Towards pluralistic livestock service delivery system for the commercialization of smallholder livestock agriculture in Ethiopia: Evidence from smallholder dairying in Debrezeit milkshed

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Abstract

Ethiopia has a huge untapped potential for market oriented smallholder livestock development. National policy has envisaged the transformation of subsistence livestock production systems to that of productive and market oriented systems. Despite a plethora of projects and expressed policy intent, the livestock sector has not yet really taken off. One of the major bottlenecks, as many studies revealed, is related to the limited coverage and problem associated with effectiveness, efficiency and coordination of livestock service delivery system and enabling policy and institutional environment. However, multiple service providers from the public, private and third sector are emerging in the livestock service delivery, making coordination a formidable challenge. Coordinating livestock service system is required for achieving truly pluralistic service delivery that is able to support the commercialization process. Thus this article reports the result of a study on dairy service delivery systems conducted in Debrezeit milkshed, which has relatively developed and market-oriented dairy systems. Specifically, the study looked into actors and their roles, performance of actors as perceived by their respective clients, interaction between actors, and policy and institutional arrangements influencing pluralistic service delivery for the commercialization of smallholder dairying. A comprehensive framework for analyzing pluralistic service delivery system (Hagmann et al, 2002) has informed the design and implementation of the fieldwork and data analysis. The required data was obtained through survey from 150 smallholders dairy producer randomly selected from urban, peri urban and rural area. Semi-structured interview was employed to obtain additional data from service providers in the milkshed. In addition, review of policy documents and discussion with key informants has provided additional insights. In the milkshed, dairy sector is currently in a transition towards market-orientation, with private sector investment and multiple actor involvement in the service delivery. The results reveal that while the public sector remained the major service provider, the role of private service providers and Ada'a cooperative is being increasing, particularly in livestock feed supply, product marketing and processing, micro finance, veterinary services. However, there is no effective mechanism to coordinate multiple service providers for them to effectively function as a system. Forage seed/cutting material supplier and vet clinical service providers are missing in the peri-urban and rural sub systems whereas there is no functional dairy advisory service provision in the urban subs system. The policy and institutional analysis revealed that existing government policies and strategies are important steps forwards for the commercialization of the sector with out any restriction on non public service providers to participate in the market. Nevertheless, success in pluralistic dairy service delivery, among others, is constrained by inadequacy of the existing policies and strategies (lack and/or delay in the livestock policy and *absence of role division of public and private sector in animal health service), still more enabling environment and institutional arrangements setback. Policies are required to reconfigure roles of the public sector to take up the missing role or encourage non public actors to play the roles and avail clear policies that as to what type services to be provided by the public and non public sector. Further, the policy has to support the development of private and dairy cooperatives in terms of capacity building and availing creating favorable condition to get land, credit ad incentives. This study analyzed cost sharing as an option for developing sustainable and responsive service delivery, by assessing producers' willingness to pay for advisory service using Contingent Valuation Method (CVM)*

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method. Results show that 71.3 % of the producers described themselves as willing to pay for dairy advisory service if their income from dairy would increase.

Key words: Pluralistic Service Delivery System, Livestock Services, Smallholder dairying, Commercialization of smallholder Livestock Agriculture, Ethiopia

1. Introduction

Agricultural commercialization in Ethiopia has been in the various development strategies, economic polices and development plans since 1957 (Dessalegn, 2005). However, the current agricultural commercialization which has been in the country's second Poverty Reduction Strategy Paper called Program for Accelerated and Sustainable Development to End Poverty (PASDEP) being implemented for the last two to three years clearly highlight on the transformation of smallholder subsistence agriculture to market-orientation to promote commercialization of the sector. PASDEP places a great emphasis on commercialization of agriculture, diversification of production and exports, and private sector investment in order to move farmers beyond subsistence farming to small-scale market-oriented agriculture (MoFED, 2006).

These smallholder farmers contribute to more than 80 percent of the agricultural output and value-added (amounting to more than a quarter and a third of national output and value-added, respectively) (Diao *et al*., 2007). Specifically, subsistence livestock production contributes an estimated 16 percent to the total GDP and over 40 percent to the agricultural GDP (Diao, et al., 2007), 15% of export earnings and 30% of agricultural employment (Stall et al., 2008). Moreover, livestock are estimated to contribute to the livelihoods of 60-70% of the Ethiopian population. More interestingly, the livelihood of pastoralists is dependent on livestock. Pastoral areas cover 60% of Ethiopia and include 12-15 % of the human population, as well as very large numbers of livestock (Micaheal H., 2004).

In the country, for many years the export of livestock and livestock products has been second most valuable source of foreign exchange, after coffee. Hides and skins have been by far the most important official livestock products exported and recently live animals are being exported. This potential is expected to rise following the increasing demand for livestock products worldwide. According to the International Food Policy Research Institute (IFPRI) projection, the demand for livestock products will double by the year 2020. As a result, the livestock sectors will producer more than half the agricultural output in value terms (Delgado et al., 1999). Moreover, the Food and Agriculture Organization estimate the global meat and milk production must double by 2050 that has a huge opportunity for developing country suppliers (Ahmadu and Leyland, 2008). Growth in demand is expected to emanate from developing countries owning to rising incomes, growing urbanization and population growth. These projections present enormous opportunity for developing countries to boost rural incomes and accelerate the pace of poverty reduction.

However, access to good quality support services and enabling environment will be one of the critical factors in enhancing livestock productivity and enabling the livestock producers to gain access to expanding markets and thereby smallholder commercialization. According to

Sharp *et al* (2007), in Ethiopia smallholder need a much more pro active services and support system than large farm since the latter can prosper when the basic enabling environment is in place, as they can secure critical services for themselves. There is a whole range of services that are needed to enhance the capacity of livestock producers to exploit the full potential of livestock production. These include health and production services and other market services such as credit, livestock insurance and delivery of market information and output marketing (Ahuja and Redmond, 2004) and capacity building for farmers' organization and asset accumulation of farmers (Leavy and Poulton, 2007).

In the country public provision and/or through development projects were the major sources of animal health, breed improvement, feed resource development, research, extension, finance and marketing services. While the past and the existing public services has made significant progress in expanding its geographical coverage, it remains almost exclusively within the public domain, which is supply driven and based on limited technology packages that provides the rural and peri urban dairy with limited and often inappropriate choices (World Bank, 2006). It also excludes the urban dairy producer with high potential for market oriented dairy development in the country (Stall and Shapiro, 1996 and Azage and Alemu, 1998). Moreover, the extension service is cereal crop-biased with insufficient attention given to high value crops production and commercialization of the livestock sector (EEA/EPRI, 2006). Publicly provided services are less market oriented, for instance it considers marketing services out of its mandates (Berhanu *et al*., 2006a). The extension system has no capacity to facilitate the terribly required commercialization process, since it is biased in favor of its technology transfer at the expense of organizational development, capacity building at the grass roots level and human resource development (Tesfaye, 2007). Nevertheless, the commercialization process require the transformation of the traditional role of extension to play a much more holistic and facilitatory role, and the field staff is not just a conduit of information, but an advisor, facilitator, and knowledge broker (Alex *et al*., 2002) and the purpose of extension services need to go beyond merely providing technical solutions to look more broadly at the institutional environment in which technologies are developed and disseminated (Birner *et al*, 2006). Hence, with the process of commercialization, the agricultural support service has to be transformed and should become responsive and innovative (Tesfaye, 2007) and integrated and coordinated service delivery system (Puskur and Hagmann, 2006).

On top of this, due to the high pitch placed on the importance of livestock sector in supporting Agriculture Development Led Industrialization and export potential, market orientation of the sector (fattening and dairy) and input intensive nature of technologies (dairy), multiple service providers from the public, private and third sector are emerging in the livestock service delivery (Azage, 2004, Habtemariam, 2004, Berhanu *et al*., 2006b and Azage *et al*., 2006).

Given its shortcomings with regard to effectiveness, efficiency and accountability, in some cases coverage as well, a public sector monopoly in provision of agricultural services is no more justifiable. Moreover, even though close examination of the pros and cons of disengagement of the state from financing agricultural service seems to indicate that relative efficiencies of public and private sector services widely vary, there is no point in replacing government monopoly with a private monopoly (Carney, 1998). As a result, many governments are taking various measures to improve effectiveness and efficiency of national service delivery systems through the involvement of many actors. This has created a growing trend for a state to move from being a

simple provider of agricultural services to a regulator, facilitator and to scale-up the participation level of private sectors and farmers and their organization so that they would gradually change from beneficiary to clients and partners in service delivery. This naturally leads to institutional pluralism in agricultural services delivery. According to GTZ service for rural development (2007), in this scenario, the public turns into a manager displaying public and private sector characteristics (New Public Management). Accordingly, the public would support and facilitate the identification of service demands by rural groups; link farmers' demands to adequate service providers; attract qualified service providers to the local market-place; provide and manage public service funds; provide services for public goods; and compete for private goods' services. Moving towards institutional pluralism with several actors and roles to play in a complementary and coordinated way constitutes a possible direction to improve the service delivery on a sustainable basis thereby commercialization of the sector (Carney, 1998).

The purpose of this paper, therefore, is to present the existing service delivery system and analyzes options for pluralistic service delivery system in the case of the dairy sector which is currently in a transition towards market-orientation, with liberalized markets and private sector investment. This is the one sector that is witnessing multiple actor involvement in the service delivery. Debrezeit milkshed is one of the areas that exhibit the market oriented dairy production with multiple actors' involvement in the service delivery in the country. Primary data was collected from 150 randomly selected smallholder dairy producing households located in urban, peri-urban and rural areas; and also from various service providers. The data generated by Rapid Appraisal of Dairy Innovation Systems by IPMS project in Ada'a and review of government policy and strategy documents supplemented information generated by household survey.

The paper is organized as follows. The next section presents dairy production in the milkshed. Section three presents the details of dairy service delivery in the milkshed. Section four reviews policies and institutional arrangement for pluralistic service delivery systems. Section five analyses options to develop pluralistic service delivery system in the dairy sector. Finally, section six concludes and presents implication of pluralistic service delivery for commercialization of smallholder livestock.

2. Dairy production system in the milkshed

In the milkshed, there are three distinct dairy subsystems: urban, peri-urban and rural; the urban sub system being significantly different from the others. It is a sub system with large number of cross bred dairy cows which are better yielding, higher volume of milk produced and marketed. The dairy producers have better income from dairying and have other diversified source of livelihood, dairying as their secondary activity, more educated and members of the Ada'a dairy cooperative. These producers are referred to in World Bank terminology as 'emerging commercial farmers' (Sharp *et al*, 2007). The peri urban and rural sub systems are similar in most respects, but the number of crossbred cows and access to milk market is slightly better in the peri-urban setting. Dairy producers in this two sub systems are smallholder farmers which produce crop and livestock interacting in the market both as buyers and sellers.

The dairy system mapping revealed that these sub system have different service needs and require separate service delivery arrangements. The urban sub system with higher number of crossbred cows need AI service, home based veterinary services, advisory service on improved dairying. More specifically, the urban sub systems demand a different advisory service for its concentrates based feeding systems following its zero grazing and space constrained systems (waste management). On the other hand, the peri urban and rural sub systems demand for dairy services that concentrate on cross breeding, feed and improved dairy management. In addition, the urban sub system requires different dairy service delivery arrangement following its different administration structure with its own urban agriculture unit.

3. Dairy service delivery in Debrezeit milkshed

3.1 Actors role and performance in the milkshed

3.1.1 Actors and their role in DSD

Following Birner *et al*. (2006), actors in DSD of *Debrezeit* milkshed were classified and analyzed using the three sector model (public, private and third sector). The actors' identification result highlights the diversity of actors involved in DSD. In the milkshed, there are multiple actors involved in dairy service delivery (DSD) from the public, private and third sectors.

Public sector

About 28 years ago, the public sector was the lone service delivery agent engaged in supply of crossbred heifers and related support services. Public sector especially Ada'a woreda office of agriculture and rural development (WOARD) plays a central role in DSD and includes dairy advisory and training, AI, veterinary (Table 1) and dairy input (crossbred heifer, forage seeds and cutting) distribution services. Other public actors are also involved includes Debrezeit Faculty of Veterinary Medicine (DVM), Debrezeit agricultural research center (DzARC) and National Veterinary Institute (NVI). The majority of the public sectors concentrate in the urban center, their service also covering the peri urban and rural center with the exception of the WOARD advisory service that do have development agents at kebele level that do not cover the urban center.

Private sector

Private organizations, institutions and individuals providing dairy related services in the milkshed include feed suppliers, veterinary drugs shops, full time and part time veterinarians and assistant veterinarians, private milk collectors, transporters and processors, financial institutions and private dairy farms (Table 1 -3). Owing to more demand for private services in the urban center and fragmentation of the other market, these private service providers operate more intensively in *Debrezeit* town with few feed retailers in the peri urban and rural areas. Private organizations dominate the feed, milk marketing and financial service where as the animal health service competes with the public sector.

Third sector

Third sector encompasses producers association and international actors and NGO/CSO. The only producers association in the milkshed is *Ada'a* dairy cooperative. *Ada'a* dairy cooperative in *Debrezeit* is one of the strongest co-operatives in the country with its own feed and milk processing plant. Currently, *Ada'a* milk cooperative is becoming a prime mover in DSD especially in the urban and peri urban subsystems through its major services to members, which include feed supply, AI, veterinary services, milk marketing (collection and processing) and advisory services (Table 1 and 2). International actors and NGO/CSOs fulfilled four functions in the milkshed: Supporting technology development (ILRI-DZ); technology transfer (IPMS, HUNDEE, Land O' Lakes); improving marketing (IPMS, Land O' lakes, SNV, ILRI); and enhancing the development of non public service providers in the dairy sector (SNV, Land O' Lakes and IPMS).

Even though diversified actors are emerging, forage seed/cutting material supplier and vet clinical service providers in the peri-urban and rural sub systems whereas dairy advisory service provider in the urban subs system are among the missing actors in the milkshed. This calls for policies to reconfigure roles of the public sector to take up the missing role or encourage non public actors to play it. In the urban areas, advisory service is lacking owing the fact that the sub system is following a different administration structure that depart from Ada'a woreda with its own responsible support service called urban agriculture unit. The urban agriculture unit is a one expert support that does not have a functional linkage with the major actors in the milkshed. Moreover, roles expected to create linkages between dairy producers and financial institutions and market actors, role that is critical for coordinating pluralistic dairy service delivery systems at the district level and quality assurance role are ignored where the private sector services are not monitored and/or regulated for their quality.

3.1.2 The performance of the dairy related service in the milkshed

Performance of the various actors involved in DSD was evaluated based on their effectiveness, relevance, efficiency and prospects of financial sustainability. Accordingly, the public dairy service delivery was found to be effective in terms of improving the productivity and income of dairy producers with a recorded positive impact on cross breed dairy owners. However, it is not effective in addressing the major of the subsistence poor farmers. The content of the advisory service is developed based on the supply of menu driven packages decided at the national/regional level that provides the farmer with limited and often inappropriate choices. The relevance of the public dairy service to market oriented dairy development is challenged due to its ineffective role it plays in facilitating linkages between producers and market agents, financial institutions, input suppliers and other support services. The current extension services have good numbers of staff but constrained by shortage of skills for facilitation, negotiation and network and platform building. The public dairy service constrained by system accountability, supply driven nature, poor incentive systems, shortage of operational costs and working facilities. These competencies and /or role gap require the public dairy service to adopt organizational innovation to transform itself to market oriented public dairy advisory service provider that tend to include accountability, farmer empowerment, cost sharing for sustainability, reorientation to market and knowledge management.

Ada'a dairy cooperative is effective in achieving the initial objective of providing feed and milk marketing services. Cooperative members confirmed that they have got better access to

inputs at reason price, milk market, knowledge and skills on improved dairy management, acquired business skills and more income since joining the cooperative. However, members complain on the timeliness and effectiveness of the services. More specifically, they were raising the mismanagement in the cooperative leadership including abuses by employees by under measuring, adulteration and stealing during milk collection and transportation to Addis Ababa. The cooperative working good in promoting market oriented dairy development in the milkshed through creating market link between the urban and peri urban sub systems, collaborating with other dairy associations, public organization, NGOs, projects and donors affiliated on MODD. Hence, to expand proven initiatives, strengthen good practice and addressing the weakness, the cooperative could adopt organization innovation such as participatory decision making, knowledge management activities, policy advocacy works and responsive and cost effective service delivery.

In addition, the performance of the different possible providers and the quality of their services was evaluated by dairy producers in order to identify who is good at what and the opportunity for learning and complementarily. Accordingly, producers ranked the private vet service first for their timeliness followed by the *Ada'a* cooperative vet service. For effectiveness (quality) of the veterinary service, producers selected public (DVM) clinic as the best. Producers selected private service providers for their timeliness and availability for home services. In the meantime, producers complain on the effectiveness of the private vet personnel's for use of expired drugs. Cooperative members still prefer the cooperative vet service if it can improve the quality and timeliness of service. In the same way, producers ranked the feed retailers first for their timeliness followed by the feed processors and flour factory. With regard to variety of feed supply and costliness of the service, producers selected *Ada'a* cooperative followed by feed processors for the variety and flour factories for costliness. Feed retailers with major market share are again ranked first for their nearness since they are located near to the producers' even to rural villages but their quality of feed is ranked last. Flour factories are selected first for their best quality feed supply (wheat bran). In terms of the quality of AI service, cooperatives AI technician scored very low due to its low success rates, and offering no variety of semen. One advantage of cooperatives over government inseminator is its timeliness for calls in inseminating. The government AI technician is the most preferred for its better success rates, and offering a variety of semen though it scored less for its timeliness.

In general, the current performance of the dairy related service in the milkshed can be described as follows. The advisory service is the single service provided by the public sector monopoly. The monopoly of the public sector in the service delivery has resulted in the poor quality of the advisory service in terms of timeliness, targeting, feedback and coverage especially for the urban sub system. The animal health service, though characterized as plural nature of service provision – mixes of public and private, professional and para-professional, it is constrained by timeliness, quality, far to reach animals to vet institute and lack of home service. The feed supply service especially the concentrated feed that is covered by private sector is constrained by expensive and poor quality feed together with lack of forage and shortage of hay in the feed market. Though the milkshed is utilizing four options of cross breeding, each option are constrained by specific problems. The AI is known for its very low success rate (3-4 times repetition) coupled with technician's capacity and behaviors (corruption) problem. The natural bull service is constrained by disease, unknown pedigree

and lack of home service. The public cross bred heifer supply is limited by short supply. The private cross bred sources are again restricted by unknown pedigree, no recording system, undesirable traits and expensive cost. The credit service is inhibited by poor linkage with the dairy producers, long procedure and unfavorable loan size and period. The milk market service is complained by low price payment, poor rural urban linkage and operational problems specific to organizations providing the service (cooperative, private or informal).

3.2 Actors pattern of interaction

According to Hagmann *et al*. (2002), interaction between service providers in the service delivery system are critical to 'make the system work as a system'. The different roles and mandates of service providers need to be clarified and even more important; they need to 'learn to play the roles' and work together in synergistic way towards making a difference. In additions, these multitudes of actors are supposed to work together and complementing each other requires facilitative interventions towards change. The change has to follow learning process intervention that gives a room for continual improvement through action and reflection processes based on a good framework for learning and knowledge management within and across service delivery system (ibid).

Hence, to map the interactions thereby learning among the actors in the service delivery system, linkage matrix exercise was done between the major actors. Accordingly, strong linkages were observed between dairy producers and organization involved in the supply of inputs & milk processors. This pragmatic strong linkage is occurring in the urban sub system and also expanding to the peri urban setting. Whereas, the others are links those that an organization has for the purposes of accessing a technology and knowledge or collaborating on a joint activity. These linkages are weak but would be more important for supporting continuous improvement of service delivery to take place. This barrier has prevented the integration of different types of information (technical, market intelligence, socioeconomic information) and quality control needed to improve the service system through learning process intervention.

The weak interaction among actors radiate from the actors' habit and practice of poor knowledge and information sharing and missing actor/role that are critical for coordinating the service delivery system. These weak interactions call for strong efforts to strengthen the capacities of relevant actors for interacting and learning.

3.3 Pluralistic dairy service delivery system coordination

According to Hagmann (2007), following the entrance of new actors from the private and the third in the service delivery side by side with the old (monopoly) state providers or are replacing them and find their niches, the old state monopolies are challenged by pluralism in their old mandate and self understanding. In addition, decentralization with the devolution of power to district level and new responsibilities and challenges for management of services for the population are emerging. Farmers are constantly changing needs for services within their realities for food security, market linkages, and alternative employment. The response to these challenges necessitates a renewal of rural and agricultural service systems at all levels. Farmers need to formulate their needs and demands, service providers need to be able to

respond to those, and policies need to form an enabling environment for the systems. Change has to be addressed systemically at different levels with complementary and integrating interventions. Each actor or subsystem in the dairy service delivery systems has its own contribution to the common endeavor. The contribution can be knowledge, resource, social or political capital. Also, each actor in the systems has its own expectation regarding how tasks have to be defined and coordinated. This calls for the coordination of service and actors in the evolving pluralistic service system.

However, the service delivery system revealed a weak demand side where farmers and communities are not well organized to be able to analyze their real needs and demands and validate it in view of their own resources. Nor are communities organized to experiment on their own and find their own solutions to problems. On the service provision side, the challenges have shown that the public is the major actor with weak pluralism aspect and the emerging non public service providers are not working together for their mutual effectiveness. They are also not coming under a plat form to learn and share responsibilities among each other thereby providing the space for communities to respond to their own demand. Service providers do not have the capacity to interpret the demand and to identify the type of services, which is appropriate to support the different clients. On the policy side, it was analyzed that policies are not converging towards a common and shared agenda for a coherent agricultural/rural development services, nor are policy development processes linked to the different levels of service delivery. Different policies and legislation regulating service provision modes and arrangements as well as performance management aspects, continuous adaptations in the organisational structure, culture, systems and processes, which make the support to the response of the demand effective and efficient are lacking.

Hagmann *et al* (2002) further raise one of the central questions for rural service delivery system is "Who is and should orchestrate the actors and the actions at the different levels". Since this paper focuses milkshed (district level), milkshed main actors' perception on the current level of dairy service delivery system coordination along factors that govern the current level were collected. In addition, potential actors for the coordination of the system along their relative strengthen were collected from the main actors.

The main actors (WOARD, DzARC and HUNDEE) rated the current level of coordination as poor. DzARC and HUNDEE (local NGO) identified absence of coordinating body as the structural causes for the poor coordination while WOARD identified itself as the current coordinator of the dairy service system. Table 4 presents main actors recommendation for actors who has the potential for coordinating dairy service delivery system in the milkshed with their relative strengthen and relative importance rate.

In addition to the main actors perception, capacity analysis undertaken in the WOARD revealed that, currently, the WOARD does not have the required technical and financial resource to coordinate the actors and there by the service delivery. Hence, actors in DSD are not currently coordinated. Effort has been made by IPMS to coordinate the actors through initiating and coordinating dairy platform, where WOARD is expected to lead the coordination role. But due to many problems the coordination role by WOARD couldn't come into reality. Very recently, the new business process reengineering carried out in the MoARD has structured one team to coordinate the activities of research, extension, farmer and private

sector. The performance of this new team will have paramount importance to coordinate actors in the pluralistic service delivery system there by improve the service delivery. However, this new team needs to adopt continuous organizational learning to be successful coordinating body by including stakeholders from all sectors. Other wise, this missing role require the creation of new autonomous body (like dairy board/associations such as the Kenya dairy board) at all level with the mandate to coordinate the actors' thereby strategic issues in the sector including the policy making processes.

4. Policies and institutional arrangement for pluralistic service delivery systems

The policy and institutional environment for dairy service delivery is an important condition for pluralistic dairy service delivery. In this regard, the country Rural Development Policies and Strategies (RDPS) backed by different strategies and programs (PASDEP, capacity building) and legal framework (proclamations and regulations) are important steps forwards for the commercialization of the sector with decentralization, privatization and thereby encouragement of non public service providers to participate in the market. More specifically, government built appropriate infrastructure (roads, electricity, telecommunication, and water supply facilities), under change process to bring demand driven and responsive public services (agricultural research and extension), facilitate the organization of producers organizations (cooperatives and unions) and their interaction with private sector and brought in a consortium of financial institutions to satisfy financing requirement.

Constraints in the policy and institutional arrangement

Success in pluralistic service delivery, among others, is constrained by inadequacy of the existing policies and strategies, still more enabling environment and institutional arrangements setback which either are crosscutting, sector or service specific.

Crosscutting problem in all the services

- **No system/mechanism for coordination of actors**

There exists a multiple actors in the service delivery and regulatory institutions in the public, private, farmer based organization, civil society and NGOs with verified responsibility, and yet complimentary. Currently, the Agricultural Marketing and Input Sector in the MoARD with its decentralized structure has developed implementation strategy to coordinate and support in capacity building for the production, supply, distribution and marketing of agricultural inputs system in the country, though fertilizer and improved seeds biased (MoARD, 2005). However, the public system is not functioning in an efficient or coordinated manner for the financing and delivering services thereby support responsive service delivery system due to less recognition for pluralistic service delivery system by the public and poor institutional linkage between different public organizations at different levels, and between public organizations and other players in the system (i.e., private, cooperative/unions, NGOs and civil society organizations). These weak linkages are exacerbated by the public sector's persistent emphasis on yields and technologies rather than a more comprehensive focus on improving the service delivery (Spielman *et al*., 2006). Moreover, lack of responsible organ to coordinates pluralistic service delivery in the sector at all level revealing gap in institutional arrangement for pluralistic service delivery. The institutional instability due to frequent

restructuring of organizational structure and ineffective institutional linkage with in the public sector aggravated the gap in institutional arrangement.

More specifically, the poor functional linkage between cattle breeding ranches, National AI center, Ethiopia Standard and Quality Authority (ESQA) with research and/or extension; and between research and extension, loose relation between federal and regional research institutions are mentioned with in the public. Nevertheless, pluralistic service delivery system demands strong coordination and collective learning among the multiple actors in the system.

- **No mechanism of quality assurance and qualification of service providers**

Quality assurance role is also ignored where the private sector services are not monitored and/or regulated for their quality. For example, WOARD is responsible to monitor and regulate the performance of private veterinary institutions and bull stations. Some quality standards such as animal feed and milk and milk products standards are developed by the Ethiopia Quality and Standard Authority, but not implemented due to lack of responsible actors in the service delivery.

Sector specific

- **Still more enabling environment to stimulate private sector in service delivery**

Development of responsive services requires that policies create an enabling environment for pluralistic development of service supply, and that the public sector is committed to making clear the different roles of the public and the private sectors in delivery of services. In this regard, enabling environment for development of private sector in service delivery is almost lacking and far limited to dairy market and animal feed services. The other lacked enabling environment is lack of equal play field in the market and lack of incentive and backstopping institutions in the private sector development. The public sector is expected to strengthen its efforts in developing capacity of producers in formulating the demand for services, developing favorable conditions for the private service providers (capacity building, incentives), coordinating the various service providers by creating platforms, monitoring and evaluation and quality assurance and taking care of public interests and long-term interventions (infrastructure), which are unlikely to attract private sector investment instead of participating in the free supply of inefficient and ineffective services that can be delivered through well functioning private sector.

Currently, these favorable environments are lacking to occur. The incentive to private sector development is far from expectation. Spielman *et al*. (2006) pointed that despite the growth of private sector in service delivery, some of the key market, organizational, and policy incentives have yet to fall into place in Ethiopia to stimulate private investment in agricultural service delivery. Further more, the recent World Bank measures of ease of doing and starting business in Ethiopia place the country at 102 and 106 out of 178 countries in 2008, respectively and a rank of 58 in dealing with license. The difficulties in starting a business and enforcing contracts in Ethiopia are well documented, and reflect many cumbersome procedures, strict regulations, barriers to accessing credit, and minimum capital requirements (World Bank, 2007).

Services specific

- **Animal health service**

In the country livestock producers depend mainly on public animal health service for free and/or cost recovery arrangements. Moreover, non public veterinary service providers are emerging following market oriented dairy production in the urban and peri urban settings. The government enabling environment for development of private sector in agricultural service delivery has undergone one step in animal health veterinary service through Proclamation No. 267/2002 Article 16 (registration) and 17 (service delivery). The animal health services delivery gives a room for any person to establish animal health station, center or institution upon the fulfillment of the necessary requirements and requires in advance produce a certificate of competence from the ministry or concerned region in order to obtain a business license of animal health station, center or institution. The ministry shall create favorable conditions for the promotion of private animal health services delivery and based upon the nature of the services, define the role and responsibilities of the public and the private sector in the delivery of animal health services. But, this is not yet to come which is pointed as one of the major constraint for the private sector development in the service delivery. Where as, on the basis of its public and private good character, while taking into account any externalities, moral hazard problems, or free rider problems that may accompany the production or consumption of the service, different authors have classified each services and determined the appropriate channel for delivery of services (see, Umali *et al*, 1992; Umali *et al*., 1994; FAO, 1998 and Ahuja and Redmond, 2004).

Apart from gap in institutionalizing rules and regulation, private veterinary services providers are involved fully in the import, wholesaling and retailing of vet drugs and equipments estimated to be over 627 in the country. In 2007, there are 28 firms involved in drug importation, 548 in vet drug retail, 51 in veterinary clinic (including drug dispensation) (Personal Communication-MoARD, 2008). However, the playing field revealed that private animal health service providers are seriously constrained by illegal/unlicensed dug vendors that are charge reduced price where as the public has a role in ruling out the illegal actors. Moreover, these actors are constrained by the bureaucratic registration process to get a license from MoARD and/or its decentralized structures, lack the necessary favorable conditions to get land, incentives and capacity building supports such as leave of absence and incentive for voluntary redundancies of public animal health personnel, subsidized credit and subsidized motorcycle for interested animal health professionals, which are implemented and successful in other countries (Veen and Haan, 1995 and Leonard *et al*., 2000). Service providers involved in the retail and veterinary service still compliance on the veterinary drug supply arguing that the importers do not have responsible staff for drug selection and their current status of shifting to other business like medical equipments importation.

- **Cross breeding**

AI Service

According to Azage *et al*. (2006), problem with efficiency and effectiveness of AI technician and monopolized public delivery of the service are some of the major problems in the country AI system. On top of this, the field AI system loosely linked with the National AI center responsible to produce semen nationally where AI technicians are not getting the required refreshment training, poor monitoring and evaluation and recording system to the point

difficult to trace the success rate, lack of transport and operational cost for the field service and AI technicians involvement in corruption and unethical service delivery are all irritating the inefficient and ineffective field AI service. In addition, absence of mechanism of using the revenue accrued from the cost recovery to expand the service is also a problem.

Improved Bull Service

Improved bull service is one means of getting dairy crosses through private service providers. It is the service that currently gives relief to AI problems, though it is also constrained by different problems such as lack of information on the genotype of the bull, shortage and non-replacement of exotic bulls and disease transmition. Similarly, like other private services, bull service is also not monitored and evaluated for its performance by concerned body though the performances of the bull (disease, pedigree and physical appearance) have paramount influence on the crossbreeding service.

Supply of crossbred cows from dairy farms/farmers

This option of accessing crossbreds is the major one in *Debrezeit* milkshed where 80.3 % of the respondents have got their initial/starter crossbred cow from private dairy farms/farmer. However, it is known for the supply of unknown pedigree, without history records, undesirable traits and expensive price of the cows.

***Supply of crossbred cows from* ranches**

The supply of F1 heifers in the country is organized mainly from the four government owned and operated cattle breeding and multiplication ranches with extension and/or research mandates at Gobe, Abernossa , Metekel and Andanssa (Azage *et al*., 2006 and Workineh and Ababu , 2006). The performance of these ranches to supply F1 heifers is far from smallholder demand due to lack of long term breeding programs and low overall performance to meet their annual average output targets, for example the effective heifer distribution efficiency is only 14.6% at Abernossa ranch between 1994 and 2000 (Ababu *et al*., 2006 and Azage *et al*., 2006). Experience in other countries shows that private ranches have advantage to take on a long term development path based on current and future markets and hence have a better chance of success (Workineh and Ababu, 2006).

5. Options to develop pluralistic service delivery system in the dairy sector

In order to determine appropriate governance structure with in the pluralistic dairy service delivery system, the policy and institutional arrangement for each service is also an important condition. In addition, there are either sector specific or crosscutting options to develop pluralistic service delivery system.

5.1 Service specific options

Advisory service

To analyze option for market oriented public advisory service, the different extension reforms experienced worldwide were referred. According to Andreson (2007) in his background paper for the world development report 2008 analyzed the impact of different extension governance structure reform and come out, decentralization with in the public as one of the major reform

in developing countries, tells more of the difficulties of implementation than the benefits of so doing. Hence, this paper suggests cost sharing arrangement so as to give solutions to the mainly raised problems of the current dairy advisory service: system accountability, supply driven nature, poor incentive systems, shortage of operational costs and working facilities and not covering the urban dairy sub systems. Experience shows that services which are fully or partly paid for by the users are more likely to be driven by demand than services provided free of charge. First of all, user payment guarantees that the demand is genuine and that the users are committed to receiving the advisory service. Moreover, user payment for services is a powerful tool to increase the accountability and incentives for the service providers towards the users (Neuchâtel Group, 2006). Similarly, Gautam (2000) discussed the advantage of cost recovery as it provides appropriate incentives, and hence accountability and client responsiveness; it brings budgetary respite; and it promotes pluralism by allowing alternative providers, particularly private suppliers, to enter the market.

Nevertheless, cost recovery advisory service is not with out practical problem as it excludes less commercial farmers (i.e., poorer farmers and those farming smaller and less favored areas) for whom the value of information is lower and may purchase fewer advisory services. This may entail not only social considerations, but may be an inefficient outcome if the poor have a lesser ability to prejudge the value of information and tend to undervalue it (Anderson, 2007). The resolution of this concern (e.g., Sulaiman and Sadamate 2000) is the stratification of advisory systems by types of clients within the country. That is, smaller-scale and poorer farmers may be served by public advisory or by formats of contract advisory receiving larger shares of public funding (e.g., an association of smaller farmers receives a larger matching allocation to hire advisory staff) (Anderson, 2007).

Gautam (2000) further discussed the relationship between cost sharing arrangement for advisory service and poor farmers, by identifying some pertinent issues such as producer demand for advice, their willingness to pay for it, and their ability to afford the payments. One method of assessing producers' ability and willingness to pay for the service, Contingent Valuation Method (CVM) was used. Results show that 71.3 % of the producers described themselves as willing to pay for dairy advisory service if their income from dairy would increase (Table 5). They also want to pay through cooperative societies. The CVM result showed that the Lower Bound Mean (LBM) of amount which farmers are willing to pay for dairy advisory service Birr 10.36 per visit.

The policy and the institutional options in the urban, and peri-urban and rural sub systems are different. There is a political decision on public advisory service provision for the rural and peri urban settings by the WOARD that can be understood from the huge public investment in deploying 55,000 DAs at 18,000 FTCs in the country. Moreover, the non-existence of private and weak engagement of NGOs in advisory service and the absence of monitoring and evaluation system in the public service limits other realistic options, for example, contracting for the two sub systems. Hence, this paper suggests for transformation of the traditional role of extension to market oriented public advisory service through participating dairy producers for the financing of the service. In contrast, the urban dairy sub system is neither covered nor designed to access advisory service by the public sector. Rather, discouraged to continue dairy production at individual level. However, the urban sub system is covering the majority of the milk market in the milkshed with large number of crossbred cows which demand better

management practices and thereby advisory service. In the meantime, the dairy producers are organized in Ada'a dairy cooperatives. Hence, the cooperative can at least contract advisory service (from competent service provider, for example, *Debrezeit* faculty DVM staff) or recruit its own advisory staff where dairy producers participate in co-financing the advisory service. This does not mean, however, to remain the primary responsibility of the public sector to deliver advisory service in the peri urban and rural settings for the future, but with the perspective to facilitate the development of alternative non public sector structures through supporting capacity and withdrawing as the non public service market starts functioning.

Animal health service

Options for veterinary service entails policy for appropriate division of responsibilities between the public, private and third sector, institutionalizing cost recovery concept of "user-paid" fees for specific services that are acquired from the public veterinary services so as to make the playing field leveled. Here, the role of veterinarians' associations in promoting pluralism in service providers has paramount importance. Their role is appreciated in advocating for the right enabling environment and legislation update, participate in formulation of national animal health policies, and design ways to help private veterinarians to establish their practice,

Crossbreeding service

With regard to cross breeding service, four options are on board: AI, improved bull service, supply of crossbred cows from dairy farms/farmers and supply of crossbred cows from ranches. Based on the current performance of the public AI service and its pure private good nature of the service, this study suggests private AI service delivery in urban and peri urban areas where there is effective demand and government to focus on areas where the private providers are not involved and institutionalize appropriate enabling environment. As to improved bull service, institutional innovation options with regard to monitoring and evaluation, quality assurance and support system to the private bull service delivery could be seen to improve the breeding service especially to rural areas. Options to improve supply of crossbred cows from dairy farms/farmers includes careful identification of the dairy farms and institutionalize contract arrangements for crossbred production with predefined quality and quantity and the contracted farms need to get appropriate enabling environment to facilitate the service. Finally, this paper suggests complete privatization and/or public private partnership to improve the old aged and poorly performing government owned ranches.

Feed supply service

The quality problem (mixing unwanted ingredients) in the feed supply service stipulates institutional innovation to change the role of the public sector or to encourage others to play the role of regulatory (standard and quality systems) and qualification of feed suppliers. The forage development needs innovative research and service delivery for successful supply and/or introduction into the existing farming systems. For example, Ada'a dairy cooperative can engage in contract arrangement with farmers for the production of forage and sell to its members.

Financial services

Organizational innovation is required by the financial institutions to serve the dairy producers in terms of loan size and period and include additional services like livestock insurance as one

options to improve the finance service. In addition, institutional innovation is required to forge network among the finance sector and create a link with other stakeholder in the milk value chain. With this regard, the role of dairy association at all level has paramount importance to advocate for responsive credit system for the sector.

Marketing service

In order to improve the local marketing service thereby making local producers more market oriented and competitive in the market , the following are identified as innovation needs in the sector: organizational innovation to organize milk marketing group in accessible rural and peri urban area to link to milk collectors and processors, institutional and policy changes to stimulate consumption of milk and milk products in the country through generic promotion by the government and brand promotion by the dairy processors. Change in policy making process is also required to participate dairy organizations in dairy related policy making process for example in the process of projecting the amount of milk and milk products demand and supply thereby decision on the import of dairy and dairy products imports.

Livestock research service

Option for the research system concentrates on the institutionalization of agricultural innovation system perspective that gives a room to create network and partnership (eg. public-private) among actors in the service delivery system and making the research system more user-oriented and responsive to demand and hence more relevant and less wasteful, and improving both the management of existing resources and the efficiency of service delivery.

5.2 Sector specific: Options for private sector development

There is a need for support the development of emerging private service providers through capacity building and facilitating enabling environment. Capacity building for organisational development and management, such as financial management, leadership, access to, and handling of credit, situation analysis and action planning are required. For example, in Kenya, the capacities and establishment of emerging private sector service companies is promoted. Services are outsourced to emerging providers; these get capacity building, and the programme is giving first business to them in order to allow them to establish themselves on the market. Also a certification scheme for service providers is being set up (Neuchâtel Group, 2006). Also services that aim at learning on how to gain new knowledge and developing innovations, e.g. undertaking market and value chain research, or experiments with new production and marketing practices, or study visits to places where particular innovations are already in place, which result in better understanding of service delivery and/or the identification of business opportunities. This can be better addressed by back up service either by the public or NGO supported projects and programs.

In the country, this back up services is being taken up by projects and programs. The majority of cases work with existing service providers and focus on enhancing their services, WB-RCBP, IPMS and Land O' Lakes support the establishment of new service providers (advisory service by WB and AI and feed suppliers by the later). The WB-RCBP is working towards pluralistic advisory service through supporting Farmers' Advisory Service Fund (FASF) and Advisory Service Development Fund (ASDF). FASF and ASDF, respectively support the development of demand and supply side of agricultural extension service in Ethiopia. These

backs up services also take the shape of the establishment of new national association (e.g. Ethiopian Animal Feed Industry Association (EAFIA) by Land O' Lakes, Ethiopia Milk and Milk Products Producers' and Processors Association (EMPPA) by SNV, Ethiopia Dairy Association, under process of establishment by Land O' Lakes). SNV has also initiated network of actors in the milk and milk product value chain and the so-called Coordination Groups (CG) are structured to lead this network. The establishment of different associations , network and forums will give room participate in policy research and advocacy work to get policy and public attention for the sector and capacity building, networking and alliance building among the actors for knowledge and resource sharing in the sector. Moreover, association like dairy association at all level can orchestrate actors and coordinate the pluralistic service delivery system at their respective level. This paper identifies the public sector gap and calls for the active engagement of the public sector in However, the public capacitating these emerging private service providers.

5.3 Crosscutting: Option for coordination of actors and systems in the service delivery

Pluralistic service delivery system interventions do not only need to promote access to services for the various individual actors in the sector, but also services that are directed at enabling the actors to better collaborate with one another. There is a need for institutions that enhance the collaboration and coordination along the service delivery such as for example dairy associations/ boards or dairy platforms. There is also often need for more programmatic policy support. Furthermore, pluralistic service delivery system needs to be directed towards the three levels of actors: **service clients, service providers and back-up (support) service providers,** and **to policy makers.** This service system demands attention to reform of both organisations and institutions. More effective organisations are needed to supply services e.g. advisory services, to demand services e.g. producer associations, and to train and facilitate the work of both e.g. support/backup services. These areas of organisational development need to be anchored in institutional structures which promote and regulate the interactions among actors in the service delivery. Hence, actors should be orchestrated and coordinated at all levels through **incentive based dairy platform** that will be lead by dairy associations/boards at respective level. Options for coordination mechanism includes institutionalize quality assurance role, qualifications of service providers, forums for interaction and learning, initiating join activities and participatory monitoring and valuation.

6. Conclusion and Recommendation

Despite the potential for market oriented livestock development, smallholder dairy development performance and its contribution to poverty reduction and economic development has remained very low. Constraints to the development of livestock sector in general and dairy in particular includes shortage and fluctuation in quality and quantity of feed, poor and eroding genetic resource base, poor management practices, diseases, poor market infrastructure, poor service delivery and policy and institutional arrangements. To ameliorate the constraints and realize the potential of the sector, decades of efforts have been made to improve provision of input and support services such as animal health, credit, research and extension services, processing and marketing of milk and milk products. Thus, the livestock production can not continue as business as usual but there is a need towards a

more coordination along the supply chain so as to serve the commercialization of smallholder livestock producer. Subsequently, there is an urgent need to strengthen the livestock services system through technology development and extension, markets and the demand side development, institutional competence and performance and, integrated and co-ordinated service delivery to transform subsistence oriented livestock agriculture to market orientation. The service delivery should be addressed in a system perspective that comprise three levels of intervention, those that should not be addressed individually and in isolation but rather be regarded as a system and seen as interdependent.

1. In an efficient service delivery system, producers must be considered and treated as clients. Clients' demands must be the starting point of service delivery. Hence, the public and/or third sector has to encourage dairy producers to organize them in groups (or dairy cooperatives) so that they can articulate, organize the delivery and share the costs of the services. Subsequently, producer groups (cooperatives) should be empowered for formulating and demanding quality services through strengthening their voice and negotiating power to influence service providers and to claim accountability of providers to the clients. Hence, development of demand side of service delivery is the major component for effective pluralistic service delivery system to happen.

2. Following the emergence of multiple service providers in the dairy related services, the central task is to have efficient pluralistic, decentralized service management and service delivery. Sustainability of efficient pluralistic service requires the availability of competent service providers that respond to diverse demands by dairy producers. This has to be backed up by the development of competent service providers through plat- forming and collaboration for learning and interaction thereby improving the relevance and quality of service, reframe actors' habits and practice for collaboration based on learning and trust, developing quality and standards for the services. This has to be followed by systems qualification of service providers, identify and strategizing for missing competence and role with in the pluralistic service system. WOARD should undergone organizational reform or new actor (dairy plat form/system coordinating body) should be created to coordinate dairy platforms thereby the development of efficient service providers.

3. Policies are required to change the role of the public sector or to encourage others to play different roles or play existing roles more effectively with in pluralistic service delivery systems. Private sector actors and other actors outside government are becoming important players in the dairy service delivery, and public sector must reconfigure their roles and relationships in light of these developments. For example, there are lacks of clear policies that as to what type services to be provided by the public and non public sector and the required favorable conditions for the promotion of the same (for example in animal health services), missing roles (such as regulatory role in animal feed, milk and milk products, cross breeding services quality and standards and coordination of the multiple actors and service delivery system). Hence, producers association (like dairy association, dairy cooperatives , trade unions) and professional association like ESAP, EVA and AESE should participate in policy analysis and advocating for the right enabling policies and legislation update and participate in formulation of the national policies related to the sector.

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Table 1. Types and sources of veterinary service in *Debrezeit* milkshed

Type and source		Sub System						Total	
		Urban		Peri-urban		Rural			
		N	%	N	%	N	%	N	%
Clinical service		**70**	**100.00**	**21**	**43.80**	**0**	**0.00**	**91**	**60.67**
WOARD vet clinic		1	1.40	2	4.20	0	0.00	3	3.30
Debrezeit FVM		4	5.70	3	6.30	0	0.00	7	7.69
WOARD vet personnel on call basis		13	18.60	15	31.33	0	0.00	28	30.77
Private vet clinic		1	1.40	0	0.00	0	0.00	1	1.10
Private veterinarians on call basis		38	54.33	7	14.60	0	0.00	45	49.45
Part time vet personnel on call basis		30	42.90	2	4.20	0	0.00	32	35.16
Ada cooperative veterinarian		16	22.90	0	0.00	0	0.00	16	17.58
No service		0	0.00	27	56.30	32	100.00	59	39.33
Vaccination service		**68**	**97.10**	**47**	**97.90**	**32**	**100.00**	**148**	**98.67**
WOARD vet personnel on call basis		21	30.00	47	97.90	32	100.00	100	67.57
Ada Dairy Cooperative		46	65.70	0	0.00	0	0.00	46	31.08
Private veterinarians		7	10.00	0	0.00	0	0.00	7	4.73
No source		1	1.40	1	2.10	0	0.00	2	1.35
Drug sale		**67**	**95.70**	**41**	**85.40**	**32**	**100.00**	**140**	**93.33**
WOARD vet clinic		4	5.70	2	4.20	8	25.00	14	10.00
Debrezeit FVM		7	10.00	6	12.50	0	0.00	13	9.29
Private vet clinic		26	37.20	30	62.50	32	100.00	88	62.86
WOARD vet personnel		5	7.10	0	0.00	0	0.00	5	3.57
Private veterinarians		11	15.70	3	6.30	0	0.00	14	10.00
Part time vet personnel	During treatment	7	10.00	0	0.00	0	0.00	7	5.00
Ada cooperative veterinarian		21	30.00	1	2.10	0	0.00	22	15.71
No source		0	0.00	8	16.70	0	0.00	8	5.71
Delivery service		**26**	**37.10**	**2**	**4.20**	**0**	**0.00**	**28**	**18.67**
Public health personnel		2	7.70	2	100.00	0	0.00	4	14.29
Private veterinarian		16	61.50	1	50.00	0	0.00	17	60.71
Part time vet personnel		16	61.50	0	0.00	0	0.00	16	57.14
Ada Dairy cooperative		3	11.50	0	0.00	0	0.00	3	10.71
Total (N)		70		48		32		150	

Source: Survey Result (2007)

Table 2. Source of dairy feed in the milkshed

Feeding type/source	Sub System						Total sample	
	Urban		Peri-urban		Rural			
	N	%	N	%	N	%	N	%
Hay	**34**	**48.57**	**6**	**12.50**	**9**	**28.13**	**47**	**31.33**
Ada'a milk cooperative	18	52.90	0	0.00	0	0.00	18	38.30
Own farm	0	0.00	6	100.00	9	100.00	15	31.91
Others' farm	2	5.90	1	16.70	0	0.00	3	6.38
Hay Suppliers	16	47.10	0	0.00	0	0.00	16	34.04
Processed feed	**47**	**67.14**	**4**	**8.33**	**1**	**3.13**	**52**	**34.67**
Ada'a milk cooperative	15	31.90	0	0.00	0	0.00	15	28.85
Feed processing	39	83.00	0	0.00	0	0.00	39	75.00
Feed retailers	0	0.00	4	100.00	1	100.00	5	9.62
Processing at home	1	2.10	0	0.00	0	0.00	1	1.92
Nough cake	**63**	**90.00**	**30**	**62.50**	**27**	**84.38**	**120**	**80.00**
Feed retailer	61	96.90	30	100.00	27	100.00	118	98.33
Oil processing firm	2	3.20	0	0.00	0	0.00	2	1.67
Wheat bran	**68**	**97.14**	**30**	**62.50**	**23**	**71.88**	**121**	**68.00**
Feed Retailers	49	72.1	30	100.00	23	100.00	102	84.30
Flour factories	37	54.4	2	6.70	0	0.00	41	33.88
Green grass	**56**	**80.00**	**45**	**93.75**	**24**	**75.00**	**125**	**83.33**
Own farm	0	0.00	45	100.00	24	100.00	69	55.20
Others' farm	56	100.00	6	13.33	1	4.20	63	50.40
Crop residue	**69**	**98.57**	**47**	**97.92**	**32**	**100.00**	**148**	**98.67**
Own farm	0	0.00	47	100.00	32	100.00	79	53.38
Others' farm	69	100.00	14	29.80	0	0.00	83	56.08
Factor by product (molasses and Urea)	**35**	**50.00**	**5**	**10.42**	**1**	**3.13**	**41**	**0.00**
Ada'a cooperative	34	97.10	0	0.00	0	0.00	34	82.93
Feed retailers	3	8.60	0	0.00	0	0.00	3	7.32
Feed processing (ALEMA)	0	0.00	5	100.00	1	100.00	6	14.63

Source: Survey Result (2007)

Table 3. Details of private feed suppliers in the milkshed

Type	Number and/or name of the firm	Specific feed supplied	% producers' serviced in the milkshed	Service area dimension
Floor and Biscuit /macaroni factories	*Ada'a* floor and pasta factory in DZ East Africa Floor Factory in DZ Awash floor and biscuit factory in DZ	Two grade of wheat bran	33.88 %	Within and outside Milkshed including export
Animal feed processors	Bora animal feed in DZ Alema animal feed in DZ	Concentrate feed (poultry & dairy)	75.00 %	Within and outside Milkshed
Private dairy farm	Genesis farm in DZ Almaz Farm in DZ	Concentrate feed (poultry & dairy)	0	Within and outside Milkshed
Animal feed retailers	About 15 retail shops in *Debrezeit* Retail shops in *Ada'a* district out of *Debrezeit* town (number not known) Micro and small enterprises (eg. Ude kebele)	Wheat bran Nough cake Processed feed Factory products (Molasses and Urea)	84.3 % 98.33 % 9.62 % 7.32 %	Milkshed
Hay supplier	Hay transporters and retailers in DZ (Number not known) One large scale and export oriented feed supplier in DZ	Hay	34.04 %	Within and outside Milkshed including export

Source: Survey Result (2007)

Table 4. Main actors' recommendation for coordinating dairy service delivery system in the milkshed

Key actors	Relative strengthen	Relative importance rate
	WOARD perception	
WOARD: Livestock Department	Mandate, presence of technical experts (multidisciplinary) and field level staff and Political power	1
DzARC	Control of the technology	2
Land O' lakes	Financial capacity	3
	DzARC perception	
DZ ARC	Experience of coordinating wheat coordination group , better financial and logistics capacity and presence of technical capacity	1
WoARD	Political power and presence of field level staff	2
Yerer Union	More closer to dairy producers Finance control especially for input credit	3
	HUNDEE perception	
WOARD	Staff up to field level, mandate, political capital	1
Dairy cooperative	Cooperative member mobilizing capacity	2
Hunde/ local NGO/	Financial capacity	3

Source: Survey Result (2007)

Table 5. Distribution on variables relating to willingness to pay for dairy advisory service

Variables	Total sample	Sub system		
		Urban	Peri-urban	Rural
Willing to pay (%) *	71.3	71.4	72.9	68.8
Reason for not willing to pay				
I do not trust in improving the service through payment	14.6	0.0	30.8	20.02
I could not afford	55.8	65.0	53.8	40.0
It is the responsibility of government to provide the service	30.2	35.0	15.4	40.0
Maximum willingness to pay Birr/Visit				
5 Birr	12.1	14.0	5.7	18.2
10 Birr	34.6	24.1	37.1	54.5
10-20 Birr	32.7	44.0	28.6	13.6
> 20 Birr	20.6	18.0	28.57	13.6
Reasons for the maximum willingness to pay				
I couldn't afford more than this	39.8	52.0	32.3	22.7
I think it worth this amount	44.7	44.0	51.6	36.4
Government should cover the rest	15.5	4.6	16.1	40.9
Self evaluation on the willingness to pay				
Not able	22.4	32.0	14.3	13.6
Able	65.4	62.0	60.0	81.8
Well able	12.1	6.0	25.7	4.5
Preferred mode of payment				
Individually/personally	17.5	18.4	25.0	4.5
With other producers	1.9	4.1	0.00	0.00
In cooperative	80.6	77.6	75.0	95.5
Conditions that will enhance payment				
Relevance of the advisory service	15.9	6.0	28.6	18.2
Effectiveness and efficiency of the development agent	9.3	12.0	5.7	9.1
Improvement in production output and market	36.4	52.0	28.6	13.6
Improved income from dairy	38.3	30.0	37.1	59.1
Willing to pay (N)	107	50	35	22
Total (N)	150	70	48	32

*- There is no statistical significance across the sub system (χ^2 =0.003)

Source: Own Survey (2007)