests of all stakeholders, the precise nature of which will depend on individual circumstances and the objectives of the fund.

Case study funds with an equity focus have been more successful at addressing poverty issues than gender issues. They have probably been least successful in addressing the problems of groups disadvantaged on ethnic grounds. One reason appears to be inadequate training and sensitisation amongst those awarded grants. The case study funds which focus on the strategic end of the research spectrum do not directly concern themselves with equity issues, but if the work they support ultimately lowers the price of food or significantly affects employment opportunities, it is of great relevance to the disadvantaged. However no evidence of this indirect impact was uncovered in the case studies.

Decentralisation is an area in which there may be a trade-off between quality and relevance: it has been resisted in one case study fund because it was felt that it would compromise quality, it was promoted in another because of a belief that it would increase relevance. The case studies clearly show that where networking is a specified aim of a fund, there tends to be a relatively high level of inter-disciplinarity and institutional complementarity, and a relatively wide range of activities within the research-to-delivery spectrum, but there is little public-commercial sector networking. Where this exists there is important synergy. Most funds can provide a maximum of three years funding, which distorts the portfolio towards short-term issues, regardless of relevance to the country's needs and priorities.

Financial sustainability

The case study funds which have a wide basis of support tend to be found in countries that have a tradition of reasonably successful research and extension and a supportive legal and financial framework. In these same countries the national authorities, rather than donor agencies, have tended to take the lead in establishing the fund, indicating an underlying level of experience and self confidence. Funds that have their origins in national initiatives also tend to be carefully targeted.

Many of the newer funds exhibit a certain similarity of objectives. As these are much in keeping with current development thinking, 'donor drive' is implied. Staff at one African research institute described CATFs as 'transient', 'donor-imposed' and 'faddish', which does not augur well for the sustainability of this approach in countries where donors have taken the lead. So far, there is little evidence of donor-initiated funds being taken over by national governments.

Funds in which donors have had close involvement in establishing modalities tend to have a strong equity focus, but the funds that have best stood the test of time have no such remit. Lacking this, fund managers have been able to concentrate on serving clients who have both their own resources and the political influence to ensure that financial inflows can be sustained. Funds with a central equity focus require a great deal more effort and political commitment if they are to have any real prospect of sustainability.

References

- Dunn, E. G. (1997) 'Basic guide to using debt conversions'. Technical Paper No.44. S. D. Washington, D.C.: USAID.
- Echeverría, R. G. (1998) 'Does competitive funding improve agricultural research performance?' Draft Discussion Paper of ISNAR/IADB, September.
- Echeverría, R. G., Trigo, E. and Byerlee, D. (1996) Institutional change and effective financing of agricultural research in Latin America. Washington, D.C.: World Bank.
- Gill, G. and Carney, D. (1999) Competitive agricultural technology funds in developing countries. Research Study. London: ODI.
- Gilles, J. L. (1997) 'Checkoffs: New approaches to funding research, development and conservation programs. Technical Paper No.53. S. D. Washington, D.C.: USAID.
- Kampen, J. (1997) Financing of agricultural research: Lessons learned with agricultural research funds. (Mimeo) Washington, D.C.: World Bank.
- Weatherly, P. (1996) 'Endowments in Africa: A discussion of the issues for using alternative funding mechanisms to support agricultural and natural resource management programs'. Technical Paper No.24. S. D. Washington, D.C.: USAID.

Gerry Gill can be contacted at: gill@colloquium.co.uk
Diana Carney can be contacted at: d.carney@erols.com

Acknowledgements The authors are indebted to the DFID Natural Resources Policy Research Programme for financial support. However the views expressed here are those of the authors above.

The case studies were undertaken by: Julio A. Berdegue and German Escobar (RIMISP – International Network of Farming Systems Research Methodology, Santiago), Sam Chema (Agricultural Research Foundation, Nairobi), Annie Dufaut (Overseas Development Institute, London), and Suresh Pal (National Centre for Agricultural Economics and Policy Research, New Delhi). These case studies are not published separately, but can be viewed on RIMISP and ODI websites at: www.rimisp.cl/odiprinc.html and www.odi.org.uk/rpeg/comptech.html

Natural Resource Perspectives present accessible information on important development issues. Readers are encouraged to quote from them for their own purposes or duplicate them for colleagues but, as copyright holder, ODI requests due acknowledgement. The Editor welcomes readers' comments on this series.

Administrative Editor: Melanie Woodland
Series Editor: John Farrington



ISSN: 1356-9228
© Copyright: Overseas
Development Institute 1999

DFID Department for
International Development

This series is published with financial support from the Department for International Development (formerly the Overseas Development Administration). Opinions expressed do not necessarily reflect the views of either ODI or DFID.

Overseas Development Institute
Portland House
Stag Place
London SW1E 5DP, UK

Telephone +44 (0)171 393 1600
Fax +44 (0)171 393 1699
Email: nrp@odi.org.uk