Facilitating agricultural innovation: example from Agricultural Innovation Grant Scheme (AIGS) in Papua New Guinea

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Abstract

The work presented here is based on a five-year project that pursued a holistic capacity-building initiative in Papua New Guinea supported by AusAID. The initiative was called Agricultural Research and Development Support Facility (www.ardsf.nari.org.pg). This work was inspired by the innovation systems perspective and its offshoot – Agricultural Research for Development (AR4D) – even though it was not explicitly required in the design. The design pitched a high-level goal – improved food security and increased incomes among smallholder agricultural producers – and provided Component 1 to build capacity for the national agricultural research institute, Component 2 to build capacity for five research and extension organisations and Component 3 to pilot an agricultural innovation grant scheme (AIGS). The three components were expected to synergistically interact to more effectively contribute to the overall goal. The AIGS promoted innovation along respective value chains. These included technological, organisational, institutional and policy innovations, consequently leading to increased productivity, access to lucrative local and international markets, increased incomes and associated improved livelihoods.

These achievements were, however, made against great challenges, especially during the first two years of project implementation. These included the lack of a common understanding of innovation and how innovation systems operate. This was largely due to the entrenched legacy of previous development approaches highly oriented towards compartmentalised capacity-development approaches. The traditional approaches also did not sufficiently emphasise collective learning, which is central to innovation systems thinking. Consequently, it took about a year and a half to introduce innovation systems thinking and practice among the key leadership and associated stakeholders.

Some of the key lessons drawn from this work were: i) the need for flexibility during implementation to provide adequate opportunities for all key stakeholders to fully understand the idea of innovation and how to achieve impact of people's livelihoods through learning-by-doing; ii) the importance of having a clearly articulated purpose of the scheme that specifies how it will impact on the livelihoods of smallholders; iii) the importance of scoping each successive funding call to ensure links with the purpose; iv) creating institutional arrangements that ensure ownership of the scheme with continuous capacity development; and v) the need to balance pressure from the donors to spend project money in a stipulated time with the need to facilitate necessary learning for innovation.

Keywords: *innovation, innovation systems, grant scheme, capacity building*

Introduction

This paper describes the development and implementation of an agricultural innovation grant scheme (AIGS) as part of a capacity-building process framed by Agricultural Research for Development (AR4D). The grant scheme was critical to the capacity-building process in the

national research and extension systems in Papua New Guinea (PNG), where it provided resources for agricultural research organisations to work in a new way as part of wider development activities. The development of the scheme illustrates the way its protocols were iteratively developed through a series of four grant calls. This helped finetune the targeting of the scheme towards innovation projects that had development relevance and made the most of research as well as developmental expertise of the partners involved. The success of the scheme has made it a potential candidate for scaling up as a national competitive grant scheme.

Key principles of funding innovation in AR4D

Innovation systems perspectives and the AR4D approach demand new types of projects that support innovation as the key means of generating sustainable social and economic benefits. This involves projects that combine research and development activities and that place strong emphasis on adding value to emerging opportunities. Projects may also tackle constraints in the innovation process – technical, institutional or policy bottlenecks – but this is done with a view to promoting innovation of social and economic significance rather than as an end in itself. As stated above, innovation-oriented projects should result in social and economic benefits at various levels, more importantly at local level. Therefore, the basis of funding this type of project is different from the way research and extension activities are normally funded.

With few exceptions, where participatory research and extension systems were introduced, funding for major agricultural research organisations was through either competitive or core support. The purpose of research organisations was conceived as generating new information and developing new technologies in response to different agricultural development constraints. Agricultural extension activities were then used to promote research-driven information and technology[10]. This research-extension linkage model focused more on technological innovation and less on associated institutional and policy innovations, consequently limiting potential adoption of the technology among resource-poor smallholder farmers.

Features of innovation projects

An innovation project is different from both a research project and extension services in a number of respects. Key features extracted from 31 successfully implemented innovation projects under the Agricultural Research and Development Support Facility (ARDSF) in PNG are summarised below.

- The primary focus of innovation projects is not on conducting research, but on finding ways that research products and expertise can be used productively for social and economic benefits.
- The purpose is not just to transfer technologies, but to couple access to technology and expertise with access to markets, credit and other inputs and to create the institutional arrangements that make these links responsive to the needs of stakeholders in the innovation processes.
- The scope of such projects can go beyond agriculture and include related issues in education, health, energy, commerce and industry and financial sectors.
- Different types of organisations, including development organisations, private enterprises and research organisations, and advisory and other support services from the public and private sector can lead such projects. Leadership depends on the theme being addressed. Projects usually involve a coalition of different types of organisations working together.

[10] This research-extension model is globally known as the linear model or transfer-of-technology model.

- Such projects usually address issues at multiple levels. They may involve technological change but usually also involve addressing issues in institutional arrangements (how things are done, incentives etc.) as well as in the policy domain that frames activities and innovation.
- Different projects will, however, impact at different scales. Some will impact on individual communities or enterprises, some will impact on value chains, while others will impact at regional and national scales.
- Innovation projects are inherently process-driven – promoting innovation in different and dynamic contexts always needs to be learnt and improved through trial and error. This means that learning-oriented mentoring is a key management tool in these projects.
- Innovation projects have an explicit or implicit capacity-development agenda. Capacity development is an important driver of change in this case, because organisations have different institutional histories, organisation cultures and capacities to innovate. Hence, there is a need to provide space for organisations to work in new ways and with different partners. Such projects anticipate that institutional lessons (how to work differently for impact) are an important outcome.
- In this type of project, scaling out is not concerned with replication but with linking similar initiatives to promote lesson sharing and wider innovation. Scaling up is not concerned with formulation of recommendations for policy but with linking experiences and lesson learning to debates that shape wider policy and institutional frameworks and the nature and direction of development pathways.

Innovation projects should therefore strive to integrate technological, institutional and policy innovations to ensure sustainable social and economic benefits to the target groups. Importantly therefore, innovation grant schemes should broker related projects to ensure synergy from the three innovation pillars.

Entry points for innovation projects

The following are examples of innovation projects from the AIGS in Papua New Guinea:

- *Technology adaptation and troubleshooting.* Adapting technologies to different contexts of application and conducting research to resolve "second-generation" technical constraints encountered during application.
- *Strengthening technology delivery systems.* Creating viable demand-responsive delivery systems for new technologies, such as improved crop varieties, but also providing training in new production and marketing techniques and regulatory compliance. This may be done through the market or through public or civil society organisations providing advisory services.
- *Strengthening value chains.* Creating viable and equitable value chains that link smallholders to local, national and international markets. This might be in response to a new market opportunity. It may also be driven by new technological opportunities, such as new types of storage or value addition through agroprocessing.
- *Strengthening social organisations.* Creating farmer or commodity groups and enterprises as a way of improving production, process and marketing. This may also be used as a way of better accessing inputs, such as seeds or credit, and as a way of collectively articulating demand for research services and advisory support.
- *Strengthening innovation brokering.* Supporting service organisations to use facilitation, intermediation and communication to help build coalitions of partners around emerging opportunities. This might involve undertaking research and/or setting up innovation platforms to identify new opportunities and bringing partners together to exploit these.
- *Enterprise incubation.* This often involves providing start-up capital and technical assistance to enterprises involved in commercialising new technologies or services to

smallholders. It may also include mixed-revenue business models, where products and services are paid partly by the market and partly from public or private subsidy.

- *Policy and institutional change*. This involves generating, synthesising and communicating information to policymakers to change the framework conditions for a particular innovation pathway. It may involve support to specific interest-group agencies, e.g. an organic produce organisation. Alternatively, it might mean supporting policy thinktanks to link development practice experiences with the policy process.

Obviously, these are only entry points for projects. The AIGS in Papua New Guinea affirmed international experience that innovation projects work best when the different types of entry points are clustered together to address the different types of bottlenecks encountered in innovation processes (Hall 2011, Ton *et al* 2013, World Bank 2010).

Example of innovation grant scheme

Project title: Positive Sustainable Development of Smallholder Farming Communities through Value Addition and Market Improvement of Coconuts in Gazelle District.

Lead and other partners: Pacific Spices Ltd.

Duration: Initially one year, but extended by one more year due to implementation problems.

Budget: Kina 250,000 (approximately USD 120,751) approved and fully utilised.

Rationale: This project focuses on value addition through agroprocessing and marketing and involves a partnership between a private company and community groups. In the Gazelle District, the coconut industry had been relatively unsuccessful over the previous 20 years due to the inconsistency of prices of copra, increasing costs of fuel and lack of all-weather roads. This led to a decline in production of coconuts and copra at farmer level. Partly in response to this, Pacific Spices Ltd, a private company, started processing and adding value to selected cash crops to encourage farmers to produce these crops. This, in turn, helped Pacific Spices Ltd ensure consistency of supply. One of the initiatives involved the Sinivit community in Pomio District.

Main activities: Pacific Spices worked with community members to process coconut into virgin coconut oil and to market this in PNG and overseas. This helped households maintain regular cash income from coconut production. Besides providing technical know-how on producing organic products for the world market, the company also helped increase shipping freight services to the district, ensuring that the produce reached intended markets at least cost. The partnership was extended to include the East New Britain Provincial Government and the Catholic Mission.

The project funded the following activities:

- Renovation and upgrading of an existing building to a value added processing facility providing an efficient product flow - that not only reduced handling, but also maximised production capacity.
- Procured and established a coconut processing equipment, resulting in production of quality virgin coconut oil and other coconut byproducts.
- Provided hands-on staff training regarding product quality and hygiene issues associated with high-value/perishable food products, coupled with the consistent production of coconut oil.
- Storage facility for a crystal clear virgin coconut oil that allowed for packaging of 350 kgs of organic virgin coconut oil for export to Japan.
- Logistic arrangements for a copra buying point at Induna Plantation to provide an on-site market for farmers.
- Data collection from farmers in three outreach communities – Merai, Lat and Gar – including crop and production history.

- Organic certification for grower group and processing facility gained to the international organic standard (International Federation of Organic Agricultural Movements – IFOAM). Coconut, Nutmeg, Patchouli and Cocoa listed as organic.
- Five-day visit to Rabaul by a buyer from Australia looking for consistent supply of coconut oil. Sales agreement discussed and agreed for the supply of coconut oil and other coconut products on a monthly basis.

Roles of different partners

Pacific Spices and the Catholic Mission worked in partnership on the Induna Plantation, which is owned and managed by the Catholic Mission. Farmers in the vicinity of the plantation sold their produce to the processing firm. In addition, Pacific Spices provided the certification process for organic coconut oil production and linked farmers with the Sea Transport and Marketing Service, leading to better prices for their produce. This partnership clearly demonstrated the role of an integrated approach to rural development, whereby the development of transport routes to and from the market paved the way for additional economic and social benefits to the smallholder producers in the area.

Outcomes

- Linked the local coconut market with international markets in Canada, Japan, Europe and America, through value adding and organic certification of their products
- Market opportunities encouraged farmers to invest their time and other resources to improve profitability levels
- Created network of local communities, using family ties and village leadership to promote production and productivity of coconut, especially organic production methods
- Farmers using increased incomes to give their families better healthcare and education
- The initiative that began in one ward eventually expanded to three wards.

Challenges of innovation projects

A lack of a common understanding among key stakeholders on the concept of innovation and how innovation systems operate was the biggest challenge in implementing the AIGS. Among some key stakeholders, the scheme was perceived as a mechanism to transfer technologies from research to farmers. This reflected a legacy of previous capacity-development approaches, which focused on funding research for technology development and supporting extension systems for disseminating technologies. Most of the AIGS leadership was initially heavily influenced by this perspective. Consequently, it took about a year and a half to broaden their perspectives to embrace innovation systems thinking.

Lesson and recommendations

New projects will usually build on existing clusters of innovation activity – technological development, enterprise or developmental activity and market changes that provide opportunities for innovation of economic and social significance. Grant schemes, therefore, need to have scoping mechanisms to identify promising nodes of innovation (for details, see Mbabu & Hall 2012).

AIGS holds many operational and policy lessons for those designing competitive funding mechanisms to support innovation as part of the AR4D approach. These include:

- The importance of creating operational space to experiment with and incubate a novel form of innovation grant scheme; this helps develop workable institutional arrangements that are fit-for-purpose and provide proof of concept that can be leveraged in wider policy debates.

- The importance of ensuring that all key stakeholders fully understand the idea of innovation and the wider paradigm of AR4D and the implications this has for the design and operation of an innovation grant scheme.
- The importance of conceiving and operating the scheme as a way of stimulating agricultural production, processing and marketing innovations, as well as innovations in service delivery; this means supporting new ways of working by sector stakeholders.
- The importance of tailoring funding calls to themes that will allow a scheme to demonstrate its wider utility beyond the agricultural sector as a policy instrument that can contribute to national development plans and goals.
- The importance of an iterative approach to funding, learning from the experience of earlier calls and adjusting future calls accordingly.
- The importance of staffing grant schemes with people who have the right skill mix to support an AR4D orientation. It might also be necessary to provide staff space to "learn by doing" as no manual is available for many of the tasks they are likely to encounter.
- The importance of focusing calls on identifying innovation opportunities and then structuring support and partnerships around these opportunities. As some partners will be new to the world of proposal development (particularly non-traditional partners), considerable technical support needs to be provided in proposal development.
- The importance of robust result frameworks and monitoring and evaluation arrangements to ensure that innovation grant schemes continue to focus on higher-order development objectives that have been set for them.

There are also pitfalls that are best avoided:

- Inheriting institutional arrangements from technology-transfer grant schemes places an extra burden on the institutional development of innovation grant schemes. Personnel with experience in technology grant schemes are probably best avoided, although this can sometimes be difficult.
- Avoid the temptation to issue calls before at least basic institutional arrangements have been put in place. Donors should note that the imperative to spend money quickly may undermine the ability of the grant schemes they are supporting to achieve their purpose.

Conclusions

Agricultural innovation grants need to be conceived and practised as an opportunity to translate ideas and research results into concrete social and economic benefits through facilitation of *learning by doing* and providing complementary inputs through grants in cash or in kind or a combination of the two. The overall idea is to link research with development in a manner that contributes to improved livelihoods, especially of the resource-poor smallholder producers, by involving various stakeholders in the innovation processes.

References

Hall A. 2011. Putting agricultural research into use: lessons from contested visions of innovation. UNU-MERIT Working Paper Series #2011-076. Maastricht: UNU-MERIT.

Mbabu AN & Hall A. 2012. Capacity building for agricultural research for development: lessons from practice in Papua New Guinea. Maastricht: UNU-MERIT.

Ton G, Grip K de, Klerkx L, Rau ML, Douma M, Friis-Hansen E, Triomphe B, Waters-Bayer A & Wongtschowski M. 2013. *Effectiveness of innovation grants to smallholder agricultural producers: an explorative systematic review*. London: EPPI-Centre, Social Science Research Unit, Institute of Education, University of London.

World Bank. 2010. Designing and implementing agricultural innovation funds: lessons from competitive research and matching grant projects. Report No. 5457-GLB. Washington DC: World Bank Agriculture and Rural Development Department.