Systematic review

Effectiveness of innovation grants to smallholder agricultural producers:

An explorative systematic review

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May 2013

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This research was funded by the Australian Agency for International Development (AusAID). The research was commissioned as part of a joint call for systematic reviews with the Department for International Development (DFID) and the International Initiative for Impact Evaluation (3ie)

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This report should be cited as:
Ton G, de Grip K, Klerkx L, Rau M-L, 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. EPPI-Centre, Social Science Research Unit, Institute of Education, University of London.

ISBN: 978-1-907345-54-8

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List of abbreviations

2SWR	Two-stage weighted regression
3ie	International Initiative for Impact Evaluation
AIMS	Agricultural Information Management Standards (FAO)
AISP	Agricultural Input Supply Programme (Malawi)
AJOL	African Journals Online
ATIRI	Agricultural Technology Information and Response Initiative (Kenya)
AusAID	Australian Government Overseas Aid Program
BLDS	British Library for Development Studies
C3F	City-Community Challenge Fund
CATF	Competitive agricultural technology funds
CEDAC	Cambodian Center for Study and Development in Agriculture/Centre d'Etude et de Développement Agricole Cambodgien
CF	Competitive fund(s)
CGIAR	Consultative Group on International Agricultural Research
CIAL	Local agricultural research committees
CIAT	International Center for Tropical Agriculture/Centro Internacional de Agricultura Tropical (Colombia)
CIDA	Canadian International Development Agency
CIRAD	International Research Centre for Agricultural Development French Centre for Agricultural Research for Development/Centre de Coopération Internationale en Recherche Agronomique pour le Développement (France)
CRS	Catholic Relief Services
DFID	Department for International Development (UK)
DIIS	Danish Institute for International Studies
DURAS	Promoting Sustainable Development in Agricultural Research Systems/Promotion du Développement Durable dans les Systèmes de Recherche Agricole du Sud (France)
EPPI-Centre	Centre for Evidence for Policy and Practice (Social Science Research Unit, Institute of Education, University of London)
ESFIM	Empowering Smallholder Farmers in Markets
ETC	Ecology Technology Culture Foundation, Leusden (the Netherlands)
FAIR	Farmer Access to Innovation Resources (PROLINNOVA)
FAO	Food and Agricultural Organization of the United Nations
FDTA	Fundación para el Desarrollo Tecnológico Agropecuario (Bolivia)
FFS	Farmer field school(s)
FID	Farmer institutional development (Uganda)
FNN	Farmer Nature Network (Cambodia)
GFAR	Global Forum on Agricultural and Rural Development
GTZ	Gesellschaft für Internationale Zusammenarbeit (Germany)
HYV	High yielding variety
IDRC	International Development Research Centre (Canada)
IEG	Independent Evaluation Unit (World Bank)
IFAD	International Fund for Agricultural Development
IFPRI	International Food Policy Research Institute
IMF	International Monetary Fund
INCAGRO	Agricultural Research and Extension Program/Inspección de Calidad Agricola (Peru)
INDAP	Instituto de Desarrollo Agropecuario, Ministerio de Agricultura (Chile)

INNOVAGRO	Innovation in the Agri-Food Sector/Innovación en el Sector Agroalimentario
IPCA	Participatory Research in Central America/Investigación Participativa en Centroamerica
IPM	Integrated pest management
ISFG	Integrated support to farmer groups (Uganda)
IV	Instrumental variable
KARI	Kenya Agricultural Research Institute
KENFAP	Kenya National Federation of Agricultural Producers
KIT	Royal Tropical Institute, Amsterdam (the Netherlands)
KSL	KENFAP Services Ltd
LEI	Agricultural Economics Research Institute (WUR)
LIBIRD	Local Initiatives for Biodiversity, Research and Development (Nepal)
LISF	Local innovation support funds (PROLINNOVA)
LISP	Local Initiatives Support Project (Lesotho)
MAAIF	Ministry of Agriculture, Animal Industries and Fisheries (Uganda)
MIDEPLAN	Ministerio de Planificación y Cooperación de Chile
MINAG	Ministerio de Agricultura y Ganadería (Peru)
NAADS	National Agricultural Advisory Services (Uganda)
NAAIAP	National Accelerated Agricultural Inputs Access Programme (Kenya)
NGOs	Non-governmental organisation
NIF	National Innovation Fund (India)
NORAD	Norwegian Agency for Development Cooperation
NPK	Nitrogen–phosphorus–potassium
NRI	Natural Resources Institute (UK)
NRM	Natural resources management
ODI	Overseas Development Institute (UK)
OPV	Open pollinated variety
PFI–FFS	Promoting Farmer Innovation – Farmer Field Schools (FAO)
PPB	Participatory plant breeding
Prolinnova	Promoting Local Innovation
PTD	Participatory technology development
R&D	Research and development
RePEc	Research Papers in Economics
SciELO	Scientific Electronic Library Online
SF-FFS	Self-financed farmer field schools
SIBTA	Bolivian Agricultural Technology System/Sistema Boliviano de Tecnología Agropecuaria
SSCI	Social Sciences Citation Index
SSPF	Small-Scale Project Fund (GTZ)
SSRN	Social Science Research Network
TDS	Technology development site (NAADS)
USAID	United States Agency for International Development
VDC	Village development committee (Sierra Leone)
WUR	Wageningen University and Research (the Netherlands)

Abstract

Grants for agricultural innovation are common but grant funds specifically targeted to smallholder farmers remain relatively rare. Nevertheless, they are receiving increasing recognition as a promising venue for agricultural innovation. They stimulate smallholders to experiment with improved practices, to become pro-active and to engage with research and extension providers. The systematic review covered three modalities of disbursing these grants to smallholder farmers and their organisations: vouchers, competitive grants and farmer-led innovation support funds. The synthesis covers, among others, innovation grant systems in Malawi (Agricultural Input Subsidy Programme), Latin America (several Challenge Funds for Farmer Groups), Uganda (National Agricultural Advisory Services), and Colombia (Local Agricultural Research Committees - CIAL).

The review team used a systematic search in electronic data-bases to capture studies from different disciplines and geographical areas, published until January 2012. The synthesis was based on 20 impact studies and makes reference to another 42 largely qualitative studies. These additional studies provide information about the functioning and effectiveness of the innovation grant system but do not contain a structured assessment of impact.

All studies present evidence of the positive changes due to these investments in agricultural innovation. Some of the impact studies show mixed impacts on natural resources, especially due to land clearing of tree species or increased cultivation without soil conservation. The negative outcomes reported in these studies are however always accompanied by a positive outcome in another area, such as an increase in yields or income. Unfortunately none of the studies had a research design that generated comparative information about the impact of alternative policies.

Most studies focus on field-level impacts and use household survey data to support their inferences. However, in most cases, the grant is often only one of the many contributing factors to smallholder innovation along with access to markets, supporting infrastructure, access to credit, and/or starting levels of social and human capital. This complexity is especially relevant for business development grants and innovation support funds, where the grants feed into existing innovation processes. Their impact on household wellbeing often lies beyond the project period. The review points to an important and transversal outcome area of innovation grant systems: the creation of human and social capital to sustain creative thinking and innovative practices. Indicators used to measure this are knowledge on agricultural practices, changes in agricultural practices and capabilities of farmer groups. Measurement of human and social capital with common indicators would help to establish longitudinal data-sets, to be used for benchmarking and comparing different support policies or development interventions to facilitate innovation in smallholder agriculture.

Executive Summary

Background

Grants for agricultural innovation are common but grant funds specifically targeted to smallholder farmers remain relatively rare. Nevertheless, they are receiving increasing recognition as a promising venue for agricultural innovation. They stimulate smallholders to experiment with improved practices, to become pro-active and to engage with research and extension providers.

The systematic review covered three modalities of disbursing these grants to smallholder farmers and their organisations: vouchers, competitive grants and farmer-led innovation support funds. The synthesis covers, among others, innovation grant systems in Malawi (Agricultural Input Subsidy Programme), Latin America (several Challenge Funds for Farmer Groups), Uganda (National Agricultural Advisory Services), and Colombia (Local Agricultural Research Committees - CIAL).

Objectives

The systematic review aimed to synthesize the available literature in order to elaborate under what conditions innovation funds tend to be effective in facilitating innovation and benefiting the poor and women in developing countries.

In this review, we have considered both quantitative and qualitative information relating to the impact of agricultural innovation grants to smallholders. Our approach to synthesis is essentially explorative with many emergent concepts and very limited possibilities to analyse data-sets with comparable outcome indicators.

Methods

The review team used a systematic search in electronic data-bases to capture studies from different disciplines and geographical areas.

- The relevant electronic search results (186 out of 4,322 hits) were complemented by hand-searching additional references through snowballing and reviewing project web-sites. This resulted in a total of 227 studies.
- Most of these studies were excluded in a later stage because they did not contain any information on the way in which the grant was disbursed and/or the role of the farmers in governing the innovation grant system.
- Finally, the synthesis was based on 20 impact studies and makes reference to another 42 largely qualitative studies. These additional studies provide information about the functioning and effectiveness of the innovation grant system but do not contain a structured assessment of impact.

Details of the included studies

		A - Vouchers grant systems	B- Business development grants	C – Farmer driven agricultural research	Grant fund impact study	Grant outcome monitoring report	Descriptive study	Largely quantitative	Largely qualitative	Mixed method
1	Anderson and Feder (2004)	1					1	1		
2	Ashby et al (2000)			1			1		1	
3	Avornyo et al (2010)			1		1			1	
4	Azuba-Musoke and Waiswa (2004)						1			1
5	Banful (2010)	1					1	1		
6	Bebbington and Sotomayor (1998)	1			1					
7	Becker et al (2000)			1			1			
8	Benin et al (2007)			1	1			1		
9	Benin et al (2008)			1	1			1		
10	Berdegué (2001)			1	1					
11	Braun and Hocdé (2000)			1			1		1	
12	Braun, Thiele and Fernandez (2000)			1			1		1	1
13	Bukenya (2010)			1			1		1	
14	CEDAC (2011)			1		1			1	
15	Cobo (2004)			1		1			1	
16	Cromwell et al (2001)						1		1	
17	Denning et al. (2009)	1					1			1
18	Dorward, Chirwa et al (2008)	1			1					1
19	Echeverría (1998)						1		1	
20	Ekboir et al. (2009)						1		1	
21	Ekwamu and Brown (2005)			1	1					
22	Friis-Hansen (2008)			1	1					1
23	Friis-Hansen and Egelyng (2006)			1			1		1	
24	Fundación Chile (2009)		1		1				1	
25	Gebremichael et al (2011)			1		1			1	
26	Gill and Carney (1999)			1			1		1	
27	Govere et al. (2009)	1					1		1	
28	Gustafson (2002)			1			1		1	
29	Harnett (2008)	1					1			
30	Hartwich, Alexaki and Baptista (2007)		1				1			1
31	Holden and Lunduka (2010a)	1			1			1		
32	Holden and Lunduka (2010b)	1			1			1		

		A - Vouchers grant systems	B- Business development grants	C – Farmer driven agricultural research	Grant fund impact study	Grant outcome monitoring report	Descriptive study	Largely quantitative	Largely qualitative	Mixed method
33	Humphries et al (2000)			1	1					
34	Humphries et al. (2005)				1				1	
35	ITAD (2008)			1			1		1	
36	Kaaria et al. (2006)			1	1				1	
37	KENFAP (2010)	1			1			1		
38	Losira (2011)			1		1			1	
39	Malley (2011)			1		1			1	
40	Nathaniels (2005)			1			1		1	
41	Opondo et al (2006)			1			1		1	
42	Perrett (2004)						1		1	
43	Prolinnova Int. Secretariat (2008)			1			1			
44	Ramirez et al (2011)						1		1	
45	Remington et al. (2002)	1			1					1
46	Richards (2007)	1			1					1
47	Ricker-Gilbert (2009)	1			1			1		
48	Roy (1989)		1				1		1	
49	Sandoval (2009)			1	1					1
50	Shroff et al (2012)			1	1				1	
51	Sotomayor et al (2008)		1		1				1	
52	Ton (2007)		1				1		1	
53	Toro (2003)		1				1			
54	Triomphe (2012)			1			1		1	
55	van der Meer and Noordam (2004)		1	1			1			1
56	van Veldhuizen, et al (2005)			1			1		1	
57	Vera-Cruz (2008)						1		1	
58	Waters-Bayer, et al. (2005)			1			1		1	
59	Witcombe et al (2010)			1			1			
60	Wongtschowski et al. (2010)			1			1			1
61	World Bank (2009)		1		1				1	
62	World Bank (2010)						1		1	

Synthesis results

On Voucher Schemes

Hypothesis A1: *The quantity and quality of inputs and services provided to smallholder famers are enhanced as a result of the voucher system and can be sustained in the future.*

The studies on voucher systems show ample evidence that the vouchers indeed lead to the uptake of practices that enhance innovation in the smallholder farming system. Effective targeting mechanisms to reach non-users are key.

Conclusion: *strong support in studies.*

Hypothesis A2: *Farmers' livelihoods, and in particular those of the poor and women, start to change as a result of the improved agricultural practices enabled by these inputs and services.*

The studies show positive impact on key elements of the farmer livelihoods, except when prices fall in response to an increase in production in a context of limited markets outside the production area. The content of a 'one size fits all' technology package supplied through a voucher system could constrain agricultural innovation, while offering a menu of options to choose from would enhance innovation.

Conclusion: *moderate support in studies.*

On Business Development Grant Systems

Hypothesis B1: *Competitive grants trigger value-adding business activities by (groups of) farmers as a way to facilitate innovation processes with smallholder farmers in markets.*

The studies on business support grants show that the grants indeed translate into investments in technology or support services to business proposals from farmer groups. Initial organisational social capital of the groups is a necessary precondition for developing these proposals and handling the grants. Grants tend to be a minor factor in a wider constellation of factors that make the business proposal successful. Therefore, outcomes of the grant system on organisational social capital and institutions that provide the context for further development of these business are important. The necessary transparent and sustained procedures needed for business support grants place high demands on the governance system. Participation of farmer organisations in the governing body is valued positively by most authors.

Conclusion: *strong supporting evidence in studies.*

Hypothesis B2: *Farmers' livelihoods improve as a result of social activities and economic returns derived from the new value-adding business activities.*

The three studies that analyse the impact of the business proposals supported by these grant systems document positive impacts on producers, though their methodologies suffer from the absence in their research design of comparison groups or other methods of counterfactual reasoning. The changes in income through the grant-supported business proposals is not necessarily attributable to the grant, and definitely not to the grant alone.

Conclusion: *weak supporting evidence in studies.*

On Farmer-led Agricultural Innovation Support Funds

Hypothesis C1: Grants to facilitate farmer-driven experimentation and learning open up neglected research areas in agricultural production and enhance the applicability of research results.

The studies on farmer-led innovation support funds all make reference to the difference that doing research made, and to the benefits of an interactive relationship between the farmers and the technical supporters or researchers. No study has a design that permits counterfactual reasoning about which other research areas would or would not have been opened up without the grant. Impact studies provide weak support but the hypothesis is considered to be valid by most authors.

Conclusion: *moderate supporting evidence in studies*.

Hypothesis C2: *Participation of local farmer organisations in decision-making about research funds is effective in (re-)directing the research to critical constraints in on-farm agricultural innovation, and particularly to the needs of the poor and women.*

This review only examines studies where farmers participated in the governance structure. These studies show that this participation indeed defines the activities supported by the grant (e.g. NAADS, PROLINNOVA) in ways that make them more in line with their priorities.

Conclusion: *strong supporting evidence in studies.*

Hypothesis C3: *Participation of higher-level farmer organisations in decision making about research grant funds is effective in scaling-up and scaling-out on-farm agricultural innovation processes.*

The studies all mention the progressive involvement of higher-level farmer organisations in the scaling-up and scaling-out of the innovation grant activities. The organisations studied, however, are more a result of the scaling process not the drivers of it. Supporting institutions (NGOs, governments) are more important in this respect.

Conclusion: *weak supporting evidence in studies.*

On the overarching question related to Innovation Grants to Smallholders

Overarching hypothesis O1: *Innovation grant systems that combine the grants to smallholders with enabling and brokering access to additional services to address imperfections in the innovation system are more effective in achieving improved livelihoods than the systems that work only on financing farm-level innovations (e.g. knowledge, technologies).*

Most studies mention the need for wider support, beyond the grant, to enable positive impacts of innovation processes. There are no studies that compare different packages of support. Impact studies provide weak support but the hypothesis is considered to be valid by most authors.

Conclusion: *strong supporting evidence in studies.*

Overarching hypothesis O2: *Grant systems that combine different modalities of grant allocations (e.g. combining demand-driven research funds with service voucher schemes) are more effective in achieving outcomes at scale than single modality grant systems solely directed at farm households.*

The studies that treat the innovation grant systems within more comprehensive support policies (especially Chile's experience with business support grants (Berdegué 2001) and extension vouchers (Bebbington and Sotomayor 1998) and the studies on NAADS (Ekwamu and Brown 2005; Benin, Nkonya et al. 2008; Friis-Hansen 2008) are all positive about this broader environment of support. The comparative literature, e.g. World Bank (2010), also supports the assumption.

Conclusion: *moderate supporting evidence in studies.*

Conclusions and recommendations

Innovation grant systems have a small evidence base on impacts but a plausible rationale …

Innovation grant funds are 'hot' and implemented widely. However, our review shows that studies on their functioning and impacts are scarce. We found 20 studies that use a wide range of impact indicators to explore impact. All studies document improvements in most of these indicators. With the notable exceptions of the studies on the Malawi input voucher programme and the studies on the NAADS system in Uganda, the impact studies that we included in the review were conducted by scholars that are or were involved in the implementation of the grant system that they study. We may assume that authors of these studies on innovation grant systems are likely to be more positive about them than truly independent evaluators. However, this is not likely to change the overall picture that smallholders are able to invest grants in changed and innovative agricultural practices. We found no study that challenged the relevance or effectiveness of innovation grant systems for smallholder farmers, as compared to conventional research and extension approaches. Though the evidence base is rather thin, the assumptions in the rationale, on which the decision to implement innovation grant systems is based, remain largely unchallenged. All studies present evidence of the positive changes as a result of these investments in agricultural innovation. Some of the impact studies show mixed impacts on natural resources, especially due to land clearing of tree species or increased cultivation without soil conservation. The negative outcomes reported in these studies are, however, always accompanied by a positive outcome in another area, such as an increase in yields or income. As a result of the wide diversity in contexts and implementation modalities of such funds, it is very difficult to compare their cost-effectiveness. The critical remarks in some of these studies, e.g. in the studies on input vouchers, question the political priority of fund innovation grant systems compared to other interventions such as infrastructural investments or cash transfers. Unfortunately, none of the studies has a research design that generates comparative information about the impact of these alternative policies (the counterfactual); e.g. there is debate on the use of vouchers as a means to spur innovation in East African countries, especially in relation to the amounts of government budgets used to fund it, compared with infrastructural investments or market enabling policies. However, evidence from these impact studies does not challenge the assumption that input vouchers as such indeed can cause impact on yields and, in doing so, trigger innovation in agriculture.

… for facilitating innovation as a complex process …

Most of the impact studies focus on field-level impacts and use household survey data to support their inferences. This partly explains the lack of impact studies on business development grants and innovation support funds. In these grant systems,

the grant is often only one of the many factors contributing to smallholder innovation along with access to markets, improved infrastructure, access to credit, and/or starting levels of social and human capital. Often, these grant modalities explicitly target ongoing innovation processes that are shaped in cooperation with other support entities. Control groups are useful for the assessment of short-term impact in outcomes that directly result from the grant, e.g. of technology packages. However, they are not appropriate for measuring outcomes that need more time to mature, and that result from more complex and diverse innovation processes. For the latter, probably the most common situation for innovation grant systems, the major gains in the quality and usefulness of evaluations, will lie in the accuracy and comparability of the measurement of key changes in the group of beneficiaries.

… where human and social capital drive sustained learning and experimentation

The studies point to an important and transversal outcome of innovation grant systems in addition to their field-level impacts: the creation of human and social capital to sustain creative thinking and innovative practices. The operationalisation of these indicators differs a lot between the studies. Common indicators and common measurement tools could facilitate benchmarking between grant systems and even enable analysis of cost-efficiency. Friis-Hansen (2008) points to the fact that FFS provided the social capital needed for success with other innovation grant systems like NAADS. Gustafson (2002) suggests using these outcomes on human and social capital to judge the relevance of FFS. He proposes considering small grants as 'learning grants' and emphasises the impact on innovative behaviour and innovation capabilities of farmer groups, more than on yields and farmer income. This reconceptualisation could change the position of innovation grants in government policy. Instead of an agricultural development investment, innovation grant funds would be treated more as a vocational training instrument for sustained learning and experimentation. When considered as such, the innovation grant systems contribute beyond the specific project and add to human and social capital. If common proxy-indicators to measure changes in human and social capital for innovation could be developed, this would enable comparison between alternative policies and projects. Potential transversal indicators to measure these outcomes are knowledge on agricultural practices, changes in agricultural practices, capacities of farmers to learn and adapt, and capabilities of farmer groups to generate synergy through collective action. Policy-makers and grant system designers could specify these areas as a major objective of innovation grants, along with outcomes in yield and household income, to create an incentive for projects to measure this human and social capital regularly.

1. Background

1.1 Aims and rationale for review

Grants for agricultural innovation are designed to address shortcomings in the innovation system. They are used in many countries to stimulate private sector and farmer engagement in activities related to technology generation, technology dissemination and overall innovation processes. The increased use of innovation grants in the last decade is a result of two tendencies that shape policies on agricultural extension and advisory services. Firstly, many countries have shifted to a more demand-led agricultural research and development (R&D) system, in which users of R&D has a voice in determining R&D and innovation priorities or even decision-making authority. Secondly, there is growing awareness that agricultural development is not only driven by production technology but also encompasses organisational and institutional change (Klerkx and Leeuwis 2008). Agricultural innovation is, therefore, not only about adopting new technologies; it also requires a balance among new technical practices and alternative ways of organising, for example, markets, labour, land tenure and distribution of benefits (Dormon, Van Huis et al. 2004; Adjei-Nsiah, Kuyper et al. 2008). Agricultural innovation is seen here as a co-evolutionary process, i.e. combined technological, social, economic and institutional change.

The Global Forum on Agricultural and Rural Development (GFAR) organised two international conferences, one in 2010 (at Montpellier in France) and one in 2012 (at Punta del Este in Uruguay) to develop a roadmap for a more effective steering of research by farmers and other stakeholders to achieve development impacts (GFAR 2010). Users need to be endowed with decision-making authority to influence the research processes that support innovation (Douthwaite 2002; Klerkx and Leeuwis 2008; Neef and Neubert 2011). Furthermore, there is an increasing recognition that much innovation relevant to smallholders happens 'below the radar' of national research institutes. This makes it essential to have, besides financial support for the formal research and knowledge institutes, research approaches to support experimentation and innovation for and by smallholder agricultural producers (Hall, Clark et al. 2007; Wongtschowski, Triomphe et al. 2010). Therefore, most government policies and donor initiatives aimed at fostering agricultural innovations tend to include a component to support smallholders in their capacity to generate innovation (Wennink and Heemskerk 2006).

Innovation grant funds specifically targeted to smallholder farmers are still quite rare but are receiving increasing recognition as a promising avenue for agricultural innovation (World Bank 2012). The process of obtaining and using the grants stimulates smallholders to be more pro-active and critical towards research and extension providers instead of being passive recipients of top-down technological recipes. This systematic review maps the existing literature on these innovation grants to smallholder farmers, concentrating on the evidence on outcomes of the grant system for smallholders. We use the evidence to revisit assumptions about the key impact pathways that form the rationale behind them.

1.2 Definitional and conceptual issues

The question central to this systematic review is Question 43 of the AusAID (Australian Government Overseas Aid Program), DFID (Department for International Development, UK) and 3ie (International Initiative for Impact Evaluation) joint call for systematic reviews from 2010. It calls for an exploration of the evidence on: '*the effectiveness of innovation grants to smallholder agricultural producers in*

facilitating agricultural innovation, particularly in ways that benefit the poor and women in developing countries'. This review focuses on grant systems that are explicitly directed to fund innovation processes of smallholder agricultural producers. We look at grants, not loans, and therefore do not include systems of micro-credit or revolving funds provided to groups for internal loans, even though these may very well trigger agricultural innovation.

1.2.1 Diversity in modalities

To facilitate comparative analysis, we divided the innovation grant systems into three groups, each with a different funding modality and objectives. In Figure 1.1, we have highlighted them as A, B, and C.[1]

A = Voucher grant systems
B = Business development grant systems
C = Farmer-driven agricultural innovation funds

Each type has its specific way(s) of facilitating innovation. With the exception of voucher grant systems, which are usually targeted directly at individual farmers, the modalities tend to work through intermediate institutions of smallholders, like farmer groups, farmer unions, multi-stakeholder platforms or decentralised extension systems where smallholder representatives have decision-making authority.

For each of these types we developed a 'core' impact logic. These impact logics relate to the causal steps that are expected to translate the grant for innovation into outcomes for smallholders. The typology is just a rough measure to reduce diversity. Within each typology there still remains a high degree of diversity. For example, the degree of involvement and decision making by farmers constitutes one important characteristic that creates diversity. In some systems, the final beneficiaries can have strong decision-making power over the use of the grant, while they can act as passive beneficiaries in other systems.

1.2.2 Diversity in outcomes

The diverse definitions of what is considered an 'innovation grant to smallholder farmers' are challenging, as are the diverse ways in which the outcomes and outcome patterns of these grants are described. Different outcome indicators are used as a proxy for the effectiveness of the facilitating of agricultural innovation (Van den Berg and Jiggins 2007) and there are different processes used for generating these indicators, with diverse methodological mixes of self-assessments and external evaluations. Outcome patterns of innovation grants play out on two levels: directly, influencing the effectiveness of farmer practices and livelihoods, and/or indirectly, changing the effectiveness of the innovation system the farmer is a part of.

1.2.3 Diversity in context

Grant systems will not work the same way in all contexts. There are specific conditions that enable or disable the impact of innovation grants. The types of enabling condition embedded in each grant system are summarised in Figure 1.1 in the four circles around both types of grant modality: governance structure,

[1] In the systematic review protocol (Ton et al. 2011), five types were initially distinguished. During the review process and in consultation with the advisory board, we decided to simplify the typology, because the logic behind the additional subdivision was not clear-cut: on-farm or off-farm is often mixed, and vouchers for inputs or services are not fundamentally different.

institutional setting, social embeddedness and complementary services. In addition to these grant implementation-related contextual factors, there are other conditions that are important for understanding the effectiveness of the grant system, like key production challenges, key market tendencies and political or social conditions in a country or region. Sometimes the grants address imperfections in the broader innovation system, defined as 'a network of organisations, enterprises, and individuals focused on bringing new products, new processes, and new forms of organisation into economic use, together with the institutions and policies that affect the way different agents interact, share, access, exchange and use (World Bank 2006 pp. vi-vii)

1.3 Policy and practice background

While there has been considerable policy attention given to smallholder innovation grants, and experimentation with a great number of grant modalities, there is little and dispersed information on the impact and effectiveness of these grants. There is thus a need for reviewing the existing evidence and analysing whether there are emergent lessons to be learnt from these studies. The systematic review of the available evidence is meant to aid decision making on, and the design of, innovation grants. The intended audience of this report is those people designing innovation grant systems as well as those responsible for the allocation of funding to these systems.

1.4 Research background

Issues related to agricultural innovation grants are discussed in different streams of academic literature. Most of this literature concerns discussions on how to change research and extension systems in such a way that they stimulate innovation in favour of smallholder innovation. Some studies specifically look at the institutional arrangements that enable the end-users of innovation grants and funds to be reached, e.g. local agricultural research committees (CIALs) and farmer field schools (FFS). Others relate to the alternative funding modalities, like competitive funds (CF), public–private partnerships and voucher systems (for example Heemskerk and Wennink 2005; Hartwich and Tola 2007; Klerkx and Leeuwis 2008; Vera-Cruz, Dutrénit et al. 2008). Another branch of the literature looks at the conditions and institutional change necessary to support demand-driven agricultural research and development (for example Dorward, Kydd et al. 2004; Hall, Janssen et al. 2006). There are few studies that explicitly analyse the effectiveness of these different modalities and institutional set-ups. Generally, the authors of research articles present innovation grants as an illustration of a (favoured) approach in order to stimulate research on smallholder impact, rather than as the object of empirical analysis.

The academic debate most closely related to this systematic review is the one regarding the challenge of finding appropriate criteria to judge the validity of research methods. The discussion on the validity of methods is specifically located in the area of evaluation studies, especially when qualitative research is concerned (Farrington 2003; Bamberger and Rugh 2008; Donaldson, Christie et al. 2008; Ton, Vellema et al. 2011a; Snilstveit, Oliver et al. 2012; Stern, Stame et al. 2012).

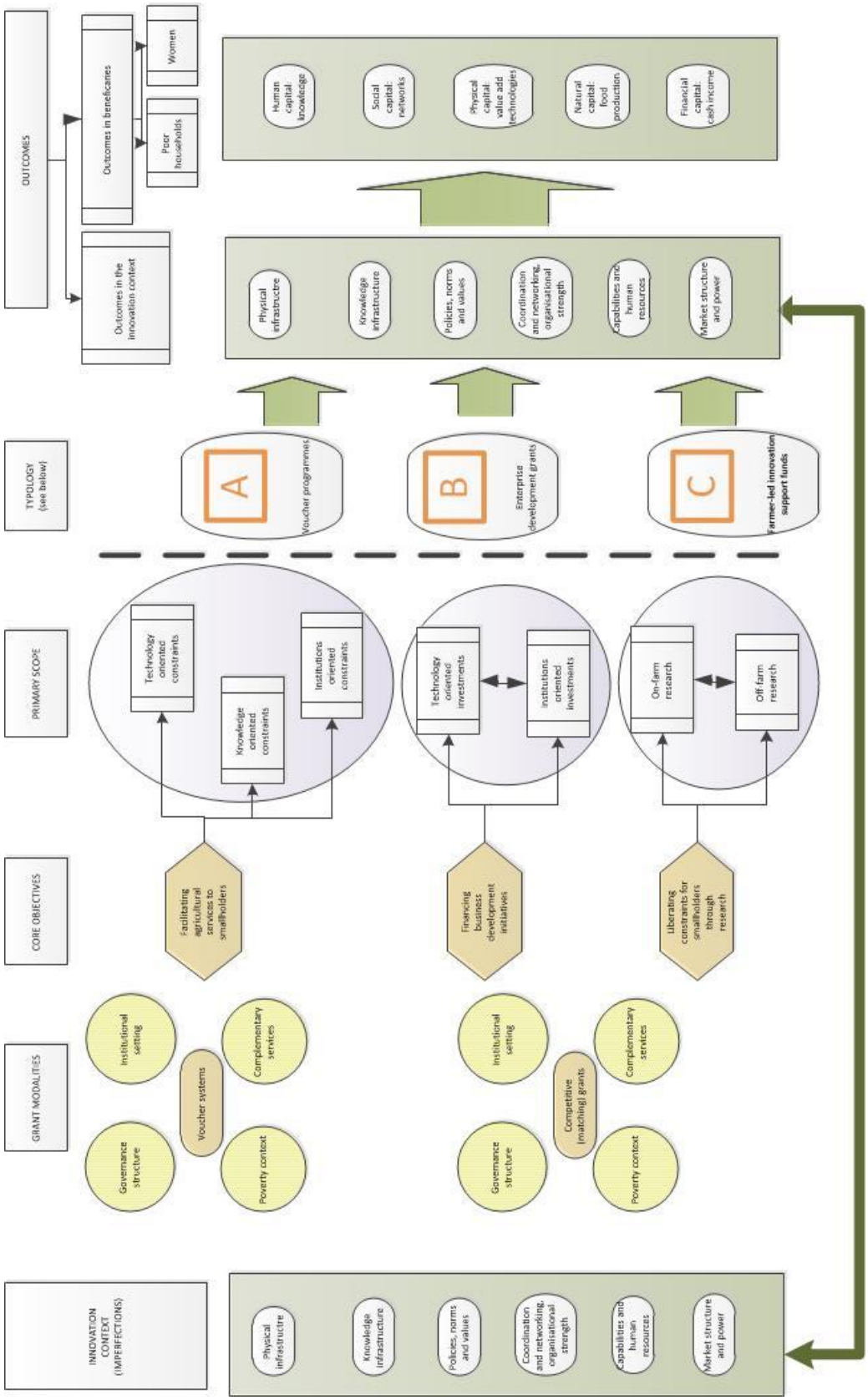


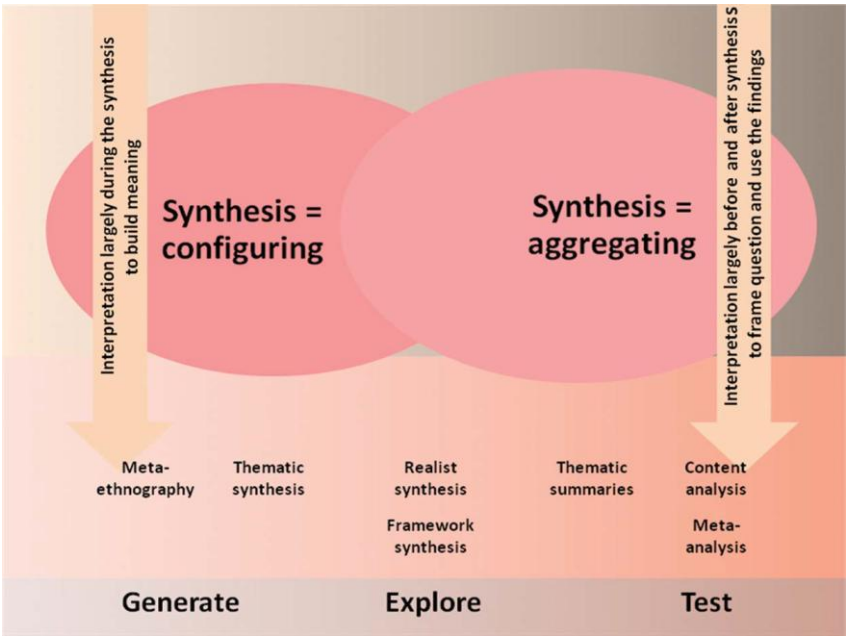
Figure 1.1: Typology of innovation grants covered in this systematic review of innovation grants to smallholder farmers

1.5 Objectives

The systematic review aims to synthesise the available literature in order to elaborate under what conditions innovation funds tend to be effective in facilitating innovation and benefiting the poor and women in developing countries.

In this review, we consider both quantitative and qualitative information relating to the impact of agricultural innovation grants to smallholders. Our approach to synthesis is essentially explorative with many emergent concepts and very limited possibilities for analysing datasets with comparable outcome indicators. Figure 1.2 gives an overview of the different approaches to systematic review. We place our review in the middle of the continuum between aggregative and configurative systematic reviews (Gough, Oliver et al. 2012). The synthesis is, therefore, largely configurative in discovering mechanisms that produce positive outcomes that facilitate innovation by smallholder producers.

Figure 1.2: Different approaches to systematic review



Source: Snilstveit et al. (2012).

2. Methods used in the review

2.1 User involvement

2.1.1 Approach and rationale

We started the development of the systematic research protocol through communication with the person designated by AusAID and the commissioner of the review (Mr Adiel Mbabu). This allowed us to refine our approach and carefully define the boundaries of the research. In doing so, we used the knowledge within the advisory board to develop a typology of grant systems and to highlight the crucial issues where comparative analysis of the studies could provide insights on effectiveness.

The advisory board consisted of people who have been involved in the design of innovation grant systems and/or previously published reviews. Two of the members of the advisory board had been involved in an earlier review of local innovations funds and demand-driven extension services by the Danish Institute of International Studies (DIIS) and the International Research Centre for Agricultural Development, France (CIRAD). An important practitioner network (PROLINNOVA; Promoting Local Innovation) was invited to participate in the advisory group, along with a former practitioner from PROLINNOVA, who since 2010 has been working for the Royal Tropical Institute (KIT) in Amsterdam, the Netherlands.

The advisory board for the systematic review on innovation grants to smallholder farmers is:

- Dr Ann Waters-Bayer
- Mrs Mariana Wongtschowski
- Dr Bernard Triomphe
- Dr Esbern Friis-Hansen

We used the knowledge and experiences of the advisory board to highlight the crucial issues where comparative analysis of the studies could provide insights on effectiveness. The advisory board also linked the review team to unpublished material that provided evidence on the impact of grant systems. This proved especially useful when it became clear that the systematic search generated information on only a small number of innovation grant systems, and did not capture the whole range of studies that existed on these systems.

The review benefited from training by the EPPI-Centre, especially by Dr Sandy Oliver, on the different approaches to systematic review (Gough et al. 2012) and Dr Geoff Wong, who provided comments on realist synthesis design. The review was registered with the EPPI-Centre, part of the Social Science Research Unit, Institute of Education, University of London, and the protocol was published in December 2011 (Ton, Vellema et al. 2011a).

2.1.2 User involvement in designing and conducting the review

The framework of the systematic review, including its hypotheses and approach was discussed with AusAID in a telephone conference in June 2011. A follow-up telephone conference was organised for the advisory group to provide comments on the draft of the typologies of innovation grant systems. Their comments were incorporated in a modified typology that was communicated to research and

practitioner networks through a dedicated website (http://innovation-grants-review.wikispaces.com/). The link, and information on this site, was circulated into the following communities of practice and e-discussion groups:

- The Knowledge Brokers' Forum (www.knowledgebrokersforum.org/)
- Platform on African and European Partnerships in Agricultural Research for Development (http://paepard.blogspot.com/)
- Global Conference on Agricultural and Rural Development – Africa (http://gcardblog.wordpress.com/tag/africa/)
- Global Forum on Rural Advisory Services (www.g-fras.org/en/)
- Endogenous Livestock Development (http://tech.groups.yahoo.com/group/ELDev/)
- INNOVAGRO (Innovation in the Agri-Food Sector) (www.redinnovagro.in/)
- PROLINNOVA (www.prolinnova.net)
- PTD-Forum (St Ulrich Group) (http://tech.groups.yahoo.com/group/PTD-forum/)

The response to the website generated several useful studies, but fewer than we had expected. The webpage, however, worked quite well, attracting attention to the review itself and generating contacts with people who showed interest in the output of the review. We referred to the website when contacting key people for the provision of additional material and will use it in the dissemination strategy for the synthesis findings.

2.1.3 User involvement in interpreting the review results

A workshop on 2–3 April 2012 was used to review the results of the search, the preliminary results of data extraction and the approach to synthesis. In that meeting, in view of the somewhat disappointing results from the electronic search of peer-reviewed literature, the advisory group also reflected, with the review team members, upon the lessons learnt from other systematic reviews (Hagen-Zanker, Duvendack et al. 2012). This meeting was decisive in adapting the synthesis process and maximising the benefit to practitioners, highlighting both the diversity in implementation methods between and within grant systems, and the diversity in research methods used to collect evidence on impacts. The advisory board supported the steps to proceed proposed by the research team:

- Adapt the initial typology to three grant system modalities;
- Restrict the synthesis to a limited set of innovation funds for which one or more quantitative impact studies are available;
- Conduct additional hand-searching around these systems to complete the evidence base on these funds;
- Compare the range of research methods used to assess impacts;
- Draw lessons learnt on key issues related to grant effectiveness using both the impact studies and other literature on these systems.

Draft results of the synthesis were discussed again with the advisory group in May 2012 and the final version was discussed in December 2012. Additional feedback on the draft final report and review findings were provided in October 2012 by the EPPI-Centre and AusAid, including a peer-review of the draft technical report by Helena Posthumus of the Natural Resources Institute (NRI).

2.1.4 User involvement in communication and dissemination of review results

The review team and the advisory board will feed the review and policy brief into their networks. Where possible, a link to the electronic version of the final report will be sent to the authors and donor organisations mentioned in the studies that are included for data extraction.

To inform development practitioners, the final output will be disseminated through various non-academic websites and information portals. In particular, the policy brief will be translated into French and Spanish. The report will also be linked to the project website in the wiki domain in order to reach the wider public in general, but also the many individuals, whether practitioners or researchers, with a special interest in the topic. The site ranks quite highly in most web search engines. See: http://innovation-grants-review.wikispaces.com.

2.2 Identifying and describing studies

2.2.1 Identification of potential studies: search strategy

Box 2.1: Search terms used in the review

Group of search terms 1: intervention:

Types of innovation grants as defined in the conceptual framework but also referring to the mechanisms and institutions which are supported to steer innovation (see section 1.7):

'innovation fund', 'research fund*', grant*, scheme*, (revolving, trust) fund*, subsid* support, measure*, voucher* (program*, seed, BDS), 'competitive grants', 'basket fund*', 'competitive fund*', finance, financing, loan*, credit*, micro-credit, microcredit, micro-finance, microfinance, farmer-driven farmer driven, farmer led, community-driven, farmer field school*, 'agricultural research committee*'

Group of search terms 2: target population of the intervention:

farm*, 'small farmers', small-holder*, smallholder*, 'agricultural producer*', peasant, small enterprises, subsistence, backyard, small scale, women, gender, 'the poor', rural

Group of search terms 3: aim of the intervention:

agricultural (research, development, innovation*, extension), technolog* (transfer, change, adoption), diffusion, modernization, modernisation, infrastructur*, institution*, knowledge, networking, capabilities, capacity, empowerment, cooperation, co-operation, income, yield*, input*, rehabilitation, productivity, value chain development, 'market access', 'market structure'

Group of search terms 4: location:

General description of countries but also, more specifically, the name of the developing (low-income or middle-income) countries as defined by the World Bank, July 2011: http://data.worldbank.org/about/country-classifications

The review followed several steps in seeking and identifying relevant studies for data extraction. First of all, we sought studies by using combinations of search terms in four groups. Within the groups, the search terms were combined by OR, and between the different groups they were combined by AND. The Boolean type search was adjusted according to the search options of each data source. The search terms used were deliberately quite open, to capture a diverse set of studies from a diverse range of disciplines (see Box 2.1).

This resulted in lists of potentially relevant studies that were merged and stored in the EPPI-Reviewer tool. After removing duplicated studies, the group of reviewers

screened the studies (see section 2.2.3) on title and abstract. Simultaneously, the references on key websites were hand-searched to track down other relevant studies, especially in the grey literature. Those studies that qualified as being relevant, having met the inclusion/exclusion criteria, were included for full-text screening. The studies that qualified for inclusion in the review were checked for relevant references ('snowballing').

In the search, different sources of information were used in order to identify relevant studies (see Appendix 2.2): bibliographic scientific databases, electronic online search engines, specialist websites of organisations and institutions as well as direct contact with experts on innovation grants.

2.2.2 Defining relevant studies: inclusion and exclusion criteria

The following criteria were applied in a full-text assessment of the studies that were identified as relevant by the search terms. Studies included in the systematic review data extraction met the following inclusion/exclusion criteria (also see Appendix 2.1):

2.2.2.1 Title-abstract

i. Exclude on country (developing country).

ii. Exclude on group of intended beneficiary (smallholder agricultural producers, or agricultural service providers).

iii. Exclude if no specific innovation grant, except farmer-driven research and extension (vouchers, matching grants, competitive grants. FFS, not: credit-only interventions).

iv. Exclude on sector (agriculture, agroforestry. Not: fishery, forestry, tourism, non-agricultural service provision).

2.2.2.2 Full-text

v. Exclude if no information on at least one characteristic of the grant system (grant governance, institutional setting, poverty context, complementary activities within project).

vi. Exclude if no information on innovation context (system imperfections the grant wants to address).

vii. Exclude if no information on outcomes (innovation context, smallholder livelihoods).

2.2.2.3 Additional for type C:

viii. Exclude if no decision making by beneficiaries on innovation grant system.

2.2.3 Screening studies: applying inclusion and exclusion criteria

After identifying studies in the electronic search, there were two screening phases. Firstly, the title and abstract of the relevant studies were screened by applying the basic inclusion/exclusion criteria to title and abstract. The full-texts were retrieved for those studies that remained after the first screening, and these were assessed by applying an extended list of inclusion/exclusion criteria. Through 'snowballing', the number of included studies was further extended. The selected literature base was mapped according to the type(s) of grant system that they related to. Based on this mapping a selection of empirical innovation funds was

made for which additional internet searches provided several new studies. Some additional studies were sent to the review team by the advisory board members, especially some unpublished reports relating to PROLINNOVA innovation support funds. We organised the synthesis in such a way that the study quality and validity of impact estimates are discussed in the text.

2.2.4 Identifying and describing studies: quality assurance process

During title–abstract screening, two researchers independently reviewed a small sample of the studies (12 studies for each of the four reviewers), and the coding results were cross-checked to identify any different interpretations of the inclusion/exclusion criteria. During full-text screening, the leader of the review team cross-checked the results, and mapped the included studies according to different categories: *impact studies* – studies that presented information and evidence on outcomes in the selected grant systems; *outcome studies* – studies presenting monitoring data on relevant outcome indicators but without conclusions on impact; and *descriptive studies* – studies that discussed the effectiveness of the grant systems without structured data collection on outcomes and impact.

2.3 Methods for synthesis

2.3.1 Assessing the quality of studies

The studies differed in design, in quality of analysis and in the rigour used to make inferences on impact. While some studies included quantitative impact assessment, the majority of studies were of a qualitative nature. During synthesis, we mapped the subset of studies categorised as 'impact studies' (studies with a structured process for collecting data on outcomes of the grant system on agricultural innovation) and assessed the apparent validity threats to authors' conclusions about attribution of impact. In a comparative table, we drew up the outcome indicators used in the study and the strength of the method for making inferences on impact, including the use of methods to control for selection bias and the use of counterfactuals or counterfactual reasoning. We present this overview of outcome areas and proxy-indicators used in each of the impact studies in Chapter 4.

2.3.2 Overall approach to and process of synthesis

A common coding tool was applied in the software application EPPI-Reviewer 4 (Thomas, Brunton et al. 2010) to extract data and information. This was helpful to summarise the relevant information provided by the studies in a comparative format (see Appendix 2.6 for the draft coding tool used to extract information from the studies).

Based on an assessment of the characteristics of the studies we mapped them in three categories:

- Grant fund impact studies: studies with a structured process of data collection on outcomes of the grant system on agricultural innovation;
- Grant outcome monitoring reports: studies that present monitoring data without conclusions about impacts or effectiveness of the grant system;
- Descriptive/comparative studies: studies that discuss the merits and effectiveness of grant systems but without a systematic way of presenting evidence on outcomes of the grant system on agricultural innovation;

The extracted material from the grant fund impact studies became the empirical evidence on impact, while the other studies were used for analysis and reflection on this evidence. In the synthesis, we looked for ways to build arguments around

the core impact pathways for each type of innovation grant system. For each grant system impact study, we gave special attention to the way in which evidence on outcomes was collected and how claims of attribution were made. We scrutinised each of the studies to identify the outcome areas and proxy-indicators used.

Table 2.1: Mapping of the eligible studies

Code	A: Voucher grant systems	B: Business development grant systems	C: Farmer-driven agricultural innovation grants
Grant fund impact study	8	3	9
Grant outcome monitoring report	0	0	6
Descriptive/comparative study	5	5	17

2.3.3 Selection of studies for synthesis

To focus the synthesis, we concentrated on those innovation grant funds for which we had at least one impact study and access to one or more descriptive studies. This made it possible to have different perspectives and compare and contrast information. The selected innovation grant systems are:

- The Ugandan National Agricultural Advisory Services (NAADS) programme;
- The Promoting Local Innovation (PROLINNOVA) programme;
- Latin American business plan competitive grants;
- Self-financed farmer field schools (FFS);
- Local agricultural research committees (CIALs);
- The input starter pack programme in Malawi.

Table 2.2: Selection of innovation funds for the synthesis process

	Input starter pack	Business plan competitive grants	NAADS	PROLINNOVA	Farmer-led FFS	CIAL	General comparative studies	Miscellaneous
Grant fund impact study	6	4	3	1	1	3	0	2
Grant outcome monitoring report	0	0	0	5	0	1	0	0
Descriptive/ comparative study	4	4	3	6	4	5	6	5

2.4 Deriving conclusions and implications

The core impact pathways, already defined in the protocol, served as a framework to anchor the lessons learnt. As we explained in our protocol (Ton, Rau et al. 2011b), we are aware of the subjective and interpretive characteristic of this explorative systematic review, adhering to a realist systematic review paper: 'The essence of our synthesis is interpretation. (…) We are fully aware that (in common

with other qualitative research) this method is subjective and interpretative. Therefore another team reviewing the same literature may arrive at a different set of middle-range theories with which to make sense of this vast field' (Wong, Greenhalgh et al. 2010)

During the workshop with the advisory board, several issues were discussed as possible axes/criteria for mapping diversity between and within grant systems. This long list helped the review team to develop several entry points to map diversity between grant systems.

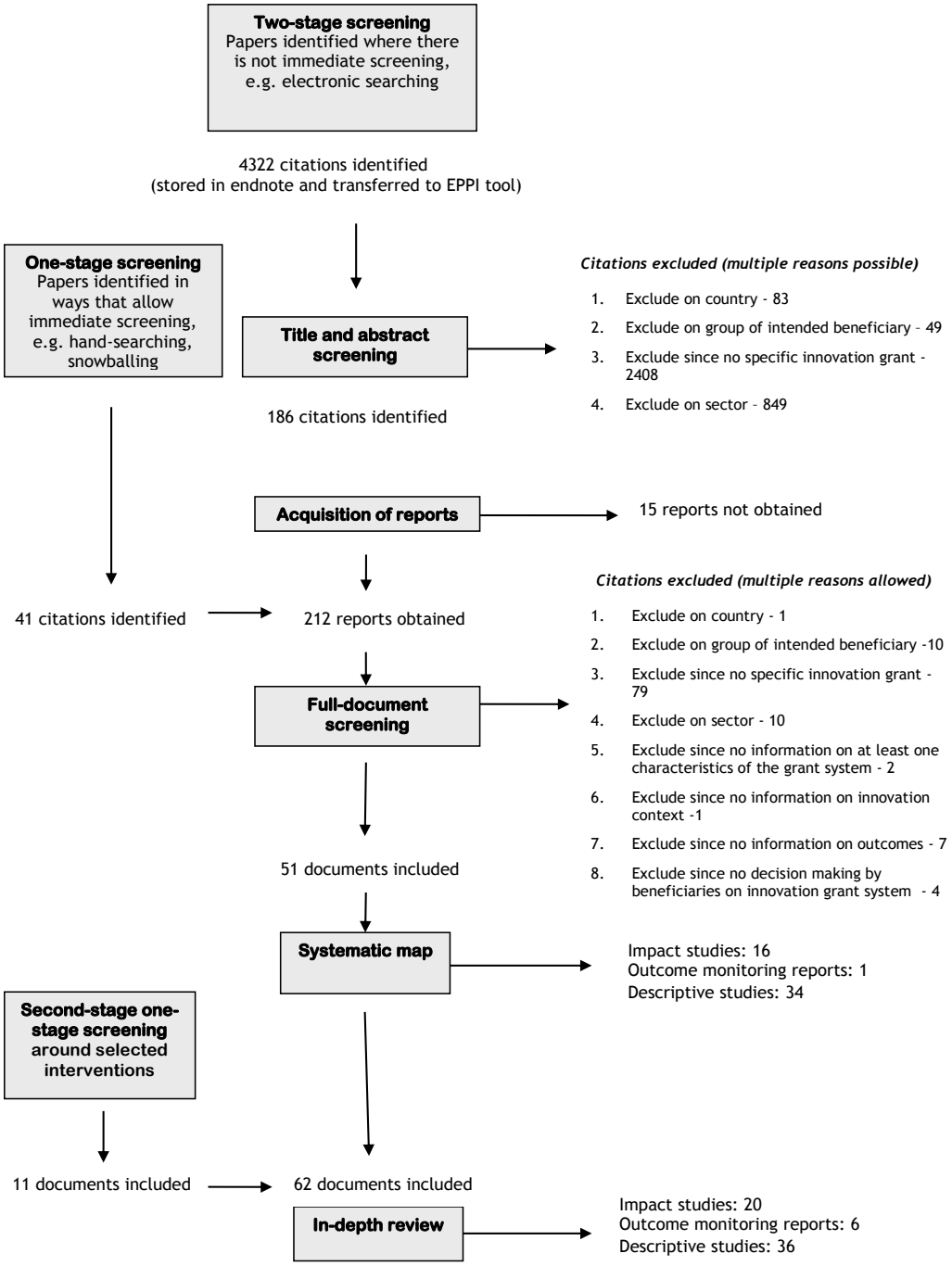
This draft synthesis was prepared by the review team leader and submitted for comments to the advisory board and other review team members, as well as to AusAid and EPPI-Centre. Based on their feedback, the final report was developed and submitted to AusAID and EPPI-Centre.

3. Search results

3.1 Studies included from searching and screening

The studies selected for in-depth review resulted from a structured process of step-wise elimination of search results from electronic databases, complemented with hand-searching and 'snowballing' (looking at the references of an included study to find others).

Figure 3.1: Flow of included studies



3.2 Details of included studies

We list here the studies that we included in the review. More details are given in Appendix 3.1 and in Chapter 4.

1. Anderson JR, Feder G (2004) Agricultural extension: good intentions and hard realities. *World Bank Research Observer* 19(1): 41–60.
2. Ashby JA, Braun AR, Gracia T, Guerrero, MP, Hernández LA, Quirós CA, Roa JI (2000) *Investing in farmers as researchers: experience with local agricultural research committees in Latin America*. CIAT Publication No. 318. Cali: International Center for Tropical Agriculture.
3. Avornyo FK, Kombiok JM (2010) *Farmer Access to Innovation Resources (FAIR) project – Ghana: impact assessment report*. Leusden: PROLINNOVA
4. Azuba-Musoke R, Waiswa C (2004) New approaches to extension service delivery in Uganda: beneficiaries assessment and challenges. Paper presented at: *Animal Health: a Breakpoint in Economic Development? The 11th International Conference of the Association of Institutions for Tropical Veterinary Medicine and 16th Veterinary Association Malaysia Congress*, Petaling Jaya, Malaysia, 23–27 August 2004.
5. Banful AB (2011) Old problems in the new solutions? Politically motivated allocation of program benefits and the 'new' Fertilizer subsidies. *World Development* 39(7): 1166-1176
6. Bebbington A, Sotomayor O (1998) Case study: agricultural extension in Chile. Chapter 7 in: Beynon J, Ackroyd S, Duncan A, Jones S (eds) *Financing the future*. Oxford: Oxford Policy Management.
7. Becker Reifschneider FJ; Byerlee DR, Basilio de Souza F (2000) *Competitive Grants in the New Millennium: a Global Workshop for Designers and Practitioners*. Brasilia: Brazilian Agricultural Research Corporation.
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10. Berdegué JA (2001) *Cooperating to compete: associative peasant business firms in Chile*. Wageningen: Wageningen University.
11. Braun AR, Hocdé H (2000) Farmer participatory research in Latin America: four cases. *Working with farmers: the key to adoption of forage technologies. Proceedings of an international workshop*, Cagayan de Oro City, Mindanao, Philippines, 12–15 October 1999. Canberra: Australian Centre for International Agricultural Research.
12. Braun A, Thiele G, Fernandez M (2000) *Farmer field schools and local agricultural research committees: complementary platforms for integrated decision-making in sustainable agricultural*. AgREN Paper No. 105. London: Overseas Development Institute.
13. Bukenya C (2010) *Meeting farmer demand? An assessment of extension reform in Uganda*. Unpublished thesis, Wageningen University.
14. CEDAC (2011) *Impact assessment report PROLINNOVA and FAIR/LISF Cambodia*.
15. Cobo F (2004) *'Un sueño hecho realidad'. Comité de investigación agrícola local – CIAL 'El Diviso': estudio de caso. Municipio de Rosas, Cauca, Colombia*. Cali: International Center for Tropical Agriculture.
16. Cromwell E, Kambewa P, Mwanza R, Chirwa R (2001) *Impact assessment using participatory approaches: 'starter pack' and sustainable agriculture in Malawi*. AgREN Paper No. 112. London: Overseas Development Institute.

17. Denning G, Kabambe P, Sanchez P, Malik A, Flor R, Harawa R, Nkhoma P, Zamba C, Magombo C, Keating M, Wangila J, Sachs J (2009) Input subsidies to improve smallholder maize productivity in Malawi: toward an African green revolution. *PLOS Biology* 7(1): 9.
18. Dorward A, Chirwa E, Kelly VA, Jayne TS, Slater R, Boughton D (2008) *Evaluation of the 2006/7 agricultural input subsidy programme, Malawi*. Future Agricultures Consortium.
19. Echeverría R (1998) *Will competitive funding improve the performance of agricultural research?* ISNAR Discussion Paper No. 98-16. The Hague: International Service for National Agricultural Research.
20. Ekboir JM, Dutrénit G, Martínez G, Torres Vargas A, Vera-Cruz AO (2009) *Successful organizational learning in the management of agricultural research and innovation. The Mexican produce foundations*. Washington, DC: International Food Policy Research Institute.
21. Ekwamu A, Brown M (2005) Four years of NAADS implementation program outcomes and impact. In: *Proceedings of the Mid Term Review of National Agricultural Advisory Services*. Kampala: Ministry of Agriculture; Animal Industry and Fisheries, pages 25–46.
22. Friis-Hansen E (2008) Impact assessment of farmer institutional development and agricultural change: Soroti District, Uganda. *Development in Practice* 18(4–5): 506–523.
23. Friis-Hansen E, Egelyng H (2006) *Supporting local innovation for rural development: analysis and review of five innovation support funds*. Copenhagen: Danish Institute for International Studies.
24. Fundación Chile (2009) *Impactos de los instrumentos de transferencia technologica en Chile*. Santiago: Consejo Nacional de Innovacíon para la Competitividad.
25. Gebremichael Y, Araya H, Fenta T (2011) *Impact assessment of the Farmer Access to Innovation Resources (FAIR) piloting in Ethiopia*. Leusden: PROLINNOVA
26. Gill GJ, Carney D (1999) *Competitive agricultural technology funds in developing countries*. ODI Natural Resource Perspectives. London: Overseas Development Institute.
27. Govere I, Foti R, Mutandwa E, Mashingaidze AB, Bhebhe E (2009) Policy perspectives on the role of government in the distribution of agricultural inputs to farmers: lessons from Zimbabwe. *International NGO Journal* 4(11): 470–479.
28. Gustafson DJ (2002) Supporting the demand for change: recent experiences with farmer learning grants in Kenya. Case study presented at the workshop *Extension and Rural Development: Convergence of Views on International Approaches?*
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39. Malley ZJU (2011) *Impact assessment of PROLINNOVA and LISF/FAIR activities in Tanzania.* Leusden: PROLINNOVA
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56. van Veldhuizen L, Wongtschowski M, Waters-Bayer A (2005) *Farmer Access to Innovation Resources (FAIR): findings from an international review of experiences*. Working Paper No. 9. Leusden: PROLINNOVA.
57. Vera-Cruz AO; Dutrénit G, Ekboir J, Martínez G, Torres-Vargas A (2008) Virtues and limits of competitive funds to finance research and innovation: the case of Mexican agriculture. *Science and Public Policy* 35(7): 501–513.
58. Waters Bayer, A, van Veldhuizen L, Wongtschowski M, Killough S (2005) *Innovation support funds for farmer-led research and development*. Leusden: PROLINNOVA.
59. Witcombe JR, Devkota KP, Joshi KD (2010) Linking community-based seed producers to markets for a sustainable seed supply system. *Experimental Agriculture* 46(4): 425–437.
60. Wongtschowski M, Triomphe B, Krone A, Waters-Bayer A, van Veldhuizen L (2010) *Towards a farmer-governed approach to agricultural research for development: lessons from international experiences with local innovation support funds*.Leusden: PROLINNOVA
61. IEG-World Bank (2009) *Agricultural research and competitive grant schemes: an IEG performance assessment of four projects in Latin America*. Washington, DC: World Bank.
62. World Bank (2010) Designing and implementing agricultural innovation funds: lessons from competitive research and matching grants. Washington, DC: International Bank for Reconstruction and Development, World Bank.

3.3 Mapping the studies

We mapped the included studies in three categories. Studies that provided information on outcomes in the context of innovation and the livelihoods of smallholders while using a structured process of data collection and analysis through some sort of representative sampling were mapped as 'impact studies'. These studies provide the evidence base for the synthesis. The other literature was mapped as 'descriptive studies'. We introduced a third category of 'outcome monitoring reports', provided in the final stage of the synthesis through the advisory board, that document progress of the grant fund through a structured process of focus group discussions but have a weaker design for assessing impacts in beneficiaries through a representative sample.

3.4 Evidence on outcomes in the impact studies

We summarised the outcome areas and proxy-indicators used to assess impact in tables by type of grant system. In chapter 4 we present the grant system that is the focus of each study, the outcome areas covered in the study and the proxy-indicators used to assess impact. For each of these proxy-indicators we indicate the direction of change and the valuation of this change: some proxy-indicators indicate positive impact when they increase, others when they decrease; some indicators are positive when they do not change (often indicators that point to negative unintended consequences) and others are considered negatively (often the intended consequences of the grant system). We use three categories to summarise the assessment of the change as a result of the grant system: negative – neutral – positive. The valuation of the impact of the grant system is based on the findings of the author(s). The review team made a valuation of the research design used to assess these changes and the methods used to derive inferences on impact. Authors often draw conclusions from several proxy-indicators, but the same research design is not always used for measuring/assessing that particular proxy-indicator. Therefore, a study can be strong on one proxy-indicator and moderate or weak on another. Studies that do not use control groups to assess the counterfactual are sometimes considered as being strong in rigour, when the conditions of the change process induced by the grant system was such that a counterfactual design with control groups was inappropriate or impossible. The latter was especially the case in the business development grant system.

4. Synthesis results

The impact studies included in the synthesis relate to a relatively small number of innovation grant systems. In Chapter 3, we presented evidence on outcomes presented in these impact studies. In this chapter we combine this information with insights from the descriptive studies. We do this in the hope of sharpening our interpretation of and reflections on the evidence on outcomes, specifically in relation to the impact pathways presented in section 1.5.

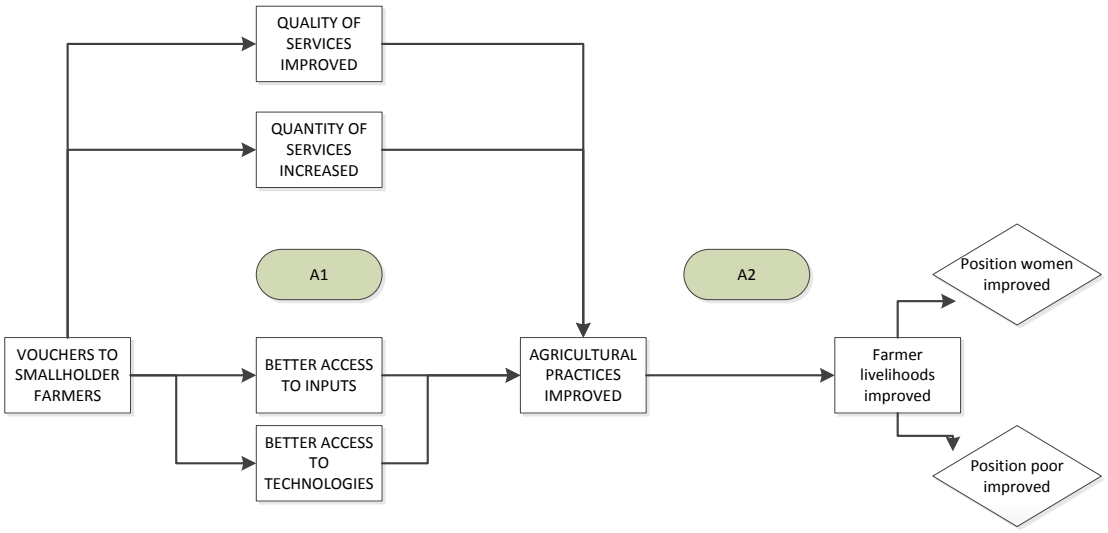
To make them more comparable we have organised the information and evidence in these studies around one or more specific grant systems. A necessary condition was that we had to have more than one study for each grant system, including at least one 'impact study'.

4.1 Impact pathways type A: voucher grant systems

4.1.1 Rationale

This type of innovation grant provides vouchers to distribute subsidies on inputs, technologies and/or services to trigger innovation in agriculture. For example, voucher programmes are used to subsidise the distribution of quality seeds and fertilisers, to promote micro-irrigation, to hand out tools and seeds after conflicts or natural disasters, to distribute heifers in dairy expansion programmes, etc. While in the absolute sense the degree of innovation might seem low, at the local level it does imply major changes in the socio-institutional and technical agricultural system around smallholder farming, and thus facilitates innovation at local level. The objective of input voucher programmes is to impact directly by improving on-farm production, productivity and income/food security. The vouchers are a way to target the subsidies to the recipient groups. A subtype of voucher scheme targets the development of an enabling institutional environment for farmers to produce. Fostering demand from smallholders, the vouchers are used to encourage a sector of service providers to develop knowledge and routines to target farmers, such as private extension services or business development services. This triggers the development of institutions and institutional arrangements that facilitate the innovation by farmers. Vouchers provide a means of 'incubating' a service sector for farmers and an incentive for experimenting with these services by farmers. Generally, they are intended to develop a sector that becomes economically sustainable when the voucher system ends.

Figure 4.1: Impact pathway for voucher grant systems



Vouchers are used to increase the uptake of inputs or support services by a target group. The key causal steps in the impact logic behind voucher grant systems are related to the way that impact on agricultural practices is realised, and the way that these practices translate to improvements in farmer livelihoods.

- Hypothesis A1: *The quantity and quality of inputs and services provided to smallholder famers are enhanced as a result of the voucher system and can be sustained in the future.*
- Hypothesis A2: *Farmers' livelihoods, and in particular those of the poor and women, start to change as a result of the improved agricultural practices enabled by these inputs and services.*

4.1.2 Literature

We focus on the voucher scheme for which various studies selected for the review provide evidence on impact and analyses of the way that these are realised: the Malawi Agricultural Input Supply Programme (AISP).

Table 4.1: Literature on impact of voucher systems for smallholder innovation

Type A	Grant fund impact study	Grant outcome monitoring report	Descriptive study		Largely quantitative	Largely qualitative	Mixed method
Bebbington and Sotomayor (1998)	1					1	
Dorward et al. (2008)	1						1
Holden and Lunduka (2010a)	1				1		
Holden and Lunduka (2010b)	1				1		
KENFAP (2010)	1				1		
Remington et al. (2002)	1						1
Richards (2007)	1						1
Ricker-Gilbert and Jayne (2009)	1				1		
Anderson and Feder (2004)			1		1		
Banful (2011)			1		1		
Denning et al. (2009)			1				1
Govere et al. (2009)			1			1	
Harnett (2008)			1			1	

4.1.3 Malawi Agricultural Input Supply Programme

The Malawian government started implementing the AISP in the 2005/06 season with the stated objectives of improving smallholder productivity and food and cash crop production, and of reducing vulnerability to food insecurity and hunger. Other objectives were promotion of food self-sufficiency, development of the private sector input markets, and wider growth and development. Different suppliers offered different pack sizes of OPV (open pollinated variety) seed and hybrid fertilisers (2 kg of hybrid seed or 2 kg or 3 kg of OPV seed, depending on supplier costs). The seed system introduced an element of farmer choice, with competition between suppliers. In the 2006/07 growing season, the programme allocated two million seed and three million fertiliser coupons to districts and areas within districts for distribution to targeted households. The subsidised fertiliser was distributed through both private and government channels. Six private firms won the right to procure and distribute subsidised fertiliser through their networks. Farmers who received coupons could hand them in at participating retailers along with US$6.75 to redeem their fertiliser. Retailers would then submit the coupon

and receipt to the government for payment. 'Supplementary' NPK and urea coupons were distributed in two subsequent batches, the first comprising one million coupons. Coupons were supposed to be allocated to targeted households only (able farmers who would otherwise be unable to purchase inputs) by village development committees. Allocation procedures in practice varied widely between different areas, with some local authorities deciding to give one coupon each to a larger number of households.

Table 4.2: Summary of the evidence on outcomes in the impact studies of voucher systems for smallholder innovation (type A)

Grant system	Evidence base	Outcome areas	Proxy-indicators	Change	Valuation	Type of method	Rigour of method	Counterfactual	Independent evaluation
Malawi input starter pack	(Holden and Lunduka 2010)	Input use	Application of fertiliser	Increase	Positive	Matched comparison	Strong	Yes	Yes
			Use of improved seeds	Increase	Positive	Matched comparison	Strong	Yes	
			Intensified maize production	Increase	Positive	Matched comparison	Strong	Yes	
		Biodiversity effects	Application of manure	Increase	Positive	Matched comparison	Strong	Yes	
			Indigenous tree vegetation on farms	Decrease	Negative	Matched comparison	Strong	Yes	
			Intercropping system in maize	No effect	Positive	Matched comparison	Strong	Yes	
	(Holden and Lunduka 2010b)	Input market	Size of secondary market for inputs and input vouchers	Increase	Negative	T-test	Strong	Yes	Yes
		Farmer livelihoods	Self-perception on food security	Increase	Positive	T-test	Strong	Yes	
			Agricultural production	Increase	Positive	Regression	Strong	No	
			Perceived food security	Increase	Positive	Simple tabulation	Moderate	Yes	
			Health/school	Increase	Positive	Simple tabulation	Moderate	No	
			Crime level	Increase	Negative	Simple tabulation	Moderate	No	
			Assets accumulation	No effect	Neutral	Regression	Strong	Yes	
		Natural resource base	Area planted	No effect	Neutral	Simple tabulation	Moderate	No	
			Use of organic manure	No effect	Neutral	Simple tabulation	Moderate	No	
	(Ricker-Gilbert and Jayne 2009)	Input use	Use of fertiliser	Increase	Positive	Regression	Strong	No	Yes
	(Dorward, Chirwa et al. 2008)	Farmer livelihoods	Maize output	Increase	Positive	Matched comparisons and simulation	Strong	Yes	Yes

Grant system	Evidence base	Outcome areas	Proxy-indicators	Change	Valuation	Type of method	Rigour of method	Counterfactual	Independent evaluation
			Household food security	Increase	Positive	Regression and simulation	Strong	Yes	
		Input market	Number of agrodealers	Increase	Positive	Time-series	Strong	Yes	
			Changes in sales volume per agrodealer	Increase	Positive	Time-series	Strong	Yes	
		Input use	Use of fertiliser	Increase	Positive	Regression	Strong	Yes	
Sierra Leone – war rehabilitation	(Richards 2007)	Farmer organisation	Knowledge on composition village council	Increase	Positive	Interviews	Moderate	No	Not clear
			Perception of function	Increase	Positive	Interviews	Moderate	No	
			Quality of deliberation	Increase	Positive	Observations	Strong	No	
		Seed diversity	Number of rice varieties used per farmer	Increase	Positive	Interviews	Moderate	No	
			Range of seed varieties requested	Increase	Positive	Interviews	Strong	No	
Kenya inputs access programme	(KENFAP 2010)	Farmer income	Maize production per acre	Increase	Positive	Panel survey	Moderate	No	No
			Gross margin	Increase	Positive	Panel survey	Weak	No	
Chilean Instituto de Desarrollo Agropecuario (INDAP) extension vouchers	(Bebbington and Sotomayor 1998) referring to unavailable study by MIDEPLAN (1994)	Innovation system	Effective co-financing extension services by farmers	No effect	Neutral	Interviews	Strong	No	Yes
		Farmer livelihoods	Household income	Increase	Positive	Random survey	Moderate	No	

4.1.3.1 Reflecting on the impact studies

The Malawi voucher scheme provided a context in which econometric impact evaluation research faced less methodological challenges than in the other types of innovation fund, as its national coverage of most farmer households generated possibilities for deriving inferences on impact from general household surveys, and the intervention/treatment is well defined. The included studies are all independent evaluations, by people not employed by the implementing agency, and have random selection of respondents as part of their research design. Outcome indicators that proxy for agricultural innovation by smallholders are input use, especially fertiliser and improved seeds. Other proxy-indicators for farmer well-being covered in the study by Holden and Lunduka (2010a) are crime levels, health and education, food security – though with evidence collected and analysed using weaker research methods than for the production and income indicators. As an indicator to monitor impact in the institutional organisation in the value chain, all impact studies mention the impact of the input voucher on agrodealers.

4.1.3.2 Reflecting on the impact pathways

4.1.3.2.1 HOUSEHOLD EFFECTS

All impact studies on the Malawi voucher scheme (Dorward, Chirwa et al. 2008; Ricker-Gilbert and Jayne 2009; Holden and Lunduka 2010; Holden and Lunduka 2010b) present convincing evidence for positive impacts on yields and household income when farmers used new seeds and fertiliser. The impact of the vouchers on farmers' asset accumulation is less strong, implying that the cash generated from production (or from the sale of the subsidised inputs on the market) was probably spent on household expenses and food security. The studies on voucher systems show ample evidence that the vouchers indeed lead to the uptake of practices that enhance innovation in the smallholder farming system. The impact studies support the assumption in the impact pathway that vouchers increase inputs or services to farmers. Indeed, effectively, input vouchers translate into an increase in use of the inputs that are offered and an increase in associated yields. The limits set on disposition of the voucher facilitates the growth of an agro-input 'market': the vouchers are a way to establish input supply chains in rural areas that need a threshold market demand; that is, they provide an effective demand for inputs for private investors (agrodealers) to come in with their investments.

All studies mention the possibility that cash transfers instead of vouchers could have similar effects on food security and household well-being, though they would have had less effect on increased agricultural production. A descriptive study that experimented with 'flexi-vouchers', vouchers that could be used to buy inputs and/or food items, confirmed this tendency of households to use a less technology-constrained voucher/grant for non-agricultural objectives, especially soap, sugar and salt (Harnett 2008). If farmer livelihoods and well-being were the sole objective of the implementing agency, cash transfers would be an alternative option that could increase farmer decision making on the grant use. The same arguments for further delinking the value of the voucher from specific inputs or service providers are made in other studies on voucher schemes, like the ones for extension and research support in Chile (Bebbington and Sotomayor 1998). The content of a 'one size fits all' technology package supplied through a voucher system could constrain agricultural innovation, while offering a menu of options to choose from would enhance innovation.

Richards (2007) points to the risk that the distribution through vouchers of a 'one size fits all' seed variety may tend to reduce farmer experimentation instead of facilitating it. The technology is introduced in a context where farmer innovation

practices are already in place, e.g. the simultaneous cropping of a diversity of seeds in small plots, a practice that might be lost due to the cheap flow of the variety provided through the voucher system. The use of the voucher in a context of choice may remediate this. Linking up with seed fairs seems an effective way to provide a choice of seeds; this is a very promising activity that embeds the vouchers in a broader context of local farmer innovation (Remington, Maroko et al. 2002), and generates possibilities for enabling both external certified seeds and locally improved varieties, in addition to possibilities for using the same venues to provide access to other technologies, such as ox-traction, storage facilities, etc., that could trigger innovation by smallholders.

The studies show that without effective targeting mechanisms to ensure they benefit the non-users of inputs, the distribution of vouchers tends to be directed to the farmers who already use the inputs and technologies, substituting part of their cash expenses with government subsidy support, without facilitating agricultural innovation per se. The challenge for voucher schemes that want to avoid subsidising farmers that already use these technologies is to target only the group of smallholders that is currently not using the inputs and can be expected to start doing so as a result of the vouchers. Several targeting mechanisms are mentioned in the studies. The risk is that vouchers are allocated in ways that strengthen existing power relations of exclusive clans (Richards 2007) or influence party politics (Ricker-Gilbert and Jayne 2009; Banful Afua 2011) Richards (2007) points to the importance of transparency and 'ritual' in the distribution of seeds and inputs as a way to build more robust local institutions that might take up other roles and functions than 'just' channeling input subsidies.

4.1.3.2.2 MARKET EFFECTS

Whereas the link between fertiliser use and livelihoods seems quite positive, the picture of impacts on poverty (income) is less clear. The impact studies show positive impact on key elements of the farmer livelihoods, except when prices fall in response to an increase in production in a context of limited markets outside the production area. This is partly the result of the double-position of smallholder households in markets: both as sellers (after the harvest) and as consumers (typically in the period before the harvest). Denning et al. (2009) indicate that lower prices of food benefit farmers-as-consumers, e.g. the poorer households or landless labourers. The increased production and yields also generate work and have an upward effect on casual labour wages in the production areas. Better remuneration of labour benefits especially the poor and women, typically employed in farming and petty trade.

The main mechanism that can prevent the increased yield from translating into better well-being is the impact of a better harvest on farm prices. Market conditions are thus especially important as a moderating factor. In some regions of Kenya, market prices are mentioned as being negatively affected by the increased supply of the crop to remote local markets (KENFAP 2010) in such a way that these locations did not benefit. This is, however, only true when counterfactual reasoning is applied, because, even in this context of low market prices, the additional yields would provide these farmers with more income and food than farmers who had not applied the package. Most studies, therefore, point to the necessary complementing of a voucher scheme with effective market-stabilising local institutions and infrastructure, such as storage facilities and roads and regional trading networks. Without this market infrastructure, a rapid increase in production of one specific crop in an isolated locality can lead to a very low price and provide negative incentives for future farm investments.

4.1.3.2.3 INSTITUTIONAL EFFECTS

Though vouchers stimulate the settlement of agrodealers in rural areas, there are also victims of these dynamics (Govere, Foti et al. 2009; Holden and Lunduka 2010a). Competition between established and new agrodealers can force some previously existing agrodealers to shut down, especially when they are bypassed by the voucher system for political reasons. Holden and Lunduka (2010b) suggest that the emergence of a secondary market of inputs is a threat to existing input-provisioning channels but do not provide convincing evidence for this. Dorward et al. (2008) and Denning et al. (2009) provide evidence that there might be some limits in the mechanisms to target the beneficiaries of the government subsidies, but this cannot be considered an indication of a negative impact on the related local institutions. Another impact study on a similar voucher system conducted by the Kenya National Federation of Agricultural Producers (KENFAP). KENFAP (2010) makes a positive evaluation of the impact on the number and role of agrodealers, though it does not present strong evidence to support this statement and they might have had conflicts of interest, as KENFAP's commercial branch, KENFAP Services Ltd (KSL), was one of the major input providers.

4.1.4 Conclusions

- Hypothesis A1: *The quantity and quality of inputs and services provided to smallholder famers are enhanced as a result of the voucher system and can be sustained in the future.*

  The studies on voucher systems show ample evidence that the vouchers indeed lead to the uptake of practices that enhance innovation in the smallholder farming system. Effective targeting mechanisms to reach non-users are key.

  Conclusion: *strong support in studies.*

- Hypothesis A2: *Farmers' livelihoods, and in particular those of the poor and women, start to change as a result of the improved agricultural practices enabled by these inputs and services.*

  The studies show positive impact on key elements of farmer livelihoods, except when prices fall in response to an increase in production in a context of limited markets outside the production area. The content of 'one size fits all' technology package supplied through a voucher system could constrain agricultural innovation, while offering a menu of options to choose from would enhance innovation.

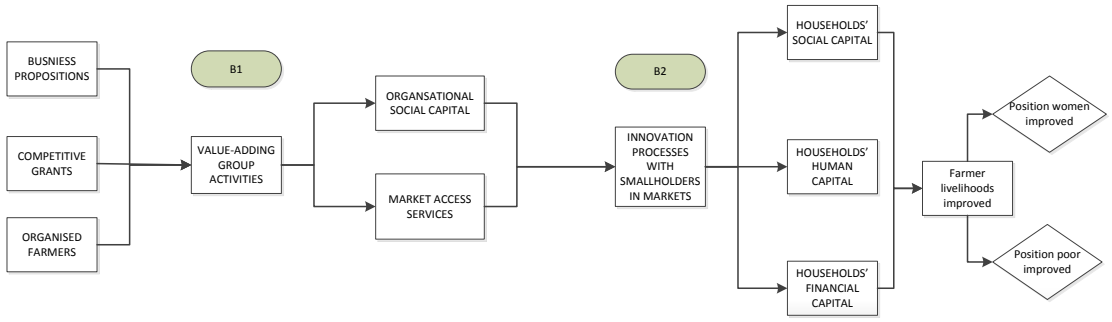
  Conclusion: *moderate support in studies.*

4.2 Impact pathways type B: business development grant systems

4.2.1 Rationale

A special type of grant system focuses on activities that are organised by groups of farmers or smallholder-sourcing enterprises. The investments are made in processing, value-added marketing, etc. Many value-chain development projects have a grant component to help farmers overcome threshold investments hurdles to entering other (urban, regional, international) markets. Business plan competitions are a common term for this type of grant system. The short-term outcomes of these grants are not necessarily located in the farmer households but related to the economic and organisational performance of the group/business. Mid-term direct outcomes for farmers' livelihoods are reflected in better prices and increased sales though the marketing arrangement.

Figure 4.2: Impact pathway for business support grant funds



Business support grants enable farmer organisations to seize business opportunities that facilitate innovation processes in rural areas. The key assumptions relate to the impact on the capabilities of the group and the impact that these have on farmer livelihoods.

- Hypothesis B1: *Competitive grants trigger value-adding business activities by (groups of) farmers as a way to facilitate innovation processes for smallholder farmers in markets.*
- Hypothesis B2: *Farmers' livelihoods improve as a result of social activities and economic returns derived from the new value-adding business activities.*

4.2.2 Literature

Most studies focus on the experiences in Latin America, where in the last decades quite similar business grant systems were introduced in several countries. We look especially at the subgroup of funds that provides matching grants to farmer groups, and we combine insights from the literature on several countries.

Table 4.3: Literature on impact of business support grants for smallholder innovation

Type B	Grant fund impact study	Grant outcome monitoring report	Descriptive study	Largely quantitative	Largely qualitative	Mixed method
Fundación Chile (2009)	1				1	
Sotomayor et al. (2008)	1				1	
IEG-World Bank (2009)	1				1	
Berdegué (2001)			1			1
Hartwich et al. (2007)			1			1
Roy (1989)			1		1	
Ton (2007)			1		1	
Toro (2003)			1		1	
van der Meer and Noordam (2004)			1			1

4.2.3 Matching grants to farmer groups in Latin America

Increasingly, national governments specialise in the design and control of rules and regulations, while the execution of the agricultural support activities is delegated to implementing agencies through competitive grants systems. Through 'matching grants', these funds provide co-financing for agricultural business development.

These activities can vary from research and extension support for companies and farmer organisations as well as for training workshops, pre-professional internships, and even direct subsidies, to necessary infrastructural investments. Generally, these grant funds are managed by decentralised, specialized governmental entities Producer organisations can apply for grants to fund applied technology innovation proposals. They are eligible for funding if they co-finance a percentage of the total funding requested (often 30%), either from their own resources or with the support of third parties, and, of course, if their business proposal meets minimum quality requirements defined by the grant system. When a proposal is deemed eligible for a matching grant, a public call for proposals is sometimes issued to invite private service providers to further elaborate the business case in co-ordination with the farmer organisation that originally submitted the business proposal.

Table 4.4: Summary of the evidence on outcomes and impact in the impact studies of business plan support grant for smallholder innovation (type B)

Grant system	Evidence base	Outcome areas	Proxy-indicators	Change	Valuation	Type of method	Rigour of method	Counterfactual	Independent evaluation
Corredor Puno – Cusco	(Sotomayor, Palma et al. 2008)	Farmer livelihood	Farmer sales volume	Increase	Positive	Self-assessment	Moderate	No	No
			Food security	Increase	Positive	Household survey	Strong	No	
			Household income	Increase	Positive	Household survey	Strong	No	
		Farmer organisation	Use of business planning tools	Increase	Positive	Self-assessment	Moderate	No	
Inspección de Calidad Agricola (INCAGRO), Peru	(IEG-World Bank 2009) referring to Escobal unpublished data (2003, 2005)	Farmer livelihood	Net income per hectare	No	Neutral	Matched comparison	Moderate	Yes	Yes
	(IEG-World Bank 2009) referring to MINAG/INCAGRO unpublished data (2009)		Producer income	Increase	Positive	Household survey	Strong	No	
			Technology adoption	Increase	Positive	Household survey	Moderate	No	
Centros de Gestión, INDAP, Chile	(Fundación Chile 2009)	Farmer organisation	Profits	Increase	Positive	Business survey	Weak	No	No
			Use of business planning tools	Increase	Positive	Business survey	Weak	No	

4.2.3.1 Reflection on the impact studies

Van der Meer and Noordam (2004) reviewed the World Bank portfolio of projects to address market failures, in which competitive grants for business development, 'productive-type projects' are a minor though growing part. They concluded that very few studies look at outcomes that have an economic character; most outcomes reported for this type of project are of a qualitative nature. It is difficult to capture these effects of the grants with household surveys alone, especially as the number of beneficiaries of the business opportunities in the short term tends to be limited. And, even more important, the effects of the business plans need time to mature. Scale can be reached only after some time, when other support and a range of other market factors will have complemented the grant support. Counterfactual designs with control groups at the level of the household are therefore inappropriate to capture the impact of the business grants.

The World Bank (2010) reviews a large number of this type of business development grant funds and concludes that the available evidence on impact is not convincing, especially because of the absence of good studies. The World Bank Independent Evaluation Unit (IEG-World Bank 2009) considers only the study on Inspección de Calidad Agricola (INCAGRO) in Peru a moderately credible one. This virtual absence of impact studies is surprising, as many donors use this modality to allocate resources to promising development areas and business opportunities. For the synthesis, we hand-searched some of these studies. The International Fund for Agricultural Development (IFAD) study on the Corredor Puno – Cusco is illustrative of the good intentions yet great methodological challenges facing the generation of evidence on impact. The need to report within the project period means that most evaluation reports cover a short time span. They focus on disbursement of funds and the outreach (the number of smallholders involved) but only very superficially on the outcomes in terms of farmer livelihoods or changes in the innovation systems. Another reason is the 'embeddedness' of the grant systems in wider systems of support to agriculture, which induces the implementation agencies to evaluate not the effectiveness of the grant modality as a separate instrument, but the impacts on rural development of the total support package.

4.2.3.2 Reflection on the impact pathways

4.2.3.2.1 *HOUSEHOLD EFFECTS*

Most studies included in the review highlight the outreach of their business development grant systems and the diversity of business proposals that have been funded. The evidence that the grant effectively triggers the start-up of value-adding activities by the target group is convincing. However, the evidence on the impact of the activities after start-up on farmer livelihoods is far less convincing, not the least because almost all studies reflected on the performance of the grant fund during its operation and did not follow up the businesses supported by it. Partly this can be explained by the time-interval between the moment that investments are made in the business and the moment that this business translates into livelihood impacts. Berdegué (2001) conducts one of the few studies with a longer time-frame that examines this type of external support to farmer group business activities in a more-than-anecdotal manner. He concludes that the grants to associative business are more effective when they relate to activities in higher-end markets. He states that, in a market economy open to international competition, firms involved in non-traditional products and in markets with high transaction costs have more economic impact on their members' farms and households. His description of the support package to small-scale producers in Chile points to the importance of a range of supporting services, in addition to the financial grant.

Support for the assumption that the business grants trigger changes at the household level is weaker. Impact depends a lot on the performance of the farmer group that handles the grant. The performance of the group is influenced by many more factors than just the grant and, as a result, so are the quantity and quality of their services to their members, the smallholder farmers. The positive influence of farmer groups on their members is an axiom generally considered to be self-explanatory: if this were not the case, the members would withdraw their support. Clarification of membership and the development of internal regulations to sanction deviant behaviour are considered to be essential elements for farmer organisations' production projects to be successful (Berdegué 2001; Ton 2007; Ostrom and Ahn 2009). Trust in and commitment of smallholders to their organisation are strong mediating factors for grants to farmer groups to be effective for smallholders. The literature on farmer-driven agricultural innovation funds described below explores this issue in more detail.

4.2.3.2.2 *Service market effects*

Bebbington and Sotomayor (1998) and Toro and Espinoza (2003) indicate a weak point in the Chilean and similar systems, where the limited market of service providers leads to a situation where farmers are already 'married' to a service provider when submitting a proposal to the grant system, and the co-financing requirements – an essential element for determining the seriousness of the proposal – exist only on paper. They are effectively co-financed by the service provider, not by the farmer group. Hartwich et al. (2007) and Ton (2007) report on similar processes in Bolivia in the Sistema Boliviano de Tecnología Agropecuaria/Fundación para el Desarrollo Tecnológico Agropecuario (SIBTA/FDTA) system. The support provided with the grants – a combination of training and technical support and investment in productive infrastructure – effectively links the farmers with service providers and is complemented with other funding lines to stimulate strategic research with a broader focus than the direct interest of the farmer groups, such as soil fertility. Hartwich et al. (2007) highlight the unintended effects of strict eligibility criteria for service providers being used during the bidding process. It tends to generate operational antagonism between the (locally scarce) service providers; it also points to the limited involvement of more sustainable institutions; in the Bolivian system, universities, non-governmental organisations (NGOs) and government agencies were even explicitly excluded as service providers to the farmers' business plans.

Toro and Espinoza (2003) point to another inherent problem in the competitive bidding process. The criteria used to evaluate the proposals tend to focus on cost-effectiveness, and place value on proposals that have limited overhead and supporting staff costs. Price competition triggered unintended processes that led to partial and low-quality service provisioning by providers. The limited offer means that providers cannot use all the resources that might be available to them (senior staff, facilities, etc.). To resolve this, service providers may enter into oligopolistic or corruptive practices to prevent price competition from competitors.

4.2.3.2.3 *Governance mechanisms*

The difficulties inherent to the functioning of government agencies in clientalist political systems with underpaid staff have led to the general conviction that this type of funding may be better regulated by an independent institution, rather than the government (Echeverría 1998; Gill and Carney 1999). This independence is two-fold: it facilitates transparency of the allocation process to applicants and at the same time it generates a context in which donors are convinced that their priorities are indeed served, making it easier to earmark funds for this purpose. The latter donor dependency, however, can backfire on the long-term sustainability of these grant systems. Donors enter and leave the stage relatively

easily, while government institutions are more permanent. The management of grant systems by independent institutions that obtain at least part of their funding through levies on agricultural production seems a good compromise (Echeverría 1998; Ton and Jansen 2007).

The way in which the governance mechanisms of the specific grant systems are shaped and provide room for effective farmer participation varies greatly. Most service provision contracts between farmer organisations and private service providers paid by business development grants allow for adjustments when things do not proceed as expected (Ton 2007). However, even when adjustment mechanisms exist, the possibility for grassroots farmer organisations to use them effectively is limited by high transaction costs. Questioning a service provisioning arrangement will cost time and money, and it may sometimes result in overt disagreement or conflict that could cost them their reputation with other support agencies in the future. Grassroots farmer organisations will look for ways to prevent this negative image. This is the reason that higher-level farmer organisations tend to be involved in grant governance. They can act on behalf of their member organisations and reduce the eventual costs of discussing contract issues (Ton 2007).

4.2.3.2.4 *Screening of business proposals*

Several 'handbooks' (Wiens and Guadagni 1998; Toro and Espinosa 2003; van der Meer and Noordam 2004; World Bank 2010) present extensive guidance and valuable lessons learnt on the design of transparent, effective and farmer-responsive governance mechanisms. The guidance, however, often falls short when the rules for analysis of the economic/commercial feasibility of the proposals are concerned. Those provided are often no more than 'rule of thumb screening' (Wiens and Guadagni 1998; van der Meer and Noordam 2004). One recommended way to focus grants is to concentrate on areas where more expert knowledge on markets, innovation dynamics and the competitive landscape is available.

Because of the inherent dynamic nature of the business environment, time lags between the initial business proposal and the implementation of the plan create a need for modifications of proposals. However, as the evaluation criteria were applied to a written document and the verdict has to be 'fair' to proposals that were discarded, the room for such adaptability is generally constrained. This inflexibility creates room for 'white elephants', of unused or over-dimensioned infrastructure. Toro and Espinoza (2003) advise instituting an independent 'flexibility committee' to make decisions on this.

4.2.3.2.5 *Institutional context*

The World Bank report on the design of agricultural innovation funds (World Bank 2010) stresses the need to embed the matching grants of business development in a wider context of support, with specific attention to value-chain development platforms and the use of brokers in supporting the applicants to generate better business plans and comply with other fund requirements. While promoting this type of fund because of its flexibility in adapting to demands in diverse and changing contexts, the report advises concentrating the investments in sectors or clusters to generate multiplicity of experiences and a more developed market of service providers and market outlets. This may feed sector dynamics with spill overs and synergies beyond the direct applicants. The World Bank (2010) also stresses the need for field appraisals of the applicant's situation before approving the concept note for further development The information provided by the applicant on paper may differ quite dramatically from the reality on the ground.

Perret (2004), reflecting on IFAD experiences with community development funds, is concerned about the mushrooming of this type of grant fund in the absence of a

good initial understanding of whether a sufficiently enabling political, institutional and social environment exists for its use. He notes that these funds have generally performed better on short-term infrastructural and tangible achievements than on capacity building for longer-term impact, and are better at disbursing funds than channelling benefits to the targeted poor. And he points to another unintended effect, where the provision of a large number of grants may potentially undermine the credit culture and repayment rates for related programmes.

4.2.4 Conclusions

- Hypothesis B1: *Competitive grants trigger value-adding business activities by (groups of) farmers as a way to facilitate innovation processes with smallholder farmers in markets.*

  The studies on business support grants show that the grants indeed translate into investments in technology or support services for business proposals from farmer groups. Initial organisational social capital within the groups is a necessary precondition to develop these proposals and to handle the grants. Grants tend to be a minor factor in a wider constellation of factors that make the business proposal successful. Therefore, outcomes of the grant system on organisational social capital and institutions that provide the context for further development of these businesses are important. The necessary transparent and sustained procedures needed for business support grants place high demands on the governance system. Participation of farmer organisations in the governing body is valued positively by most authors.

  Conclusion: *strong support in studies.*

- Hypothesis B2: *Farmers' livelihoods improve as a result of social activities and economic returns derived from the new value-adding business activities.*

  The three studies that analysed the impact of the business proposals supported by these grant systems documented positive impacts on producers, though their methodologies suffer from the absence in their research design of comparison groups or other methods of counterfactual reasoning. The change in income through the grant-supported business proposals is not necessarily attributable to the grant, and definitely not to the grant alone.

  Conclusion: *weak support in studies.*

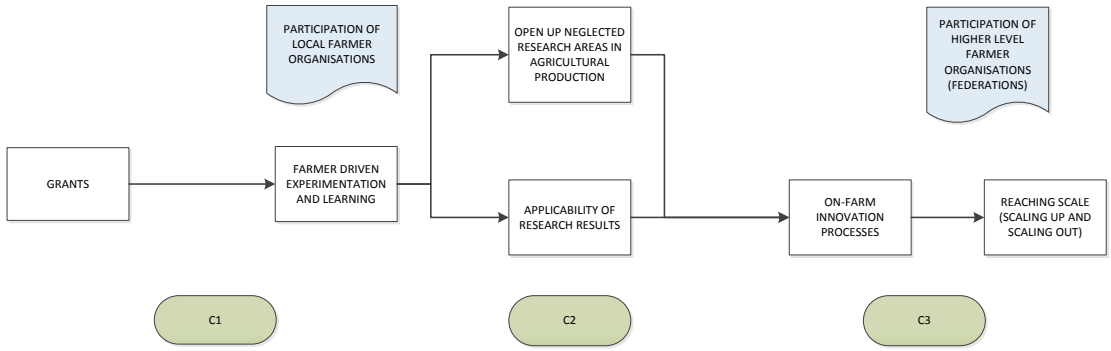
4.3 Impact pathways type C: farmer-led innovation support funds

4.3.1 Rationale

This type of grant system covers research support to farmers for experimentation enabled by the provision of a grant to the service providers (e.g. input providers, NGOs or community-based organisations). A distinctive feature of this system type is that the research grant may be managed (financially and logistically) by a third party, not the farmer.

The logic behind this type of grant system is based on the assumption that farmer experimentation is key to developing, testing and/or adapting innovations that respond to the constraints experienced by the farmers. This farmer-led research is assumed to open up neglected research areas. Participation of farmer organisations in the governance of this type of grant is considered to enhance their effectiveness. We only include studies that explicitly mention participation of farmer organisations in grant governance structure, e.g. by members sitting on decision-making boards, and having formal decision-making authority over grant allocation.

Figure 4.3: Impact pathway for farmer-driven agricultural innovation grants



Farmer-driven agricultural innovation grants are directed at learning about, and experimenting on, key constraints in the farmers' agricultural system. The difference from other agricultural extension and innovation approaches is the assumption that the participation of farmers, through their organisations, in the steering and governance of the grant system makes them effective to reach smallholder farmers who tend to be bypassed in traditional government-led or private-sector-led interventions. The issues that farmer-led grant systems address are assumed to be different from, or complementary to, the issues that would normally be addressed in research and extension.

- Hypothesis C1: *Grants to facilitate farmer-driven experimentation and learning open up neglected research areas in agricultural production and enhance the applicability of research results.*
- Hypothesis C2: *Participation of local farmer organisations in decision making about research grant funds is effective in (re-)directing the research to critical constraints in on-farm agricultural innovation, and particularly to the needs of the poor and women.*
- Hypothesis C3: *Participation of higher-level farmer organisations in decision making about research grant funds is effective in scaling-up and scaling-out on-farm agricultural innovation processes.*

4.3.2 Literature

Table 4.5: Literature on impact of farmer-led agricultural innovation support for smallholder innovation.

Type C	Grant fund impact study	Grant outcome monitoring report	Descriptive study	Largely quantitative	Largely qualitative	Mixed method
Benin et al. (2008)	1			1		
Benin et al. (2007)	1			1		
Ekwamu and Brown (2005)	1				1	
Friis-Hansen (2008)	1					1
Humphries et al. (2000)	1				1	
Kaaria et al. (2006)	1				1	
Sandoval (2009)	1					1
Shroff et al. (2012)	1				1	
Avornyo et al. (2010)		1			1	
CEDAC (2011)		1			1	
Cobo (2004)		1			1	
Gebremichael et al. (2011)		1			1	
Losira (2011)		1			1	
Malley (2011)		1			1	
van der Meer and Noordam (2004)			1			1
Ashby et al. (2000)			1		1	
Becker Reifschneider et al. (2000)			1			
Braun and Hocdé (2000)			1		1	
Braun et al. (2000)			1			1
Bukenya (2010)			1		1	
Friis-Hansen and Egelyng (2006)			1		1	
Gill and Carney (1999)			1		1	
Gustafson (2002)			1		1	
ITAD (2008)			1		1	
Nathaniels (2005)			1		1	
Opondo et al. (2006)			1		1	
PROLINNOVA International Secretariat (2008)			1		1	
Triomphe et al. (2012)			1		1	
van Veldhuizen et al. (2005)			1		1	
Waters-Bayer et al. (2005)			1		1	
Witcombe et al. (2010)			1		1	
Wongtschowski et al. (2010)			1		1	

4.3.3 National Agricultural Advisory Services in Uganda

The NAADS programme in Uganda is a public–private extension service delivery approach with the goal of providing a decentralised, farmer-owned and private sector extension system. The objectives are to enable the 'economically active poor' farmers of Uganda to increase their agricultural productivity and incomes in a sustainable manner. Working under the umbrella of a national NAADS secretariat, formally independent from Ministry of Agriculture, Animal Industries and Fisheries (MAAIF), the programme is being implemented at sub-county level by district NAADS co-ordinators in collaboration with local government staff, private service provider companies and newly formed farmer institutions, i.e. farmer groups, sub-county farmer fora, parish co-ordinating committees and community-based facilitators. Implementation of the 25-year programme started in 2001 in six districts and gradually expanded. By the end of Phase I (2008) NAADS was being implemented in 79 districts. Some 39,600 farmer groups were established and some 715,000 farmers have benefited.

Under the NAADS approach, farmer groups contract private sector service providers (including NGOs) who are awarded short-term contracts to promote specific agricultural activities (called 'enterprises') and provide advisory services. Farmers can decide whether or not to participate in the programme. When a farmer decides to participate, he or she has to do so through membership of a NAADS-participating farmer group. Then, together with the members of the group and of other NAADS-participating groups in the sub-county, they request specific technologies and advisory services associated with their preferred enterprises and also obtain grants to support acquisition and development of those technologies. The grant is initially used to finance the establishment of an experimental plot (technology development site – TDS), the proceeds of which become a revolving fund for members. Thus, the direct benefit or impact of the programme is via farmers' access to this grant or revolving fund. However, the NAADS TDSs and experimenters are accessible to all farmers in the sub-county as sources of knowledge, irrespective of a farmer's membership in a NAADS-participating farmer group. This is the channel through which the indirect benefit or impact of the programme is manifested.

There is a co-ordinator at the district level who works with the sub-county and the local community to identify priorities, manage the allocation of contracts, and monitor and evaluate performance and accountability of service providers and farmer groups. The contracted private firms and individuals who provide the training and advisory services are the primary interface of NAADS with farmers and farmer groups. As part of this system, NAADS provides a revolving fund for members of farmer groups to obtain agricultural inputs for production and marketing. This revolving fund component has been continued in Phase 2, which started in 2011, and is complemented by a matching grant facility for market oriented production groups and individuals.

4.3.3.1 Reflection on the impact studies

The two International Food Policy Research Institute (IFPRI) impact studies (Benin, Nkonya et al. 2007; Benin, Nkonya et al. 2008) are econometrically robust. They also illustrate the difficulty of providing convincing evidence on impacts of a broad range of interventions, in many crops, embedded in different settings, aimed to trigger agricultural innovation. The 2007 study used household surveys without matching the characteristics of the NAADS beneficiaries and the control group. The study was informative about the mixed results of NAADS. The follow-up report (Benin, Nkonya et al. 2008) used four different econometric designs for estimating

impact (average treatment effects) and increased rigour by correcting the differences in outcomes between participants and non-participants through a matching procedure. These four econometric methods to assess impacts, each with different analytical assumptions, result in tables with mixed evidence on impact: some changes in outcome indicators are not significant with some econometric formulas while with other formulas they are.

The study by Friis-Hansen (2008) focuses on one of the districts where NAADS was most successful and refers especially to the processes and mechanism that created different responses of farmers to NAADS, which were induced by a former experience with FFS. He analysed a household survey for groups defined on a poverty ranking based on farmers' own perception of well-being. The complementary use of life-cycle interviews supports his inferences of positive impacts. This mixing of methods reduces the validity threats inherent to the stand-alone use of self-assessments or thick descriptions in case studies. The survey design included a group of respondents who were not member of a NAADS group. Nevertheless, the strong influence of previous FFS interventions in the area constrains the generalisability of the positive evaluation to NAADS as a whole.

Table 4.6: Summary of the evidence on outcomes and impact in the impact studies of NAADS agricultural innovation support grant systems for smallholder innovation (type C)

Grant system	Evidence base	Outcome areas	Proxy-indicators	Change	Valuation	Type of method	Rigour of method	Counterfactual	Independent evaluation
NAADS	(Benin, Nkonya et al. 2007)	Farmer livelihoods	Awareness of improved practices	No	Negative	Household survey	Strong	Yes	Yes
			Use of improved practices	No	Negative	Household survey	Strong	Yes	
			Participation in markets	Increase	Positive	Household survey	Strong	Yes	
			Famer income	Increase	Positive	Household survey	Strong	Yes	
			Food security	Increase	Positive	Household survey	Strong	Yes	
			Soil management	No	Negative	Household survey	Moderate	Yes	
			Farmer empowerment	No	Neutral	Group survey	Moderate	Yes	
		Innovation system	Access to services and institutions	Increase	Positive	Group survey	Moderate	Yes	
			Quality of advisory services	Increase	Positive	Group survey	Moderate	No	
		Farmer organisation	Participation in community activities	No	Neutral	Group survey	Moderate	No	
	(Benin, Nkonya et al. 2008)	Farmer organisation	Farmer empowerment	No	Neutral	Household survey	Strong	Yes	Yes
		Innovation system	Quality of advisory services	Increase	Positive	Household survey	Strong	Yes	
		Farmer livelihoods	Improved agricultural practices	Increase	Positive	Regressions (IV, 2SWR)	Strong	Yes	
			Soil conservation	No	Neutral	Regression (IV, 2SWR)	Strong	Yes	
			Crop productivity	Increase	Positive	Regression (IV, 2SWR)	Strong	Yes	
			Participation in markets	No	Neutral	Regression (IV, 2SWR)	Strong	Yes	
			Livestock productivity	Decrease	Negative	Regression (IV, 2SWR)	Strong	Yes	
			Farmer income	No	Neutral	Regression (IV, 2SWR)	Strong	Yes	

Grant system	Evidence base	Outcome areas	Proxy-indicators	Change	Valuation	Type of method	Rigour of method	Counterfactual	Independent evaluation
FFS/NAADS-Uganda	(Friis-Hansen 2008)	Innovation system	Number of private extension providers	Increase	Positive	Interviews	Moderate	No	Yes
			Analytical and organisational skills	Increase	Positive	Interviews	Moderate	No	
		Farmer organisation	Trust among group members	Increase	Positive	Interviews	Moderate	No	
		Farmer livelihoods	Change in poverty status	Increase	Positive	Household survey and lifecycle interviews and well-being ranking	Strong	Yes	
			Improved agricultural practices	Increase	Positive	Household survey	Strong	Yes	

4.3.3.2 Reflection on the impact pathways

4.3.3.2.1 *INNOVATION EFFECTS*

The demand-led character of NAADS and the process of prioritising 'enterprises' (crops or livestock sectors to be developed as commercial farming activities by the community) indeed created room for manoeuvre for farmers to get the advisory services adapted to issues that they see as important. Opondo et al. (2006) point to the fact that the constrained number of enterprises from which farmers could choose led to the exclusion of certain social groups that had limited ability to work on these enterprises, especially due to limited access to land and labour for commercial crops. However, over time, enterprises selected under NAADS have tended to include activities with lower cost of adoption. Overall, NAADS seems to have made a difference in smallholder farming practices. A study by Ekwamu and Brown (2005) report that only 22% of the households in the NAADS districts have the same top two crops as 10 years ago, suggesting farm households are willing to change production in favour of crop and livestock activities that yield higher returns. Benin et al. (Benin, Nkonya et al. 2008) stress that the quality of advisory services is nevertheless not the only important factor influencing this technology adoption. Credit, access to inputs, adequate access to farming land and mechanisms to cope with unfavourable weather patterns and the incidence of pests are all mentioned as factors for which other government interventions are needed to complement and reinforce the extension support.

4.3.3.2.2 *CONSTRAINTS ON EXPERIMENTATION*

Bukenya (2010) points to the apparent mismatch between the expectation of farmers towards NAADS and the activities that were implemented. His study reveals that farmers were in general enthused by the NAADS campaign of 'farming as a business' in as far as this initiative was seen as intending to revive the agricultural sector. This initial zeal (and appreciation) was, however, soon followed by frustration, when they felt that NAADS did little to facilitate access to inputs and even to improve access to relevant market information. The greater inclination of farmers to value tangible inputs above knowledge led to press statements on the part of the farmers indicating that they could benefit from the knowledge/skills on offer in a more meaningful way if these were backed by appropriate technology instruments (Bukenya 2010).

Until 2007, NAADS had three agricultural innovation grants at the sub-county level: (i) farmer institutional development, (ii) advisory services (provided by private companies, and (iii) technology development. The technology areas ('enterprises') that were supported were developed through a participatory dialogue between three actors: sub-county farmer fora (representing all farmer groups), private service provider companies and district NAADS staff. All three actors influenced the technology enterprise selection and development. Over time, the control of the process by farmers' institutions (farmer fora) gradually increased. Gradually, and especially after 2007, the emphasis became more and more on the transfer of technology. The key assumption that farmer-led innovation grants would lead to a shift in research focus became, therefore, less relevant for NAADS, as the main characteristic became not the generation of improved knowledge and appropriate technologies, but the creation of awareness in farmers of existing technologies and knowledge and linking farmers with service providers that could train the groups on these issues, and/or provide the inputs to experiment with them. NAADS became, in this way, more similar to the Malawi voucher system where the extension of technology to farmers is more important than the generation of knowledge by farmers, which is the key objective in FFS, PROLINNOVA or CIALs. This feature also explains the problems encountered by NAADS where knowledge is less uniform and

codified and where more interaction between the knowledge of the extension worker (private service provider) and the knowledge of farmers is necessary to develop appropriate knowledge and solutions, such as the experimentation and learning related to marketing, an issue which has consistently featured as a low priority in the implementation of the programme (Opondo, German et al. 2006; Benin, Nkonya et al. 2007; Benin, Nkonya et al. 2008; Bukenya 2010).

4.3.3.2.3 *FARMER GROUPS IN GRANT GOVERNANCE*

The original NAADS guidelines called for formation of new agriculturally oriented farmer groups disregarding existing groups or assuming that there were none. However, Opondo et al. (2006) and Friis-Hansen (2008) point to the fact that the districts where NAADS groups emerged often built on an ample set of pre-existing groups. As NAADS groups were formed by election in the village, people and groups that had previous experience in organisations and networks tended to be elected. As a result, the NAADS group members tend to be more affluent than the average farmers in the area (Friis-Hansen 2008). The initial high expectations (Opondo, German et al. 2006; Bukenya 2010) motivated farmers to become active in the groups to obtain access to the (expected) credit and technologies. This 'pull factor' was reinforced by the initial practice of paying farmers for their attendance at NAADS sensitisation sessions (Opondo, German et al. 2006). As the programme progressed, these groups tended to reorganise themselves in response to the reality of reduced access to the tangible inputs from the NAADS programme, leaving a stronger group, primarily motivated by agricultural experimentation.

NAADS is based on farmer groups managed through farmer representatives at sub-county and district levels known as 'farmer fora'. A sub-county farmer fora consists of 15 members, including a chair, a secretary and a procurement subcommittee of seven members. The district farmer fora are made up of the chairs of the sub-county farmer fora. Likewise, the national farmer forum draws representation from the district chairpersons.

The farmer forum members and the sub-county NAADS co-ordinator selected the service providers to work with farmer groups. A weakness in the NAADS system, noted in the study by Opondo et al. (2006), is that the criteria used for this selection were not very transparent. Bukenya (2010) notes that in some regions this created a political discourse among opinion leaders that asked the question as to who – farmers or service providers – are the ultimate beneficiaries of NAADS? Opondo et al. (2006) point to the fact that these farmer fora did function, though with responsibilities for which capacity and 'voice' were initially quite low. The role assumed by the farmer fora was especially to monitor the performance of the service providers. It indeed reflected an empowerment of farmers in the advisory system but created also a certain antagonism between the farmer organisations at the higher level and the service providers and their client groups in the villages (Opondo, German et al. 2006). Friis-Hansen (2008) is more positive about the farmer fora and the empowerment that resulted from the NAADS governance structure, especially in the first phase of NAADS, till 2007.

4.3.4 Local innovation support funds supported by PROLINNOVA

Promoting Local Innovation is an NGO-initiated multi-stakeholder network to stimulate local innovation in ecologically oriented agriculture and natural resource management. The network builds on and scales up farmer-led approaches to development, which starts with finding out how farmers do informal experiments to develop and test ideas for better use of natural resources. Through PROLINNOVA's FAIR (Farmer Access to Innovation Resources) programme, local innovation support funds (LISFs) were initiated to test if and how funds could be

channelled to and accessed by small-scale farmers for pursuing user-generated innovative activities in agriculture and natural resources management and developing innovations of their own choosing. The first phase of FAIR (2006–07) was funded by the French programme 'Promoting Sustainable Development in Agricultural Research Systems' (DURAS) under a competitive grant scheme and focused on action research and setting up and managing LISFs in Cambodia, Ethiopia, South Africa and Uganda. The second phase (2008–11) expanded the number of countries to eight: country platforms in Nepal, Kenya, Ghana (north) and Tanzania joined the initiative. The small grants (typically a few hundred dollars per group of farmers) specifically targeted poor and vulnerable households and focused more (but not exclusively) on local ideas and technologies. Grants can go up to US$2000 or more when stakeholders other than farmers are also involved in the joint experimentation.

Table 4.7: Summary of the evidence on outcomes and impact in the impact studies of PROLINNOVA innovation support grant systems for smallholder innovation (type C)

Grant system	Evidence base	Outcome areas	Proxy- indicators	Change	Valuation	Type of method	Rigour of method	Counterfactual	Independent evaluation
PROLINNOVA	(Shroff, Martin et al. 2012)	Farmer livelihoods	Empowerment of farmers	Increase	Positive	Interviews	Weak	No	Not clear
			Engagement with research	Mixed	Neutral	Interviews	Moderate	No	
			Income from innovations	No	Negative	Interviews	Weak	No	

4.3.4.1 Reflection on the impact studies

Our initial search did not produce any studies that described outcomes of the LISFs in a systematic way. We received at a later stage a series of unpublished studies that were commissioned as impact evaluations. These studies (Avornyo and Kombiok 2010; CEDAC 2011; Gebremichael, Araya et al. 2011; Losira and Mpunga 2011; Malley 2011) used structured interviews in focus group discussions to track progress, harvest stories on significant changes and explore unintended outcomes. The information provides details of beneficiaries' characteristics and qualitative reasoning on the effectiveness and relevance of the innovation funds. The studies in Ghana (Avornyo and Kombiok 2010) and Tanzania (Malley 2011) were the most explicit in describing the methodology, and the teams talked with both grantees and non-grantees. The studies in Ethiopia (Gebremichael, Araya et al. 2011), Uganda (Losira and Mpunga 2011) and Cambodia (CEDAC 2011) reflect more on process and project results (activity outputs) and less on identifying changes in intermediate and ultimate outcomes related to farmer innovation. These participatory impact assessments would have benefited from a complementary survey to put findings from focus groups in context.

The document most closely resembling an external evaluation (Shroff, Martin et al. 2012) has a strong focus on assessing changes as a result of the PROLINNOVA-supported grant system but is not based on structured data collection. The arguments are supported mainly by results of interviews with field staff in two countries, which focused more on the process than the impacts. It is not clear if it is an external and independent evaluation, as Rockefeller Foundation was the main donor of the intervention.

4.3.4.2 Reflection on the impact pathways

4.3.4.2.1 *INNOVATION EFFECTS*

The local support funds promoted by PROLINNOVA cover, compared to the other innovation grant systems studied in this review, a very broad pallet of innovations on crops, technologies and organisation. The comparative literature (van Veldhuizen, Wongtschowski et al. 2005; Friis-Hansen and Egelyng 2006; Triomphe, Wongtschowski et al. 2012) suggests that the opening-up of research to critical constraints of smallholders (hypothesis C1) seems indeed effective and promising, though there is still very little systematic evidence on the discrete innovation processes funded with the grants, nor on the novelty of the experiments of the farmers for the formal research community. The grant amounts involved are also very small, which may make it difficult for implementing NGOs to allocate sufficient resources to structured monitoring and reporting.

4.3.4.2.2 *FARMERS IN GRANT GOVERNANCE*

It proves difficult to strike a cost-effective balance between 'decentralisation – responsiveness – dynamism' and 'quality screening – administrative handling – programme co-ordination'. In PROLINNOVA , over time and across all countries, LISF pilots have generally been moving toward more farmer-led governance mechanisms and structures states (Wongtschowski, Triomphe et al. 2010). Supporting organisations (mostly NGOs) have shifted to building the capacity of farmer groups and ensuring the quality of submitted proposals, rather than managing the LISF directly The control of farmers over the use of the grant and the type of technology used is, compared to for example voucher systems, relatively high because, alongside the wide variety of activities to choose from, the grant fund is generally channelled directly to farmer groups that manage the specific experiments and new business activities.

The development of alternative farmer-governed funding mechanisms for local agricultural research for development is the stated objective of PROLINNOVA (Wongtschowski, Triomphe et al. 2010). The recent studies (Wongtschowski, Triomphe et al. 2010; Shroff, Martin et al. 2012) suggest that, with the exceptions of (i) Uganda, which has a highly farmer-led grant decision-making structure at the local level (Losira and Mpunga 2011), and (ii) Cambodia, which only very recently started to operationalise a long-standing plan to work through the national farmer organisation Farmer Nature Network (FNN) in the first screening of fund requests (CEDAC 2011), most countries still manage the grant fund through NGO partnerships. In Ethiopia, the management of the grant is increasingly aligned with the administrative organisation of the government and existing local service cooperatives (Gebremichael, Araya et al. 2011).

The studies give some support to the assumption in the impact pathway that higher-level organisations are useful for scaling-up and scaling-out. Waters-Bayer et al. (2005) describe the rolling-out strategy of the PROLINNOVA programme through local organisations and institutions that have strong links with farmers, but are not necessarily governed by them. This is slowly changing, also as a result of donor pressure. The change in 2011 to develop a new structure in Cambodia, with FNN taking over the LISF, leaving the NGO partners solely in an advisory role, has been partly motivated by the fact that small-scale NGO-led initiatives were less attractive for funding by the government and international donors (Wongtschowski, Triomphe et al. 2010). The experiences from the PROLINNOVA programme are expected to lead to grant management formats that are easily manageable and will not need expensive local support by NGOs. If this indeed proves possible, the scaling-out through existing networks of farmer organisations or farmer federations looks promising in the future. PROLINNOVA objectives and future plans are assuming the above pathway, but studies do not yet provide the evidence to support or challenge the assumption.

4.3.4.2.3 *LINKS TO RESEARCH INSTITUTES*

PROLINNOVA facilitates an interface between farmers and support organisations in rural innovation. The pilots differ greatly in the way they relate to the wider innovation system. The links with the national research community seem less close than in other innovation grant funds covered in this review (CIALs, FFS, NAADS). The diversity of topics and the relatively unstructured and interactive process of experimentation will make it more difficult to establish these closer links with current formal agricultural research, which has organisational and institutional limitations to dealing with these dynamic changes in research questions.

4.3.5 Farmer-led grants in farmer field schools

Originally, the FFS were developed in Asia. FFS were designed to empower farmers in the longer term and to improve farmers' analytical and decision-making skills, develop expertise in integrated pest management (IPM), and end dependency on pesticides as the main or exclusive pest-control measure. To accomplish this, farmers had to gain an understanding of the agro-ecological production system and experiment with production and pest-control mechanisms. FFS provide an opportunity for 'learning by doing', based on principles of non-formal education. Extension workers or trained farmers facilitate the learning process, encouraging farmers to discover key agro-ecological concepts and develop crop-management and pest-control skills through self-discovery activities practised in the field. Initially, most FFS started around IPM, funded by the Food and Agricultural Organization of the United Nation's (FAO's) FFS–IPM programme. Some of these groups developed a broader focus and continued to function independently of external support.

Farmer-led FFS exist in Kenya, as a result of an FAO-funded pilot project in western Kenya. Since 1996, the number of FFS in Kenya has grown to over 1,100, involving around 25,000 farmers. These have followed the standard experiential learning outline of field schools, with groups of 25–30 farmers meeting weekly over the course of a growing season to try out various crop and livestock production options, examine the results and discuss their appropriateness for individual conditions. Almost all of the field schools have been financed through learning grants, with the funds going directly to the group's bank account. The group pays for FFS materials as well as a fee or travel allowance to the facilitator. Typically, after one year of weekly meetings, members of the FFS group 'graduate'. Some groups will continue deepening their knowledge and/or shift their focus to new issues related to agricultural production, other groups tend to become dormant and can re-activate when needed, e.g. in response to new opportunities for support from development projects.

4.3.5.1 Reflection on the impact studies

There is abundant literature on the effectiveness of the technological change and income effects that result from FFS. A separate systematic review has been conducted by Waddington et al. (Waddington, Snilstveit et al. 2010). However, there are almost no studies that evaluate the effectiveness of farmer-led grant governance in FFS. We could identify only one study that explicitly related to FFS, discussing the role of the group in receiving and handling an innovation grant with a systematic process of assessing impact. This study in Soroti District, Uganda (Friis-Hansen 2008), however, was also related to the NAADS system, and the importance of the human capital created through the FFS obtaining access to NAADS innovation grants. Outcomes and impact statements on the NAADS grant system in Soroti District are, therefore, only partly and indirectly attributable to the FFS and to the grants that are involved in the FFS. Friis-Hansen points to the fact that the role of current FFS in improving the groups' organisational and productive capacities built on the previous FFS project, which had already created a bank account and related administrative procedures that proved an advantage for obtaining access to support through the new NAADS system.

Table 4.8: Summary of the evidence on outcomes and impact in the impact studies of farmer-led FFS innovation support grant systems for smallholder innovation (type C)

Grant system	Evidence base	Outcome areas	Proxy-indicators	Change	Valuation	Type of method	Rigour of method	Counterfactual	Independent evaluation
FFS/NAADS – Uganda	(Friis-Hansen 2008)	Innovation system	Number of private extension providers	Increase	Positive	Interviews	Moderate	No	Yes
			Analytical and organisational skills	Increase	Positive	Interviews	Moderate	No	
		Farmer organisation	Trust among group members	Increase	Positive	Interviews	Moderate	No	
		Farmer livelihoods	Change in poverty status	Increase	Positive	Household survey and lifecycle interviews and well-being ranking	Strong	Yes	
			Improved agricultural practices	Increase	Positive	Household survey	Strong	Yes	

4.3.5.2 Reflection on the impact pathways

4.3.5.2.1 *FARMER GROUPS AS SOCIAL CAPITAL*

Many of the FFS in Kenya, documented in the descriptive study by Gustafson (2002), have continued beyond the initial year as such, self-financed by commercial activities that FFS members implement with the knowledge or technologies they have acquired. He indicates that the size of a typical FFS has been designed to provide a critical mass that enables the group to continue when a support project withdraws. The sustainability of the innovation process is in the heads of the farmers, not in the support project that is by definition temporal. Gustafson (2002) mentions the personal link to Kenya Agricultural Research Institute (KARI) staff as an important success, both for the farmer groups that obtain access to wider support than just the FFS, and for the KARI staff that can use them as social infrastructure for research and outreach with and beyond FFS. These FFS members are relatively affluent, but do not form a self-contained group, being in frequent contact with the poorer farmers (Braun, Thiele et al. 2000; Nathaniels 2005; Friis-Hansen and Egelyng 2006). More than a way to open up neglected research areas, the FFS are a way to articulate demand for already developed technologies (Gustafson 2002), to test and 'peer-review' the innovations that are already available, and to promote 'first see then believe' outreach to the wider farming community. Especially for issues like IPM and land conservation, the agro-ecological emphasis in FFS training seems more successful than less intensive training modalities. Interestingly, the FFS-led farmers seem particularly effective as facilitators of innovation when they share knowledge and experiences with farmers outside their own villages (Braun, Thiele et al. 2000), when they are treated as knowledgeable experimenters only, free from other cultural stigmas that may influence the interaction with their neighbours. At the start of an FFS, some participating farmers are not motivated by the experimentation alone but join with an expectation of accessing other (monetary) benefits. However, such farmers generally leave the group during the first six months of meeting and experimenting (Friis-Hansen and Egelyng 2006).

4.3.5.2.2 *FAMERS IN GRANT GOVERNANCE*

Our review of FFS did not allow us to explore the influence of higher-level farmer organisations as moderators of effectiveness, as we found no information on the involvement of farmer organisations in the management of the grants, except in the use of the grant as a revolving fund.

4.3.6 Local agricultural research committees

The 'CIAL approach' was developed at CIAT (International Center for Tropical Agriculture) in Colombia in the 1990s, with the goal of increasing the efficiency of the agricultural research and technology development system by integrating farmers better into the process. It fitted well with the participatory research movement. A CIAL is a highly farmer-led research service that is answerable to the local community. The community elects a committee of farmers chosen for their interest in research and willingness to serve the community. The CIAL conducts research on priority issues identified through a diagnostic process, in which all are invited to participate. The community monitors the performance of the CIAL and is free to add, remove or replace committee members at any time. The CIAL is expected to keep records of its experiments and to make these available to community members. It must also account to the community for its use of the CIAL fund. The CIAL in turn monitors the performance of the technical people that supports it (Ashby et al. 2000). Each CIAL is supported by an agronomist or extension agent who trains the committee members in research design (controls, replicates, systematic evaluation of results) and who visits their trials regularly to

provide technical support. Support for the agronomist comes from the institution supporting the CIAL, usually an NGO, the national research or extension service, or some other institution involved in technology development and transfer.

Research problems and priorities are set at the level of the community (by vote), but the experimentation is done by the CIAL on behalf of the community. Community members are able to visit the trials at any time, and results of experiments are disseminated at the level of the community. If a series of experiments identifies a promising technology or practice, the CIAL will recommend it. Costs of experimentation are covered by a CIAL fund. This fund is established to help absorb research risks. The fund is initiated with seed money, which may take the form of a one-off donation from the facilitating organisation. Alternatively, it may be provided from a rotating fund managed by an association of CIALs. Farmers are not paid for their participation or time. The CIAL approach is used in approximately 250 communities in several Latin American countries.

4.3.6.1 Reflections on the impact studies

Comparing the two impact studies on CIALs that we retrieved is interesting. The studies reflect the efforts of the authors to increase the validity of the evaluative findings; the first (2006) study was improved in the subsequent (2009) paper with additional data. The main difference in the analyses is the use, in the later study, of a comparison group of villages that are not supported by a CIAL to allow counterfactual reasoning about impact. Sandoval et al. (2009), using data from a comparison group, come to somewhat different conclusions to those in the earlier study (Kaaria, Lilja et al. 2006). The slight difference in conclusions between the studies provides food for thought, especially with respect to the lack of significant impact on crop yields, and the small difference in the adoption of new agricultural practices between the treatment and control groups. This small difference is explained by the authors as a consequence of the fact that organisations and institutions other than the CIALs were working on agricultural development in the nearby 'control' areas. This illustrates the difficulty of applying a counterfactual design with an 'untreated' control group in rural development, as the counterfactual might not be the absence of a treatment but the presence of another type of treatment. The studies pay particular attention to impacts on social capital, especially on the organisation of farmers, but struggle with finding proxy-indicators that, like 'participation in community organisation', are not intrinsically correlated with baseline characteristics of experimenting farmers. The case descriptions in the descriptive studies on CIALs, especially Ashby et al. (2000), are informative about the impact on social capital but are not categorised as impact studies as they lack a structured design to support conclusions on impact on farmer livelihoods.

Table 4.9: Summary of the evidence on outcomes and impact in the impact studies of CIAL agricultural innovation support grant systems for smallholder innovation (type C)

Grant system	Evidence base	Outcome areas	Proxy-indicators	Change	Valuation	Type of method	Rigour of method	Counterfactual	Independent evaluation
CIAL	(Kaaria, Lilja et al. 2006)	Farmer livelihoods	Experimenting with new agricultural practice	Increase	Positive	Household survey	Moderate	No	No
			Adoption of new agricultural practice	Increase	Positive	Household survey	Moderate	No	
		Farmer organisation	Participation in community organisations	Increase	Positive	Household survey	Weak	No	
	(Sandoval, Kaaria et al. 2009)	Farmer organisation	Participation in community organisations	No	Neutral	Household survey	Strong	Yes	No
			Farmer-to-farmer extension	Increase	Positive	Household survey	Moderate	Yes	
		Farmer livelihoods	Adoption of new seed varieties	Increase	Positive	Household survey	Strong	Yes	
			Adoption of other new agricultural practice	No	Neutral	Household survey	Moderate	Yes	
			Target crop yields (beans)	Increase	Positive	Household survey	Moderate	Yes	
			Non-target crop yields	No	Neutral	Household survey	Moderate	Yes	
			Analytical and organisational skills	Increase	Positive	Household survey	Moderate	No	
			Crop diversification	Increase	Positive	Household survey	Moderate	No	
			Yields	Increase	Positive	Household survey	Moderate	No	

4.3.6.2 Reflections on the impact pathways

4.3.6.2.1 INNOVATION EFFECTS

The descriptive studies on the experiences in CIALs (Ashby, Braun et al. 2000; Braun, Thiele et al. 2000; Humphries, Gonzales et al. 2000; Humphries, Gallardo et al. 2005) support the hypothesis/assumption that this approach generates a different research agenda and a different relationship between the researchers and the farmers. The emphasis in most of the CIAL groups is on seed variety development and testing (participatory plant breeding – PPB). The activities facilitate innovation by the farmers involved, but also generate new seed varieties that facilitate agricultural innovation on a wider scale. The case study by Cobo (2004) points to the fact that CIALs prove especially successful and dynamic when their work results in innovations (quality seeds) that can be marketed outside the village to cover organisational expenses. Ashby et al. (2000) also indicate this marketing of innovative products (seeds, crops, value-added products) as an important way to sustain the functioning of CIALs after donor support stops. Experimentation alone seems insufficient to generate enough benefits to the farmer groups to sustain their organisation. Braun et al. (2000) point to the process of diversification of experiments in older CIAL groups to other innovations than seeds, like disease management and soil and water conservation.

Even when the scope of issues that are the focus of the research in a CIAL is a little constrained compared to, e.g. PROLINNOVA and the business development grants with its main focus on small experimental plots for seed selection, for the smallholder farmer it may open a window to a range of other innovations. The CIAL method of systematically working from problem diagnosis through planning a line of action, to evaluating and analysing results, leads to the development of individual and collective capabilities that facilitate innovation in other (even non-agricultural) areas. The social network around CIALs and supporting institutions is also facilitating links to other experimenting farmers, market demands and alternative technologies (Ashby, Braun et al. 2000).

4.3.6.2.2 GROUP SELF-SELECTION

The specific start-up procedure of a CIAL group, the fact that CIAL members are elected by the village, is meant to increase outreach and guarantee accountability for the funds that are managed. The election by the community makes the CIAL, in theory, vulnerable to local elite-capture. However, the amount of money in the innovation fund is very low which makes it attractive only to farmers who really enjoy experimentation. The need to invest additional time in farming and social organisation explains the over-representation of landowners versus landless villagers (Humphries, Gonzales et al. 2000). Many of the CIAL experimenters had played similar roles in previous projects in the village. As described above for FFS, people who are not motivated by the experimentation alone but join with an expectation of accessing other (monetary) benefits generally leave the group during the first six months (Friis-Hansen and Egelyng 2006). Humphreys et al. (2005) stress the utmost importance of social organisational capital in the group, with clear rules and regulations regarding members' obligations to the group and the community, to ensure that the use of the innovations that emerge in the group (e.g. quality seeds) are safeguarded for the group instead of providing private benefits.

A high degree of pre-existing social capital is an asset that makes the innovation fund more effective. The regular meetings, inherent to the CIAL approach, build on social capital and, in doing so, help to enhance it. The organisational and leadership skills required to conduct the weekly/monthly meetings are strengthened by the CIAL process and can help its members to become involved in

a range of other social and economic activities. These skills are evidence of organisational maturity and a capacity for collective action within the CIALs, which is helping to build social capital more broadly in the communities (Humphries, Gonzales et al. 2000; Ashby, Braun et al. 2001).

4.3.6.2.3 FAMERS IN GRANT GOVERNANCE

In both Colombia and Honduras, where the CIAL approach was implemented on a relatively large scale, second-order farmer organisations were created on the basis of the local CIAL groups (Ashby, Braun et al. 2000; Humphries, Gonzales et al. 2000). The two documented higher-level organisations, in Colombia and Honduras, have the maintenance of the CIAL network as their prime focus. They did not exist before CIAL groups were formed. As such, these higher-level organisations cannot be considered as a moderating factor for faster scaling-up and scaling-out. Instead, it is the result of the scaling itself, realised through other mechanisms, principally through the networking with local development NGOs and local research institutes.

4.3.7 Conclusions

- Hypothesis C1: *Grants to facilitate farmer-driven experimentation and learning open up neglected research areas in agricultural production and enhance the applicability of research results.*

  The studies on farmer-led innovation support funds in this review all made reference to the difference that doing this type of participatory research made compared with traditional research in the area and to the benefits of an interactive relationship between the farmers and the technical supporters or researchers. No study had a design that permitted counterfactual reasoning about which other research areas would or would not have been opened up without the grant. Impact studies provide weak support but the hypothesis is considered to be valid by most authors.

  Conclusion: *moderate support in studies.*

- Hypothesis C2: *Participation of local farmer organisations in decision making about research grant funds is effective in (re-)directing the research to critical constraints in on-farm agricultural innovation, and particularly to the needs of the poor and women.*

  The review only examined the studies where farmers participated in the governance structure. The studies show that this participation indeed defines the activities supported by the grant (e.g. NAADS, PROLINNOVA) in ways that make them more in line with their priorities.

  Conclusion: *strong support in studies.*

- Hypothesis C3: *Participation of higher-level farmer organisations in decision making about research grant funds is effective in scaling-up and scaling-out on-farm agricultural innovation processes.*

  The studies all mentioned the progressive involvement of higher-level farmer organisations in the scaling-up and scaling-out of the innovation grant activities. The organisations studied, however, are more a result of the scaling process not the drivers of it. Supporting institutions (NGOs, governments) are more important in this respect.

  Conclusion: *weak support in studies.*

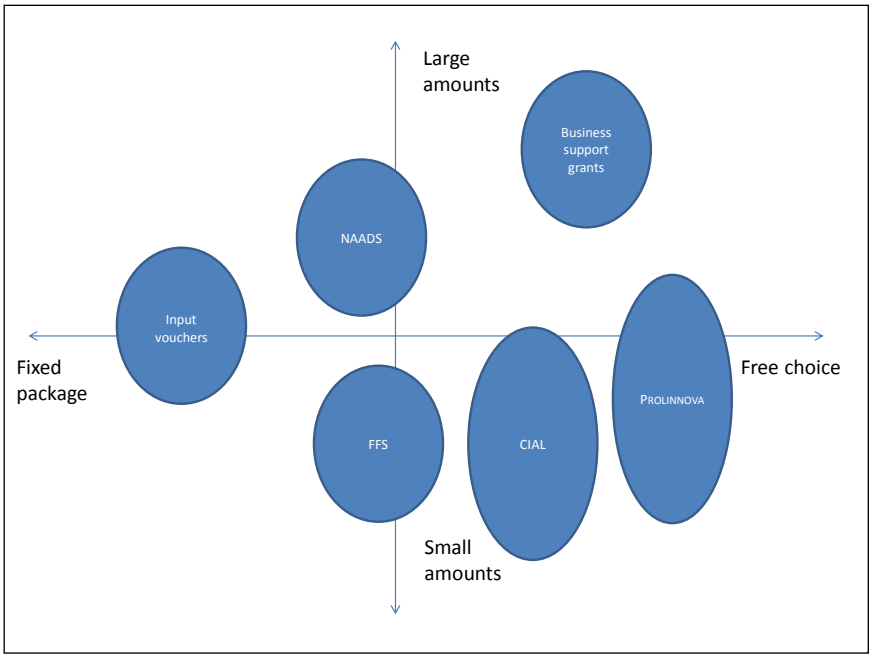
4.4 Improved typology of innovation grant systems

It is difficult to make generalised inferences from studies that refer to different contexts and different ways that grants are allocated and that have different

objectives. However, we distilled some issues from the studies that helped to improve our understanding of the diversity in innovation grant systems, and that tend to be relevant for all the innovation grant studies. While we stressed in Figure 1.1 the difference in innovation grant systems according to the ways that they allocate the grant, we now propose a typology across several other dimensions that are transversal to them.

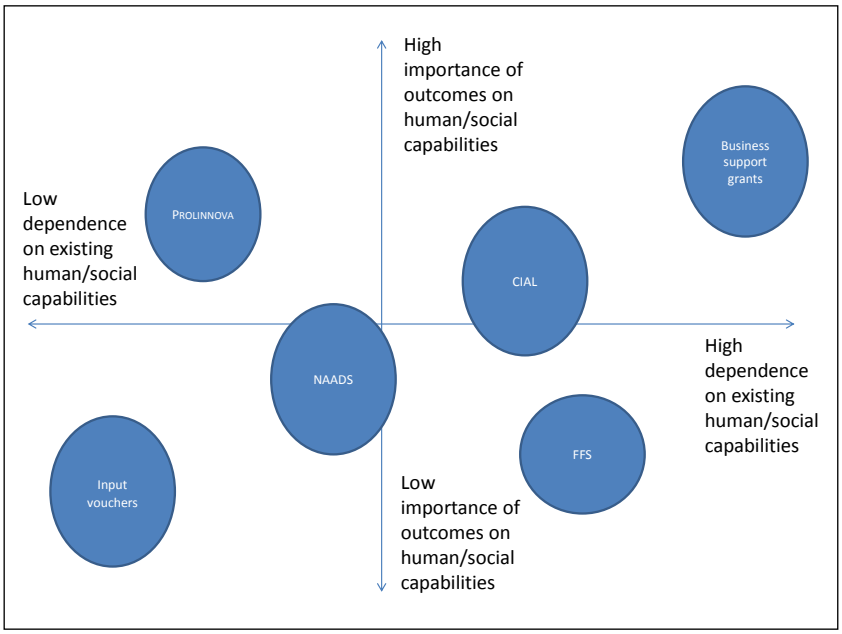
Firstly, innovation in smallholder agriculture comprises both techniques and inputs to solve constraints in production, but also involves changes in the stakeholders involved in the creation and transfer of knowledge and information. The chance that the innovation support grant really addresses key constraints for farmer livelihoods is larger when the content of the innovation is not defined beforehand by outsiders with limited insight into the constraints. Technologies (e.g. seeds, inputs) that are accessible as a result of the subsidy involved may create dependence in the future when the subsidies are not necessarily available. It is therefore recommended to offer choice to farmers in how to use the subsidy. Figure 4.4 gives a schematic picture of the relative position of the innovation grant systems described in the preceding sections on the extent to which they constrain the menu of choice for the farmer. In the same figure, we also depict the relative size of the grant per household involved.

Figure 4.4: Innovation grant systems in relation to the choice of technology and grant size



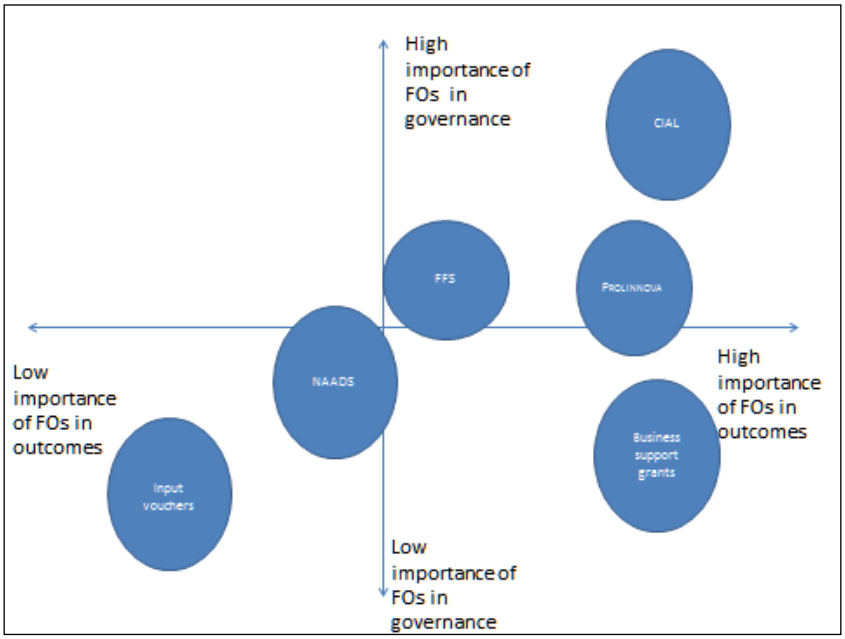
Secondly, each of the grant systems adds to a pre-existing capacity for innovation in the area. Grant systems that target lead farmers or farmer experimenters often build on the capacities created by earlier projects or programmes. Their main outcomes might also be realised in follow-up programmes, where experiences with innovative practices will feed into enhanced learning. The need for initial social and human capital will differ with the type of innovation grant. In Figure 4.5, we depict the relative position of the grant systems in terms of this aspect. We also include in the figure the importance of outcomes in the human and social capital sphere, relative to the outcomes in the sphere of production.

Figure 4.5: Innovation grant systems in relation to social and human capital involved



Thirdly, and finally, we illustrate the characteristics of the innovation grant systems relative to the importance of farmer organisations in governing these systems, and the focus of the grant system in building or strengthening farmer organisations.

Figure 4.6: Innovation grant systems in relation to the role of farmer organisations



FO = farmer organisation.

4.5 Summary of results of synthesis

4.5.1 Support for the hypothesis on impact pathways

4.5.1.1 On voucher schemes

- Hypothesis A1: *The quantity and quality of inputs and services provided to smallholder famers are enhanced as a result of the voucher system and can be sustained in the future.*

  The studies on voucher systems show ample evidence that the vouchers indeed lead to the uptake of practices that enhance innovation in the smallholder farming system. Effective targeting mechanisms to reach non-users are key.

  Conclusion: *strong support in studies.*

- Hypothesis A2: *Farmers' livelihoods, and in particular those of the poor and women, start to change as a result of the improved agricultural practices enabled by these inputs and services.*

  The studies show positive impact on key elements of the farmer livelihoods, except when prices fall in response to an increase in production in a context of limited markets outside the production area. The content of a 'one size fits all' technology package supplied through a voucher system could constrain agricultural innovation, while offering a menu of options to choose from would enhance innovation.

  Conclusion: *moderate support in studies.*

4.5.1.2 On business development grant systems

- Hypothesis B1: *Competitive grants trigger value-adding business activities by (groups of) farmers as a way to facilitate innovation processes with smallholder farmers in markets.*

  The studies on business support grants show that the grants indeed translate into investments in technology or support services to business proposals from farmer groups. Initial organisational social capital of the groups is a necessary precondition for developing these proposals and handling the grants. Grants tend to be a minor factor in a wider constellation of factors that make the business proposal successful. Therefore, outcomes of the grant system on organisational social capital and institutions that provide the context for further development of these business are important. The necessary transparent and sustained procedures needed for business support grants place high demands on the governance system. Participation of farmer organisations in the governing body is valued positively by most authors.

  Conclusion: *strong supporting evidence in studies.*

- Hypothesis B2: *Farmers' livelihoods improve as a result of social activities and economic returns derived from the new value-adding business activities.*

  The three studies that analyse the impact of the business proposals supported by these grant systems document positive impacts on producers, though their methodologies suffer from the absence in their research design of comparison groups or other methods of counterfactual reasoning. The changes in income through the grant-supported business proposals is not necessarily attributable to the grant, and definitely not to the grant alone.

  Conclusion: *weak supporting evidence in studies.*

4.5.1.3 On farmer-led agricultural innovation support funds

- Hypothesis C1: *Grants to facilitate farmer-driven experimentation and learning open up neglected research areas in agricultural production and enhance the applicability of research results.*

  The studies on farmer-led innovation support funds all make reference to the difference that doing research made, and to the benefits of an interactive relationship between the farmers and the technical supporters or researchers. No study has a design that permits counterfactual reasoning about which other research areas would or would not have been opened up without the grant. Impact studies provide weak support but the hypothesis is considered to be valid by most authors.

  Conclusion: *moderate supporting evidence in studies*.

- Hypothesis C2: *Participation of local farmer organisations in decision-making about research funds is effective in (re-)directing the research to critical constraints in on-farm agricultural innovation, and particularly to the needs of the poor and women.*

  This review only examines studies where farmers participated in the governance structure. These studies show that this participation indeed defines the activities supported by the grant (e.g. NAADS, PROLINNOVA) in ways that make them more in line with their priorities.

  Conclusion: *strong supporting evidence in studies.*

- Hypothesis C3: *Participation of higher-level farmer organisations in decision making about research grant funds is effective in scaling-up and scaling-out on-farm agricultural innovation processes.*

  The studies all mention the progressive involvement of higher-level farmer organisations in the scaling-up and scaling-out of the innovation grant activities. The organisations studied, however, are more a result of the scaling process not the drivers of it. Supporting institutions (NGOs, governments) are more important in this respect.

  Conclusion: *weak supporting evidence in studies.*

4.5.1.4 On the overarching question related to innovation grants to smallholders

- Overarching hypothesis O1: *Innovation grant systems that combine the grants to smallholders with enabling and brokering access to additional services to address imperfections in the innovation system are more effective in achieving improved livelihoods than the systems that work only on financing farm-level innovations (e.g. knowledge, technologies).*

  Most studies mention the need for wider support, beyond the grant, to enable positive impacts of innovation processes. There are no studies that compare different packages of support. Impact studies provide weak support but the hypothesis is considered to be valid by most authors.

  Conclusion: *strong supporting evidence in studies.*

- Overarching hypothesis O2: *Grant systems that combine different modalities of grant allocations (e.g. combining demand-driven research funds with service voucher schemes) are more effective in achieving outcomes at scale than single modality grant systems solely directed at farm households.*

  The studies that treat the innovation grant systems within more comprehensive support policies (especially Chile's experience with business support grants

(Berdegué 2001) and extension vouchers (Bebbington and Sotomayor 1998) and the studies on NAADS (Ekwamu and Brown 2005; Benin, Nkonya et al. 2008; Friis-Hansen 2008) are all positive about this broader environment of support. The comparative literature, e.g. World Bank (2010), also supports the assumption.

Conclusion: *moderate supporting evidence in studies.*

4.5.2 Quality of study designs

- A large number of peer-reviewed studies on the grant systems are not geared to make inferences on effectiveness and impacts ('did it work?') but are looking for insights and lessons learnt that could improve the design of the intervention in questions. These descriptive studies may well have an appropriate research design for drawing conclusions on these aspects, but tend to have validity threats when making inferences about effectiveness and impact.
- Only the studies whose design allow the counterfactual situation to be considered (e.g. use a control group, or matched comparisons) present negative or mixed evidence on impact. Authors of all the studies, except one, without such a design, draw positive conclusions on the impact of the innovation grant system. This gives reason to believe that a systematic review that includes non-counterfactual studies will tend to see more positive outcomes, though perhaps for certain subgroups of cases, than reviews that have a counterfactual design as an inclusion requirement. This is to be expected, as these non-counterfactual studies tend to tackle broader questions than assessing treatment effects.
- Most descriptive studies are not independent, as the innovation grant fund designers are often also the main authors of the studies. This could be expected, as the knowledge, insights and lessons learnt on grant design and grant governance are especially located in these practitioners, and they are also motivated to present their experiences to research audiences. There is, however, a risk of reporting bias as they might have an inherent tendency towards 'promoting' instead of 'critically examining' the outcomes of their respective innovation grant funds.
- Many studies are written during the start-up or redesign of the innovation grant system, when there is a need to write project proposals and/or reports on progress during project implementation. Very few studies have observations of the innovation grant system several years after the project period. This makes it difficult to see ultimate outcomes in the sphere of the livelihoods of farmers; within the timespan of the project only immediate outcomes will be realised (improved knowledge, etc.).
- The shortage of studies with a more sophisticated design than *ex-post* panel interviews with recall can be explained by the fact that both the intervention and the outcomes tend to be very diverse in nature. However, provided the funds are available, there is ample room to generate more robust evidence on effectiveness in this type of intervention.
- The number of studies with a design to cope with the counterfactual is limited. Even studies that incorporate quasi-experimental design capture a very limited number of outcome areas, limited to changes in knowledge and adoption of agricultural practices. Many of the conclusions on important outcomes, such as organisational social capital and farmer well-being, even in the studies that used counterfactual designs (Benin, Nkonya et al. 2007; Benin, Nkonya et al. 2008; Sandoval, Kaaria et al. 2009), are not based on measures of these

outcomes in the treatment and comparison groups but on additional questions in the survey for the treatment group only. This points to the fact that important outcome indicators that are less tangible, or that result from more complex interactions, are difficult to capture through survey-based quasi-experimental designs. Qualitative case studies looking at mechanisms of change, e.g. using causal process-tracing, are necessary complements to capture these.

- The grant system with the best-defined intervention pathway is the voucher system, for which a more linear causal relation can be assumed between a more or less homogenous treatment and straightforward outcome indicators. This explains the relatively large number of econometric studies that are related to this type of innovation grant. Survey-based quasi-experimental designs to derive the average treatment effect do 'fit' this type of less complex intervention. Nevertheless, our review also shows that for this type of intervention key insights on governance and targeting are derived from the more qualitative anthropological literature.
- The business support grant system, with an already long-standing trajectory in many Latin American countries and with large budgets that permit strong inherent impact evaluation designs, do not have impact studies with a strong design (World Bank 2010). The design of impact evaluation methodologies for this type of intervention is challenging as a result of the inherent selection bias in this system, where allocation of grants is determined by the quality of the business proposal, and the quality of the business proposal is inevitably related to baseline characteristics of the farmers or farmer groups that apply for such grants. Also, the change processes embedded in these business proposals tend to be more heavily influenced by a wider group of stakeholder and support interventions than just the treatment. The grant is often only a minor factor among the contributing factors in a wider configuration of conditions that defines its impact.
- Some innovation grants have not been subject to independent impact evaluations, as they have been financed by national governments without support from international donor agencies. A good example is the National Innovation Fund in India (NIF), which is the world's largest innovation fund (Friis-Hansen and Egelyng 2006). Even though NIF operates in more than 500 districts in India, no academic studies on NIF outcomes on farmer livelihoods or local innovation systems are available.

5. Strengths and limitations

The use of systematic reviews to gain insight into international development interventions is relatively new. The appropriate approach to a systematic review depends on the review question and the characteristics of the treatment/intervention and the cross-case comparability of outcomes. There has to be a 'fit' (Bamberger, Rao et al. 2010) between the evaluation question and the review methodology. The ambiguity of the definition of 'grants' and 'innovation' in our review question made it virtually impossible to perform a meta-analysis to test hypotheses. We, therefore, decided to do an explorative systematic review and include more studies than only those with counterfactual research designs.

This opening up to a wider body of literature generated time constraints. These time constraints are related to two methods implied by systematic review and defined in the protocol: (i) the harvesting of studies with electronic searches, and (ii) the data extraction through a predefined coding tool. These two activities led to a large period in which there was little substantive analysis of the content of the studies, while the search resulted in a wider range of studies than just those using a quasi-experimental design. As a result, the time available for synthesis was relatively short. Similar observations on the trade-off between the time needed to screen titles and abstracts from the electronic search and the time left for synthesis are made in the Overseas Development Institute (ODI) briefing on their experiences with systematic review (Hagen-Zanker, Duvendack et al. 2012).

6. Conclusions and recommendations

6.1 Conclusions relevant for policy-makers and practitioners

Innovation grant systems have a small evidence base on impacts but a plausible rationale …

Innovation grant funds are 'hot' and implemented widely. However, our review shows that studies on their functioning and impacts are scarce. We found 20 studies that use a wide range of impact indicators to explore impact. All studies document improvements in most of these indicators. With the notable exceptions of the studies on the Malawi input voucher programme and the studies on the NAADS system in Uganda, the impact studies that we included in the review were conducted by scholars that are or were involved in the implementation of the grant system that they study. We may assume that authors of these studies on innovation grant systems are likely to be more positive about them than truly independent evaluators. However, this is not likely to change the overall picture that smallholders are able to invest grants in changed and innovative agricultural practices. We found no study that challenged the relevance or effectiveness of innovation grant systems for smallholder farmers, as compared to conventional research and extension approaches. Though the evidence base is rather thin, the assumptions in the rationale, on which the decision to implement innovation grant systems is based, remain largely unchallenged. All studies present evidence of the positive changes as a result of these investments in agricultural innovation. Some of the impact studies show mixed impacts on natural resources, especially due to land clearing of tree species or increased cultivation without soil conservation. The negative outcomes reported in these studies are, however, always accompanied by a positive outcome in another area, such as an increase in yields or income. As a result of the wide diversity in contexts and implementation modalities of such funds, it is very difficult to compare their cost-effectiveness. The critical remarks in some of these studies, e.g. in the studies on input vouchers, question the political priority of fund innovation grant systems compared to other interventions such as infrastructural investments or cash transfers. Unfortunately, none of the studies has a research design that generates comparative information about the impact of these alternative policies (the counterfactual); e.g. there is debate on the use of vouchers as a means to spur innovation in East African countries, especially in relation to the amounts of government budgets used to fund it, compared with infrastructural investments or market enabling policies. However, evidence from these impact studies does not challenge the assumption that input vouchers as such indeed can cause impact on yields and, in doing so, trigger innovation in agriculture.

… for facilitating innovation as a complex process …

Most of the impact studies focus on field-level impacts and use household survey data to support their inferences. This partly explains the lack of impact studies on business development grants and innovation support funds. In these grant systems, the grant is often only one of the many factors contributing to smallholder innovation along with access to markets, improved infrastructure, access to credit, and/or starting levels of social and human capital. Often, these grant modalities explicitly target ongoing innovation processes that are shaped in cooperation with other support entities. Control groups are useful for the assessment of short-term impact in outcomes that directly result from the grant, e.g. of technology

packages. However, they are not appropriate for measuring outcomes that need more time to mature, and that result from more complex and diverse innovation processes. For the latter, probably the most common situation for innovation grant systems, the major gains in the quality and usefulness of evaluations, will lie in the accuracy and comparability of the measurement of key changes in the group of beneficiaries.

… where human and social capital drive sustained learning and experimentation

The studies point to an important and transversal outcome of innovation grant systems in addition to their field-level impacts: the creation of human and social capital to sustain creative thinking and innovative practices. The operationalisation of these indicators differs a lot between the studies. Common indicators and common measurement tools could facilitate benchmarking between grant systems and even enable analysis of cost-efficiency. Friis-Hansen (2008) points to the fact that FFS provided the social capital needed for success with other innovation grant systems like NAADS. Gustafson (2002) suggests using these outcomes on human and social capital to judge the relevance of FFS. He proposes considering small grants as 'learning grants' and emphasises the impact on innovative behaviour and innovation capabilities of farmer groups, more than on yields and farmer income. This reconceptualisation could change the position of innovation grants in government policy. Instead of an agricultural development investment, innovation grant funds would be treated more as a vocational training instrument for sustained learning and experimentation. When considered as such, the innovation grant systems contribute beyond the specific project and add to human and social capital. If common proxy-indicators to measure changes in human and social capital for innovation could be developed, this would enable comparison between alternative policies and projects. Potential transversal indicators to measure these outcomes are knowledge on agricultural practices, changes in agricultural practices, capacities of farmers to learn and adapt, and capabilities of farmer groups to generate synergy through collective action. Policy-makers and grant system designers could specify these areas as a major objective of innovation grants, along with outcomes in yield and household income, to create an incentive for projects to measure this human and social capital regularly.

6.2 Conclusions relevant for evaluation design

There is need for capturing changes in intermediate outcomes …

There is a need to measure impact in outcome areas where the grant can plausibly claim attribution. Most likely, these are intermediate outcomes related to the grant and not the ultimate impacts in smallholder households. To capture impacts of innovation grants that need time to mature, impact evaluation studies would benefit from time-series data on proxy-indicators for human and social capital, rather than measuring only the impacts on income and yields. The rigorous measurement of human and social capital, e.g. the knowledge and investment decisions of farmers and their organisational capabilities and service delivery of farmer organisations, would also be useful information to inform conclusions on the sustainability of impacts in time.

… with stronger evaluation designs …

Longitudinal studies like regression discontinuity designs might be the most appropriate quasi-experimental design (Shadish, Cook et al. 2002), though these demand observations over a considerable length of time before the grant system is implemented. More common designs to attribute impact to an intervention are

double-difference designs, with a baseline and a comparison group. Difference-in-difference is also an appropriate design when the project planning cycle is concerned. The baseline generates information that feeds the implementation phase and may help in better targeting the appropriate beneficiary groups. The information on control or comparison groups spurs creative thinking and 'surprise'. The strongest, most rigorous, impact studies in the review are based on difference-in-difference designs with control groups.

Innovation funds without a unique 'package' of technology face challenges in implementing research designs that incorporate control groups. Therefore, the approach to impact evaluation that is most used in these situations is the *ex-post* with recall with beneficiaries only. This is the most flexible design, though a less convincing design to determine net effects of interventions; the approach is strong in registering a wide range of outcomes, but weak in attributing them to the intervention.

… where control groups are useful, though not always appropriate …

Any double-difference design that is intended to estimate treatment effects by comparing the indicator scores between treatment and control will need a matching procedure to enable comparisons between treatment and comparison groups. This is important because, due to the constrained geographical coverage and limitations on obtaining a large enough sample of groups and villages within it, the characteristics of the treatment groups may differ importantly from the comparison group (Sotomayor, Palma et al. 2008). In the studies selected for this review, the quasi-experimental designs are based on matching treatment and comparison groups through propensity score matching or two-step Heckman econometric procedures (Benin, Nkonya et al. 2008; Dorward, Chirwa et al. 2008; Holden and Lunduka 2010). These matching procedures are only possible when there is a large sample of farmers or groups of farmers that respond to the same treatment and where adoption is plausibly related to the set of characteristics where data are available in the dataset. The input vouchers in maize, in the Malawi case, is a good example of a grant fund where these designs are appropriate and generate relevant information. Other approaches for matching treatment and control groups, e.g. using the 'cut-off points' of valuation committees for business proposals or the use of pipeline designs (Khandker, Koolwal et al. 2009) are not used in the reviewed studies.

However, matching is seldom possible in more complicated change processes with business support funds or innovation support funds, where the activities or technologies adopted by the group are very diverse, the impact is not always immediate and the factors that explain adoption differ: e.g. dairy processing groups, honey production, seed selection, etc. And, when matching is difficult or impossible, comparing treatment and control groups to derive estimates of impact is not appropriate. It is not advisable for donors to require counterfactual designs (World Bank 2010) to evaluate the impact of these types of project. Such designs may be useful to measure the effectiveness of specific clearly defined subcomponents of these grant schemes but will not inform policy-makers on the relevance and effectiveness of the grant system as such.

… with a need for studies that measure beyond the grant fund implementation period

Due to the short time-intervals between the implementation of a grant fund and the assessment of impact, there is little information on the sustainability of the impact. Evaluations would benefit from time-series data of key outcome indicators.

National monitoring systems, e.g. household poverty surveys, economic indicators, price monitoring, etc., need strengthening, as they could provide this. National monitoring systems could also improve the comparability of outcomes between studies, providing best-practice methodologies for measuring incomes, social and human capital, food security, etc.

Donors should commission impact evaluations on innovation grant programmes that have been supported in the past, e.g. to study ten-years-after effects, using process tracing to identify the role that the innovation grant system has played in shaping the pattern of innovation in a particular sector. Funding support by organisations like 3ie, with a longer time-frame than the funders or implementers of an intervention, could make this happen.

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Appendices

Appendix 1.1: Authorship of this report

Authors of the review

Giel Ton (LEI Wageningen UR)
Karin de Grip (LEI Wageningen UR)
Laurens Klerkx (Knowledge, Technology and Innovation Group, Wageningen University)
Marie-Luise Rau (LEI Wageningen UR)
Marieke Douma (independent consultant)

Review group membership

The review group comprised: Giel Ton (project leader), Laurens Klerkx, Karin de Grip and Marie Luise Rau. The review group was assisted by an advisory board of experts in the development of the conceptual framework for the systematic review, who commented and provided guidance based on their expertise on innovation grants in developing countries. See table below for an overview.

Table A1.1: Review group and advisory group of experts

Surname	Name	Affiliation	Role
Ton	Giel	Agricultural Economics Research Institute (LEI), part of Wageningen University and Research (WUR)	Senior researcher, review team leader.
Klerkx	Laurens	Wageningen University, Communication and Innovation Studies (CIS), part of Wageningen University and Research (WUR)	Assistant professor, review group
de Grip	Karin	Agricultural Economics Research Institute (LEI), part of Wageningen University and Research (WUR)	Researcher, review group
Rau	Marie-Luise	Agricultural Economics Research Institute (LEI), part of Wageningen University and Research (WUR)	Researcher, review group
Douma	Marieke	Independent consultant	Research assistant, data extraction
Waters-Bayer	Ann	PROLINNOVA International Support Team, ETC Foundation (ETC)	Senior advisor
Triomphe	Bernard	French Centre for Agricultural Research for Development (CIRAD)	Senior researcher
Friis-Hansen	Esbern	Danish Institute for International Studies (DIIS)	Senior researcher
Wongtschowski	Mariana	Royal Tropical Institute in Amsterdam (KIT)	Senior advisor

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Acknowledgements
Support in the electronic searches by Hans van Hoeven and Elizabeth Sadi, both librarians at LEI Wageningen UR, is gratefully acknowledged. The project received co-funding from the Knowledge Base programme of the Dutch Ministry of Economic Affairs, Agriculture and Innovation (KB-11-004-003 'Impact of Interventions and Knowledge').

Appendix 2.1: Inclusion and exclusion criteria

Inclusion/exclusion criteria for screening on title and abstract

i. Exclude on country (developing country).

ii. Exclude on group of intended beneficiary (smallholder agricultural producers, or agricultural service providers).

iii. Exclude if no specific innovation grant, except farmer-driven research and extension (vouchers, matching grants, competitive grants. FFS, no credit).

iv. Exclude on sector (agriculture, agroforestry. No fishery, forestry, tourism, non-agricultural service provisioning).

Additional inclusion/exclusion criteria for screening on full-text

Additional for all

v. Exclude if no information on at least one characteristic of the grant system (grant governance, institutional setting, poverty context, complementary activities within project).

vi. Exclude if no information on innovation context (system imperfections the grant wants to address).

vii. Exclude if no information on outcomes (innovation context, smallholder livelihoods).

Additional for type C

viii. Exclude if no decision making by beneficiaries on innovation grant system.

Appendix 2.2: Databases used in the search
The details about the different sources of information used to 'harvest' studies relevant for the systematic review are given below.

Bibliographic scientific databases

- Scopus, the world's largest abstract and citation database of peer-reviewed literature and quality web sources, covering all disciplines
- Web of Science, covering all disciplines
- Web of Knowledge
- Social Sciences Citation Index (SSCI), part of Web of Knowledge
- CAB Abstracts, comprehensive database of the applied life sciences includes agriculture, environment, veterinary sciences, applied economics, food science and nutrition
- AgEcon, site collecting information about agricultural economics, including working papers, conference contributions, etc.
- AGRIS, International System for Agricultural Science and Technology, under the umbrella of Coherence in Information for Agricultural Research for Development (CIARD), CIRAD, FAO
- Agricola, bibliographic database of citations to the agricultural literature created by the US National Agricultural Library and its co-operators
- EconLit, American Economic Association's electronic bibliography, indexes over 120 years of economics literature from around the world
- SocINDEX, most comprehensive and highest quality sociology research database
- TROPAG & RURAL, bibliographic, abstracting and indexing database that brings together the widest range of literature on tropical agriculture from the developing rural areas of Africa, Asia, the Pacific and the Americas
- Gender Studies Database

Library catalogues and journal collections (online)

- ScienceDirect, leading full-text scientific database offering journal articles and book chapters, part of Scopus
- British Library for Development Studies (BLDS): largest collection of economic and social development materials in Europe
- African Journals Online (AJOL), the world's largest online collection of African-published, peer-reviewed scholarly journals
- SciELO, a scientific online library, especially on Spanish Latin American studies, www.latindex.unam.mx/, including Latin American Journals online
- IDEAS, largest bibliographic database dedicated to Economic, economic research, including Research Papers in Economics (RePEc) database

Gateways and specialist websites of organisations and institutions

- Google, internet search engine
- Eldis, collection of editorially selected and abstracted full-text, online documents on development issues
- Jolis, World Bank and IMF (International Monetary Fund) database, http://external.worldbankimflib.org
- 3ie Database of Impact Assessment, covering impact evaluations conducted in low- and middle-income countries, www.3ieimpact.org/database_of_impact_evaluations.html
- Google scholar, general search, the first 150 hits screened with regard to their relevance to the systematic review.
- Social Science Research Network (SSRN), includes working papers and submitted papers under review
- Taylor and Francis online

Appendix 2.3: Review-specific search terms used

The search terms describe the intervention, the target of the intervention and the country where the agricultural innovation grant is applied (see below). In the search, we will use OR within the groups of search terms and AND between the groups to combine the respective search terms.

The Agricultural Information Management Standards (AIMS), web portal managed by FAO (see http://aims.fao.org), and here in particular AGROVOC, which is the world's most comprehensive multi-lingual agricultural vocabulary will be used to define synonyms and search terms related and relevant for the search. The thesaurus provided by CABI will also be used to refine the search terms.

Group of search terms 1: intervention

Types of innovation grant as defined in the conceptual framework but also referring to the mechanisms and institutions which receive support to steer innovation (see section 1.7):

'innovation fund', 'research fund*', grant*, scheme*, (revolving, trust) fund*, subsid* support, measure*, voucher* (program*, seed, BDS), 'competitive grants', 'basket fund*', 'competitive fund*', finance, financing, loan*, credit*, micro-credit, microcredit, micro-finance, microfinance, farmer-driven farmer driven, farmer led, community-driven, farmer field school*, 'agricultural research committee*'

Group of search terms 2: target population of the intervention

farm*, 'small farmers', small-holder*, smallholder*, 'agricultural producer*', peasant, small enterprises, subsistence, backyard, small scale, women, gender, 'the poor', rural

Group of search terms 3: aim of the intervention

Agricultural (research, development, innovation*, extension), technolog* (transfer, change, adoption), diffusion, modernization, modernisation, infrastructur*, institution*, knowledge, networking, capabilities, capacity, empowerment, cooperation, co-operation, income, yield*, input*, rehabilitation, productivity, value chain development, 'market access', 'market structure'

Group of search terms 4: location

General description of countries but also more specifically, the name of the developing (low-income or middle-income) countries used as defined by the World Bank, July 2011 (http://data.worldbank.org/about/country-classifications)

Developing countr*, low-income, middle-income

*Names of low-income countries (*per capita annual income *$1,005 or less):* Afghanistan, Gambia, Myanmar, Bangladesh, Guinea, Nepal, Benin, Guinea-Bissau, Niger, Burkina Faso, Haiti, Rwanda Burundi, Kenya, Sierra Leone, Cambodia, Korea, Somalia, Central African Republic, Kyrgyz Republic, Tajikistan, Chad, Liberia, Tanzania, Comoros, Madagascar, Togo, Congo, Malawi, Uganda, Eritrea, Mali, Zimbabwe, Ethiopia, Mozambique

*Names of lower-middle-income countries (*per capita annual income *$1,006 to $3,975):* Angola, India, São Tomé and Principe, Armenia, Iraq, Senegal, Belize, Kiribati, Solomon Islands, Bhutan, Kosovo, Sri Lanka, Bolivia, Lao PDR, Sudan, Cameroon, Lesotho, Swaziland, Cape Verde, Marshall Islands, Syrian Arab Republic, Congo, Mauritania, Timor-Leste, Côte d'Ivoire, Micronesia, Tonga, Djibouti,

Moldova, Turkmenistan, Egypt, Mongolia, Tuvalu, El Salvador, Morocco, Ukraine, Fiji, Nicaragua, Uzbekistan, Georgia, Nigeria, Vanuatu, Ghana, Pakistan, Vietnam, Guatemala, Papua New Guinea, West Bank and Gaza, Guyana, Paraguay, Yemen, Honduras, Philippines, Zambia, Indonesia, Samoa

*Names of upper-middle-income countries (*per capita annual income *$3,976 to $12,275):* Albania, Ecuador, Namibia, Algeria, Gabon, Palau, American Samoa, Grenada, Panama, Antigua and Barbuda, Iran, Peru, Argentina, Jamaica, Romania, Azerbaijan, Jordan, Russian Federation, Belarus, Kazakhstan, Serbia, Bosnia and Herzegovina, Latvia, Seychelles, Botswana, Lebanon, South Africa, Brazil, Libya, St. Kitts and Nevis, Bulgaria, Lithuania, St. Lucia, Chile, Macedonia, St. Vincent and the Grenadines, China, Malaysia, Suriname, Colombia, Maldives, Thailand, Costa Rica, Mauritius, Tunisia, Cuba, Mayotte, Turkey, Dominica, Mexico, Uruguay, Dominican Republic, Montenegro, Venezuela

Appendix 2.4: List of relevant journals covered
A selection of the relevant journals included in the search. The journals mentioned are covered in the search of the bibliographic and electronic data sources in the search.

- *World Development*
- *Development Policy Review*
- *Journal of Development Studies*
- *Food Policy*
- *Journal of Agricultural Resources*
- *Governance and Ecology*
- *Journal of Agricultural Economics*
- *Journal of Agricultural Education and Extension*
- *Agricultural Systems*
- *Research Policy; Science and Public Policy*
- *Evidence and Policy*

Appendix 2.5: Specialist websites

Specialist websites of organisations/institutions involved in agricultural innovation grants to that were hand-searched.

www.prolinnova.net

www.naads.or.uk

www.ifad.org

www.idcf.org

www.ifpri.org

www.odi.org.uk

www.dfid.gov.uk

www.ausaid.org

www.usaid.gov

www.gatesfoundation.org

www.ilo.org

www.worldbank.org

www.imf.org

Appendix 2.6: Draft coding tool

Attached as a separate document:
'innovation grant data synthesis – coding tool v2.xls'

Appendix 3.1: Synthesis evidence base

Author	Title	Publication type	Grant type	Country	Description	Funding study	Independent from grant system studied?
Grant fund impact studies							
6. Bebbington and Sotomayor (1998)	Case study: agricultural extension in Chile. In: Financing the future.	Book chapter	A – Voucher (miscellaneous)	Chile	This reference draws upon experiences in Chile on innovative approaches to agricultural technology transfer. Technical assistance is delivered to farmers by private organisations and, in principle, farmers 'own' vouchers for the purchase of extension services. The chapter begins by outlining the development of the Chilean model after the introduction of a voucher scheme and subcontracted service provision in 1978. It discusses the preconditions for success and why transferability to sub-Saharan Africa may be limited.	Public institution (DFID)	Yes
9. Benin et al. (2007)	Assessing the impact of the National Agricultural Advisory Services (NAADS) in the Uganda rural livelihoods	Report	C - Agricultural innovation support (NAADS)	Uganda	This study quantifies the initial impacts of NAADS in the districts and sub-counties where the programme was operating by 2005, using descriptive analyses of a survey of 116 farmer groups and 894 farmers in 16 districts where NAADS was operating and 4 districts where NAADS had not yet operated	Public institution (World Bank)	Yes
8. Benin et al. (2008)	Impact evaluation and returns to investment of the National Agricultural Advisory Services (NAADS) program of Uganda	Report	C - Agricultural innovation support (NAADS)	Uganda	Building on the mid-term evaluation of NAADS (Benin et al. 2007, and others), the overall objective of this study was to undertake a rigorous end-of-Phase I evaluation of the NAADS programme to analyse and document the outcomes and the direct and indirect impacts of the programme, and assess the return on investment. This was done using data from 2 rounds of farmer group and household surveys conducted in 2004 and 2007, in addition to obtaining secondary data on NAADS expenditures and provision of public services in all the surveyed sub-counties.	Public institution (DFID, CIDA, World Bank)	Yes
18. Dorward et al. (2008)	Evaluation of the 2006/7 agricultural input subsidy programme, Malawi	Report	A – Voucher (Malawi)	Malawi	This report evaluates the 2006/07 Malawi Government AISP and assesses the impact and implementation of the AISP in order to provide lessons for future interventions in growth and social protection. The evaluation combined qualitative and quantitative methods of data collection and analysis. The analysis is based on descriptive statistics, econometric modelling and livelihood and rural economy modelling.	Public institution (DFID, USAID)	Yes

Author	Title	Publication type	Grant type	Country	Description	Funding study	Independent from grant system studied?
21. Ekwamu and Brown (2005)	Four years of NAADS implementation program outcomes and impact	Report published	C – Agricultural innovation support (FFS, NAADS)	Uganda	Report prepared for a workshop to discuss progress in NAADS. They refer to survey data and statistical analysis that indicate NAADS is having a positive economic impact in Uganda and will continue to do so if it maintains minimum levels of adoption and returns on livestock and crop enterprises. They note that maintaining profitability may be a challenge in the future as NAADS expands, and supplies of certain products increases. Marketing will thus be important in managing these expected increases in production. Preliminary evidence indicates household productivity is increasing as a result of adoption of NAADS technologies.	Public institution (Uganda)	Not clear
22. Friis-Hansen (2008)	Impact assessment of farmer institutional development and agricultural change: Soroti District, Uganda	Peer-reviewed journal	C – Agricultural innovation support (FFS, NAADS)	Uganda	This article assessed the impact of NAADS and the FFS programme, and specifically the well-being impact of agricultural technology among poor farmers in Soroti District, Uganda. The central argument is that a combination of farmer empowerment and innovation through experiential learning in FFS groups, changes in the opportunity structure through transformation of local government staff, establishment of new farmer-governed local institutions, and emergence of a private service provider have been successful in reducing poverty.	Not clear	Yes
24. Fundación Chile (2009)	Impactos de los instrumentos de transferencia tecnológica en Chile	Report	C - Business development grant	Chile	The Chilean instrument for agricultural development, INDAP, is analysed in this report as part of a more comprehensive review of instruments. The grant studied in more detail consisted of the financing of decentralised and farmer-led advisory centres to support business of organised farmer groups.	Private institution	No
31. Holden and Lunduka (2010a)	Too poor to be efficient? Impacts of the targeted fertilizer subsidy programme in Malawi on farm plot level input use, crop choice and land productivity	Report	A – Voucher (Malawi)	Malawi	The Malawian programme aims to provide coupons for purchase of subsidised fertiliser and seeds to targeted poor rural households. The objectives of this study are to identify (i) the extent to which the targeted fertiliser and seed subsidy programme results in efficient utilisation of these inputs through enhancement of farm plot level land productivity, (ii) the productivity of alternative seed varieties of maize (hybrid varieties [HYVs] and open-pollinated varieties [OPVs] versus local seeds), and (iii) the extent to which fertiliser subsidies for maize crowd out other crops and the use of organic manures and have other sustainable land management implications. This study used the data from initially 450 households and their farm plots. The presentation of the results is brief and impact is estimated not in relation to the	Public institution (NORAD)	Yes

Author	Title	Publication type	Grant type	Country	Description	Funding study	Independent from grant system studied?
					innovation grant, as the grant is a dummy in the estimation.		
32. Holden and Lunduka (2010b)	Impacts of the fertilizer subsidy programme in Malawi: targeting, household perceptions and preferences	Report	A – Voucher (Malawi)	Malawi	The Malawian fertiliser and seed subsidy programme aims to boost agricultural production and to enhance food security in the country, through provision of coupons for purchase of subsidised fertiliser and seeds to targeted poor rural households. This report provides new evidence on the extent of leakages of coupons and seeds from the administrative programme and how these leakages re-enter the rural economies through the informal markets. The relationships between household characteristics and access to administratively targeted coupons, purchased coupons and purchased cheap fertilisers are analysed.	Public institution (NORAD)	Yes
33. Humphries et al. (2005)	Linking small farmers to the formal research sector: lessons from a participatory bean-breeding programme in Honduras	Peer-reviewed journal	C – Agricultural innovation support (CIAL)	Honduras	Co-operation in plant breeding between Honduran farmers and scientists through CIALs was studied. Findings and policy implications include, among others: (i) farmers trained to conduct participatory plant breeding (PPB) have succeeded in improving the yield and the value of a local bean variety; (ii) intermediary research and development NGOs provide a critical link between farmers and scientists in initiating decentralised PPB at remote locations; (iii) the costs associated with PPB at remote locations may be comparable to conventional breeding at the outset; (iv) the benefits from PPB should not be measured only through the development of new varieties but also through skill development and the sense of empowerment that it brings to local farmers.	Public institution (CIDA)	No
36. Kaaria et al. (2006)	Assessing impacts of farmer participatory research approaches: a case study of local agricultural research committees in Colombia (CIALs)	Peer-reviewed journal	C – Agricultural innovation support (CIAL)	Colombia	This paper presents preliminary results of the changes in the livelihoods of the farmers and their communities, attributable to the CIAL methodology and assesses the effectiveness of the CIAL methodology. It involves 13 CIALs. Preliminary results show significant social and human capital benefits for CIAL members (more knowledge about agriculture, experimenting with and access to new technology, seen as agricultural experts and advisors in the community).	Public institution (CIAT)	No

Author	Title	Publication type	Grant type	Country	Description	Funding study	Independent from grant system studied?
37. KENFAP (2010)	An assessment of the effects of government intervention in input and output market in Kenya: a case of maize seed, fertilizer and maize grain	Report	A – Voucher (miscellaneous)	Kenya	The study was to review the effects of the National Accelerated Agricultural Inputs Access Programme (NAAIAP) on input and output markets in the context of the smallholder farmers' livelihoods in Kenya. The study recommends supporting the programme for a longer period to allow development of markets, increase budgetary allocation, increase geographical coverage, introduce simple and affordable technologies at the local level to reduce post-harvest losses and develop complementary and investment policies (extension services, financing, insurance and marketing) and enhance private sector participation and sector players.	Private institution (ESFIM)	No
45. Remington et al. (2002)	Getting off the seeds-and-tools treadmill with CRS seed vouchers and fairs	Peer reviewed journal	A – Voucher (miscellaneous)	Uganda, Kenya, Tanzania, Southern Sudan	This paper presents a seed security assessment framework to distinguish between the causes of seed insecurity and focuses on 3 principal concepts: seed availability, access to seed, and factors associated with seed utilisation. The study involves a combination of seed voucher distribution and the organisation of seed fairs, which bring together a range of sellers from whom the holders of vouchers may purchase seed. The paper then presents an ex-post evaluation of the effectiveness of seed vouchers and fairs using the seed security assessment framework and closes with a discussion of the opportunities and challenges ahead.	Private institution (CRS)	No
46. Richards (2007)	How does participation work? Deliberation and performance in African food security	Peer-reviewed journal	A – Voucher (miscellaneous)	Sierra Leone	This article examines deliberative and performative participation in a programme for agrarian rehabilitation in Sierra Leone in the aftermath of civil war. The agency formed a village development committee (VDC), a group of civilian volunteers tasked with assisting the agency. But the VDCs commandeered benefits for their own use All residents were registered as beneficiaries to make clear that everybody counted, whatever their origin or status. Then seed types were supplied according to individual user preferences to correct the former practice where the agency supplied recommended varieties in bulk to household heads as nominated by the VDCs.	Private institution (WUR)	Not clear
47. Ricker-Gilbert and Jayne (2009)	Do fertilizer subsidies affect the demand for commercial fertilizer? An	Unpublished	A – Voucher (Malawi)	Malawi	This study uses panel data from Malawi, which recently implemented a large fertiliser subsidy programme, to determine how receiving subsidised fertiliser affects (i) a farmer's decision to participate in the commercial fertiliser market, and (ii) the amount of commercial fertiliser that a	Public institution	Yes

Author	Title	Publication type	Grant type	Country	Description	Funding study	Independent from grant system studied?
	example from Malawi.				farmer purchases and whether or not this decision is made sequentially or simultaneously. Malawi makes for an interesting case study because since 2005/06 the country has implemented an innovative input voucher programme in which the government distributes vouchers to farmers that can be redeemed at private fertiliser dealerships. Relatively little is known about the extent to which the programme has affected total fertiliser use and whether or not it has been cost-effective.		
49. Sandoval et al. (2009)	Impactos en términos del capital humano y social de los métodos de investigación participativa en agricultura: El caso de los comités de investigación agrícola local – CIAL, en el Cauca, Colombia	Unpublished	C – Agricultural innovation support (CIAL)	Colombia	The article presents the results of an impact evaluation of the CIAL methodology in the department Cauca in Colombia. The groups were analysed in relation to the human and social capital and their impact on agricultural development in the villages. It shows the important effects on seed varieties and agricultural production. The study uses information from supported and unsupported villages.	Public institution (CIAT)	No
50. Shroff et al. (2012)	Accelerating innovation for development: ETC PROLINNOVA	Book chapter	C – Agricultural innovation support (PROLINNOVA)	Kenya Uganda	The study reviews the experiences of ETC Foundation, which was awarded a grant to implement LISFs in 8 countries. The funds are operationalised differently in the 8 countries with varying roles taken on by both the farmers managing the LISFs in the localities where they are established and the members of the national-level committee. The study analyses the LISFs in Kenya and in Uganda.	Private institution (Rockefeller Foundation)	Not clear
51. Sotomayor et al. (2008)	Proyecto de desarrollo rural corredor Puno – Cusco. Informe final	Report	B – Business development (Latin America)	Peru	This report presents information of impact of the IFAD-supported Project Corredor Puno – Cuzco. The project introduced innovative ways for targeted households to obtain access to support from the government budget, showing that local governments could facilitate processes by which households invest in their businesses. The support consisted of enabling households to obtain technical assistance and to manage this directly, based on their business profiles and/or business plans.	Public institution (IFAD)	No

Author	Title	Publication type	Grant type	Country	Description	Funding study	Independent from grant system studied?
61. IEG-World Bank (2010)	Agricultural research and competitive grant schemes: an IEG performance assessment of four projects in Latin America	Report published	B – Business development (Latin America)	Brazil, Colombia, Nicaragua, Peru	This report assesses the performance of 4 agriculture projects that used a similar approach to support agricultural research in Brazil, Colombia, Nicaragua and Peru and draws conclusions based on a comparative analysis of the 4 projects. The unifying theme for this assessment is the performance of nationwide systems of agricultural research with particular reference to the use of competitive grant schemes to fund a wide range of generally small-scale initiatives for developing and transferring agricultural technologies.	Public institution (World Bank)	Yes

Author	Title	Publication type	Grant type	Country	Description	Funding study	Independence study
Descriptive studies							
1. Anderson and Feder (2004)	Agricultural extension: good intentions and hard realities	Peer-reviewed journal	A – Voucher grant systems	No specific country	This article provides a framework outlining farmer demand for information, the public good character of extension services, and the organisational and political attributes affecting the performance of extension systems. The framework is used to analyse several extension modalities and their likely and actual effectiveness. The analysis highlights the efficiency gains that can come from locally decentralised delivery systems with incentive structures based on largely private provision, though in most poorer countries extension services will remain publicly funded.	Public institution	Yes
2. Ashby et al. (2000)	Investing in farmers as researchers: experience with local agricultural research committees in Latin America	Book chapter	C – Farmer-driven agricultural innovation grants	Colombia, Bolivia, Ecuador, Brazil, Nicaragua, El Salvador, Honduras, Venezuela	This book describes the experiences with the CIAL approach. The CIAL concept was developed by CIAT and is a farmer-run research service that is answerable to the community. There are 249 active CIALs in 8 countries of Latin America. The book describes the process and also includes some impacts in terms of number of experiments, economic growth, social equitability and the sustainability of agriculture's natural base.	Private institution (CIAT)	No
4. Azuba-Musoke and Waiswa (2004)	New approaches to extension service delivery in Uganda: beneficiaries assessment and challenges. Presented at: Animal Health: a Breakpoint in Economic Development?	Other: conference paper	C – Farmer-driven agricultural innovation grants	Uganda	The study assessed previous extension approaches, in comparison to the current NAADS approach, viewed challenges, stakeholder participation and satisfaction. Local government officials ranked the new approach better in addressing rural poverty and farmer empowerment in decision making. Farmers (80%) especially women noted that the approach improved their skills and information access and provided new and more profitable crop varieties and livestock breeds.	Not clear	Not clear
5. Banful (2011)	Old problems in the new solutions? Politically motivated allocation of program benefits and the 'new' fertilizer subsidies	Brief: IFPRI Discussion paper	A – Voucher grant systems	Ghana	This paper studies how vouchers, for the purchase of fertiliser, were distributed among districts in Ghana's 2008 fertiliser subsidy programme. Findings show that politics played a significant role in the allocation of vouchers. The analysis also shows that district poverty levels were not a statistically significant determinant of districts' voucher allocation. The evidence that vouchers were targeted to areas in which the opposition party received strong support is suggestive of the vouchers being used for vote-buying. This finding highlights the danger that, despite innovations	Public institution	Yes

Author	Title	Publication type	Grant type	Country	Description	Funding study	Independence study
					in implementing fertiliser subsidies, politically motivated allocation of subsidy benefits remains a major potential source of inefficiency.		
7. Becker Reifschneider et al. (2000)	Competitive Grants in the New Millennium: a Global Workshop for Designers and Practitioners	Other: conference proceedings	C – Farmer-driven agricultural innovation grants		This report provides a brief outline of concerns and lessons learnt from common experiences in competitive programmes from 10 countries. Competitive programmes are a funding mechanism with both advantages and disadvantages. They are not appropriate in all situations, and should be linked with other funding sources for research, extension and training to promote a complementary system of R&D funding. The reports draws lessons from various aspects of competitive grant programmes concerning management, funding, cooperation of public and private institutions, and necessary human and financial resources.	Public institution	Not clear
11. Braun and Hocdé (2000)	Farmer participatory research in Latin America: four cases. Working with farmers: the key to adoption of forage technologies.	Other: conference proceedings	C – Farmer-driven agricultural innovation grants	8 countries in Latin America	The paper elaborates on the emergence of farmer participatory research in Latin America. One of the 4 cases analysed is of interest: CIALs, first launched by CIAT in Colombia in 1990, to strengthen rural communities' capacity as decision makers and innovators of agricultural solutions and to exert demand on the formal R&D system. The discussion focuses on similarities and differences in the processes, principles, roles and relationships underlying these experiences and key lessons learnt.	Not clear	Not clear
12. Braun et al. (2000)	Farmer field schools and local agricultural research committees: complementary platforms for integrated decision-making in sustainable agricultural	Peer-reviewed journal	C – Farmer-driven agricultural innovation grants	Latin America	The paper elaborates on FFS and CIALs as participatory platforms for improving decision-making capacity and stimulating local innovation for sustainable agriculture. It discusses their objectives, commonalities and strengths.	Not clear	Not clear
13. Bukenya (2010)	Meeting farmer demand? An assessment of extension reform in Uganda	Dissertation	C – Farmer-driven agricultural innovation grants	Uganda	Analysis in this thesis shows that NAADS has managed to improve access by farmers in the 2 study sub-counties to knowledge and skills for improved agricultural production but that it is as yet generally unable fully to meet farmers' needs for technology-related inputs. This suggests that NAADS has failed to	Academic	Not clear

Author	Title	Publication type	Grant type	Country	Description	Funding study	Independence study
					focus enough attention on the material dimension of its extension package.		
16. Cromwell et al. (2001)	Impact assessment using participatory approaches: 'starter pack' and sustainable agriculture In Malawi	Peer-reviewed journal	A – Voucher grant systems	Malawi	This paper is based on a study undertaken as part of the Malawi Starter Pack Evaluation Programme (1999–2000). It describes how participatory approaches can be used for impact assessment and the kind of information that emerges from such an approach. The study explored how farmers themselves perceive the concept of sustainable agriculture and how this relates to their livelihoods. Detailed information was collected from 30 villages and was used to determine variations in sustainability across regions and between different households, and trends over the last 30 years. The types of input required for increased agricultural sustainability were also ascertained.	Public institution	Yes
17. Denning et al. (2009)	Input subsidies to improve smallholder maize productivity in Malawi: toward an African green revolution	Peer-reviewed journal	A – Voucher grant systems	Malawi	The article reviews the Malawi starter pack programme. It documents the impact on yields and food availability. It argues that any abrupt halt or downscaling of the subsidies, as was experienced in Malawi following 2 years of implementation of the starter pack programme, would probably reverse the progress of the previous 3 years and must be avoided. However, with food security stabilised, input subsidies can be gradually decreased and replaced by smallholder-focused rural credit. Price support through strategic government procurement may also be required to stabilise prices during times of bumper harvests.	Not clear	Not clear
19. Echeverría (1998)	Will competitive funding improve the performance of agricultural research?	Report published	B –Business development grant	Latin America	Competitive grants are increasingly being used in developing countries, especially Latin America, to fund research on agriculture and natural resources. This paper describes the potential advantages and disadvantages of competitive funding and proposes guidelines to improve the performance of competitive grants. When competitive funding complements institutional funding, it has the potential to improve research performance. This paper describes the ways in which this can happen.	Public institution	Not clear
20. Ekboir et al. (2009)	Successful organizational learning in the management of	Report	B –Business development grant	Mexico	This study is analysed the organisational culture, governance and learning activities of the Mexican produce foundations, to explore how an organisation can manage public funds for research and extension	Public institution	Not clear

Author	Title	Publication type	Grant type	Country	Description	Funding study	Independence study
	agricultural research and innovation – the Mexican produce foundations				and sustain organisational innovation over extended periods.		
23. Friis-Hansen and Egelyng (2006)	Supporting local innovation for rural development: analysis and review of five innovation support funds	Report published	C – Farmer-driven agricultural innovation grants	Different countries	This desk study reviews 5 innovation support funds or funding concepts: the Indian 'National Innovation Fund' (NIF) and its associated web of institutions; the GTZ-funded 'Small-Scale Project Fund' (SSPF); the NGO concept 'Promoting Local Innovation in ecologically oriented agriculture and NRM' (PROLINNOVA); the FAO's project, 'Promoting Farmer Innovation – Farmer Field Schools' (PFI-FFS); and the CIALs in Latin America. The review develops an analytical framework to analyse the innovation support funds and concludes with a recommendation for establishing a global innovation facility that could enhance the effectiveness of existing innovation support funds and the global expansion of activities by facilitating institutional learning, exchange of experiences between the funds and provision of technical assistance.	Public institution	Yes
26. Gill and Carney (1999)	Competitive agricultural technology funds in developing countries	Brief	General	Experience from different funds in countries in sub-Saharan Africa	This paper reviews experience with 10 competitive agricultural technology funds (CATFs) in very different national and institutional settings, as an alternative mechanism for funding agricultural research and dissemination. Policy conclusions include: where there is sufficient agricultural R&D capacity in-country to constitute an effective market, a CF 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; the best 'home' for a CATF is in an independent institution that does not bid for projects. Monitoring and evaluation should focus on impact on intended beneficiaries.	Public institution	Yes
27. Govere et al. (2009)	Policy perspectives on the role of government in the distribution of agricultural inputs to farmers: lessons	Peer-reviewed journal	A – Voucher grant systems	Zimbabwe	This paper is a policy perspective that attempts to answer the question of whether governments should be involved in the distribution of free agricultural inputs to farmers. The paper offers a critique of the merits and demerits of alternative agricultural input distribution approaches. The paper also proposes	n/a	Not clear

Author	Title	Publication type	Grant type	Country	Description	Funding study	Independence study
	from Zimbabwe				practical policy strategies for the private sector, governments and donor aid agencies; vouchers are mentioned as one modality. The paper concludes that there is a rationale for direct government supply of free inputs to farmers to ensure agricultural recovery and food security or to complement failed private sector input marketing channels. Private input marketing firms and financial institutions should play the pivotal role in the supply of inputs to farmers while government and development aid agencies play facilitator roles of creating conducive policies and promoting the sharing of costs and risks between the farmers and input suppliers.		
28. Gustafson (2002)	Supporting the demand for change: recent experiences with farmer learning grants in Kenya. Case study for the workshop: Extension and Rural Development: Convergence of Views on International Approaches?	Brief: workshop	C – Farmer-driven agricultural innovation grants	Kenya	Recent project experience in Kenya with learning grants supplied directly to farmer groups to obtain extension services and research technologies provide an interesting example of how research and extension services can be more demand-driven. The vehicles for this effort have been FFS and the Agricultural Technology Information and Response Initiative (ATIRI) of KARI. This paper describes both experiences, including some governance, sustainability aspects and results.	Public Institution (World Bank)	Not clear
29. Harnett (2008)	Cash transfers – do they work? A study of flexi-vouchers in Malawi	Peer-reviewed journal	A – Voucher grant systems	Malawi	In Malawi, the government gives a starter pack of seeds and fertilisers to poor farmers and this paper examines the consequences of giving a voucher of similar value, which can be exchanged for a variety of goods. The subsequent choices make sense in the real world of the farmer and suggest that cash transfers may be a more appropriate way of transferring resources and delivering aid to the poor.	Not clear	Yes
30. Hartwich et al. (2007)	Innovation systems governance in Bolivia – lessons for agricultural innovation policies	Report published	C – Farmer-driven agricultural innovation grants	Bolivia	The report presents results from a study that analysed to what extent the Bolivian Agricultural Technology System (SIBTA), as part of the country's agricultural innovation system, has complied with a set of governance principles – including participation of stakeholders (especially small farmers) in decision making, transparency and openness, responsiveness and accountability, consensus orientation and	Public institution (IFPRI)	not clear

Author	Title	Publication type	Grant type	Country	Description	Funding study	Independence study
					coherence, and strategic vision – and compares those principles with benchmarks of innovation systems governance in 5 other developing countries.		
33. Humphries et al. (2005)	Linking small farmers to the formal research sector: lessons from a participatory bean-breeding programme in Honduras	Peer-reviewed journal	C – Farmer-driven agricultural innovation grants	Honduras	Cooperation in plant breeding between Honduran farmers and scientists through CIALs was studied. Findings and policy implications include: (i) farmers trained to conduct PPB have succeeded in improving the yield and the value of a local bean variety; (ii) scientists, farmers and a local NGO have successfully worked together over a 4-year period to support the PPB process; (iii) farmers and scientists may not make the same choices in the selection of varieties for use in marginal agricultural areas; (iv) the improved local variety was publicly recognised as the product of the labour of local farmers on its release in 2004 at the municipal level; (v) social development activities and high levels of trust between farmers and NGOs are required to maintain the involvement of poor farmers when the return from their labour investment is long term and uncertain; (vi) intermediary research and development NGOs provide a critical link between farmers and scientists in initiating decentralised PPB at remote locations; (vii) the costs associated with PPB at remote locations may be comparable to conventional breeding at the outset; (viii) the benefits from PPB should not be measured only through the development of new varieties but also through skill development and the sense of empowerment that it brings to local farmers	Public Institution	Yes
34. Humphries et al. (2000)	Searching for sustainable land use practices in Honduras: lessons from a programme of participatory research with hillside farmers	Brief: AgREN network papers are not a formal journal	C – Farmer-driven agricultural innovation grants	Honduras	The project Participatory Research in Central America (IPCA) was established to support farmers in community-based agricultural research in the region, and introduced CIALs. The IPCA project has been monitoring the development of CIALs in Honduras for 5 years. The experience shows that teaching formal research methods to poor hillside farmers is viable and has served to link farmers to formal-sector researchers in innovative technology development programmes that directly meet users' needs. Farmers have benefited through access to new technologies, have learnt new ways to manage their environment and have been empowered in the process. However, complex	Public institution (IDRC)	No lead author works in the project himself

Author	Title	Publication type	Grant type	Country	Description	Funding study	Independence study
					research needs to be framed within the context of social programmes that can provide more immediate benefits to farmers. Technology-led development must be supported by other development initiatives that aim to build social capital as widely as possible across the community.		
35. ITAD (2008)	Performance evaluation of National Agricultural Advisory Services (NAADS). Final report	Unpublished	C – Farmer-driven agricultural innovation grants	Uganda	This report evaluates the performance of the NAADS Secretariat in terms of its relevance, effectiveness, efficiency, results and sustainability. It evaluates the various aspects: FID (farmer institutional development), the use of advisory services and integrated support to farmer groups (ISFG).	Private institution	
40. Nathaniels (2005)	Cowpea, farmer field schools and farmer-to-farmer extension: a Benin case study	Brief	C – Farmer-driven agricultural innovation grants	Benin	The brief reports on results of a case study on pilot cowpea FFS in Benin and discusses the following themes with respect to FFS and its place in agricultural innovation and extension delivery systems: (i) whether FFS reach a wide range of farmers; (ii) the way, and the extent to which, knowledge gained from FFS spreads among farmers; (iii) whether FFS promote innovations that offer appropriate solutions to farmers' problems; (iv) the extent to which farmer learning through experimentation is addressed; and (v) scaling-up issues.		
41. Opondo et al. (2006)	Lessons from using participatory action research to enhance farmer-led research and extension in south-western Uganda	Report published	C – Farmer-driven agricultural innovation grants	Uganda	A participatory action learning process to facilitate farmer groups in their institutional development process, encompassing community visioning and planning, strengthening group organisational dynamics, agro-enterprise selection and skill-building for farmer forum members was introduced and facilitated. This paper discusses preliminary outcomes from building farmers' competencies and the use of participatory action research to learn from and further the NAADS programme through action-based learning with various actors involved in 'organising the demand side of demand-driven development.	Not clear	No
42. Perrett (2004)	Community development funds: emerging lessons for	Report	B – Business development grant		This report reviews the experiences in IFAD with community development funds, and distils lessons on the ways these funds could be better designed and	Public institution	Not clear

Author	Title	Publication type	Grant type	Country	Description	Funding study	Independence study
	a project design - main report				operated.		
43. PROLINNOVA International Secretariat (2008)	FAIR – Farmer Access to Innovation Resources: synthesis of lessons learnt.	Report published	C – Farmer-driven agricultural innovation grants	Nepal, Cambodia, Ethiopia, South Africa, Uganda	PROLINNOVA, an international partnership programme promoting local innovation and participatory innovation development, initiated LISFs, which have been piloted in 5 countries. This publication summarises the initial findings from the pilots, covering 2 years (2006 and 2007). It describes the mechanisms for fund application, utilisation of funds, how monitoring and evalation is set up and the longer-term sustainability of the funds. It also includes impact of the funds on improved land-husbandry practices, scaling-up of practices and the impact on local livelihoods, change in farmers' capacity, and support and interest from agricultural R&D agencies in the approach.	Public institution	Not clear
44. Ramirez et al. (2011)	Fostering inclusive rural innovation: the case of INCAGRO in Peru.	Unpublished	B – Business development grant	Peru	The Peruvian Agricultural Research and Extension Program (INCAGRO) gave great emphasis to designing financing instruments that would give equitable opportunities to indigenous people's and women's organisations. This brief describes how INCAGRO integrated indigenous peoples' and women's organisations into its activities to strengthen the market for agricultural services and the agricultural research system by co-financing collaborative research activities and capacity building through the establishment of a CF.	Public institution	
48. Roy (1989)	Enhancing the diversified strategies of the rural poor in Lesotho	Brief	C – Farmer-driven agricultural innovation grants	Lesotho	The brief describes the approach to the design of the Local Initiatives Support Project (LISP) which was designed to enhance the effectiveness of the rural poor's coping strategies, which meant understanding and building upon pre-existing diversity in southern Lesotho. The brief describes the objectives, the approach and how the LISP functions.	Private institution	Not clear
52. Ton (2007)	Farmers' organisations in agricultural research and development: governance issues in two competitive funding programs in Bolivia	Book chapter	C – Farmer-driven agricultural innovation grants	Bolivia	This chapter addresses the growing importance of CF and the growing role of farmers' federations as mediators between grassroots organisations and private service providers in governing the contracting process and contract conditions. Two case studies of R&D programmes in Bolivia are used as illustrations.	Public institution	Not clear

Author	Title	Publication type	Grant type	Country	Description	Funding study	Independence study
53. Toro and Espinosa (2003)	Los fondos competitivos para la agricultura y el desarrollo rural: fundamentos, aplicaciones y lecciones Aprendidas.	Book chapter	B – Business development grant	Latin American examples, especially from Chile	The report reviews the experiences with matching funds in Latin America, linked to the processes of privatisation of agricultural extension. It detects lessons learnt on the operation of this type of fund, and the challenges that remain in relation to transparency of the allocation process in a constrained market of service providers.	Public institution	Not clear
54. Triomphe et al. (2012)	Module 5 – IAP4: providing farmers with direct access to innovation funds. In: World Bank agricultural innovation systems: an investment sourcebook.	Book chapter	C – Farmer-driven agricultural innovation grants	Several countries in Africa and Asia	The book chapter examines how schemes to support farmer innovation can be designed and what lessons can be drawn, based on (i) LISFs and (ii) competitive grant programmes. Key findings include: farmer innovation funds work better if and when decentralised settings are used and when support institutions have the necessary skills and experience to implement them; funding mechanisms can be made more sustainable by linking them with savings and credit schemes and structures (should they exist) and/or by embedding them within existing agricultural R&D institutions and mechanisms for fostering innovation; farmer innovation funds are most powerful when they are not implemented in isolation but as part of systemic, long-term efforts to promote and strengthen sustainable farming, participatory innovation development, and dynamic innovation systems and processes, in which the roles and skills of various stakeholders (particularly smallholders) are recognised and supported.	Not clear	No
55. van der Meer and Noordam (2004)	The use of grants to address market failures – a review of World Bank rural development projects	Report published	B – Business development grant	Niger, Takikistan, Benin, Madagascar, India, Peru, Romania, Nicaragua, Brazil, Vietnam, Indonesia, Malawi	In recent years, there has been a rapid increase in use of grants for enhancing private economic activity through the World Bank's rural lending. Grants can be used to overcome market failure and, as such, can be a welcome instrument. However, grants are a subsidy and there is concern that they are in fact sometimes misused for providing undesirable subsidisation of inputs and credit through the back door rather than for overcoming market failures. There is limited guidance and empirical information about the use of grants in rural lending. This paper aims to fill some of these gaps in information. It mainly focuses on the use of grants for overcoming market failure and related design issues in lending. The paper discusses theoretical and	Public institution	Not clear

Author	Title	Publication type	Grant type	Country	Description	Funding study	Independence study
					empirical issues, and proposes a framework for assessing and designing grant schemes, which will enhance Bank staff's capabilities for preparing grant schemes.		
56. van Veldhuizen et al. (2005)	Farmer Access to Innovation Resources (FAIR): findings from an international review of experiences	Report published	C – Farmer-driven agricultural innovation grants	Netherlands, Colombia, Honduras, Kenya, Uganda, India, Zambia	This paper reviews and summarises experiences with various innovation funds: CATFs, CIALs, SSPF, ATIRI, SF-FFS (self-financed FFS), NIF, C3F (City-Community Challenge Fund), Innovatie Fonds Tuinbouw and LIBIRD () and translates insights on the following aspects to the operational design of LISFs. It treats a range of elements of grant system administration, such as farmer-owned funds versus institutionally based funds, level of decentralisation, time horizon, and fund replenishment/fund raising.	Not clear	Not clear
57. Vera-Cruz et al. (2008)	Virtues and limits of competitive funds to finance research and innovation: the case of Mexican agriculture	Peer-reviewed journal	General	Mexico	CF have become a preferred mechanism to allocate research funding particularly in developing countries, to the point that they are the most important (and often unique) source of funds. This paper reviews the experience of the Mexican produce foundations with CF in the agriculture sector and discusses some benefits and limits of using CF as the main mechanism to fund research in a country with a relatively weak national innovation system, a relatively small research system, and some very innovative actors in the agricultural system.	n/a	Yes
58. Waters-Bayer et al. (2005)	Innovation support funds for farmer-led research and development	Brief	C – Farmer-driven agricultural innovation grants	Cambodia, Ethiopia, Ghana, Nepal, Niger, South Africa, Sudan, Tanzania, Uganda	The brief describes the initial contours, design and preparation of the innovation support funds initiated by PROLINNOVA. The fund schemes will be designed in 9 countries and each will have a country-specific design. The brief also discusses the sustainability aspect of the design.	Public institution (World Bank)	No
59. Witcombe et al. (2010)	Linking community-based seed producers to markets for a sustainable seed supply system	Peer-reviewed journal	A – Voucher grant systems B – Business development grant	Nepal	The paper reviews outcomes of past attempts at establishing sustainable seed producer groups in Nepal, showing that after donor support was withdrawn a lack of marketing skills resulted in the groups no longer producing seed. New attempts were initiated to establish sustainable seed producer groups in Chitwan District, Nepal, emphasising the strengthening of their marketing and managerial capabilities rather than training in technical issues such as seed quality control.	Public institution	Not clear

Author	Title	Publication type	Grant type	Country	Description	Funding study	Independence study
					The paper reports on the performance of these groups and examines how well they helped in scaling-out seed of new varieties.		
60. Wongtschowski et al. (2010)	Towards a farmer-governed approach to agricultural research for development: lessons from international experiences with local innovation support funds	Brief	C – Farmer-driven agricultural innovation grants	Cambodia, Ethiopia, Ghana, Nepal, Niger, South Africa, Sudan, Tanzania, Uganda	This paper reports on international experiences with LISFs which are being piloted in 8 countries across Asia and Africa under the umbrella of the PROLINNOVA international partnership programme. The ways of setting up the LISFs vary greatly between countries, in response to country-specific conditions, experiences and opportunities, but all share certain structural elements. The paper examines the diverse results obtained across countries in terms of structure and process of grant administration; number, size and type of grants; thematic foci; monitoring; and impact assessment. Some critical issues are also discussed.	Private institution	No
62. World Bank (2010)	Designing and implementing agricultural innovation funds: lessons from competitive research and matching grants	Book chapter	B – Business development grant		This report synthesises experience with the 2 main innovation funds that the World Bank has used to fund agricultural innovation – competitive research grants and matching grants – and offers lessons and guidelines for designing and implementing them. Though the report draws extensively on experience with World Bank investments, the lessons are relevant in other contexts. The practical aspects of designing and implementing successful grant schemes are emphasised throughout.	Public institution (World Bank)	Not clear

Author	Title	Publication type	Grant type	Country	Summary	Funding study	Independence study
Grant outcome monitoring report							
3. Avornyo and Kombiok (2010)	Farmer Access to Innovation Resources (FAIR) project – Ghana: impact assessment report	Report: Project documentation	C – Farmer-driven agricultural innovation grants	Ghana	This report is concerned with assessing the impact made by FAIR; the impact assessment was carried out to produce a report for the second level of evaluation of the FAIR project. It covers the effectiveness of the LISF approach for achieving food security and improving people's livelihoods. It also highlights the strengths and weaknesses of the project and measures that may be needed to make the project more effective. In addition it evaluates the overall project implementation and the strategies used to achieve the project objectives.	Private institute	No
14. CEDAC(2011)	Impact assessment report PROLINNOVA and FAIR/LISF Cambodia	Report	C – Farmer-driven agricultural innovation grants	Cambodia	This assessment was conducted in 4 of PROLINNOVA Cambodia's target provinces: Prey Veng, Battambang, Kompong Speu and Kompong Cham. These selected provinces represented provinces with strong, medium and weak performance of the PROLINNOVA programme and LISF. It is important to note that PROLINNOVA and LISF are working in 10 target provinces throughout Cambodia.	Private institute	No
15. Cobo (2004)	'Un sueño hecho realidad'. Comité de investigación agrícola local – CIAL 'El Diviso'. Estudio de caso. Municipio de Rosas, Cauca, Colombia	Report	C – Farmer-driven agricultural innovation grants	Colombia	The report is a case study evaluation of a CIAL in a village with a long-standing relationship with CIAL. It describes the relations between the CIAL committee and the village and highlights the importance of the commercial activities related to seed improvement to sustain group activities.	Private institution (CIAT)	Not clear
25. Gebremichael et al. (2011)	Impact assessment of the Farmer Access to Innovation Resources (FAIR) piloting in Ethiopia	Report	C – Farmer-driven agricultural innovation grants	Ethiopia	The overall aim of this assessment was to understand the impact of FAIR in Ethiopia and the challenges encountered, and to indicate the way forward for the sustainability of LISFs in addressing community needs and priorities.	Private institute	No
38. Losira and Mpunga (2011)	LISF impact assessment study in Uganda	Report	C – Farmer-driven agricultural innovation grants	Uganda	FAIR was born out of a belief that a fundamental change in mechanisms for allocating research funding is required if small-scale farmers/pastoralists, their concerns and their own innovation capacities, are to play a more central role in agricultural research and development. The report assesses the process since 2006 in Uganda.	Private institute	No
39.	Impact assessment of	Report	C – Farmer-driven agricultural	Tanzania	This report assesses the impact of PROLINNOVA and LISFs activities on capacities of farmer organisations/groups in	Private institute	No

Malley (2011)	PROLINNOVA and LISF/Fair activities in Tanzania		innovation grants		developing and promoting local innovations, and on agricultural R&D organisations' attitudes on working on local innovations and with innovators in Tanzania towards development of sustainable agricultural systems and sustainable NRM. In addition, the assessment helps to explain the impact of PROLINNOVA and LISF on the livelihoods of the local innovators and communities at large.		

The authors of this report were supported by the Evidence for Policy and Practice Information and Co-ordinating Centre (EPPI-Centre) and the Australian Agency for International Development.

The Evidence for Policy and Practice Information and Co-ordinating Centre (EPPI-Centre) is part of the Social Science Research Unit (SSRU), Institute of Education, University of London.

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This research was funded by the Australian Agency for International Development (AusAID). The research was commissioned as part of a joint call for systematic reviews with the Department for International Development (DFID) and the International Initiative for Impact Evaluation (3ie). The views expressed are those of the authors and not necessarily those of the Commonwealth of Australia. The Commonwealth of Australia accepts no responsibility for any loss, damage or injury resulting from reliance on any of the information or views contained in this publication. The report was first published in 2013 by:

Evidence for Policy and Practice Information and Co-ordinating Centre (EPPI-Centre)
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ISBN: 978-1-907345-54-8
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