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Putting Research into Use (RIU):

Technology Development for the Poor Farmer in Low Income Countries

By Norman Clark

The Research Into Use programme aims to help agricultural research projects put its existing stock of knowledge into practical use rather than investing in new scientific research. In doing this, it hopes to increase the reach of the scientific projects in low-income countries and set up productive, sustainable and high impact technologic development projects.

A continuous (and long running) issue in public policy debate is that of how to fund science. Whereas what private companies do in their own business (usually concerned with normal profit maximising behaviour) most industrialised countries now have enormous budgets designed to fund bodies to search for, validate and diffuse information which may (or may not) have benefit for social welfare. The argument put simply is that if the state does not do this then society as a whole will suffer. The argument is sometimes put in cultural terms but deep down the belief is ultimately connected with the potential use of new knowledge in achieving social and economic welfare

goals. Hence the enormous sums of money routinely spent on higher education, national research councils, government ministries and related organisations. Every so often, however, the sheer costs involved arouse public concern. Attempts are then made to rationalise expenditure like the UK Rothschild Commission on in-house government R&D funding (1971) or the creation of “Technology Foresight” activity run by the UK Office of Science and Technology (OST).

new knowledge. Moreover how this knowledge is subsequently used is not the responsibility of science. The scene is thereby set for a classic argument that goes back a long way, certainly to C P Snow’s “two cultures” debate which hit the headlines in the 1960s¹. Recently the issue has taken on a new dimension due to the credit crunch and the need for greater public saving. British research councils now emphasise likely “impact” as an important criterion for funding public research.

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Running through much of this discussion is reluctance on the part of scientific communities to lose decision-making autonomy. Since they, and they alone, fully understand their work’s complexity, interference by penny-pinching bureaucrats will compromise scientific quality and endanger the “seed corn” that arises from

Similar injunctions are made by higher education funding bodies in deciding how university departments should be judged in the allocation of research monies. The problem of course is that research “impact” is enormously hard to compute both *ex ante* (it takes time for the seed corn to germinate) and *ex post* (the seed corn has been combined

with many other resources and suitable “agronomy” to produce its fruit; so it hard to say how instrumental the original “seed” has really been).

Research into Use Programme (RIU)

This short article provides an illustrative example of this general issue, an example that has tried to move it on in policy terms. It concerns poverty-related economic development aid in very poor rural regions of the world, in this case Africa. In the early 2000s The UK Department for International Development (DFID) had become increasingly concerned about its research expenditure in the natural resources sector. Under its Renewable Natural Resources Research Strategy (RNRRS) it had funded, through its Central Research Department (CRD), some 1600 projects costing £220 million between 1995 and 2005, largely in UK research organisations; but it seemed impossible to demonstrate how and to what extent the resultant “knowledge” had resulted in practical low income country (LIC) development, particularly for impoverished rural communities heavily dependent on subsistence agriculture. In response the CRD decided that research targeted at development was necessary but not sufficient – what was required was additional effort aimed at putting the knowledge into use. Accordingly it launched a call for consortia whose remit was precisely to fill this gap. This took the form of a £37.5m for a programme designed to validate and promote the best innovations from previous RNRRS research.

The RIU programme was launched in July 2006². Its approach was to shift the focus of attention away from the tasks involved in the generation of new knowledge to the ways in which an existing stock of knowledge can be put to

productive use. What has distinguished it from most technology development activities is the inclusion of three characteristics. The first is its use of the idea of an *innovation system* to guide its operations³. What this has meant in practice is that successful technology development depends on a network of organisations and individuals involved in generating, modifying, and using new knowledge. Science is important but it is only one of many necessary inputs from ancillary bodies in the private and NGO sectors. Innovation, not science, is the centre of gravity.

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Secondly it was introduced as a learning programme. Unlike modern industry where the investing firm routinely accesses whatever new knowledge it needs either from its own R&D departments or outside cognate bodies, the small poor farmer has no similar option. At the same time publicly financed extension systems have ceased to be fit for comparable purpose⁴. But how can an aid agency fill the gap? This was a question that needed its own investigation. But of course “impact” cannot be identified *ex ante* for the obvious reason that the outcomes are learned through actually carrying out projects. This proved hard for a government department to manage but DFID has shown it can be done. Thirdly there are wider issues of foreign aid dependence and arguably its relative failure to create independent entrepreneurship and growth in some recipient countries⁵. So an important aspect of RIU has been to investigate how the private sector can be

leveraged into aid programmes both as a contributory player and as potential new local start-up businesses.

Best Bets

These features are illustrated by one of the RIU component activities, the Best Bets sub-programme. The inspiration for the RIU Best Bets initiative came from the successful and popular BBC television programme *Dragons’ Den*. Versions of this programme had been broadcast around the world under a variety of local names (*Money Tigers* in Japan; *Shark Tank* in the USA). The

basic concept is that would-be entrepreneurs pitch their business ideas to a panel of wealthy and successful entrepreneurs who, subject to satisfactory due diligence, invest their own money and expertise in proposals that they find convincing in return for an equity stake in the business. RIU Best Bets took the central tenets of ideas being pitched to an expert panel and rigorous due diligence, but in other significant aspects the procedure and principles varied significantly. A major difference was that the RIU Best Bets panellists would not invest their own resources; rather they make recommendations as to how RIU should invest its programme money.⁶

The objective of RIU Best Bets was to identify promising proposals to take existing agriculture research products and put these into use in ways that would benefit the poor (and others) in developing countries through partnerships in which private sector actors play a major role. The sum set aside for

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this in Africa was £5 million. Coverage would be on any aspect of agriculture in Africa - including crops, livestock, fisheries or forestry throughout the entire value chain, from production, through processing, storage and input and output markets, to consumption. In September 2009 advertisements were placed in a number of newspapers covering East, Central and Southern Africa inviting the submission of Best Bets concept notes. Applicants were asked to limit these to two pages only; they would state how much financial support they were seeking from RIU, but no limits were specified. Concept notes were required to address four criteria:

- The proposal should be grounded in rigorous research in agriculture, including fisheries and forestry
- The originators of the research should be involved in the programme in a significant way so that they would be able to apply their tacit knowledge and learning to the programme
- The proposal was expected to achieve significant development impact at scale in East and/or Central Africa (and perhaps beyond)
- The proposal should comprise a consortium of partners (e.g. academic, public sector, NGO) led by an African institution and should include a private sector partner with evidence of support, which could be financial or in-kind

By the deadline for submissions in early October 2009, RIU had received 105 concept notes⁷. These were screened in a process in which RIU was assisted by the London-based Cambridge Economic Policy Associates (CEPA) - an economic and financial policy advisory business. A short-list of 11 proposals was developed. In two cases, pairs of proposals that appeared to offer significant opportunity for synergy (an army worm forecasting system and an

army worm control technology; and two aquaculture proposals) were invited to amalgamate their proposals. The lead organisation for the short-listed proposals was asked to write a business plan following a format provided by RIU. To facilitate this, a grant of £1,500 was made available which teams used in various ways, such as to bring team members together to enable them to work jointly on their plans. Two representatives from each proposal were also supported to attend the “dragon’s den” event in Nairobi on 26th and 27th November 2009.

Most of the initial Best Bet proposals fell at an early stage simply because scientists wished to carry on practicing science (producing more seed corn!) and failed to grasp the developmental nature of the required projects.

At this event, two representatives of each of the short-listed proposals presented their idea to the independent panel drawn from leaders in the African business, finance and research and development communities. The panellists had already read the business plans. Following a ten-minute oral presentation, panellists had 20 minutes to interrogate the proposal, followed by a further 10 minutes in private to discuss the proposal among themselves. At the end of the day, the panel announced the proposals they were recommending that RIU should support. Subject to due diligence, RIU accepted these recommendations and proceeded to issuing contracts.

The money that RIU invested in the selected Best Bets was in the form of a grant since RIU’s expected return on its investment was not financial; it was to be in the form of learning. The Best Bet proposals which RIU supported would thus become part of an experiment in

enabling innovation. RIU researchers would rigorously monitor the Best Bets with a view to teasing out useful lessons; what worked well, what worked less well and why? These lessons would then form an important part of RIU output and would help shape future policy and practice to enable research to have greater impact on small-scale agricultural innovation. The Best Bet teams were also expected to work closely with RIU communication specialists and journalists to achieve wide-spread coverage of their research into use success stories.

Outcomes, Impact and Policy

What have been the broad conclusions of this venture? To begin with it quickly became evident that there were no “low hanging technological fruit” emanating from the original RNRRS projects that could easily be put into use. Instead a context had to be created within which the science could be embedded. Most of the initial Best Bet proposals fell at an early stage simply because scientists wished to carry on practicing science (producing more seed corn!) and failed to grasp the developmental nature of the required projects. But in the selected projects it became clear that scientists had a major role to play in adaptive R&D and mentorship connected to the original RNRRS projects. In the selected 9 funded best bets over 60 of the original projects were used (despite the apparent lack of low hanging fruit at the start). And so the creation of a suitable context became the key. Its characteristics in summary were:

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While it is clear that committed scientists have often played a valuable developmental role, the pattern of incentives within which they work tends to minimise the impact they could potentially make. The DFID experiment has shown a way forward.


1. In all cases the mobilisation of other linked knowledge sources proved necessary. Often these derived from NGO bodies but included government departments, local and international science bodies as well of course as the private sector itself. Indeed the projects worked best as consortia in which the different stakeholders operated as an holistic innovation system with each player contributing its own unique expertise.
2. In all cases private sector interests have played a key role, both as “product champions” and as the core activity ensuring economic continuity. Clearly economic incentives have an important role in ensuring longer-term sustainability and in some cases markets for established firms have expanded as new outlets have been created. In addition there have been a range of new small businesses created as a result of RIU interventions and there are indications that new forms of financial support will be forthcoming from venture capital sources.
3. The evidence has confirmed the generally held view that formal national government- led extension systems need to be modified (if not replaced) and it became clear that the private sector should now play a much greater role in this respect. In this way it should help to improve the pace and impact of technology development for the rural poor.
4. In many cases RIU Best Bet projects have helped to mobilise national capacities, particularly in universities. This is important in the light of frequent criticisms of Higher Education [HE] sector viability in Africa and the need to encourage local innovation.
5. In all cases RIU project funding played a necessary role in covering pre-investment costs associated with

risk and related factors. It is likely that this type of pre-competitive support will continue to be an area for necessary technology development aid.

6. The actual business of technology development was in all cases fairly complex involving applications engineering, negotiations with government regulatory bodies, accessing products through imports (in the absence of local production capacity) and dealing with the many problems that always plague new innovative ventures.

At the same time not all the projects succeeded in output and impact terms. The successful ones helped create entrepreneurship and employment. Others (still on-going) may evolve into success given more time. Yet others have clearly failed. But the DFID experiment has learned a lot. It has for example, shown that an aid agency can manage risk and catalyse technology development in the most unlikely contexts. To do so may require a lighter and imaginative managerial touch. But it will also argue for linking research more directly to production. In the case of private sector input it is also clear that it can and should make a major contribution to international technology development for the rural poor.

As for scientific communities themselves there is a strong case for going well beyond the “seed corn” model. The original RNRRS projects no doubt produced good science but results often stayed on publication shelves, raw material for more funding from research councils and related bodies. While it is clear that committed scientists have often played a valuable developmental role, the pattern of incentives within which they work tends to minimise the impact they could potentially make. The DFID experiment has

shown a way forward. Let us hope that its message will be heard. 

Complete details of the RIU may be found in Clark N, Frost A, Maudlin I, Ward A. (2013), *Technology Development Assistance for Agriculture: Putting Research into Use*, Routledge, London, April; and Gildemacher P and Mur R (2012) *Research Into Use In Sub-Sahara Africa: Programme Review Using Mixed Methods*, Royal Tropical Institute, The Netherlands. Comprehensive details of RIU may be accessed through www.researchintouse.com. Responsibility for this text remains with the author and in particular DFID takes no responsibility for the article’s content.

About the Author

Norman Clark is a development economist specialising in science and technology policy analysis in low income countries. He is Professor of Innovation Systems and Development at the Open University, UK. He acted as senior economic adviser to the DFID RIU programme between 2008 and 2012.

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7. These came from East and Southern Africa. The call then went out to West Africa; this generated 20 more proposals.