Research Into Use *sharing lessons to enable innovation in agriculture*

AFRICA MATTERS

Emergent policy-relevant lessons from the RIU Africa country programmes

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June 2010

Introduction

As part of its broad portfolio of activities RIU established country programmes in Malawi, Nigeria, Rwanda, Sierra Leone, Tanzania and Zambia. These Africa country programmes were established with an explicit agenda of experimenting with ways of building capacity that enables research to be put into use. The main tools deployed as part of this agenda are innovation platforms: a family of approaches focused on linking organisations relevant to various topics where the private sector is or should be prominent.

Agricultural innovation and its support through science and technology initiatives has been one of the mainstays of development assistance in Africa. Initially deployed as a way of tackling food-based poverty, more recently it has been re-emphasised because of the recognition that agriculture and rural-led growth can be an effective way of reducing poverty. The contemporary understanding of innovation as a process of mobilising knowledge and technology from multiple sources, however, requires a re-think about the sorts of capacities needed to support development: scientific capacities that underpin agricultural research are not sufficient to drive innovation in today's multi-dimensional agricultural sector. Instead the notion of capacity for innovation needs to be expanded to encompass the complex set of activities, players and policies involved in developing, accessing and using knowledge and technology for agriculture and rural system innovation.

What this new type of investment is, however, still something of an open question. Although the RIU country programmes in Africa initially struggled to work out how to explore the *research into use* question, over the past twelve months the scope of the country programmes has been slimmed down to ensure a more manageable set of experiments, and they are now starting to build evidence on ways of strengthening innovation capacity by connecting different parts of the innovation systems in which they are working.

Country cases

While country programmes could and should have been nimble in responding to opportunities to put research into use in local innovation systems, the programmes went through a formative period generally typified by rather mechanistic and often ill-conceived methods. As a result the strategy of

putting research into use in Africa initially focused mainly on developing structures -in a fairly blueprinted fashion- variously described as "innovation platforms" and "national innovation coalitions" - which involved a variety of activities that tried to address some of the most intractable R&D problems, often identified by country scoping studies, using approaches that were generally based on large-scale demonstration and technology dissemination efforts.

In Malawi, for example, a cotton innovation platform tried to deal with research and development problems in a stagnant sector involving technologies and practices for boosting cotton production and productivity. The rationale was to demonstrate the potential to increase farmers' seed cotton yield per unit area through application of recommended technologies – with rather limited impact but typical of the approach that most R&D practitioners would traditionally have taken.

Similarly, in Zambia, a 'conservation agriculture platform' tried to increase the adoption of water-saving agricultural practices through a large number of 'integrated' demonstration plots, much along the lines, albeit at a larger scale, of what had been tried over the past 20 years. With the increased autonomy and flexibility of the RIU Africa programmes, combined with a new research design and analytical framework and demand-led advisory and mentoring services that add intellectual oversight on learning lessons and integration into national and regional policy debates, however, many of these activities have now been reoriented.

Whilst not denying the importance of addressing long-standing rural development conundrums, reorientation of part of the country programmes has indicated that investment in new and dynamic rural sector opportunities may have better pay-off in increasing the sector's contribution to economic growth and poverty reduction. The following case examples present a flavour of emerging empirical evidence.

Malawi: 'this little piggy went to the market'

Although demand for pork in Malawi has recently increased significantly, much of this requirement has been met by importing animals from South Africa. Pig rearing, however, is widespread in Malawi and numerous project-based interventions have encouraged a rapid increase in the production and availability of improved breeds. Whilst such projects may have addressed perceived management and genetic problems, they have not been able to establish the stable market that would take local pig rearing beyond sustenance production.

Recent brokering efforts by RIU Malawi using an innovation platform mechanism, however, are rapidly transforming the sector, as the facilitation of linkages and negotiation among key public, private and civil society stakeholders in the pork value chain is solving some of the sector's most 'pig-headed' issues. As a result a constant local supply of quality pigs is being provided to processors and consumers through the establishment of decentralized pig marketing structures.

Much of the hard work of RIU Malawi focussed on establishing effective linkages among actors that don't normally interact. This was achieved by the facilitation of group and one-to-one meetings to discuss and analyse sector issues and to discover the incentives that would create trust and coherence among these diverse groupings. The brokering activities that led to the establishment of these decentralized pig marketing structures involved negotiations of quality requirements and sales contracts between producers and buyers; public health and food safety policy advocacy; the facilitation of training of pig farmer associations in business management and marketing; and the

provision of grant funds and technical coordination to the livestock platform for construction of formalized pig market structures. The platform mechanism also gave sector actors the opportunity to review and plan the activities and construction of decentralized pig markets, and it continues to provide an evolving forum that allows a broad range of actors, both 'new and old', to share experiences and lessons and to explore sector opportunities and challenges.

The active participation of meat processing companies in establishing new marketing structures gave confidence to many individual pig farmers. Other platform members are teaming up to become pig buyers due to the promising market prospects. This capacity-building has also attracted funding from other donors; for example, in the supply of basic processing and cold storage facilities to enable the servicing of a larger range of clients.

Whilst the situation in each location differs, it has been the private sector that has assisted marginalized pig producers to unite in piggery associations and they take the lead in activities related to decentralized markets, e.g. establishing modalities for the markets' management, contacts with relevant stakeholders and authorities in the local district / town assembly and organization of access to, and provision of, pig production input services.

Nigeria: Bean bags

While cowpeas faces many challenges throughout its lifecycle, post-harvest weevil infestation is its biggest threat, rendering the crop unsuitable for human consumption in a matter of days. Few staple foods, however, command higher market prices in sub-Saharan African countries. Cowpea production, marketing and processing offer very lucrative livelihood options, and its many small-scale producers, traders and consumers have tried various methods of preserving the seeds post-harvest. Chemicals, such as phostoxin and actellic dust, kill the cowpea weevils in storage and are popular, but misuse of these chemicals contaminates the crop, making it poisonous to humans and frequently leading to severe illness or even death.

Scientists at Purdue University in the United States developed an improved, airtight bag which can kill the weevils and preserve cowpea seeds in storage, thereby eliminating the need for the application of chemicals. Significant funding from the Bill & Melinda Gates Foundation and a link with the Consultative Group on International Agricultural Research subsequently enabled the wide-scale promotion of this initiative in cowpea-producing regions across Nigeria.

It was, however, not until RIU Nigeria negotiated a multi-agency collaboration with this programme and a range of other key sector stakeholders (including the state-funded Agricultural Development Programmes, a private sector plastics company, independent consultants and local researchers) by facilitating meetings and stakeholder dialogues, policy advocacy, and providing suitable incentives, that the invention found the appropriate traction. Indeed, such has been the success of this initiative that even poor quality 'counterfeit bags; have started hitting the market!

Intervention by RIU Nigeria has led to the direct involvement of target communities and establishment of vital linkages among stakeholders which facilitated the provision of necessary support services, training and local production and availability of high-quality storage bags in different sizes. This networked capacity has also allowed the sector to deal with second-generation research questions based on feedback received from cowpea farmers and marketers based on their experiences in the use of the storage bags.

Rwanda: Big business in tiny tubers

Brokering activities by RIU Rwanda has knitted together the network required to deal with the regeneration of local potato production in Gicumbi District and spawned a profitable business in the production of basic potato seeds or micro-tubers.

As a result, a variety of activities involving a large number of sector actors (e.g. the import, multiplication and large-scale distribution of two new disease-resistant varieties from neighbouring Uganda and the implementation of positive selection in informal seed systems) are regenerating potato production in Gicumbi District. RIU Rwanda has therefore provided income generating opportunities for poor households by stimulating dialogue and interaction among key public, private and civil society stakeholders in the potato sector.

Another line of activities facilitated through the innovation platform, combines *in-vitro* planting material supplied by the National Agricultural Research Institute (ISAR) and the entrepreneurship of a farmers' cooperative. It aims to solve the chronic lack of potato mini-tubers through the establishment of the first commercial unit to produce basic potato seeds in a greenhouse in Gicumbi District. RIU paid for the in-country training of the agricultural experts from the cooperative that runs the seed production unit, and is covering part of the running costs of the operations' first production cycle, until earnings kick-in. Certification and other required follow-up/mentoring services by specialised institutions, such as ISAR, are provided and accessed through other platform members.

With the first 7,000 in-vitro potatoes planted in mid-May 2010, the initial sets of micro-tubers produced in Gicumbi District will be in the fields by October 2010. Demand for the micro-tubers, however, is already such that at least two additional commercial units are envisaged to be operational by the next planting season in October 2010.

Sierra Leone: Policy – Privatized and PAID dividends

A Partnership in Agricultural Innovation for Development (PAID) was established by RIU in Sierra Leone in July 2008. The partnership draws members from government ministries, research organizations, NGOs, universities, civil society, farmers and farmers' organization. It currently has over 150 members and is officially recognized by the Ministry of Agriculture, Forestry and Food Security. PAID membership claims to represent about 23% of the country's population and approximately 45% of the total farming population. Through RIU Sierra Leone facilitation, PAID has become an inclusive social-business network bringing together actors in different parts of the value chain.

PAID was conceived as a platform for members to exchange information and services and to create awareness of the role and potential of agricultural research in poverty reduction and economic growth. It is aligned with various local policy frameworks such as the Agricultural advisory Group and the Agriculture Technical Team, and several PAID members are involved in agricultural and natural resources policy formulation. Over time it has evolved to become a main driver of key rural development themes such as market access, youth and use of research in Sierra Leone.

PAID members also took the bold step of registering as a limited liability company but with members rather than shareholders and no share capital. As a result PAID now acts as a private sector 'partnership of service providers' and source of independent advice on how government, the NGO community and other key national umbrella organisations can effectively create an environment that would best support the fledgling but vital community of rural entrepreneurs.

In fact PAID has started to act as a broad-based private sector rural development think tank – perfectly positioned to impact on policy and institutional change in Sierra Leone.

Tanzania: Counting their chicken

As in other countries, population growth, increasing urbanisation and rising incomes has stimulated demand for animal protein in Tanzania. But unlike many other nations, the increased importation of frozen poultry and the rearing of commercial broilers have not been able to meet demand as consumers continue to prefer the taste and food preparation qualities of the local *kuku* (chicken).

Whilst this market is exploited by some small-scale producers and traders, there has not been the enabling environment to allow systemic sector changes to occur. In a significant change to this situation, RIU Tanzania has built linkages among key sector stakeholders. This has not been achieved by an easily definable set of actions, but required persistent interaction, dialoguing, negotiation, knowledge sharing and sector-wide meetings. These actions are slowly establishing a local poultry sector network that is turning increased urban demand for poultry into an opportunity for marginalized households and rural entrepreneurs by adapting and utilizing new and existing research outputs and facilitating the provision of a broad range of input and output services.

While innovation in the local poultry sector may be consumer-led in some areas, or investment-led in others, is has been the networked capacity that has been fomented in the sector through the brokering activities by RIU Tanzania that has enabled new ways of working, access to information and services, and investment. This is an evolving story but the outlook is good. Fundamental changes in interaction among sector actors and the new modes of operation by producers and entrepreneurs has provided new solutions to problems and opportunities to be identified and dealt with quickly, or to bring in new actors that can deal with the issue.

As farmers expand the number of local poultry raised and receive training in entrepreneurship, demand grows for flexible saving schemes to safeguard their profits for re-investment and expansion of their businesses. At the same time, farmers need simple mechanisms to ensure availability of quality inputs and services when needed.

While the majority of people in urban centres enjoy efficient mobile money transfer services, rural areas are currently not so well catered for. In addition, when small-scale farmers have cash they often come under intense social pressure to use their money for pressing needs in their extended families and communities. RIU Tanzania, a selected animal health company and RIU-supported hatcheries are therefore piloting the use of mobile-phone money transfer services. These enable farmers to pre-pay for advisory services and production inputs. This exciting initiative prevents cash needed for re-investment in the next poultry production cycle from being diverted to meet unpredicted social needs, whilst at the same time guaranteeing access to quality services and production inputs.

So far we are talking about only a few thousand households but advocacy and empirical evidence from RIU Tanzania has caught the attention of policy makers and rural development investors and is informing policies and ways of working that will contribute to sector changes that will allow more poor producers, entrepreneurs, service suppliers and market agents to take advantage of the opportunities offered by producing and marketing local poultry (Tanzania web-page).

Zambia: Environmental services?

Renewed market interest in local rice varieties is proving beneficial not only for producers but also for the environment. RIU Zambia 's investment and brokering activities in the rice sub-sector in the Chambeshi floodplains have created the potential both to respond to unmet demand and to reduce pressure on local wildlife and forests.

By forming a partnership with the Community Market for Conservation (COMACO – an off-shoot of the Wildlife Conservation Society) and upgrading and expanding community trading centres, RIU Zambia has increased producers' access to commodity purchasing, processing, branding and distribution to higher-end market outlets whilst enabling the use of rice-related research outputs. This mechanism allows farmers to benefit from finance that assures a timely market for their local rice at a premium price through a variety of equitable 'contract-farming' arrangements. This provides a large number of subsistence farmers with new opportunities in an area where a lack of income generating and livelihoods options was increasing reliance on forest exploitation and poaching.

The facilitation of linkages among the public sector (ministries and research organizations), private sector, farmer organizations, local authorities and other relevant community-based organizations through the meetings, dialogues, removal of bottlenecks and incentives provided by RIU Zambia, has not only leveraged policy-relevant issues and lessons through an existing national rice stakeholder forum, but also accesses the broad resources and expertise to address new sector challenges and opportunities.

Such evolving networked capacity is well illustrated in the response to a recent set of events. As local rice production and the number of producers increased, the availability of quality seed to meet the market demand for quality products became an issue. Brokering by RIU Zambia and the established linkages among producers, traders, the Seed Control and Certification Institute and seed research organisations has facilitated improved productivity of the local rice seed that has now reached the status of Quality Declared Seed (QDS). Involvement of the private sector in the multiplication of seed is also ensuring that enough QDS will be available to producers that include small-scale farmers .

Emerging lessons

Although the country programmes have another 12 months to run under the current RIU funding arrangements, it is nonetheless possible to discern a number of emerging, generic lessons relevant to policy makers and development investors. Such lessons fall in the following broad categories:

Solving problems versus identifying opportunities

The re-orientation of the country programmes towards an opportunity-led agenda indicates that investment in new and dynamic rural sector opportunities offers opportunities to increase the sector's contribution to economic growth and poverty reduction. Whilst this does not imply that addressing some of the most intractable problems should no longer be on the development agenda, it does indicate that alternative rural development options exist that can and should be exploited. Rural development interventions and investment should not be solely about solving problems but also about pursuing exciting new options.

The role of research in innovation

Whilst research and technology are, in one way or another, integral to all the country case examples, in none of these instances has research or technology driven innovation. Even in the case of Nigeria, a technical solution developed in splendid isolation needed a capacity building process for it to be put into use, i.e. the rate-limiting step is not technology development or promotion but the level of innovation capacity. These case studies also suggest that rather than simply promoting research products, it is more valuable to link research processes to activities led by entrepreneurs and other users of new ideas. Dissemination of technological interventions alone is unlikely to contribute significantly to take-up; what is needed, is the diffusion of the process instrumental in systems innovation.

In all the cases presented here, research was initially largely peripheral to developments. It is only after production increases and linkages are developed that researchable issues, or so-called 'second generation' research issues arise. This is an important observation because it not only gives further weight to the observation that investment in research capacity alone will do little to enhance innovation and rural development, but it also provides important indications about the type of research capacity that needs to be present for it to be relevant to rural sector innovation and growth. With researchers in most countries still ensconced in research organizations that set long-term priorities, there is often not the required capacity or institutional flexibility that would allow research to respond to the types of needs described above. In terms of strategies that would increase the integration and relevance of research to rural innovation and development, a crucial aspect will thus be the degree to which at least part of the available research capacity can respond to real needs.

Institutional architecture

Some of the country programmes are led by private companies; others are an integral part of policy bodies or ministry departments. These differences in institutional arrangements have led to a number of different ways in which the country programmes are linked into the wider policy and economic environment. A crucial aspect appears to be the ability to discern when different strategies may be more or less effective in influencing policy and investment choices, and to build the capacity that can respond accordingly.

Notwithstanding these differences in institutional architecture, by slimming down operations over the past 12 months the RIU country teams have evolved from active implementation to facilitation of the necessary linkages or the elimination of obstructions – roles now described as 'innovation brokering'. The impact of these activities on the ability of the systems in which the country programmes operate to cope, respond and prosper under changing conditions, indicates that these brokering functions fill an institutional hiatus. However, this also poses significant questions about who will take over such roles at the end of the RIU programme. It suggests, however, that in addition to investment in research and technology initiatives, agricultural innovation and rural development may also require the establishment of independent rural development brokering agencies.

Private sector?

The case studies clearly indicate that most market-oriented rural development initiatives need strong private sector involvement to succeed - particularly in light of the continuing retreat of the State in most developing economies. Entrepreneurship in Africa, however, is not uniformly developed across

all sectors and all nations. The absence of such private financial initiatives has led to the emergence of a new member of the institutional architecture, often rooted in civil society or the public sector. These budding organizations use public or donor money to perform private sector brokering and other private sector roles. The case studies also provide examples of private sector agents performing a variety of functions that would normally be considered to belong to the public sector. In institutional landscapes where both private and public sector functions may variously be under-represented or underdeveloped, competing and prospering requires each sector to undertake activities that would usually be considered outside their traditional roles and competencies.

Similarly, the nascent type of entrepreneurship presented in the various case studies doesn't conform to commonly recognised industry models either; they often consist of networked business models covering a broad range of necessities that their clientele, generally located in the lower socio-economic strata of society, have. Such *Bottom Billion Businesses* may well be starting to rewrite the commerce development handbooks in Africa. Results obtained in the RIU country programmes in funding the activities of these nascent groups are indicative of new avenues where development donors may want to direct their investments to stimulate rural innovation.

In conclusion

The policy implications of these findings in building innovation capacity in the RIU African country programmes clearly indicate that agricultural innovation, rather than simple investment in research and technology initiatives, may also require the establishment of appropriately-funded rural development brokering agencies. In addition, whilst the private sector may be ideally placed in some sectors, local circumstances may currently limit their role in many areas. In light of this, coalitions of private, public and civil society sector actors are important for developing, accessing and using knowledge and technology for agricultural and rural system innovation. These findings raise important questions about how global public research and development efforts could or should reorient themselves to be able to respond.

Further information

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This document is an output from the Research Into Use programme funded by the UK Department for International Development (DFID) for the benefit of developing countries. The views expressed are not necessarily those of DFID.