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Strengthening Agricultural Innovation Capacity: Are Innovation Brokers the Answer?

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STRENGTHENING AGRICULTURAL INNOVATION CAPACITY: ARE INNOVATION BROKERS THE ANSWER?

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Abstract

This paper examines the role of innovation brokers in stimulating innovation system interaction and innovation capacity building, and illustrates this by taking the case of Dutch agriculture as an example. Subsequently, it reflects upon the potential role of innovation brokers in developing countries' agriculture. It concludes that innovation brokerage roles are likely to become relevant in emerging economies and that public or donor investment in innovation brokerage may be needed to overcome inherent tensions regarding the neutrality and funding of such players in the innovation system. The Dutch experience suggests that innovation brokers need to be contextually embedded, and are unlikely to become effective through a centrally-imposed design. Hence, we conclude that stimulating their emergence requires a policy that supports institutional learning and experimentation. In the evaluation of such experiments, it is important to note that innovation brokers tend to play intangible roles that are not easily captured through conventional indicators.

Key Words: Agriculture, Developing Countries, the Netherlands, Innovation Broker, Neutrality, Institutional Learning, Context-Specific, Innovation Systems, Capacity Strengthening, Agricultural Extension

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TABLE OF CONTENTS

I. INTRODUCTION

The multifunctional agricultural sector of the 21st century is embedded in a fast-changing global context of market, technology, policy and regulatory settings that present both challenges and opportunities. In this fast-changing world, innovation is a central strategy in tackling challenges and grasping opportunities and as a means of achieving economic, social and environmental goals. Yet, many countries are still struggling with agricultural innovation arrangements and policies informed by simpler and more stable techno-economic conditions of the mid-20th century. As a result many countries around the world are attempting to reform and evolve their agricultural innovation arrangements to develop flexible and responsive capacities. This is particularly urgent in developing countries as agriculture remains a central element of the economy and innovation is key to the agricultural growth needed to reduce poverty (Thomas and Slater, 2006; World Bank, 2008; Bezemer and Headey, 2008).

It is now realised that central to this reform and evolution process is the shift from public sector agricultural research — which delivers new technology in an institutional configuration that resembles a pipeline — to arrangements that resemble a network or a system of researchers, farmers, entrepreneurs and other organisations involved in the creation, diffusion, adaptation and use of knowledge, as well as in providing other resources for innovation (Biggs, 1990; Engel, 1995; Hall et al 2001). Moreover, it is widely acknowledged that agricultural innovation requires a balance between new technical practices and alternative ways of organising — for example, markets, labour, land-tenure and distribution of benefits (Leeuwis, 2004; Adjeih-Nsiah et al, 2004; Dormon et al., 2007). In this light, innovation scholars have re-conceptualised innovation as a successful combination of 'hardware' (i.e., new technical devices and practices), 'software' (i.e., new knowledge and modes of thinking) and 'orgware' (i.e., new social institutions and forms of organisation) (adapted from Smits, 2002). These sorts of insights have been elaborated through the idea of fostering effective agricultural innovation systems (Hall et al., 2001; Biggs, 2007; Spielman et al. 2008; Lenné, 2008). In agricultural innovation systems, networks of different players are transient and emerge around specific challenges and tasks at particular points in time. Public agricultural research is one of these players, but its value is as a responsive element of a network or system, rather than in its own right (Sumberg, 2005; Kristjanson et al.,

2009). Other players such as the private sector or civil society organisations have a prominent role — not just as passive knowledge users or transmitters, but as pro-active agents who are interdependent in working towards effective socio-technical innovations in agriculture (Hall et al., 2001; Leeuwis, 2004; Biggs, 2007). Much of the literature on such networks or 'coalitions' (Biggs and Smith, 1998) deals with more formalised public-private partnerships (PPPs) (Byerlee and Fischer, 2002; Hartwich and Tola, 2007), but it is not only 'high profile' PPPs that matter for pro-poor agricultural development. As Hall suggests, "Rather mundane and less high-profile cases are going to be of the type that planners and policymakers are going to have to deal with on a day-to-day basis" (Hall, 2006: 5).

A number of questions remain unanswered when it comes to how everyday innovation capacity may be improved. How can a production base made up of many farmers organise its demand for knowledge, technology and organisational change? What mechanism will facilitate the search for information? Who will coordinate the networks of interaction needed for innovation? A recent study by the World Bank (2006) found that even when there were strong market incentives for players to collaborate for innovation, linkage formation was still extremely limited. While this suggests that an important role of public policy should be to promote these linkages, how can this be achieved in practice? Is there a need for an organisation with a brokering role to help coordinate multiple players and facilitate partnerships and linkages? Should this be a private organisation or a public agency?

As public policy comes to grips with these new ideas it is becoming increasingly apparent that intermediary organisations, which sit between and connect different agents involved in innovation trajectories in developing countries (Mytelka, 1993; Fisher and Vogel, 2008; Szogs, 2008), are important as they fulfil boundary work (Kristjanson et al., 2009) and play a role in 'bridging', 'bonding' and 'linking' social capital (Heemskerk and Wennink, 2004; Hall, 2006). Hartwich et al. (2007a: vii) state in this regard that "third-party catalysing agents are necessary to bring partners together, motivate them, provide information, and organise space for negotiations." The type of intermediary that is becoming increasingly important is not the 'traditional' third party in a one-to-one relationship, such as conventional agricultural extension, but a 'systemic' intermediary as an in-between in a many-to-many relationship (Van Lente et al.,

2003; Howells, 2006). In other words, a role that is neither involved in the creation of knowledge nor in its use in innovation, but one that binds together the various elements of an innovation system and ensures that demands are articulated to suppliers, that partners connect, and that information flows and learning occurs.

These systemic intermediaries play a role as *innovation brokers*, whose main purpose is to build appropriate linkages in innovation systems, and facilitate multi-stakeholder interaction in innovation. So far, the agricultural sector has mainly relied on public sector intermediaries such as agricultural extension services, often with questionable effectiveness and a limited mandate (Leeuwis, 2004: Sulaiman et al., 2005). National governments and development assistance agencies now face the difficult task of identifying appropriate mechanisms that can play this innovation broker role in the context of the dynamic and evolving contemporary agricultural scenario, in which numerous challenges (e.g., sustainability, climate change, poverty alleviation, agri-industrial development) need to be addressed simultaneously (see Hall, 2008).

There is already some experience on innovation brokers in the agricultural sector to draw lessons from. From a policy perspective it is important to understand the effectiveness of different brokerage mechanisms (German and Stroud, 2007; Spielman, 2007). And it is equally important to understand the process that governs the emergence and evolution of these mechanisms in specific contextual settings (Hall et al., 2005). This is so because past experience has taught us that efforts to transplant organisational blueprints from one context to another are unlikely to be effective.

The purpose of this paper is, therefore, twofold. Using the case of innovation brokers in the Dutch agricultural sector, the paper first explains the circumstances that have led to the emergence of these arrangements and discusses the role of policy in facilitating this emergence. Secondly, it outlines what these intermediaries look like in practice and discusses the factors that determine their effectiveness. The paper concludes with a wider discussion of the implications of this experience and, particularly, its implication for developing countries. Many of these countries still have quite some distance to travel in their reform process and are only now facing the challenge of strengthening innovation capacity in the contemporary systemic sense. The

conclusion of the paper stresses the importance of shifting from policy perspectives focused on introducing generic mechanisms to achieve innovation brokering functions to policy perspectives that focus on stimulating and enabling the institutional innovations needed to allow these to emerge and grow organically in context-specific ways. Before embarking on this trajectory, we first present a brief review of the literature on innovation brokers in order to further clarify and demarcate the area of discourse and provide an analytical lens.

II. THE ROLE OF INNOVATION BROKERS AS INNOVATION SYSTEM CATALYSTS

The roles, performance and effects of innovation brokers for the industrial sector in Western countries are quite well-documented (see Van Lente, 2003; Howells, 2006; Winch and Courtney, 2007; Sapsed et al., 2007; Johnson, 2008). Although being mentioned as a solution to innovation system fragmentation and underperformance and being researched in preliminary studies (Clark, 2002; Garforth et al., 2003; Morriss et al., 2006; Spielman and Von Grebner, 2006; Hartwich et al., 2007a; Van Mele, 2008; Kristjanson et al., 2009), the topic is less systematically researched in the agricultural sector. This reflects the fact that in the agricultural sector innovation brokers have only recently emerged as distinct from the traditional agricultural intermediary organisation — namely, the public extension services.

2.1 What is an innovation broker?

Howells coined the term 'innovation intermediary', defined as: "an organisation or body that acts as an agent or broker in any aspect of the innovation process between two or more parties. Such intermediary activities include: helping to provide information about potential collaborators; brokering a transaction between two or more parties; acting as a mediator, or go-between; bodies or organisations that are already collaborating; and helping find advice, funding and support for the innovation outcomes of such collaborations." (Howells, 2006, 720). However, the provision of brokerage or 'innovation intermediation' functions may often not be the primary role of an organisation. As Howells (2006: 726) argues, "Organisations providing intermediation functions do not solely or even wholly restrict themselves to intermediary functions, but also cover more traditional contract research and technical services, which involve no third-party type collaboration." To distinguish such 'specialised' brokers from other individuals or organisations that provide some brokerage functions, but not as a core function, Winch and Courtney (2007: 751) define an innovation broker as "an organisation acting as a member of a network of actors [..] that is focused neither on the organisation nor the implementation of innovations [sic.], but on enabling other organisations to innovate".

2.2 What are the main functions of innovation brokers?

Innovation brokerage comprises several detailed functions (Howells, 2006; Johnson, 2008), which can be reduced to three generic functions (Van Lente et al., 2003, Klerkx and Leeuwis, forthcoming):

- **Demand articulation:** Articulating innovation needs and visions and corresponding demands in terms of technology, knowledge, funding and policy, achieved through problem diagnosis and foresight exercises.
- **Network composition:** Facilitation of linkages between relevant actors, i.e., scanning, scoping, filtering, and matchmaking of possible cooperation partners (Howells, 2006).
- **Innovation process management:** Enhancing alignment in the often heterogeneous networks, constituted by actors from different institutional backgrounds and reference frames related to norms, values, incentive and reward systems. This requires continuous 'interface management' (Smits et al., 2004) in which there is a 'translation' between the different actor domains, which has been described as 'boundary work' (Kristjanson et al, 2009) and 'knowledge brokerage' (Hargadon, 2002). Furthermore, it includes a host of facilitation tasks that ensure that networks are sustained and become productive, e.g., through the building of trust, establishing working procedures, fostering learning, managing conflict and intellectual property management (Leeuwis, 2004).

2.3 Reported Risks and Drawbacks

Despite the potentially important role that innovation brokers can play, there are a number of risks and possible drawbacks that have also been identified with regard to their functioning.

- *Neutrality tensions*

A key factor for the credibility and legitimacy of innovation brokers is an impartial or neutral and independent position (Kolodny et al., 2001; Spielman and Von Grebmer, 2006). On the one hand, this is complicated because stakeholders (e.g., financiers or participants) may exercise pressure to compose and manage networks in a way that fits their objectives (Isaksen and Remoe, 2001), which may result in the broker being seen as a representative of a single organisation. On the other hand, maintaining a neutral position is inherently difficult because brokers always exercise a certain degree of steering (Laschewski et al., 2002). However, as

innovation is about breaking out of current practices, sometimes innovation brokers actively need to help 'destroy' existing systems to be able to bring about new networks and new ways of thinking (Smits and Kuhlmann, 2004).

- *Functional ambiguity*

Innovation brokerage can be both a side activity of 'traditional' knowledge-intensive service providers such as research institutes or extension service providers and the core business of a dedicated organisation. This may imply that brokers have overlapping functions with parties for whom they intend to broker, and hence may be seen as competitors instead of facilitators. Also, there may be ambiguity about the actual benefit of having a mediating agent (Candemir and Van Lente, 2007). As a result of competing functions and role ambiguity, innovation brokers may alienate themselves from players in the existing knowledge infrastructure who nevertheless can be important for network composition (as possible partners in the network to be formed).

- *Invisible effects/ willingness to pay*

Assessing the impact of innovation brokers is seen to be difficult, given their indirect impact on profit and incomes (Howells, 2006). Despite their contribution being quite invisible, they may have had a determining role in achieving success instead of failure (Johnson, 2008). Main tensions include:

- Difficulties in ex-ante evaluation of service value and low ex-ante identifiability of benefits that affect willingness-to-pay amongst private parties for, especially, functions that relate to demand articulation and network composition. Bessant and Rush (1995) speak in this regard of brokerage as 'missionary work'.
- Funding impatience: Funding is provided for too short a period and this impedes the innovation broker from becoming well-established and the networks it supports from becoming sustainable (Rosenfeld, 1996). This is enhanced by the fact that the impact of innovation brokers on innovation is hard to make visible with current evaluation methods aimed at 'hard' indicators (Rasmussen, 2008).

The following section will explore if the Dutch experience with innovation brokers in the agricultural sector can throw more light on the policy challenges faced by those seeking to reform NARS and strengthening agricultural innovation capacity in developing and emerging countries.

III. THE EMERGENCE AND ROLE OF INNOVATION BROKERS IN THE DUTCH AGRICULTURAL INNOVATION SYSTEM

3.1 The rise and fall of the OVO-triptych

Historically the Dutch public agricultural research and extension system was characterised by a high degree of interconnections among its main actors. This so-called OVO-triptych (meaning Research-Extension-Education triptych) has been credited as a key factor in the development of innovation capacity within Dutch agriculture and making it an important player in the global agricultural scene (Röling, 1990; Roseboom and Rutten, 1998; Smits, 2002). The OVO-tryptich embodied the corporatist Dutch agribusiness culture, in which there were well-developed, institutionalised linkages and feedback mechanisms and continuous alignment among farmers, agri-industry, research and extension establishments and government (Wielinga, 2001). Having its origin in post World War II policy on food security, its main focus was the modernisation of Dutch agriculture, with a focus on homogenous development paths emphasising productivity increase and efficiency gains (Nieuwenhuis, 2002). The OVO approach was seen to work well until the mid-Seventies (Wielinga, 2001). However, starting from the 1980s the OVO triptych became less successful, and changes were triggered by a set of political, cultural, institutional and economic forces (Leeuwis et al., 2006). Growing public concern on health issues, production surpluses, increasing environmental awareness in European society, combined with serious food production scandals (BSE, swine fever and foot-and-mouth disease), led to reduced support for the 'industrial' productivity increase paradigm which was dominant in the OVO triptych (Nieuwenhuis, 2002). In general, the need was felt for a major re-think of how agricultural production in the Netherlands could be shaped to deal with new societal, economical and ecological demands, and how the knowledge infrastructure could support that. As policy shifted towards reducing the environmental constraints, the interests of policymakers and farmers, which were once aligned, started to become increasingly divergent. Publicly-funded research and extension became increasingly oriented to issues such as reducing the environmental impact of farming, and hence did not align well with farmers' economic motives. This caused a loyalty conflict among agricultural extensionists, who wanted to be loyal to both their paymaster (government) and their clients (entrepreneurial farmers).

Against these backgrounds, the dominant policy view came to be that the OVO triptych could not remain a purely agricultural affair, and that it needed to open up to new societal players (e.g., consumers, nature conservationists, the environmental movement, etc.) in order to be able to deal with new societal concerns, options and priorities. The agricultural sector (including the OVO triptych) was seen to respond rather slowly to the redefined public interest, and it became increasingly regarded as an obstacle (i.e. as part of a defensive agricultural lobby) rather than as a stimulant of desirable change (Verkaik and Dijkveld Stol, 1989). As part of a wider wave of reform and privatisation of public services, the government responded to these problems in the OVO triptych by embarking in 1990 on a trajectory of privatisation of research and extension establishments, accompanied by the introduction of radical new financing mechanisms and procedures (Roseboom and Rutten, 1998). This was not only meant to make room for new providers of research and extension services, but was also seen as a way to change service delivery culture (of providers) and expectations (of clients), shifting the balance from supply-driven to demand-driven approaches. The privatisation of public Dutch agricultural research and extension establishments induced a repositioning of the different players in the agricultural knowledge architecture, according to the new 'rules of the game' imposed by the new 'knowledge market' setting in which they had to operate. These policy and institutional changes led to increased competition and shielding-off of information among research and extension organisations, and weakened the once strong linkages among agricultural research, extension, farmers, agri-industry and government (Leeuwis, 2000; Wielinga, 2001), which were seen as key factors for the success of the OVO triptych.

3.2. Different types of innovation brokers emerge

In response to what many experienced as the 'collapse' of the OVO triptych a number of proposals for new organisational arrangements for agricultural research and innovation support were formulated (Enzing et al., 1998; De Groot, 2003). This emphasised the need to come to a renewed OVO-triptych, strengthening some of the linkages in the triptych that had weakened over time. It was out of this context that intermediary organisations with the function of agricultural innovation brokers came to prominence, both as a policy intervention and as a pragmatic response of civil society, farmers' organisations and the private sector to social and economic challenges and opportunities.

An initial attempt by the government to establish a central innovation broker to channel the knowledge flows in the privatised knowledge architecture proved non-viable. Due to its close connections to government it was seen to have a biased agenda which did not match with the interests of clients. Moreover, the organisation could not cope well with the increasingly fragmented, local and autonomous set of networks that emerged after the reform (Wielinga, 2001). At the same time various types of innovation brokers emerged in a more self-organised manner at regional and sub-sectoral levels, with the goal to restore and optimise the linkages in the agricultural innovation system. Although such brokers were generally established in a concerted effort of private (research and extension providers, farmers' organisations) and public (municipalities, provinces), individual founders were not always altruistic in their intentions as goals such as profit-seeking and policy realisation were reasons to invest.

Following the function-based typology of Klerkx and Leeuwis (in press) seven distinct types of agricultural innovation brokers can now be seen in the Netherlands. They are discussed and illustrated below:

a) Type 1 and 2: Innovation consultants

These organisations either focus on the individual farmer (Type 1), or on a collective of farmers with a common interest and who wish to jointly develop or implement an innovation (Type 2). They focus mostly on incremental innovations. They make an innovation SWOT analysis of a farm, define an innovation strategy with the farmer, and help to find and guide interaction among cooperation partners. Such a SWOT analysis may be on request of the farmer, but sometimes they also actively approach farmers (presumably to sell their services). Innovation consultants can be found with different organisational formats — for-profit private firms, government agencies, and non-profit foundations. Generally these organisations have emerged out of a concern of both public (such as government at local, regional or national level) and private parties (such as farmers' organisations, privatised research and extension establishments) that there was a gap between farmers' innovation needs and existing service provision for technology and information supply. These parties either subsidise these organisations or they participate as shareholders. Most often, the SWOT type analysis (demand articulation) and the identification of

cooperation partners and information sources (network composition) are initially free-of-charge. These organisations often have a regional coverage, attending to different types of agricultural enterprises. An example of such an organisation is the Agricultural Knowledge Centre North Holland (AKC-NH), which emerged out of a concern of closure of a regional experimental station after privatisation of the research and extension system. AKC-NH was jointly funded by provincial and local government, privatised research and extension providers, regional agricultural colleges, and the regional farmer's organisation. An example of its services is the guidance it provided in the search for a 'flower bulb disease detector' to automate disease detection and reduce labour costs. Instead of ending up at the 'default' formerly public agricultural research institutes, in its role of a neutral broker the AKC-NH searched for available knowledge in public and private, agricultural and non-agricultural, research institutes and R&D departments of large companies. Having found a candidate technology, AKC-NH then searched for subsidies to conduct feasibility studies as the investment risk for farmers was too high. Furthermore, they helped maintain energy and stamina in the process, mediated between the different 'cultural worlds' of the actors involved, and guided the process of intellectual property protection.

b) Type 3: Peer network 'academies'

These organisations usually have a sub-sectoral focus (such as horticulture, dairy farming, pig farming). They focus on the formation of so-called 'soft networks', which are concerned with knowledge exchange and often have an informal character. In the Dutch agricultural sector, informal network structures (so-called study clubs, which resemble farmer learning networks such as Farmer Field Schools[i]) traditionally existed, often guided by an external facilitator (generally an extensionist or private consultant). Due to changes such as the diversification of farmer interests, a decreasing number of farmers, and the fact that facilitation by a consultant from a public agricultural extension service is no longer available free of charge, the original study club concept was considerably weakened. The peer network academies are an attempt to 'revitalise' the study club concept. An example is the Dairy Farming Academy (DFA), whose goal is to set up new farmer networks on the basis of shared interests (see Klerkx and Leeuwis, 2009). Networking activities include information exchange through an online databank; network members' farms used as demonstration farms; experienced farmers acting as coaches for less-

experienced farmers; best practice meetings in which farmers discuss a theme of common interest; and 'master classes' by non-agricultural entrepreneurs. DFA aims to be demand-driven, programming working themes based on aggregated demand obtained by analysis of the online databank, questionnaires, and on impressions obtained by facilitators during previous sessions. To be able to closely identify with farmers' lifeworlds, facilitators themselves are dairy farmers. DFA's role as an innovation broker thus focuses on demand articulation, strengthening links between peers and with the wider set of agricultural innovation actors (network composition) and 'gatekeeping' (bringing in relevant external information and contacts into the networks).

c) Type 4: Systemic instruments

The main difference between the systemic broker and the previous two discussed is that the former goes beyond individual firms, or clusters or networks of firms, but targets higher level innovation architectures that involve complex constellations of business, government, and societal actors, dealing with complex problems. This type of innovation broker is often a civil society organisation (although with public funding), reflecting its interests in innovation and policy issues that go beyond the conventional domain of government or the private sector. An example in the Netherlands is the Innovation Network Rural Areas and Agricultural Systems (INRAAS), described by Smits and Kuhlmann (2004). It was established in mid-2000 to address challenges such as reducing detrimental effects of agriculture on the environment and the need to shift from bulk production to multifunctional agriculture. The realisation of this complex agricultural agenda required intermediation between a diverse set of agricultural and non-agricultural stakeholders. The main activities of INRAAS are thus geared towards managing and strengthening a collective systemic vision and approach to agricultural innovation. This includes foresight exercises, network building, and initiating experiments to jointly identify, develop and implement innovative opportunities. Through their efforts, these organisations also want to bring about change in 'hard' and 'soft' institutions, and go beyond participating actors and organisations, but also include policies, rules, habits, standards, procedures, and laws. Following INRAAS, a number of subsectoral instruments have been set up: SIGN (meaning Dutch Greenhouse Horticulture Innovation Foundation), Courage (its name phonetically reflecting the Dutch word for cow and the courage needed to innovate) for the dairy sector, and very recently 'Kiemkracht' (meaning 'germination power') for arable farming, and 'Eggnovation' for the

poultry sector. An example is SIGN's idea of the greenhouse as an energy source instead of a major energy user, which at the conception of the idea eight years ago was seen as a ridiculous idea, but now there is a working prototype based on a very efficient heat exchanger.

d) Type 5: Internet portals

A large variation of internet portals has developed in the Dutch agricultural sector, which display relevant information, such as agricultural news, market information, and 'yellow pages' of service providers whose function is to connect farmers with these information sources. These portals may be stand-alone efforts or part of a research project. They are sometimes operated commercially, or are paid for from subsidies by government or commodity boards. Examples include the Agri-logistics Knowledge Portal for linking actors and knowledge developed in several projects related to agri-logistics (Van Baalen et al., 2005), and the web-based question-answer databank integrated in the previously described Dairy Farming Academy.

e) Type 6: Research councils with 'innovation agency'

Although in the Netherlands traditionally farmer-driven research planning mechanisms exist, these do not always forge broader linkages in the innovation system (see Klerkx and Leeuwis, 2008b). A new sort of research council has recently emerged, in which all relevant actors in the organic agriculture value chain (organised in sectoral product workgroups — PWG) have been granted decisionmaking authority in research funding, utilising public funds of the Ministry of Agriculture (see Klerkx and Leeuwis, 2008c). Farmer and industry representatives are expected to propose topics based on broadly-shared demand from their constituencies, which they discuss and prioritise with so-called research theme coordinators. These feed the researchers within their institutes with information from the PWG to guide proposal development to make these fit with sector' needs. Within the PWG, a so-called knowledge manager fulfils the role of facilitator, streamlining the flows of information coming from the different system components and mediating between the different actor groups involved. Bioconnect also facilitates the participatory research that results from the process, as well as the set-up of broader innovation networks tackling the issues facing the organic sector, making a link with legislation and market developments.

f) Type 7: Education brokers

Because the Dutch Ministry of Agriculture continues to fund agricultural education, basic research and research that supports policymaking, it has responded to a perceived lack of interaction between agricultural (vocational) education establishments, research institutes and practice by supporting the set-up of the so-called Green Knowledge Cooperation (Kupper et al., 2006). This Green Knowledge Cooperation, besides linking the several education establishments, aims to position the agricultural schools as regional 'knowledge centres', who respond to innovation queries from the agricultural sector involving both teachers and students. Another example from a brokerage arrangement for supporting agricultural education is the so-called 'Content Broker', which helps to find teachers material to use in their classes, such as journal articles, educative computer models, and manuals. It does this by making explicit the demands of and supplies for the participating organisations.

3.3 The Observed Contribution of Innovation Brokers

Several studies have looked at the contribution of the Dutch innovation brokers (Klerkx and Leeuwis, 2008a; 2008b; 2008c; 2008d; Batterink et al., 2009) in terms of their influence on the way innovation arrangements are organised (roles, responsibilities and patterns of interaction) and how routine working practices and policies (institutional setting) have changed[ii]. Below we discuss the main findings in terms of whether innovation broking mechanisms have (or have not) fulfilled the earlier outlined functions (see section II) needed for establishing dynamic responsive innovation systems.

In the sphere of demand-articulation they have helped farmers and other agri-food stakeholders to think about new possibilities to sustain their businesses. Because of their unbiased position, innovation brokers appear to provide a fresh look in diagnosing the constraints and opportunities of farmers or, at a higher level, production chains, regions or sub-sectors. Because brokers are critical and provide a mirror for self-reflection, they tend to force their clients to look beyond their current situation and constraints and, instead, at the possibilities.

In the sphere of network building there are numerous examples where innovation brokers have helped farmers and others who want to initiate innovation projects (innovation champions) to get

in touch and negotiate with project partners and other relevant stakeholders from the policy, market and civil society domain, as well as with suitable knowledge providers who could assist them in making changes towards new activities. This included more than just the traditional research and extension providers to agriculture. They, hence, make a variety of sources available, which is essential for making the 'new combinations' central to innovation. At the system level, they contributed to the development of innovation agendas and radical and/or system innovations to meet future challenges, by performing foresight exercises and initiating innovation projects which bear a high risk of failure. This has resulted in several new concepts, some of which were initially regarded with suspicion and disbelief, but now have become viable new development strategies.

Finally, it has been confirmed that innovation process management is an important function that can be performed by innovation brokers. Innovation processes tend to involve different groups of actors, who have different expectations and interests, determined by their institutional background. For example, farmers often want quick access to applicable knowledge and quick results; research providers have an interest in undertaking (publishable) research, policymakers want to realise their policy goals and see the results of public investments. They thus differ with regard to the time horizons of projects, and the desired output. Innovation brokers have clearly facilitated cooperation and managed to synchronise expectations of different actor groups during a number of innovation processes. They have reportedly made the different project partners aware of their institutional backgrounds and expectations and of the role they can fruitfully play in the innovation process. Moreover, they were successful in making the risks and benefits that are attached to engagement in the innovation process transparent. They are especially useful because by doing so they contribute to reducing uncertainty in the early stages of innovation processes when there is a high risk of failure, which would discourage private parties from innovating (see also Sapsed et al., 2007; Johnson, 2008). In addition, they acted as a 'translator' between the different 'worlds', and performed mediating roles in case of conflict about, for example, the attribution of intellectual property rights, strongly diverging goals and visions, or the division of funds. The involvement of innovation brokers in innovation processes, hence, avoids inertia and accelerates the process by helping project members maintain their focus and energy throughout. Beyond the level of the single project, innovation brokers fulfil a catalyst role

(to bring about change and stimulate cooperation) a liaison role (e.g. to inform policy) within the agricultural innovation system, and also an 'innovation capacity building' role.

3.4 Observations about the Inherent Vulnerabilities of Innovation Brokers

Not surprisingly, the vulnerabilities that are reported in general (non-agricultural) literature on innovation brokers also seem to play a role in the Dutch agricultural innovation system. Below we indicate how these expressed themselves, and what lessons can be learned.

a) Neutrality tensions

Besides the recognition that total neutrality is hard to achieve[iii], there are several pressures on innovation brokers, which may impair their neutrality. As stated earlier, in an effort to restore knowledge infrastructure linkages and optimise innovation system interaction, several parties in the Dutch agricultural sector supported the set-up of innovation brokers through concerted action. However, a social dilemma manifested in that the benefits for the collective were recognised (enhancing innovation systems' performance by facilitating the formation of linkages between system components) but that parties also want to realise conflicting individual goals through a broker as a condition for (financial) support.

For example, the providers of research and extension who contributed financially as shareholders or financiers of several type 1 and 2 innovation brokers (e.g., the earlier mentioned AKC-NH), (explicitly or implicitly) expected some form of return on investment. They wanted to be seen as a 'preferred supplier' and show unwillingness to cooperate with other (competing) knowledge providing parties, hence forcing innovation brokers into the role of procurement instruments. Although most innovation brokers did not adhere to such preferred suppliership, this had negative effects on their perceived impartiality (especially among other research and extension providers) and could, thus, hamper collaboration.

Innovation brokers also risk becoming, or being seen as, vehicles to realise policy objectives of financiers. Externally imposed goals may inhibit, or destroy, (informal) interactional patterns conducive to innovation. For example, farmers perceived the government-funded broker Nutrient Management Support Service as having a direct link with the realisation of undesired

government policy, and hence it never gained credibility and quickly disappeared (Klerkx et al., 2006). Contrasting objectives may also cause loyalty conflicts with financiers and clients. In the case of DFA, the Ministry wanted it to focus on certain activities that emphasised advanced in-depth learning on certain topics, whereas farmers preferred to have more casual knowledge exchange on day-to-day experiences in dairy farming with other farmers. So DFA was driven by both farmers' demand, and financiers' demand, with a resulting dilemma for the broker of whose demands to give prevalence to (Klerkx and Leeuwis, 2009). These tensions indicate that innovation brokers should be given the freedom to independently operate as a basic condition for effectiveness.

b) Functional ambiguity tensions

In the Dutch agricultural innovation system, independent innovation brokerage is not always fully understood and accepted. This is partly due to the response from established players (i.e., the established research institutes and extension providers) to the 'revitalisation and 'innovation catalyst' mission of innovation brokers, which is about breaking with old structures and establishing new networks and partnerships, and partly due to the overlap with existing or new functions from 'traditional' research and extension providers.

For example, in the case of KnowHouse, a type 1 broker (see Klerkx and Leeuwis, 2008d[iv]), research and extension organisations welcomed it as a demand articulator and network composer, but saw it as a competitor in the provision of certain services during the innovation process (innovation process management). This caused annoyance among research and extension organisations, because they felt KnowHouse forced itself on the project without bringing added value, and taking up a part of the project money which otherwise could be used for the research itself. Farmers' representatives positively evaluated KnowHouse's contribution to innovation, but at the same time saw it as a threat in terms of KnowHouse's role as an opinion leader. There was vagueness about the different roles that KnowHouse was meant to play, i.e., whether it is a 'sparring partner' for the development of ideas on innovation, a broker that matches demand and supply in the knowledge infrastructure, or a delegated taskmaster for agricultural entrepreneurs and hence client of research and extension providers. The result is that though the brokers may be a positive influence on network formation and the effectiveness of cooperation in the

innovation process, parties may lose confidence in them as they are not sure what it is they actually do and whom they represent. This indicates that the role of innovation brokers should be made clear to the parties they work with, together with what they can expect from the broker, and where each party's responsibilities lie.

c) Tensions regarding funding and willingness to pay

Tensions such as low private willingness to pay and public funding impatience have also manifested in the Dutch context. These tensions appear to be felt particularly by innovation consultants and peer network brokers (types 1, 2, and 3), who offer services to optimise innovation at the level of the individual farmer, such as AKC's KnowHouse and DFA. This tension seems to be an inherent characteristic of these types of mechanisms. It also has to be understood against the historical backdrop of innovation support services in the Netherlands and the fact that these were mainly free of charge in the past. Type 4, 6 and 7 appear to receive more continuous funding as the radicalism of the innovations they wish to support is of such a nature that it is commonly accepted that private investment will be initially low, or they align with public concerns of government. However, these organisations also have to continuously struggle to prove their usefulness. This is because the process-oriented services of innovation brokers, such as demand articulation and network composition, take place in the early phases of the innovation process and are highly intangible and invisible, i.e., non-compatible with SMART (Specific, Measurable, Agreed, Realistic, Time-bound) criteria. Also, in their role as innovation process managers, innovation brokers sometimes choose to operate in the background or their contribution cannot be easily distilled as they operate in multi-actor networks. Thus, the contribution of innovation brokers to a successful innovation is, in hindsight, often taken for granted by clients, or the specific contribution is hard to define. If this work is done on a fee-for-service basis, there is often little initial incentive to pay for such a service and organisations experience difficulties charging for it. Despite being for profit-organisations, their income is often largely derived from public funds through innovation subsidies which they channel. Publicly-financed organisations do not have this complication as the cost of these activities is covered, but the difficulty of showing the effect of activities on the end result may, unfortunately, influence impact evaluations negatively.

As a response to these funding tensions and changes in funding schemes (i.e., the gradual withdrawal of public funding to make brokers self-financing), broker organisations may also simply cease to exist because they cannot make brokerage activities profitable. Another possibility is that they become a 'content-providing' consultant rather than a facilitator; this may hamper the demand articulation and network composition function as brokers are not seen as neutral and credible anymore in their function of referral service and matchmakers. Illustrative of the problem of the impact in evaluations and unstable public policy on innovation brokers is the case of ISW (Innovation Supportpoint Wageningen). Government-funded ISW had high client satisfaction but was nevertheless discontinued. However, one year after dissolving ISW, the Ministry of Agriculture decided to co-invest in a pilot project aimed at including the agricultural sector within the service provision of Syntens (a non-agricultural innovation broker financed by the Ministry of Economic Affairs), and funded the Syntens Agro pilot, which essentially provided the same services as ISW.

Despite this vicious circle of short-term funding-disappearance of the broker — and renewed funding of a similar broker — the policy is to publicly support innovation brokers (exceptions are the systemic instruments in which there is more acceptance that facilitating innovation costs time, and that failure is inherent to radical innovation) only temporarily in the hope that they become self-sufficient. Here again the dilemma is that the systemic contribution of innovation brokers is recognised, but individual actors who benefit from the contribution innovation brokers make to the system's innovation capacity are hesitant to contribute in the long-term to the intermediaries' funding without having a short-term return-on-investment.

Such short-term sight is symptomatic of the current post-privatisation, market-based knowledge infrastructure, in which there is an emphasis on short projects that have to compete in competitive grant schemes every time to get continued funding and have to serve specific policy objectives that may radically change. From the Dutch cases, it became clear that the demand articulation and network composition activities need continued public funding, but the innovation process management function, if added value is recognised, could be funded by means of private payments of network participants. This could then also be done by research and

extension service parties who have facilitation as a new activity, and resolve the functional ambiguity that is felt.

3.5 Overall lessons from the Netherlands experience

After 15 years of experimenting, there appears to be growing recognition of the value of innovation brokers in the new agricultural innovation system of the Netherlands. This is evident in the practice of farmers and policies of government. The fact that it has become more accepted is shown by the fact that there is an increase in the number of brokers of all types, which results in a complete palette of brokers for different subsectors. This is, however, not the result of coordinated policy, but generally of regional or sub-sectoral initiatives as most brokers emerge in a bottom-up fashion as a result of a concerted action by both public and private parties — for example, regional farmers' organisations and research establishments feel the need for a broker and approach policymakers with a request for (partial) funding. A policy implication is that a considerable incubation period is required to change attitudes towards the "invisible" services provided by innovation brokers. Without this period of incubation neither policy nor private support will emerge to sustain them.

An overriding observation about the effectiveness of innovation brokers in the Netherlands is that both their strengths and weaknesses (tensions) arise partially because of inherent characteristics of different innovation brokering mechanism and functions. However, it is also clear that the effectiveness of these mechanisms can only be properly understood in the context of the institutional and political circumstances that gave rise to them. A related point is that the effectiveness of these mechanisms also rests on a much wider set of institutional settings than might be imagined. For example, the perceptions of the role and (most importantly) the value of brokers in society. These perceptions and accepted ways of working are themselves changing over time as a result of experimentation with brokering. In other words the incorporation of innovation brokers into the overall agricultural innovation capacity of a country is truly dependent on a process of institutional and policy learning and this is likely to be a long-term process. The effectiveness (and for that matter composition) of innovation brokers in the Netherlands was different 10 years ago and, because of the effects of this policy and institutional learning process, is likely to be different again in 10 years' time. This, of course, raises a larger

question. If effectiveness of broking mechanisms is determined by institutional and policy learning at a macro-level, how can this be accelerated? This question in turn points to the fact that the public policy may have to assume a new role and approach in its efforts to promote innovation because, as the Netherlands case has shown, of the systemic and evolutionary nature of the capacities involved.

The following sections chalks out some of the practical implications of the Netherlands case for developing countries looking to strengthen their innovation capacity.

IV. INNOVATION BROKERS IN EMERGING ECONOMIES: OBSERVATIONS AND OPTIONS

We have seen that innovation brokers have been proven to play useful roles in the Dutch agricultural innovation system. A relevant question is, of course, whether these experiences bear relevance to innovation systems in emerging economies, or whether the conditions in which these brokers emerged, and their contributions, are uniquely determined by the Dutch institutional setting. Whereas the Dutch agricultural innovation system used to be characterised by a great cohesion, and has been affected by full privatisation of the supporting knowledge infrastructure, this may be different elsewhere. Moreover, it should be kept in mind that there are different cultures of collaboration, which affect the potential for innovation brokers to be effective (e.g., Siemsen, 2005; Lenné, 2008). Also, especially in the context of rural poverty, differentiated approaches are needed in the design of such systemic intermediaries depending on a combination of asset positions and favourable or unfavourable production environments (Berdegué and Escobar, 2002; Van Mele, 2008), and gender issues (Caniels et al., 2006). However, in many countries conditions and challenges are broadly similar to those in the Netherlands — including the need to enhance networking in the innovation system; the need for a guiding agent in a fragmented innovation system; and dealing with the challenges of multi-functional agriculture (Clark, 2002; Sulaiman et al., 2005; Hall, 2006; Spielman et al., 2008). Hence, a question that remains here is: who are innovation brokers in the context of developing country agriculture? A review of the literature shows that in the context of agricultural innovation in developing countries there are already many parties fulfilling innovation brokerage roles. Examples include:

- *National NGOs:* Goldberger (2008) describes the way NGOs have brought together several actors in Kenyan agriculture to facilitate the transition to organic agriculture in export horticulture production. Cabero and Van Immerzeel (2007) report on Pachamama Raymi as a farmer network broker for sharing indigenous knowledge in Bolivia.
- *International NGOs :* Clark et al. (2003) and Hall et al. (2007) document the activities of an international NGO, International Development Enterprises, in managing respectively packing technology and low cost irrigation pump innovations in India and Bangladesh.

Other examples of international NGOs are the PROLINNOVA initiative (Waters-Bayer et al., 2008) or the Latin-American Grupo Chorlaví (Ramirez and Pino, 2008).

- *(Descendants of) special projects:* Bentley and al. (2007) describe the Bolivian Innova project, which acted as a demand articulator for farm technology, with subsequent network formation. Adeoti and Olubamiwa (2009) report on the 'cocoa rebirth initiative' to forge linkages in the Nigerian cocoa innovation system. Clark et al. (2007) document the evolution of the Andhra Pradesh Netherlands Biotechnology Programme into a self-financed broker of research and development projects using biotechnology to address smallholder agriculture.
- *International donor agencies*: Kuada and Sørensen (2005) describe the role of Danish development agency Danida in fulfilling the role of a broker in inter-firm collaboration in Ghana, and Van Leeuwen et al. (2007) describe a similar role for Dutch development organization SNV in several Latin-American countries.
- *Experiments in national research and extension programmes*: Hall and Yoganand (2003) document experimentation in the Ugandan agricultural extensions systems and the creation of the National Agricultural Advisory Services (NAADS). This provided funds to farmers to hire and train private services providers to act as innovation brokers and assist with technology and marketing support. The National Agricultural Innovation Programme of the Indian Council of Agricultural Research, with its focus on the establishment of consortia around agricultural development themes, is another example of such experimentation (www.naip.icar.org.in).
- *Farmer and industry organisations*: Heemskerk and Wennink (2004) describe the role of farmers' organisations in bonding African farmers into farmer groups, connecting these with other organisations, and linking them to formalised agricultural research and extension to influence research and extension agenda setting and execution. In the Colombian cutflower industry, the Ceniflores innovation centre was set up by producers' associations to act as an independent 'virtual' broker between the industry and research institutes, supporting demand articulation and platform formation (Lee and González, 2006). Other descriptions of roles such as linking farmers to markets, building innovation systems, or supporting territorial development are made by Wennink and Schrader (2007) and Abramovay et al. (2008).

- *Research organisations or affiliates*: Spielman et al. (2007) describe the case of the AGRONATURA Science Park at the International Centre for Tropical Agriculture (CIAT). It hosts private companies and other research, technology, and development organisations and aims at building relationships, financing new research projects, and promoting private-sector research. Van Mele (2008) suggests that the broker role would be a new role for the CGIAR institutes. Devaux et al. (2009) describe the role of the International Potato Centre in the context of value chain innovations (i.e. linking farmers to markets) through the Papa Andina project, and Kristjanson et al. (2009) describe several efforts of the International Livestock Research Institute in facilitating livestock husbandry-related innovations.
- *Specialist third party organisations*: Hall (2005) describes the International Organisation for the Acquisition of Agri Biotechnology Applications (ISAAA), a non-profit organisation established to broker access to technologies, genes and protocols owned by the private sector or held in public laboratories in developed countries.
- *Government organizations*: Hartwich et al. (2007b) describe the Bolivian SIBTA, a combined government-NGO supported initiative, which combined a fund for applied technical innovation projects and a knowledge management scheme based on the idea of markets for local knowledge. Implicitly, this scheme permitted networking among a range of agents. Vera-Cruz et al. (2008) describe a similar development of the Mexican Produce Foundations. Bell and Juma (2007) and Nelson (2007) describe the respective role of the Fundación Chile and CORFO as a booster of the networking with foreign technology sources that co-enabled Chile's agricultural development.
- *ICT-based brokers*: Although often on a more operational level (market/production information) than for strategic (innovation) purposes a range of ICT-based brokerage instruments have been applied to act as 'infomediaries' (Rao, 2007), such as information kiosks in India through which farmers may access cattle health information (Ramkunar et al., 2007).

The main difference between the already existing brokerage interventions in the developing country context and those in the Dutch context appears to lie in the fact that the latter interventions concern mainly new and specialised organisations, whereas in the former case

many parties fulfilling innovation brokerage roles can be considered ‘traditional’ intermediaries, which take up such innovation brokerage functions in addition to their traditional roles as representatives, funding agencies, and research organisations. Such new roles have either purposefully or serendipitously emerged and were found to have similar beneficial effects on innovation as have been reported for the Dutch innovation brokers (e.g. Bentley et al., 2007; Kristjanson et al, 2009; Devaux et al., 2009). However, it would be interesting to assess the effect of this organisational connection with ‘traditional’ roles (such as research and extension, advocacy and representation, and funding) on core values of neutrality and credibility. Having mixed identities may have negative effects on the organisational and institutional manoeuvring space that is given to execute the brokerage role, and the sustainability of this role, as has been noted by several authors (Hulsebosch et al., 2006; Kristjanson et al, 2009; Devaux et al., 2009). Positioning innovation brokers as organisationally detached from existing organisations may be an option to prevent neutrality tensions and provide more freedom to act as a innovation catalysts and bring about institutional change, but also bears its own tensions with regard to neutrality, function overlap and funding, as the analysis above has shown.

There are several indications from the Dutch case that these independent brokerage agents need some form of continued support by a public funding agency, or through collective funds such as farmer levies. Also, in the case of developing countries it has been noted that there is a need for such public sector ‘promoting agents’ or ‘system coordinators’ (Rivera et al., 2005; Hartwich et al., 2007b). Public or donor funding may be justified since: (1) it appears inherently difficult to make the demand articulation and network composition functions self-sufficient; (2) innovation brokers contribute to systemic interaction, hence mitigate innovation system failure (which would provide a rationale for public intervention — e.g., Smith, 2000), and have a role as catalysts of innovation; and (3) innovation brokers can fulfil the role of facilitator more neutrally than parties that have a substantive stake in the subsequent research or innovation process. Nevertheless, there are also some challenges in this regard, including (1) the difficulty of assessing the contribution of innovation brokers though conventional forms of impact evaluation; (2) the proper demarcation of the mandate of publicly-financed innovation brokers, as activities that go beyond demand articulation and network composition are sometimes perceived as competition; and (3) the risk that due to resource dependencies the innovation broker may

nevertheless become a more or less ‘hidden messenger’ for government or another party which may be detrimental to its impartiality, credibility and hence longevity.

These findings have important implications for governments in developing countries and donors, as countries may have less resources and development assistance’s focus on projects is inherently susceptible to ‘funding impatience’. This may mean that brokerage roles cease to exist when a project has ended (see Clark et al., 2003; Siemsen, 2005; Caniels et al., 2006; Kristjanson et al., 2009), but the acquired brokerage skills and social capital built can be used to set up other projects. It is thus important to see how in this context innovation brokerage organisations can become durably embedded. Possibly, the role of innovation brokers can be played by what is left of public agricultural extension services, as has been suggested by several authors (Alex et al., 2002; Nagel, 2003; Leeuwis, 2004; Sulaiman et al., 2005; Dormon, 2006). However, this then requires a shift from technology transfer agents to facilitators, which has major implications in terms of organisation structures, cultures and incentive mechanisms, as well as for the knowledge and competencies that present and future extensionists need to possess (see Leeuwis, 2004; Davis et al, 2008).

V. CONCLUSIONS AND IMPLICATIONS FOR POLICY

We have argued that it is plausible that investment in innovation brokers may not only be sensible in the Dutch context, but also in emerging economies. In fact, we have seen that existing organisations expand their mandate and are already taking up brokerage roles. Whether such organisations are ideally placed to play these roles should be a subject for further study. The Dutch case suggests that specialised innovation brokers can be more neutral and credible in fulfilling important roles such as demand articulation, network building and innovation process management. In any case, there remains significant scope for existing research and extension organisations to 'retool themselves' in order to play new roles (Devaux et al., 2009). As Kristjanson et al (2009: 6) make us realise, this may not be an easy process: "boundary spanning may be institutionalised by creating a new organisation or by making it a function of part of an existing organisation. Existing institutions, however, are often disinclined to invest in boundary-spanning activities that appear extrinsic rather than central to their core mission, whereas government and private funding agencies have proved reluctant to invest in the creation of new organisations aiming to serve as 'go-betweens'. Largely for this reason, there exists little incentive for individuals to build their careers in the 'boundary space'."

Besides the question of *who* should take up innovation brokerage roles, an important question is *how* to foster their emergence. A striking feature of the Dutch case is that centrally-designed blueprints failed, and that successful innovation brokers (even if eventually subsidised) emerged in a self-organised manner, building on local, regional or sectoral initiatives, and resulting in a very diverse landscape of contextually-embedded innovation brokers. Moreover, we have seen that the current configuration has evolved over time, required considerable experimentation and institutional adaptation, and continues to be dynamic. Combining the generally bad experiences with wholesale transfer of institutional innovations from one country to another, -- the fallacy of universal agricultural extension models (Sulaiman and Hall, 2008) --, this should lead to the conclusion that we need a policy approach that encourages institutional learning and experimentation. Because a 'one-size-fits-all' approach to innovation system interventions is inappropriate (Hartwich et al., 2007a), the Dutch innovation brokers should be seen as an inspiration rather than a blueprint. In order to allow innovation brokers to emerge and become

embedded contextually, we would like to make raise several points that require attention during such a process. First, we feel that it is important to adequately map and diagnose the strengths and weaknesses of the innovation system to be strengthened, in order to develop a clear vision of which weaknesses to tackle, at which system aggregation level, and with what kind of innovation ambition (radical or incremental innovation). In doing so, it should also become clear if some parties already fulfill a brokerage role and to what extent these may complement or overlap with the envisioned task of the innovation broker to be established. When established, a broker organisation should be given considerable freedom to explore new options and establish new linkages, and not be tied to prescribed input-output schemes and logframe-determined performance indicators. It should be recognised that the primary work of innovation brokers is to improve the quality of interactions and processes during innovation trajectories, and that this includes many intangible contributions to making interdependent actors and networks collaborate effectively. In performing such roles they have accountabilities to several parties and thus they will always have to perform a balancing act.

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[i] The basis of the FFS is the belief that if farmers are to gain the confidence to lower dependence on insecticides, they need to become acquainted with certain agroecological principles which are best acquired through discovery learning. An FFS is a group of farmers (roughly 20–25) who meet periodically (usually once a week) in a designated field throughout the major part of the crop cycle (Tripp et al., 2005). Farmer Fields Schools are increasingly seen more broadly as a way of farmer-to-farmer extension (Anandajayasekeram et al., 2007).

[ii] No studies have been carried out so far on the economic efficiency of innovation brokers. Such a study is not easy to carry out given their rather intangible and 'behind the scenes' mode of operating. This will be further illustrated in section 3.4.

[iii] As Groot (2002) argues, facilitators can never act totally neutral because the norms and values of facilitators always (subconsciously) influence the way they perceive the issue at stake, the choice of their theories and methodologies and their actions. They should hence strive for 'acceptable' neutrality.

[iv] In this publication KnowHouse is referred to with the pseudonym InnoFac, because of confidentiality concerns at the time of the research