SCALING INCLUSIVE INNOVATIONS: A STUDY ON DAIRY BUSINESS HUBS IN KENYA

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PREFACE

This report is a result of my master thesis that was written between July 2013 and August 2014 at the chair group the Knowledge, Technology and Innovation as the final component of my study Msc International Development. The main topics of my thesis 'inclusive innovation/business' and 'scaling' were taken as a point of departure to start this research because they have my interest in relation to development and possibly also regarding my future career.

I would like to express my gratitude to my supervisor, Laurens Klerx, who provided guidance throughout the process. Also I would like to thank Annemarie van Paassen for being second reader. As part of this thesis I conducted a 10 week field study in Kenya. I want to thank Jan van der Lee for arranging the contacts with my host organization SNV Kenya. Special thanks go to Marloes Philippo for guiding me at SNV and for all SNV employees at the regional office in Eldoret for welcoming me. Lastly, I am grateful for all people who provided information or helped me in any way while carrying out this thesis.

ABSTRACT

An increasing amount of development efforts envision profitable business as a key driver for tackling poverty and achieving sustainability. Business models specifically directed towards the poor are named 'inclusive business models', innovations in this field are referred to as 'inclusive innovations'. The notion of inclusive business is based on the premise that the private sector can profit within the BoP context following Prahalad's idea of using low margins in high volumes. Consequently to be successful inclusive innovations have to reach a certain scale. There are numerous challenges when bringing innovations to scale, however in this thesis three enduring challenges were addressed: 'locally-specific, yet widely-applicable', 'appropriate to, yet transforming situations' and 'project-based solutions, yet seeking structural change'.

In this research the scaling of Dairy Business Hubs in Kenya is analyzed as a case of inclusive innovation. Dairy Business Hubs are a mechanism that should improve the input and output marketing opportunities for smallholders by increasing coordination. The main purpose of this research is to find out in what way the three enduring were relevant regarding the process of scaling DBHs in Kenya. The researcher translated the challenges in three research questions:

- *How did the DBHs develop from a general approach towards an embedded application of the hub model?*
- *In what ways have smallholders been able to influence the development of contextualized DBHs?*
- *How did 'innovation intermediaries' influence the development of DBHs?*

As part of this master thesis a ten week field study was conducted in order to collect data on scaling DBHs in Kenya. The main method for data collection was semi-structured interviews. A case study approach was chosen and four cases were selected for comparison: Tanykina, Metkei, MUKI F.C.S. and Meru Union. At each site several stakeholders were interviewed, the most important being representatives of the DHB and (dairy) farmers. Additionally interviews were conducted with 'dairy experts' employed at various organizations that supported DBHs.

The wide scope of this research limited the potential to give concise answers to the research questions. The results indicate that the assumption that DBHs transform from a general model to an embedded application can be disputed, especially outside context of the EADD project. Factors that contributed to the contextualization of the hub model are: pre-existing conditions and contextual factors, the influence of target communities and the influence of innovation intermediaries. The fact that a DBH is a modular concept contributes to the fact that the concept is 'context specific, yet widely applicable'. From the collected data it is difficult to assess to what extent smallholders have been able to influence how DBHs develop. However, farmer inclusion (and loyalty) seems to be important to allow DBHs to develop. The support given by EADD and SNV are incomparable, because EADD uses an integral approach involving creating DBHs from scratch whereas SNV support existing dairy initiatives mainly in the field of extension as part of their larger dairy program. Although the support from EADD can be considered standardized this does not appear to limit the hubs from developing in a contextualized fashion.

Keywords: *Inclusive innovation, Scaling, Dairy Business Hubs, Kenya*

CONTENTS

ABBREVIATIONS

ABS (TCM)	African Breeders Service (Total Cattle Management)
AGM	Annual General Meeting
AI	Artificial Insemination
BMGF	Bill and Melinda Gates Foundation
BoP	Base of the Pyramid
CSR	Corporate Social Responsibility
CP	Cooling Plant
DBH	Dairy Business Hub
EADD	East African Dairy Development Project
FO	Farmer Organization
FCS	Farmer Cooperative Society
FSA	Financial Service Agency
FSP	Forages for Smallholder Project
ILRI	International Livestock Research Institute
KCC	Kenya Co-operative Creameries (state-owned)
KSh	Kenyan Shilling
LCB	Local Capacity Builder
NKCC	New Kenya Co-operative Creameries
NHIF	National Health Insurance Fund
SACCO	Savings And Credit Co-Operative
SNV	Stichting Nederlandse Vrijwilligers (Dutch Development Organization)
SoI	Systems of Innovations
TCHP	Tanykina Community Healthcare Plan
TM	Traditional Market (relating to a type of dairy business hub)
TNS	Technoserve

1 INTRODUCTION

1.1 THE NEED FOR INCLUSIVE BUSINESS

Today an increasing amount of development efforts envision profitable business as a key driver for tackling poverty and achieving sustainability. Several concepts based on this notion have been developed, for example Corporate Social Responsibility (CSR), social entrepreneurship, shared value, sustainable sourcing, and business at the Bottom or Base of the Pyramid (BoP). Nonetheless, it is reckoned that business cannot foster development without the support of actors in the fields of production, policy and research in order to create enabling conditions for inclusive and sustainable markets. The predominant term for this movement is 'inclusive business' (Woodhill et al., 2012). In the Box 1 two definitions for inclusive business are given.

Two definitions for inclusive businesses
"An inclusive business is one which seeks to contribute towards poverty alleviation by including lower-income communities either directly or through companies' value chains as suppliers, distributors, retailers and service providers, while not losing sight of the ultimate goal of business, which is to generate profits." – *World Business Council for Sustainable Development*

"Inclusive business models include the poor on the demand side as clients and customers, and on the supply side as employees, producers and business owners at various points in the value chain. They build bridges between business and the poor for mutual benefit." – *United Nations Development Programme*

BOX 1 DEFINING INCLUSIVE BUSINESS. SOURCE: (WEGNER, 2012)

From these definitions can be derived that inclusive business is based on two important principles distinguishing it from traditional development efforts:

1. The ultimate goal of business, which is profit, should not be lost. Mutual profit for both the poor and the involved businesses should be created.
2. The role of the poor should change instead of being a mere recipient of aid; they become clients, customers, employees, producers and entrepreneurs within this approach.

The notion of inclusive business is based on the premise that the private sector can profit within the BoP context following Prahalad's (2005) concept of using low margins in high volumes. While the idea of mutual profit is very attractive, many challenges have to be overcome before the concept can be successful in practice. According to Wegner (2012, p. 7): "the biggest challenge for modern (agri-food) business to work with small-scale farmers lies in costs and risks of organizing supply, economies of scale, traceability and private sector standards." Moreover: "Base of the pyramid markets are plagued by challenges like low levels of education, inadequate infrastructure, poorly designed or enforced regulation, and more. These challenges are often too systemic to address through business model innovation alone" (Gradl and Jenkins, 2011, p. 7).

Regardless of these challenges, the concept of Prahalad has inspired businesses, of all sizes, to engage commercially with the poor. Business models specifically directed towards the poor are typically termed 'inclusive business models' (Gradl and Jenkins, 2011), innovations in this field are referred to as 'inclusive innovations'. Such innovations are specifically directed towards the needs at the BoP and include the poor both at the demand (as clients and customers) and the supply side (as employees, producers and entrepreneurs). Inclusive innovations are products or services "that

positively impact the lives of the poor, and/or offer access to livelihood opportunities for the poor" (Van der Hilst, 2012).

1.2 CONCEPTUALIZING INCLUSIVE INNOVATION

In their effort to conceptualize inclusive innovation, Foster and Heeks (2013, p. 3) give a more detailed description of the 'poor' and identify four dimensions of inclusivity. They state that inclusive innovation "explicitly conceives development in terms of active inclusion of those who are excluded from the mainstream of development". Excluded groups usually are the poorest of the poor, but may also entail women, youth, disabled and ethnic minorities. Foster and Heeks (2013, p. 3) identify four dimensions of inclusivity from literature, stating that the label 'inclusive' is appropriate if at least one of those criteria is met:

- "Inclusivity of innovation precursors: for example that problems to be addressed by innovation are of relevance to the poor.
- Inclusivity of innovation processes: for example that the poor are involved in the development of innovative goods and services.
- Inclusivity of innovation adoption: for example that poor consumers have the capabilities to absorb innovations.
- Inclusivity of innovation impacts: for example that innovative goods and services have a beneficial effect on the livelihoods of the poor."

INCLUSIVE INNOVATION AND SOI

In order to understand inclusive innovation better Foster and Heeks (2013) apply the Systems of Innovations (SoI) framework to inclusive innovation. SoI is an evidence-based approach increasingly used in literature to understand innovation. Five core elements of SoI are identified: actors, innovation, learning, relations and institutions. Literature provides several areas where applying SoI to inclusive innovations might require refinement.

An important modification is the scope of study, conventional methods often use a macro-level approach to study structures, the authors advise to use micro-level analysis to trace innovation processes and livelihoods. Regarding actors this means that the focus shifts towards non-traditional, demand-side innovators, opposing the large, formal organizations on the supply side usually represented in conventional SoI frameworks. This also involves the inclusion of innovation intermediaries who are needed to overcome the recurrent mismatch between externally designed innovations and the implementation context. Inclusive innovations usually differ from innovations analyzed with conventional SoI in the sense that they are oriented towards local needs, demand-driven, non-technical and incremental. Learning in both applications of SoI can be analyzed using the 'doing, using and interacting' (DUI) mode. However, where originally the focus of SoI was to learn about the actual innovation (product) and its implementation, the authors suggest shifting the focus to learning about diffusion and wider social processes in the case of inclusive innovation. Moreover, the assumption that the learning process is coherent and instrumental in the sense that it aims for profit-maximization might not hold in the context of inclusive innovation. On the topic of relationships, it is unclear what is the optimal configuration using both strong and weak ties. Weak ties might lead to more flexibility allowing innovators to meet specific local needs. In contrast, they also might lead to higher costs and risks in already uncertain environments. The term 'institution' as used in SoI usually implies formality, either in the sense of constraining behavior or as an

equivalent of organization. In the field of inclusive innovations, it is important to recognize the importance of informal institutions where formal ones are either absent or dysfunctional. Examples from literature show that actors in a role of innovation intermediaries might be important for the diffusion of inclusive innovations. Foster and Heeks (2013) find that the diffusion of mobile phones in Kenya, profited from the collaboration between wholesalers and micro-enterprises as a 'chain of innofusion intermediaries'. The micro-enterprises are neither formal nor informal; they might be described as 'less formal'. Their case study, the diffusion of mobile phones in Kenya, supports the critique on conventional SoI assuming coherence and instrumental learning based on profit maximization, learning about inclusive innovation might be instrumental towards survival and utility maximization. Inclusive innovation requires informal and loose but socialized relations; however this is not without downsides. More work is required to find the optimal configuration and even if that optimum was found it remains questionable if it is possible to manage these actor relations. Foster and Heeks (2013) found a complex institutional interaction between formal and informal institutions. Formal state institutions do influence inclusive innovation in an indirect way. This results partly from implementation gaps and partly from the importance of informal institutions in low-income markets.

1.3 SCALING INNOVATIONS

One of the underlying ideas of inclusive business is making profit using low margins in high volumes. Therefore, directly linked to the potential success of inclusive business is the condition to reach a relatively large scale. Scale is needed to satisfy both business motives and developmental motives. Regarding business a larger scale can compensate for the low margins that are viable when doing business with the poor. With regard to developmental motives scale can be seen as a component of impact.

Literature provides many different definitions of scaling, typically separating between scaling up and scaling out. In this thesis the definitions of Van den Berg et al. (2012, p. 3) are used, they distinguish between: vertical or scaling up and horizontal or scaling out. "Scaling up refers to the capacity of an innovation to accommodate changes in larger volumes of products or numbers of people without changing the processes and structures underlying the innovation process or changes to the innovation itself. This focus helps to detect what the limits to scaling are and how these limits relate to the nature of the innovation. Scaling out is the replication of interventions or practices, or doing the same thing with a similar scale in a different context. The way in which scaling occurs becomes relevant when an intervention reaches its 'natural' limits, for example the number of farmers that can join a field school." It should be noted that scaling is not just a matter of multiplying quantities but also of enlarging impact (Uvin et al., 2000).

Scaling up and scaling out are not mutually exclusive and in reality those processes are likely to be closely related. Previously, the assumption was that innovations which proved to be beneficial to farmers would diffuse naturally through various channels. This might be true for cheap and simple technologies, adoption and scaling of complex innovation is more challenging (Millar and Connell, 2010). Millar and Connell witness that in many cases too little attention is given to the impact that the introduced innovation have on peoples livelihoods. Inappropriate scaling lead to low farmer adoption or declining participation after adoption incentives have vanished. Moreover, scaling unsuitable technologies might lead to "social inequities, environmental degradation, and loss of cultural connections" (Millar and Connell, 2010, p. 214).

1.4 CHALLENGES TO SCALING INCLUSIVE INNOVATIONS

Unfortunately, scaling – in general and also specifically regarding inclusive innovation – is a process that is not easy to understand, facilitate or enhance. When trying to scale, challenges become systemic. Numerous challenges have to be overcome by businesses in order to do profitable business with smallholders. Well-known challenges are: lack of infrastructure, low levels of knowledge and skills among target groups, ineffective regulation and limited access to finance. These challenges contribute to the unfortunate circumstance that large-scale successes remain exceptions (Wegner, 2012). Moreover small scale success does not automatically indicate that the same project can be successful at a larger scale (Millar and Connell, 2010). Experienced actors in the field of inclusive business have pointed out that effective inclusive approaches are very context-specific (Woodhill et al., 2012). However as it is impossible for researchers to cooperate with large numbers of farmers directly, the process of scaling is perceived to be in conflict with participation (Gonsalves, 2000). Another question related to scaling inclusive innovations, is what type of firms best fit to introduce and foster inclusive innovations within BoP communities. George et al. (2012) refer to 'paradox of size and scale', when they point out that small entrepreneurial firms have the motivation to think of and implement ideas of inclusive innovation, however they lack the resources to scale these efforts. Large multinationals on the other hand, have access to these resources but often lack the motivation needed. Relating to the former, a further challenge for scaling is the fact that the process takes time, up to fifteen years or even more. The long timespan needed for scaling threatens its realization, because donors and NGOs shift priorities, governments change and key actors might move on (Hartmann and Linn, 2008).

As becomes apparent from the former paragraph, many challenges can hinder the potential success of scaling innovation. Rather than identifying all challenges that might be encountered when trying to scale, Smith et al. (2013) identify three enduring challenges for grassroots movements. Grassroots movements seek "innovation processes that are socially inclusive towards local communities in terms of the knowledge, processes and outcomes involved" (Smith et al., 2013, p. 1). Although these movements fundamentally differ from the ideas of inclusive innovation, both concepts share overlapping features. Therefore the three identified challenges are also applicable to inclusive innovation ideas. The enduring challenges are:

- *Locally-specific, yet widely-applicable.* Local-scale suitability (sometimes) opposes large scale application. The challenge is to balance between a socio-technical configuration that fits the context and standard technologies that aim for broad application.
- *Appropriate to, yet transforming situations.* Sometimes efforts have to be unsuitable regarding the short-term, to the end that they might bring changes that make them fit a more just prospect.
- *Project-based solutions, yet seeking structural change.* The third challenge Smith et al. (2013) identify for grassroots innovation movements is that their aim is to internalize more socially just principles, while they are not addressing the social structures causing these inequalities. Deprived of wider structural changes, grassroots innovations will always struggle. For example, the appropriate technology movement was proven to be unsustainable after the aid and fund were cut. The authors recommend grassroots

innovations to address the structuring effect of market-based development approaches (Smith et al., 2013).

The challenges are considered 'enduring', because they are rooted in the principles of grassroots innovation. Seyfang and Smith (2007) identified a number of important differences between grassroots and main-stream, market-based innovations. These differences include:

"distinct organizational forms (firms vs. a wide range of organizational types encompassing co-ops, voluntary associations, informal community groups etc.); different resource bases (commercial income vs. voluntary labor, grant funding etc.); divergent contextual situations (the market economy vs. the social economy); alternative driving motivations (the pursuit of profit vs. meeting social needs or pursuing ideological commitments); and the pursuit of qualitatively different kinds of sustainable development (mainstream business greening vs. radical reform of sociotechnical systems)" (Hargreaves et al., 2013, p. 2).

We argue that inclusive innovation as discussed above holds the middle ground between these two extremes. And therefore the enduring challenges for grassroots innovation as identified by Smith et al. (2013) are also relevant for and applicable to inclusive innovation and will be guiding in this research on scaling inclusive innovations.

1.5 DAIRY BUSINESS HUBS

Dairy Business Hubs (DBHs) are an example of inclusive businesses and, as they bring about a 'new' way of organizing the dairy sector for smallholders, inclusive innovation. The concept is commonly used in Eastern Africa to enhance the development of the dairy sector. Jaleta et al. (2013, p. 252) define DBHs broadly as "either as a single business entity supplying inputs and providing services, or the existence of several business entities supplying inputs and/or providing services in a specific geographic area serving beneficiaries' needs. These different entities could be private, cooperative, or public owned. They may or may not coordinate with each other in running their business."

The rationale behind this approach is that DBHs can improve both input and output marketing opportunities for smallholders. By linking several supply chain actors together in a DBH, transaction can be decreased and smallholders can gain access to more formal markets. Expected benefits for smallholders are increased profit resulting from economies of scale, ease of business and bargaining power. Input providers, service providers and processors can benefit from DBHs using the opportunity to cooperate with large groups of smallholders in an economically viable way. The aim is to develop DBHs in a way that enables them to become a sustainable business after an initial investment in capacity building, infrastructure and equipment. Using a centralized service center, transactions costs should decrease and supply and demand are expected to become more balanced. Moreover farmers can gain extra negotiation power and a check-off system allows them to use services before income becomes available. Additionally, service and input suppliers can serve more clients and have more security regarding payments. Expected indirect outcomes of establishing DBHs are that the transaction costs will drop sector wide as a result of increased efficiency and that traded volumes and quality will be boosted by the availability of better services and input (Van der Lee and Giani, 2013).

1.6 PROBLEM STATEMENT

DBHs are considered to be an effective approach in facilitating dairy business development in African countries such as Kenya and Uganda. Therefore, plans are made to expand the concept to other countries such as Ethiopia and Tanzania. The most important organization supporting the set-up of DBHs in Kenya is the East African Dairy Development Project (EADD). Within their evaluation report of the first phase of EADD project they recognized that it might be rewarding to support hubs in evolving along paths that would make them more responsive to local conditions. This suggested change towards tailor made models "makes it more accurate to refer to a DBH approach instead of a DBH model" (EADD, 2013, p. 16). Moreover, it is important to balance between scaling quickly and taking time to learn from experiences. Scaling too fast might constrain an effective learning process. Although the authors conclude that there appears to be no ideal hub model, it is mentioned that farmed-led models can help to scale and sustain the success of the DBH models. They suggest to aim for a "more thoughtful, and holistic hub development model that is driven by farmers' needs and the context" (EADD, 2013, p. 70).

At time of study, it was unclear to what extent DBHs in the Kenyan context have evolved in this fashion. In what ways have DBHs in Kenya adapted to their environment? Is this a process which was carefully planned and executed or an unintended outcome of establishing DBHs in different contexts? To what extend have DBHs addressed and overcome the enduring challenges as identified by Smith et al. (2013). Analyzing how planning, implementation and development of DBHs occurred gives insight regarding how hubs become embedded in their local context. And ideally, from this insight can be learned how DBHs can be supported in evolving "along pathways that are responsive to local conditions" (EADD, 2013, p. 6).

What 'scaling DBHs' implies?
As mentioned before many different definitions of 'scaling' are used, this might cause confusion. Therefore here will be explained what is meant in this thesis when referring to scaling DBHs. It is important to understand that Dairy Business Hubs can be regarded as a mechanism to scale service delivery to smallholders. According to the definitions by Van den Berg et al. (2012, p. 3) this is 'scaling up', the "capacity of an innovation to accommodate changes in larger volumes of products or numbers of people without changing the processes and structures underlying the innovation process or changes to the innovation itself. This focus helps to detect what the limits to scaling are and how these limits relate to the nature of the innovation."

However in this thesis 'scaling DBHs' generally refers to the process described by Van den Berg et al. (2012, p. 3) as 'scaling out', "the replication of interventions or practices, or doing the same thing with a similar scale in a different context." This is the type of scaling in which challenges such as 'locally-specific, yet widely-applicable' become apparent and takes place if the DBH approach is applied in a new context. Nonetheless processes usually referred to as scaling up might be important in the development of new DBH applications and therefore be discussed within the scope of this thesis.

BOX 2 SCALING DAIRY BUSINESS HUBS

1.7 RESEARCH OBJECTIVES

Social relevance: One of the assumptions in this research is that scaling is not an autonomous process, but that scaling should be facilitated and can (possibly) be steered. This research aims to provide outcomes contributing to the understanding of scaling the Dairy Business Hub approach.

Scientific relevance: To gain insight in the processes which take place when an innovation becomes embedded in a (new) context, using related 'theories' to reflect and explain the findings.

2 THEORETICAL FRAMEWORK

In this chapter the theoretical framework of this thesis is presented. In Section 2.1 the background of the Kenyan Dairy Sector and DBHs are conceptualized. From Section 2.2 onwards theories that are used as fundament for analyzing the scaling process of Dairy Business Hubs are presented and discussed. The following categorization is based on the three enduring challenges identified by Smith et al. (2013), however liberally interpreted by the researcher:

1. Diffusion, innofusion and scaling: This section relates to the challenge 'locally-specific, yet widely-applicable'. Theories discussed here focus on the diffusion of innovations. The issue at stake is to find out how the diffusion process of innovations is balanced between deriving from a blue-print approach and creating tailor-made innovations for each context.
2. Inclusion of the poor: The part of the theoretical framework relates to the second enduring challenge, 'appropriate to, yet transforming situations'. Smith et al. (2013) find that innovation processes are often unjust due to differences in power balances. Although innovations need to be locally appropriate, they also should induce changes that lead towards a more just future. The authors state that focusing on this challenge, requires an innovation to be framed towards 'empowering inclusion' (Smith et al., 2013).
3. The role of innovation intermediaries: Since innovations are analyzed from a systems perspective, rather than in a linear approach, growing attention has been given to intermediating actors. These actors are referred as 'innovation intermediaries' (Klerkx et al., 2009) and my assumption is that they play an important role regarding the outcomes of the processes of scaling and inclusion. Moreover, those actors are important actors regarding the final challenge 'project-based solutions, yet seeking structural change'.

2.1 BACKGROUND OF KENYAN DAIRY SECTOR

This section gives a short background of the Kenyan dairy sector and the role that DBHs could have in overcoming problems in this sector.

2.1.1 KENYAN DAIRY SECTOR

After years of decline, highlighted by the collapse of Kenya Cooperative Creameries (KCC) in 1997, the dairy industry in Kenya has been growing over the last decade (EADD, 2009). The dairy sector accounts for 3.5 percent of Kenya's GDP and 40 percent of the national livestock GDP[1]. During the last eight years the growth rate of the dairy sector was estimated to be four to five percent annually, resulting in a yearly production of roughly 5 billion liters. Smallholders account for approximately 80 percent of this production. Various estimations set the number of households to be involved in the dairy sector at 700,000 (SNV, 2013), although other estimations go up to 1.8 million households (EADD, 2009). Because the sector employs many women and youths and contributes to nutritional and food security, it can be seen as a key sector for pro-poor economic and social development (SNV, 2013).

[1] All statistics on the Kenyan dairy sector should be regarded as estimates EADD. (2009). *The dairy value chain in Kenya*. Nairobi, Kenya: East Africa Dairy Development Project (EADD), SNV. (2013). *Dairy Sector Policy Study and Capacity Needs Assessment of Stakeholder Associations*: SNV Kenya.

Out of all milk produced in Kenya around 55 percent is marketed, while the remaining 45 percent is used for home consumption, feeding calves or sales to neighbors. Of the marketed milk it is estimated that only 32 percent reaches the market through formal (implicating processed) channels. The formal milk market in Kenya is dominated by a few large players such as New KCC, Brookside and Githunguri Dairy. The Kenyan dairy sector has a huge potential. Currently, the average yearly consumption in Kenya is estimated to be 145 liters per person, whereas the WHO recommends a yearly consumption of 200 liters. In combination with the increasing population, this gap presents a huge opportunity to grow the national dairy market. Moreover, the sector has potential for export in both Eastern and Southern Africa and the Middle-East. (SNV, 2013)

Regardless of the potential of the Kenyan dairy sector in general and specifically for pro-poor economic and social development there are also challenges. Because the informal channel operates outside the legal framework, no health or hygiene standards are enforced, moreover no taxes are paid. Therefore, the informal market raises health concerns and it distorts the business environment for the dairy sector. Nonetheless, the informal market is not completely undesirable, in some areas the formal market is non-existent and field interviews indicate that the informal provides incentives for increasing production, rather than hampering the sector's growth. Moreover, in Kenya there is a mismatch between dairy production and processing. During the rainy season the milk production exceeds the processing capacity, while during the dry season the processors cannot source enough milk to use their use their capacity. (SNV, 2013)

Despite growth, the Kenyan dairy productivity is low compared to international standards. This is mainly caused by poor and inadequate feeding and breeding practices. Feeding practices are troubled by the availability, quality and costs of feeds. Regarding breeding AI is still not adopted as the main breeding practice in many areas. (EADD, 2009)

There are several other challenges, most of them derive from the fragmented nature of the Kenyan dairy sector both on the supply and marketing side and both in the formal and informal channels. This fragmentation hampers the growth and the competitiveness of the dairy sector (EADD, 2009; SNV, 2013).

2.1.2 COORDINATION IN SMALLHOLDER DAIRY DEVELOPMENT

The fragmented nature of the Kenyan dairy sector can be attributed to a lack of coordination in the sector. Coordination is in general subdivided into three categories. From a smallholders' perspective; horizontal coordination refers to coordination between farmers, vertical coordination entails synchronization between players in the value chain and complementary coordination relates to input and service delivery (Kilelu, 2013). Several challenges that reduce the chances for smallholders to effectively participate in value chains are resulting from a lack of coordination, as presented in Table 1.

TABLE 1 CHALLENGES RELATED TO COORDINATION (SOURCE: KILELU, 2013)

Coordination	Challenges
Horizontal	• Limited collaboration and loyalty that hamper the mobilization of economies of scale for participation in markets; • Lack of mutual trust and reciprocity among farmers that can result in opportunistic behavior and free-riding; • Diversity of interests that limits effective organizing;

	• Exclusion of some farmers from collective action; • Lack of transparency indecision making processes.
Vertical	• Lack of trust between farmers and market actors; • Unequal power relationships between farmers and output market actors; • Inconsistency and unpredictability of actions of market actors that undermine smallholder farmers' collective action.
Complementary	• Problems of reliability in accessing agro-input supplies and extension service systems; • Lack of commitment in the delivery systems which is also related to the high transaction costs in input and service market serving smallholders; • Lack of transparency and assurance about inputs and services; • Disconnected understanding by support service providers of the resource constraints faced by farmers and how this is linked to adoption and use of inputs; • Power imbalances between supply and demand sides of input and extension service markets, which may push intensive input use in smallholder or peasant agricultural systems. This push does not adequately take into account the effect of such a model on the resilience, return on investment and sustainability concerns of smallholders.

One of the propositions to overcome the fragmentation in the Kenyan dairy sector is to introduce Dairy Business Hubs. In other words, DBHs are regarded as a platform that can increase the coordination in the Kenyan dairy sector.

Poulton et al. (2010) discuss opportunities for successful service delivery to smallholders. Arguments that support the idea of small farm development as the best approach for initial mass poverty reduction are built on the idea that smallholders can profit from labor advantages as long as they are supported by well-functioning services. These services should assist smallholders to gain a competitive advantage over large farms by increasing labor and land productivity and by linking smallholders to rewarding outputs markets. In post liberalization periods in African countries, access to upstream services (inputs, finance, extension and research), quality control and prices paid for remote products generally have suffered. However other authors found that where coordination mechanisms were established, liberalization often resulted in higher production and productivity. Poulton et al. (2010) have found coordination mechanisms that were common in cases were smallholders successfully engaged with the formal supply chain. Moreover core techno-economic commodity and contextual characteristics are identified which could result in important actor incentives to invest in enabling smallholders' production. These results are captured in Table 2.

TABLE 2 FACTORS RELATED TO SUCCESFUL SERVICE DELIVERY TO SMALLHOLDERS (POULTON ET AL., 2010)

Coordination mechanisms	Core techno-economic commodity and contextual characteristics	Player incentives to develop ways of enabling small farm production
• concentration of produce markets (local or national) with incentives to increase investment in service delivery	• lower credence products, meaning that the quality of the product can quite easily be assessed	• external donor or NGO (financial and/or organizational) support • some form of horizontal farmer coordination (involving relatively

• horizontal and focal coordination between a few important actors in the chain in order to interlock transactions • including farmer organizations in order to decrease transaction costs	• limited opportunities for wholesalers to source from larger farms either because they do not exist or because they have more profitable production alternatives • more labor intensive products • small farmer motivations for participation that extend beyond short term direct profits from participation • product lines with a certain degree of stability in supermarkets' quality and quantity demands	independent farmer organizations or contract farming mechanisms) • significant investments by produce buyers in facilities and institutional mechanisms (and learning) for farmer monitoring and support • Mechanisms which allowed produce buyers and farmers to respond to supermarkets' (limited) changes in quality and quantity demands across and within product lines

From the findings of Poulton, Dorward, and Kydd (2010) can be derived that the succes of the Dairy Business Hubs as coordination mechanism might depend on characteristics related to the commodity (dairy) and the context.

DAIRY BUSINESS HUBS AS A COORDINATION MECHANISM

Dairy Business Hubs in Kenya are a new way of organizing services and marketing dairy products for smallholders, basically they promote improved coordination. Kilelu (2013) conceptualizes the hub as a coordination mechanism performing three main roles:

1. The hub as a broker; in this role the hub connects various cooperating actors. Brokering entails functions including demand articulation, matchmaking and network building, and enhancing relationships.
2. The hub as a one-stop shop; in this role the hub is considered a mechanism to improve service accessibility, providing a number of (integrated) services in a central location.
3. The hub as a cluster; in this role the hub is a cluster of firms that cooperates in order to optimize flows of knowledge, technology and support services for innovation.

As described in the previous section the Dairy Business can be conceptualized as a coordination mechanism, performing three main roles. In this thesis DBHs are investigated as an example of inclusive innovation, the inclusive innovation in this case therefore is a *coordination mechanism.*

2.2 DIFFUSION, INNOFUSION AND SCALING

The scaling or diffusion phase of an innovation is often presented as the final step in the innovation trajectory, after problem identification, piloting and evaluation. However, presented in this way the importance and complexity of scaling processes are underemphasized.

Past experiences have highlighted the importance of adjusting innovations to local realities. On the contrary, tailor made solutions might decrease the potential for scaling. The challenge is to make innovation 'context specific, yet widely adaptable' (Smith et al., 2013). In this section theories are discussed which provide insight to how innovations could become embedded in their context.

2.2.1 FACILITATED DIFFUSSION

Millar and Connell (2010) state that, in order to achieve wide spread and significant systems change, both the processes of scaling out and scaling up are required. They refer to both processes as mechanisms, using the following definitions: "Scaling out as the geographical spread of a technology, practice or systems change over time. Scaling up refers to expanding beneficial institutional and capacity building practices within and across organizations and networks at local to international levels" (Millar and Connell, 2010, p. 214).

Clear and tangible profits for the target group lead to higher uptake and adaptation of the innovation, compared to innovations yielding more diffuse and long term benefits. Still, farmers' preliminary judgment of the innovation can change if they are included in a facilitated and interacted learning environment, allowing them to test results within their own context (Millar and Connell, 2010). Millar and Connell studied the scaling of a 5-year program of participatory research known as Forages for Smallholder Project (FSP), background information on the case study is presented in Box 3.

Forages for Smallholder Project
The goal of the Forages for Smallholder Project was to identify and integrate robust and commonly used forage varieties in Southeast Asia. Scaling out was not an objective in the first stage of the FSP project. The encouraging response by farmers stimulated the program managers to expand and consolidate the technology. Capacity building of local facilitators, participatory approaches, establishment of local forage multiplication sites and the development of a regional network for sharing outcomes, were dominant features of the second phase. Within two years, households started to yield livelihood benefits and number of participating villages and households increased significantly. Nonetheless, the amount of households experiencing significant impacts regarding other aspects of the intervention remained rather low. Therefore, program managers started seeking for a different approach to accelerate the diffusion of the innovation and its impacts. Researchers investigating the process of scaling out forage and livestock technologies, found that scaling out could take place in three ways. The first option was that the technologies could be introduced into new villages, secondly farmers in currently participating villages could be encouraged to adapt the technologies to their own systems. Finally the technologies could be embedded into new developmental programs. Prior to scaling out, evidence had to be collected to prove the innovation's impact to be real, achievable and significant. To this end, project staff was trained to recognize direct impacts and significant livelihood impacts and capture the evidence. Feedback from farmers indicated that pictures and descriptions by staff could increase awareness, however farmers desired to see evidence from their local context. Extension workers started to conduct cross visits, where farmers were taken to another village to discuss production methods and impacts with more experienced farmers. This proved to be a powerful method to enhance farmer-to-farmer learning and stimulate uptake of the technologies. The method was preferred by farmers over other methods as 'case studies' and 'champion farmer visits', although these were also considered effective and used complementary. Resulting from these efforts the number of participating farmers and villages continued to be growing and more staff was needed to support this growth. Hitherto, the process was driven by and facilitated through support from donors. But, starting from 2005 a spontaneous and dynamic diffusion of forages was established in certain districts. Farmers in other districts were motivated to develop the quality and quantity of their herd due to high prices offered by Vietnamese traders.

BOX 3 BACKGROUND INFORMATION ON THE FSP, SOURCE: MILLAR AND CONNELL (2010)

From the case study Millar and Connell (2010) identify several vital elements that are required at several stages of the scaling process:

- Proven technologies suited to social, cultural and environmental conditions.
- Evidence of innovation, adaptation and significant impacts in personal contexts
- Facilitation of farmer learning by competent extension staff.
- Institutional support and partnerships.

Millar and Connell (2010) conclude that scaling out is not just enhancing adoption. It entails enabling farmers to identify their problems, testing several options and lastly making a motivated choice on how they want to improve their livelihoods. This means that farmers can decide to relinquish from the proposed innovation. Scaling out is not an autonomous process; to be successful it should be planned and facilitated. Millar and Connell share the opinion of Pannell et al. (2006) that trialability as an important strategy for scaling out, moreover they stress the importance of peer learning and creating evidence. Farmers should be key actors in designing the scaling process to give them sense of ownership over and commitment towards the process of improving their livelihoods.

2.2.2 INNOFUSION

Foster and Heeks (2013) use Fleck's (1993) term 'innofusion' to capture the process of bringing inventions to use. Innofusion draws away from linear models that explain innovation as separate processes of innovation, production and diffusion. Fleck recognized that processes of production, distribution and implementation are closely linked and analyzing them separately does not comply with the reality of (implementing) innovations. Foster and Heeks argue that the diffusion of an innovation always comes with additional innovations to both the good or service as to the context in which it will be implemented. Therefore, innovation and diffusion are inseparable processes. After analyzing the diffusion of mobile phones in Kenya, Foster and Heeks (2013) conclude that the concept of innofusion holds well. The diffusion of an innovation comes with additional minor innovations; appropriation, configuration, use variation and domestication. For inclusive innovations those modifications are vital to "work in useful ways" (Foster and Heeks 2013 p. 15).

2.2.3 SCALING DAIRY BUSINESS HUBS

Millar and Connell (2010) and Foster and Heeks (2013) describe different paths for innovations to diffuse, here they are used to illustrate processes that might take place when bringing an innovation to scale. Millar and Connell (2010) regard scaling as a planned and facilitated process. Although they recognize that 'spontaneous and dynamic diffusion' can take place, they state that scaling is not an autonomous process. Therefore they emphasize the measures that can be taken to enhance the scaling process, with a focus on learning and adaptation in each new setting. A large role is played by the target groups. Farmers should be supported to test the innovation within their own context and ultimately should make a motivated decision regarding adoption. Scaling as described by Millar and Connell (2010) is a process of subsequently problem identification, appropriation (testing in own context) and adoption decision. Strategies for successful scaling are finding simple technologies that can easily be trialed in different contexts, moreover innovative practices can be encouraged by facilitated (peer) learning. In contrast, the innofusion approach as discussed by Foster and Heeks (2013) implies diffusion takes place through a series of minor innovations (appropriation, configuration, use variation and domestication). Those modifications result from actions taken by several actors and are not necessarily coordinated. The scaling of an innovation in this sense is the result of intertwined processes of production, distribution and implementation. Moreover, whereas Millar and Connell (2010) describe adaptations to the original innovation practice, Foster and Heeks (2013) observe new innovations that belong to the diffusion process. Additionally, Jaleta et al. (2013) suggest that the development of integrated input supply and service delivery (e.g. Dairy Business Hubs) is likely to be a gradual process, rather than emerging at once. Starting all services at once requires a high capital investment which might not

be feasible in economic sense. A gradual approach starting with the services that are needed daily might be the solution.

Former findings hint to several factors that might distinguish one scaling process from others, mainly related to the amount of planning and inclusion that is part of the process. In the case of DBHs the model might be adapted to the context before implementation. During or after implementation the model might evolve resulting for several 'drivers': planned and facilitated, gradually or unplanned. The adaptation to the 'original DBH model' before, during and after implementation – either planned or unplanned – will ultimately lead to an 'embedded DBH model'. The goal is to find how this process took place in the case of four DBH cases in Kenya. It should be noted that 'embedded DBH model' might not be a static condition, it probably will remain a dynamic model.

2.3 INCLUSION OF SMALLHOLDERS IN SCALING DBHS

Relating to the second enduring challenge 'appropriate to, yet transforming situations', Smith et al. (2013) frame innovation as 'empowering inclusion'. Obviously, inclusion is one of the main principles of inclusive innovation. According to the United Nations Development Program inclusive business models include "the poor on the demand side as clients and customers, and on the supply side as employees, producers and business owners at various points in the value chain" (Wegner, 2012). As specified by Foster and Heeks (2013) 'the poor' refers to groups that are excluded from mainstream development, usually the poorest of the poor. Regarding the DBHs inclusion concerns the targeted dairy producers, primarily smallholders. Foster and Heeks (2013) identify four dimensions of inclusivity, which – according to my judgment – can be visualized in chronological order. According to Foster and Heeks in order for an innovation to be 'inclusive' only one of these criteria has to be met.

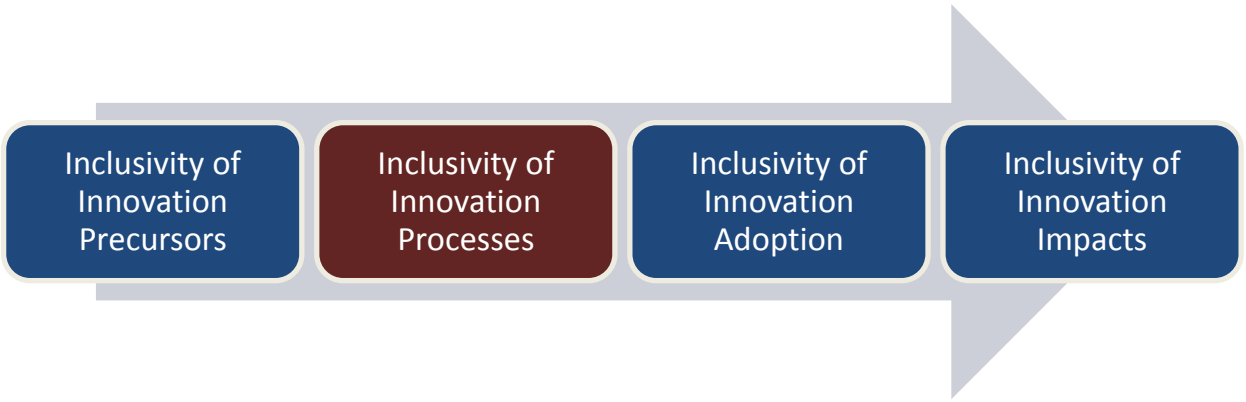

FIGURE 1 FOUR DIMENSION OF INCLUSION (FOSTER AND HEEKS, 2013)

The first dimension of inclusivity entails that innovation efforts are directed to overcome challenges which are relevant to the poor. It is generally recognized in the development cooperation sector that the needs of target groups are critical, target groups should be in the driver seat of development programs. For successful partnerships values, aims and drives of all parties involved should be shared and made explicit (Termeer et al., 2010). Complying with the second dimension means that the poor are actively involved in the development of the innovation. The third dimension encompasses that adopting the innovation is feasible and possible for the poor.

With regard to this dimension literature states that it is important factors to enhance the adoption of an innovation are 'relative advantage' and 'trialability' (Millar and Connell, 2010; Pannell et al., 2006). Relative advantage is "the degree to which an innovation is perceived as being better than the idea [or practice] is supersedes" (Rogers (2003) in Pannell et al., 2006, p. 1413). Trialability refers to characteristics of the innovation that influence the ease of learning about the innovations' performance and its optimal management. Trialability boosts adoption and reduces insecurity about the relative advantage of the innovation. Pannel et al. (2006) conclude that the focus in promoting adoption should not be on communication, education or persuasion. Rather, innovations should be adoptable. According to the fourth dimension the impacts of the innovation should make a positive contribution to the livelihoods of the poor.

2.3.1 INCLUSIVITY OF THE INNOVATION PROCESSES

Due to the topic of this thesis, the focus regarding inclusion will be on the inclusivity of the innovation process, although the other dimensions of inclusivity might be touched upon as well. The question is not whether DBHs can be classified as inclusive innovation, because once one of the dimensions of inclusivity is addressed the label inclusive is considered appropriate (Foster and Heeks, 2013). The aim is to understand the role is of the target group (smallholders) in the process of diffusion or innofusion as described in the former section. *What is the role of the dairy producers in the process that turns a general DBH concept into an existing Dairy Business Hub?*

Inclusion as emphasized in inclusive innovation is not a new idea. Gradually a shift takes place from top-down approaches towards more participatory or inclusive ways of innovation. The evolution towards participatory approaches reflects the increasing awareness that farmer involvement and empowerment is imperative for development. It has been witnessed that participatory methods significantly increase the farmers' motivation, readiness to join collective action, and sense of ownership regarding the process (Franzel et al., 2001). The expectation is that involving a range of stakeholders (e.g. farmers) can speed up innovations processes (Hocdé et al., 2009). Nonetheless, top-down approaches still prevail in many instances and the question is whether inclusive innovation is able to truly involve the smallholders?

Hocdé et al. (2009, p. 142) highlight "how difficult it is to move away from token participation and to ensure a strong, balanced involvement of all participants, especially the farmers". Projects initiated by research (supply-driven) often have more difficulties in involving farmer organizations (FOs), compared to programs initiated by the FOs themselves. Thus, initiative seems to be an important factor regarding the inclusiveness of the innovation process. Additionally, Swaans et al. (2014) conclude that social organization, representation and incentives are important to ensure a true participatory and inclusive innovation process.

Including farmers in the innovation process is not an end in itself, it serves a two purposes. Primarily, diversity calls for site-specific practices. Farmers operate in diverse contexts and each farming system comes with challenges and opportunities. It is impossible to generate the number of innovations needed to fit each specific context. Therefore local adaptation and locally specific development is vital for successful innovation (Waters-Bayer et al., 2009). Swaans et al. (2014) argue that incentives are important to guarantee a demand driven and contextualized innovation process. Secondly, conditions are always changing and require local capacities to adapt. An innovation – a solution to a certain problem – does not remain effective eternally. Therefore sustainability can only be reached if farmers have the capacity to adapt. Moreover, usually the

specific innovations are not suitable for wider dissemination in order to promote local innovation. Scaling up local innovation rather relates to learning processes on how to stimulate these processes, build partnerships and create enabling environments (Waters-Bayer et al., 2009). Hence, inclusion of farmers is important to promote local adaptation of innovation (related to challenge 1) and to increase the sustainability of the innovation (related to challenge 3).

The aim related to the second enduring challenge is to find out if and how smallholders were included in the innovation process. What was their role in the process that turned the idea of a DBH into an application of the concept in their context? Were partners facilitating the development of DBHs able to move away from token participation?

2.4 THE ROLE OF INTERMEDIARIES

The third enduring challenge 'project-based solutions, yet seeking structural change' is related to the sustainability of the Dairy Business Hubs. Concerning sustainability the author has chosen to focus on the role of innovation intermediaries, because their support represents the 'project-based' component of the (sustainable) inclusive businesses that the DBHs are designed to become.

Through their work of connecting specific and isolated innovation projects with other projects and wider work, intermediary actors are in the position to detect common challenges across different projects (Hargreaves et al., 2013). By sharing this knowledge they can support new innovation projects in the process of diffusion. Based on work by Geels and Deuten (2006), Hargreaves et al. (2013) identify three fundamental roles for intermediary actors in niche development: 'aggregation', 'institutional infrastructure' and 'reversal'. Aggregation is the process of transforming local knowledge into context-free knowledge, so that it can travel between different local practices. The creation of institutional infrastructure supports the circulation of this knowledge, through for example seminars and workshops. The reversal takes place when context-free is used again and becomes guiding in local practices (Geels and Deuten, 2006). By virtue of these three roles intermediary actors are critical in the creation of niches that can be sustained in the long run and potentially diffuse and scale up (Hargreaves et al., 2013). Smith et al. (2013, p. 8) seem to draw a similar conclusion when reflecting upon the challenge 'locally-specific, yet widely-applicable' when they state: "If grassroots ingenuity has wider relevance then it is in two senses. First, there might be transferable knowledge about how processes for incorporating local knowledge and emphasizing the diverse situations of the grassroots could be designed into other innovation processes. Second, there will be knowledge about which aspects of the grassroots innovation are more or less strongly embedded and embodied in the local situation. Such knowledge can be used to generate more place-sensitive information about technologies for social inclusion and their transferability."

2.4.1 CONCEPTUALIZING INNOVATION INTERMEDIARIES

Former assertions support the assumption that intermediary actors play a crucial role in the processes of both diffusion (scaling) and inclusion. The general view on innovations shifted from a linear to a systems approach, innovations are regarded as the outcome of a "process of networking interactive learning and negotiation and negotiation among a heterogeneous set of actors" (Klerkx et al., 2009, p. 410). In this new understanding (agricultural) innovation is considered to be more than adopting new technologies, innovation requires balancing between novel technologies and alternative ways of organizing. It is in this new perspective that the importance of intermediary

organization has become apparent, and the need for systemic support has led to a new breed of intermediaries, the 'innovation intermediary' (Van der Hilst, 2012).

Innovation intermediaries have been defined by both their activities and their purpose. Examples by Howells (2006) and Dalziel (2010) are provided in Box 4.

Two definitions for innovation intermediary

"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, for bodies or organisations that are already collaborating; and helping find advice, funding and support for the innovation outcomes of such collaborations." – Howells (2006, p. 720)

"Organizations or groups within organizations that work to enable innovation, either directly by enabling the innovativeness of one or more firms, or indirectly by enhancing the innovative capacity of regions, nations, or sectors." – Dalziel (2010, pp. 3-4)

BOX 4 DEFINITIONS FOR INNOVATION INTERMEDIARY

Innovation intermediaries perform a detailed set of activities that can be generalized into three main functions: 'demand articulation', 'network composition' and 'innovation process management' (Klerkx et al., 2009). Kilelu et al. (2013, p. 67) use the following, more elaborated list of, functions to unravel the intermediary role played by innovation platform EADD in the development of DBHs:

1. Demand articulation – Facilitating the process of identifying innovation challenges and opportunities as perceived by the various stakeholders through diagnostic exercises, visioning, needs assessment. The needs could include access to information, technologies, finance or institutional gaps.
2. Institutional support – Facilitating and advocating institutional change (e.g. policy change, new business models and stimulating new actor relationships).
3. Network brokering – Identifying and linking different actors.
4. Capacity building – Strengthening and incubating new organizational forms.
5. Innovation process management – Coordinating interaction and facilitating negotiation and learning among different actors.
6. Knowledge brokering – Identifying knowledge/technology needs and mobilizing and disseminating the technology and knowledge from different sources.

Innovation intermediaries are seen as important actors enhancing innovation performance. Particularly small and medium enterprises (SMEs) struggle to facilitate innovation on their own. Intermediaries can support SMEs in building networks and enable SMEs to profit from them (Van der Hilst, 2012). Uncertainties in the early stages of innovation can be reduced by intermediaries, allowing (private) parties to innovate that otherwise might have been excluded. Moreover, intermediaries could include the poor by giving them a voice in the development process (Klerkx et al., 2009).

2.4.2 THE ROLE OF INNOVATION PLATFORMS IN DBH DEVELOPMENT

In work by Kilelu et al. (2013) the role of innovation platforms supporting co-evolution of innovation is unraveled. The role of EADD in developing Dairy Business Hubs is used as a case study, making the research particularly interesting for this thesis.

An innovation platform is a multi-actor established to support and take actions contributing to innovation, usually in the agricultural sector. EADD is implemented by a consortium of five organizations: Heifer International, International Livestock Research Institute (ILRI), Technoserve (TNS), African Breeders Services Total Cattle Management Limited (ABS TCM LTD.) and World Agro-forestry Centre (ICRAF). In order to analyze the role of EADD Kilelu et al. (2013) operationalized innovation as co-evolution, using Leeuwis and Van den Ban's (2004) "definition of innovation as alignment of hardware (technology in the form of new technical devices), software (new modes of thinking and corresponding practices and learning processes), and orgware (new institutions and socio-organizational arrangements)" (Kilelu et al., 2013, p. 66). The role of the EADD, performing as an innovation intermediary, is analyzed based on the six functions usually performed by innovation intermediaries that are mentioned Section 2.4.1.

Kilelu, Klerkx, and Leeuwis (2013) conclude that the dimensions (hardware, software and orgware) of co-evolution can reinforce each other. Innovation platforms can play and important role in connecting the different dimensions by establishing effective patterns of interaction. Moreover the role of innovation platforms throughout the innovation process is highlighted, starting with demand articulation and fund raising and evolving towards network orchestration. This indicates that platforms cannot be static structures, but have to remain highly dynamic. Also instead of one central intermediary, intermediary functions will be performed by a set of actors some of whom might be less formal.

As co-evolution cannot be fully steered or controlled, the authors also identify several tensions faced when using platforms as a tool to foster innovation. The first tension relates to purpose, should all platforms have similar compositions regarding diversity and governance structure? EADD was successful regarding improving marketing opportunities, however appeared to lack the capacity to increase farmer innovation and productivity regarding breeding and feeding. This raises the question whether platforms should differ depending on their aims and levels of operation? The second tension relates to the point that intermediary functions are not performed by a single actor, although useful, this also leads to tensions deriving from diverse strategies and aims. The third tension derives from the reality that platforms have to remain adaptive towards unanticipated events, whereas funding schemes and resources often are not.

Thus although innovation platform EADD was useful and performed important functions in the establishment of Dairy Business Hubs, the approach is not free of tensions or risks.

In this thesis mainly the influence of the support given by innovation intermediaries on the flexibility and the sustainability of Dairy Business Hubs will be analyzed.

3 RESEARCH QUESTIONS

3.1 MAIN QUESTION

To what extent were the 'three enduring challenges' relevant to the process of scaling out Dairy Business Hubs in Kenya?

3.2 SUB QUESTIONS

1) **How did the DBHs develop from a general approach towards an embedded application of the hub model?** *Relating to the challenge 'Locally-specific, yet widely-applicable'.*
2) **In what ways have smallholders been able to influence the development of contextualized DBHs?** *Relating to the challenge 'Appropriate to, yet transforming situations'.*
3) **How did 'innovation intermediaries' influence the development of DBHs?** *Relating to the challenge 'Project-based solutions, yet seeking structural change'.*

3.3 ANALYTICAL FRAMEWORK

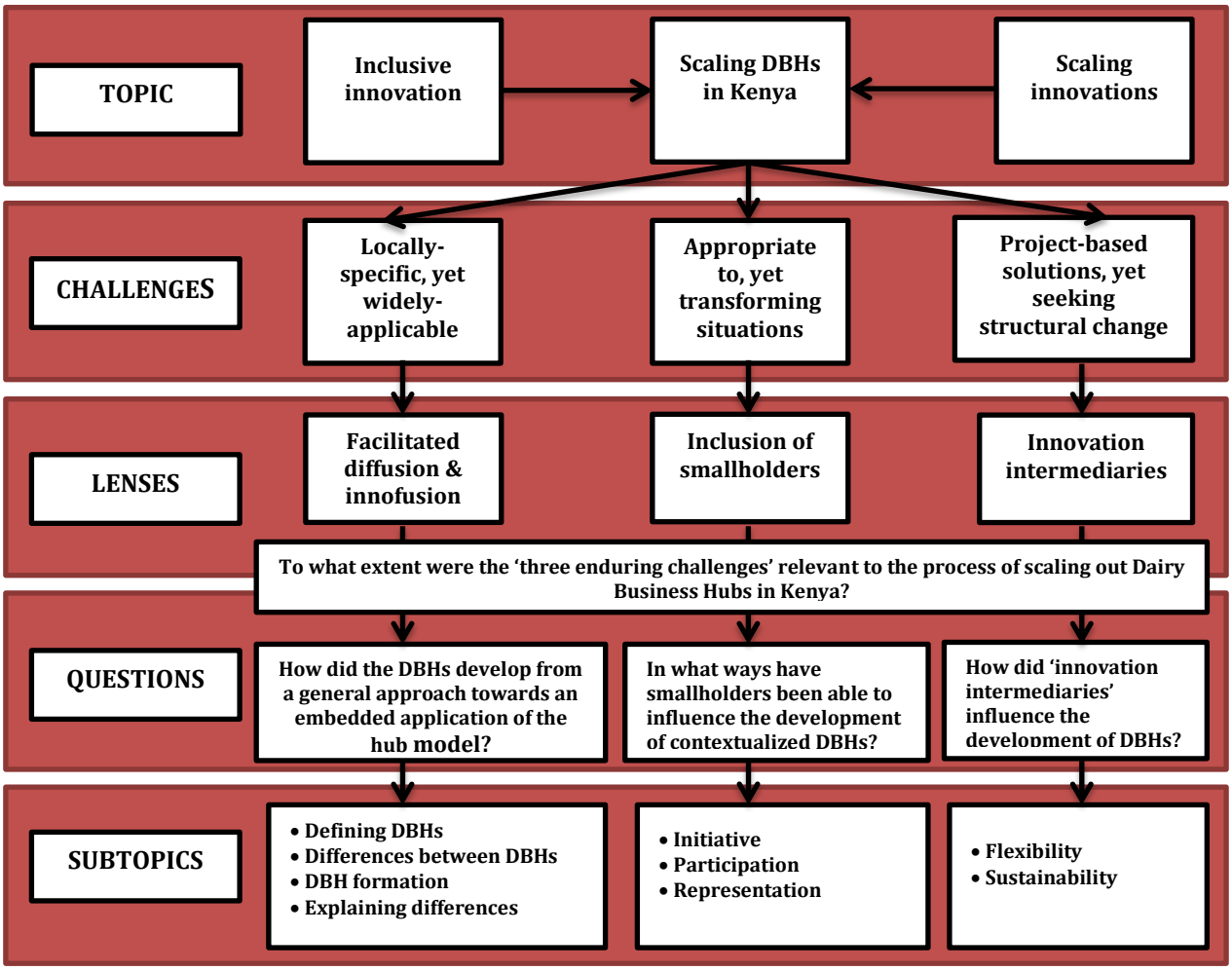

FIGURE 2 ANALYTICAL FRAMEWORK

4 METHODOLOGY

Innovation processes are complex and in-depth enquiry takes time. This thesis is designed as an explorative study to find out how scaling of the DBH concept took place in the Kenyan context. Therefore the researcher favored qualitative research methods over quantitative methods.

In order to answer the research questions a case study approach has been selected in combination with semi-structured interviews with persons working for organizations that are playing an intermediary role in the process of scaling DBHs. An exploratory case study is the preferred method when "a 'how' or 'why' question is being asked about a contemporary set of events, over which the investigator has little or no control" (Yin, 2002, p. 9). The Dairy Business Hub approach has spread over several countries in East Africa (Kenya, Uganda and Rwanda), moreover it is explored whether the concept could be scaled out to Ethiopia and Tanzania. Because the approach is well established in Kenya, the researcher decided – for practical reasons – to merely select cases within Kenya. Cases selection was done during the field trip, in correspondence with the hosting organization (SNV), as discussed in Section 4.1. A case is an application of the DBH concept in a certain (geographical) context. The choice for multiple cases reduced the time available for data collection per case, however in relation to the research' focus – scaling – it was preferred to select multiple cases for comparison.

The main methods used for data collection were semi-structured interviews. Interviews were conducted among several stakeholders of the DBHs: farmers, business managers, input suppliers and intermediary organizations. However as Jansen and Vellema (2011, p. 172) state "interviewing is generally biased towards collecting data on the individual knowledge of respondents." Consequently some processes are difficult to capture only through interviews. During the field research when possible interview answers were validated by observations, however in practice this often proved complex.

4.1 CASE SELECTION

The cases where selected based on few criteria. The most important one was accessibility, meaning the possibility to have a contact person that was able and willing to guide the researcher in the field. Another factor was that cases had to be located in different regions, because one of the aims of the study is to find out whether the DBH-model is adapted to its context. To be acceptable as a case the Dairy Business Hubs also had to be established for some time, so that their operations are more or less stabilized and not in a start-up phase. A final factor was to select cases supported by both SNV and EADD, which allowed the researcher to study the differences in how the organizations carry out their role as 'intermediary'. Ultimately, four cases

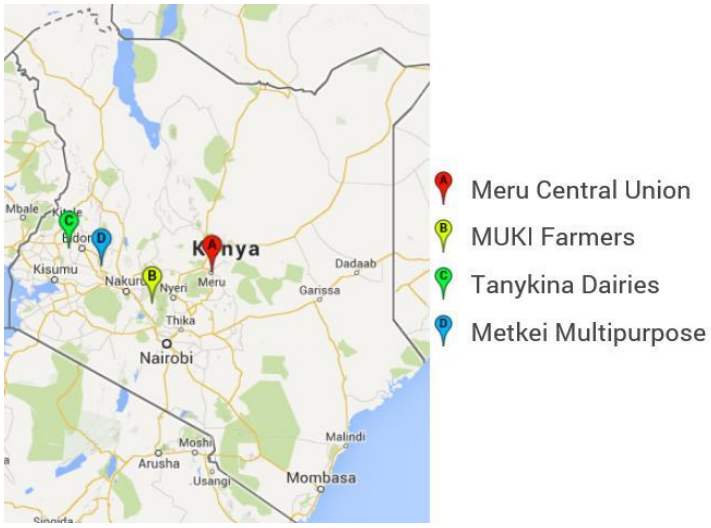

FIGURE 3 MAP OF DBH LOCATIONS

were selected, two in the Rift Valley (Tanykina and Metkei), one in the Central region (MUKI F.C.S.) and one in the region that is called Eastern (Meru Union). The cases in the Rift Valley both received support from the EADD program and the other cases were currently supported by SNV. The cases are geographically located in Figure 3 and a short introduction for each case is given below.

MERU CENTRAL DAIRY CO-OPERATIVE UNION (SHORT: MERU UNION)

Meru Central Dairy Co-operative Union was founded in May 2005 by 19 affiliated cooperatives. Currently the union serves around 30,000 members of which 10,000 are active suppliers, which can be grouped in cooperatives (affiliated and non-affiliated), self-help groups and individuals. The aim of the organization is to serve their suppliers, giving them the best possible services and prices. Currently the union is supported by SNV, mainly in the area of extension.

MUKI FARMER COOPERATIVE SOCIETY (SHORT: MUKI F.C.S.)

MUKI Farmer Cooperative Society is located in the central province of Kenya. It was established in 2001, growing out of the milk department started in 1998 as an additional activity of MUKI SACCO. MUKI FCS has around 11,500 members of which 5,050 are active. Next to MUKI SACCO, the cooperative is closely collaborating with MUKI Investment and the processor Kinangop Dairy Ltd. The four entities are working together to protect the farmers' interest and to empower farmers in economic sense. Similar to Meru Central this cooperative is supported by SNV, in the past TNS provided business advice, links with other organizations and business visits.

TANYKINA DAIRIES LTD. (SHORT: TANYKINA)

Tanykina dairy plant is located in the North Rift, almost 35 km west of Eldoret. Tanykina was registered in 2003 and started its operations in 2005 with the support of Heifer International, in 2008 it became one of the pre-existing hubs in the EADD project. Tanykina serves over 11,000 small scale farmers and aims to empower their members to improve and sustain their milk production. Moreover they facilitate farmer participation in the dairy value activities, enabling them to benefits from the value chain by adopting a hub model. Next to transporting, bulking, chilling and marketing milk the Tanykina hub facilitates services such as a healthcare scheme, financial services and farm related services.

METKEI MULTIPURPOSE COMPANY LTD. (SHORT: METKEI)

Metkei chilling plant was established in 2009 and is located in Keiyo district, roughly 70 km southeast of Eldoret. Metkei is one of the DBHs established from 'scratch' by EADD. Currently they have 2524 members registered as shareholders, 6881 as milk suppliers and around 3200 active suppliers. Metkei sources their milk through hired transporters, cooperatives, individuals and middlemen. Next to milk transport, bulking, chilling and marketing the hub offers agrovet, artificial insemination and financial services to its suppliers.

'EADD HUBS' AND 'OTHER HUBS'

In order to easily distinguish the hubs supported by EADD and the hubs supported by SNV from here onwards the hubs that received support from EADD will be labeled 'EADD Hubs' and the hubs that received support from SNV will be referred to as 'other hubs' or a similar term. It would not be correct to label them as 'SNV Hubs' since SNV started collaborating with pre-existing initiative.

Moreover SNV's approach is not based on the hub model, whereas EADD either established hubs from scratch or upgraded pre-existing cooling plants (CPs) based on the hub model.

4.2 SELECTION OF INTERVIEWEES AND PROCEDURE

In this section will be described how the interviewees were selected, the interviews done with 'innovation intermediaries' and with respondents that were connected to one of the cases are discussed separately. All interviews were conducted in the months of September and October of the year 2013. In this research no names are cited, the interviewees are only mentioned by function.

4.2.1 DAIRY EXPERTS

Several respondents from organizations supporting DBHs in Kenya were selected, the researcher aimed to interview at least one person of each EADD organization and SNV, these persons will be referred as dairy experts (or simply experts) in the rest of this research. The EADD consortium consisted of five partner organizations (Heifer, ILRI, ABS, TNS and ICRAF) and respondents of each organization were selected. The respondents were selected based on suggestions by two persons whom are currently employed at SNV, but that formerly were active within the EADD program. Some of the interviewees had left their positions within the EADD program to start working for another organization, their EADD employer is mentioned in the right column of Table 3.

TABLE 3 OVERVIEW OF 'EXPERT' RESPONDENTS

#	Date	Function of interviewee	Current organization	EADD organization
[1]	20-09-13	Head of milk Supply & Extension	New KCC	Heifer International
[2]	25-09-13	Program Manager	TNS	TNS
[3]	28-09-13	Managing Director	ABS	ABS
[4]	30-09-13	Agricultural Economist	ILRI	ILRI
[5]	02-10-13	PM&E Coordinator &	Heifer International	Heifer International
		Livestock Specialist	Heifer International	Heifer International
[6]	25-10-13	Consultant Advisor	SNV	n/a
[7]	25-10-13	Feed Advisor &	SNV	ICRAF
		Business Development Advisor	SNV	TNS

The interviews with respondents working for one of the intermediary organizations were planned in advance. The researcher conducted semi-structured, using questions included in Appendix A. The researcher adapted the interview according to the answers given by the respondent and specified them to the organization the respondent was working for. Interviews conducted with this target group required between 1 and 2 hours, depending on the answers given by the respondent. During the interviews the researchers captured answers in short sentences and key words, in order to transcribe the interview using a laptop at the first opportunity after the interview. The transcribed interviews were sent to the respondents by email to give them the opportunity to adapt and agree on the content. However, this opportunity was only used by two respondents.

4.2.2 CASE STUDY INTERVIEWS

During the field visits the researcher aimed to interview as many relevant respondents as possible within the available timeframe, which was between two and five days for the selected cases. Contrary to the interviews with innovation intermediaries, it was not possible to plan these interviews in advance. Respondents were found with the help of the contact person or selected hub

or through 'snowballing'. The most important respondents regarding the DBHs were someone representing the DBH (manager, staff and/or board members) and farmers, other possible respondents were service providers and government officers. In Table 2, an overview of the respondents for each case is given.

The interviews with one representative of the DBH, farmers and service were semi-structured. The researcher had roughly determined which topics and questions would be discussed during the interview, interviews with other respondents (e.g. government officers) were done with little preparation. In those cases, the researcher determined a few topics to be covered and continued according to the given answers.

Interviews with the representative of the hub lasted approximately ninety minutes, interviews with other respondents covered between fifteen and forty-five minutes. Although all interviews were conducted in English, in some farmer interviews help from the local contact person was needed in order to refine how farmers interpreted the question or how the researcher understood the given answers. Equally to the interviews with intermediaries, the researcher captured the interviews by writing down key words and transcribing the interview at the first opportunity. Opposed to those interviews respondents in this category did not have the opportunity to revise the interview, for practical reasons the researcher has chosen to limit this option to the innovation intermediaries.

TABLE 4 OVERVIEW OF 'CASE' RESPONDENTS

#	Date	Tanykina Dairies Ltd.
[Tan1]	06-09-2013	Manager Tanykina
[Tan2]	07-09-2013	Chairman Tanykina
#	**Date**	**Meru Central Dairy Co-operative Union**
[Mer1]	30-10-2013	Internal Auditor Meru Union
[Mer2]	29-10-2013	Manager Githongo Dairy F.C.S.
[Mer3]	29-10-2013	Technical Assistant Twiga Chemicals Ltd.
[Mer4]	30-10-2013	Farmer
[Mer5]	30-10-2013	Farmer
[Mer6]	29-10-2013	Farmer
#	**Date**	**MUKI Farmers Co-operative Society**
[Muk1]	17-10-2013	Manager MUKI F.C.S.
[Muk2]	16-10-2013	Extension manager MUKI F.C.S.
[Muk3]	16-10-2013	Extension assistant MUKI F.C.S.
[Muk4]	16-10-2013	Agrovet shop attendant MUKI F.C.S.
[Muk5]	17-10-2013	Head of District office Livestock Ministry
[Muk6]	16-10-2013	Farmer
[Muk7]	17-10-2013	Farmer
[Muk8]	19-10-2013	Farmer
[Muk9]	19-10-2013	Farmer
#	**Date**	**Metkei Multipurpose Company Ltd.**
[Met1]	04-10-2013	Manager Metkei
[Met2]	04-10-2013	Extension Manager Metkei
[Met3]	03-10-2013	Quality Assurance Manager Metkei
[Met4]	04-10-2013	Board member Metkei
[Met5]	04-10-2013	Manager Tumeigo F.C.S. (and farmer)
[Met6]	03-10-2013	Manager Metkei F.C.S. (and farmer)
[Met7]	03-10-2013	Manager Agrovet shop Metkei
[Met8]	03-10-2013	Government Livestock Extension Officer
[Met9]	03-10-2013	Farmer
[Met10]	05-10-2013	Farmer
[Met11]	05-10-2013	Farmer

4.3 DATA ANALYSIS

After completing the field, the researcher started analyzing the data. As described above all interviews were transcribed after conducting them. After completing all interviews and returning from the field research, the researcher started organizing the data. Due to a lack of experience with software for qualitative analysis, the researcher categorized the interview data manually. Categories were made based on topics, respondents or cases and were used as regarded appropriate by the researcher. The results are presented in Section 5 of this thesis.

5 RESULTS

In this chapter the findings from the interviews conducted during the field work in Kenya will be discussed. This chapter is organized based on the sub questions that are formulated in Section 3 and presented in the analytical framework. Accordingly, in Section 5.1 the results relating to the first sub question will be discussed, in Section 5.2 the results relating to the second sub question and the third and final section the results relating to the third sub question will be discussed. After each section the most important findings will be presented in a short summary. Aspects discussed in certain sections may also relate to other sub questions, as the sub questions are interconnected as well.

The information that was collected in the case studies will be used in relation to the different topics and therefore will not be presented as separate case studies.

5.1 DIFFUSION, INNOFUSION AND SCALING

In this section results that provide insights in order to answer the first sub question will be presented. The first sub question relates to the enduring challenge 'locally-specific, yet widely-applicable' and was formulated: *How did the DBHs develop from a general approach towards an embedded application of the hub model?*

In order to answer the first sub question first the current state of Dairy Business Hubs in Kenya is considered. Subsequently, the researcher attempts to deduct *why* the hubs are as they are; what causes differences? First an overview of the case studies will be given in order to understand references made to the case studies further on.

5.1.1 BRIEF OVERVIEW OF SELECTED CASES

In this section the cases will be compared in order to create a brief overview of the selected cases. To begin with an overview, some general information of the selected cases is presented in Table 5.

TABLE 5 OVERVIEW OF SELECTED CASES

	Meru Union	**MUKI FCS**	**Tanykina**	**Metkei**
Legal framework	Cooperative (Union)	Cooperative	Company	Company
Supported by	SNV	SNV	EADD	EADD
Founded	2005	2001	2003	2009
Supply base (approximately)	30,000 suppliers 10,000 active	11,500 suppliers 5,050 active	6,800 suppliers 3,500 active	6,881 suppliers 3,200 active
Collecting through	- Affiliated cooperatives - Unaffiliated cooperatives - Self-help groups - Individual farmers	- Individual farmers	- Individual farmers (satellite coolers)	- Cooperatives - Individual farmers - Middlemen
Services offered (Excl. Transport, chilling and marketing)	- AI services - Milk testing - Administration*	- SACCO - Agrovet - AI service	- Healthcare scheme - Village bank - Cow insurance	- FSA - Agrovet - AI service

	- Semen and feeds*	- Veterinary service - Extension - NHIF (on check-off)	- Agrovet - AI service - Veterinary service - Extension	- Veterinary service - Extension
Selling to	Marketing their own brand or sales to NKCC* in case of emergency	Marketing their own brand and selling surplus to Brookside* or NKCC*	Buzeki*, Sameer*, informal market	Daima*
Processing	Yes	Yes (performed by Kinangop Dairy)	Only traditional (Mala)	No

* Private processing companies in Kenya

VALUE CHAINS OF SELECTED CASES

The value chains of the case studies were discussed with the managers or another representative of the selected cases. The outcomes are presented in the figures below.

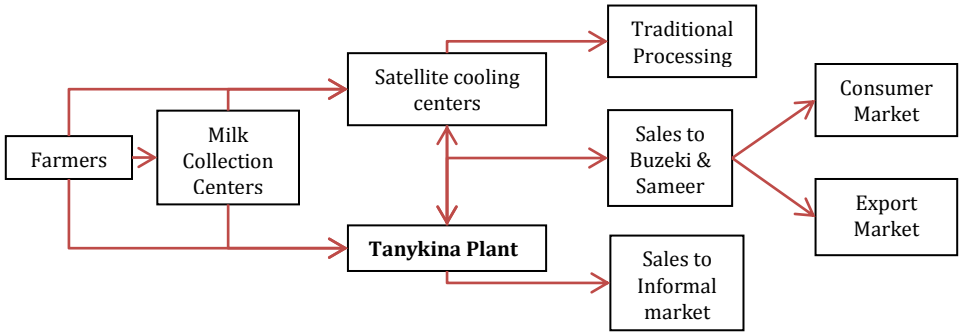

FIGURE 4 THE VALUE CHAIN OF TANYKINA [TAN1]

In Tanykina the milk is collected from individuals through milk collection centers and satellite cooling centers. Milk is transported to these centers by transporters or by farmers themselves earning a small share from the milk price. Milk that reaches the satellite cooling centers is either sold to processors from there or transported towards the central Tanykina plant. From the plant it can either be sold to processors or to the informal market, a small share of the milk is processed into a local product named 'Mala'.

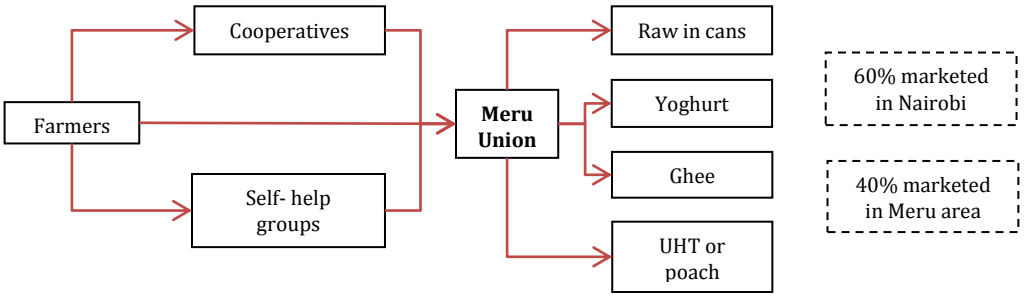

FIGURE 5 THE VALUE CHAIN OF MERU UNION [MER1]

Meru Union sources milk primarily from cooperatives and self-help groups, although some individuals also deliver milk to the union. The transport is arranged by the producers themselves who receive a transport fee. Once the milk reaches the factory it is sold raw in cans or processed

into UHT milk, pasteurized milk (in poaches), yoghurt and ghee. Approximately forty percent is marketed in the district Meru Central, the remaining part is marketed in Kenya's capital Nairobi.

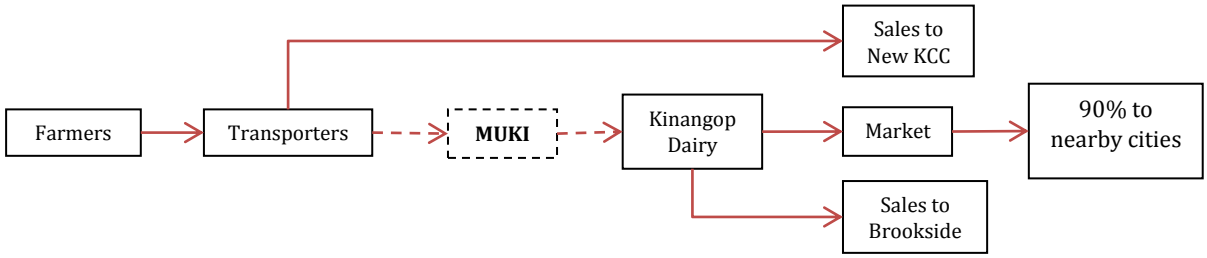

FIGURE 6 THE VALUE CHAIN OF MUKI FCS [MUK1]

MUKI FCS is a cooperative that sources the milk from their suppliers; the transport is arranged and paid for by the cooperative. MUKI FCS sells their milk to the processor Kinangop Dairy which is represented by a dashed line as in reality the milk is bulked directly at the processors' location. Kinangop Dairy is a private processing company partly owned by the cooperative. Milk that is collected in a certain (isolated) area is sold directly to New KCC. Kinangop Dairy is not able to market all milk that is supplied through MUKI FCS under their own brand, therefore part of the (raw) milk is sold to a larger processor: Brookside. Out of the milk that is processed by Kinangop approximately ninety percent is sold in nearby cities.

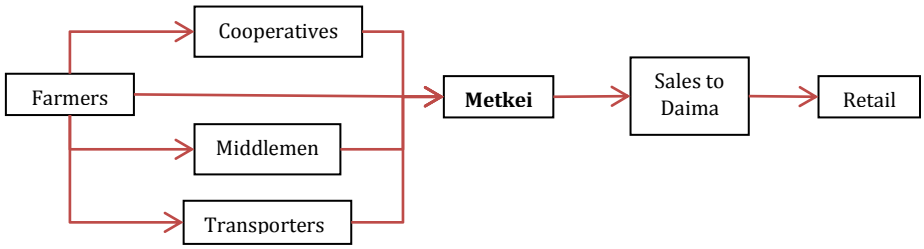

FIGURE 7 THE VALUE CHAIN OF METKEI [MET1]

Metkei sources their milk from individuals and cooperatives. Transport of the milk is taken care of by farmers themselves, by transporters employed by Metkei, by cooperatives or in some cases by middlemen. This last option entails individual buying from distant farmers and reselling it at a higher price to Metkei, although this practice is undesirable Metkei cannot afford to lose milk from their chain. All the milk that is collected by Metkei is sold to the processor Daima.

5.1.2 DEFINING DAIRY BUSINESS HUBS

In the previous section four examples of Dairy Business Hubs were briefly presented. From these examples can be concluded that hub have similar functions, they increase horizontal and vertical coordination between smallholders. However there are also differences between the Dairy Business Hubs regarding for example how they source their milk, what services they supply and which market channels they use. Therefore, in this section is attempted to define what a DBH is.

In the introduction the broad definition of Jaleta et al. (2013 p. 252) was used to describe DBHs as "either as a single business entity supplying inputs and providing services, or the existence of several business entities supplying inputs and/or providing services in a specific geographic area serving beneficiaries' needs. These different entities could be private, cooperative, or public owned. They may or may not coordinate with each other in running their business." In order to get a more

narrowed down understanding of what a Dairy Business Hub is, the dairy experts were requested to share their definitions. From their answers can be concluded that currently there is no consensus to what a Dairy Business Hub precisely is.

Several experts state that DBHs are centered around the business of bulking and/or chilling milk [1, 2, 7]. All interviewees emphasized the importance of service delivery for DBHs, these services can be related to milk production but once the hub grows the service range can be extended into other areas. Sometimes the relation between the hubs and the services can be observed in a physical place, such as a cooling plant, however this is not mandatory. When the hub is not established in a physical place it is based on relationships between stakeholders [4]. The aim of the DBH is to create economies of scale [3, 4] and to serve farmers in their diverse needs [2].

Some interviewees state that the number of services delivered determines whether the business can be called a hub [1, 2, 6], "if one service beyond transport and bulking is supplied it can be named a Dairy Business Hub." [1] Moreover, conditions such as having a sustainable service range and looking for expansion [2] and accessibility of services [6] are named as requirements to be named a hub. Services are can be offered in order to create new revenue streams [2] and to increase farmer loyalty [6]. The main objective differs per service [7].

Kenya offers several alternatives to register organizations; hubs can be registered either under the Company Act or under the Cooperative Act. All EADD Hubs were registered under the Company Act [3], although respondents state it is not a requirement to be classified as a hub [2, 4, 5]. According to an ILRI employee the legal framework is one of the two most important differences between a DBH and a (regular) cooperative, a hub doesn't have to be registered under the Cooperative Act. EADD chose to register hubs as companies, because the Cooperative Act is considered to be restrictive, for example in terms of members. The other major difference is that cooperatives usually provide in-house services, while DBHs are (also) coordinating outsourced services for example by establishing connections with for example AI providers [4]. Some respondents believe that Dairy Business Hub is simply a name to describe the model [7]. One respondent claimed that DBHs are not different from the cooperative model and that the term 'Dairy Business Hub' was invented in order to restore farmers' confidence in the concept, which was lost after the collapse of state-owned KCC [3]. The hub approach is not a concept that is confined to the EADD project or to Kenya. Organizations that are not attached to the EADD project, such as SNV are also supporting hubs and for example in India hubs are known as clusters [4].

It can be concluded that there is no consensus to what exactly a Dairy Business Hub is or should be. Dairy Business Hubs perform similar functions as cooperatives do and the most important differences are registration and the extent and type of service provision. Hubs that were part of the EADD project are registration under the Company Act opposed to the Cooperative Act in order to avoid government restrictions. Moreover DBHs generally coordinate a larger number of services and are also looking to outsource services.

DEFINING THE CASE STUDIES

Since there is no concise definition of Dairy Business Hub it is interesting to see how the selected case fit the concept of Dairy Business Hubs. The term Dairy Business Hub in the Kenyan context is closely connected to the EADD project. Therefore regarding the 'EADD Hubs' Tanykina and Metkei it is relatively straightforward that hubs are the organizations respectively named 'Tanykina Dairies Ltd.' and 'Metkei Multipurpose Company Ltd.'. However, regarding Metkei could be debated

whether the cooperatives that are part of the conglomerate but run as separate entities are part of the hub.

For hubs unrelated to the EADD project (the 'other hubs') it is less obvious what should be regarded as part of the hub and what not. MUKI FCS is an organization that performs similar functions as Tanykina and Metkei, however MUKI FCS closely collaborates with MUKI SACCO and MUKI Investment, together with some private investors these organizations established the private processing company Kinangop Dairy. Kinangop Dairy is established with the aim of processing and marketing the milk that is supplied through MUKI FCS. Depending on how broadly dairy business hub is defined a number of these organizations will belong to the hub and others will not. Moreover MUKI FCS has established an agrovet shop and collaborates with existing shops (outlets) on other locations. Again the question is whether these elements are part of the hub? Meru Central Dairy Co-operative Union has nineteen affiliated dairy cooperatives (6 are dormant), which are represented in the union through delegates. These cooperatives function as separate organizations, receiving support from the union supports in several areas. The union also sources milk from unaffiliated cooperatives, self-help groups and individual dairy farmers.

5.1.3 DAIRY BUSINESS HUB FORMATION

After creating an idea of what a Dairy Business Hub is, it is interesting to explore the origin of Dairy Business Hubs. How are Dairy Business Hubs initiated? It is important to note that this section focuses on the establishment of actual hubs and not on the concept of the DBHs. In this section responses of experts will be combined with data from the cases in order to gain insight in the origin of Dairy Business Hubs. In this research two EADD supported cases and two SNV supported cases (other hubs) were selected, as the approach of both organizations is different the establishment of those hubs will be discussed in separate sections.

FORMATION OF EADD HUBS

Experts involved in the EADD project were asked to share their opinion on the formation of EADD hubs, primarily with the aim of finding out whether EADD used a standardized process for hub establishment. The majority of EADD respondents agreed that the hubs were established according to a standardized process. An ex-employee of Heifer International gave the most elaborate description of this process and this description was in line with comments of other respondents.

The first stage after receiving an application for support from a certain community was conducting a feasibility study. Based on that study the application had to be approved by a certain committee inside the EADD project. Out of 30 sites that were assessed by EADD, ultimately 15 were targeted [4]. Subsequently the applying community was visited, other relevant parties, for example the local government, were involved in order to make them aware of the project. In that meeting EADD staff members explained the DBH-concept and government support was formalized in (individual) performance contracts. In subsequent meetings the next level of local leaders (e.g. opinion leader, church leaders and teachers) were assembled by the community and the local government. In this stage the community and the local government are expected to start owning the project. They explained the concept to the locality, supported by EADD staff who explained the business mathematics. At that point the new DBH was registered as a company and an interim committee was appointed to lead the new company. Registering the DBH as a company served two purposed, it increased the trust from farmers whom were disappointed by previous cooperatives and it reduced government interference. Dairy producers were grouped in cooperatives (if those were not

established already) and subsequently into a company. The requesting community was challenged to raise ten percent of the total project costs through registration fees. The registration fees were low, meaning that many farmers had to participate in order to reach the ten percent requirement. Moreover, the community was challenged to start bulking milk in order to verify the viability of the DBH and also to create some starting capital. After a three month period was determined whether the hub had graduated, meaning that the ten percent had been met and bulking was initiated successfully. After graduation, the site for the plant was selected, the cooler was established and the hub committee received training. The project was funded by a 30% interest free loan provided by the EADD project and a 60% full commercial loan that was used to purchase the cooler. In reality, the cooler was already bought by EADD and then repaid using the commercial loan. When the plant and cooler were established, the hub committee was expected to start identifying what (services) could attract farmers to the business. Therefore, relations with service providers such as AI specialists and agrovets were established. This process of identifying opportunities to grow should become continuous, creating a growing hub. [1]

One expert added that the first step was pre-hub establishment, subsequently different hub types would be assessed and finally a five year strategic plan was composed. An example of a (different) hub type is the pre-bulking hub, were farmers are only connected by collective services not by collective marketing. EADD did not establish the pre-bulking hub in Kenya, as it was more appropriate to the context in Uganda. Furthermore the expert explained that in reality farmer mobilization was often started before site selection, raising expectations among the communities. Also it was not always clear for local authorities what the project would and would not cover [4]. Another expert added that the registration fees varied according to the total project costs and the number of farmers [5]. Besides the period used to obtain the ten percent equity was an important difference, as in some cases farmers already started collecting before the program came in. Additionally, the quality of hub management and its board determined how fast the hub was able to raise the ten percent equity [7]. Although most experts agree that there is a more or less similar process of hub formation within the EADD project, some experts believe that hubs did not follow a particular path [7].

There is an important difference in the formation of the selected EADD cases as Tanykina was a pre-existing hub and Metkei is one of the sites that were ‘established from scratch’. Tanykina Plant Ltd. was registered in 2003 and started its operations in 2005, before the EADD project started in 2008 Tanykina received support from the consortium leader Heifer International.

FORMATION OF OTHER HUBS

SNV takes a different approach compared to EADD; instead of establishing Dairy Business Hubs they support a selection of (promising) existing dairy communities, focusing their support on extension service. Two of these sites were selected for further investigation: Meru Union and MUKI FCS.

A consultant working for SNV shared her opinion regarding the establishment of DBHs. She believes that an important aspect is that the concept of cooperatives in Kenya has not changed since the 1950s; most cooperatives were registered in 1963 or 1964. Since that time the Cooperative Act remained essentially the same and this act prescribes how a cooperative is supposed to work. The consult reasons that this act causes the similar patterns of development that can be observed in cooperatives. The expert believes that even Dairy Business Hubs are managed in a similar fashion as farmers are used to do and what they know. Comparing the selected hubs the expert describes

the differences regarding organization between MUKI FCS and Meru Union. MUKI FCS is a cooperative that sells milk to a separate yet related private processor named Kinangop Dairy Ltd, which primary aim is to generate profits. Meru Union was founded by 19 affiliate cooperatives together establishing a processor union, an organization which primary aim is to serve its members. Nonetheless, the consultant states that both organizations are managed in the same fashion. According to her the differences are a result of the structure that was chosen during the establishment the organization, but she does not believe the differences significantly affect the hubs' operations [6].

An interesting aspect is that both MUKI FCS and Meru Union have their roots in organizations with a core business other than dairy. MUKI FCS originates from a SACCO that was established in 1990. In 1998 this SACCO started a branch intended for bulking milk, which became the foundation for MUKI FCS that was founded 2001. This process was facilitated without external help from development partners, but was championed by a rich local entrepreneur [Muk1]. Meru Central Dairy Co-operative Union was registered under the Cooperative Act in May 2005; previously it was one of the activities of the former giant union named Meru Central Farmers Co-operative Union. From 2000 onwards the giant union experienced a lot of challenges and in 2003 the Ministry of Co-operative Development and Marketing intervened. A commission recommended restructuring the giant union into four independent business entities: coffee, dairy, multipurpose and SACCO [Mer1].

5.1.4 SIMILARITIES AND DIFFERENCES BETWEEN DAIRY BUSINESS HUBS

In the first section of this chapter the selected cases were briefly compared. After discussing the definition and the origin of Dairy Business Hubs it is interesting to gain a more detailed understanding of the similarities and (more importantly) the differences between DBHs in Kenya.

SIMILARITIES BETWEEN HUBS

From the overview of the case studies, the definition of DBH and the origins of Dairy Business Hubs can be deducted that all organizations that could be labeled 'Dairy Business Hubs' share several common elements. Primarily, they share the main purpose of coordinating marketing and providing other services (e.g. transport and input supply) for smallholders or in other words 'hubs are centered around the business of bulking (or chilling) milk'.

As Dairy Business Hubs take similar positions in the value chain they perform or coordinate similar functions. These functions can be dairy related functions such as transport, checking quality, bulking, marketing, providing inputs and other services related to dairy business. However, Tanykina, Metkei and MUKI all provide additional services that are not directly related to dairy production such as financial services or insurances.

An additional similarity between the selected hubs is that they are all owned by farmers or FOs, therefore these hubs are predominantly concerned with farmers' interests. This is not self-evident, as hubs could also be private owned or owned by a processing company and thus (primarily) serving different causes. Besides all the selected organizations receive external support in some form (possibly because they serve the farmer's interest).

DIFFERENCES BETWEEN HUBS

An important question is whether differences are fundamental or result from variation in hub maturity. A former Heifer International staff member characterized maturity of hubs as the number of services a hub provides to its members [1], although other definitions are imaginable.

Dairy experts expressed different opinions regarding the question whether differences are fundamental or can be explained by maturity. Some experts believe that Dairy Business Hubs are similar, because they derive from the same concept [5] or because they reflect practices that Farmer Organizations (FOs) are familiar with from a historic perspective [6]. Therefore a consultant at SNV stated that differences mainly occur in levels of service provision, opposed to differences in the model itself [6] an opinion that is shared by two dairy experts currently working for Heifer International who think 'unique services' account for the most important differences between DBHs [5]. Likewise, some believe that Dairy Business Hubs differ from one another, however that these differences can mainly be explained by differences in growth stage or maturity [3].

On the contrary one expert stated that hubs are fundamentally different, providing examples of the hub model applied in different countries. In other countries hubs have developed differently compared to DBHs in Kenya, for example the pre-bulking hubs in Uganda [4]. A former ICRAF employee stated that hubs are unique in their own ways and that many factors affect the way DBHs function and grows. This expert believes hubs are different in both their functions and their growth rates [7]. A TNS manager pointed out that hubs can rise from organizations that eventually served purposes other than dairy, as exemplified in the previous section by Meru Union and MUKI FCS. And potentially hubs can evolve into businesses that do not have dairy as their core business anymore [2]. The quality assurance manager at Metkei believes that hubs have chosen different strategies for the future. As an example he stated that Kabiyet – another EADD hub – is planning to invest in feed processing while Metkei is planning to invest in dairy processing [Met3].

From the previous statements can be concluded that there is no consensus in the discussion whether DBHs are fundamentally similar or different. Moreover it remains uncertain to what extend differences should be attributed to hub maturity. From the data that was presented in previous sections can be concluded that hubs at least vary in the following regards:

- Origin
- Registered as company or cooperative
- Size of supply base
- Services that hubs offer
- Marketing channel

DIFFERENCES IN SERVICE PROVISION

As becomes apparent in the previous sections an important function of the DBHs is service provision. As mentioned in the former paragraphs several dairy experts believe that service provision is one of the most important factors that distinguish Dairy Business Hubs from each other and from (regular) cooperatives. Service provision is one of the differences between the hubs that is most noticeable, therefore the researcher decided to zoom in on this topic.

Services can be offered in several formats. Some services are organized by the DBHs themselves meaning that the hub owns the service and therefore is in responsible for to revenues or losses deriving from the service, this format is labeled 'in-house'. In other cases the hub merely acts as an intermediary between service providers and farmers, this format is labeled 'outsourcing'. Next to several formats there are also several motives for DBHs to offer services. Business related motives can be profits, increasing farmer loyalty or attracting new farmers to the business and increasing milk production or quality. Moreover, some DBH managers indicated that their hubs also have social motives and therefore they offer services to serve the community [Met1, Muk1].

There is a wide range of services that are offered by DBHs, common services are related to dairy business (e.g. inputs, breeding and extension), but several hubs "have been creative" [5]. Based on interviews and documents the following (incomplete) list of services was composed:

- Dairy transport, chilling/bulking and marketing
- Agrovets (inputs)
- Financial services (SACCO, FSA, village bank)
- Breeding (AI, bull service)
- Animal health (veterinary)
- Extension
- Dairy transport
- Insurance schemes
- Cow insurance
- Funeral insurance
- Paying school fees (by check-off)
- Petrol stations
- Supermarket (in Rwanda)
- Hotels[2]

The case studies also illustrate that DBHs offer a variable range of services to their farmers. Meru is the most divergent hub regarding service provision as most of their services are given at cooperative level. All selected hubs offer services directly related to dairy production such as transport, chilling, marketing and support services such as extension and AI services. At Meru Union and MUKI FCS, SNV supports the (establishment of sustainable) extension services. Metkei and Tanykina previously received aid from EADD aimed at extension, but since the project has phased out the support was cut. Both hubs had to restrain the extension service as the hubs were not able to appoint the same amount of extension officers without financial support. MUKI FCS, Tanykina and lately Metkei also offer financial services. Those three hubs furthermore offer veterinary services to their farmers and have established an agrovet shop to provide inputs for their members. Tanykina has established their own healthcare scheme, Tanykina Community Healthcare Scheme, while MUKI FCS offers farmers the possibility to pay for the National Health Insurance Fund (NHIF) by check-off. Finally, Tanykina gives members the possibility to insure their cows. [Met1, Muk1, Mer1, Tan1]

[2] Hotel in Kenya commonly refers to a place where you can eat, not offering overnight accommodation.

5.1.5 EXPLAINING THE DIFFERENCES BETWEEN DAIRY BUSINESS HUBS

Dairy experts were given the opportunity to reflect on possible causes that can explain the differences between the Dairy Business Hubs. In this regard no attention was given to the question whether these differences could be caused by maturity or not.

The dairy experts agree that leadership (internal) and context (external) are the most important factors to explain the differences between the Dairy Business Hubs. Another cause for differences between EADD hubs is that some hubs are built from scratch, while others are based on pre-existing hubs. [4].

Specifically regarding differences in service provision a TNS manager stated that service provision should always reflect needs that are experienced in the specific area [2]. Subsequently, one of the factors that should determine what is services are offered by the DBH is what services are already available in the area where the hub operates [5]. The liquidity of the hub is also an important factor the range of services that a hub can provide [7], because establishing for example AI service requires less initial investment compared to an agrovet shop.

CONTEXTUAL FACTORS THAT INFLUENCE HUB DEVELOPMENT

Dairy experts were given the opportunity to express their thoughts on which contextual have an important influence on DBH development. Below a list the contextual factors that were mentioned is presented. The order of the list is based on the number of experts that referred to each factor:

- Competition in dairy market, from processors or other buyers [1,2 4,5,7]
- Local politics [4,6,7]
- Differences in the 'target' community (attitude, culture, demographic) [1, 3,6]
- Different farming systems, based on local resources [4,5,6]
- Local infrastructure [5,7]
- Quality of heifers in certain areas is higher due to historic causes [4]
- Presence of FOs [4]
- Presence of local private service sector [4]
- Gender constraints [5]
- The presence of a 'champion' [6]
- Local weather conditions [7]

Factors that are attributed to the context can be subdivided in causes belonging to the target community (e.g. politics, culture, organization), markets (output, input) and some natural (weather) and unnatural (infrastructure) factors that can be attributed to the locality. Those categories can also influence each other. For example, Lelan is a very remote area, the (EADD) hub in this area is performing relatively well; nonetheless it is very difficult to create a service sector in this area. Because there are no roads, hospitals or quality schools, people from outside the area are not prepared to stay there for a longer period. In order to maintain a quality service sector, service providers originating from the area have to be trained [4]. In this example the fact that Lelan area has poor infrastructure also affects the quality of the local service sector.

Moreover the factors can either have a positive or a negative influence on hub development and sometimes the outcome is unexpected. This was the case with 'presence of FOs'. Initially, this was regarded as an advantage within the EADD project, because it was assumed that in these areas it

would require less effort to mobilize farmers. However, project staff soon experienced that this assumption only holds when the farmer organizations were open-minded and tolerant towards potential new members. Some farmer organizations are elitist and at that point it is better to establish new farmer organizations.

AI SERVICE PROVISION

Although AI is widely recognized as the best practice for breeding, in many parts of Kenya it is a controversial technology based on cultural believes. Therefore AI technology is an interesting subject to see if and how culture and context can influence the development of DBHs and specifically service provision. Two respondents provided an example of how context and culture can influence the uptake AI technology, presented in Box 5.

Two examples of culture and context influencing the success of Artificial Insemination
The first example wass given by the managing director of ABS. He compared the uptake of AI technology in four EADD hubs: Lelan, Siongiroi, Kieni and Kabiyet. Lelan is a DBH that is located far away from markets. Due to the distance from the markets there are not many service providers working in this area, moreover farmers are less motivated to improve their breeds because they do not have access to good markets. In Siongiroi, cultural believes impede the uptake of AI technology. In this area a man's power is represented by the fertility of his bull and AI is considered unnatural, furthermore it is a taboo for women to touch cows from behind. Although around Kabiyet similar believes are dominant the uptake of AI in Kabiyet is relatively quick, a result from its proximity to markets. The area were Kieni Dairy Ltd. was established in 2009 has been exposed to artificial insemination for a long time, additionally farmers in that area are motivated to improve their production and breeds, therefore the uptake of AI was very high here [3].

The extension department manager of MUKI FCS explained from an historical perspective how the cultural beliefs around AI changed in the 'Kinangop area', the area were MUKI FCS is active. According to him in the 1940s Kenya was the 2nd or 3rd country world-wide to adapt artificial insemination under the supervision of settlers. Kinangop was one of the areas designated to pilot the technology. A large share of the farmers currently living in the area used to work for white settlers. Therefore, most of them have gained working experience with AI. Later, after the settlers left, the government started a program in order to intensify the use of AI service. After experiencing the benefits of AI in combination with the government intervention, most farmers in the area even use imported semen these days [Muk2].

BOX 5 THE SUCCES OF ARTIFICIAL EXAMINATION EXPLAINED BY CULTURE AND CONTEXT

Next to revealing how context and culture can influence AI uptake, the examples illustrate that cultural beliefs are dynamic and that new experiences can change them over time.

5.1.6 SCALING DAIRY BUSINESS HUBS

The topic of thesis is scaling inclusive innovation, focusing on Dairy Business Hubs. To gain a better understanding of what scaling DBHs entails dairy experts were asked to reflect on what they understood as 'scaling DBHs' and to identify factors that can influence the potential for scaling the DBH model.

There was no consensus among the experts regarding to question what 'scaling DBHs' entails. Some experts responded that scaling the hub was about applying the model in a new context [3,5,7]. One expert even stated that the hub model was not necessarily connected with dairy. According to him the hub is built around a certain product that forms the center for related businesses. He believes the concept is based on common interest and nobody owns the hub as a model [1]. Other respondents focused more on how the DBH approach should be scaled, for example by mainstreaming the approach through collaboration with different partners. The process of

establishing new DBHs could be taken over by the government or by private players, such as processors [4].

Respondents also provided different examples on the subject of scaling up the DBHs, most of them regard up scaling as the process of involving more farmers and businesses/services to a certain DBH [1,3,7], other respondents view sustainability [1,6] or learning [6] as the most important processes in scaling up the DBHs. There is consensus that it can be viable to scale in different directions, primarily regarding the services that they deliver. One expert pointed out that DBHs cannot serve the needs of every individual farmer; therefore hubs need to focus on the farmers that they are able to reach [4].

The following factors that could influence the potential for scaling DBHs were mentioned by the dairy experts. Government policies could influence the development of the hubs, for example hubs could benefit or suffer from subsidy programs [4,5]. Recently, a new VAT Bill was accepted in Kenya, because this bill increases the tax on processed dairy products it creates extra difficulties for the formal dairy sector in Kenya to compete with the informal sector. In general, the DBHs (and the entire formal dairy sector) would benefit from a more quality sensitive dairy market in Kenya, because currently the informal sector is considered to be a threat to the DBHs [1]. Other factors contributing to the scalability of the Hub model are benchmarking (learning from best practices), access to finance and presence of youth and milk production in the selected area [3].

According to an agricultural economist working for ILRI the location of the hub is also important for its scalability, it has to be located in an area where it makes sense. According to her the hubs will struggle to grow gradually (without external support) in areas that are either too remote or too competitive [4]. The suggestion that the location of the hub model is influencing its success is underlined by two respondents working for Heifer International, who stated that the model has been more successful in Kenya compared to other countries where the EADD program was active (Uganda and Rwanda). According to them factors that influence the potential for scaling are the level of development of the national dairy industry and dairy policies, if the dairy sector is not well organized scaling the DBH approach becomes more difficult. Another factor is diminishing land sizes, due to population growth [5].

One respondent reflected on how DBHs in Kenya were established hitherto, emphasizing the important role of donors. This might be a serious constraint for future scaling of the DBH approach, according to a consultant at SNV: “We can’t expect others to be able to do it without this support” [6]. An additional limitation of the donor driven approach is that the lessons remain with the project managers instead of the farmers, therefore each new project starts from scratch [6]. Moreover, the high initial costs, estimated around 14 million KSh, are a constraining the potential of this approach without the support of donors.

5.1.7 SUMMARY AND ANALYSIS

Here the results described in the previous sections will be summarized and analyzed in order to find key points for discussion.

Although each hub formation process is different EADD hubs were established according to a standardized process. Factors that caused differences in these formation processes were whether there was a pre-established chilling plants and whether the farmers were already organized (in cooperatives) or not. Dairy Business Hubs that are not connected to the EADD program can be

established as a result of the efforts various actors such as farmer organizations, government departments or private investors. MUKI FCS and Meru Union are both examples of Dairy Business Hubs that originated in different organizations. MUKI FCS was established as a branch of MUKI SACCO and Meru Central Dairy Co-operative Union is one element of the disintegrated giant Meru Central Farmers Co-operative Union. An SNV employee believes that the fact that these organizations with different backgrounds still operate in similar fashion can be explained by the fact that the Cooperative Act has not changed significantly since it was established over 50 years ago.

When comparing DBHs several similarities and differences can be observed. Dairy Business Hubs are all centered around the business of bulking milk. Moreover, all selected cases are examples of farmer-owned hubs and therefore primarily represent the farmers' interests. Because all DBHs perform a similar role in the dairy value chain, all hubs perform (or coordinate) dairy related functions such as transport, chilling and marketing. Additionally hubs can perform more services that may or may not be related to dairy business. These services are among the most flagrant differences between the dairy business hubs, together with origin, size (of membership base), legal framework, collection chain and outlet. Some experts believe that unique services account for the most important differences between the DBHs. Moreover, together with the legal framework, services and the way they are designed (in-house or outsourcing) account for the most important differences between DBHs and ordinary cooperatives, while others state that there is no actual difference between those entities.

There is no consensus regarding the question whether Kenyan Dairy Business Hubs are fundamentally different and to what extend differences can be attributed to maturity. Some experts believe all DBHs are similar organizations because they are based on the same concept and that the most important differences can be explained by differences in growth stage. While others state that hubs fundamentally differ in terms of both function and maturity, pointing to adaptions of the hub model in other countries. Experts did agree on the fact that leadership and context are the most important factors to explain differences between DBHs. Contextual factors that influence hub development can be attributed to the target community, markets, infrastructure or nature.

It is not exactly clear what scaling DBHs entails, however 'including more farmers/business', 'sustainability' and 'learning' are important concepts in this regard. Kenyan dairy experts mentioned the following important factors that could potentially affect the scalability of the concept: government policies, access to finance/support and context. The dairy business hubs have to be located in a place where the approach makes sense and moreover it will be difficult to realize without external (financial) support.

5.2 INCLUSION OF SMALLHOLDERS

In this section results that relate to the second sub question will be presented. The second sub question relates to the enduring challenge 'appropriate to, yet transforming situations' and was formulated: *In what ways have smallholders been able to influence the development of contextualized DBHs?* The focus is on inclusion of farmers in the innovation process. Innovation process in this context refers to the establishment and development of cases of Dairy Business Hubs, contrary to the development of the Dairy Business Hub as a model or approach. Although it might have been interesting to investigate the inclusion of farmers in the development of the DBH as a model or approach, it should be noted that to a large extent the hub is based on the same principles as

cooperatives. Therefore the researcher decided to emphasize the role of farmers in the establishment and development of hubs on location. Topics that are discussed in this section are taking initiative, the role of dairy producers and decision making in DBHs.

5.2.1 INITIATIVE FOR DAIRY BUSINESS HUBS

As presented in Section 2.3.1 an important question regarding the participation of dairy producers in hub development is who has taken the initiative. Here again it is useful the make a distinction between EADD hubs and other hubs.

INITIATIVE FOR EADD HUBS

Several professionals that were involved in the EADD project stated that the initiative to establish the EADD hubs was taken by farmers [1,3,4,5,7]. This involved that a (usually organized) group of farmers would request EADD for support by sending an application letter. One respondent explained that hubs established by Heifer and other organizations (e.g. TNS) prior to the EADD project had already displayed the value of the approach to farming communities. Consequently the requests for support were already submitted to Heifer before the EADD project had even started [1]. Subsequently the consortium selected sites that would receive support to establish a hub based on feasibility studies [1,2,4,5,7]. Although this procedure is mentioned by all EADD respondents, it remains uncertain how well and fair this procedure was carried out. Sources whom requested to remain anonymous stated that site selection was primarily based on politics and relations that consortium partners had with dairy communities originating from projects carried out prior to EADD.

INITIATIVE FOR OTHER HUBS

MUKI FCS, currently collaborating with SNV, has received support from EADD in the past. Although the manager of MUKI FCS pointed out that they were interested in continuing the collaboration with EADD, the support ended in 2011 [Muk1]. The reason for the completed relationship was probably that MUKI FCS required different support compared to the support that the EADD project was proposing [7]. MUKI FCS was already more developed compared to other EADD hubs. The support that SNV is currently providing for the cooperative is mainly focused towards building a sustainable extension model. SNV identified several dairy societies they believed had a good potential to develop and subsequently arranged meetings to discuss whether collaboration was possible [6]. Thus in those cases, such as MUKI FCS and Meru Union, SNV took the initiative for collaboration. However SNV engaged with dairy societies that were already functioning as hubs before the collaboration started. As presented in Section 5.1.3 originally MUKI FCS originates from the efforts of a local entrepreneur. Meru Union started after the Ministry of Co-operative Development and Marketing intervened and advised to separate a former giant union into four separate entities, including the dairy union.

5.2.2 RELATIONSHIP BETWEEN FARMERS AND DAIRY BUSINESS HUBS

From the supply chains, presented in Section 5.1.4, becomes apparent that farmers can connect to hubs in several ways. Some ways are relatively direct, for example when a farmer delivers his directly to the hub or when only a transporter is interfering. Other ways are less direct, for example when a cooperative is acting as an agent between the hub and the farmers. Similarly farmers can ‘own’ the hub by buying shares directly of the hub or ‘own’ the hub through membership of a

cooperatives. In some cases farmers hold shares of both the cooperatives and hubs, while other suppliers do not own shares at all. The way farmers are connected to the hub also affects the level of participation and the sense of ownership that farmers experience regarding the hub.

MERU UNION

Meru Union is sourcing from approximately 10,000 active suppliers is the biggest DBH among the case studies. The union is owned by nineteen affiliated cooperatives, which are represented in the union by delegates. The affiliated cooperatives are the owners of Meru Union and farmers are the owners of the affiliated cooperatives. Next to affiliated cooperatives, Meru Union also sources from unaffiliated cooperatives, self-help groups and individuals. Those parties are only connected to the union as suppliers. Moreover members of the affiliated cooperatives also indicated that their only connection with the union is the supply of milk [Mer4, Mer6], they regard Meru Union as their marketing channel. A manager of one the affiliated cooperatives, Githongo FCS, indicated that their cooperative mainly operates as a transporter and agent between the farmers and the union. Also the union supports the affiliated cooperatives with financial aid, administration, semen for the AI service and sometimes animal feed [Mer2].

MUKI FCS

MUKI FCS sources their milk from approximately 5,050 active members out of a total of 11,500 members. In order to become a member, farmers have to fill out a form, be at least 18 years of age, pay a fee of 700 KSh and start supplying milk to the cooperative. Households can opt for either joint or individual membership. Because they are members and shareholders farmers of MUKI FCS are invited to join the AGMs and entitled to elect the board members. Several members indicated that they appreciate the circumstance that MUKI FCS has offices nearby, because it indicates that the cooperative will be trustworthy [Muk6, Muk8]. Nevertheless, the gap between total membership and suppliers indicates that many farmers decide to sell their milk to another buyer even though they are members of MUKI FCS. Usually these farmers respond to higher prices that are offered by competitors [Muk9].

TANYKINA

The estimated number of members at Tanykina varies. The manager indicated that Tanykina has around 3,500 active members out of a total of 6,800, but other sources (e.g. Tanykina leaflet) state that Tanykina is owned by over 11,000 small scale farmers. Regardless of the exact number, farmers own Tanykina through two farmer companies, Tanykina Holding Ltd (public) and Tamboche Surungai Farmers Ltd (private). As shareholders members of Tanykina are entitled to elect their board representatives [Tan1].

METKEI

According to their CEO Metkei currently has 6,881 registered members, 2524 shareholders and 3200 active suppliers [Met1]. Farmers can deliver to Metkei directly, through arranged transport or cooperatives and even trough middlemen. Cooperatives are registered at Metkei as one supplier and the payment therefore is done to the cooperative. In their turn the cooperative pays the farmers. Farmers who deliver their milk through cooperatives can also be shareholders of Metkei, in that case they own shares of both their cooperative and Metkei [Met5, Met9]. Sometimes farmers feel overstretched financially because they support the operations of both their cooperative and the

hub [Met8]. The manager of Tumeigo FCS indicated that his cooperative and Metkei are two separate entities, although the main function of his cooperative is to bulk milk from their members and transport it to Metkei [Met5]. Although others indicated that the cooperatives already have representatives in the board of Metkei Multipurpose Company Ltd, the manager of Metkei FCS (note: different from the hub Metkei) believes that the decision making process between the hub and the cooperatives should be harmonized. He believes both organizations should focus on their part of the chain, the role of the cooperative being transport, because the two are owned by and serving the same farmers [Met6].

5.2.3 INFLUENCE OF DAIRY PRODUCERS

One of the dimensions of inclusiveness is 'inclusivity of innovation processes', therefore it would be interesting to find out whether and in what ways dairy producers can influence the development of the Dairy Business Hubs in their area.

An interviewee employed at ILRI commented that in theory the producer organizations, through the board, should be in charge of decision making. The expert admits that in reality often the NGOs start to take over processes of decision making. Heifer International placed advisors in the board of each DBH in order to support the decision making process. Critiques claim that EADD was excessively involved in the DBHs. The respondent believes that Heifer used this representative in order to protect their investment, emphasizing that it is important to balance the power of the farmers and that of the NGOs. The respondent explained that DBHs are designed as a means to support smallholders to develop, not as end in itself. Therefore, it is of vital importance that capacity is built among farmers, they should actively participate in the process of developing the DBH. In the EADD project however, many hubs struggled with issues of loyalty, especially because farmers are very responsive to price incentives [4]. These comments are in line with other responses stating that initially EADD took control in order to establish and stabilize the business. At a certain stage the power was returned to the communities [7].

A SNV consultant indicates that SNV usually interacts with the manager and the boards of the cooperatives they support. It depends on the subject who has the final say regarding the decision [6].

OPTIONS TO INFLUENCE THE HUB

In this section will be discussed which possibilities dairy producers have to exert influence on the hub in their area.

ANNUAL GENERAL MEETINGS

The majority of experts indicated that members can influence the development of their DBHs by electing their leaders during Annual General Meetings (AGMs). The elected leaders represent farmers in the board, usually the board members are distributed over different zones or collection routes. Farmers at different Dairy Business Hubs indicated that they can air their opinion during the AGM, moreover when there is no consensus on a certain topic during the AGM the decision will be taken by voting. Shareholders hold these rights by virtue of their ownership.

At most hubs general meetings take place more often than once a year. For example at MUKI the general meeting takes place twice a year [Muk1]. At Metkei members are sometimes gathered when

a pressing issue arises, in that case notes will be distributed three weeks in advance [Met9]. In Meru members of the affiliated cooperatives do not join the AGM, they are represented by delegates from their cooperatives.

COMMITMENT AND OWNERSHIP

An additional possibility for farmers to influence the DBH development is by showing commitment and ownership. One expert provided an example taking place at the EADD hub in Sot, established by a group of disabled women. Those women used to receive support from Heifer International and decided to invest a grant as the ten percent equity needed to start a DBH in the EADD project. Although the feasibility study for that site did not come out very promising, the group managed to establish a relatively successful DBH. This was accomplished by having good management and the sense of ownership that the group felt. In periods of milk shortage hawkers usually pay higher prices for milk compared to the hubs. In that case Sot members would sell their milk to hawkers, however they would return the money to the DBH, keeping the difference. In this way the business could keep running, even though the milk was not supplied to the hub. This example is unique and shows how commitment can increase the chances for a DBH to be successful [1].

Some DBH members do not truly value their membership and ownership of the hubs, many hubs experience difficulties with farmer loyalty [4]. Several members indicated that their decision to supply milk to a competing buyer is based almost entirely on price [Met10,Muk9]. Nevertheless farmer appreciate the presence of the hub in the area, which gives them certainty that issues can be resolved [Muk6,Muk7,Muk8]. The lack of farmer loyalty underlines the importance of creating incentives for the farmers to participate.

OWNERSHIP OF SERVICES

In some cases the ownership structure of services also allow farmer to participate in decision making. Farmers can sometimes decide whether they want to support the hub in starting a new service by purchasing shares for that (specific) services [Met9,Muk6] or by allowing their hub to take a loan [Met11]. A Heifer employee provided an example of the Siongiroi hub, which was planning to start a FSA-facility. A meeting was called in order to probe the interest of the members. Once the members agreed that it was a good initiative, the farmers contributed from their savings. Each farmer contributed the same amount, however the installments were adjusted according to incomes differences [5]. A similar example is provided by Metkei where farmers currently are mobilized to buy shares the new FSA facility [Met5, Met6]. It should be noted that the plan the plan to build this facility was included in the strategic plan that was created by Metkei, therefore it is questionable what influence the farmers had regarding the decision to establish the FSA.

Regarding some farming technologies (e.g. artificial insemination) cultural beliefs or other (e.g. financial) factors restrain Kenyan farmers to adapt best practices. Or as bluntly stated by EADD (2009, p. 18): “When compared to best practices, most of Kenyan smallholders practice the opposite”. Several respondents indicated that where AI technology was not accepted, the technology was promoted through the extension system of the EADD hubs [3,5]. As mentioned in Section 5.1.5 a TNS manager commented that service provision should always reflect needs that experienced by the targeted community [2]. As the services should be running as businesses (at least break-even) farmers should be interested in using and paying for the services that are provided by the DBHs. Therefore indirectly farmers influence the services range that a DBH can offer by using or neglecting the services that are provided. An ILRI employee commented that for

some EADD staff it was difficult to see the development of the DBHs as a process, instead of a one-size-fits-all approach. According to this respondent within the project each new service should have been built as a (individual) business case, but the respondent cannot confirm whether the feasibility studies all took place. The interviewee suggests that in some cases DBH staff might have decided that 'they knew what was best for the hubs' [4]. Another complication is that it is challenging to create a business case when services do not generate profits directly, for example an extension service.

5.2.4 BOARD & MANAGEMENT

In all visited DBHs shareholders are entitled to elect their representatives. The board members represent members within a certain area, sometimes based on the collection routes of milk. Generally the management staff is responsible to implement the policies created by the board.

DBH BOARD & MANAGEMENT PER CASE

MERU UNION

Meru Union is managed by a board consisting of ten members, seven of whom are in the management committee and the remaining three from the supervisory committee. The board consists of representatives from affiliated cooperatives. The board is elected during the AGM by 27 delegates from the affiliated cooperatives. Board members have to meet some qualifications, mainly based on milk delivery. Day to day business is handled by a team of management professionals headed by the CEO of the Union, who are expected to implement the policies as establishment by the board [Mer1].

MUKI FCS

At MUKI FCS decisions are made by the board in combination with the management. The board consists of nine members and three supervisory members. Farmers can elect the board during the AGM. In order to classify as a board member one has be a member of MUKI FCS, MUKI SACCO and MUKI Investment, moreover the person has to be at least 18 years old, literate and produce at least 20 liters of milk daily. The day to day management of MUKI is carried out by a professional management team. Decisions regarding the processing factory (Kinangop Dairy) are made by their own board and management. The board of Kinangop Dairy consists of five members, two of them representing MUKI FCS, two others representing private shareholders and the final board members represent MUKI Investment [Muk1].

TANYKINA

In Tanykina most decisions are made by the board of directors. Tanykina's board of directors currently consists of 13 members. The catchment area of Tanykina is subdivided into nine zones and a zone will receive an additional board representative for every 1500L it supplies (daily). Board members elected for a period of three years. Each year elections take place in one third of the zones, meaning that one third of the board changes [Tan1]. In theory the board members can serve a maximum of two periods, nevertheless the current chairman has been in the board for two spells before becoming the chairman [Tan2]. Again, a management team executes the daily operations at Tanykina.

METKEI

Metkei Multipurpose Company Ltd. has a board consisting of 13 members; nine of them are representing cooperatives while the remaining four board members are representing unorganized suppliers in a certain area. Each board member is assigned a certain task, for example 'head of the extension department'. According to a board director at Metkei the elections to enter the board are a competitive process. To stand for election one has to at least be a milk supplier and shareholder of the hub and board members are elected for a period of three years. Metkei has established a strategic plan which prescribes important steps in the development of the hub, for example the FSA facility that was opened in October 2013. Other decisions are taken by the board of directors. According to a board member in the end the CEO, who is employed by the board, is responsible for the company's performance [Met4].

DECISIONMAKING

Generally the board of directors is in charge of decision making at the various hubs. The management staff of the hub is responsible to execute the decisions. Here two examples of decisions taken by the DBHs are briefly presented.

An example of an investment decision at Meru Union that was made recently was the replacement of old machinery. Members of the management staff analyzed the possibility of replacing the machinery that was very power consuming and caused large losses. Subsequently the management staff reported to the board that they advise to replace the machinery. The board valued this advice and decided to invest in the new machinery. After a procurement procedure, the union could finance the new machinery trough an exceptional loan at the Cooperative Bank, guaranteed by the union's financial statements [Mer1].

Decisions regarding the provision of new services are made by the board of Tanykina. During board meetings board members discuss the challenges that members face and try to identify opportunities to improve the situation. After identifying the need for a Health Care Scheme, the manager started to search online for partners that could help in establishing a scheme. After recognizing that the national insurance scheme was not an option for the members of Tanykina, the manager contacted Health Insurance Fund (HIF). Together with HIF and PharmAccess, Tanykina was able to establish the Tankykina Community Healthcare Scheme (TCHP) [Tan1].

In Section 5.2.3 was mentioned that the FSA facility that was realized by Metkei was part of a strategic plan. Unfortunately, the researcher first realized after data collection that the composition of these strategic plans (for EADD hubs) would have been an interesting subject to study regarding processes of decision making.

CHALLENGES REGARDING THE HUB BOARDS

There are several challenges related to the boards of the dairy hubs. One of these challenges is that board members usually are chosen because they are politically popular or opinion leaders, which does not necessarily makes them good board members. Sometimes this is even acknowledged by the community according to a former EADD staff member. Even though the community elects their own leaders, at the same time the community would not be interested in starting a project led by them [1].

Another challenge is that boards often consists of the 'older men of the village', in the Kenyan culture it is unlikely for women or youths to enter the board [2,4,Met4]. Boards that are balanced in terms of gender are known to perform better [4]. In Table 4 an overview of the representations of women in the selected DBHs is given.

TABLE 6 WOMEN IN DE DBH BOARDS

	Meru Union	MUKI FCS	Tanykina	Metkei
No. of board members	10	12	13	13
No. of women in board	1	1	2	0

Table 6 indicates that women are underrepresented in DBH boars even though the Kenyan law prescribes that at least one third of all elected bodies should consist of females.

A TNS manager emphasized that the importance of harmonizing the capacity (building) of the board with the development of the business (hubs). In the case of a certain DBH[3] grew so quickly within their first year that even EADD staff members were surprised by its development. However, the board was not able to cope with this rapid growth, and as formulated by the respondent "hit the ceiling and bounced back" [2].

One of the factors that determine whether it is possible to create a well-functioning board is the level of literacy in the area. Examples given by experts indicate that another opportunity to create well-functioning boards is to use people who have their roots in the area, but who can bring in expertise from outside the area. Illustrations given include young professionals that work as business manager in major cities, ex-athletes that want to help the communities they come from and (retired) board advisors that have expertise in a certain field and occasionally help the board by sharing their knowledge [2,4].

The main challenges found regarding the DBH boards thus relate to culture and board capacity (building).

5.2.5 SUMMARY AND ANALYSIS

Here the results described in the previous sections will be summarized and analyzed in order to find key points for discussion.

Prior to the study initiative was identified as an important factor regarding inclusion, because previous studies had shown that projects initiated by FOs have less trouble involving farmers. Concerning the EADD hubs we observed that farmers had to apply for support, however the selection process might be polluted by 'politics'. SNV identified hubs with potential and discussed collaboration with them, so the initiative here seems to be at SNV. However, it has to be noted that SNV engaged with hubs that were already functional (for several years). The initiative to establish the hubs was taken by a private investor (MUKI) or the government (Meru).

There are several configurations in which farmers can be linked to their hubs; these configurations can be more or less direct. In Table 7 a brief overview of supplier, representation and ownership for each case is presented.

[3] This respondent requested not to mention this hub by name.

TABLE 7 OVERVIEW OF SUPPLIERS, REPRESENTATION AND OWNERSHIP PER HUB

Hub	Suppliers	Representation	Ownership
Meru	- Affiliated cooperatives - Unaffiliated cooperatives - Self-help groups - Individual farmers	27 delegates from the affiliated cooperatives elect 10 board members in the union	Owned by the affiliated cooperatives
MUKI	- Individual farmers	Shareholders are entitled to elect a board of 12 members	Owned by individual shareholders (a large share is still in hands of a local entrepreneur)
Tanykina	- Individual farmers	Shareholders elect 13 board members divided over 9 zones	Owned by individual shareholders through one public and one private FO
Metkei	- Cooperatives - Individual farmers - Middlemen	Shareholders elect 13 board members (9 of them representing cooperatives and 4 represent unorganized farmers)	Owned by individual shareholders (and through cooperatives)

From the table we can conclude that the relation between Meru and its suppliers is more distant compared to other hubs, this might be related to the fact that Meru has the biggest supply base. Farmers in Meru are not directly electing their representatives in the hub, nor are they directly the owners of the hub.

Three ways for dairy producers to influence the development of dairy business hubs were identified:

- During Annual General Meetings shareholders can elect the persons that will represent them in the board. Moreover, farmers can share their opinion during AGMs and resolve issues were no consensus is reached by voting.
- By showing commitment and ownership farmers can support the hub, hubs are based on farmer loyalty. Therefore it is crucial to create incentives for farmers to participate in the hub.
- One of the most flagrant differences between the hubs is (the range of) service provision. Preferably, these services reflect the farmers' demand or needs. When services are managed like businesses farmers can influence the service range by using or ignoring services. Moreover in some cases farmers are requested to support the establishment of a service by becoming a shareholder.

Generally the board, representing the shareholders, is in charge of decision making at the DBHs. The management team is responsible to implement these decisions. Nonetheless, within EADD Hubs decision making was heavily influenced by the EADD consortium, especially during the initial stages of the hub development.

There are several challenges related to the boards. Primarily the capacity of the boards is a concern, DBH can grow quickly to relatively large businesses and in general smallholders have no experience leading such a business. Moreover boards are dominated by older males which are challenging the representation of other groups such as women and youths.

5.3 THE ROLE OF INTERMEDIARIES

Here results related to the third enduring challenge 'project-based solutions, yet seeking structural change' are presented. This challenge is related to the sustainability of the Dairy Business Hubs and the author has decided focus on the role of innovation intermediaries in DBH development. Their support represents the 'project-based' component of DBHs as an inclusive innovation. The research question connected to this challenge was: *How did 'innovation intermediaries' influence the development of DBHs?*

In this section the role of innovation intermediaries will be discussed. First the EADD approach will be discussed and later the SNV approach will be briefly presented, subsequently the two approaches will be compared regarding inclusivity, flexibility and sustainability.

5.3.1 EADD SUPPORT

As mentioned, the East Africa Dairy Development project implemented by a consortium of five partners: Heifer International, ILRI, TNS, ABS and ICRAF. The project was implemented in Kenya with vision that "the lives of 110,000 families will be transformed by doubling household diary income by the year 2010 through integrated interventions in diary production, market-access, technology transfer and knowledge application". The main intervention to reach that goal was the establishment of Dairy Business Hubs. EADD is the project that actively introduced the Dairy Business Hub concept in East-Africa, although the concept itself is not necessarily 'new'.

Because EADD was implemented by a consortium of five partners, below the role of the consortium partners is discussed.

ROLE OF CONSORTIUM PARTNERS

According to one expert the EADD project was unique, because it was implemented by five partners, each with different expertise and backgrounds [1]. According to the managing director of ABS the EADD project was aiming to create synergy between the different partners, even referring to the project as a pilot for working in multi-partner platforms [3]. However, both respondents indicated that lack of coordination sometimes resulted in disagreement among the project partners [1,3]. One of them described the disagreement in the field of extension. The project partners disagreed on the strategy to increase milk quantities, some just wanted to increase milk collecting while others wanted to increased productivity. Moreover, partners could not agree on the strategy to finance the extension service, as extension does not create a revenue stream directly. Heifer tried to promote extension as an integral part of the hub model by reserving a small fee for extension of every liter of milk collected by the DBH, while some of the other partners were stimulating service providers to facilitate extension. Due to these disputes, different messages reached the target communities and initially the extension service collapsed [1].

Below the role of the each project partner is briefly explained, based on the descriptions given by respondents committed to the organization.

HEIFER INTERNATIONAL

Heifer international is the consortium leader. According to two interviewed staff members of Heifer International, the main role activities of Heifer in the project were related to milk production and

farmer organizations. These issues were addressed through respectively extension and capacity building. The approach was demand driven, meaning for example that farmers could decide on what topics they wanted to receive training. In reality, this often came down to the same issues as the farmers are in similar stages of development. Training programs were also based on data that was collected during the program [5].

TECHNOSERVE

A program manager at TNS stated that the role of his organizations within the EADD project consisted of four main objectives. Their first objective was establishing the business, also known as the Dairy Farmer Business Association (DFBA). Activities related to this objective were helping the farmers to mobilize and organize themselves and registering the organization under the Company Act. Moreover, TNS facilitated the process of electing an interim board, who in turn would appoint the management staff. The DFBA also received support with obtaining capital and equipment in order to establish the business. The second objective of Technoserve was to help the hubs to expand their market opportunities. In their effort to reach this goal TNS connected the hubs with processing companies, initially only New KCC and Brookside were involved, but as the project continued other processors expressed interested in cooperation. According to the respondent the result is that DBHs currently can choose between several buyers, increasing their bargaining power. Another result is that contracts contain agreements beyond price, for example some of the processors contribute for extension. The third goal for TNS was capacity building aimed at the board of directors and management staff of the hubs. This included training, field visits, market updates for managers and a TNS business advisor sitting in all board meetings for advice. The final objective was to support the hubs in the establishment of sustainable services and pursuing growth. One of the activities connected to this goal was to help the hubs to create business plans for new services they planned to offer.

All these activities require a continuous contact between TNS and the hubs, which vary in terms of maturity and growth rate. Through this continues contact TNS is able to give support that corresponds with the needs of the different hubs in their current situation. Another approach of giving specific support is using the stage gating tool in order to assess the development of the DBH [2].

ILRI

An employee of ILRI explained that the role of ILRI in the EADD project was focused on feeding, breeding and monitoring & evaluation (M&E). Regarding feeding the support of ILRI was aimed to help hubs to set up their own, site specific, feeding plans. Although in reality only the establishment of AI service was supported within the EADD program, ILRI promoted a dual approach aiming to introduce a village bull services at sites were this was more appropriate. According to the agricultural economist, the example of feeding is illustrative for the role of ILRI within the consortium. In general, ILRI was promoting to use a more flexible approach, as they were also leading in the change from understanding the DBH as a model to understanding the hub as an approach. As demonstrated by this change in understanding the hub, M&E was characterized by a change from ‘monitoring and evaluation’ to ‘monitoring, learning and evaluation (MLE)’ [4].

AFRICAN BREEDERS SERVICES

The managing director of ABS states that their main responsibility within the project was to support AI service provision. Next to their main task, they were concerned with improving milk quality. In order to reach their goal ABS trained AI technicians that were active in the catchment areas of the DBHs. After training the service providers, ABS would make sure that the directing board of the hub became aware of the importance of having high quality AI services. Moreover, ABS supported hubs to create financial structures to sustain the AI service and created the infrastructure needed to obtain liquid nitrogen. Due to differences in culture or exposure to the technology, the uptake of AI technology varied among the hubs. In areas were the uptake was low, ABS invested more effort in promoting the technology. AI was promoted by presenting the benefits to ill adopters, for example using model farmers [3].

ICRAF

According to the former Dissemination Facilitator at the World Agroforestry Centre (ICRAF), this organization was in charge of the 'feed and fodder' aspect of the EADD project, aiming to increase cow production and to mitigate seasonal variation in production. Their strategy consisted of three elements being fodder establishment, fodder conversion and fodder utilization. Those elements were presented to farmers through extension. The strategy was similar for all Dairy Business Hubs, although adaptations were made based on climatic differences and farming systems [7].

TABLE 8 MAIN ACTIVITIES OF CONSURTIUM PARTNERS

Consortium partner	Main activities (related to)
Heifer International	- Consortium leader - Extension (production) - Capacity building (organization)
Technoserve	- Establishing business (mobilization, registration, election) - Marketing - Capacity building for board and management - Support hubs to create sustainable services (e.g. business plans)
International Livestock Research Institute	- Feeding (support in creating feeding plans) - Breeding (AI service) - Monitoring and Evaluation
African Breeder Services	- AI service provision (e.g. training AI technicians) - Milk quality
World Agroforestry Centre	- Feed and Fodder (feed establishment, conversion and utilization)

5.3.2 SNV SUPPORT

As explained by a consultant advisor at SNV, the support that SNV gives to the targeted cooperatives exists of three major agendas.

The first agenda is labeled 'value chain agenda'. It consists of support that is given on cooperative level and is similar for all targeted cooperatives. An example is extension on farmer level, which is mainly focused on fodder issues. SNV appointed Local Capacity Builders (LCBs) to the cooperatives they support, in combination with interns these LCBs are assigned to facilitate the cooperative in creating sustainable extension systems. SNV also facilitates capacity development for the board and management staff of the cooperatives [6].

The second agenda targets systemic issues and is basically focusing on innovation. SNV is currently piloting various innovations that address systemic issues in the Kenyan dairy sector. One example

of these pilots is introducing quality based payment systems, this pilot is executed in cooperation with processors such as NKCC. Another pilot explores the possibilities for contract farming regarding fodder production and is funded by the Dutch government through SNV global fund. A final example is the milk fortification project at Kinangop which is implemented with support of DSM. SNV also performed a policy and a 'bottom of the pyramid' study in the scope of the systemic issue agenda. A final activity within this agenda is SNVs effort to influence Kenya's feed & fodder policies [6].

The third agenda is focused on Vocational Skills Development. Within this agenda SNV support both public and private training institutions [6].

5.3.3 ANALYZING THE SUPPORT

In this section the approaches will be analyzed, focusing on the topics of flexibility and sustainability. A major difference in the approach taken by the two organizations is that EADD primarily promotes the hub approach, whereas SNV's program is focused towards the entire dairy sector. EADD has established new DBHs or upgraded existing dairy societies to hubs, whereas SNV does not actively pursue a hub approach. SNV identified promising dairy societies and approached them for cooperation. These societies can be identified as Dairy Business Hubs, but are not labeled as such by SNV. On cooperative (or hub) level SNVs activities are primarily aimed at establishing a sustainable extension system, whereas EADD takes an integral hub approach.

FLEXIBILITY

According to an ex-Heifer employee that is now working for NKCC the model and mobilization process that EADD used was similar for all the hubs that received support by the project. He states that adaptation and contextualization of the model was performed by the local leaders of the hubs; the directing boards and the management staff [1]. An expert working for ILRI stated, regarding flexibility of the DBH model, that it is important to realize that the EADD project is based on theoretical considerations. In order to implement the theory there was EADD staff who executed the project and finally there is the reality. The respondent clarified that people bring experiences from former jobs and project and therefore sometimes only observe what relates to their own realities. Therefore, it was perceived a challenge to train EADD staff to understand the establishment and development of DBHs as a process instead of a one-size-fits-all approach. The expert explained that according to the theory, prior to the establishment of each new service, a feasibility study should have taken place in order to determine whether there was a business case. However the respondent is uncertain to what extent feasibility studies have taken place in reality and assumes in some cases staff members have decided that they knew what was beneficial for the development of the hubs, without performing the feasibility studies [4]. An example here was the provision of breeding services. In certain areas AI technology is controversial due to cultural beliefs, nevertheless only AI provision was included as an option for breeding in the first phase of the EADD program. In areas that were reluctant to adopt AI technology, ABS has tried to "sell the benefits of AI" [3]. An ILRI researcher commented that in the proposal for EADD II a flexible approach for breeding was included [4].

From the previous statements can be concluded that several factors challenged the flexibility of the approach used by EADD, this is further illustrated by the cooperation between MUKI and EADD. MUKI, that received support from TNS in the past, was interested to cooperate longer with EADD [Muk1]. Nonetheless the support stopped, one expert believed that this was because MUKI was

already as a more advanced stage compared to the other EADD hubs. MUKI needed different support than EADD was proposing. [7]. This indicates, that EADD was ready to support the hubs with a certain package but was not able or willing to go beyond that.

Regarding the flexibility of the SNV approach should be mentioned that it is very different from the EADD approach. SNV primarily focuses their support on one aspect of the hub, being the extension system. Regarding this aspect an employee stated that the support provided by SNV is similar for all supported dairy societies [6]. They employ LCBs that each work with several cooperatives, supported by interns. This gives the LCBs the opportunity to cooperate intensively with the cooperatives they are assigned to and should allow them to support the establishment of an extension model that fits the local context.

SUSTAINABILITY

An important question regarding the potential for scaling DBHs is whether the hubs are sustainable in the long term, without external support. The selected cases Meru Union (2005), MUKI FCS (2001), Tanykina Diaries (2003) and Metkei Multi-purpose Company (2009) are by this time operational for several years. All cases except Metkei were established, before SNV or EADD proposed to support the hubs. Although it should be mentioned that Tanykina was established with the support of EADD consortium leader Heifer International. The respondents were asked to reflect on the sustainability of the DBHs without external support and the strategies that were used to increase the sustainability.

The interviewees agree that the sustainability of the hubs varies, some hubs are expected to be sustainable while others are expected to be struggling, sometimes threated by the loans that they have committed to in order to pay for the cooler(s) and factory. According to all EADD respondents the stage gate tool was an important method in the program to monitor the progress of the DBHs. Hubs that scored better according to this tool, which examined both business and production aspect, are expected to be more sustainable. One respondent explained that for the hubs within the EADD program, basically four exit strategies were used. Graduation was the best possible outcome, meaning that the hubs are expected to be able to continue themselves after EADD I ended. The expert stresses that to this end, it is important the hub has strong structures in place, for example to make sure that newly elected board members have to receive training. When EADD estimated that the hubs are not able to survive on their own, they were either moved into the second phase of the EADD project or handed off to other parties (e.g. KDFF). And the final exit strategy was an exit for poor performance, in those cases the EADD has accepted that the hub approach has not worked at the specific site [4].

According to the respondents one of the main strategies to increase the sustainability of the hub, was embedded in the program by using a business approach [1,2]. Another factor is that the hubs have built partnerships with other organizations such as the Kenya Dairy Farmer Federation (KDFF) and the government that can support them in de future. The KDFF was established as part of the EADD project, for the purpose of supporting dairy hubs after the EADD project would phase out [4,5]. Two respondents point out that the fact that hubs, have started to appreciate the importance of extension and investing in it is a factor that increases the sustainability of those hubs [5,6]. Moreover, diversification of services is expected to positively influence the resilience of DBHs, extra services do not necessarily only contribute to profitability, but also to sustainability [6,7]. The reasons that diversified services are a way of making the business more sustainable are that those services decrease the dependency of the hubs on dairy [6] and that they potentially increase farmer

loyalty [7]. A TNS manager believes that as hubs develop they should focus on services that are profitable [2].

What was observed at both Tanykina and Metkei is that the extension system had to be restructured and initially scaled down after EADD I ended [Tan1, Met1]. EADD had provided financial support to pay for extension officers until it phased out. After the financial support was cut the hubs could not pay the salaries of the entire extension staff. During the time of data collection both sites had scaled down their extension department and were looking for new ways to make it sustainable. Tanykina started to focus on 'strategic farmers' - approximately 600 farmers that are supplying the highest amounts of milk – in order to make their extension efforts sustainable. Metkei is looking for methods to create a (financially) self-sustaining extension department.

Again it is difficult to compare the integral approach used by EADD with the efforts of SNV to support the establishment of an extension system. From the previous paragraph we can conclude that an externally financed extension department is not sustainable. So in that light the approach of SNV, using an LCB that has to support the establishment of an extension system, might be more sustainable.

An SNV consultant commented that other efforts to increase the sustainability of their approach were:

- Using in inclusive business model approach, focusing on capacity building
- Documentation, to use cases as an example [6].

5.3.4 SUMMARY AND ANALYSIS

Here the results described in the previous sections will be summarized and analyzed in order to find key points for discussion.

EADD was a project with the vision to improve the income from dairy production of 110,000 households in East-Africa. This project introduced the Dairy Business Hub approach in Kenya and has supported the establishment 21 dairy business hubs in Kenya of which 6 were pre-established sites. This indicates that EADD regards the 'Dairy Business Hub' concept as an integrated innovation with hardware, software and orgware elements.

SNV is executing a dairy program based on three main agendas, one of which includes supporting dairy societies in establishing sustainable extension programs. This approach is totally different from EADD and as described in Section 4.1 therefore it is feasible to mention to EADD hubs, whereas it is not correct to describe MUKI en Meru Union as SNV hubs. MUKI and Meru Union are hubs that have grown (more or less) organically to the organizations that they are now. SNV is supporting them mainly in the field of extension.

Several factors were challenging the flexibility of the EADD approach. An important reason that made it difficult to implement a context specific approach was that staff members had their own ideas about the DBHs and regarded it as a one-size-fits-all approach.

Interviewees agree that the sustainability of the DBH vary. Factors that are believed to improve sustainability are using a business approach, building partnerships, investing in extension and an extensive (and profitable) range of services. There seems to be a trade-off between the rate of DBH development and the sustainability. In order the build hubs from scratch in a relatively short period

of time EADD had to be heavily involved and supporting that process. However, although EADD managed to establish 19 hubs in a short period of time the question remains how sustainable this approach was. Although the first phase of EADD ended during the period of data collection it was already known that some hubs would be struggling more than others after the support was dropped. And particularly in the field of extension could be noticed that hubs were not able to carry on after the financial support stopped. In that light the approach of SNV might be more sustainable, however it should be noted that it would not be possible to establish 19 hubs in a short amount of time without intensive support.

One feature of the EADD approach that might have been underestimated in this research is the five year strategic plans that were created for each hub. The reason that this feature is underestimated is due to a lack of data on the content and composition of these plans. However these plans could contain valuable information regarding the context specificity of each hub and the role that target communities have played regarding the adaptation of hub model to the local context. Moreover these strategic plans might be interesting to analyze in light of both the flexibility and the sustainability of the approach used by EADD.

6. DISCUSSION

In this section the results from this research are discussed. Based on this discussion an answer will be given to the main research question: *To what extent were the 'three enduring challenges' relevant to the process of scaling out Dairy Business Hubs in Kenya?* First the limitations of the study are discussed in section 6.1. Subsequently the discussion section is organized according to the enduring challenges (and therefore the sub questions), although some aspects might be relevant for several sub questions due to interdependencies.

6.1 LIMITATIONS

There are several limitations related to the research approach that challenge to findings in this thesis. Most limitations are related to the broadly defined topics and research questions in this thesis. Because several concepts (e.g. participation) were not operationalized in advance the researcher has been struggling to collect and review data in a constrained manner. Therefore it has been a challenge to define the boundaries for the discussion and conclusion regarding each sub question.

A factor that is limiting the comprehensiveness of this thesis is that the three enduring challenges as defined by Smith, Fressoli and Thomas (2013) were subject of the interpretation of the researcher. The study by Smith, Fressoli and Thomas (2013 p. 10) was to "map out the diverse forms of knowledge arising from grassroots innovation movements, and suggest a framework for better appreciating its potential for innovation policy". Here the enduring challenges are used as a way to understand and categorize the challenges that occur when inclusive business approaches are scaled. Moreover, the relevancy of each challenge to scaling DBHs was interpreted by the researcher and might differ from what Smith, Fressoli and Thomas (2013) envisioned.

Another limitation regarding the research approach is that the researcher assumed that the hub approach could be regarded as a general model that was applied in different contexts. This assumption holds to some extend for the hubs that are a result of the EADD project, however looking at the other hubs in Kenya it might not be viable to assume that they come from a general model. In fact it is not even sure whether these 'hubs' should be considered as DBHs, which is another factor that complicated the study. It was challenging to compare the EADD hubs with other hubs, because although they perform similar operations they have very different backgrounds.

Moreover, it was challenging that the innovation that was studied in this research were Dairy Business Hubs. Compared to some less extensive innovations it might be more complex to trace the context specific development of an organizational innovation such as a hub.

Also there were limitations regarding data collection for this study. Because it was not possible to arrange interviews and field visits before the beginning of the ten week field study in Kenya, case selection and interviewee selection had to been done on the stop, which reduced the time to execute time. Moreover case selection might have been biased because the cases were suggested by SNV (and former EADD) staff and also had to be accessible; therefore the selected cases might be examples of well-functioning DBHs. Also it was difficult to stay at the sites for a longer period of time because most of the hubs are located in remote areas and daily guidance en transport had to be available. At the time of study the EADD project had phased out and was in the process of

acquiring funds for a second phase, this circumstance complicated the arrangement of interviews with EADD staff.

6.2 'LOCALLY-SPECIFIC, YET WIDELY-APPLICABLE'

Earlier experiences with scaling innovations have underlined the significance of adjusting innovations to fit local contexts. Contrasting tailor made solutions might decrease the potential for scaling. In this section the challenge of 'context specific, yet widely adaptable' innovations is discussed focusing Dairy Business Hubs in Kenya. The research question related to this challenge is: *How did the DBHs develop from a general approach towards an embedded application of the hub model?* This section is structured as follows. First the general model of DBHs is discussed, followed by a discussion on the 'embedded application of the hub model'. Subsequently this development is compared with processes of facilitated diffusion and innofusion as presented in Section 2.2 of this thesis.

6.2.1 THE GENERAL APPROACH

In the first sub question a general hub model was assumed by the researcher, after conducting the research it is viable to question whether this assumption was valid. Even after conducting the research there seems to be no tight definition of the concept 'Dairy Business Hub'. The definition coined by Jaleta et al. (2013) (see Section 1.5) seems to be very broad, but might be illustrative for the fact that many set-ups could be considered a dairy business hub. What becomes clear from section 5.1 is that Dairy Business Hubs are all centered around the business of bulking milk. Moreover dairy business hubs are all focused towards improving horizontal, vertical and complementary coordination. They perform similar roles in the value chain for dairy products. For example, all hubs perform or coordinate dairy related services such as transport, bulking/chilling and marketing. In that sense the rationale behind Dairy Business Hubs does not differ a lot from the one behind cooperatives as indicated by several respondents.

It should be noted that in the definition formulated by Jaleta et al. (2013) hub can be either a single business entity or the existence of several business entities in a specific geographic area. If a hub consists of several business entities it is not necessary that these businesses coordinate with each other in running their business (in order to classify as a hub according to this definition). Therefore the hub concept can either be bound to an organization or to a location. In this thesis only the first option is considered.

Although the assumption of a 'general hub model' does not hold well, we do not want to dismiss the idea of going from a general approach towards and embedded application entirely as it is interesting to find out what factors have contributed to an contextualized development of the hub model.

6.2.2 THE EMBEDDED APPLICATION

An embedded application of the DBH-model in this research refers to an example of a Dairy Business Hub. In this research data was collected at four different sites: MUKI, Meru Union, Metkei and Tanykina. Each site can be considered an embedded application of the hub model.

What we found is that the sites share some elements, but are also different in many ways. The similarities are discussed in the previous section. An important variable is the range of services facilitated by the DBHs. Services directly related to dairy production (e.g. transport, bulking, AI, agrovet) are offered by all selected hubs, although Meru Union is organized different from the other cases. Services beyond dairy production are variable and range from financial services to insurances and from supermarkets to petrol stations, a list of services is provided in Section 5.1.4. These additional services are one of the most obvious differences between the dairy business hubs, together with origin/set-up, size (of membership base), registration, collection chain and outlet. Several experts believe that the variation between services is one of the most important differences between DBHs.

The question is what has caused these differences. Factors that have caused variances between hubs are discussed in the next sections.

MATURITY

The first factor that causes differences between Dairy Business Hubs is maturity. Some hubs are at a more advanced development stage compared to others. Moreover a hub is never reaches a final state, it can always grow or decline in terms of membership size or the number of services it facilitates. Hub maturity is a complex factor as experts do not agree whether differences between hubs should be regarded as structural or can (mainly) be attributed to maturity. Actually it is difficult to assess whether differences can be explained by maturity or should be considered as structural differences.

Differences that can be attributed to the maturity of the hub are for example the number of services that is provided by the hub.

PRE-EXISTING CONDITIONS AND HUB FORMATION

An important factor that explains differences between Dairy Business Hubs are pre-existing conditions and the formation process. Regarding the formation process there is a huge difference between the EADD hubs and the other hubs. EADD hubs were established in a relatively short period through a standardized process. Other selected cases have grown out of other organizations and seem to grow more organically. The swift formation of the EADD hubs was facilitated through intensive support from the EADD consortium, although pre-existing conditions such as pre-established chilling plants and FOs influenced the speed in which hubs could be established. Other hubs were established with support from the government, private investors and/or FOs.

Differences that can be attributed to the formation process are for example that all EADD hubs established coolers and are registered as companies whereas other hubs might not.

CONTEXTUAL FACTORS

Experts mentioned contextual factors as one of the most important explanations for differences between DBHs. An overview of the contextual factors that were mentioned is provided in Section 5.1.5. Factors that are attributed to the context can be subdivided in causes belonging to the target community (e.g. politics, culture, organization), markets (output, input) and some natural (weather) and unnatural (infrastructure) factors that can be attributed to the location of the hub.

A difference between DBH that can be attributed to the contextual factors is the range of services that is provided by the hub. Ideally services that are provided by a DBH reflect the 'needs on the ground' which can be regarded as a contextual factor or as the result of contextual factors. In reality it is questionable whether the differences between services provision result from supply driven or demand driven forces.

INFLUENCE OF FARMERS

Another cause of the variation between DBHs is the influence of target communities, the question is to what extend target communities have been able to influence the development of Dairy Business Hub. This factor is discussed in Section 6.2.

INFLUENCE OF INNOVATION INTERMEDIARIES

Finally the support from intermediary organizations has played a role in the development of the DBHs, this factor will be discussed in Section 6.3.

6.2.3 FACILITATED DIFFUSION AND INNOFUSION

In Section 2.2 two theories regarding the diffusion of innovations were discussed, namely 'facilitated diffusion' (Millar and Connel 2010) and 'innofusion' (Foster and Heeks 2013). When comparing the scaling process of Dairy Business Hubs we can identify some resembling and some contrasting factors to these two examples.

FACILITATED DIFFUSION

Millar and Connel (2010) stress that scaling out is not just enhancing adoption. It entails enabling farmers to identify their problems, testing several options and finally making a motivated decision on how they want to improve their livelihoods. This is not an autonomous process in order to be successful it should be carefully planned and facilitated. Pannel et al. (2006) also stress the importance of trialability to enhance the adoption of a certain innovation.

For an organizational innovation, with the magnitude of Dairy Business Hubs, it is very challenging to test the innovation in the local context before putting it in practice. Especially because it is less viable to test individual components of the hub model, as the approach is based on integrated input supply and output marketing for smallholders. This results in a relatively high initial investment that is necessary in order to establish a DBH. This factor reduces the trialability of the DBH approach.

As an alternative within the EADD project, feasibility studies have been conducted in order to estimate whether the DBH approach would fit a certain context. Additionally, as described in section 5.1.3 target communities were challenged to raise ten percent of the total project costs through registration fees. Moreover, the community was challenged to start bulking milk in order to verify the viability of the DBH approach in that area. After a three month period EADD determined whether the hub had graduated. One could argue that these processes of selection and trailing have partly covered the first stages of facilitated diffusion of using proven technologies suitable to local contexts and testing them (see Section 2.2.1). Unfortunately, those processes were polluted by 'politics' that influenced site selection.

The other hubs were already established and operational for several years when SNV initiated collaboration with the DBHs. In those cases therefore it remains unclear to what extent the approached has been trailed.

An additional insight from 'facilitated diffusion' is that farmers should be key actors in designing the scaling process to give them sense of ownership over and commitment towards the process of improving their livelihoods. In Section 6.4 will be discussed how farmers have influenced the development of Dairy Business Hubs in their context.

INNOFUSION

Foster and Heeks (2013) take an innofusion perspective on inclusive innovation. Innofusion draws away from linear models that explain innovation as separate processes of innovation, production and diffusion. This theory is discussed in more detail in Section 2.2.2. Foster and Heeks studied the diffusion of mobile phones in Kenya. Most of the innovations that increased the usefulness of mobile phones to the BoP in Kenya were located in the local context and driven by demand rather than the supply side.

It is quite complex to compare the scaling of DBHs with the theory as described by Foster and Heeks (2013). They argue that what is needed to increase the utility of innovations in the BoP context is an interlinking of the supply side and the demand side. In that interface most of the additional innovation (that belong to the diffusion process of mobile phones in Kenya have taken place) have taken place. A Dairy Business Hub basically is that interface.

Nonetheless there are some interesting aspects of innofusion that can be discussed here. For instance Foster and Heeks (2013) found that the demand side becomes the main driver (and location) for innovations that belong to the diffusion process. This is an important question regarding the scaling of DBHs. Are adaptations to the DBH model a result from differences in demand side (bottom-up) or are they implemented by the supply side (top-down)? From the results evidence for both processes can be found. There are several ways in which farmers can influence the development of DBHs (see Section 6.3 for elaboration). However there is also evidence for elements of the hub that are resulting primarily from supply side efforts, for example the AI service provision in some areas (see Section 5.1.5).

MODULARITY

One of the factors that might contribute to the fact that DBHs can be considered 'context specific, yet widely adaptable' is the fact that the concept itself is flexible. There is no confined definition of what a Dairy Business Hub is or should be. The hub approach is a modular concept, although some elements are essential needed to be considered a DBH. At the heart of the hub there is the bulking enterprise, which can be a company or a cooperative. Around the bulking enterprise several services are organized. All hubs facilitate basic dairy services such as transport, bulking and marketing. Beyond those services DBHs have many options to fulfill services or not. Next to extending their services range, DBHs can also considered moving up the value chain. Several hubs have plans to establish their own processing facilities, while some hubs have already realized those facilities. The modularity of the hub concept can contribute to its potential to be context specific, yet widely adaptable.

Jaleta et al. (2013) suggested that the development of integrated input supply and service delivery (e.g. DBHS) is likely to be a gradual process. In this way the initial investment that is needed can be reduced and the authors recommend starting with the services that are needed on a daily basis. Some experts indeed have mentioned that the initial investment might be one the reasons why hubs deliver some services instead of others. In Section 5.1.5 is mentioned that establishing an AI service requires less initial investment compared to an agrovet shop. At selected hubs was observed that services that were initially delivered were the services that are linked to dairy production rather than services that are needed on a daily basis. For example AI service was established at all hubs but is only required occasionally by small-scale farmers, moreover this service yields mainly long-term impacts. We did witness a gradual expansion of the service range offered by the hubs. Within the EADD project a five year plan was established for each hub, part of the plan for Metkei was to establish a FSA facility. At the time of the field study, after Metkei had been operational for four years, this facility was opened recently. This indicates that the 'modular' development of a DBH can also be planned in advance.

6.3 'APPROPRIATE TO, YET TRANSFORMING SITUATIONS'

In relation to the second enduring challenge 'appropriate to, yet transforming situations', Smith, Fressoli, and Thomas (2013) frame innovation as 'empowering inclusion'. Based on literature it is expected that inclusion of farmers in the innovation process can contribute to create site-specific and sustainable innovations, also involvement should increase farmers' motivation and commitment (Waters-Bayer et al., 2009). The related question formulated in relation to this challenge was: *In what ways have smallholders been able to influence the development of contextualized DBHs?* Important issues regarding inclusion are initiative, representation and incentives. The question is whether DBHs in Kenya were able to move away from token participation and ensure true participation of farmers (Hocdé et al. 2009; Swaans et al. 2014). This section is organized as follows. In 6.3.1 will be discussed who took the initiative to establish DBH and to what extent, in Section 6.3.2 the incentives will be discussed in relation to farmer loyalty. In section 6.3.3 the ways for farmers to influence hub development are discussed, followed by the farmer representation in section 6.3.4.

6.3.1 INITIATIVE

Previous studies have indicated that projects initiated by FOs have less trouble involving farmers. From the results in section 5.2.1 can be concluded that regarding EADD hubs FOs had to apply for support. In those cases the initiative seems to be with the target communities, however the selection process might have been polluted by politics. SNV identified dairy societies with potential and discussed collaboration with them, so the initiative for collaboration here seems to be at SNV.

From the data we cannot conclude what role taking initiative has played in the further involvement of the FOs in the innovation process. Although it should be noted that farmers had to apply for support and one can question to what extent this should be considered as taking initiative. It might have been different when FOs had to propose an intervention. Nonetheless the relatively standard hub formation process of EADD seems to value initiative by the target community, as they challenged the communities to start bulking and to raise ten percent equity trough registration fees.

6.3.2 INCENTIVES AND FARMER LOYALTY

Millar and Connell (2010) argue that clear and tangible benefits for the target communities lead to higher uptake and adaptation of the innovation, compared to innovations yielding more diffuse and long term benefits. Moreover Swaans et al. (2014) argue that incentives are important to guarantee a demand driven and contextualized innovation process. In Section 5.2.3 was expressed that many hubs have struggled with issues of farmer loyalty, especially because small-scale are very responsive to price incentives. Farmers at MUKI and Metkei indicated that although they are members of the hub they have decided to sell their milk elsewhere. This might indicate that the incentives for farmers to be active members of the hub were not clear or simply not attractive for farmers.

6.3.3 WAYS FOR FARMERS TO PARTICIPATE IN THE HUB

In result Section 5.2.3 was identified that there seem to be three main strategies for dairy producers to influence the development of dairy business hubs:

- During Annual General Meetings shareholders can elect the persons that will represent them in the board. Moreover, farmers can share their opinion during AGMs and resolve issues were no consensus is reached by voting.
- By showing commitment and ownership farmers can support the hub, hubs are based on farmer loyalty. Therefore it is important to create incentives for farmers to participate in the hub.
- One of the most flagrant differences between the hubs is (the range of) service provision. Preferably, these services reflect the farmers' demand or needs. When services are managed like businesses farmers can influence the (potential) service range by using or ignoring services. Moreover in some cases farmers are requested to support the establishment of a service by becoming a shareholder, by deciding whether they want to investment in a certain service they can also influence to development of the hub.

Based on the results it is difficult to assess to what extend smallholders have actually influenced the development of the DBHs in their area. Nonetheless it becomes clear that the loyalty and commitment of farmers are important for a hub to be able to development. Perhaps farmers inclusion does not how a big influence on *how* DBHs development, but rather influences *if* a DBH can development.

6.3.4 REPRESENTATION

In the former section is mentioned that one of the ways in which farmers have participated in hub development is through representation in the board. Generally the boards are in charge of decision making at the hub and the management team is responsible to implement these decisions. Nonetheless there are several limitations to the representation of the farmers through electing board members. Although it is known that mixed boards are performing better, based on culture most of the elected board members are older males. Moreover in some instances EADD professionals have seen the business (hub) grow beyond the capacity of the board.

Although in theory the decisions are made by the board several experts have stated that especially in the initial stages of hub development a lot of influence was exerted by EADD (section 5.2.3). The

initial stages of hub development might also be the most influential regarding the 'end result' of the hub. Especially when future plans are established in for example five year plans as was done for the EADD cases.

6.4 'PROJECT-BASED SOLUTIONS, YET SEEKING STRUCTURAL CHANGE'

The third enduring challenge 'project-based, yet seeking structural change' was used by the researcher to assess the role of innovation intermediaries, their support represents the 'project-based' component of DBHs as an inclusive innovation. The research question connected to this challenge was: *How did 'innovation intermediaries' influence the development of DBHs?* In this research was focused on the effect of the support of intermediaries on the sustainability and the flexibility of the DBH approach.

In relation to this question is should be noted that the role played by EADD was entirely different compared to influence of SNV. Therefore it is not feasible to compare the approaches as if they were equal. EADD applied the hub model as an integral approach and was able to establish hubs from (almost) scratch in a relatively short period of time. SNV identified several promising dairy initiatives, some of which can be regarded as DBHs, and offers support (mainly) in the field of extension. Both approaches have its limitations and benefits.

6.4.1 FLEXIBILITY

From all the data it seems that the support that was given trough the EADD project was relatively standardized. The adaptation and contextualization of the model was largely performed by the local leaders of the hubs. Moreover, the flexibility of the approach was challenged by project staff members that had trouble to move away from a one-size-fits-all approach. Also with regard of the breeding services limited flexibility of the approach can be observed. Although AI provision is not culturally acceptable in all parts of Kenya, it was the only method for breeding that was supported in the project.

Although the flexibility of the approach was limited, signs of contextualization can be witnessed when Tanykina is compared with Metkei. Differences can be observed regarding most aspects of the hub, for example: the organization of farmers, the range of services provided, the collection system and the output marketing. This indicates that although the support might have been relatively standardized, hubs still can develop in a contextualized fashion.

The effect of the SNV support on the flexibility of the DBH seems to be minimal as their support is primarily focused on the extension system. Regarding this field SNV has is providing similar support for all supported societies. However the presence of LCBs in the field that cooperative intensively with a few selected societies allows SNV to support the establishment of an extension model that fits the local context.

6.4.2 SUSTAINABILITY

The sustainability of DBHs varies, some hubs are expected to be sustainable while others are expected to be struggling. The selected cases were all considered as relatively successful hubs and were currently operating with limited external support.

One of the most important strategies to improve the sustainability of the DBH approach was embedded in the concept, namely using a business approach. This is in line with Smith, Fressoli and Thomas (2013) who suggested that the structuring effect of market-based development approaches could contribute to the sustainability of (grassroots) innovations. Within the EADD project drawing up business case (feasibility study) was mandatory for every new service that was planned, however there are indications that in reality this was not always accomplished. An example of a service were the business case often might often have been disregarded was the extension service. At both Tanykina and Metkei was observed that the extension team was scaled down radically after the external (financial) support was cut when the first phase of EADD ended.

Differences in the approach of EADD and SNV are easily observed. EADD offers support to create a 'Dairy Business Hub', an integrated approach in which all elements of the hub are supported (top-down). SNV, on the other hand, has approach dairy societies with potential and supports them were needed (bottom-up, organic growth). Each approach has advantages and disadvantages. EADD is able to build hubs from (almost) scratch rapidly, supported by large funds and their integral approach. Most likely it is not possible to replicate these results without major external support. The question is to what extend it is a trade-off between scaling quickly and sustainability.

7. CONCLUSION

During the planning phase of this thesis it was assumed that three enduring challenges to grassroots innovations - as identified by Smith, Fressoli, and Thomas (2013), but liberally applied by the researcher – also apply to the process of scaling out DBHs:

- Locally-specific, yet widely-applicable.
- Appropriate to, yet transforming situations.
- Project-based solutions, yet seeking structural change.

The main question was formulated: *To what extent were the 'three enduring challenges' relevant to the process of scaling out Dairy Business Hubs in Kenya?* After conducting the research we can conclude that the enduring challenges for grassroots innovations indeed apply to the scaling process of Dairy Business Hubs in Kenya.

The first challenge was analyzed in order to answer the research question: *How did the DBHs develop from a general approach towards an embedded application of the hub model?* Regarding this question we can conclude that the assumption of a general approach towards an embedded application might be debatable. Especially, it is questionable whether it is accurate to refer to a 'general approach'. There are several basic components that all DBHs have in common, although even the legal framework can vary, and other components that seem to be optional. In that light the hub can be considered a modular concept of which the additional components can be adapted to the context. Factors that contributed to the contextualization of the hub model are: pre-existing conditions and contextual factors, influence of target communities and influence of innovation intermediaries.

The second challenge was converted into the question: *In what ways have smallholders been able to influence the development of contextualized DBHs?* The question is whether DBHs in Kenya were able to move from token participation to true participation of farmers. From the collected data we can see some evidence of farmer involvement in the fields of initiative, representation and incentives. However it is difficult to draw conclusion regarding the extent to which farmers actually influenced the contextualization process of DBHs. It can be concluded that farmer participation is enabling the development of DBHs but less obvious is to what extent farmers can direct the development of DBHs.

The third challenge was translated into the question: *How did 'innovation intermediaries' influence the development of DBHs?* Regarding this question can be concluded that the role played by EADD was entirely different compared to influence of SNV. EADD applied the hub model as an integral approach and was able to establish hubs from (almost) scratch in a relatively short period of time. SNV identified several promising dairy initiatives and proposed collaboration (mainly) in the field of extension. Both approaches have its limitations and benefits. Innovation intermediaries can play an important role in hub development regarding the issues of flexibility and sustainability. Regarding flexibility can be concluded that relatively standardized support does not seem to prevent DBHs from developing in a contextualized fashion. Concerning sustainability there might be a trade-off between developing quickly and developing sustainably and retaining a business approach appears to contribute to sustainability.

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APPENDIX A STANDARD INTERVIEW – DAIRY EXPERT

Standard Interview* – Dairy Expert

** Interviews were conducted in a semi-structured manner*

Name: .....

Organization: .....

Position: .....

Email: .....

Explain the purpose of my research and the research questions.

1) **What is your definition of a Dairy Business Hub?** (Do you believe we can call it a model? How many Dairy Business Hubs currently exist in Kenya?)
2) **Can you tell me the basic ideas behind using a Dairy Business Hub-approach?** (How is the DBH supposed to work?)
3) **Who usually takes the initiative to 'establish' a Dairy Business Hub?** (Are 'groups of farmers' requesting for help or are NGOs reaching out to them?)
4) **Do you believe there is a typical process for establishing a Dairy Business Hub?**
5) **If you look at various Dairy Business Hubs do you believe they are similar or the concept adapted?** (Can you determine different categories of Dairy Business Hubs?)
6) In my opinion me one of obvious adaptations to the Dairy Business Hub model could be the range of services that are offered. **Do you see many (other) differences between the DBHs?**
    - **How do you think these differences occur?** (Are they planned in advance or do they 'emerge' during the DBH formation?)
        I. Who makes decisions regarding the DBH?
        II. (How) Can farmers influence the development of DBHs?
        III. What contextual factors play a role in the development of DBHs?
        IV. Do you believe facilitating organizations such as EADD or SNV take different perspectives on developing Hubs? (Go deeper into specific role of interviewees' organization in DBH development)
        V. Next to the obvious partners such as EADD or SNV (which I refer to as innovation intermediaries) do you see other organization (private, public, government) playing a facilitating role?
7) **When I mention 'scaling Dairy Business Hubs' what is being scaled?**
8) **What do you see as contributing or limiting factors to the potential to replicate the DBH-concept in other places?**
9) **Do you see DBHs taking advantage of new opportunities as they grow?** (Can you give examples?)
10) If you think about the different activities or elements in the Dairy Business Hub. **Are there some elements that worked really well, where others might have been less successful?**

11) **In what ways have Dairy Business Hubs supported farmers in improving their livelihoods?**
12) **How do you perceive the sustainability of DBHs without external support?** (What strategy was used to increase the sustainability?)
13) **Did you miss any questions in this interview? Do you have other insights you would like to share?**
14) **Could you recommend other persons that might help me in my research? And do you know of any documents that might be helpful for me?**