Effectiveness of Innovation Grants on Smallholder Agricultural Producers

Protocol for an explorative systematic review

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PROTOCOL

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List of abbreviations

AusAID	Australian Government Overseas Aid Program
CAFT	Local Agricultural Research Committees
CIAL	Competitive Agricultural Technology Funds
CGIAR	Consultative Group on International Agricultural Research
CIRAD	French Centre for Agricultural Research for Development
DANIDA	Danish International Development Assistance
DIIS	Danish Institute for International Studies
DEGIS	Dutch Ministry of Foreign Affairs - DG for International Cooperation
DFID	UK Department for International Development
ECDPM	European Centre for Development Policy Management, Maastricht
ETC	Economic and Trade Cooperation Programme at the European Centre for Development Policy Management
EU	European Union
EPPI-Centre	Centre for Evidence for Policy and Practice, part of the Social Science Research Unit, Institute of Education, University of London
FAO	Food and Agricultural Organisation
FAD	International Fund for Agricultural Development
IFPRI	International Food Policy Research Institute
KIT	Royal Tropical Institute in Amsterdam
LEI	Agricultural Economics Research Institute, part of Wageningen University and Research
LISP	Local Innovation Support Programme
NGDOs	Non-Governmental Development Organisations
NGOs	Non-Governmental Organisations
R&D	Research and Development
SDC	Swiss Agency for Development and Cooperation
SNV	Netherlands Development Organisation in Nepal
USAID	US Agency for International Development
WUR	Wageningen University and Research

1. Background

1.1 Aims and rationale for review

Agricultural innovation is not just about adopting new technologies; it also requires a balance amongst new technical practices and alternative ways of organizing, for example, markets, labour, land tenure and distribution of benefits (Dormon et al. 2004; Adjei-Nsiah et al. 2008). Agricultural innovation is thus seen here as a co-evolutionary process, i.e. combined technological, social, economic and institutional change.

With regard to the organization of innovation, Smits' (2002: 865) definition thus applies: "…a successful combination of hardware, software and orgware, viewed from a societal and/or economic point of view. Hardware relates to the material equipment (mostly) involved and software concerns the knowledge in terms of manuals, software, digital content, tacit knowledge involved in the innovation. Orgware refers to the organizational and institutional conditions that influence the development of an invention into an innovation and the actual functioning of an innovation." Innovation does not necessarily mean inventing something entirely new, but may also imply imitating and adapting existing ideas to new uses or contexts.

Fostering agricultural innovations includes the support of small holders to enable their capacity to generate innovation and use innovations generated elsewhere through all kind of elements, such as chain integration, R&D, market research, new market linkages, and entrepreneurial capacity strengthening (Heemskerk and Wennink, 2005).

Grants for agricultural innovation are generally designed to address shortcomings in the innovation systems. Innovations grants are also increasingly used to stimulate private sector and farmer engagement in activities related to technology generation, technology dissemination and overall innovation processes. Grants are also used in the field of agricultural research and development by focusing on end-user demand and participation (Worldbank, 2010, Echeverria and Elliott, 2002). The shift to a more demand-led agricultural research and development system reflects the debates about innovation systems whereby agricultural development is not only driven by production technology but also encompasses organizational and institutional change, and is increasingly influenced by drivers in the market and shifting relations of service delivery (Klerkx and Leeuwis, 2008).

The importance of looking at smallholder innovation grants is that it has become recognized that innovation is better tailored to users' needs when these are involved in an integrated manner in the innovation process and are also financially empowered and endowed with decision making authority to influence the research processes that support innovation (Klerkx and Leeuwis, 2009; Neef and Neubert, 2011). Furthermore, there is an increasing recognition that much innovation relevant for smallholders happens 'below-the-radar' which makes it essential to have tailored support at grassroots level to support innovation for smallholder agricultural producers (Waters-Bayer et al., 2009; Hall and Clark, 2010; Kaplinsky, 2011). However, there is no robust evidence on the extent to which innovation grants work, as evidence has not yet been systematized.

1.2 Definitional and conceptual issues

Agricultural innovation grants are used in different ways by different beneficiary groups: e.g. for near-market technology development, enterprise development, support services targeting farmer groups, improve agricultural research and extension services (World Bank, 2010, Friis-Hansen and Egelung, 2006, Gill et al., 1999).

The review focuses only on grants systems that target agricultural producers to facilitate agricultural innovation. There are different funding modalities of innovation grants. Even if the purpose of the grants is to facilitate agricultural innovation of producers, the recipients of the grant are not necessarily the agricultural producers themselves. Competitive funds and matching grants are often used for funding public-private-partnerships, where research institutes are the most common recipient (Worldbank, 2010). These institutes submit proposals that eventually may require ex-ante explicit consent of the farmer or farmer groups involved in the innovation process (Ton and Jansen, 2007). In some systems, producers can be full recipient or co-recipient of the grant and can have strong decision making power on the use of the grant. However, they can act as passive beneficiaries in other systems.

The degree of involvement and decision making by famers constitutes one important characteristic that differs between innovation grant systems. Besides this, the context and modalities of grant systems vary a lot, like the core commodities that they focus on or the type of innovations that they promote. Besides grants principally aimed at funding research to support innovation, other types of grants are focused at funding other aspects of innovation processes, such as bridging the gap between prototype and market-ready product, for example by means of venture capital or risk funding. Also, costs for organizing networks of complementary partners to engage in collective innovation process may be covered by grants (World Bank, 2010)

Each type of grant system exhibits a certain configuration of working mechanisms associated with different outcome patterns (Pawson and Tilley, 1997). We will develop an initial typology as a framework to map this diversity of funds.
Diversity in grant system can be mapped along several dimensions:

- MODALITY – the way the grants are distributed. Grants are used for different purposes and through different funding modalities.
- GOVERNANCE – the way decision making takes place in the grant system. Research may be either fully farmer-led or, at least, it may give farmers a strong say in research agenda setting, prioritization and execution.
- CHARACTER OF OUTPUTS – are the grants used for public and/or private goods? Some innovation grant systems aim to produce written research outputs. However, some may (also) be focused much more strongly to outputs that are more tangible (e.g. seeds, tools, brands) and linked to the private interests of the individual grant recipients, e.g. developing and/or applying innovations for private gains without public disclosure.
- USERS OF THE GRANTS/ RECIPIENTS – who receives the funding? Not all innovation grant systems are targeted to farmers only but target a wider scope of sectors (e.g. urban small and medium enterprises). And, some grant systems have the farmer as direct recipient. However, more often

these are organized farmer groups, development organisations, (governmental) extension systems or research institutes.

Not only the diverse definitions of what is considered to be an 'innovation grants' are challenging, also the diverse way of describing outcomes and outcome patterns. Different outcome indicators have been used as a proxy for effectiveness of the facilitation of agricultural innovation. Van der Berg and Jiggins (2004) indicate the challenge to compare these different indicators: there is a mix of immediate outcome indicators and longer-term development outcomes, and there are different processes used for generating these indicators with diverse methodological mixes of self-assessments by farmers, self-assessments by projects and external evaluations. Key concepts used to map outcome patterns, like 'smallholder' and 'poor' have different meaning in different context and, thus, in different strands of literature but the characteristics of these groups are often not well described in detail or delineated in a way that facilitates comparison and aggregation of findings.

In the systematic review, we will approach the issue of fuzziness and ambiguousness in the definition of (most) key concepts used in the review by mapping context, grant mechanisms and outcome patterns in an initial typology of grant systems, and compare evidence for the core impact pathways (programme theories) associated with these types. We reflect on the core intervention logics in each (type of) grant systems with a realist evaluation view around the question: 'What has worked (or not) for whom under what conditions?" and look to the mechanisms at work that explain this, by reflecting on the mechanisms that work in similar types of grant systems and similar type of contexts, to change the innovation behaviour of smallholder farmers. The result of the synthesis will help to get better 'middle-range theories' (Pawson et al., 2004) on why some systems work better than others; knowledge that will help to practitioners to (re)design innovation grant systems in a way that success/impact is more likely.

1.3 Policy and practice background

While there has been considerable policy attention to smallholder innovation grants, and experimentation with a great number of grant modalities in different countries (see e.g. World Bank, 2010; Klerkx and Leeuwis, 2009; Waters-Bayer et al., 2009), many reports and scientific publications often focus on describing the grant modality, governance, strengths and weaknesses in its operationalization and relevance but there is little systematic attention to impact and effectiveness of the grants on smallholders. To provide a rationale for policy support to smallholder innovation grants, there is thus need for bringing together the existing evidence and see whether some intervention logics are better suited than others to yield positive results for smallholders, and especially the poor and women, in specific contexts and with certain working mechanisms. The systematic review of the available evidence can guide decision making on the (re)design of innovation grants for pro-poor innovation processes. The relevance is both for people designing innovation grant systems as for people that decide on funding for these innovation grant systems.

1.4 Research background

Agricultural innovation grants are discussed in the academic literature, often focused on stimulating demand-driven research in favour of smallholder innovation. However, in general, innovation grants support a variety of activities, not only research, and may also pay for material investments, coordination costs, risk capital. Some studies specifically look at the organisation of the end users of the innovation grants and funds, like 'local agricultural research committees' and 'Farmer Field Schools' (for example Echeverria and Elliott, 2002, Ashby and Sperling, 1995). Diverse institutional arrangements like competitive funds, public-private partnerships, end-user involvement in planning systems and voucher systems are covered (for example Klerkx and Leeuwis, 2008, Klerkx and Leeuwis, 2009, Hartwich and Tola, 2007, Vera-Cruz et al., 2008, Gandarillas et al., 2007). Another branch of the literature looks at the conditions and institutional change necessary to support demand driven agricultural research and development (for example Hall et al., 2003, Dorward et al., 2003, Lettl, 2007, Jacob, 2005). The comparative literature elaborates on governance mechanisms of innovation funds, objectives of alternative funding mechanisms, and preconditions for functioning (for example Sperling and Ashby, 2001, Heemskerk and Wennink, 2005, Rivera and Alex, 2004, Elliott, 2010). Recently some studies have identified comparative assessment criteria for impact analysis (for example Triomphe et al., 2010, Mudhara et al., 2008).

More primary information on evidence about the impact of innovation grants can be found in studies of projects or programmes initiated by international organisations (FAO, World Bank, CGIAR, IFPRI, IFAD, etc.), bilateral donors (DFID, USAID, AusAID, DANIDA, EU, DGIS, SDC, Irish Aid, etc.) and Non-Governmental Development Organisations (NGDOs) (SaveAct, Rockerfeller, ETC, SNV, etc.).[1] In particular, the evaluation report of such projects or programmes may provide impact assessments that are potentially relevant for the systematic review envisioned.

Important initiatives of agricultural innovation grants in developing countries are:

- Competitive Agricultural Technology Funds (CAFT) focusing on demand driven research planning, funded by UKAID amongst others (see for example Gill et al., 1999);
- Local Agricultural Research Committees (CIAL) within which producers steer research (see for example Friis-Hansen and Egelung, 2006);
- Self-financed Farmer Field Schools in East Africa where farmer groups are provided with learning grants (see for example Krone et al., 2006, Gustafson, 2004), supported by FAO;
- Local Innovation Support Funds (LISP) that are given to farmer groups for research experiments (see for example Wongtschowski et al., 2010, Waters-Bayer et al., 2004, Waters-Bayer et al., 2008);
- National Agricultural Advisory Services (NAADS) in Uganda (see Bukenya, 2010).

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[1] Food and Agricultural Organisation (FAO), Consultative Group on International Agricultural Research (CGIAR), International Food Policy Research Institute (IFPRI), International Fund for Agricultural Development (IFAD), UK Department for International Development (UKAID/DFID), US Agency for International Development (USAID), Australian Government Overseas Aid Program (AusAID), Danish International Development Assistance (DANIDA), European Union (EU), Dutch Ministry of Foreign Affairs - DG for International Cooperation (DGIS), Economic and Trade Cooperation Programme (ETC) at the European Centre for Development Policy Management (ECDPM), Maastricht, Netherlands Development Organisation in Nepal (SNV), Swiss Agency for Development and Cooperation (SDC);

Recently, rural innovation funds granted to farmers and producer cooperatives have been initiated by banks, in India, and by IFAD in Peru and Bolivia.

1.5 Purpose and rationale for review

The goal of the systematic review is to: *examine 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.*

More specifically, the systematic review aims to synthesize the available literature in order to contribute to the understanding of agricultural innovation grants and elaborate under what conditions they tend to be more effective in facilitating innovation and benefit the poor and women in developing countries. In the review, we will consider both quantitative and qualitative information relating to the impact of agricultural innovation grants to small holders. However, note that we expect that our review will mainly find studies providing qualitative information evaluating processes and outcomes with quantitative evidence form surveys that, however, are not embedded in any structured (quasi)experimental design.

Research synthesis is not restricted to meta-analysis of statistical evidence from experimental studies. Theorists on systematic reviews (Pope et al., 2007, Mays et al., 2001) explain that frequently the reviewer has to define the scope of the review and deal with issues of generalisation, reliability and validity across different research traditions. A systematic review works form the assumption that worthwhile insights can be gained from the simultaneously considering the accumulation of evidence and findings from more than one study. We place our review in the middle of the continuum between aggregative and configurative systematic reviews. The review will be largely configurative in discovering types of innovation grant systems that, in a comparable context, can be assumed to trigger mechanisms that produce positive outcomes that facilitate innovation by smallholder producers. When possible, for similar type of grant systems (and core impact pathways) an aggregation of evidence on outcomes will be done. In realist synthesis this approach is known as the refinement of 'middle-range theories' about CMOCs (Context-Mechanism-Outcome-Configurations) (Pawson and Tilley, 1997).

1.6 Authors, funders, and other users of the review

The Review Team consists of four persons. Two researchers specialized on the issue of innovation and grant systems. Laurens Klerkx is associate professor in Wageningen University and contributes to the debate on the role of brokers of knowledge in innovation systems. His core expertise is especially in the Netherlands but has become increasingly related with developing countries, where many of his PhD-students do their field work. The systematic review is focused on the outcomes of (a sub-set) of interventions to trigger innovations in smallholder farmers is timely and relevant for this research project.

Giel Ton has a portfolio of applied research project that study outcomes and impact of interventions to improve access of smallholders in agricultural value chains. He is currently doing a PhD-research on the impacts of a small innovation grant fund in Bolivia directed to business development by organized farmer groups. The present systematic review will provide information to be used in one of the articles that form part of this PhD-trajectory.

The two other researchers are especially motivated for the systematic process in the review. The current review will provide them with a track-record for doing similar work on other review questions. Marie Luise Rau is an agricultural trade economist with a quantitative background. She has completed the EPPI-course on systematic reviews for research and policy, and with this qualification, she will be engaged in the systematic review here. Karin de Grip has a more qualitative oriented background, specialised in communication and innovation processes related with entrepreneurial skill development of farmers.

AusAID, funding the review, will be one of the prime users of the results of the systematic review, but the results will also be relevant for other institutions working on smallholder innovations, like agricultural ministries and development organisation. An advisory board with persons involved in the design and implementation ('practitioners networks') and in research ('research network') are used to connect with a wide range of persons and institutions that are involved in managing innovations funds. These networks will also be used to feed-back the results of the review to potential users.

1.7 Review questions and approach

The review question is about *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 is question 43 of the AusAID, UKAID/DFID and 3ie joint call for systematic reviews in 2010.

In the systematic review, we consider the specific conditions that enable or disable the impact of innovation grants. The aim of the subsequent synthesis is to identify the specific mechanisms that work in each case and compare them across cases, i.e. derive insights on generic conditions and combinations of conditions which enhance or decrease the effectiveness of different innovation grant mechanisms. Coding the evidence in the systematic review will help to compare the enabling conditions for the innovation grant to be effective in reaching outcomes.

To do so, we elaborated an initial mapping framework that helps to define the boundaries of the systematic research, and to provide a framework for the coding tool used to extract information. This conceptual framework behind the review consists of three parts: typology of innovation grants, outcome patterns and conditions under which the innovation grant is implemented. This section first elaborates on these three parts. Next, core impact pathways related with each type of innovation grants are formulated, that will be examined in the systematic review. The conceptual framework has been checked on coherence and relevance with the advisory board with experts from the Prolinnova network (ETC-Leusden), the Danish Institute for International Studies (DIIS), French Centre for Agricultural Research for Development (CIRAD) and the Royal Tropical Institute in Amsterdam (KIT).

1.7.1 Typology of innovation grants

We suggest a distinction of five ideal-type innovation grant systems that have (more or less) different characteristics and logic ('programme theory'). In Figure 1, we have highlighted them as A, B, C, D and E. Each type tends to have their specific way(s) of facilitating innovation. Organizing the systematic review

according to these types helps to compare findings between similar types of interventions.

      A = Input vouchers grant systems
      B = Service voucher grant systems
      C = Business development grant systems
      D = On-farm agricultural research for development (farmer experimentation)
      E = Off-farm agricultural research for development (market info, advocacy, etc.)

An innovation system is defined, flowing the World Bank (2006), 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 knowledge' (World Bank, 2006, pp.vi-vii). Some grant systems may be more comprehensive or integrative and have multiple and overlapping grant components that can be coded to belong to several of these types; grant systems are often embedded in a project or programme context that provides complementary services and activities along with the grants to farmers, which influence the innovation system and the livelihoods of beneficiaries.

Donors of innovation grants form parts of innovation systems but are not the most important part of it; there are several other actors and factors that influence the 'working' of the innovation process around the grant system, so the grants cannot be separated from the broader context. However, often donors are key actors in (co-)designing grant systems, and tend to be the 'bearers' of the core impact assumptions in the programme theory that is behind each of the grant systems.

We use the modality of the grant disbursement as a first criterion for developing a typology of innovation grants to be used in this systematic review. The main types of grant types are voucher systems and competitive funds that may match with other funding. A second distinction is made between their core objectives and their characteristic to be more technology-oriented or field-oriented innovations ('hardware'), more institution-oriented innovations ('orgware'), and more knowledge-oriented innovations ('software'). Innovation systems are the interaction of these three components. However, different types of innovation grants are likely to focus more on one of these subcomponents in the system. Innovation grants, in the end, intend to have an impact on the innovation system (intermediate outcomes) and the livelihoods and wellbeing of farmers (ultimate outcomes), but their entrance point and core 'pathway to impact' will differ.

In each type, we will define boundaries to limit the amount of eligible literature. Especially for type D and E, "Agricultural Research for Development grant systems", we need a boundary to exclude matching grant systems where the farmer has no autonomy to decide on the use of the grant or/and where the decision making within the grant system is not farmer-led. Without these additional criteria for these two type of grant funds almost all grants for research and development would qualify, which is not desirable and feasible. We will only consider evidence on grant systems that can be considered as being approximately 'farmer-led', though we are aware of the fuzziness of this eligibility criterion and the need for a cautious use of it during the screening process. We will code AR&D type of funds during screening to apply the application of these additional criteria.

Figure 1: Typology of innovation grants covered in the review
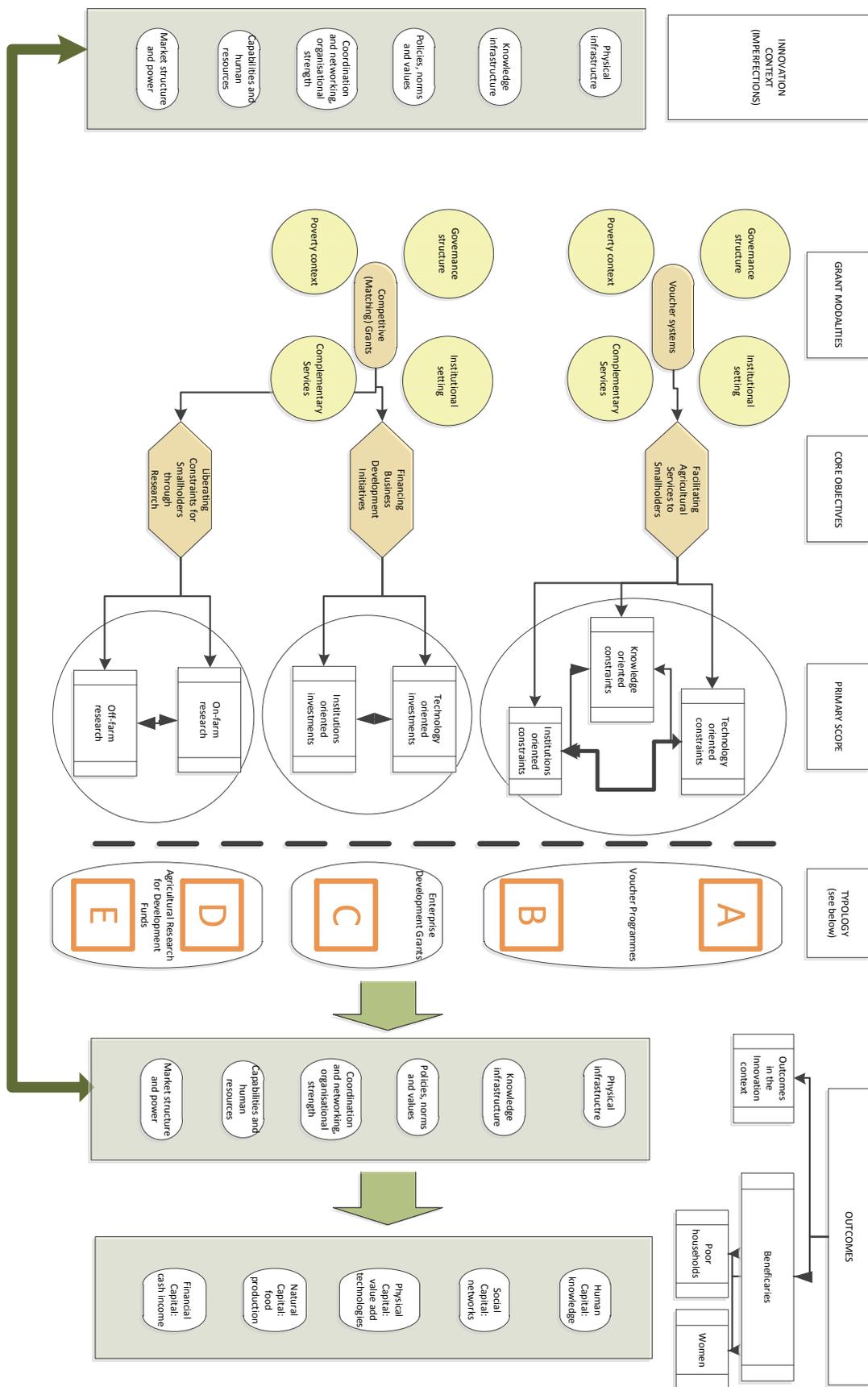
1.7.2 Enabling and disenabling conditions

The innovation systems literature emphasises the need to come to shared visions, well-established linkages and information flows amongst different public and private actors, conducive incentives that enhance cooperation, adequate market, legislative and policy environments, and well-developed human capital (Hall et al. 2001; Biggs 2007; Spielman et al. 2008). These enabling conditions both influence the working of the innovation grant, and provide the context that the grant aims to influence. There, thus, are two level of enabling conditions:

- conditions that are directly linked to the grant system itself
- conditions that influence the innovation system, independently (or before) the grant system
- conditions that are influenced by the grant system (outcome patterns)

The enabling conditions that embed each grant system are summarized on in the circles around both types of grant modalities in the graph (voucher systems and competitive grants). We will map information on the grant-related conditions: governance structure, institutional setting, social embeddedness and complementary services.

The context conditions that are important to the working of the innovation system, independently of the existence or not of a grant system, are summarized in the outer left part of the graph. We bring focus in this description of enabling and disabling conditions in the innovation system by the use of the concept of 'imperfections' or what have been called 'innovation system failures'. We adapted a framework, developed by Klein Woolthuis et al (2005) and van Mierlo et al (2010), who map the main imperfections in the innovation system to be addressed through facilitation/interventions, like the innovation grants. Different categories of failures exist: infrastructural failure, hard institutional failure, soft institutional failure, strong network failure, weak network failure and capabilities failure.

- Infrastructural failures concern (absence of) the physical infrastructure, such as railroads, telecom are constraints requiring major investments that cannot be made by the actors of the system independently. They also concern investments in knowledge infrastructure (R&D facilities) and financial infrastructure to support innovation.
- 'Hard institutional failure' refers to laws, regulations and any other formalised rules, or the lack of them, hampering innovation. For example, lack of intellectual property regulation takes away incentives from innovators as they cannot protect their innovation. Absence of environmental regulation on radically different systems, having an institutional vacuum, may slow down certain developments.
- 'Soft institutional failure' refers to unwritten rules, norms, values, culture, or 'the way business is done'. They affect how actors interact, but also relate to their (in)ability to change their norms and values to enable innovation to take place.
- Related to institutional failures are thus 'Strong network failure', which refers to actors 'locked' into their relationship, which causes myopia and blocks new ideas from outside and prohibits other potentially fruitful collaborations. 'Weak network failure' refers to a situation where actors are not well connected and fruitful cycles of learning and innovation may be prevented because there is no creative

recombination of knowledge and resources. These two failures indicate an apparent paradox in networking for innovation: a quest for a balance between openness and closure, informal or formalized interaction, trust relationships or contracts (Håkansson and Ford 2002).

- 'Capabilities failure' points to the lack of technical and organizational capacity of the system to adapt to and manage new technology and organizational innovations, such as a certain level of entrepreneurship, adequately educated persons, time to dedicate to innovation, networking skills.

- Finally, 'market structure failures' refer to the positions of and relations between market parties. Such as a monopoly or the lack of transparency in the ever enlarging food chains, but also imperfections in the 'knowledge market' (Klerkx and Leeuwis 2008b).

Of course, these limitations at the same time influence the effectiveness of, in this case, innovation grants (as grants typically cannot address all imperfections), and outcomes of the grant system are intended to at least partially reduce these imperfections. The connected arrow in the graph indicates this mutual influence. The focus on imperfections in the innovation system, instead of a comprehensive coding of 'everything' in the innovation system facilitates the use of this information for comparative analysis.

Imperfections in the innovation system are typically related with some groups of stakeholders (nodes) in the innovations system. To facilitate comparative analysis, coding of these stakeholder groups is necessary. We will map the imperfection in the innovation context in a matrix that presents six areas where system imperfections in the innovation context are typically located. (see Table 1).

1.7.3 Outcome patterns

Outcome patterns of innovation grants are on two levels:
1. directly, influencing farmer practices and livelihoods, and/or
2. indirectly, changing the innovation system that the farmer is taking part of.

To assess the mechanisms and effectiveness of each type of grant system, we distinguish in immediate, intermediate and ultimate outcomes (Mayne, 2001). Immediate outcomes are behavioural changes directly related (= high attribution) with the funding by the grant. These tend to very context specific. They will translate in subsequent changes in the innovation system: intermediate outcomes that can be tangible (seeds, production, technology, etc.) or intangible (knowledge, networks, etc.). These translate in ultimate outcomes at farmers' livelihoods level (beneficiaries). These intermediate outcomes and ultimate outcomes tend to be more suited for comparative analysis. We will map the information in the literature on intermediate level (change in the innovation context) and on the ultimate outcomes at beneficiary level. Ultimate and intermediate outcomes may not be attributed directly to an intervention (grant system) but will contribute to a wider set of factors that causes the impact. During the synthesis process, reflecting on the verbatim text in each study that explains the process that grants trigger immediate outcomes and that immediate outcomes translate into intermediate outcomes, and using explanations given in the literature, we expect to discover and test 'mechanism' that explain why the grant works for whom and under what conditions.

Intermediate outcomes are located in the innovation context, especially in the change in the 'status' of the different imperfections in the innovation system. We will use the same categories of imperfections and involved stakeholder groups to map these intermediate outcomes. The stakeholder groups that we distinguish during coding and data extraction are: farmers, buyers/consumers; input providers (land, seed, and agricultural inputs); knowledge providers (extension, research); business development service providers (credit, intermediaries) and governments (see Table 1). Of course, outcomes on innovation system imperfection can be coded to affect more than one stakeholder group.

Table 1: Matrix of imperfections related with different nodes (stakeholder groups) in the innovation system around the smallholder farmer

STAKEHOLDER GROUP AREA IN WHICH THERE MAY BE SYSTEM IMPERFECTIONS	FARMERS	BUYERS/-CONSUMERS	INPUT PROVIDERS	KNOWLEDGE PROVIDERS	BDS PROVIDERS	GOVERNMENT INSTITTUTIONS
PHYSICAL INFRASTRUCTURE						
KNOWLEDGE INFRASTRUCTURE						
POLICIES, NORMS, AND VALUES						
COORDINATION AND NETWORKING, ORGANISATIONAL STRENGTH						
CAPABILITIES/HUMAN RESOURCES						
MARKET STRUCTURE/POWER						

As framework to assess the ultimate impacts on livelihoods of farmers (=beneficiaries), we apply the five 'capitals' of the Sustainable Livelihood Approach (Bebbington, 1999): Physical, Human, Social, Financial and Natural Capital (see Figure 2). We will look at outcome patterns for farmers as a group (beneficiaries) and more specifically look at differential outcomes for the 'poor' and 'women' as subgroups when the information permits this.

Figure 2: Five 'capitals' of the Sustainable Livelihood Approach by Bebbington (1999)

Source: http://tinyurl.com/5sqwvql
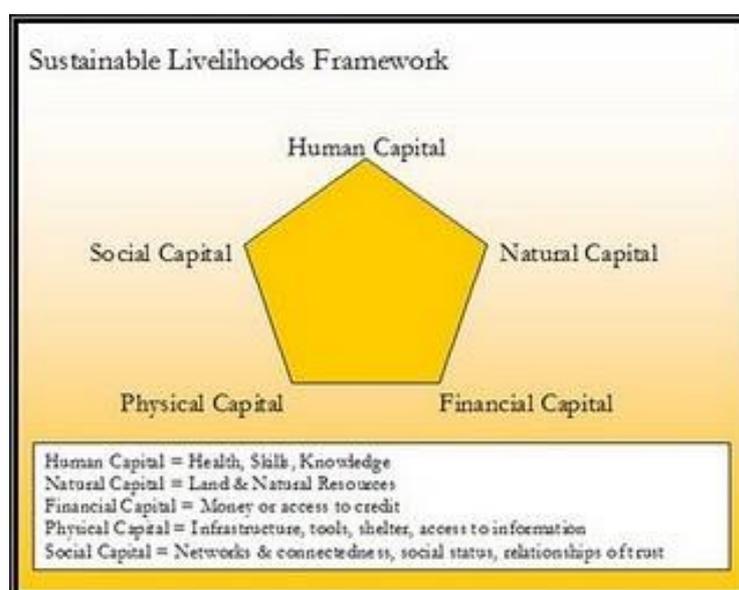
1.7.4 Intervention logics: Pathways to impact

Grant systems will have a rationale for being designed and funded. This rationale can be labelled as a 'programme theory' or 'intervention logic'. These logics can be very complex in nature, but, generally, develop around one or two central pathways of impact, with key assumptions about the causality assumed in these pathways. To focus the data synthesis part, we constructed the core impact pathways that tend to be related with each type of innovation grants. These pathways are not limiting the data synthesis, but provide an explicit starting point to develop 'middle-range theory' about CMO-configurations where this impact pathway can be observed: Where does it work (or not work), under what conditions, and why?

Two hypotheses, or 'expected' conclusions relate to all types of innovation grants and are thus overarching. They also reflect the main interest of the commissioner of the systematic review. The review synthesis will not be restricted but will at least conclude on these two hypotheses. The hypotheses will, therefore, also be incorporated in the coding tool such that the relevant data can be more easier be extracted and synthesised during the data analysis. Nevertheless, the data synthesis process is likely to come up with more insights, not restricted to these two hypotheses.

Core impact pathways of innovation grant systems

Hypothesis 1: 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 only work on financing farm–level innovations (e.g. knowledge, technologies).

Hypothesis 2: Grant systems that combine different modalities of grants allocation (e.g. combining demand-driven research funds with service voucher schemes) are more effective in achieving outcomes at scale than single modality grant system solely directed at farm households.

Core impact pathways for innovation grants: Type A – Input Voucher Grant Systems

This type of innovation grant uses subsidies on inputs and technologies to trigger innovation in agriculture. For example, voucher programmes are used to subsidize the distribution of quality seeds and fertilizers, 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 they do imply major changes in the socio-institutional and technical system around the smallholder farmer, and thus facilitate innovation at local level. The objective of input voucher programmes is to impact directly in improving on-farm production: production, productivity and income/food security. The vouchers are a way to target the subsidies to the recipient groups while using/building upon existing input providers.

Impact pathway A1: Farmers' livelihoods, and in particular poor and women, start to change to improved agricultural practices as a result of the better access to inputs and technologies provided through the vouchers offered to them.

Core impact pathways for innovation grants: Type B – Service voucher Grant Systems

This type of innovation grant 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, like private extension services, or business development services. This triggers the development of institutions and institutional arrangements that facilitate the innovation of farmers. Though the rationale may be to facilitate improved livelihoods and wellbeing of farmers, intermediate outcomes in the innovation context, such as amount and quality of extension visits to farmers, number of successful business plans, area of coverage etc., are often more meaningful as indicator of success than the ultimate outcomes on farmers. Vouchers provide the 'incubation' of a service sector for farmers and an incentive for experimenting with these services by farmers. They, generally, intend to develop a sector that becomes economically sustainable when the voucher system ends.

Impact pathway B1: The quantity and quality of services provided to smallholder famers are enhanced as a result of the voucher system and can be sustained in the future.

Impact pathway B2: Farmers' livelihoods have improved as a result of the enhanced quality and quantity of services provided.

Core impact pathways for innovation grants: Type C – Business Development Grant Systems

A special type of grant system focuses on activities that are organized 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 to enter other (urban, regional, international) markets. Business plan competitions are a common term for these type of grant systems. As business development is high risk, 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.

Impact pathway C1: Competitive grants trigger value-adding activities by (organized) farmers as a way to facilitate innovation processes with smallholder farmers in markets.

Impact pathway C2: Farmers' livelihoods improve as a result of social activities and economic returns derived from the new value-adding activities.

Core impact pathways for innovation grants: Type D – On-Farm Agricultural Research for Development

This type covers research support to farmers for on-farm experimentation enabled by the provision of innovation grants to the service providers (e.g. NGOs or community-based organisations). Outcomes are primarily in terms of knowledge

production that translates into innovative practices and initiatives by smallholders. There may be different functions of local and higher level farmer organisations in the governance of these types of funds (Ton, 2007). The research itself may have a research for development focus which includes creating incentives for effective on-farm use of existing research results.

Distinctive feature of this type is the situation that the research grant may be managed (financially and logistically) by a third party, not the farmer. We limit ourselves to on-farm experimentation by smallholder farmers, and exclude field trials and experiments done without direct involvement of the farmer (except giving access to his field). This type will focus on on-farm research funded by innovation grants. In this Type D, we only include studies that have an explicit mentioning of participation of farmer organisations in their governance structure, e.g. by sitting on decision making boards, having formal decision making authority over grant allocation.

One strand of literature that may fit in this type of innovation grants is related to Farmer Field Schools (FFS). 3IE is currently working on a systematic review of FFS. The result of the systematic review of the quantitative studies is being finalized (Waddington et al., forthcoming), with an analysis of the qualitative studies currently in progress. To facilitate any future cross-review of literature on FFS, we use parts of their coding in the review of innovation grants ((Waddington et al., forthcoming), access kindly granted by Hugh Waddington on 13-10-2011), especially when meta-analysis of studies is possible.

The logic behind this type is based on the assumption that farmer experimentation is key to develop, test and/or adapt innovations and to learn from the constraints experienced by the farmers to open up neglected research areas. The participation in the governance structure of the research is also considered to be important and instrumental.

Impact pathway D1: Grants to facilitate farmer-driven experimentation and learning open up neglected research areas in agricultural production and enhance the applicability of research results.

Impact pathway D2: Participation of local farmer organisations in decision-making over 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.

Impact pathway D3: Participation of farmers in decision-making over research funds by higher level farmer organisations (farmer federations) is effective in scaling up and scaling out on-farm agricultural innovation processes.

Core impact pathways for innovation grants: Type E – Off-Farm Agricultural Research for Development

This type covers farmer-driven research on issues that go beyond the farm plot, such as market information and advocacy for enabling policies for example. The innovation grants in this type are not directly administered by farmers or their organisations but through intermediaries (e.g. NGOs). To prevent all agricultural and rural development literature to be eligible (that is obviously too vast to manage), we only include studies that have an explicit mentioning of participation

of farmer organisations in their governance structure, e.g. by sitting on decision making boards, having formal decision making authority over grant allocation. As an additional criterion for literature in this Type E, we (may) also select only the literature after 2,000. For Type E, we will only consider evidence on grant systems that can be considered as being approximately 'farmer-led', though we are aware of the fuzziness of this eligibility criterion and the need for a cautious use of it.

Impact pathway E1: Participation of farmers' organisations in decision-making over research funds is effective in (re-)directing research to critical constraints in the innovation system (such as policies, institutional arrangements in markets)

2. Methods used in the review

2.1 User involvement

2.1.1 Approach and rationale

Conducting this systematic review we will stay in contact with AusAID commissioning the review (Adiel Mbabu) as well as the advisory group. The advisory group consists of persons that have been involved in the design of innovation grant systems and/or prior published reviews. An important practitioner network (PROLINNOVA) is present in the advisory group.

Ann Water-Bayers and Mariana Wongchowski are involved in several local innovation funds through the Prolinnova-network and bring in the practitioners perspectives. Bernard Thiomphe and Esbern Friis-Hansen are or have been studying these type of funds and help to reflect on ways to conceptualize and map key concepts in the review.

The review will be registered with the EPPI-Centre, part of the Social Science Research Unit, Institute of Education, University of London.

2.1.2 User Involvement in designing the review and conducting the review

An important interaction with users and their involvement in the review is the refinement of the review question and approach. This refinement takes place in coordination with the AusAid group and in consultation with the advisory group at the start of the assignment. The framework of the systematic review, including the hypothesis and approach of the review was discussed with AusAID in a telephone conference in June 2011. Another telephone conference was organised for the advisory group that provided additional comments on the draft of the typologies of innovation grants systems, and their comments are incorporated in the typology presented above. A dedicated web-site (http://innovation-grants-review.wikispaces.com/) has been started with a call for 'hidden' impact studies. The link and information on this site has been circulated into different communities of practice and e-discussion groups:

- The Knowledge Brokers' Forum (http://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 (http://www.g-fras.org/en/);

- Endogenous Livestock Development (http://tech.groups.yahoo.com/group/ELDev/);

- INNOVAGRO (http://www.redinnovagro.in/);

2.1.3 User involvement in interpreting the review results

A workshop of two days is planned to pilot the data extraction tool and reflect on the outcomes with the advisory group. The aim is to discuss the first preliminary findings in view of improving the coding tool to be used in the data extraction.

Draft results of the completed review will be presented and discussed again with the advisory group by mail. Additional feedback and some kind of validation of the review findings is expected from donors, practitioners and partners in the field that deal on a daily basis with these types of grants, circulating our draft outputs to a number of well-placed people, representing diverse types of strategic stakeholders and practitioner networks (see communication and dissemination under 2.1.4).

2.1.4 User involvement in communication and dissemination of review results

The review group as well as the advisory group will make the review and resulting outcome such as the planned policy brief available to contacts and networks they are involved at. If possible, we will submit a full review paper based on the work to appropriate peer review journals. The final report will be submitted to 3IE for publication.

To the extent possible, the draft report will be send directly to the authors and donor organisations mentioned in the studies that are included for data extraction. Other possibilities for dissemination of findings will be discussed with AusAID and possibly DFID and 3ie as they commissioned the systematic review.

To inform development practitioners, we will submit it through different non-academic web-sites and information portals. In particular, the option of a policy brief will be considered in co-operation with the advisory group. We translate these briefs in French and Spanish. In addition, the report will be linked to the project website of the review in the wiki domain order to reach the wider public in general but also as many individuals, whether practitioners or researchers with a specialties interest on the topic. See: http://innovation-grants-review.wikispaces.com.

2.2 Identifying and describing studies

2.2.1 Defining relevant studies: inclusion and exclusion criteria

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

Title-Abstract

1. Exclude on country [developing country]

2. Exclude on group of intended beneficiary [small holder agricultural producers, or agricultural service providers]

3. Exclude since no specific innovation grant, except farmer-driven research and extension [vouchers, matching grants, competitive grants. FFS, Not: credit-only interventions)

4. Exclude on sector [agriculture, agro-forestry. Not: fishery, forestry, tourism, non-agricultural service provisioning]

Full-text

5. Exclude since no information on at least one characteristics of the grant system [grant governance, institutional setting, poverty context, complementary activities within project]

6. Exclude since no information on innovation context [system imperfections the grant wants to address]

7. Exclude since no information on outcomes [innovation context, small holder livelihoods]

Additional for Type D & E:

8. Exclude since no decision making by beneficiaries on innovation grant system

2.2.2 Identification of potential studies: Search strategy

The review follows several steps for searching and identifying relevant studies for the data-extraction. First of all, we search for studies by using combinations of search terms that are defined below. This results in lists of potentially relevant studies that are merged and stored in the EPPI tool. After cleaning of duplicated studies, the titles, abstracts and eventually full-text of the relevant studies are screened by the group of reviewers (see chapter 2.2.3). The references of the relevant studies will be checked (reference check/snowballing), and those studies that qualify as being relevant and meet the inclusion/exclusion criteria will be added to the list of relevant studies. The references on key websites will be followed in order to specifically trace down other relevant studies, especially in the grey literature. Decisions on the inclusion and exclusion of studies will be made explicit and transparent.

In the search different sources of information will be 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 exports on innovation grants; for details see below. Thus, the systematic review involves several searches. Each search will be documented in a search history and the members of the review team will individually report on their searches in search diaries, which will give an overall overview of the searching activities undertaken. The results of the searches will be reported in a flow chart that illustrates the number of records found and accounts for the various steps of the search process.

The searches will combine groups of review-specific search terms that are specified in the Appendix 2.3. Within the groups, the search terms are combined by OR, and the different groups are combined by AND. The Boolean type search will be adjusted according to the search options of the respective data source. Furthermore, search terms may also need to be adjusted, in particular when searching bibliographic databases and online search engines.

The details about the different sources of information used to identify studies relevant for the systematic review are as follows:

Bibliographic scientific databases: Bibliographic databases will be searched by using the combinations of search terms defined below. The bibliographic databases include:

- 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
- 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…)
- AGRIS (International System for Agricultural Science and Technology, under the umbrella of Coherence in Information for Agricultural Research for Development, 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

The bibliographic databases allow for conducting full text but also specialised searches on indexed subheadings and/or keywords with a possible thesaurus option to use synonyms of the search terms applied. Such specialised searches will be practical for pinning down relevant studies. Relevant journals are listed in the Appendix 2.4.

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, http://www.latindex.unam.mx/, including Latin American Journals online

Gateways and specialist websites of organisations and institutions (search engines):

In addition to peer-reviewed journal articles as well as other referenced material provided by bibliographic databases, Google scholar, the websites of organisations and institutions involved in development aid in general and innovation grants in

particular as well as specific online gateways will be searched. The gateways search is listed below. The detailed list of websites searched is provided in the Appendix 2.5. The search of the specialist websites involves hand-search. Searching these data sources aims to locate but at the same time also limit the vast number of grey literature, such as working papers, conference contributions and other formats of the grey literature, for example project reports.

The grey literature is potentially rather broad with detailed information about existing projects and hopefully some kind of impact assessment. Here, we use the organisations and institutions that have implemented and/or supported known projects and programmes as an entry point for the search and expect to find project reports or other documentation through indicated websites and searches on the Google Internet search engine. The reports would comprise impact assessments or some other kind of evaluations of respective projects/programmes that have been evaluated sometime after the grants have been used by the beneficiaries.

- Eldis (collection of editorially selected and abstracted full-text, online documents on development issues)
- IDEAS (largest bibliographic database dedicated to Economic, economic research, including Research Papers in Economics database (RePEc)
- Jolis: World bank and IMF database, http://external.worldbankimflib.org
- 3ie Database of Impact Assessment, covering impact evaluations conducted in low- and middle- income countries, http://www.3ieimpact.org/database_of_impact__evaluations.html
- Google scholar: general search, the first 150 hits will be screened with regard to their relevance to the present systematic review.
- SSRN, Social Science Research Network, that includes working papers and submitted papers under review
- Taylor&Francis online

Contact with experts on innovation grants: Entry into the large number of potentially relevant studies will also be achieved by a first scan of the studies and report forwarded by experts contacted. The contacts will be from the network of the review group but most importantly from the network of the advisory group. In addition, there will be a project website in the wiki domain to reach as many individuals, whether practitioners or researchers with a specialties interest on the topic, and to ask them to forward studies on agricultural innovation grants. See: http://innovation-grants-review.wikispaces.com.

2.2.3 Screening studies: applying inclusion and exclusion criteria

After identifying studies as being relevant in the search, there are two screening phases. First, the title and abstract of the relevant studies are screened by applying the inclusion/exclusion criteria on title and abstract. For those studies that remain after the first screening the full texts will be retrieved and assessed by applying an extended list of inclusion/exclusion criteria. Those studies qualifying as being relevant after the second screening (full-text screening) will be assess, and the information provided will be extracted with the help of a common coding tool (data extraction) (see chapter 2.3.1). We will check the reference lists of these studies for additional studies that can be included (snowballing).

It is important to note that we can only extract data for those studies that report sufficient information. In the case of lack of information, we will contact the

authors of the respective study if possible. We may also need to contact authors for clarification of study results.

2.2.4 Identifying and describing studies: quality assurance process

In the search and identification of relevant studies, the members of the review groups will work together. For a transparent and replicable review, each team member will keep a search diary. In case of doubt about the relevance of studies, there will be cross checks, and the reviewers will discuss the issues and challenges occurring in both the search and the screening if necessary.

Depending on the number of studies selected for the detailed review, two researchers will independently review a sample of the studies, and the coding results will be cross-checked to avoid biases. In the cases of doubt, the review group will work in pairs such that their results and decisions will be compared. There will be discussion in order to achieve consensus. That is, reviewers will discuss different coding results and find consensus, with the possibility to involve the advisory board. Authors of the original research will be contacted if clarification and more information and data are necessary.

2.3 In-depth review

2.3.1 Overall approach to data extraction – coding tool

A common coding tool will be developed so as to extract data and the information relevant for answering the review question specified. This makes the relevant information provided by the studies comparable and facilitates the synthesis of results.

In addition to the standard details about the studies (for example authors, affiliation, funding, goal of the study), the information to be extracted with the coding tool covers information to distil the intervention logics and the type of immediate, intermediate or ultimate outcomes that are reported in the studies. The outcomes for the poor and women will be specifically considered. The different parts of the coding tool, for which data will be extracted where available, are summarised in Table 2. The coding tool will be implemented in the software developed by Thomas et al (2010) and provided in the EPPI-Reviewer (see Appendix 2.6 for the draft coding tool).

2.3.2 Assessing the quality of studies and weight of evidence for the review question

The methodological rigour of the studies will differ. While some studies may include quantitative impact assessment, we expect the majority of studies to be of qualitative nature. First of all, the inclusion/exclusion criteria will ensure that only studies of a reasonable quality and methodological rigour will be considered as relevant for the actual review. Studies identified as meeting the inclusion criteria will be assessed in depth by the aforementioned coding tool, using the EPPI-Centre's detailed data-extraction software (the EPPI-Reviewer). The coding includes an evaluation of the quality of the studies in a quality and relevance appraisal (see table 2). More specifically, the study quality will be assessed according to the following elements, and this information will be used for an overall weighing of the evidence provided:

- Type of study – (quasi-)experimental, qualitative or mixed methods
- Study design – soundness of studies (methodological coherence), appropriateness of study design to analyse the research question posed (e.g. assess impacts with or without counterfactual; build 'theory' on what works and why; process to get information on outcome patterns, etc.)
- Rigour in data collection, including the selection of respondents and the measurement of the efficiency of the outcome of the innovation grants
- Representativeness of the observations (e.g. from the sample, measures, scenario, focus group or other indicator of the focus of the study)
- Relevance of the focus of the study to derive implication on the impact of agricultural innovation grants.

2.3.3 Data extraction - synthesis of evidence

As already mentioned, the review is expected to result in a limited number of quantitative studies that comprise rigorous impact assessment and evaluations of innovation grants and that use a quasi-experimental design to resolve the counterfactual (IE-studies). Most literature will be more qualitative or mixed method studies (non-IE studies). We will synthesise these two types of studies in different ways and use the results in combination to provide some overall insights and conclusions. The extracted material will become the 'evidence on impact' on which evaluative inferences will be made. When necessary, additional information will be asked for to the authors of the studies.

IE studies: Though unlikely, when possible a statistical meta-analysis will be done on a sub-set of studies that used experimental or quasi-experimental designs around similar types of innovation grants and similar working mechanisms. The estimates of the meta-analysis (an option available in EPPI Reviewer software) will report on their significance and confidence intervals as well as forest plots will summarise the quantitative evidence about innovation grants and their outcome and efficiency. The potential heterogeneity of the studies will be considered by examining sub-groups on context characteristics that might differ between the cases.

Non-IE studies: We will read the respective studies in order to become as familiar as possible with the content and detail and start the process of extracting evidence related with outcomes and with intervening factors (conditions, mechanisms). We will extract data from each of the studies using the coding tool.

In the comparative analysis, we will look both for possibilities to aggregate studies on impact, but, more importantly, build arguments around the lead question in our systematic review: What works for whom under what conditions, and how? The answer on these questions will inevitably lead to the (re-)configuration of the initial typology and the building on 'middle-range theories' (Wong et al., 2010, Pawson et al., 2004). Therefore, during data synthesis, we may use other literature to help understand and frame results of the comparative analysis, even when this literature has been excluded in an earlier phase. This process will be iterative in nature and most probably link to a wider body of social theory that is not necessary restricted to agriculture and developing countries. To do so, during data synthesis, several additional literature searches will be made to select studies that may help to build (aspects of) these middle-range theories, and use the extracted data to 'test' these candidate theories. "An appraisal of the 'worth' of any section of data

(within a data source) should be made on whether it can contribute to theory – its relevance, and if the method used to generate that piece of data is credible and trustworthy – its rigour" (personal communication with Geoff Wong). The search strategy that will be used to get these studies will be described and documented, to allow replication.

The synthesis process will compare and contrast findings from different studies in a structured way, highlighting both confirmatory and contradictory findings related with each type of innovation grant (type of intervention theory), aiming to refine the core rationale and impact pathways ('programme theories') in the light of evidence. While each study will be summarised separately in the appendix, a mapping matrix will be constructed identifying determinants or facilitators of and barriers to the effectiveness of each type of intervention in the studies. Nevertheless, in spite of the typology an mapping exercise to reduce diversity, we expect that we will still have sets of quite heterogeneous primary studies of each type of innovation grant system.

We will reflect on the core impact pathways described above, which reflect the core 'theory' and rationale behind these innovation grant systems. We use the evidence to 'test' these theories and, at the same time, to build new theories about how and why some types of innovation grant system tend to produce positive or negative outcomes for smallholder, and especially the poor and women. These are called 'middle-range theories' that will have to be supported by the evidence collected during data-extraction from the individual studies that where selected as eligible in the review.

2.3.4 Deriving conclusions and implications

The extracted data will allow us to explore a wide range of context-mechanism-outcome combinations and use the available qualitative data reported in the primary studies to build and refine theories of how innovation grants tend to 'work'. "The essence of our synthesis is interpretation. Hence key processes are immersion (reading and re-reading texts), reflection, discussion amongst team members, comparison and continuing to seek explanations and test theories until saturation of the data is reached. (..) We are fully aware that (in common with other qualitative research) this method is subjective and interpretive. 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 et al., 2010).

The insights derived from the systematic review will be presented and discussed with the person in the advisory board and, as a draft report, distributed for peer-review to the policy makers that initiated the review question, and in the networks of practitioners and researchers. Based on these comments, additional comparative analysis may be done and alternative theories on the how and why of the working of innovation grants will be 'tested' with the available evidence base in our extracted data-set.

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Appendices

Appendix 1.1: Authorship of this report

The review group comprises: Giel Ton (project leader), Laurens Klerkx, Karin de Grip and Marie-Luise Rau. The review group is assisted by an advisory group of experts in the development of the conceptual framework of the systematic review by commenting and providing guidance from their expert point of view about 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)	Project leader, review group leader
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Conflicts of interest (if any)

There were no conflicts of interest.

Appendix 2.1: Inclusion and exclusion criteria

Including / excluding criteria for screening on TITLE AND ABSTRACT

1. Exclude on country [developing country]

2. Exclude on group of intended beneficiary [small holder agricultural producers, or agricultural service providers]

3. Exclude since no specific innovation grant, except farmer-driven research and extension [vouchers, matching grants, competitive grants. FFS, No credit)

4. Exclude on sector [agriculture, agro-forestry. No fishery, forestry, tourism, non-agricultural service provisioning]

Including / excluding criteria for screening on FULL TEXT

Re-examen

1. Exclude on country [developing country]

2. Exclude on group of intended beneficiary [small holder agricultural producers, or agricultural service providers]

3. Exclude since no specific innovation grant, except farmer-driven research and extension [vouchers, matching grants, competitive grants. FFS, Not: credit-only interventions)

4. Exclude on sector [agriculture, agro-forestry. Not: fishery, forestry, tourism, non-agricultural service provisioning]

Additional for all

5. Exclude since no information on at least one characteristics of the grant system [grant governance, institutional setting, poverty context, complementary activities within project]

6. Exclude since no information on innovation context [system imperfections the grant wants to address]

7. Exclude since no information on outcomes [innovation context, small holder livelihoods]

Additional for Type D & E:

8. Exclude since no decision making by beneficiaries on innovation grant system

Appendix 2.2: Databases used in the search

- Scopus, the world's largest abstract and citation database of peer-reviewed literature and quality web sources, covering all disciplines
- Web of Knowledge (formerly ISI Web of Knowledge), covering all disciplines
- 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…)
- AGRIS (International System for Agricultural Science and Technology, under the umbrella of Coherence in Information for Agricultural Research for Development, 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
- 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
- Wageningen University Library catalogue and databases
- Scientific Electronic Library Online, Latin America, http://www.latindex.unam.mx/, including Latin American Journals online
- Eldis (collection of editorially selected and abstracted full-text, online documents on development issues)
- IDEAS (largest bibliographic database dedicated to Economic, economic research, including Research Papers in Economics database (RePEc)
- Jolis: World bank and IMF database, http://external.worldbankimflib.org
- 3ie Database of Impact Assessment, covering impact evaluations conducted in low- and middle- income countries, http://www.3ieimpact.org/database_of_impact_ evaluations.html

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 the Food and Agriculture Organization (FAO) (see http://aims.fao.org), and here in particular AGROVOC, which is the world's most comprehensive multilingual agricultural vocabulary will be used to define synonyms and search terms related and relevant for the search. The thesaurus provided by CAB will also be used to refine the search terms.

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 get supported to steer innovation (see chapter 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 will be 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 ($1,005 or less): Afghanistan, Gambia, Myanmar, Bangladesh, Guinea, Nepal, Benin, Guinea-Bisau, 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 ($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 ($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

This list gives 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.

Relevant journals for example include:

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 of organisations/institutions involved in agricultural innovation grants to be 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'