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# **BDS Report for Azerbaijan IGP-BDS Project # 1064**

***Mercy Corps Cluster Access to Business Services (CABS) Program  
in Rural Azerbaijan***

**microREPORT #83**

**USAID/EGAT/MDD  
Weidemann Associates, Inc.**

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**BDS REPORT FOR AZERBAIJAN IGP-BDS PROJECT # 1064**  
**Mercy Corps Cluster Access to Business Services (CABS) Program in**  
**Rural Azerbaijan**

**FINAL REPORT**

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# EXECUTIVE SUMMARY

## Overview

This study of Business Development Services in Azerbaijan is part of a broader study, supported by USAID/EGAT/MD, to explore the contributions of the Business Development Services (BDS) market development approach to strengthening micro- and small enterprises (MSEs) and to the amelioration of poverty. This research is based on a USAID-funded project implemented by Mercy Corps entitled *Cluster Access to Business Services (CABS)*. The purpose of the Mercy Corps project was “to improve profitability for clusters of rural poor and women micro-entrepreneurs by increasing access to a network of trained veterinary and production advice service providers resulting in a significant expansion of the service and final goods markets.”

This study was designed to assess the impacts of the project on business service providers (veterinarians) and farmers in the Massali and Lenkeran regions of southern Azerbaijan. The longitudinal study on which this report is based was conducted in two stages:

- 1) an initial field study carried out in December 2003; and
- 2) a replication of the field study 3 years later, in January, 2007.

The project appeared to be successful in helping participating veterinarians to increase the number of types of services they provide to farmers, to improve veterinarians’ access to quality drugs, and to expand veterinarians’ client base. The veterinarians who received BDS training had higher calculated profits in the previous month than veterinarians who were not trained by the project, though they did not have higher estimated profits for the full year of 2006.

Farmers who participated in Farmer Clusters organized by Mercy Corps were found to have bought medicines more frequently and to have both higher incomes from sales and higher profits than farmers who did not participate in those farmer groups. Farmers who accessed veterinary medical and non-medical services more frequently have significantly greater income from sales, expenses, and profits than farmers who purchase fewer veterinary services and inputs.

The reported mean incomes from sales of all studied groups, whether farmers or veterinarians and whether project participants or non-participants were lower in 2006 than they had been in 2003. This is likely to be at least somewhat related to the increase in animal deaths from contagious diseases, including an avian flu scare. This, coupled with reduced demand for meat, may have reduced farmers’ ability to pay for veterinary services. However, while veterinarians reported lower incomes in 2006 than in 2003, they also had lower costs, so they reported higher profits for 2006 than for 2003 (See Table 9 for details). Those farmers who participated in the project had significantly higher profits in 2006 than farmers who did not receive support from the project (See Tables 17-19 for details).

The second phase of the research was conducted more than a year after the project had concluded its activities in the region. The fact that many of the practices promoted by the project are still in use, coupled with the fact that there are still significant differences between veterinarians who participated in the project and those who did not - and between farmers who participated in the project and those who did not – show that project impacts have been sustainable beyond the life of the project itself.

## The Mercy Corps CABS Project

The goal of the Mercy Corps CABS project was to improve profitability for clusters of rural poor and women micro-entrepreneurs (MEs) by increasing their access to a network of trained veterinary and production advice service providers, resulting in significant expansion of the service and final goods markets. The objectives were 1) ME: Increase sales by an average 35% for 6,958 micro-entrepreneurs—of whom 58% are women—through greater access to services via 67 client clusters; 2) Provider: Strengthen the capacity of a network of 90 veterinarians and veterinary suppliers to provide innovative and quality services through improved business and marketing skills, resulting in an 87% increase in profitability; 3) BDS Market: Expand the veterinarian and production advice services markets by 70% and 59% respectively [and] sustain expansion through network and cluster revitalization and development; and 4) Product Market: 22% increase in sales volume for meat products in the target area over three years. <sup>1</sup>

The Mercy Corps project functioned as a BDS facilitator. Through this lens, the project addressed key elements along the value chain. This helped both veterinarians and farmers improve their production and improve their links to markets - and thus reduced the risks for both. It assisted veterinarians and farmers to build networks that highlighted both individual and group benefits. On the supply side, the project facilitated building the capacity of local private service providers (primarily veterinarians) to improve their services and expand their client base. In the latter part of the project, Mercy Corps supported the establishment of a feed production business that supplied a range of animal feed products to local farmers. On the demand side, the project facilitated the development of clusters of farmers (micro-enterprises) to assist them to improve their own profits by raising their awareness about and promoting greater access to veterinary services. All told, in Lenkeran and Massali (the regions where the project initiated its work in this sector and where this research was conducted), the project worked with 49 Farmer Clusters which included the participation of 5,711 farm microenterprises.

Note that this research was not intended as an evaluation of the of whether the Mercy Corps CABS project achieved its objectives. Rather, this research looks at specific aspects and attributes of business development services themselves.

## Methodology

The first phase of this longitudinal study was conducted through quantitative questionnaires, semi-structured in-depth interviews, focus group discussions and observations in late November and December of 2003. The results from the initial phase of the research provided the baseline and basis for assessing changes due to project for the final report. In January 2007, the initial

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<sup>1</sup> The project was originally intended to be carried out in Massali and Lenkeran, and later expanded its reach to cover other regions of the country.



research was replicated, with a few additional questions designed to cover new developments in the region.

## Quantitative Data Collection:

*Veterinarians:* In 2003, 100 veterinarians were interviewed in Massali and Lenkeran, all of whom were men. Fifty of these veterinarians were participants in the Mercy Corps project (the Experimental Group) and 50 veterinarians were not project participants (the Control Group). Since 109 veterinarians were registered in Massali and Lenkeran at the time, this sample represented nearly a full census. In 2007, 99 veterinarians were interviewed: 49 Mercy Corps Participants and 50 in the Control Group.

*Farmers:* In 2003, a total of 313 farmers were interviewed in Massali and Lenkeran. Of them a) 133 were Mercy Corps Participants and 180 were in the Control Group; b) 162 were men and 151 were women; and c) 172 were from remote villages and 141 were from villages close to large towns. In 2007, a sub-sample was taken from the set of farmers interviewed in 2003. Interviews were conducted with 159 farmers in 15 villages, 8 of which were home to a Farmer Cluster supported by the project. Seventy-four of the repeat respondents were project participants and 85 of them were part of the control group.

Qualitative Data Collection: In both 2003 and 2007, qualitative research was done through 16 semi-structured in-depth interviews, 6 focus groups, and observations. Four in-depth interviews were conducted with veterinarians, two with project participants and two with veterinarians from the control group. Thirteen veterinarians participated in two focus group discussions. Eight in-depth interviews were conducted with farmers. Half of these were with women and half with men. Half were with farmers who participated in Farmer Clusters organized by Mercy Corps and half were non-participant farmers. Twenty-eight farmers participated in focus group discussions: half were men and half were women, and half were project participants while half were not.

## Considerations for Interpreting the Data

- *Control and Experimental Groups were Appropriate for Comparison:* Overall, analysis based on the 2003 field survey showed that both the veterinarians and farmers who were participating in the Mercy Corps project were quite similar to their non-participating Control Group counterparts. With a few exceptions, the groups were quite comparable and are reasonably well-suited for straightforward comparison and hypothesis testing.
- *Non-participating Veterinarians do not constitute a pure “Control Group:”* During the project’s second year, Mercy Corps strongly encouraged the participating veterinarians to share their new skills and knowledge with their non-participating counterparts. While this would likely not have the same impact as direct participation in the project, and while the veterinarians who did not participate in the project had a lower opinion of the extent and utility of the information sharing than did the veterinarians who directly participated in the project (see Hypothesis 1C below), there was still some sharing of project benefits.
- *Source of Decline in Incomes:* Results for all of the sub-groups of interest to this study - veterinarians and farmers, participants and non-participants, women and men – show a decline in the mean estimated year’s income. Reasons for this decline cited by respondents include a surge in animal deaths due to serious diseases, inflation, and a depressed local economy. However, it is possible that there may be a recent shift in respondent bias towards

underestimating income when speaking to strangers or an enumerator bias (since different enumerators did the field work in 2003 and 2007). Still, the fact that both mean estimated incomes and estimated expenses declined gives credence to the idea that people's financial situation was indeed worse in 2006 than in 2003.

- *Money:* All 2003 financial information reported here is listed after adjusting for the overall 18% increase in inflation between 2003 and 2007 (according to the CIA World Factbook). This method of controlling for inflation is not completely accurate, however, as input and product prices in Massali and Lenkeran may not have changed at the same rate as overall inflation in Azerbaijan. ). At the time of the field study in January 2007, a new manat was worth US\$ 0.913.
- *Gender:* Women who participate in Farmer Clusters may be self-selected as women who feel fewer impediments in talking with non-family men in general and veterinarians in specific. Note, though, that no women declined to be interviewed for this survey.
- *De Facto Women-headed Households:* It was not possible to identify women-headed households for these surveys. This was in part because we were specifically requested by Mercy Corps staff not to do so for cultural reasons. In part it was because a woman without a husband living in the home would often identify a male relative (e.g., her father, father-in-law, uncle or brother - or even her oldest son) as the head of the household and central decision-maker - even if that person were elderly or not yet an adult and it was she who was the de facto head of household, making the day-to-day decisions for the house and farm.

## Context for the Findings

Agro-economy: Many informants said that the Massali and Lenkeran region was economically stressed, and that there were fewer jobs at the same time as prices were rising. A number of interlocking factors that would stress farm microenterprises were reported by respondents, including a) an increase in the price of hay and other animal feed; b) reduced demand for red meat because of the economic slowdown (as reported by the butcher who was interviewed); c) increased animal deaths due to disease; and d) a cycle in which animals sickness and deaths negatively affected household finances and thus limited the funds available for purchasing and maintaining animals.

The regions of Massali and Lenkeran where the project had worked was unusually strongly affected by hoof and mouth disease and anthrax in the year prior to the final field study. There was also an avian flu scare that had enormous impacts, both on poultry populations and on farmers' and consumers' attitudes towards raising and eating birds. Many animals and birds sickened and died or were destroyed. This had a dual impact on veterinarians. First, they had additional business when animals were getting sick. Indeed, veterinarians in the areas where the diseases hit hardest had higher profits than the veterinarians in more isolated, less affected areas. (This points to a paradox in working toward improving veterinarians' profits: robustly healthy animals require less veterinary assistance than sick animals.) Second, the wake of the diseases left both fewer animals for veterinarians to take care of and farmers with fewer healthy animals and thus fewer resources to pay for the veterinary services that they needed for the animals that they still had. This was combined with national inflation and a regional economic

slow-down that left consumers with less ability to pay for meat (sales of beef showed particularly low elasticity in the local markets) and animal products. In sum, farmer income from their animals was lower in 2006 than in 2003.

Veterinarians: Veterinarians cited earnings from vaccines, medicines, emergency care, artificial insemination, birthing or natural breeding services, equipment and tool sales, marketing and price information, and production advice. The inputs that veterinarians paid for included fuel and other transportation expenses, utilities, communications, advertising, medicines, gloves, syringes, and a variety of small tools.

Farmers: Farmers generally raised a mix of animals; among the most common were cows (for milk and meat), chickens and other fowl, and sheep. They sold their animals and animal products at farmgate and in local and regional markets.

## **FINDINGS**

### **Overall BDS Impacts**

The project appeared to be successful in helping participating veterinarians to increase the types of services they provide to farmers, to improve their access to quality drugs, and to expand their client base. While the fact that these ostensible business improvements did not result in significant increases in participating veterinarians profits is unexpected, it may be at least somewhat related to the efforts that the project made to have participating veterinarians extend the information acquired from the project trainings and other project benefits to non-participating veterinarians.

While participating veterinarians rated the BDS trainings they received from the project very highly (86% of the ratings were “extremely satisfied”) and a number of veterinarians lamented the absence of sources of BDS outside of the project, when veterinarians were asked in a focus group whether they would pay for additional training, the response was negative: “we wouldn’t be able to pay because we have small incomes.”

Both farmers and veterinarians – and both project participants and non-participants – reported lower incomes and expenses in 2006 than they had in 2003. The income declines seen by farmers are likely linked to the increase in animal deaths from contagious diseases and to reduced demand for meat by consumers facing inflation and a difficult local economy, which in turn would have reduced their ability to pay for veterinary services. However, veterinarians reported higher profits for 2006 than in 2003 (which may be a result of better business management as well as of reduced costs). As for farmers, even in the face of the difficult (and, one hopes, fairly unusual) circumstances, those who participated in the project had significantly higher profits in 2006 than farmers who did not receive support from the project.

## **Veterinarian Results: Impacts of the Mercy Corps BDS Project**

### Impacts of BDS Training

- Veterinarians who received BDS training directly from the Mercy Corps project
  - have a significantly higher number of clients than the veterinarians who did not receive the training
  - offer significantly more types of services (both medical and non-medical services) to farmers than veterinarians who did not receive training.
  - had a significantly higher calculated income in the previous month
  - had significantly higher estimated incomes, expenses and profits in 2003 (after 1 year of project implementation) but did not have significantly different estimated income, expenses or profits in 2006

### Impacts of Demographics on Veterinarians' Business

- Age was not correlated with income or profits
- Veterinarians who have completed university training
  - have significantly more clients than veterinarians who have only completed technical school
  - had significantly greater calculated income, expenses and profits in the previous month
  - did not have significantly higher estimated income, expenses or profits during the full year of 2006

### Impacts of Business Location and Initial Size on Veterinarians' Performance

- Veterinarians with a business located in a large town or in one of the regional capitals
  - had significantly higher incomes and profits in 2006 than those whose business is based in a remote village or small town
  - do not have significantly more clients
- Veterinarians with a larger volume of sales in 2003
  - did not gain significantly more customers by 2007 than veterinarians who had smaller businesses in 2003
  - do not have significantly greater profits in 2006 or a significantly better change in profits since 2003
  - had a significantly greater drop in business volume (sales and expenses) between 2003 and 2006

## **Farmer Results: Impacts of the Mercy Corps BDS Project**

### Impact on Farmers of Mercy Corps BDS Training for Veterinarians

- Farmers who participated in Farmer Clusters organized by Mercy Corps
  - have significantly higher incomes from sales and significantly higher profits in 2006 than those who did not participate in farmer groups
  - buy medicines significantly more frequently
  - spend significantly more on animal husbandry products (tools, equipment, and specialized feed)
- Increased use of veterinary services and inputs:
  - Farmers who purchase veterinary medical services and access veterinary non-medical services more frequently have significantly greater income from sales, expenses, and profits in 2006 than farmers who purchase fewer veterinary services
  - Farmers who spend more on veterinary medical services
    - have significantly greater income from sales in 2006 than farmers who purchase fewer veterinary services
    - do not have significantly greater profits from sales of animals and animal products
  - Farmers who raised animals for household use and who participated in farmer groups significantly increased their purchases of veterinary services and products, while participating farmers who raised animals for sale did not

### Impacts of Farmer Demographics

- Younger farmers
  - call a veterinarian for emergency care for sick animals significantly more frequently and spend significantly more on emergency care than do older farmers
  - do not access significantly more non-emergency animal husbandry services and inputs and do not spend significantly more on these
- Farmers with higher levels of education
  - purchase animal medicines significantly more frequently than farmers with lower levels of education
  - do not access services and inputs (besides medicines) significantly more frequently
  - do not spend significantly more on any services or inputs
- Gender
  - Women

- do not purchase significantly fewer services or inputs than men
- do not spend significantly less on services or inputs
- Women participants in project-sponsored Farmer Clusters
  - spend significantly more on animal husbandry services and inputs than women who did not participate in a farmer organization
  - do not use any veterinary medical or non-medical services or purchase inputs significantly more frequently

### Farm Location and Size

- Farmers who live in remote areas
  - purchase medicines and medical services in general significantly fewer times than farmers who live closer to large towns
  - spend significantly less on medical services
- Farmers with higher numbers of poultry
  - get vaccines, medicines, emergency care, non-medical veterinary services, and animal husbandry inputs significantly more frequently than farmers with fewer poultry
  - spend significantly more on vaccines and animal husbandry inputs (specialized feed and tools)
- Farmers with higher numbers of cattle
  - get vaccines significantly more frequently than farmers with fewer cattle
  - spend significantly more on animal husbandry inputs (specialized feed and tools) and significantly more on ordinary feed
- Farmers who own and/or rent larger amounts of land get medical services and animal husbandry services and inputs significantly more frequently than farmers with less land

## **Broader Considerations for Similar Future Projects**

**Links between Frequency of Use of Veterinary Services and Farmer Profits:** Ultimately, veterinarian profits are tied to farmer profits. Farmers' biggest limitation to increasing expenditures on veterinary input in both 2007 and 2003 was "I can't afford it." According to World Bank statistics, some 68% of the people the southern region of Azerbaijan live below the poverty level. As such, lack of cash in hand (or poultry in hand, for that matter) for increasing their input purchases, can be a real factor.<sup>2</sup> However, "affordability" is to some degree a judgment. For farmers, the link to greater profits appears to be in the frequency of use of veterinary services rather than the amount spent on those services. Farmers who participated in the project used veterinary medical and non-medical services more frequently and had higher

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<sup>2</sup> Note that while farmer poverty is certainly a serious factor in this region, the poverty does not appear to be as intractable a factor in the value chain here as it did in the region of Uganda that was the focal point for one of the companion studies in this assessment of BDS projects. In Azerbaijan, the market systems and infrastructure to enable farmers to sell their products, while not ideal and while still in transition from the former Soviet system, appear to be more functional than in the area of Uganda where the research was conducted.

profits. Greater spending on veterinary inputs is not, however, linked to higher profits. It appears that one of the successes of the project was in working with veterinarians to help farmers learn to assess both when they needed help and what kind of help they needed (and did not need) and so to use veterinary services both more frequently and more efficiently.

**Scale of Impacts on Participating Veterinarians:** The impact of the Mercy Corps BDS project on participating veterinarians may appear in this analysis to be more muted than it actually was in reality. During the project's second year, Mercy Corps strongly encouraged the participating veterinarians to share their new skills and knowledge as well as their access to higher quality drugs with their non-participating counterparts, and the difference in business outcomes between the control and experimental groups may have been affected by this. This is certainly to be applauded in terms of project impact on the people in Massali and Lenkeran. However, it created a less than ideal context for this research.

**A Project's Potential for Skewing the Market:** Development projects, by the very nature of their limited resources, necessarily benefit some people more than others. At the same time, efforts should be made to minimize externalities such as potential inadvertent negative impacts on non-participants. In the case of a project like this one, efforts should be made to avoid any expansion of one veterinarian's (or other business) customer base or profits at the expense of another's where this has occurred primarily due to access to project services on the part of the original participants. Clearly, we live in a world that views competition as good and in which those veterinarians (or other businesspeople) who have been able to expand their customer base can be judged as simply more successful businesspeople than those who have lost customers. However, unequal access to productive resources can artificially tip the balance in ways that are not necessarily favorable in broader terms of veterinary service coverage and poverty reduction - especially in the marginal areas that such projects are likely to target. During the initial survey in 2003, many non-participating veterinarians expressed frustration at not having access to project benefits and said that they were losing customers to veterinarians with access to better animal drugs and new information. It is recommended that shifts in customer bases or other potentially "zero-sum" factors be tracked (at a minimal level) by projects. The fact that Mercy Corps recognized this and addressed it by asking participating veterinarians to share with others was likely good for both the veterinarians and farmers in the region.

**Gender:** One of the assumptions upon which the project was designed is that cultural constraints severely limit women's access to veterinarians. As such, this issue was afforded a good deal of attention in both the qualitative and quantitative elements of this research. Mercy Corps paid very close attention to gender issues in this project, and 37% of the project's clients were women. The project helped set up separate women's Farmer Clusters (farmer associations) and worked with veterinarians on how they could best provide support to women. Veterinarians interviewed for this research described few limitations on their work with women. At the same time, Mercy Corps staff reported in 2003 that there had been cases in the region where animals had died because a woman was alone at home and was waiting for her husband to call the veterinarian (though whether this was due to her reticence in speaking to the veterinarian or her level of decision-making control over family resources was not clear). When women described their own interactions with veterinarian, they described few impediments, saying that they felt comfortable taking an active role in calling a veterinarian for help and talking with him after he had arrived. However, when women described interactions with veterinarians when their husbands were present, women tended to show themselves taking a backseat role, saying, for instance, that "out of respect" the veterinarian would discuss animal health with their



husband while the woman herself might “quietly milk the cow.” This points to the importance not only of helping veterinarians and women find ways of communicating effectively with each other, but also of helping women and the men in their households better understand the value of the women’s improved knowledge about animal care. One unanticipated result found here was it appears that men may have benefited more from participation in a Mercy Corps-supported Farmer Cluster than women did, at least in sense that participating men’s profits were higher than participating women’s profits were (even though they did not have significantly different numbers of cattle and poultry). This dynamic merits close attention in future projects of this type.

**Sustainability:** Since the second phase of this research was conducted more than a year after the project ceased its direct activities in Massali and Lenkeran, the fact that there are still strong differences between project participants and non-participants is both a testament to the success of the project and an early indicator for the sustainability of the project’s impacts. At the same time, some of the project impacts that were apparent early on have diminished somewhat. For instance, the number of different types of medical and non-medical services that veterinarians provided in 2006 was lower than it was in 2003 (several months after the project began). Anecdotally, 2 farmers mentioned during in-depth interviews that their farmer cluster no longer meets. It appears that some of the participating veterinarians may not have continued the promotional and information-providing visits to farmers that they began under the project. Several farmers who had been in farmer clusters mentioned that visits from their veterinarian had fallen off. During a focus group of men in Atchalar who had participated in a farmer cluster, the recommendations that they gave for local veterinarians included several suggestions along the lines of “They should visit us periodically,” “They should gather 4-5 people to their house and teach them,” “If they do, we will have less sick animals,” and “They should come to village and teach farmers, like Mercy Corps did.” Farmers appeared to be interested in having veterinarians continue the support services that the project had encouraged them to provide.

## I. Purpose of the Study

This study of Business Development Services (BDS) in Azerbaijan is part of a broader study, supported by USAID/EGAT/MD, to explore the contributions of the Business Development Services (BDS) market development approach to strengthening micro- and small enterprises (MSEs) and to the amelioration of poverty. Companion studies are being implemented in Uganda and India. This work will contribute to measuring the impacts of the IGP (Implementation Grant Program) projects on microenterprise (ME) performance and poverty measures. The results will provide information that will help practitioners gain a better understanding of the impacts and of the cost effectiveness of current approaches to BDS market development (including methods for conducting impact assessments) and to improve understanding of good practice in BDS programming.

The study reported here is based in a USAID-funded project carried out by Mercy Corps, entitled *Cluster Access to Business Services (CABS)*. This project was implemented in the southern Azerbaijan regions of Lenkeran and Massali. The purpose of the Mercy Corps project was “to improve profitability for clusters of rural poor and women micro-entrepreneurs by increasing access to a network of trained veterinary and production advice service providers resulting in a significant expansion of the service and final goods markets.” This study was designed to examine changes in the business situation of small farmers who raise animals and of the business services providers - veterinarians - who provide them with animal care.

This report summarizes the impacts of the Mercy Corps BDS project on veterinarians and farmers in the Massali and Lenkeran regions of southern Azerbaijan. The longitudinal study had two parts: 1) December 2003 field work to establishing the business situation of the target population (rural poor and women micro-entrepreneurs) and evaluating the business situation of the business service providers (local veterinarians) themselves at that time and 2) replicating the research through a follow-up study with the same people three years later, in January of 2007.

The quantitative data covers three substantive aspects of the veterinarians' business: 1) the structure (e.g., customer base, marketing practices, and type of animals treated); 2) medical and non-medical services and inputs offered; and 3) costs and sales. For the farmers, the quantitative data covers 1) attributes of their animal husbandry; 2) use of medical and non-medical services and inputs for raising their animals; and 3) costs and sales. As a complement to this, the qualitative data delves into how farmers and veterinarians interact, how they make choices about their businesses, and how the project has affected the regions.

For the results of the baseline study conducted in the 2003, please see Warne, Rees (Weidemann Associates, Inc.), *“Initial Phase Report for Azerbaijan: IGP-BDS Project #1064: Mercy Corps, Access to Business Services (CABS) Program in Rural Azerbaijan, (October, 2004) available from the USAID/EGAT/MD, Weidemann Associates, Inc., or the author.*

## II. Overview of the Sector, Value Chain, and Project Activities



*Sheep grazing in Bilasar*



*In the Lenkeran market*

### 1. Overview of the Sector and Value Chain

As context for this discussion of sector supply chains, it is important to keep in mind that until 1992 Azerbaijan was part of the USSR. Its transition to existence as an independent country has not always been smooth or easy. Poverty skyrocketed in the early years as the soviet infrastructure was largely dismantled. Massali and Lenkeran were particularly hard hit when collective farming enterprises closed and processing facilities were dismantled. The cropping mix shifted dramatically, and collective livestock operations were closed, animals sold (primarily as meat) and families began to be responsible for very small individual farms and whatever animals they could afford to keep. For their part, veterinarians shifted from being fully employed by the state to being nominal state employees (responsible for vaccinations and animal health inspections) but dependent on sales of other services to individual, mostly very small, farms as a large part of their veterinary income. While Azerbaijan was part of the USSR, access to many agricultural inputs in the planned economy were provided or mediated by the state, through collective farms, and through centralized processing facilities. In independent Azerbaijan, the Veterinary Department of the Ministry of Agriculture has been restructured and has largely limited its role to providing vaccinations and animal health inspections. This has left a vacuum in the information and support aspects of the value chain for small-scale animal production.

The Mercy Corps project addressed key elements along the value chain. This helped both veterinarians and farmers improve their production and improve their links to markets - and thus reduced the risks for both. In order to provide information on the baseline state, the following section is focused on the value chain *in absence* of the project.

## **1. A. Livestock and Poultry Value Chains**

### **1.A.i. Input Markets for Livestock and Poultry Farmers**

Inputs for livestock and poultry sector production can be roughly categorized as 1) feed [including grazing]; 2) labor; 3) information, knowledge or expertise; 4) medical care; and 5) capital. The central links in the value chain are a) sellers of animal feed; b) farm households; c) extended family and neighbors; and d) veterinarians and veterinary drug stores (all of which are run by veterinarians). Improving access to and quality of medical care and knowledge/expertise inputs through BDS for veterinarians was at the center of the CABS project, and it inserted its assistance into categories 3 and 4, thus becoming a short term link in the value chain.

In Massali and Lenkeran today, feed is handled primarily on an individual basis, with people feeding their animals products from their own farms, buying hay or other inputs from other farmers, and or grazing their animals on their own or rented land. In addition, the project supported the establishment of a local animal feed business to provide specialized feed for improved animal nutrition. Labor is almost exclusively provided by the household. There are few sources of formal credit appropriate to farmers' needs.

Production knowledge and expertise are primarily acquired through family members and through more experienced and successful farmers in the community and surrounding areas. Specifically medical information is sought from the same sources and from veterinarians – usually during a medical visit to handle that specific problem and sometimes through conversations at a local teahouse (where all clientele are men). Basic animal medical care is generally provided by household members using drugs purchased from a veterinarian or shop, while a veterinarian is more likely to be called in for complex problems and issues that put the animal's life at risk. Both understanding of the importance of professional care and money to pay for veterinary care are factors in the decision of whether or not to call a veterinarian.

### **1.A.ii. Output Markets for Livestock and Poultry Farmers**

The central aspects of selling output includes 1) processing; 2) price information; 3) market linkages; and 4) transport. For small-scale farmers in Massali and Lenkeran, the central links in this value chain are a) farm households; b) extended family and friends; c) middlepeople; d) retail venders (usually people who run stall at a bazaar); and e) final consumers. The Mercy Corps project is part of this value chain in that it is currently facilitating access to pricing and marketing information, largely through veterinarians, and is facilitating linkages between newly formed Farmer Clusters and retailers.

While Azerbaijan was part of the USSR, processing was done through large processing facilities. In Massali and Lenkeran today, most dairy products are processed in the home. For

sales of meat, there are some medium-sized business that buy animals from farmers and fatten the animals for market and others that buy products at farmgate and sell them directly in the two regional bazaars or to other venders or end consumers. Information about pricing and information about marketing is generally acquired from neighbors and from middlepeople (not necessarily the most advantageous source from the farmers' point of view). Transport to market is a serious challenge for farmers in villages farther from the two regional bazaars, villages in more mountainous regions, and villages with poorly maintained (currently largely un-maintained) roads. While some middle people have a large truck that can navigate most roads during most seasons, transportation is likely to remain a constraint in the near future. There is some question as to whether there is enough local demand for meat and dairy products, given generally low income levels in the region, to absorb additional output. At the same time, potential for improving links to markets outside of Massali and Lenkeran, such as in the capital, still exists.

## **1.B. Veterinary Services for the Livestock and Poultry Value Chains**

### **1.B.i. Input Markets for Veterinarians**

Veterinary business inputs can be categorized as 1) labor; 2) credit; 3) veterinary tools and other supplies; 4) veterinary drugs; and 5) information, knowledge or expertise. The latter two are the elements of concern for the BDS aspects of the Mercy Corps project and for this report. Labor is supplied by the veterinarians themselves. The main links in the value chain for veterinarians are a) the Veterinary Department of the Ministry of Agriculture; b) veterinary drug retailers; and c) retailers of other supplies.

Again, in the USSR, the planned economy affected the organization and provision of all of these inputs. Veterinarians interviewed as part of this research said that they knew of no sources of BDS (beside the Ministry of Agriculture, which had little mandate or resources to provide support). As is the case for farmers, there are few sources of credit that fit veterinarians' needs.

At the start of the project, veterinarians typically purchased their veterinary drugs at the regional office of the state Veterinary Department or from veterinarians who run small stores. At that time, both of these sources got their drugs from the State Drug Supply Center run by the Ministry of Agriculture Veterinary Department. This State Drug Supply Center got its drugs from Russia, and local veterinarians expressed strong concern about the quality of these drugs. There are several privately owned veterinary drug supply outlets in the capital, Baku, which get their drugs from European and Turkish suppliers, but before the project started, veterinarians in Massali and Lenkeran had few ways of linking to these. In addition, their distance from the region and the higher cost of their drugs limited local veterinarians' access to those drug suppliers. The project facilitated linkages between participating veterinarians and these firms. This early impact was a source of enthusiasm on the part of both participating veterinarians and the farmers who gained access to higher quality drugs through those participating veterinarians. At the same time, their own lack of access to these better drugs was a source of some disgruntlement on the part of veterinarians who were not part of the project. It appears that the access to higher quality drugs that had spread to most of the non-participating veterinarians in the region by 2006.

### 1.B.ii. Output Markets for Veterinarians

The most basic veterinary outputs are 1) medical care for sick animals; 2) preventative care for well animals; 3) animal health inspections; and 4) (increasingly and likely due to the project) transfer of advice and knowledge to farmers. The veterinary service market is usually quite small including just a) farmers (both the few large farming enterprises in the region and small family farms) and b) the government (through vaccination services and animal health inspection services – which ultimately are meant to benefit farmers and consumers). A few veterinarians have arrangements with c) private businesses (to provide animal health inspections). Most veterinarians' client base is made up of the small family farms in the village where they live and the immediate vicinity.

## **2. Mercy Corps CABS Project<sup>3</sup>**

The goal of the Mercy Corps CABS project was to improve profitability for clusters of rural poor and women micro-entrepreneurs (MEs) by increasing access to a network of trained veterinary and production advice service providers, resulting in significant expansion of the service and final goods markets. The objectives were 1) *ME*: Increase sales by an average 35% for 6,958 micro-entrepreneurs—of whom 58% are women—through greater access to services via 67 client clusters; 2) *Provider*: Strengthen the capacity of a network of 90 veterinarians and veterinary suppliers to provide innovative and quality services through improved business and marketing skills, resulting in an 87% increase in profitability; 3) *BDS Market*: Expand the veterinarian and production advice services markets by 70% and 59% respectively [and] sustain expansion through network and cluster revitalization and development; and 4) *Product Market*: 22% increase in sales volume for meat products in the target area over three years.

The Mercy Corps project functioned as a BDS facilitator. It assisted veterinarians and farmers to build networks that highlighted both individual and group benefits. On the supply side, the project facilitated building the capacity of local private service providers (primarily veterinarians) to improve their services and expand their client base. In the latter part of the project, Mercy Corps supported the establishment of a feed production business that supplied a range of animal feed products to local farmers. On the demand side, the project facilitated the development of clusters of farmers (micro-enterprises) to assist them to improve their own profits by raising their awareness about and promoting greater access to veterinary services. All told, in Lenkeran and Massali (the regions where the project initiated its work in this sector and where this research was conducted), the project worked with 49 Farmer Clusters which included the participation of 5,711 farm microenterprises.

## **III. Casual Model**

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<sup>3</sup> This section is based on the proposal for the Mercy Corps Cluster Access to Business Services (CABS) program in Rural Azerbaijan and Mercy Corps Semi-Annual Reports.

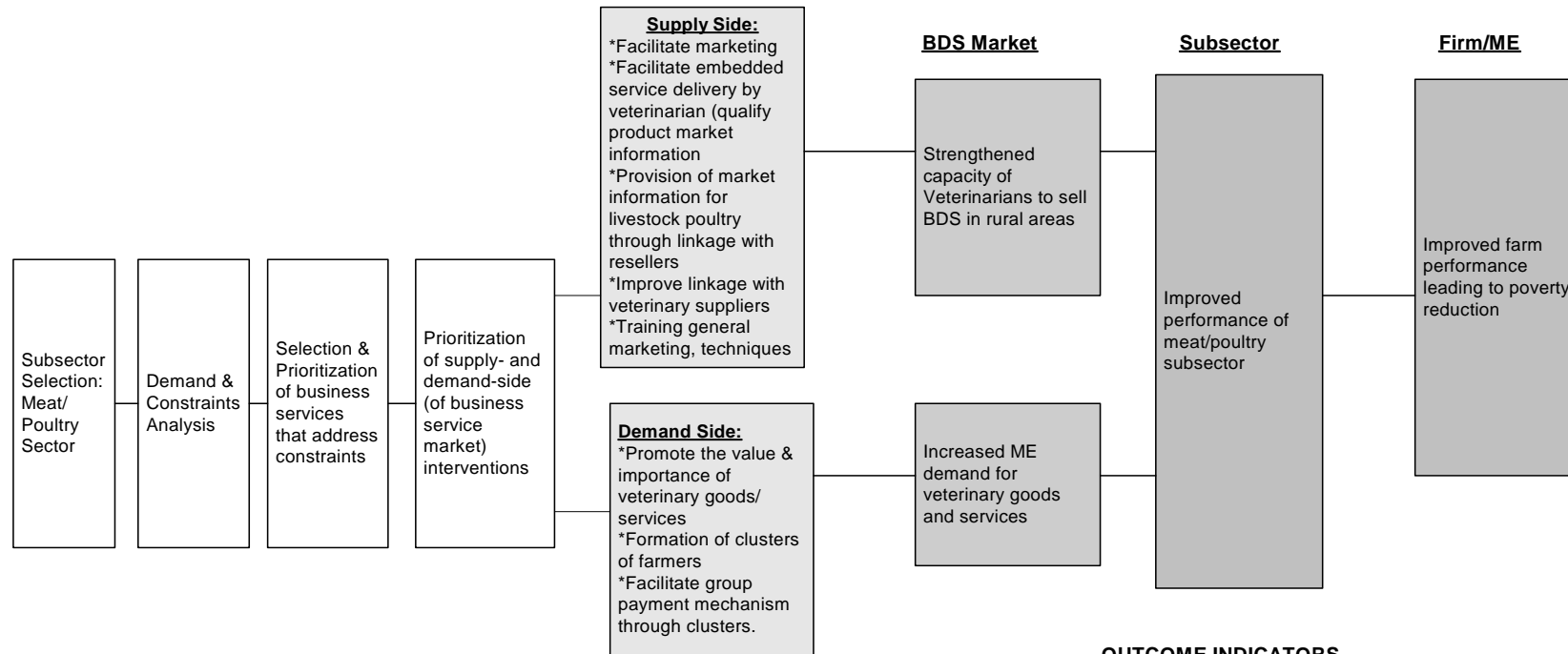
The Causal Model for this research can be found on the following page. Results from testing the hypotheses based on the Causal Model are provided in Section [VI](#).

***Causal Model: Azerbaijan***

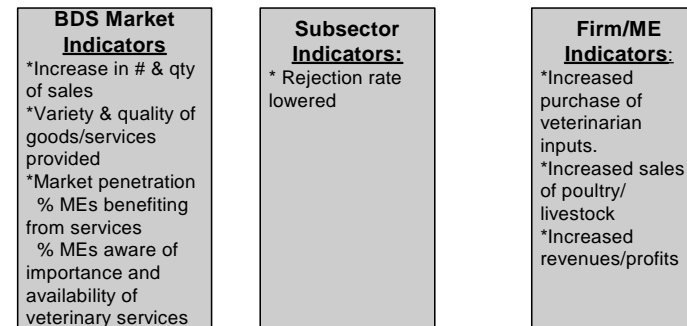
**PRE-INTERVENTION ACTIVITIES**

**FACILITATION SERVICES**

**OUTCOMES**



**OUTCOME INDICATORS**



**PERFORMANCE MONITORING** →

**IMPACT ASSESSMENT** ←



## IV. Methodology

The first phase of this longitudinal study was conducted through quantitative questionnaires, semi-structured in-depth interviews, focus group discussions and observations in late November and December of 2003 (with a few follow-up interviews in February 2004). The results from the initial phase of the research provided the baseline and basis for assessing changes due to project for the final report. In January 2007, the initial research was replicated, with a few additional questions designed to cover new developments in the region.

### Quantitative Data Collection:

#### 1.A. Veterinarians

In 2003, 100 veterinarians were interviewed in Massali and Lenkeran, all of whom were men. Fifty veterinarians were participants in the Mercy Corps project (the Experimental Group) and 50 veterinarians were not project participants (the Control Group). Since 109 veterinarians were registered in Massali and Lenkeran at the time, this sample represented nearly a full census.

In 2007, 99 veterinarians were interviewed: 49 Mercy Corps Participants and 50 in the Control Group. Seventy-nine of these were the same people who were interviewed in 2003, and the longitudinal aspects of the study are based on these 79. An additional 20 veterinarians were added as replacements for the 20 who were interviewed in 2003 but who could not be found in 2007, and the overall analysis of the veterinarians includes these.

#### 1.B. Farmers

In 2003, a total of 313 farmers were interviewed in Massali and Lenkeran. Of them a) 133 were Mercy Corps Participants and 180 were in the Control Group; b) 162 were men and 151 were women; c) 172 were from remote villages and 141 were from villages close to large towns; and d) 73 were pre-identified by participating and non-participating veterinarians as current clients and 240 were selected using a random selection (for Farmer Cluster participants) and a combination of random selection and the snowball technique (for the control group).

In 2007, a sub-sample was taken from the set of farmers interviewed in 2003. Interviews were conducted with 159 farmers in 15 villages, 8 of which were home to a Farmer Cluster supported by the project. Seventy-four of the farmers re-interviewed were project participants and 85 of them were part of the control group.

**Table 1:** Farmer Micro-enterprises Surveyed in 2007

Farmers (micro-enterprises)	Control Group		Mercy Corps Participants		Total
	Men	Women	Men	Women	
Remote Village	20	20	20	20	80
Close Village	21	24	19	15	79
Total	41	44	39	35	159

## Qualitative Data Collection

In both 2003 and 2007, qualitative research was done through 16 semi-structured in-depth interviews, 6 focus groups, and observations.

### **2.A. Veterinarians**

Four in-depth interviews were conducted with veterinarians, two with project participants and two with veterinarians from the control group. Thirteen veterinarians participated in two focus group discussions.

### **2.B. Farmers**

Eight in-depth interviews were conducted with farmers. Half of these were with women and half with men. Half were with farmers who participated in Farmer Clusters organized by Mercy Corps and half were non-participant farmers. Twenty-eight farmers participated in focus group discussions: half were men and half were women, and half were project participants while half were not.

## 3. Considerations for Interpreting the Data

**3.A. Non-participating Veterinarians do not constitute a pure “Control Group”:** The impacts of the Mercy Corps BDS project on veterinarians may appear in this analysis to be more muted than they were. As it turned out, the “control group” of veterinarians was not completely unaffected by the project. The Mercy Corps project started out by working with approximately half of the veterinarians in Massali and Lenkeran. These veterinarians formed the experimental group for the initial research, and the veterinarians who did not participate in the project trainings and other activities were classified as the control group. During the project’s second year, Mercy Corps strongly encouraged the participating veterinarians to share their new skills and knowledge with their non-participating counterparts. While this would likely not have the same impact as direct participation in the project, and while the veterinarians who did not participate in the project had a lower opinion of the extent and utility of the information sharing than did the veterinarians who directly participated in the project (see Hypothesis 1C below), there was still some sharing of project benefits. While this was a positive move on the part of the project in terms of development impacts, it can be considered to have created some level of “contamination” of the control group sample.

**3.B. Source of Decline in Incomes:** Results for all of the sub-groups of interest to this study - veterinarians and farmers, participants and non-participants, women and men – show a decline in the mean estimated year’s income. Possible reasons for this decline (such as a surge in animal deaths due to serious diseases, inflation, depressed local economy, etc.) are discussed elsewhere. However, it is important to note that these changes may have some basis in bias introduced through the interview process. The lower figures given for incomes could have an exogenous influence that could have exacerbated the nearly ever-present reluctance to provide accurate income details to a stranger (for instance, the implementation of the government tax structure in this region may have changed or there may have been concern that the enumerators for this study would pass income information on to the government – inquiries on this issue revealed little useful information). Another possible factor is a potential enumerator bias: the enumerators who carried

out the interviews in 2003 were agricultural professionals (including a veterinarian) who were more experienced with veterinary and farm economics than were the enumerators for the 2007 field survey. There is a possibility that, with their familiarity with animal husbandry, the 2003 team may have been more effective at probing and encouraging greater “revelations” of actual incomes. Still, the fact that both mean estimated incomes and estimated expenses declined gives credence to the idea that people’s financial situation was indeed worse in 2006 than in 2003.

**3.C. Money:** All 2003 financial information reported here is listed after adjusting for the overall 18% increase in inflation between 2003 and 2007 (according to the CIA World Factbook). This method of controlling for inflation is not completely accurate, however, as input and product prices in Massali and Lenkeran may not have changed at the same rate as overall inflation in Azerbaijan. In addition, 2003 income and expenses were adjusted for the currency shift from “old manat” to “new manat” (which are worth 5000 old manat). At the time of the field study in January 2007, a new manat was worth US\$ 0.913.

**3.D. Time:** The initial field study was conducted in late November and throughout December of 2003 (with a few follow-up interviews conducted in February 2004). The second phase of field research was conducted in January, 2007. There is some room for confusion in reading this report because, while the two studies were essentially conducted 3 years apart in time, the calendar dates make the studies appear to be four years apart. This is complicated by the fact that veterinarians and farmers were asked to estimate their incomes and expenses for the last year: in this report, “last year” is signified as 2006. Thus, while a farmer may be cited as saying something “in 2007,” the report also refers to outcomes for 2006.

**3.E. Gender:** It is important to note that women who participate in Farmer Clusters and women who consent to be interviewed may be self-selected as women who feel fewer impediments in talking with non-family men in general and veterinarians in specific. Note, also, though, that no women declined to be interviewed for this survey.

**3.F. De Facto Women-headed Households:** It was not possible to identify women-headed households for these surveys, in part because we were specifically requested by Mercy Corps staff not to do so. There were three main reasons for this. First, it is not uncommon for a household’s working age men to be living and working elsewhere and sending home remittances. Often, the adult women are left running the household and, along with it, the livestock and poultry management. Because many of the absent men were working outside the country without formal permission from the government to do so (i.e., quasi-illegally) women would not advertise this fact to strangers. (In fact, when I asked a focus group of veterinarians to estimate the percentage of male ostensible “heads of household” who were working out of the country, I was met with an uncomfortable silence, broken by one of the men saying, “This information needs to be communicated to you by the KGB, not by us.”) Second, divorce is severely frowned upon in this part of Azerbaijan, so we were asked to not ask this marital status question so as not to “humiliate” the respondent. Indeed, every last respondent described themselves as married in 2003. Which brings us to the third reason: polygamous marriages are relatively common in this part of Azerbaijan (it lies near the border of Iran) where most inhabitants are Muslim. Having more than one wife is officially frowned upon, and we were told that, to avoid antagonizing the respondents, we should not ask women respondents if they were their husband’s only wife. (This question, when put to a focus group of veterinarians, met with chuckles and the assertion that it was better not to reply.)

The baseline study for the CABS project itself (not the initial phase of the research), designed by Tim Canedo, asked the question, “Can you show the percentage of women farmers or women handled enterprises among the farmer and family enterprises?” Based on responses from 33 service providers in the project area, the report concludes that just 2% of the farms are “handled” by women.<sup>4</sup> While we were not able to tease out which farms were run by women, veterinarians did say in 2007 that, overall, 17% of their clients are women. Interestingly, when asked about this in 2003, the information given by veterinarians on their client base indicated that a mean of 46% of their clients were women. Asking the question - about the number of men and women farmers veterinarians worked with – in slightly different ways led to different answers. When veterinarians were asked in the quantitative survey in 2007 how many of their clients were women, the mean response was 17% (with a range from 0 to 90%). When veterinarians were asked in in-depth interviews from whom they got most of their calls, almost all responded with answers of between 60 and 90%. It appears that the critical distinction was the difference between the concept of “farmer” as “client” and the concept of who was responsible for day to day animal health, which included calling a veterinarian to help with a sick animal. This participating veterinarian’s response may illuminate this difference in conceptualization: I give advice to “mostly men, because heads of farms are men. But, no, if you consider all advice, women come to me more - 60-65% are women.” One non-participating veterinarian described the dynamic this way: “Most of the farmers are men, but in small farms most of the people who work with animals are women. About 80% [of the people who call me] are women. Let’s say men are not here – they have gone to Russia on business, and women are home. So 80% are women and 20% are men.”

While we could have asked who made most of the decisions about the household’s animals, we were discouraged from doing so as it would be too clear a proxy for asking about sensitive issues and, again, might antagonize the respondent. These difficulties were exacerbated by the fact that households are often multi-generational. We were told (and found when we asked) that a woman without a husband living in the home would identify a male relative (e.g., her father, father-in-law, uncle or brother - or even her oldest son) as the head of the household and central decision-maker - even if that person were elderly or not yet an adult and she was the person making the day-to-day decisions for the house and farm.

**3.G. Women in this Research:** While the enumerators asked that their interviews be conducted in private, and most were, this was not always practicable (or polite). Where it was true that in some cases, enumerators were unable to keep men from prompting women about forgotten

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<sup>4</sup> “Baseline Survey Report for Service Providers. Cluster Access to Business Service Program in Southern Regions of Azerbaijan. Mercy Corps Azerbaijan. 2003. (p. 4). The question text is from Question B.8 on the survey. It may be worth noting, however, that the data is reported in several ways. Here is the raw data itself as reported in the reports annex (the interpretations of the data have been removed).

Can you show the percentage of women farmers or women handled enterprises among the farmer and family enterprises?	
a.0%-5%	19
b.6%-10%	1
c. 11%-20%	2
d.21%-30%	0
e.31%-40%	0
f.41% and more	1

Note that while, of the 23 service providers who responded to this question, 83% (19) said that between 0% and 5% of the enterprises were run by women and 3 others said that between 6 and 20% of these businesses were women handled, one service providers reported that more than 40% of the farm enterprises were handled by women. It was not clear whether the answers were related to each respondent’s own client base or to the demographics of the region. Also note that English/Azeri translation issues could have some impact on the interpretation of this question and its responses in both languages. Perhaps importantly, 3 of the respondents to this baseline survey were women themselves.

expenses and costs, it was equally true that in some cases women prompted male respondents about the same sorts of issues. This may have an impact on our ability to tease out gender differences in number of services accessed and amounts spent. While women who actually were heads of households would have had reasonably good recall of what they themselves bought and sold, both men and women in married households would have recalled what they had bought and sold and at least some of what their spouse or other family member had bought and sold.

**3.H. Colinearity:** There are a few factors of interest to this research that exhibit colinearity. For example, while the hypotheses seek to test linkages between age and input use and between farmer education level and input use, age and education level are negatively correlated (with younger farmers significantly more likely to have higher education levels than older farmers).

## V. Overview of the Context and the Respondents



*Veterinarian with his wife and daughter*



*Farming family*

This section summarizes the underlying conditions found through the initial field survey and the follow-up survey, including some of the important exogenous impacts on the sector in the years between the field studies. It also summarizes the most relevant similarities and differences in the basic demographic and business characteristics between the veterinarians and farmers who participated in Mercy Corps activities (the experimental group) and those who were not (the control group). Similarities and differences related to the study assumptions and hypotheses are set out in the corresponding hypothesis sections below. Overall, analysis based on the 2003 field survey showed that both the veterinarians and farmers who were participating in the Mercy Corps project were quite similar to their non-participating Control Group counterparts. With the few exceptions outlined below, the groups were quite comparable and are reasonably well-suited for straightforward comparison and hypothesis testing. Finally, this section explores some of the indicators from the Azerbaijan BDS Causal Model that were not included within the hypotheses of the overall three-country BDS study.

### 1. Changes in the Local Context

Many informants said that the Massali and Lenkeran region was economically stressed, and that there were fewer jobs at the same time as prices were rising. A number of interlocking factors that would stress farm microenterprises were reported by respondents, including a) an increase in the price of hay and other animal feed; b) reduced demand for red meat because of the economic slowdown (as reported by the butcher who was interviewed); c) increased animal deaths due to



disease; and d) a cycle in which animals sickness and deaths negatively affected household finances and thus limited the funds available for purchasing and maintaining animals.

A chicken sickness that many believed to be avian flu swept through the region. While most veterinarians said that the sickness was ultimately shown to not be avian flu, many believed that it was for quite some time. Many birds died of the illness. Some farmers were told to destroy their flocks and others did so out of fear that the suspected avian flu might be passed to their children (chickens are often kept loose and have free range around the yard and the barn level of the house structure). Many farmers said in interviews that they had lost or destroyed all of their chickens, geese, turkeys and guinea fowl and that they were concerned about rebuilding their flocks, both because of the potential re-loss of investment and the potential that avian flu would actually erupt.

Hoof and mouth disease passed through the region in two successive waves. Many cows sickened and died as well as some sheep and goats. While vaccines for foot and mouth do exist, there are many strains of the disease and the vaccines are highly specific and may, thus, be ineffective. Anthrax caused animal deaths as well. The animal drug supplier who was interviewed summed up the situation, saying, "It used to be better before; there were not as much diseases as now." A veterinarian in Lenkeran described how troubling the situation was, "I have never seen foot-and-mouth disease spread this much. ... I had not seen anthrax spread this much either."

## 2. Overview of Veterinarians

In 2003, 100 veterinarians were interviewed: 50 Mercy Corps Participants (MCPs) and 50 in the Control Group. Of the basic demographic and business characteristics listed in Table 2 below, none were statistically significantly different. At that time, most of the measures of comparison between the control and experimental group veterinarians showed no significant differences. They had similar demographics, similar mixes of large and small farm clients, and similar profits. Therefore, we judged that the control and experimental groups were at least nominally comparable and formed a sound basis for the research.

In 2007, 99 veterinarians were interviewed: 49 Mercy Corps Participants and 50 in the Control Group. Seventy-nine of these were the same people who were interviewed in 2003, and the longitudinal aspects of the study are based on these 79. An additional 20 veterinarians were added as replacements for the 20 interviewed in 2003 who could not be found in 2007, and the overall analysis of the veterinarians includes these.

**Table 2:** Basic Characteristics of Veterinarians and their Veterinary Business in 2003

	<b>Control Group</b>	<b>Mercy Corps Participants</b>
Average Age	44.4	45.0
Average Number in Household	5.8	6.1
Average % of Household Income from Veterinary Business	66%	62%
Average % of Clients who are Women	47%	45%
Average % of Clients who have a Small Farm	83%	81%
Average % of Clients who are in remote villages	48%	33%

In 2003, most of the veterinarians in Massali and Lenkeran were at least nominal government employees. The government assigned veterinarians to work in specific areas and paid the veterinarians to provide periodic vaccinations to the animals of that area. Though the farmers had to pay the cost of the vaccines themselves, the labor of the veterinarians was paid by the government. Three veterinarians in the region received support through a World Bank project and had stopped working in the government program. The 2003 report concluded that the differences in access to information and technology between participating and non-participating veterinarians (such as the artificial insemination which was newly introduced into the region by the project) were almost certainly due to the project activities. Likewise, we felt comfortable attributing to the CABS project the finding that participating veterinarians offered many more types of non-medical services to their clients. Thus the two groups were judged to be reasonably comparable before the project started and suitable for comparison through the follow-up study.

The inputs that veterinarians paid for included fuel and other transportation expenses, utilities, communications, advertising, medicines, gloves, syringes, and a variety of tools and other inputs (teat cups, nose rings, forceps, foot trimmers, semen, etc.). Earnings were cited from vaccines, medicines, emergency care, artificial insemination, birthing or natural breeding services, equipment and tool sales, marketing and price information, and production advice. No veterinarian cited rent, loan payments, information services, salaries or wages among their expenses. No veterinarian cited having sold specialized feed or vitamins or anything not previously listed. About the same number from each group provided informal credit or postponement of payments to their clients (23 MCPs and 21 from the Control Group) in 2003, but just nine participants and one non-participant said that they provided informal credit in 2006. The only difference between the types of sales of the participating and non-participating veterinarians was that the non-participants did not provide any artificial insemination (this was introduced by the project).

### 3. Overview of Farmers

Of the 313 farmers who were interviewed in 2003, 133 participated in the Mercy Corps project (the Experimental Group) and 180 were non-participants (the Control Group). In 2007, 159 farmers were re-interviewed, 79 of them were project participants and 80 of them were part of the control group.

Results in 2003 showed that, on average, project participants were slightly older, owned slightly less land (0.08 hectares [ha] less), rented more land, and owned more sheep, goats and poultry than non-participants. The two groups had similar household sizes, got similar percentages of household income and household consumption from their animals, and owned similar numbers of large animals (defined as cows, horses, water buffalo and donkeys).

Women tended to be younger than men, have smaller household sizes, slightly smaller land holdings (0.09 ha less) and get more of their household income from their animals than did men. Women and men owned similar numbers of animals in all categories and consumed a similar percentage of their production.

**Table 3:** Basic Characteristics of Farmers and their Livestock Business in 2003

	<b>Control Group</b>	<b>Mercy Corps Participants</b>	<b>Men</b>	<b>Women</b>
Average Age	44.5	<b>46.2*</b>	46.7	<b>43.6**</b>



Average Number in Household	6.3	6.2	6.5	<b>6.0**</b>
Average % of Livestock, Poultry and Animal Products produced that are Consumed by the Household	25%	24%	24%	25%
Average % of Household Income from Animals and Animal Products	74%	76%	73%	<b>76%**</b>
Average Amount of land owned	0.95 ha	<b>0.87 ha**</b>	0.96 ha	<b>0.87 ha**</b>
Average Amount of land rented	0 ha	<b>0.29 ha*</b>	0.23 ha	<b>0 ha*</b>
Average # of cows, horses, water buffalo and donkeys owned	2.6	2.7	2.83	1.2
Average # of sheep and goats owned	5.4	<b>8.8*</b>	7.8	5.8
Average # of poultry owned	36.6	<b>46.0**</b>	40.2	40.9

▪ Independent samples t-test: \* indicates a statistical significance at the 0.05 level.

\*\* indicates a significant difference at the 0.01 level.

In 2003, a few significant differences were found between the farmer control and experimental groups in terms of their use of animal husbandry services and inputs. All of these differences were, however, in use of services that the project was promoting. Since the project had initiated work some nine months before the study was conducted, it could easily be that the differences found were early impacts of the project. The significant difference in the number of total purchases made by the MCPs and Control Group disappears when services promoted by the project (marketing information, production advice and formal training) are removed from consideration. It is important to note that all of the farmers surveyed already purchased inputs (all purchased at least vaccines and medicines) before the project started. The MCP and Control groups were also well matched in sales of almost all types of products – total sales and sales of some dairy products are the only exceptions.<sup>5</sup>

The higher costs and incomes reported by Mercy Corps participants may be due to some inherent difference between the groups in this respect, possibly related to the type of people who chose to participate. For instance, it may be that people who are more engaged with their animal production were more inclined to participate. However, note that the demographics for these two groups are quite similar (See Table 3) and that there is no difference between the groups in the percent of household income provided by their work with animals. It is also possible that the project was already having an impact for some of the farmers. For instance, one woman participating in the project said “I have produced better quality products compared to the last year, and therefore, I made a little bit more.”

In sum, the 2003 report concluded that, while there appeared to be some early impacts of the project, the two groups were sufficiently similar to provide a good basis for comparison to tease out project impacts after the final survey.

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<sup>5</sup> The difference in sales of milk and cheese cannot be attributed to the number of cows owned by each.

## VI. Factors Affecting the Impact of BDS

This section contains the results from testing key points from the Causal Model and the study hypotheses about BDS impacts on veterinarians and farmers. The hypotheses for this study are based on the common questions about BDS impacts in the three countries of interest in the context of the larger study: Azerbaijan, India and Uganda. The Causal Model for this part of the research was based on the project impacts being assessed in Azerbaijan. Therefore, key points from the Causal Model that are not included in the study hypotheses are discussed here at the beginning of the Veterinarian and Farmer Sections. Details of the results for veterinarians and farmers along with discussion and interpretation of the results are provided in Sections 1 and 2 below. A summary of the results of the Azerbaijan testing of the overall study hypotheses is provided in Section 3.

### 1. Veterinarians



*Veterinarian greeting farmers outside a tea house*

#### **1.A. Key Points from the Causal Model**

##### **Change in Demand for BDS by Veterinarians**

In 2003, veterinarians said that the two most important barriers to improving their business were their 1) financial status and lack of credit and 2) transportation difficulties. In 2007, these were still the two most important limitations, but their order was reversed. The 3<sup>rd</sup> and 4<sup>th</sup> most common limitations cited by non-participating veterinarians in 2003 barely registered with the project

participants: a need for more business training and the difficulty of getting needed supplies.<sup>6</sup> The most frequently cited needed supply was “quality drugs.” Neither of these was frequently cited in 2007. The drug supply issue was substantially resolved in large part because the project helped improve the supply of quality drugs to the region. While 70% of the Control Group said that they needed more business training (a type of training that the project had provided to participating veterinarians before the 2003 survey was conducted), only 4% (2 people) of the MCPs said that they needed more. (See Table 4 below.)

**Table 4:** What prevents your Veterinary Business from growing faster or being more profitable?

	2003		2007†	
	% Control Group Farmers	% Mercy Corps Participants	% Control Group Farmers	% Mercy Corps Participants
Lack of access to credit, insurance or other financial service	88%	90%		
Transportation difficulties	86%	60%	57%	44%
Financial status (of veterinarians and/or farmers)			30%	42%
Need more business training	70%	4%	2%	10%
Difficult to get needed supplies	56%	12%	6%	10%
Low demand for services			24%	8%
Not enough time/busy with other things	-	22%	6%	6%
Market conditions	4%	4%	14%	6%
Need more technical training			6%	4%
Farmers are too poor to pay well			4%	6%
Competition with other veterinarians			4%	6%

▪ Note that farmers were asked to list all the reasons that applied, so the numbers do not add to 100%.

In 2007, however, there were new concerns. Veterinarians cited low demand for their services, farmer poverty, and competition with other veterinarians for the first time, and market conditions grew in importance. In a focus group in Lenkeran, the primary limitation mentioned was farmer solvency (see below for veterinarians’ thoughts on this).

To see what new skills veterinarians found the most useful, they were asked to name the top three new skills that they had acquired through training. (See Table 5 below.) Note that in 2007, no Control Group veterinarians said that they had received any training in the prior 2 years.

<sup>6</sup> Since both of these were issues that the project was helping the participating veterinarians with, the non-participants’ saying that their lack of them was an obstacle might have been related to their knowledge that participating veterinarians had received these from the project.

**Table 5: Three Most Important Skills Veterinarians Gained from Training**

New Skills	# of Mercy Corps Participants Mentioning this Skill	
	2003 (n=50)	2007 (n=49)
Bookkeeping or financial management	35	0
Differences in relations with suppliers	28	15
Assistance in coordinating supplies with sales	24	2
Customer relations	24	30
Ideas related to alterations in customer base	17	15
Differences in products/services to offer	14	10
Technical/medical/veterinary skills	3	20
Artificial insemination	2	25

▪ *Note that veterinarians were asked to cite the three most important skills, so the total here is more than 50.*

In 2003, veterinarians cited very literal business skills (bookkeeping, relations with suppliers, coordinating supplies and sales, and customer relations) as the most important things that they had learned. By 2007, customer relations still stuck out for veterinarians as a central skill that they learned through the project, and artificial insemination and technical/medical/veterinary skills rounded out the top three. Interestingly, though half of the veterinarians surveyed said that artificial insemination was among their top three most important skills learned, only 3 of the veterinarians surveyed said that they had performed this service in the past year and only 4 farmers (including three with such large businesses that they were considered outliers to the analysis) said that they used this service.

All Business Development Services in Massali and Lenkeran that veterinarians cited knowing anything about were provided through either this Mercy Corps project or through the World Bank project. Note that the World Bank supported three veterinarians in this region, and all of them also participated in the Mercy Corps project and received support from Mercy Corps. Mercy Corps itself supplied most of the training for the veterinarians. Mercy Corps hired outside veterinary assistance for artificial insemination. Veterinarians participating in the project provided much of the technical training for the farmer clusters. All of the local sources of veterinary drugs are small stores and bazaar shops operated by local veterinarians.

All of the veterinarians who said that they had attended trainings were project participants. Except for two participating veterinarians who also said that they attended a government-led training, all of their training was through the project. One non-participating veterinarian also attended that training. Except for him, none of the veterinarians who did not participate in the project said that they had attended training in the last three years.

The veterinarians who participated in the project were generally very pleased with the quality of the training: the trainings received 86% “extremely satisfied,” 12% “very satisfied,” and 3% somewhat satisfied” ratings from those who attended them. Outside of the Mercy Corps project and the World Bank project, veterinarians said that there were no private suppliers of BDS from which veterinarians in Massali and Lenkeran get BDS services. One non-participant veterinarian put it bluntly, “There is no one who assists veterinarians.” A number of them said in in-depth interviews that it would be good if there were a source of BDS. However, when veterinarians were asked in focus group whether they would pay for trainings, there was one response: we don’t make enough money to be able to afford to pay for training. As noted below, affordability is a relative concept.

While reluctance to pay for something that one has previously received for free is hardly uncommon, this lack of interest in paying for training may be related to the kind of systemic support that people had been accustomed to before Azerbaijan's departure from the Soviet Union and the dismantling of the planned economy, collective farming, and overarching government support. There were frequent references in in-depth interviews to how much more support veterinarians - and farmers - had had "in the time of the Soviets" (i.e., more than 14 years ago).

## **1.B. Veterinarian Hypotheses**

### **Hypothesis 1: Training veterinarians in BDS will lead to increased demand for their products and services**

#### **Hypothesis 1A: Training veterinarians in marketing techniques will lead to increased demand for their products and services**

**Result:** Hypothesis Supported

- Veterinarians who participated in Mercy Corps trainings on marketing techniques and other BDS skills had a significantly higher number of customers in 2007 than the veterinarians who had not received the training. *(statistically significant: test for independent means)*

#### **Data:**

Number of Clients: The primary indicator for demand for a veterinarian's services is the number of customers that he has.<sup>7</sup> In 2007, the mean number of clients reported by MCPs was 184, while the control group reported a mean of 92 (this difference is statistically significant at the .01 level). In in-depth interviews and focus group discussions, participating veterinarians said that they gained customers in 2003 and non-participating veterinarians said that they lost customers in 2003: both groups attributed these impacts to the project.

There was no significant difference between the MCPs and the control group in the proportion of their clients who came from small, medium or large farms. Nor was there any significant difference between them in the proportion of their clients who lived in remote small villages, large villages, or near the capital towns of Massali and Lenkeran.

There *may* be tendency for MCPs to have more women clients. An average of 21% of MCPs clients were women while the control group had an average of 13% women clients. While this difference is not statistically significant (t-test significance of .060), it bears mentioning because improving women's access to veterinarians and teaching veterinarians to work better with women were important thrusts of the project.

Through the 2007 quantitative survey, veterinarians provided a wide variety of reasons for the change in their client base. The most frequently cited reasons had little to do with actions taken by the veterinarians themselves: just 17% cited changes in their own business practices. The most common reasons had to do with macro-changes in the sector, basically related to more households deciding to start raising animals. This particular type of change has two aspects. First, more households with animals could directly translate into more potential clients. Second, though, with the bumpy transition from being part of the USSR with its state-directed economy of collective

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<sup>7</sup> "He" is used quite consciously here as all of the veterinarians who serve farmers in Massali and Lenkeran are, indeed, men. The one woman veterinarian in the region works in a lab and does not work directly with farmers and their animals.

farms and guaranteed jobs to an economy based in individual entrepreneurship (albeit with little infrastructure or individual preparation for this), many households have found themselves with a bit of land and with children to feed but very little experience in raising animals. Households newly deciding to raise animals, therefore, likely means that there are some literally “new” farmers who may not have in-depth knowledge about animal health.

**Table 6:** Reason for Change in Number of Clients

	% of Veterinarians Citing this Reason		
	Control Group	Mercy Corps Participants	Total
<b>Why Clients Increased: Changes in the Livestock Sector in the Region</b>			
Increase livestock breeding	29.2%	17.0%	23.1%
There are more farmers now	18.8%	14.7%	16.8%
Existence of more diseases	12.6%	4.3%	8.4%
There are more people breeding cattle	4.2%	2.1%	3.2%
Households grow bigger	2.1%	4.3%	3.2%
Development of agriculture in the region	2.1%	2.1%	2.1%
There is more demand	2.1%		1.1%
The financial situation in the region has improved		2.1%	1.1%
<b>Why Clients Increased: Changes in Veterinarian Business Practices</b>			
Increase of entrepreneurship	8.3%		4.2%
My being experienced	2.1%	6.4%	4.2%
People trust me	6.3%	2.1%	4.2%
Because I work in many villages		2.1%	1.1%
I provide high quality veterinarian services		2.1%	1.1%
I have improved my skills		2.1%	1.1%
We have extended teaching to more people		2.1%	1.1%
<b>Why Clients Decreased</b>			
More farmers are helping themselves	2.1%	2.1%	2.1%
Decrease in number of people who use veterinary services		4.3%	2.1%
Since I have no time	2.1%	2.1%	2.1%
Decrease of diseases		2.1%	1.1%
There are more veterinarians now		2.1%	1.1%

- The total is less than 100% as not all veterinarians responded to this question.

While many MCP veterinarians said in the focus groups in semi-formal interviews that they were much better off because of their participation in the project, in 2003, there was a significant *negative* correlation between the number of clients and the estimated year's profits (Pearson correlation coefficient of -0.253, significant at the 0.05 level). This situation was reversed in 2006, when there was positive correlation between number of clients and profits (Pearson correlation coefficient of 0.373, significant at the 0.01 level). This change likely has two aspects. On the one hand, some veterinarians in 2003 complained that they were doing more and more work but not



getting paid any more. Veterinarians said that the client number: income disparity was in part because farmers did not have enough money to pay them (in both 2003 and 2007, veterinarians talked about using a sliding scale for charging customers for their services, and some mentioned not getting paid at all). It was also in part, some said, because (in part at the project's urging), they were providing many services – especially non-medical services – for free. In 2007, veterinarians reported providing significantly fewer non-medical services than they had in 2003.

**Veterinary Marketing:** How much of the changes found can be attributed to veterinarian marketing depends on how marketing is defined. In 2003, 78% of veterinarians who participated in the Mercy Corps project said that they spent money on advertising while just 18 % of the control group veterinarians did. None of the veterinarians said that they paid for advertising during 2006. Still, in in-depth interviews in 2007, some participating veterinarians reported visiting farmers to promote the use of their services, and some non-participating veterinarians reported doing so as well.

In interviews in 2003, MCP veterinarians reported that they had been encouraged to market themselves to farmers to promote their services. In a focus group, one veterinarian said, “Previously, we never went to farmers to promote our services and explain the importance of what we do.” There appeared to be a difference in the way that veterinarians talked about the concept of promotion before the project started and the concept of promotion that was being encouraged through the project. In a focus group with participating veterinarians, several men said that they had always done “promotion” and that it was part of their duties within the government vaccination program. This seemed to entail infrequent visits to farmers and reminding that they should vaccinate on schedule. But when they talked about the “promotion” that they were being encouraged to do by the project, they spoke of something quite different. The new “promotion” entailed visiting farmers simply to say hello, offer basic advice, and raise the consciousness of the farmers regarding the importance of thorough veterinary care. The veterinarians saw this as a way to drum up additional

**Discussion:** Assessing the change in number of clients between 2003 and 2007 is rather problematic. In 2003, the mean number of clients that MCPs said that they had that year was 211. This was remarkably similar to the mean of 210 clients that the control group reported that they had that year. However, when farmers were asked in 2007 to recall the number of clients they had three years earlier, their response were often quite different from the responses they had given during the initial survey. In 2007, when asked to think back to 2003, MCPs reported an average of 121 clients for the year while the control group reported 56 clients. Calculating the change in number of clients based on the number of clients given in the 2003 survey gives a *reduction* in the number of clients for 2007. If the change in number of clients is calculated based on the 2003 client number given by veterinarians in the 2007 questionnaire, the number of clients appears to increase. The difference between the change in number of clients for participating veterinarians and non-participating veterinarians is significant in the former case but not in the latter case (though in this latter case the Mercy Corps participants do *appear* to have more clients).

**Hypothesis 1B: Those veterinarians in the project who have had more levels of training will have better business and sales practices than those who have fewer. This will translate into more sales for the more completely trained veterinarians.**

**Results:** Hypothesis Not Supported

- Veterinarians who participated in more BDS trainings did not have significantly higher business sales or profits for 2006. (no significant correlation)

- Veterinarians who participated in more BDS trainings did not offer significantly more medical or non-medical services to their clients in 2006. (no significant correlation)

**Data:**<sup>8</sup> Veterinarians' costs and sales for the month preceding the survey were calculated by asking them about specific types of services and the amount that they earned from them and about specific types of fixed and variable costs and how much they spent on these. Yearly income and costs were estimated by the veterinarians based on their recollection of income and costs each agricultural season and covered a wider range. Yearly profits were calculated by simply subtracting yearly costs from yearly income from the business.

There was no significant correlation between the number of trainings that a participating veterinarian attended and his income, his costs, his profits, or the number of types of medical or non-medical services he provided in 2006.<sup>9</sup>

**Discussion:** The lack of significant correlation for this hypothesis may be due to a mismatch between the hypothesis and the way that trainings were delivered by the project. Training was not necessarily offered as a series of consecutive "levels" of training as the ex ante hypothesis posits. Rather, trainings were conducted at regular meetings of participating veterinarians. Some of the trainings were more elaborate than others, but the majority of meetings contained at least some educational element. As such, the range of "trainings" that veterinarians reported participating in ranges from 1 to 55.

**Hypothesis 1C: Veterinarians who are trained by the project will be more likely to vary and improve the goods and services they offer (either for sale or embedded) than veterinarians who are not trained.**

**Results:** Hypothesis Supported

- Veterinarians who participated in BDS training supported by the project offer significantly more types of services (both medical and non-medical services) to farmers than veterinarians who did not receive training from the project. (significant difference: test of independent means)
- Between 2003 and 2006 ,veterinarians who participated in the trainings reported a significantly greater percentage drop in the number of types of non-medical services that they offered than did non-participating veterinarians. ( significant difference: test of independent means)

**Data:**<sup>10</sup> Veterinarians were asked about the five main types of medical services (including vaccinations, medicine and treatment for sick animals, emergency medical care, artificial insemination, and natural breeding and birthing) that they might have provided to the farmers that they worked with during the months of August, September and October. Veterinarians were also

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<sup>8</sup> The five outliers with the highest incomes and costs were exempted from this analysis. An additional outlier with a high number of times that services were offered was also exempted.

<sup>9</sup> If all veterinarians are considered - not just those who participated in the project and attended trainings – then there were some significant correlations: the more BDS trainings a veterinarian participated in, the higher his estimated 2006 profits are likely to be (Pearson correlation coefficient of .214, significant at the 95% confidence level). This held true both when profits were estimated for the preceding year (as above) and when they were calculated for the previous month based on actual income for specific veterinary services provided. This positive relationship with training is not linked to increased expenditure; there was no significant correlation between number of trainings and costs whether estimated for the year or calculated for the previous month.

<sup>10</sup> The five outliers with the highest incomes and costs were exempted from this analysis. An additional outlier with a high number of times that services were offered was also exempted.



asked about non-medical services that they might offer to their clients above and beyond the medical services that veterinarians normally provide. This list included informal credit for postponed payments, promotions or discounts for purchases, small tools, specialized feed or vitamins, marketing price and location information, production advice, and formal training (most of which were services promoted by the project). Veterinarians trained in BDS said that they had provided an average of 4.6 different types of medical and/or non-medical services to their clients in 2006 and an average of 8.3 of these services in 2003. (See Table 7 below for a summary and Table 8 for more detail). Veterinarians who did not participate in BDS trainings offered an average of 3.9 types of the medical services in 2006 and 5.6 in 2003. These differences were both statistically significant at the .01 level.

**Table 7:** Total Number of Types of Medical and Customer Services Veterinarians Offered to Farmers in 2006 and 2003

	Mean		Statistical Significance
	Control Group	Mercy Corps Participants	
<b>Medical Services</b>			
2007 # of types of Medical Services offered	3.5	3.6	0.375
2003 # of types of Medical Services offered	3.8	3.9	<b>0.148</b>
Change in # of types of Medical Services offered	-0.4	-0.3	<b>0.654</b>
<b>Non-Medical Services</b>			
2007 # of types of Non-Medical Services offered	0.5	0.9	<b>0.093</b>
2003 # of types of Non-Medical Services offered	1.9	4.4	<b>0.000**</b>
Change in # of types of Non-Medical Services offered	-1.3	-3.4	<b>0.000**</b>
<b>Medical &amp; Non-Medical Services</b>			
2007 Total # of types of Medical and Non-Medical Services offered	3.9	4.6	<b>0.008**</b>
2003 Total # of types of Medical and Non-Medical Services offered	5.6	8.3	<b>0.000**</b>
Change in Total # of types of Medical and Non-Medical Services offered	-1.7	-3.8	<b>0.000**</b>
Percent Change in Total # of types of Medical and Non-Medical Services offered	-.27%	-44%	<b>0.002**</b>

- Independent samples t-test: \*\* indicates a significant difference at the 0.01 level.
- The top 6 outliers were removed
- For 2007, n=95. For 2003, n=73. For Change between 2003 and 2007, n=73.

The difference in the number of types of medical services that the two groups provided was not significant. The difference in the number of types of non-medical services (largely information and advice-based) that they provided was significant in 2003, but not in 2006. In 2003, veterinarians participating in the CABS project said they offered an average of 4.4 non-medical services. This was significantly greater than the control group's average offering of just 1.9 of these types of services (statistically significant at the 99% confidence level). When interviewed in 2006, though, both groups cited a lower number of non-medical services. The difference in their 2006 means was not significant, with participating veterinarians offering an average of 0.9 types of non-medical

services while the control veterinarians offered an average of 0.5. Between 2003 and 2006, the participating veterinarians had a significantly greater drop in the number of non-medical services that they offered, dropping them by an average of 44% while drop in non-medical services was 27% for the control veterinarians. In 2003, three of the 79 veterinarians who were surveyed in both years said that they offered none of these services non-medical services. In 2007, 39 of the same veterinarians said that they offered none of these non-medical services.

**Table 8: Number of Times Veterinary Services were Provided in the Last 3 Months:  
Mercy Corps Veterinarians and Control Group: 2003 and 2006**

Veterinary Service	Control Group				Mercy Corps Participants				t: Statistical Significance (# Times)	
	% of Veterinarians providing this		# Times Provided		% of Veterinarians providing this		# Times Provided			
	2003	2006	2003	2006	2003	2006	2003	2006	2003	2006
Vaccines	100%	53%	17.2	9.3	100%	71%	28.2	12.7	.000**	.792
Medicines	100%	100%	33.9	23.7	100%	95%	56.1	17.8	.000**	.468
Emergency Care	100%	91%	25.7	14.6	100%	100%	35.0	14.9	.000**	.955
Artificial Insemination	0%	0%	0	0	3%	5%	3.0	34.5	n/a	n/a
Birthing or Natural Breeding Services	100%	46%	12.6	6.27	100%	58%	18.9	6.3	n/a	n/a
Marketing or Price Information	15%	0%	5.4	4	70%	10%	8.6	20.8	n/a	n/a
Production Advice	15%	0%	5.8	0	100%	15%	6.6	26.4	n/a	n/a
Formal Training	0%	0%	0		82%	0%	2.9	3.5	n/a	n/a
Informal Credit (postponed payment)	48%	3%	6.5	4	46%	21%	7.0	17.5	n/a	n/a
Promotions or discounts	0%	5%	0	3	0%	3%	0	10	n/a	n/a
2003: Total # of Times provided These Services	100%	100%	98.3	48.3	100%	100%	153.6	50.67	.000**	.883

- Independent samples t-test: \*\* indicates a significant difference at the 0.01 level.
- The top 6 income and/or cost outliers were removed and the 2 veterinarians who had started but not completed university education were removed.

**Discussion:** Participating veterinarians clearly offered more non-medical services to farmers in 2003 than in 2007. When the initial survey was conducted in 2003, the project had been underway for approximately nine months. One of the early activities that the project undertook was to link participating veterinarians to suppliers of high quality drugs. The project also began veterinarian training very early in the project. At the time of the survey, veterinarians who participated in the project reported that they were already acting on the new client service practices they had learned from the project.

In 2006, the BDS-trained veterinarians still offered significantly more services than their non-participating counterparts. This speaks to some level of sustainability of the project's impact. However, both groups reported offering fewer non-medical services in 2007. It is not clear why this is the case. This could be an artifact of the enumerators' technique (e.g., they may have done less probing in 2007). It could also be that the participating veterinarians felt that they had already saturated their own market with home visits and that enough new households were joining the sector that they did not need to promote their services.

Because this research was connected to a development project, it is worth noting that there is also a possibility that the particularly high numbers of non-medical services cited by participating veterinarians could be due to a bias purposefully introduced by the respondents themselves. While the enumerators took pains to explain that they were not related to or working with the project, some respondents may have wanted to assure the project that they were indeed using the skills taught to them and may even have thought that that assurance would support the project's continued work in the region. However, the fact that non-participating veterinarians also cited offering a larger number of non-medical services in 2007 goes some way towards undercutting this particular explanation.

### **Hypothesis 1D: Veterinarians who are not trained by the project will have significantly lower sales and profits than those who are trained**

#### **Results:** Hypothesis Partially Supported

- Veterinarians who did not receive BDS training did **not** have a significantly lower estimated **income** or **profit** for **2006** than those who did receive training. *(no significant difference: test of independent means)*
- Veterinarians who did not receive BDS training from the project had a significantly lower calculated **income** in the previous **month** than veterinarians who had received the training. *(significant differences: tests of independent means)*
- Veterinarians who did not receive BDS training from the project had significantly estimated lower **income** and showed a significantly lower estimated **profit** in **2003** than those who did receive training. *(significant differences: tests of independent means)*
- Veterinarians who did not receive BDS training from the project had significantly lower estimated **costs** in **2003** than veterinarians who received training but did **not** have significantly lower costs in **2006**. *(tests of independent means)*
- There was no statistically significant difference in the way that the veterinarians in the two groups reported their perceptions of their change in profits over time. *(no significant difference: test of independent means)*

**Data:**<sup>11</sup> In addition to the calculated and estimated sales and costs described above, veterinarians were also asked about their perception of the change in their profits, rating the change on a five point Likert scale from “much worse” to “much better.” In a nutshell, while the amount of money that veterinarians reported making from their business in 2006 was much lower than what they reported making in 2003, their expenses had dropped by even more. As a result, their net profits were higher in 2006 than they were in 2003.

Veterinarians who participated in the project had calculated incomes for the previous month that averaged 106.6 manat. This was significantly higher than the mean previous month income calculated by non-participants (62.7 manat: this was statistically significant at the .01 level). (See Table 9 below.) However, the previous month's costs, and the 2006 estimated income, costs and profits of the two groups were not significantly different.

**Table 9:** Total Income, Expenses and Profit for Veterinarians in 2006 and 2003

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<sup>11</sup> The five outliers with the highest incomes and costs were exempted from this analysis.

	Mean		Statistical Significance
	Control Group	Mercy Corps Participants	
Income from Veterinary Work Last Month (calculated)			
2006: Last Month's Income	62.7	106.6	0.003**
2003: Last Month's Income (adjusted for inflation)	66.9	108.9	0.000**
Costs for Veterinary Work Last Month (calculated)			
2007: Last Month's Costs	48.9	67.6	0.154
2003: Last Month's Costs (adjusted for inflation)	50.1	88.1	0.000**
Income from Veterinary Work in Last 12 Months (estimated by season)			
2006 Total Year's Income	737.8	802.4	0.503
2003: Total Year's Income (adjusted for inflation)	734.6	1193.6	0.000**
Change in Yearly Income: 2003 to 2006	10.4	-399.5	0.000**
Expenses for Veterinary Business in Last 12 Months (estimated by season)			
2006 Total Year's Expenses	355.1	400.4	.363
2003: Total Year's Expenses (adjusted for inflation)	612.8	1049.4	0.000**
Change in Yearly Expenses :2003 to 2006 (adjusted for inflation)	-242.3	-668.3	0.000**
Profit from Veterinary Work			
2006 Year Profit	382.7	402.0	0.781
2003 Year Profit	121.8	144.2	0.031*
Change in Year Profit	252.7	268.8	0.835

- Independent samples t-test: \*\* indicates a significant correlation at the 0.01 level  
\* indicates a significant correlation at the 0.05 level
- The top 5 income and/or cost outliers were removed and the 2 veterinarians who had started but not completed university education were removed.
- For 2007, n=95. For 2003, n=73. For Change between 2003 and 2007, n=73.

There were differences in costs and incomes between 2003 and 2006. Veterinarians trained in BDS reported earning a mean of 802 manat for their work in 2006. In 2003, they reported earning a mean of 1194 manat. This represents a significant drop in their reported income of 43%. Veterinarians who did not receive training reported earning a mean of 738 manat in 2006 a virtually unchanged income of 735 manat in 2003. Expenses for both groups dropped significantly between 2003 and 2006. Participating veterinarians' expenses dropped by a mean of 62%, from 1049 manat in 2003 to 400 manat in 2006. Control group veterinarians reduced their expenses by a mean of 43%, from 613 manat in 2003 to 351 manat in 2006. Again, it appears that profits are better in 2006 than in 2003 not because veterinarians are increasing their incomes (indeed for the Mercy Corps participants these appear to have decreased substantially), but because they are reducing their costs by even more.

When asked about their perception of the change in their profits between 2002 (before the project started) and 2006, there was no significant difference in how the veterinarians who participated in trainings and the veterinarians in the control group rated this. Most veterinarians in both groups said that their profits were "somewhat better" now than in 2003 (67% of the control group and 64% of the participating veterinarians). The same proportion of veterinarians in each group said that their 2006 profits were "about the same" (16%) or "somewhat worse" (8%). (See Table 10 below.)

**Table 10:** How Veterinarians Say their 2006 Profits compare to Profits in 2002 and 2005

How would you compare your 2006 profits to your profits in other years?	Control Group (n=51)		Mercy Corps Participants (n=50)	
	2006 compared to 2002	2006 compared to 2005	2006 compared to 2002	2006 compared to 2005
Somewhat worse	8%	2%	8%	10%
About the same	16%	39%	16%	38%
Somewhat better	69%	57%	64%	50%
Much better	8%	2%	12%	2%

The results were similar when veterinarians were asked to rate the change in their profits between 2005 and 2006, except that some participating veterinarians appear to have been slightly less happy with the changes in their business. Ten percent of participating veterinarians (five people) said that their profits were “somewhat worse,” while just one of the non-participating veterinarians rated his 2006 profits as worse than those in 2005. (This difference is not significant.)

**Discussion:** Perhaps the most interesting finding here is that participating and non-participating veterinarians reported significantly different incomes, expenses and profits when they were queried 2003, some 9 months after the project had begun training the participating veterinarians and farmers with whom some of them worked. In 2006, though, the incomes, expenses and profits of participating and non-participating veterinarians were *not* significantly different. It is not clear why this is the case. Discussions with Mercy Corps staff and veterinarians point to three possible explanations: 1) sustainability of project impacts; 2) access to high quality drugs; and 3) project action to address the disparity between participating and non-participating veterinarians.

Impact sustainability may have been a factor. The survey was conducted in January 2007, and the project closed its active work in Massali and Lenkeran a year earlier. It may be that without encouragement from project staff, trained veterinarians slipped back into their old business practices.

Another possible factor is that the participating veterinarians reported experiencing a surge in new customers during 2003. They attributed this surge primarily to two factors: 1) the improved skills and marketing practices that the project taught, and 2) their access to high quality imported drugs through the project. In 2003 both veterinarians and farmers cited participating veterinarians’ access to higher quality drugs through the project as making those veterinarians more attractive to clients than the non-participating veterinarians (who only had access to lower quality drugs). It may be that by 2006, the non-participating veterinarians had secured access to the better quality drugs as well and that their previous customers gravitated back to them.

A third factor could be the increase in households raising animals that some veterinarians noted and that was discussed above. Non-participating veterinarians may have absorbed many of these.

A fourth factor could be the project’s direct action to use the participating veterinarians to extend information from the project’s BDS training to the non-participating veterinarians. The initial project documents noted that information given to participating veterinarians through BDS trainings (about half of the veterinarians in the regions of Massali and Lenkeran) were expected to diffuse throughout the population of veterinarians. At the time of the 2003 study, this did not appear to be happening. In in-depth interviews and focus group discussions at that time, many non-participating veterinarians expressed disgruntlement that they were losing clients to the participating veterinarians. This was cited in the report on the 2003 survey as a concern regarding impact

equity. Project staff reported that they subsequently stepped up efforts to encourage participating veterinarians to share information with non-participating veterinarians.

There are two exogenous factors that may have had a notable influence on both expenses and incomes in 2006. First was the generally worsening economy of the region which left both farmers and consumers of farm products stretched. Second was a serious increase in the impact of contagious diseases. A foot and mouth disease wave left many cattle sickened or dead. An avian flu scare<sup>12</sup> in which domesticated birds sickened and died and many flocks were exterminated as a preventative measure decimated the population of chicken, geese and other fowl. These diseases both increased the calls for veterinarian assistance in the short term and decreased the population of animals who were left to care for. In particular, many families had a reduced number of cows and chickens in 2006 when compared to 2003. (See below for more details on farmers and their animals.)

### **Hypothesis 2: Demographic characteristics will affect the degree to which veterinarians take advantage of BDS training**

As a backdrop to this set of hypotheses, it is important to note again that in the 2007 survey, veterinarians reported *lower* incomes and expenses than they had reported in 2003. In 2007, they also reported offering fewer types of medical and non-medical services to clients than they had reported in 2003. See Hypothesis 1 above for notes on this situation.

### **Hypothesis 2A. Younger veterinarians will be more pro-active and therefore will have larger increases in sales.**

**Result:** Hypothesis Not Supported

- Younger veterinarians did not have significantly better sales or better percentage changes in sales than older veterinarians. (*not significant: correlations*)

**Data:** The veterinarians surveyed in Masalli and Lenkeran ranged in age from 32 to 66. There almost no significant correlations between a veterinarian's age and the basic aspects of his business. The only two significant correlations were found. First, younger veterinarians had a slightly larger percentage of their business based in working with sheep. The only other characteristic that appeared to be significantly correlated with age was related to the broader household income structure: the younger the veterinarian, the less his veterinary business contributed to his overall household's income (slight correlation with a Pearson correlation coefficient of -.230, significant at 0.05 level). Note that many households in this region of Azerbaijan are multi-generational, so younger people's income may form part of an extended network of family income sources.

In 2003, no significant differences existed between older and younger in terms of a) income, b) expenses, c) previous month's calculated profit, d) previous year estimated profit, e) percent of household income from veterinary business, f) number of times provided products and services, g) percent of work with cattle, sheep, or poultry, h) number of clients or change in number of clients; i) percent of clients with small and medium sized farms, or j) percent of clients who are women.

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<sup>12</sup> There was agreement that birds were getting sick, but there was disagreement about whether or not it was actually the avian flu. Many people were encouraged to – or decided on their own to - destroy their flocks as a preventative measure.

Neither was there any significant difference between the older and younger veterinarians in the number of times they currently provide the types of services that the Mercy Corps project had targeted such as market information, production advice, promotions, or advertising.

## **Hypothesis 2B. Better educated veterinarians will be more pro-active and therefore will have larger increases in sales.**

Whether or not veterinarians with higher educations were more proactive than those with less education was not tested per se; tests were based on education level and sales along with other aspects of veterinarian businesses.

### **Results: Hypothesis Partially Supported**

- Veterinarians who had completed university training did *not* have significantly greater estimated income during the **2006** than veterinarians who had only completed technical school. (no significant difference: test of independent means)
- Veterinarians who had completed university training had significantly greater calculated income, expenses and profits in the previous **month** than veterinarians who had only completed technical school. (significant differences: tests of independent means)
- Veterinarians who had completed university training had significantly more clients during the previous month and during 2006 than veterinarians who had only completed technical school. (significant differences: tests of independent means)

**Data:** All veterinarians had either a technical degree (45 had a technical high school specialization, and 2 attended some university beyond their technical degree) or a university degree (54 completed university). There were significant differences in the amounts that veterinarians from these two groups calculated that they earned from farmers, spent to do their work, and the resulting profit over the previous month. Veterinarians with university educations said that they earned, spent and profited in the realm of twice as much as veterinarians who had only completed technical school. University-educated veterinarians said that they earned an average of 112 manat in December while veterinarians with technical school educations said that they earned 60 manat. (See Table 11 below.) However, when veterinarians were asked to provide estimates for the previous year, (the full year of 2006), there were no significant differences between the estimated mean income, costs or profit of veterinarians who had university or technical school educations. University-educated veterinarians said that they earned a mean of 910 manat in 2006 while veterinarians with technical school educations said that they earned a mean of 857 manat in 2006.

**Table 11: Veterinarian Education Level and Differences in Business Characteristics**

	Mean		Statistical Significance
	Technical School (n=42)	University (n=51)	
2006 Income (estimated)	857 .3	909.6	0.701
2006 Costs (estimated)	369.8	506.0	0.101
2006 Profit (estimated)	487.5	403.6	0.293
Last Month's Income (calculated)	60.3	111.6	<b>0.001**</b>



Last Month's Costs (calculated)	37.8	76.3	<b>0.003**</b>
Last Month's Profit (calculated)	34.4	73.2	<b>0.006**</b>
Total # of medical and non-medical services offered in 2006	4.3	4.3	0.939
Total # of medical and non-medical services offered in 2003	6.7	7.5	<b>0.041*</b>
Number of clients served last month	13.0	24.0	<b>0.004**</b>
Number of clients served last year	90.9	180.4	<b>0.005**</b>
Number of clients served in 2003	53.9	121.7	<b>0.005**</b>

- *Correlation: \*\* indicates a significant correlation at the 0.01 level*  
*\* indicates a significant correlation at the 0.05 level*
- *The top 5 income and/or cost outliers were removed and the 2 veterinarians who had started but not completed university education were removed.*

The only other significant difference between the two groups was in the number of clients that they had: the university-educated veterinarians had about twice as many (which corresponds nicely to the two-fold difference in income and expenses). In fact, the number of clients and income are fairly closely correlated (Pearson correlation coefficient of 0.490 which is significant at the 99% confidence level). Veterinarians with university educations had significantly more clients in the previous month (24 clients vs. 13 clients for technical school veterinarians) and in 2006 (180 vs. 91 for veterinarians with technical school education).

Comparisons were run for the same business elements with respect to the veterinarians' education level as were run regarding the veterinarian's age. When looking at those other aspects of their businesses, no significant differences exist between veterinarians with technical school educations and veterinarians with university education in terms of a) percent of household income from veterinary business; b) number of times they provided medical and non-medical services to clients in 2006; c) percent of their work that is with cattle, sheep, or poultry; d) percent of clients with small and medium sized farms; e) percent of clients who are women; or f) number of times they provided medical services to clients. Neither was there any significant difference between the two groups in the number of times they currently provide the specific types of non-medical services such as market information, production advice, promotions, or advertising.

**Discussion:** The differences found here may, to some extent, be collinear with differences between the veterinarians who participated in the project and those who did not. Sixty-two percent of the project participants had completed university while 49% of the non-participants had attended university (45% completed university and 4% had some university education).

Veterinarians with university educations did provide significantly more types of medical and non-medical services that to clients in 2003 (a mean of 7.5 different types of services for university-educated veterinarians and a mean of 6.7 different types of those with technical school educations). This may suggest that university-educated veterinarians were more able to quickly implement the practices that the project was teaching, but it could also have been a relic of the higher number of university-educated veterinarians who participated in the project. Likewise, the greater number of clients that university-educated veterinarians had in 2003 may have been extant before the project began or it may be related at some level to the ability of university-educated veterinarians to use the marketing skills taught by the project to attract new customers, or it may simply be an artifact of their higher level of participation in the project.



### **Hypothesis 3: The location of a veterinary business and its size at project outset will affect the impact of BDS training**

As a backdrop for Hypothesis 3 (as for Hypothesis 2), it is important to note that in the 2007 survey, veterinarians reported *lower* incomes and expenses than they had reported in 2003. In 2007, they also reported offering fewer types of medical and non-medical services to clients than they had reported in 2003. See Section IV.3 above for a discussion of this situation.

While approximately half of the veterinarians in the regions of Massali and Lenkeran lived in remote areas vs. near towns and approximately half of them participated in the project, the total number of veterinarians in the two regions was too small to allow statistical tests to be run. Therefore, the tests were run simply to determine the impact of business size and location on veterinarians in general.

### **Hypothesis 3A. Veterinarians with a business located closer to densely populated centers or who have easy access to suppliers will be more likely than those who do not to benefit from project interventions**

#### **Results: Hypothesis Partially Supported**

- Veterinarians with a business located in a large town or in one of the regional capitals had significantly higher incomes and profits in 2006 than those whose business was based in a remote village or small town. (*significant differences: tests of independent means*)
- Veterinarians with a business located in a large town or in one of the regional capitals had significantly better changes in income and changes in profits since 2003 than those whose business was based in a remote village or small town. (*significant differences: tests of independent means*)
- Veterinarians with a business located in a large town or in one of the regional capitals did not have significantly more clients than those whose business was based in a remote village or small town. (*significant difference: tests of independent means*)

**Data:**<sup>13</sup> This hypothesis is analyzed based on the assumption that profit level can be used as a proxy for training impact. The business outcomes of veterinarians who lived in remote rural villages and in larger towns and the peri-urban areas of the large towns of Massali and Lenkeran were compared.<sup>14</sup>

In 2006, veterinarians who lived in a large town had significantly higher incomes (with a mean of 905.8 manat) and significantly higher expenses (with a mean of 436.0 manat) than the veterinarians who lived in small rural towns or villages. The veterinarians in the smaller towns and villages had an average income of 586.7 manat and average expenses of 281.0 manat. Both of these differences are statistically significant at the .01 level. (See Table 12 below.) Their resulting mean profits were also significantly different: 470.0 for the veterinarians in large towns and 305.7 for the veterinarians in smaller towns and villages.

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<sup>13</sup> The five outliers with the highest incomes and costs were exempted from this analysis.

<sup>14</sup> Because so few veterinarians lived in the large towns of Massali and Lenkeran, the capital towns of the regions where the project operated, the veterinarians in those location categories were added to the group of veterinarians in large towns for the purposes of testing this hypothesis.

**Table 12: Business Location: Veterinarians who are located in Rural Villages and in Large Towns/Regional Capitals**

	Mean		Statistical Significance
	Remote Village (n=32)	Large Town or Regional Capital (n=54)	
Last month's Income (calculated)	68.63	95.61	0.088
Last month's Costs (calculated)	38.47	67.85	<b>0.022*</b>
2006 Income (estimated by season)	586.72	905.80	<b>0.001**</b>
2006 Expenses (estimated by season)	281.00	435.95	<b>0.002**</b>
2006 Profit	305.72	469.86	<b>0.030*</b>
Change in Real Income (2003 to 2006)	-357.33	-70.72	<b>0.018*</b>
Change in Real Expenses (2003 to 2006)	-532.10	-416.81	0.138
Change in Real Profit (2003 to 2006)	174.77	346.09	<b>0.029*</b>
% Change in Income	-32%	-3%	<b>0.022*</b>
% Change in Expenses	-61%	-44%	<b>0.032*</b>
% Change in Profit	72%	161%	0.182
Number of Clients in 2006	107.34	141.68	0.301
2006 % of Clients who are Women	17.0%	17.1%	0.981

▪ Correlation: \*\* indicates a significant correlation at the 0.01 level

\* indicates a significant correlation at the 0.05 level

▪ The top 5 income and/or cost outliers were removed

All veterinarians reported lower incomes and expenses in 2006 than in 2003 (see the discussion section below). However, their resulting profits were significantly higher in 2006 than in 2003. Still, the veterinarians in the large towns had significantly smaller drops in income and significantly better increases in profits than veterinarians in smaller, more remote villages.

No significant differences existed between veterinarians in these two locations in terms of the a) number of times they provided medical and non-medical services to clients in 2006; b) percent of work with cattle, sheep, or poultry; c) percent of clients with small and medium sized farms; or d) percent of clients who are women. Neither was there any significant difference between the two groups in the number of times they provide the specific types of services that the Mercy Corps project was targeting such as market information, production advice, promotions, or advertising.

**Discussion:** Veterinarians' locations were not classified in the same way as farmer locations were, so there is not a perfect correspondence between the farmers who are classified as living in villages "close" to the towns of Massali and Lenkeran and the veterinarians who live in a large town. Still, some elements of the information that farmers provided can be useful here. Farmers who lived in villages close to the towns of Massali or Lenkeran spent significantly more on medical services than did farmers who lived in more remote villages. This could be a contributing element of the higher incomes of veterinarians in the large towns. Some veterinarians in the large towns run animal drug stores, so this could contribute to part of the income differential seen here.

**Hypothesis 3.B. Veterinarians with a larger volume of sales at the outset are more likely than those at the lower end to be able to take advantage of new methods/options drawn from training and access to new marketing skills**

**Results:** Hypothesis Not Supported

- Veterinarians with a larger volume of sales in 2003 had a significantly greater drop in business volume (sales and expenses) between 2003 and 2006 than veterinarians who had smaller businesses in 2003. (significant: correlations)
- Veterinarians with a larger volume of sales in 2003 did not have significantly greater profits in 2006 or a significantly better change in profits since 2003 than veterinarians who had smaller businesses in 2003. (not significant: correlations)
- Veterinarians with a larger volume of sales in 2003 did not gain significantly more customers by 2007 than veterinarians who had smaller businesses in 2003. (not significant: correlation)

**Data:** As above, this hypothesis is analyzed based on the assumptions that profit level can be used as a proxy for training impact.

As noted earlier, veterinarians reported lower average income and expenses in 2006 than in 2003. In 2007, veterinarians with larger incomes from sales in 2003 saw significantly larger drops in income from sales than veterinarians who reported lower sales in 2003. This was true for both the change in actual income (Pearson correlation coefficient of -0.387, significant at the 99% confidence level) and the percent change in income (Pearson correlation coefficient of -0.312, also significant at the 99% confidence level). (See Table 13 below.) In other words, the higher a veterinarians' income from sales in 2003, the more his income dropped between 2003 and 2006.

**Table 13: Impact in 2006 of Having a Larger Business in 2003**

	Pearson Correlation Coefficient	Statistical Significance
2006 Income (estimated)	0.132	0.261
Change in Real Year's Income	-0.387	<b>0.001**</b>
% change in income	-0.312	<b>0.007**</b>
Change in % of Household Income from Veterinary Business	0.132	0.262
2006 Expenses (estimated)	0.122	0.301
Change Year Expenses	-0.658	<b>0.000**</b>
% Change in Expenses	-0.339	<b>0.003**</b>
2006 Profit	0.101	0.393
Change in Profit	0.046	0.699
% Change in Profit	-0.040	0.732
2006 # of Non-medical Services Offered	0.165	0.159
Change in # of Non-medical Services Offered	-0.478	<b>0.000**</b>
2006 # of Clients	0.218	0.063
Change in # of Clients	0.195	0.095
% Clients who are Women	0.082	0.489

- Correlation: \*\* indicates a significant correlation at the 0.01 level  
\* indicates a significant correlation at the 0.05 level
- The top 5 income and/or cost outliers were removed

At the same time, veterinarians with higher income from sales in 2003 reduced their expenses by significantly more than did veterinarians with lower sales in 2003. As in the case of sales, this was true for both the change in actual expenses (Pearson correlation coefficient of -0.658, significant at the 99% confidence level) and the percent change in expenses (Pearson correlation coefficient of -0.339, also significant at the 99% confidence level).

There was no significant difference in the number of clients in the 2006 client base of veterinarians who had larger sales volumes in 2003. Other aspects of the veterinarians' work that may be related to business success were also examined. There were no significant differences between veterinarians who lived in large central towns and veterinarians in small remote villages in terms of a) in the number of clients and the change in number of clients; b) percent of household income from veterinary business; c) number of times they provided medical and non-medical services to clients in 2006; d) percent of work with cattle, sheep, or poultry; e) percent of clients with small, medium and large farms; or f) percent of clients who are women.

**Discussion:** The result of this strong adjustment in expenses was that the 2007 profits of veterinarians who had higher sales in 2003 were not significantly different from the 2007 profits of the veterinarians who had lower sales in 2003. To a certain extent, this represents a shift in who was making the highest sales.

## 2. Farmers



*Members of a women farmers' group*



*Men gathering in a Massali village*

### **2.A. Key Points from the Causal Model**

#### **Market penetration**

##### **Percent of Farm MEs benefiting from Animal Husbandry Services**

All farmers surveyed in 2003 were currently using at least some veterinary services. For both the MCPs and the Control Group, 100% of all farmers surveyed already vaccinated their animals. (As mentioned above, the government assigns veterinarians to villages and pays them to provide vaccination services – farmers paid for the vaccine serum themselves. While Azerbaijan was part of the Soviet Union, the government paid for other veterinary services as well.) In addition, in 2003 100% of farmers purchased medication for their animals at least once. Eighty-four percent of the MCPs called a veterinarian at least once for emergency care for their animals that year, and 88% of the Control Group called a veterinarian for emergency care (not a significant difference). As such, in terms of access, there was already 100% market penetration for veterinary services of vaccination and medicines. However, vaccination regimens and medicines for very sick animals are a bare minimum in animal care. Both farmers and veterinarians reported that it was common for animals to die when the wrong medication was purchased or the veterinarian was called too late. The project was designed to reduce animal deaths, improve animal health and productivity, and improve farmer profits by helping farmers learn to proactively manage animal health and helping link them to veterinarians who could provide services beyond emergency care. As is shown below, the 2003 market penetration of many some of the other veterinary medical and animal husbandry services promoted by the project was relatively low.

As mentioned above, veterinarians in Massali and Lenkeran were well established in providing basic vaccination coverage. Therefore, (purportedly) all established farmers have had interaction

with at least one veterinarian. As such, it is likely that all farmers already knew of a veterinarian that they could seek when they needed one. New entrants into the sector would have reasonably easy access to information on how to contact the local veterinarian through their neighbors.

### **Market Penetration: % of Farmer MEs aware of the Importance and Availability of Animal Husbandry Services**

In 2003, 70% (58% of the MCPs and 84% of the Control Group) said that they wanted more veterinary and animal production assistance. It is very important to note that all but one of those 218 farmers who said that they would like to get more veterinary services and animal production assistance cited “I can’t afford it” as a limiting factor – along with 10 of those who said that they didn’t want more veterinary services and said “I can’t afford it.” Twenty-six percent of all farmers said that their access to additional veterinary services was limited by timing (difficulty in getting a veterinarian when needed). Sixty-eight Control Group farmers (38%) said that they were limited because they were not satisfied with the quality of the products offered (poor quality medicines were a problem that the project worked to remedy).

Because 81% of the Control Group (farmers who were not part of farmer clusters organized by the project and who had not attended meetings that taught about animal health and promoted veterinary services) said in 2003 that they wanted more veterinary and animal production assistance, it can be said that there was at that time some awareness of the importance of animal husbandry services. In contrast, only 54% of the MCPs said that they would like to have additional veterinary services. (This would seem to indicate that nearly half of the participating farmers felt that, through the project, they now were getting the veterinary care that they wanted – an early impact of the project.) This difference was likely due to the fact that some MCPs had already received some additional services through participating veterinarians. See Table 14 below for details on MCP and non-participating farmers’ interest in increased services and the limitations that they face in accessing increased services.

**Table 14:** What are the limitations that keep you from getting more veterinary and animal production assistance?

Limitations cited	2003		2007†	
	% Control Group Farmers	% Mercy Corps Participants	% Control Group Farmers	% Mercy Corps Participants
I want additional veterinary services	84%	58%	19%	16%
I can't afford more veterinary services	84%	58%	28%	15%
Timing of access was not good	38%	16%	0%	1%
I am not satisfied with the products	4%	0%	0%	0%
I am not satisfied with the quality of the services	3%	0%	1%	6%
Too hard to contact the veterinarian	0%	2%	3%	0%
The veterinarian doesn't come soon enough	0%	1%	1%	0%
My animals were not sick	0%	1%	3%	6%

- Note that farmers were asked to list all the reasons that applied, so the numbers do not add to 100%.
- † In 2007, not all of the farmers answered this question.

In reviewing the obstacles to getting additional veterinary services that farmers cited in 2003 and 2006, note that there has been a drop in the percentage of farmers who say that they want more veterinary services. This could indicate that the project has been successful in helping



veterinarians to increase their coverage. Note also, though, that the primary obstacle to getting more veterinary services is still “I can’t afford it.” However, the percentage of farmers who say that they can’t afford additional veterinary services appears to have dropped between 2003 and 2006.

For many farmers, this awareness of the importance of animal husbandry services seems to go hand in hand with their assessment of how much they can afford to spend on increased access to services provided by veterinarians. In 2003, all but one of the 218 farmers who said that they wanted more veterinary services cited “I can’t afford it.” as a primary limitation. In 2007, even farmers who said that they didn’t want more veterinary services than they already had said that their primary limitation was money – this underscores the idea of co-joint analysis of what is “wanted” and what is “possible.”

The following excerpts from an interview with a woman farmer in 2003 illustrate a common approach to the weighing of costs and benefits of calling a veterinarian for assistance. She was aware of the importance (and price) of prophylaxis treatments, nutrition, barn conditions, genetics and basic medical maintenance – and of the poor quality of the drugs that her veterinarian and the local stores had access to at the time. Sizing it all up, she had made decisions on the level of veterinary care she felt she could afford to use.

Though I am woman, I was born in a family of farmers, and I understand how to feed animals and how to care for livestock. Imagine - I spend the most of my day with them. So I understand when they are not okay and when they are doing well. In addition, my long term involvement in livestock [and my neighbors] taught me lots of new livestock farming practices. Therefore, I can easily take care of cattle by helping them to birth, deworming them in time and even treating them against simple mastitis, other simple diseases. ...I call the veterinarian when I have serious problems with cattle or I urgently need help with livestock. As an example, I may say that my cow could get injured in the pasture by other cows and I may need a veterinarian to assist me in handling the situation. Bearing in mind that I do not have enough money, I will try to call for veterinarian for specific and limited purposes. ... You see, mainly lack of finance and means of communication will keep me from calling the veterinarian for the services. I think that sometimes it is cheaper to solve the problem on my own..... As I told you I tried - and am trying - to cut down my costs to the minimum and this allows me spend the money on other sides of livestock businesses. ... I may get some advice from the veterinarian while he is present on the farm, but this will be more or less related to the specific case he is handling. But I never ask him separately for a specific advice (which I would need to pay for), since he might ask me for the payment.

This can be contrasted with some of the comments made by a woman who participated in trainings set up by Mercy Corps:

I call the veterinarian for most of my animals’ health related issues, since I do not want to make mistakes and to treat or to care for animals in the wrong way. ... It is obvious that when I see that my animals do not produce well or seem to be very sick and there is no way out I will call for veterinarian. ... I call the veterinarian for animal treatment and also for prophylaxes. It helps me very much. If I invest in prophylaxes now, it will save me double costs compared to the treatments. ... If I had more money I would call the veterinarian for providing some other services and advice.

Importantly, the most frequently cited concern of farmers in 2003 and 2007, being able to pay for veterinary services, was cited by veterinarians in both years as well. Farmer disposable income remains a central problem – it was cited by more veterinarians during the focus group of

veterinarians who participated in the project than any other problem. These are a few of the veterinarians' revealing comments from 2003:

- "I have more clients now, but, in practice, they have no money, so I have less income. People just can't pay."
- "We promote our services, so we get more clients who want more services, so we do more for them - but it's free of charge."
- "I do have more clients now, but my profit is the same. People are getting poorer. They don't even have a chicken to pay me with."

Veterinarians were still raising similar concerns in 2007:

- "Sometimes [the farmers] cannot give the reason why they did not follow my advice, but it is related to financial situation: they do not have money. Sometimes this person does not even have money to purchase medication, so I give them the necessary medication. There are farms where I have treated 4-5 animals and did not take any money. When they offered to pay, I told them to pay when they have enough resources. "
- "They are able to pay less now because their business is not doing well and the income is low. Sometimes they are not even able to pay our transportation fees, so we have to pay ourselves."
- "Sometimes they do not even have money to pay for the medicine."
- "I give half-priced or free service for poor customers."
- "Usually I don't charge poor families."

A woman farmer in Zovle commented on this willingness of veterinarians to help when needed, "Our veterinarian is doing his best. He even comes to help when I don't have money to pay him."

### **Change in rejection rate**

In 2003 there were clear differences between farmers who participated in the project and those who did not in terms of how difficult it was for them to find a buyer for their animals and animal products, with 95% of non-participating farmers saying that it was "somewhat" or "very" difficult and 74% of participating farmers saying that it was "easy." This was likely due to early project impacts as one of the aims of the project was to help link farmers to markets. This was not the case in 2007. In 2007, most farmers in said that it was "easy" to find a buyer. (See Table 15 below.)

**Table 15:** How difficult is it to find a buyer for your animals and animal products when you want to sell them?

	2003		2007†	
	% Control Group Farmers	% Mercy Corps Participants	% Control Group Farmers	% Mercy Corps Participants
<b>Easy</b>	5%	74%	58%	66%
<b>Somewhat difficult</b>	66%	23%	10%	11%
<b>Very difficult</b>	29%	4%	15%	10%
<b>Impossible</b>	0%	0%	1%	0%
<b>No answer</b>	0%	0%	17%	15%
<b>Total</b>	100%	100%	100%	100%

- † In 2007, some of the farmers did not answer this question.



Farmers did not cite rejection of their animals and animal products as a factor limiting their sales in 2003 or in 2007. In 2003, transportation difficulties (including lack of access to vehicles and bad roads) was the most common limitation to finding buyers cited by farmers in the more remote villages. (As one farmer put it, “I suffer from the lack of transporting facilities and bad conditions of roads leading the rayon center.”) Lack of marketing information was the most frequent limitation cited by farmers who lived in closer villages. Another farmer responded, “I have no idea on the actual prices on the market. When buyers come to my farm I have to sell without thinking about it.”) Few cited concerns about the quality of their products. In 2007, for those who had trouble finding a buyer, the most common reason was transportation difficulties. No one mentioned market price information as a limitation.

Still, although more farmers in 2007 said that it was “easy” to find a buyer when they wanted to sell, 47% of farmers said that they didn’t sell anything at all during 2006. Both the butcher and the animal drug supplier noted that there is less demand for meat now because consumers have less money. A butcher in the Massali bazaar said “People can not afford buying much meat as they used to before. ... People used to buy 1-2 kilos or more, but now they buy with grams; 700 grams, 500 grams and so on.”

This may seem counterintuitive since the most common reason farmers gave in 2007 for ease of sales was that the demand for meat was high and butchers were interested in buying animals. The demand for meat appears to have stayed low during 2006, but the supply of meat appears to have varied quite a lot due to the animal disease cycles. Supply of meat was higher when farmers chose to slaughter animals rather than risk their becoming ill as diseases spread. Supply of meat was lower when many animals had died and farmers had few left to sell. A few farmers in this survey who had kept animals in 2003 no longer had animals when the 2007 survey was conducted. As an animal drug supplier put it, serious diseases “devastate farms and animals. People keep animals and some kind of diseases kills of them, then people simply give up keeping any animal.”

## **2.B. Farmer Hypotheses**

### **Hypothesis 4: As a result of this project, farmers will purchase increased amounts of inputs, find new market outlets and experience a greater volume of production, sales and profits**

Because the hoof and mouth disease and avian flu scare changed the poultry and livestock situation so dramatically, there is little utility in deeply exploring the change in farmers’ income and profits from 2003 to 2006. In short, the mean number of animals and the mean costs, income and profits all appear to be lower in 2006 than in 2003 – for both farmers who participated in the project and farmers who did not. Of greater utility is to compare how the participating and non-participating farmers weathered the exogenous shocks to their farming system.

### **Hypothesis 4A: Farmers who purchase more veterinary products and services will experience an increase in sales translating into an increase in the net profit of their business**

Results: Hypothesis Partially Supported

- Farmers who purchase veterinary medical services and access veterinary non-medical services more frequently have significantly greater income from sales, expenses, and profits in 2006 than farmers who purchase fewer veterinary services. (significant correlations)
- Farmers who spend more on veterinary medical services have significantly greater income from sales in 2006 than farmers who spend less on veterinary services. (significant correlation)

- Farmers who **spend** more on veterinary medical services do not have significantly greater profits from sales of animals and animal products than farmers who spend less on veterinary services in 2006. (no significant correlation)

**Data:**<sup>15 16</sup> for 2006, the more a farmer spent on veterinary medical services and non-medical services (information, etc.), the greater his or her income from sales was likely to be. The Pearson correlation coefficient for amount spent on these services and income from animal and animal product sales is .346, which is significant at the 99% confidence level. There is no significant correlation, however, between the amount spent on these veterinary services and 2006 profits (the Pearson correlation coefficient is .105). (See Table 16 below.) The correlation between amount spent on veterinary services and overall expenses for 2006 was significant (Pearson correlation coefficient of .299 significant at the 99% confidence level).

There are significant positive correlations between the number of times a farmer acquired medical and non-medical (information, etc.) services from a veterinarian and his or her estimated income and profits during 2006. The Pearson correlation coefficient for frequency of use of non-medical services and income from animal and animal product sales is .293, which is significant at the 99% confidence level. The Pearson correlation coefficient for frequency of use of non-medical services and profit from raising animals and producing animal products is .205 (significant at the 95% confidence level). Again, as expected, the correlation between frequency of access of veterinary services and 2006 expenses was also significant (Pearson correlation coefficient of .299 significant at the 99% confidence level). This pattern of positive correlations existed in 2003 as well, except that the correlation between the number of times a farmer accessed veterinary services and his or her profit was significant just at the 95% level.

**Table 16: Correlation between Use of Veterinary Services (medical and non-medical) and Income, Costs and Profits**

	# times Accessed a Veterinary Service		Amount spent on Veterinary Services	
	Pearson Correlation Coefficient	Statistical Significance	Pearson Correlation Coefficient	Statistical Significance
2006 Year's Income from animals and animal products	0.346	<b>0.000**</b>	0.293	<b>.000**</b>
2006 Year's Expenses for animals and animal products	0.299	<b>0.000**</b>	0.332	<b>.000**</b>
2006 Year's Profit 2006 from animals and animal products	0.205	<b>0.012*</b>	0.105	.200
2003 Year's Income (for animals and animal products	0.281	<b>.000**</b>	0.688	<b>.000**</b>
2003 Year's Expenses for animals and animal products	0.343	<b>.000**</b>	0.729	<b>.000**</b>
2003 Year's Profit for animals and animal products	0.184	<b>.024*</b>	0.483	<b>.000**</b>

- Correlation: \*\* indicates a significant correlation at the 0.01 level  
 \* indicates a significant correlation at the 0.05 level

<sup>15</sup> For this hypothesis, as for the rest of the farmer hypotheses, six outliers were removed. Five of these outliers were farmers whose income in 2006 was more than three standard deviations above the mean and more than one standard deviation over the next highest income (i.e., incomes of over 5,400 manat where the mean income was 542 and the next highest income below 5,400 was 3,300). None of these five farmers were project participants. Three of the income outliers were also outliers in terms of expense outlays, and one additional farmer was classified as an outlier for his high expenses, being one of the four farmers with expenses over 3800 (more than three standard deviations over the mean of 438 and more than one standard deviation over farmer with the next highest costs at 2660).

<sup>16</sup> Calculated month profits are not considered here as, in the agricultural sector, the link between expenditures and profits takes longer than one month to appear.

**Discussion:** It is worth noting again here that income and expenditures tended to be lower in 2006 than in 2003. For 2006, the mean income from animals and animal products of the farmers surveyed was 246 new manat. In 2003, the mean income from animals and animal products (adjusted for 18% inflation between 2003 and 2006) was 986 new manat. Similarly, the 2006 animal husbandry expenses of the farmers surveyed were lower than they were in 2003: 247 new manat in 2006 vs. 840 new manat in 2003. Profits too appeared to be lower in 2006: -1 new manat vs. 150 new manat for the farmers surveyed in 2003. (See Section IV.3 above.)

It is important to note that the relationships described here are correlations and are not related to causality. It is not clear whether farmers with more income were able to purchase more veterinary services or whether the purchase of veterinary services resulted in higher incomes. In any case, the relationship between the number of times a farmer accesses veterinary services and sales and profits is complex and problematic. Profit is calculated as income minus expenses – and veterinary inputs are expenses. It would be expected for profits to be higher for farmers with more animals, and a farmer with more animals likely uses more inputs to care for them. This, though, is complicated by economies of scale. For instance, a large part of the expense of veterinary care in Massali and Lenkeran is the cost of transporting the veterinarian to the farm. The more animals that a veterinarian attends during a visit, the fewer times the veterinarian is needed per animal and the lower the cost per animal. The economies of scale with production advice are of course, greater, since advice on, say, cow nutrition would benefit one cow if the farmer has only one – and 10 cows if the farmer has 10. In addition, some veterinary costs are prophylactic and would be expected to increase profits. Other veterinary expenses are based in damage control, in which case the need for calling a veterinarian itself becomes both an expense and an indicator of sick animals that would potentially lower a farmer's profits.

Leaving aside the question of whether this measure is the most appropriate, it does provide some insight into the problem to examine the relationship between inputs and profits<sup>17</sup> for farmers at slightly different scales. It was not possible to control for number of animals (a farmer with 1 cow might also have between 0 and 25 sheep and 10 and 60 chickens – all of which need different types of veterinary inputs – while a farmer with 10 cows may or may not have significant numbers of other types of animals), however, it was possible to do a rudimentary segregation of farmers by looking purely at the number of large animals and poultry that they have. To do this, farmers with more than 9 chickens, geese, turkeys and/or other fowl (55 farmers) were classified as having “large” numbers of poultry. Farmers with more than four cows, horses, water buffalo and/or donkeys (35 farmers) were classified as having “large” numbers of large animals. With the renewed caveat that this issue is complex and that these apparent relationships may be misleading, there is a significant correlation between the amount spent on inputs and profits for farmers with larger numbers of poultry (Pearson correlation coefficient of .277, significant at the 95% confidence level), while there is no correlation between the amount spent on inputs and profits for farmers with larger numbers of large animals (Pearson correlation coefficient of .073, which is not significant). This is a shift from 2003, when the farmers with large numbers of cows had a significant correlation between amount spent on inputs and profits.

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<sup>17</sup> Note, though, that the benefits of raising animals can not be encapsulated as “profit” defined by income from sales minus cash outlays. Non-negligible but non-cash inputs such as land owned, grazing and labor were not included in the “cost” calculations, and home consumption was not included as a “sale.” Many households consumed significant percentages of what they produced, and some sold nothing for cash.

#### **Hypothesis 4.B. Farmers will purchase an increased amount of goods and services as a result of better marketing strategies by veterinarians**

Since they cover similar information – two aspects of farmers’ use of animal husbandry services - the analysis and discussion of Hypotheses 5Bi and 5Bii are combined here. For context, this is preceded by a discussion of marketing done by veterinarians under the auspices of the project. See also the discussion on veterinary marketing under Hypothesis 1 above.

##### **Hypothesis 4Bi. Farmers who form clusters will be more likely to obtain veterinary services than will farmers who do not form clusters**

And

##### **Hypothesis 4Bii Farmers in clusters will purchase more on average than those not in clusters**

#### **Results: Hypotheses Supported**

- Farmers who participated in farmer clusters organized by Mercy Corps bought medicines significantly more frequently than farmers who did not participate in farmer groups. (significant difference: tests of independent means)
- Farmers who participated in farmer clusters organized by Mercy Corps spent significantly more on animal husbandry products (tools, equipment, and specialized feed) than farmers who did not participate in farmer groups. (significant difference: tests of independent means)
- When only those farmers who reported having an income from their animals or animal products were included, there were no significant differences between farmers who participated in farmer clusters and those who did not in the number of times specific services or products or classes of services or products were accessed or in the amount spent on these.

**Data:**<sup>18</sup> Farmers were asked about the number of times they accessed and the amount that they spent on the following services and products during the past year:

- Vaccinations, emergency care, medicines, artificial insemination, and natural breeding or birthing services (grouped ex post as “veterinary medical services”)
- Market or price information, marketing services (butchering, processing etc.), production advice, formal training, promotions, and informal credit or delayed payment (grouped ex post as “veterinary non-medical services”)
- specialized feed or vitamins, seeds for grazing crops, equipment rental, and equipment or tool purchase (grouped ex post as “animal husbandry inputs”)

Almost all farmers used vaccinations and medicines. Most purchased emergency care. These three veterinary services are analyzed individually. While farmers were also asked about the variety of other services and inputs just mentioned, too few of the farmers interviewed said that they accessed any of these services to allow for statistical analysis. Therefore they were grouped for analysis.

Farmers who participated in one of the farmer clusters organized by Mercy Corps bought medicines significantly more frequently than farmers who were not in farmer organizations. In fact,

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<sup>18</sup> For the primary results for this hypothesis, 11 outliers were removed. Six of these were the income outliers described in the footnote for Hypothesis 5A above. The other five were those farmers who accessed animal husbandry services and products most frequently. These five purchased or otherwise accessed services and inputs more than 40 times. This was more than 2 standard deviations over the mean number of 9.7 times and more than one standard deviation over the next highest number of purchases (28 times). Three of them were project participants and two were not.

farmers in clusters bought medicines about twice as frequently, with a mean of 3.0 times purchasing medicine in 2006 for participating farmers and a mean of 1.5 times for non-participating farmers (this difference is significant at the .01 level). Farmers in clusters also spent significantly more on specialized feed (feed manufactured to animal nutrition specifications as opposed to hay or silage), spending an average of 48.9 manat vs. an average of 24.2 manat spent by non-participants (this difference is significant at the .05 level). There were no significant differences between farmers who participated in Mercy Corps-supported farmer clusters and those who did not in terms of the number of times they got vaccinations or emergency care for their animals or the amount they spent on these crucial veterinary services. Still, the overall amount that participating farmers spent on the services and inputs of interest here was also significantly different from that of non-participating farmers: 81.7 manat for participating farmers and 48.7 manat for non-participating farmers (significantly different at the .05 level).

The above were the results without the top 10 outliers (5 income and expense outliers and 5 outliers in terms of number of times they animal husbandry purchased inputs). When the five farmers whose purchasing frequency made them outliers were added back into the analysis, a few other significant differences were found. With these top purchasers included, the farmers who belonged to Mercy Corps-supported Farmer Clusters were also found to have purchased medical services in general from veterinarians a significantly higher total number of times (6.0 times) than farmers who did not belong to farmer groups (4.0 times). This difference was significant at the .05 level. These participating farmers also bought non-medical inputs (chiefly specialized feed and tools) significantly more times and spent more on them: 4.8 times and 64 manat for participating farmers as contrasted with 2.4 times and 32 manat for non-participants (both significant at the .05 level). These are in addition to the three significant differences mentioned above.

When the responses from just those 75 farmers who said that they actually had an income from their animals and animal products were examined (half of the farmers surveyed), there were no statistically significant differences between the farmers who participated in farmer clusters and those who did not in the number of times that they accessed any specific service or any type of service (medical services, non-medical veterinary services, or animal husbandry products). Neither were there any statistically significant differences in the amount that the two groups said that they spent on the services and products that they bought.

In 2003, participating farmers bought products and services and acquired free services an average of 17.17 times over the course of the year. The non-participating farmers in the Control Group accessed services significantly fewer times: 11.21 times during the year (statistically significant at the 0.01 level). When formal training, production advice, marketing and price information and artificial insemination (all activities that were promoted by the project) were not counted, MCPs averaged 11.68 inputs per year – not significantly different from the 10.97 times that their non-participating counterparts accessed medical services and bought animal husbandry products. Specifically, farmers in farmer clusters bought medicine more frequently and spent more on medicines, got marking information more frequently and spent more to get this information, and bought animal husbandry inputs (specialized feed, seeds for grazing crops, tools, and equipment) more frequently and spent more on them. Twenty-four percent of participating farmers accessed artificial insemination services for their cows (a service promoted by the project) while none of the non-participating farmers did. At the same time, farmers in the clusters got assistance with natural breeding and/or birthing fewer times and spent less on this type of assistance. There was no significant difference in the number of times that the two groups got medical or information services, but the farmers in the clusters spent significantly more to pay for their medical and information services. (As noted above, by 2006, the participating farmers were no longer paying significantly more for these services.) It is important to note that, in 2003, these significant

differences were thought to be early impacts of the project rather than inherent differences between the groups.

It does not appear that access to marketing information was seen as a substantive result of the project. In 2007, only five veterinarians reported that they provided market or market price information to farmers and no farmers reported receiving this type of information. In in-depth interviews and focus group discussions, most farmers said that they got their market and price information from the local bazaar or from neighbors. Most veterinarians said that they got this information from the bazaars as well (and one veterinarian noted that he got his price information from farmers).

Discussion: The significant differences in number of times medicines were purchased and the amount spent on specialized feed in 2006 both represent substantive successes for the project. One of the initial aims of the project was to help farmers learn about the benefits of timely veterinary care for their animals. The fact that participating farmers bought medicines significantly more frequently seems to indicate that this was both successful and sustainable. Another aim was to help farmers to carry out routine care themselves and to recognize when medical attention and intervention were needed. The fact that, while participating farmers purchased medications more frequently, they did *not* spend significantly more on those medications may indicate that they were able to effectively choose when medications were needed and, with the help of veterinarians, purchase appropriate medications.

In its second year, the CABS project supported a local feed mill and encouraged farmers participating in the farmer clusters to purchase specialized feed to improve animal nutrition and production. Much of the increased spending by participating farmers appears to have been in these specialized feed purchases.

Notably, while 24% of participating farmers surveyed in 2003 reported purchasing artificial insemination for their cows, only one farmer (a farmer cluster participant) of the 149 the main sample reported purchasing this service in 2006.<sup>19</sup> One of the veterinarians surveyed said that there had been a problem with semen supplies and that a recent batch of semen had been stale, thus damping demand for the service.

There are clear differences between the two groups that appear to be as a result of the project. Whether or not the differences in use of veterinary and other animal husbandry products and services between the participating and control farmers can be attributed to “marketing” by veterinarians specifically depends on how marketing it defined. Therefore, it is important to clarify the project’s approach to this concept here. The project encouraged participating veterinarians to advertise but also to market themselves and their services directly: to visit farmers frequently to provide support and advice, to educate them about animal health and about veterinary medicines and services, and to build relationships with them. The project also supported veterinarians to work with farmer clusters to teach them about animal diseases and the utility of veterinary services for both maintaining animal health and improving productivity. (See also the discussion on veterinarian marketing in Hypothesis 1 above.)

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<sup>19</sup> Three other farmers who were surveyed said that they purchased artificial insemination for their cows in 2006. However, all three of these were considered outliers (and thus not included in most of the analysis reported here), and none of them were project participants).

**Hypothesis 4C: Farmers in clusters will have higher income from sales and a higher profit margin than those not involved.**

**Results:** Hypothesis Supported

- Farmers who participated in farmer clusters organized by Mercy Corps had significantly higher incomes from sales and significantly higher profits in 2006 than those who did not participate in farmer groups. (significant differences: tests of independent means)

**Data:** Overall, the farmers who participated in a Mercy Corps-supported Farmer Cluster had significantly higher sales and higher profits in 2006 (with a mean of 335 manat in sales and a mean of 69 manat in profit) than farmers who did not belong to a farmer group (who had a mean of 165 manat in sales and a mean overall loss of 64 manat). This includes all farmers – whether they sold animals or animal products or not. (See Table 17 below.) Still, the significant differences between the participating and non-participating farmers look much the same when only those farmers who actually sold animals or animal products in 2006 are examined. When just looking at the business results for the farmers who actually sold meat, dairy products, eggs or wool (when the top 8 outliers were removed), farmers who participated in farmer clusters had statistically significantly higher incomes and profits than farmers who did not: participating farmers had a mean income of 548 manat and a mean profit of 211 manat, while non-participating farmers had a mean income of 394 manat and a mean profit of just 54 manat. Notably, in both cases, these participating farmers did *not* have significantly higher expenses than their non-participant counterparts, nor did they rely to a greater extent on the income from their animals as part of their household income.

**Table 17: Estimated Year Income, Expenses and Profits**

	Control Group	Mercy Corps Farmer Cluster Participants	t-test: Statistical Significance
<b>Farmers who sold meat or other animal products</b>			
2006 Income (based on seasonal estimates)	394	548	.066*
2006 Expenses (based on seasonal estimates)	340	337	.956
2006 Profit	54	211	.009**
<b>Farmers who raised animals but did not sell animals or animal products</b>			
2006 Income	-	-	-
2006 Expenses	149	154	.886
2006 Profit	-	-	-
<b>All Farmers who raised animals</b>			
2006 Income	165	335	.004**
2006 Expenses	229	266	.328
2006 Profit	-64	69	.002**

- Independent samples T-test: \* indicates a significant difference at the 0.05 level.  
\*\* indicates a significant difference at the 0.01 level.
- 8 top income and expense outliers removed

The sales and profits above may give an artificially low impression of farmers' production, however. All farmers surveyed consumed at least some of what their animals produced – and many farmers consumed all (or consumed some and gave away the rest<sup>20</sup> of their animals' production (live animals, meat, dairy products, eggs and/or wool) in 2006. This household consumption is a very important part of the household economy, and farmers are willing to invest in their animals even when they do not plan to sell them.

While all of the farmers surveyed in 2003 sold at least some of the animals, meat, dairy products eggs and/or wool they produced, in 2006, about half of the farmers surveyed did not sell any of these (74 farmers, 48% of the total). The farmers who sold nothing represent 39% of the farmers who participated in the project and 58% of the non-participating farmers. There was no significant difference between the amounts spent on medical and other inputs by those who did and did not sell their animals or animal products.

When farmers were asked about specific sales and costs over the last month, the picture was slightly different. The calculated sales over the last month of farmers who participated in a Farmer Cluster were significantly higher than the calculated sales of farmers who did not participate in a group. However, the participating farmers' calculated expenses were significantly higher too, with the result that the calculated profits for the last month for the two groups were not statistically significantly different. (See Table 18 below.)

**Table 18:** Calculated Month Income, Expenses and Profits

	Control Group	Mercy Corps Farmer Cluster Participants	t-test: Statistical Significance
<b>Farmers who sold meat or other animal products</b>			
Last Month's Income <i>(based on calculation of specific sales)</i>	69	214	.003**
Last Month's Expenses <i>(based on calculation of specific fixed and variable costs)</i>	139	234	.019*
Last Month's Profit	-70	-20	.413
<b>Farmers who raised animals but did not sell animals or animal products</b>			
Last Month's Income	-	-	-
Last Month's Expenses	59	99	.058
Last Month's Profit	-	-	-
<b>All Farmers who raised animals</b>			
Last Month's Income	30	131	.001**
Last Month's Expenses	92	181	.000**
Last Month's Profit	-20	25	.747

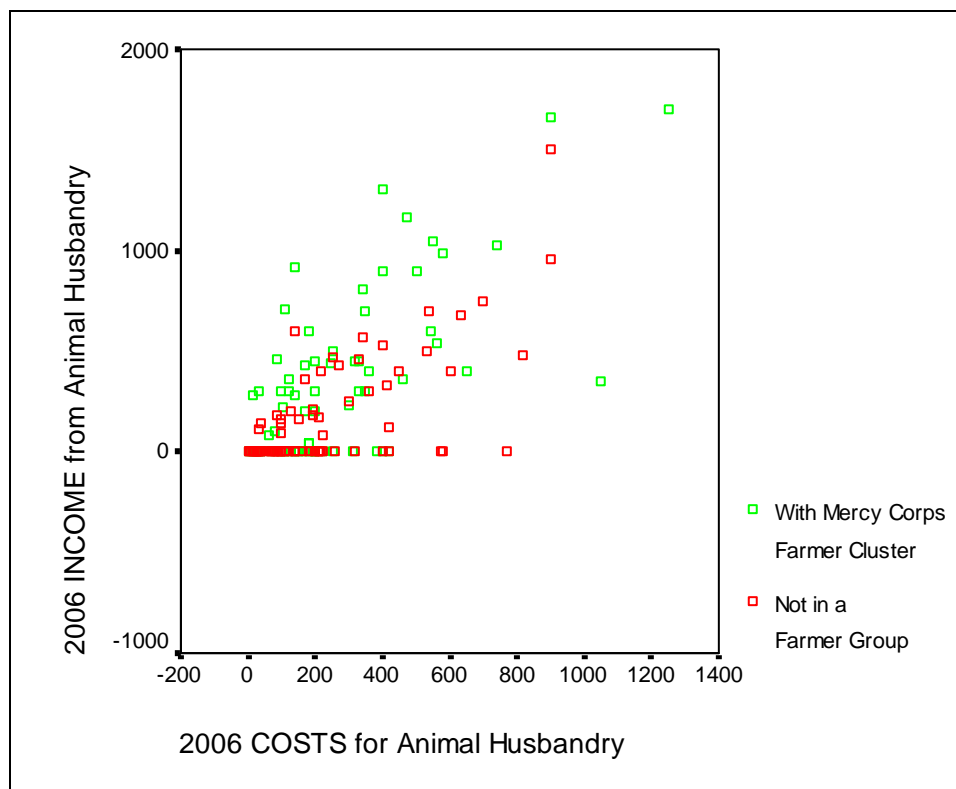
- Independent samples T-test: \* indicates a significant difference at the 0.05 level.  
\*\* indicates a significant difference at the 0.01 level.
- 8 top income and expense outliers removed

<sup>20</sup> Many farmers noted that they gave food to extended family, neighbors or to the less fortunate (the latter, for example, for the holy days of Gourban Bayramy (Eid-al-Adha: the feast of sacrifice).



Another view onto the difference between the farmers who participated in a Farmer Cluster and those who did not can be found in the relationship between their costs and sales: see Figure 2 below.

**Figure 2: Correlations Between Farmer Costs and Income**



**Discussion:** The mean sales of both the participating and non-participating farmers surveyed in 2007 were lower than the mean sales of the two groups found in the 2003 survey. However, this needs to be seen in the macro context of dropping demand for meat (attributed by a local butcher to rising prices of meat and falling consumer incomes) and an increase in animal disease in the region.

Again, the above results are found in a region highly impacted by hoof and mouth disease, anthrax, and by a chicken sickness. Even while medical care increased, these diseases took a serious toll on people's animals. When asked how many of their animals had died due to disease or other causes (besides slaughter for meat), 37% more farmers said they lost chickens in 2006 than in 2003.

Interestingly, farmer cluster participants lost a significantly higher number of chickens in 2006 (a mean of 12) than did non-participants (with a mean of 2). This may be because of their closer contact with veterinarians and greater exposure to information about diseases – anecdotally, participating farmers said that they had been encouraged to slaughter and burn their chickens when it was believed that the emerging chicken sickness was avian flu.

#### **Hypothesis 5: Demographic characteristics, location and farm size affect the likelihood of farmers purchasing inputs**

All farmers surveyed in 2003 reported having accessed medical or other veterinary services. In 2007, three of the farmers surveyed who had had animals in 2003 did not have any animals at all during 2006. Accordingly, these three accessed no animal-related services and had no animal-

related expenses. Of the other 156 farmers with animals surveyed in 2007, nine reported that they did not use any veterinary medical services, access non-medical animal services or purchase tools or specialized feed. All nine of these did, however, purchase ordinary feed for their animals. Of these 156 farmers, 142 (90%) got medical care and 94% got medical care and/or specialized feed or tools. Therefore, the analysis for the following set of hypotheses is focused on the number of different types of services and inputs that they accessed for their animals and the amount that they spent on those services and inputs rather than on the likelihood of purchase.

For three of the sub-hypotheses in this section, correlations were run with the demographic characteristics (farmer age and education level) or farm characteristic (farm size) of interest and a variety of measure of service and input use. A test of independent means was used to test for differences between men and women farmers and to test for whether another farm characteristic – farms relatively close to the central towns of Massali and Lenkeran or relatively far from those two central towns – had an effect on use of animal husbandry services and inputs. Specifically, the tests were run with the following measures:

- Frequency of access to animal husbandry services and inputs: the number of times the farmer accessed:
  - Vaccinations
  - Emergency medical care
  - Medicines
  - All medical services together (vaccinations, medicines, emergency care, artificial insemination, and/or natural breeding and birthing services)
  - All non-medical animal husbandry services from a veterinarian (marketing assistance, market price information, production information, informal credit or delayed payment, promotions and/or formal training)
  - Other animal husbandry inputs (specialized feed, seeds for grazing crops and tools or equipment)
- Amount spent on animal husbandry services and inputs: the amount the farmer spent on
  - The same individual services and sets of services mentioned immediately above

While farmers were asked about these grouped medical and non-medical services and other inputs specifically, too few farmers used those services and inputs to allow for statistical testing. Therefore, they were grouped for testing.

### **Hypothesis 5A: Younger farmers are more likely to purchase animal husbandry services and inputs.**

#### **Results: Hypothesis Partially Supported**

- Younger farmers are significantly more likely call a veterinarian for emergency care for animals than are older farmers. (*significant correlation*)
- Younger farmers are likely to spend significantly more on emergency care for animals than are older farmers. (*significant correlation*)
- Younger farmers are not significantly more likely to access more non-emergency animal husbandry services and inputs than older farmers. (*no significant correlation*)
- Younger farmers are not likely to spend significantly more on non-emergency animal husbandry services and inputs than older farmers. (*no significant correlation*)

**Data:** There is a significant negative correlation between age and the *number of times* farmers purchased emergency care for their animals (Pearson correlation coefficient of -.205, significant at the 95% confidence level). Correspondingly, there is also a significant negative correlation

between age and the amount that farmers *spent* on emergency care for their animals (Pearson correlation coefficient of -.191, also significant at the 95% confidence level).

Besides purchase of emergency service, correlations were also run with age and all of the factors listed in the introduction to Hypothesis 6 (specific and grouped measures of medical services, non-medical veterinary services, or input purchases – see the list above). There were no other significant correlations between farmer age and any of the other measures of access to services and inputs.

The differences between participants and non-participants with respect to age and service access were also considered. When just those farmers who participated in a Mercy Corps-supported Farmer Cluster were examined, younger farmers called a veterinarian for emergency care assistance significantly more times than older farmers did (Pearson correlation coefficient of -.235, significant at the 95% confidence level). However, the younger participating farmers were not significantly more likely to spend more on those services.

On the other hand, younger farmers who did not participate in a farmers' group were significantly more likely to spend more on emergency care than their older counterparts (Pearson correlation coefficient of -.238, significant at the 95% confidence level), but not to call the veterinarian more frequently. Younger non-participants were also likely to access vaccination services significantly more frequently (Pearson correlation coefficient of -.234, significant at the 95% confidence level). Younger non-participant farmers were likely to spend significantly *less* on ordinary animal feed (hay and the like) than older farmers (Pearson correlation coefficient of .333, significant at the 99% confidence level).

**Discussion:** There are two types of likely explanations for the finding that younger farmers got more emergency medical assistance and spent more on that assistance than did older farmers. First, it may be that younger farmers are more likely to be innovative and may be more receptive to making changes in the way they run their animal production. Second, older farmers may be more experienced with animals and their illnesses and may be better able to handle some animal problems on their own without calling in a veterinarian.

## **Hypothesis 5B: Better-educated farmers are more likely to purchase animal husbandry services and inputs**

**Results:** Hypothesis Partially Supported

- Farmers with higher levels of education are likely to purchase animal medicines significantly more frequently than farmers with lower levels of education. (significant correlation)
- Farmers with higher levels of education are not likely to access services and inputs (besides medicines) significantly more frequently than farmers with lower education levels. (no significant correlations)
- Farmers with higher levels of education are not likely to spend significantly more on any services and inputs than farmers with lower education levels. (no significant correlations)

**Data:** There is a significant correlation between farmer education level and frequency of purchase of medicines for sick animals (Pearson correlation coefficient of .200, significant at the 95% confidence level). This correlation between education level and frequency of purchase of medicines appeared to be largely due to the farmers who participated in the Mercy Corps-supported Farmer Clusters. For participating farmers, those with higher levels of education were likely to purchase medicines for sick animals significantly more frequently than participating

farmers with lower levels of education (Pearson correlation coefficient of .304, significant at the 99% confidence level). When the purchases of just those farmers who did not participate in the project were examined, there was no significant correlation between education and frequency of medicine purchase (the Pearson correlation coefficient of -.145 was non-significant at .200).

In 2003, there was no correlation between level of education and the overall amount spent animal husbandry services or inputs or the number of times that these services were accessed. This held true for when just Farmer Cluster participants were considered and when just non-participants are considered.

**Discussion:** Interestingly, this effect of education appears to be active primarily for farmers who live close to the central towns of Massali and Lenkeran. Education correlates with none of the measures of interest for farmers on remote farms. Education does, however, significantly and positively correlate with the number of times a farmer who lives closer to the large towns of Massali or Lenkeran purchased medicine and the number of times he or she called a veterinarian for emergency care.<sup>21</sup> The number of times a more highly educated farmer near a large town called a veterinarian is not necessarily related to veterinary proximity as many veterinarians live in or near the small villages they serve. Close-in farmers with higher education levels also spent significantly more on the sum of all veterinary inputs grouped together and on feed and tools.

## **Hypothesis 5C: Gender affects project impact**

**Hypothesis 5C.i: Women are less likely to purchase inputs than men**

And

**Hypothesis 5C.ii: Project-affected women will be more likely than non-project-affected women to purchase veterinary services and inputs**

### **Results:**

- **5C.i:** Hypothesis Not Supported
  - Women did not purchase significantly fewer services or inputs than men. (no significant differences: tests of independent means)
  - Women did not spend significantly less on services or inputs than men. (no significant differences: tests of independent means)
- **5C.ii:** Hypothesis Partially Supported
  - Women participants in project-sponsored Farmer Clusters spent significantly more on animal husbandry services and inputs than women who did not participate in a farmer organization. (significant difference: test of independent means)
  - Women participants in project-sponsored Farmer Clusters did not use any veterinary medical or non-medical services or purchase inputs significantly more frequently than women who did not participate in a farmer organization. (no significant differences: tests of independent means)

### **Data:**

Men and Women: There are no significant differences in any of the study's aspects of purchase or use of medical services, non-medical services or animal husbandry inputs by the 75 men and 78

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<sup>21</sup> There may be some co-linearity with the rate of animal sickness in the close-in areas (see Hypothesis 6D below). However, it does appear that education has an impact in and of itself.

women who were interviewed. When asked to list all of the purchases that they had made over the past year, women reported buying or otherwise accessing animal husbandry products and services to improve their businesses an average of 7.6 times while men reported buying them an average of 9.8 times. When asked how much they spent on each of these products and services, women's purchases totaled an average of 69.9 manat over the course of a year while men's purchases totaled an average of 66.9 manat. Neither of these differences was statistically significant. There were no significant differences between the purchasing patterns of men and women in 2003 either. Neither in 2003 nor in 2007 was there any difference between men and women respondents in terms of the number of large animals, sheep and goats, or poultry that they owned.

Women who Participated in the Project: Women who participated in the project-sponsored Farmer Clusters and received training from project-trained veterinarians spent significantly more – about twice as much - on veterinary and animal husbandry services and inputs. Participating women spent an average of 95.9 manat in 2006 while non-participating women spent an average of 49.9 manat (t-test for independent means significant at the .05 level). However, there was no significant difference in the number of times that women farmers who did and did not participate in the project used veterinary services (including medical services and non-medical services) or bought specialty inputs (such as specialized feed, tools or equipment): participating women accessed these services and inputs an average of 8.4 times while non-participating women accessed them an average of 6.9 times. The participating women did not have significantly different numbers of cows, other large animals, or poultry than did the non-participating women, so the difference is not rooted in this.

In 2003, not counting the training offered by the project, women who were participating in Farmer Clusters did not acquire animal husbandry services or inputs significantly more times than women who did not participate. Participating women accessed animal husbandry services and inputs (besides formal training) 13.6 times while women who did not participate accessed these types of services and inputs a mean of 10.6 times. The difference in spending of the women in these two categories was not statistically significant.

**Discussion:** Because gender issues in Azerbaijan *vis a vis* this project and this research are rather complex, gender merits special discussion here. As a very broad (perhaps too broad) generalization, it should be noted that, while the egalitarian gender ideals at least formally espoused during the decades of Azerbaijan's membership in the USSR have made impacts, women's roles in most of rural Azeri society in Massali and Lenkeran is also rooted in rural Muslim culture, and that women have, at least formally, different roles from men. While men are ostensibly ultimately responsible for large livestock and women for chickens and other poultry, women have large roles in the day-to-day care and feeding of all animals and in the handling of animal products. It is also important to note that the results here may not be fully representative of all women in the region: women who participate in Farmer Clusters and women who consent to be interviewed may be self-selected as women who feel fewer impediments in talking with non-family men in general and veterinarians in specific.

In terms of this hypothesis, while women who actually were heads of households would have recalled what they themselves bought, both men and women in married households would have recalled what they had bought and at least some of what their spouse had bought. These results could also simply indicate that women and men make similar decisions on how, how much, and when to invest their relatively scarce household resources in their animals.

By the time that the initial field research was done, people who were participating in the project had already had access to a set of animal husbandry inputs through the project, including free training. Therefore, it is safe to assume that, at that stage, at least part of the difference between the

number of times participating and non-participating women accessed services is due to the project and not to inherent differences between the groups.

Differential Project Impacts on Men and Women: Disaggregating the data by gender and by project participation and looking at men's and women's outcomes (income, costs and resulting profits) reveals further information about the project's apparent impact on women. Before going into the results, it is important to note that the results presented here are not conclusive. As noted in Section IV.3 above, it is difficult to completely distinguish between men and women farmers. On the one hand, farming is a family activity: so while, for instance, the household members may say that the cows belong to the male head of household, it may be women within the household who do most of the care of the animals. On the other hand, there may have been some inconsistencies in the way that some of the enumerators recorded who in the household participated in a Mercy Corps Farmer Cluster. It appears that one of the nine enumerators may have occasionally recorded that the respondent him or herself was a participant rather than that someone else in the household was a participant. This means that it is possible that not all of the women who are categorized here as Farmer Cluster participants were actually themselves a participant (but that some of them may have been from the same household as a participant). While ordinarily results would not be presented if there is this type of lack of clarity, the implications of the results, if correctly representative, are important enough to merit discussion.

As noted above, women participants spent more on medical and non-medical services and specialized inputs than women who did not participate. However, women who participated in a Farmer Cluster do not appear to have had higher incomes or profits than non-participating women. (See Table 19 below.) In fact, women's incomes, costs<sup>22</sup> and profits appear to be virtually identical whether or not they participated in the project. Men, however, show a different pattern. Men who participated in the project had significantly higher incomes and profits than men who did not participate. It thus appears that men may have benefited more from their participation in a Farmer Cluster than women did. The reasons for this are not clear. However, if this is indeed an outcome, then it is an important issue to take into account in the design of future projects.

**Table 19: Differences in Income, Expenses and Profit for Project Participants and Non-Participants (sub-categorized by Gender)**

	Non-Participant s (control)	Farmer Cluster Participant s	Statistical Significance
<b>Women</b>			
2006 INCOME from your animals and animal products (estimated by season)	201.5	207.5	0.950
2006 COSTS for your animals and animal products (estimated by season)	217.8	212.4	0.904

<sup>22</sup> It may appear at first glance that there is a contradiction between finding that women participants spent significantly more on medical and non-medical services and specialized inputs than non-participating women and then showing that their expenses were not significantly different. However, these two measures were calculated by different means and cover different types of inputs. The 2006 income and costs reported in the table are based on asking farmers to estimate how much they spent on all aspects of their animal production and to estimate how much they earned from their animals and animal products during each agricultural season over the past year. The figures for medical services, non-medical services, and specialized feed and tool inputs were calculated by asking farmers how many times they had used each of 15 different types of services and inputs whose use the project had promoted and how much they had spent on each of these in the last year. While this method offers a high level of specificity for services and inputs of interest, it by no means covers the full gamut of expenses (food, shelter, purchase price, transportation, etc.) that a farmer might have in raising his or her animals. These are captured in the figures for overall expenses.

2006 PROFIT	-16.3	-4.9	0.898
<b>Men</b>			
2006 INCOME	199.6	514.2	<b>0.007**</b>
2006 COSTS	247.3	307.3	0.320
2006 PROFIT	-47.7	207.0	<b>0.009**</b>
<b>All Farmers</b>			
2006 INCOME	200.6	371.4	<b>0.025*</b>
2006 COSTS	231.1	263.1	0.392
2006 PROFIT	-30.5	108.3	<b>0.039*</b>

▪ Correlation: \*\* indicates a significant correlation at the 0.01 level

\* indicates a significant correlation at the 0.05 level

*Gender, Communication, and Access to Veterinarians:* One key element of concern regarding gender is that women may face special hurdles in terms of access to animal husbandry services and inputs. We were told by key informants that women were not “supposed” to speak with men outside their family unless accompanied by an adult male family member. This would be expected to have an impact on women’s ability to call upon veterinarians for assistance or to receive value-added services (such as production advice) during a visit by a veterinarian (all of the veterinarians in the region who make house calls to care for animals are men). Mercy Corps staff were, of course, concerned about this and designed project activities focused towards women and specifically talked with veterinarians about the importance of working with women.

At some level, this may be an artificial “assumed” rather than real barrier to veterinarian’s ability to work with women (and vice versa). This is not to say that a barrier does not exist, but that the type of attention placed on it may have, to a certain extent, have had the effect of solidifying it in the minds of project staff (few of whom were originally from the region where the project was conducted) as they were trying to break it down. For other projects in this region of the world and in this sector, it is recommended that gender assumptions be carefully evaluated, along with the elements of the project that are conducted based upon them, that the cultural assumptions of all the actors in the project, veterinarians, men farmers, women farmers, and project staff (many of whom are not themselves from the same localities and/or cultures as their clients), be carefully and objectively considered, and that approaches to this issue adjusted, if appropriate, based on inputs from local men and women farmers and from veterinarians.

This research was not designed to go in-depth into illuminating gender relations in Massali and Lenkeran, so conclusions can not be drawn on this dynamic. However, the results of this work suggest that it may be the set of communications expectations *within* the household that impacts on the communication between women and veterinarians as well as the set of expectations around women communicating with men from *outside* the family. While some women in focus groups said that of course they met with the veterinarian – others said that they remained in the background while their husband talked with the veterinarian. “Respect” (within the household) was frequently cited as a factor influencing the ways the women interact with veterinarians and vice versa. For instance, one woman reported, “If my husband is at home he [the veterinarian] may talk to him and me at the same time. But as a respect to my husband sometimes I leave them alone. But I can still participate in their discussions, and I am the one who mainly receives the instructions on the animal health if they are given.” Another said that she would meet with the veterinarian if her husband were not home, but that if her husband was present she “might quietly milk the cow”



listening and occasionally asking “a small question” while the two men talked. The respect issue cuts both ways: another woman said “I think that if the husband is at home the veterinarian will talk to him as a matter of respect. But I can take a part in the discussion, and there is no problem.”

For their part, veterinarians noted few constraints to communication with women. As one veterinarian said in a focus group, “Women are more active in talking to us. It seems like they understand us better because they deal with the animals all the time.” Many women also indicated that they have frequent interactions with veterinarians and that there was no difference for them between calling for a veterinarian themselves and buying medicines themselves or having a male relative do it. One non-participating veterinarian said that “It is easier to work with women. Men usually do absolutely nothing. And whatever I tell to men to do, they ask their women to do what I said. So I talk to women directly to make sure that they understand everything clearly.”

*Animal Husbandry as a Family Affair:* As mentioned above, men are nominally responsible for large animals while women are responsible for poultry. Still, women are responsible for most of the care and milking of cows, and since they spend time with the cows daily, women are more intimately familiar with the animals and more apt to notice health problems. In any case, women are responsible for all animals when there is no adult male in the house temporarily or semi-permanently. Many veterinarians were quite vocal about women’s familiarity with their animals (see below).

All of this means that while we interviewed women who raised animals about the inputs that they purchased, we could not be completely sure that they were reporting what they actually spent themselves or what their husbands spent. One woman asked if she should classify the following situation as an expense by her or by her husband, “The cow was sick so I sent my son to find the veterinarian. My son couldn’t find him so I sent my daughter who brought him home. My husband came home when the veterinarian was here and got the money from the house and paid him for the work.”

*Woman in the Veterinary Client Base:* In 2003, there was no statistical significance in the difference between the percentage of women in the client bases of MCPs and the Control Group. However, in 2007, veterinarians trained in BDS through the project said that a mean of 21% of their clients were women, while non-participating veterinarians said that a mean of 13% of their clients were women. (This difference is significant at the .05 level.)

However, when veterinarians were asked in in-depth interviews whom they got most of their calls from, almost all responded with answers of between 60 and 90% of their calls for assistance were initiated by women. It appears that the critical distinction was the difference between the concept of “farmer” as “client” (often the head of household) and the concept of who was responsible for day to day animal health, which included calling a veterinarian to help with a sick animal. This participating veterinarian’s response may illuminate this difference in conceptualization: I give advice to “mostly men, because heads of farms are men. But, no, if you consider all advice, women come to me more – 60 to 65% are women.” One non-participating veterinarian described the dynamic this way: “Most of the farmers are men, but in small farms most of the people who work with animals are women. About 80% [of the people who call me] are women. Let’s say men are not here – they have gone to Russia on business, and women are home. So 80% are women and 20% are men.” Another took this farther saying “Since most of the men are in Russia, less than 1% of my customers are men.”

As noted above in the Data Considerations section, there may have been some bias introduced in the way that the question about the percentage of women farmers in the veterinarians’ client base. In the 2007 quantitative survey, veterinarians said that, overall, 17% of their clients are women. However, when veterinarians were asked in in-depth interviews who they got most of their calls for emergencies

and advice from, almost all responded with answers of between 60 and 90%. Interestingly, when asked about this in 2003, the information given by veterinarians on their client base indicated that a mean of 46% of their clients were women. The difference here may be in the way that veterinarians understood the concepts of “farmer” and “animal owner” (which is likely to be implicitly a male) and “person who is responsible for the household animals on a day to day basis.”

While there may have been some confusion introduced in this way, there may also be some concrete differences between the local client base in 2003 and 2007. Anecdotally, some farmers noted that there is less work for men outside the region so some have come home. Another factor might be that farmers in general had fewer animals and were using fewer veterinary services in 2007 than in 2003. At the same time, half of the farmers in 2007 reported that they sold no animals or animal products in 2006. Sixty-one percent of the farmers with no income from their animals were women, and it may be that this decline is also reflected in the veterinarians’ perceptions of their client base.

Still, many veterinarians reported in in-depth interviews and focus groups that their primary limitation in working with women was that women were not strong enough to hold a large animal still during treatment. The only veterinarian to mention actively not liking to work with women put it this way, “You know, in order to work with animals they need to be tightly kept. Sometimes animals don’t move when a woman pets them, but mainly I don’t like working with women, in a sense that an animal can cause a trouble.” At the same time, all of the veterinarians who participated in in-depth interviews talked about advantages of working with women. One participating veterinarian encapsulated many others’ comments when he said, “In some farms the animal won’t obey when men are around them. When a woman pets the animal they stay calm and obey. So I tell the man to leave. That works for me more. Animals hear the sound of women and they pet the animal, so it stays calm.”

Hypothesis 5D: Farmers in remote areas are less likely to purchase animal husbandry services and inputs

**Results:** Hypothesis Supported

- Farmers who lived in remote areas purchased medicines and medical services in general significantly fewer times than farmers who lived closer to large towns. (*significant differences: tests of independent means*)
- Farmers who lived in remote areas spent significantly less on medical services in general than farmers who lived closer to large towns. (*significant differences: tests of independent means*)

**Data:** In Massali and Lenkeran, as anywhere else, “remote” and “close” are relative terms. For the purposes of this study, “remote” villages are those which are between 45 minutes and 3.5 hours by car from the central towns of the districts of Massali and Lenkeran. Each of these large towns has a large bazaar (market). Most of the “remote” villages were also in the mountainous parts of the districts, and some were on roads that are virtually impassable except by large truck during the winter and in muddy conditions. “Close” villages are defined as those which are within five to 25 minutes by car from the two district capital towns of Massali and Lenkeran. Note that the travel time is measured by travel in a vehicle as respondents indicated that they did not carry products to market by walking but paid for vehicular transport or used middlemen to get their products to market.

Farmers who lived in remote villages purchased medicines an average of 1.65 times in 2006. Farmers who lived in villages closer to the central towns of Massali and Lenkeran bought medicines an average of 2.84 times. This difference is statistically significant at the .05 level. When all major types of medical services (medicines, vaccinations, emergency care, artificial insemination and natural breeding and birthing) were considered together, farmers in remote villages still used significantly fewer services. Farmers in remote villages used these medical services in total a mean of 3.73 times, while farmers in closer villages used them about twice as many times, with a mean of 6.34 times (this difference is statistically significant at the .01 level). Correspondingly, the remote farmers spent about half as much on those medical services: a mean 14.9 manat in 2006 for remote farmers vs. a mean of 28.2 manat for farmers closer to the large towns (statistically significant at the .05 level).

In 2003 as well, farmers who lived farther away from a large town and market accessed animal husbandry services and inputs significantly fewer times than did farmers who lived closer. Farmers who lived in the outskirts of the central towns of the two rayons and those who lived less than 30 minutes away from these towns purchased (or acquired free of charge) an average of 15 veterinary services or business inputs in the past year. Farmers who lived between 45 minutes and 3.5 hours away from these towns and their markets acquired an average of 12.1 services and inputs. At that time, there was no statistically significant difference in the amount paid for products and services between farmers who lived farther away and farmers who lived closer.

When the 2006 data were disaggregated for farmers who did and did not participate in project, the differences between remote and close farmers are even more stark. It also appears that the additional use and expenditure on medical services for “close” farmers was due primarily to the farmers who participated in the Farmer Clusters. Participating farmers in close villages used medical services significantly more frequently (8.27 times vs. 4.18 times for the participating farmers in remote villages) and spent significantly more on them (38.5 manat vs. 15.8 manat for the participating farmers in remote villages). Both of these differences were significant at the .05 level.

When looking at the results for just non-participating farmers, two different elements showed as significant differences between farmers close to and more remote from the central towns. Non-participating farmers in close villages bought animal husbandry inputs (specialized feed, seeds for grazing crops and/or tools and equipment) more frequently than their more remote counterparts. Since grazing land is at a shortage in the closer villages, much of this may be based in the number of times that they bought feed for their animals. The non-participating farmers in “close” villages also showed significantly more frequent use of any of the full set of medical and non-medical services and inputs (with a mean of 8.07 times) than did the non-participant farmers farther away (whose mean use was 4.74 times). Both of these differences were significant at the .05 level. There were no significant differences in the spending patterns of the non-participant farmers, no matter where they lived.

**Discussion:** The point of examining distance from the two central towns as a factor in agribusiness is that farmers nearer the central towns can be expected to have easier access to larger markets for their animals and animal products (and thus higher prices and greater potential demand for their products), and easier access to places to purchase medicines and some other types of inputs. On the other hand, the farms in these closer villages tend to be physically smaller, and access to grazing is more limited (though it is important to note that grazing lands are limited too in the remote areas, in part by lack of farmer access to forest lands for grazing). This leaves the farmer either to turn to purchased ordinary or specialized food for large animals or to maintain a smaller number of animals than he or she would be able to in areas where grazing or hay were more cheaply accessible. Access to affordable feed appears to be a critical factor. As a male farmer in Miyenku said, “the milk is in cow’s mouth. If you feed the cow well, you will get plenty of milk.”

It is important to note that distance from a large town does not necessarily imply remoteness from a veterinarian. For instance, while there is no veterinarian in the small town of Bilasar some 3 hours on a bad road from Lenkeran, there is a veterinarian living in a neighboring village. In 2003, 81 farmers (26%) indicated that “timing of access” was a limiting factor in their use of animal husbandry services. Of these 81, 42 lived “close” to the large towns and 39 lived in “remote” villages. Many reported that they used the services of more than one veterinarian to compensate for this: of the 76 farmers who explained why they called on the services of more than one veterinarian, 51 said that when one wasn’t available they called another.

One way to interpret the findings that farmers who live close to large towns bought more medicines and medical services and spent more on those medical services would be to conclude that farmers who lived closer to the large towns were more able to take advantage of the skills taught by the project to them and to the participating veterinarians. The corollary would be that even the support of the project was not enough to lift the use of medical services by participating farmers significantly above that of non-participants when they lived in remote villages. This would have strong implications for the design of future projects.

Another way to cast light on these findings is to look at the relative “need” for medical services in close and remote areas. The primary fatal diseases that affected animals in Massali and Lenkeran in 2006 were contagious diseases. Even when farmers have relatively large tracts of land, animals are primarily kept near the home (though they may be herded out to grazing lands). Farmers in villages close to Massali and Lenkeran tend to live closer together than farmers in more remote rural villages – and the villages themselves are closer together. These conditions may aid the spread of diseases. Indeed, when the data on animal deaths in 2006 are examined, they show that a significantly greater number of farmers in close villages had at least one cow die in 2006: 51% of farmers who kept cows in close villages lost one or more cows while just 21% of farmers in remote villages lost one of their cows. Thus, it may be that farmers in close villages bought medicines and

medical services significantly more frequently, and spent significantly more on those medical services, simply because they had more need of them than did farmers in more remote areas.

It is not possible to be certain which of these interpretations is the more accurate in this situation. Both should be kept in mind in future project design.

**Hypothesis 5E: Farmers with larger farms are more likely to purchase animal husbandry services and inputs.**

**Results: Hypothesis Generally Supported**

- Number of Animals:
  - Farmers with higher numbers of poultry are likely to get vaccines, medicines, emergency care, non-medical veterinary services, and animal husbandry inputs (specialized feed and tools) significantly more frequently than farmers with fewer poultry. (significant correlations)
  - Farmers with higher numbers of poultry are likely to spend significantly more on vaccines and animal husbandry inputs than farmers with fewer poultry. (significant correlations)
  - Farmers with higher numbers of cattle are likely to get vaccines significantly more frequently than farmers with fewer cattle. (significant correlations)
  - Farmers with higher numbers of cattle are likely to spend significantly more on animal husbandry inputs (specialized feed and tools) and on ordinary feed than farmers with fewer cattle. (significant correlations)
- Amount of Land Owned and/or Rented
  - Farmers who owned and/or rented larger amounts of land got medical services in general and animal husbandry services and inputs significantly more frequently than farmers with less land. (significant correlations)

**Data:** Farms were examined based on the number of animals that they had. However, an animal husbandry business based on milk and beef has a very different dynamic than one based on wool and mutton - and both function differently than a business based on sales of eggs and poultry (including chickens, geese, turkeys, guinea fowl and other birds). Therefore, the relationships between each of these types of animals and the use of animal husbandry services were examined separately. In addition to the poultry just mentioned, farmers were also asked about cattle, water buffalo, horses, donkeys, sheep, and goats. Many farms had a preponderance of one of these types of animals, and other farms had a more balanced mix. Unsurprisingly, the more animals a farmer has in general, the more he or she is likely to spend on animal husbandry services and inputs. There are, however, specific patterns of services and input use for different animals.

**Poultry:** Poultry appear to have required more medical care in 2006 than other animals. There was a significant positive correlation between the number of poultry a farmer had and the number of times the farmer accessed each measure of frequency of use of animal husbandry services and inputs that was tested for. All but one of those correlations was significant at the 99% level. (See Table 20 below.) Farmers who owned many birds also spent significantly more on vaccines and on specialized food and tools than did farmers with fewer birds. As the region faced an Asian bird flu scare during 2006, and many birds became sick, it is not surprising that there was significant use of veterinary services to care for the birds. However, it is not clear how much this use of veterinary services for poultry was related to the bird flu and how much was simply related to bird care itself. At the same time, the bird deaths reduced some veterinarians' income flow. This was discussed in a focus group in Lenkeran. Comments included "The birds are gone, request for treatment

decreased, income decreased,” and “Now there are birds left only in remote villages and in small numbers. Before we could treat the birds and make money, now we can’t do this.”

In 2003, the number of birds that a farmer owned was positively correlated with the number of times that he or she acquired animal husbandry services or inputs (the Pearson correlation coefficient of 0.257 was statistically significant at the 0.01 level). There was also a positive correlation with the amount that he or she spent (the Pearson correlation coefficient of 0.215 was statistically significant at the 0.01 level). Therefore, it may be reasonably concluded that farmers with more birds use more veterinary services in general and in normal years as well as years with particular disease problems.

Cattle: Farmers with more cattle were more likely to get vaccines and medical services in general than were farmers with fewer cattle. For vaccines, the Pearson correlation coefficient is .271 (which is significant at the 99% confidence level), and for medical services in general the Pearson correlation coefficient is .257 (which is significant at the 99% confidence level). Farmers with large numbers of cows also spent significantly more on specialized feed and tools (Pearson correlation coefficient of .199, significant at the 95% confidence level) and on ordinary feed such as hay (Pearson correlation coefficient of .185, significant at the 95% confidence level). That these cost correlations are relatively weak suggests that there may be some economies of scale in feeding large animals. On the other hand, farmers with access to larger amounts of land tend to have more cows (and/or sheep), so the cost of feed for farmers without land may be a limiting factor. In focus groups and in-depth interviews, several farmers said that feed had gotten much more expensive over the past several years and that the price of feed made it difficult for them to make a profit or to expand the number of animals they kept. All of the farmers in the focus group discussion in Atcahlar said that the price of feed was the primary limitation on their business. One said “Food is expensive, plus you have to buy it [frequently and with high transaction costs]. One to two years of raising the animal, it’s hard work. It is not profitable. The animal may be considered as a capital, so you can have money at once, but it is not profitable.”

Sheep and Goats: Sheep present a slightly different challenge. Farmers with higher numbers of sheep and goats appear to spend more on medicines, emergency care and ordinary food. However, the number of farmers with these animals was too small to allow for testing of statistical significance.

Discussion: The amount of land that a farmer owns and/or rents is highly correlated to the number of animals he or she has, so the correlation between the amount of land and the number of medical and non-medical services and inputs used is repetitive of but rather less useful than the correlations based on the number of animals owned.

Interestingly, the amount of land that a farmer rented correlated with more of the measures of service and input use than any of the other factors examined. This suggests that service and input use may be linked to the relative wealth and poverty of the farmer. Farmers who are more able to mobilize capital may also be more able and willing to use it on health care for their animal husbandry business.

**Table 20:** Correlations between # of Animals & Use of Animal Husbandry Services and Inputs

		# of Cows	# Poultry	Amount of Land Owned &/or Rented
# times got vaccines for animals	Correlation coefficient	0.271	0.293	0.172
	Significance	<b>0.001*</b>	<b>0.000**</b>	0.033
\$ spent on vaccines for animals	Correlation coefficient	0.063	0.315	0.045
	Significance	0.436	<b>0.000**</b>	0.582
# times got medicines for sick livestock	Correlation coefficient	0.149	0.410	0.154
	Significance	0.066	<b>0.000**</b>	0.058
\$ spent on medicines for sick livestock	Correlation coefficient	0.033	0.154	0.040
	Significance	0.684	0.058	0.623
# times got emergency medical care for livestock	Correlation coefficient	0.096	0.182	-0.029
	Significance	0.237	<b>0.024*</b>	0.722
\$ spent on emergency medical care for livestock	Correlation coefficient	0.084	0.142	0.135
	Significance	0.299	0.079	0.096
# times got any medical services	Correlation coefficient	0.257	0.401	0.166
	Significance	<b>0.001**</b>	<b>0.000**</b>	<b>0.040*</b>
\$ spent on medical services	Correlation coefficient	0.108	0.201	0.089
	Significance	0.182	<b>0.013*</b>	0.272
# times got non-medical animal-related services	Correlation coefficient	0.049	0.468	0.075
	Significance	0.548	<b>0.000**</b>	0.357
\$ spent on non-medical animal-related services	Correlation coefficient	-0.061	0.008	0.027
	Significance	0.454	0.924	0.737
# times got animal husbandry inputs (specialized feed, equipment, or tools)	Correlation coefficient	0.104	0.345	0.105
	Significance	0.199	<b>0.000**</b>	0.195
\$ spent on other inputs for animals (specialized feed, equipment, or tools)	Correlation coefficient	0.199	0.539	0.116
	Significance	<b>0.014*</b>	<b>0.000**</b>	0.152
\$ spent on ordinary feed	Correlation coefficient	0.185	0.037	0.072

	Significance	<b>0.032*</b>	0.672	0.408
total # times got animal services and inputs	Correlation coefficient	0.211	0.471	0.164
	Significance	<b>0.009**</b>	<b>0.000**</b>	<b>0.043*</b>
total \$ spent on animal services and inputs	Correlation coefficient	0.212	0.545	0.133
	Significance	<b>0.008**</b>	<b>0.000**</b>	0.102

- Correlation: \*\* indicates a significant correlation at the 0.01 level  
\* indicates a significant correlation at the 0.05 level



## VII. Conclusions



*Man outside his house with chickens*



*A couple with their grandchild*

### Context for the Findings

The region was unusually strongly affected by hoof and mouth disease and anthrax in the year prior to the final field study. There was also an avian flu scare that had enormous impacts, both on poultry populations and on farmers and consumers attitudes towards raising and eating birds. Many animals and birds sickened and died or were destroyed. This had a dual impact on veterinarians. First, they had additional business when animals were getting sick. Indeed, veterinarians in the areas where the diseases hit hardest had higher profits than the veterinarians in more isolated, less affected areas. (This points to a paradox in working toward improving veterinarians' profits: robustly healthy animals need less veterinary assistance than sick animals.) Second, the wake of the diseases left both fewer animals for veterinarians to take care of and farmers with fewer healthy animals and thus fewer resources to pay for the veterinary services that they needed for the animals that they still had. This was combined with national inflation and a regional economic slow-down that left consumers with less ability to pay for meat (sales of beef showed particularly low elasticity in the local markets) and animal products. In sum, farmer income from their animals was lower in 2006 than they were in 2003.

### Overall BDS Project Impacts

The project appeared to be successful in helping participating veterinarians to increase the types of services they provide to farmers, to improve their access to quality drugs, and to expand their client base. While the fact that these ostensible business improvements did not result in significant increases in participating veterinarians profits over non-participating is unexpected, it may be at least somewhat related to the efforts that the project made to have participating veterinarians extend the information acquired from the benefits of the project training to non-participating veterinarians. While participating veterinarians rated the BDS trainings they received from the project very highly (86% of the ratings were "extremely satisfied") and a number of veterinarians

lamented the absence of sources of BDS outside of the project, when veterinarians were asked in a focus group whether they would pay for additional training, the response was negative: “we wouldn’t be able to pay because we have small incomes.”

Both farmers and veterinarians – and both project participants and non-participants – reported lower incomes and expenses in 2006 than they had in 2003. The income declines seen by farmers are likely linked to the increase in animal deaths from contagious diseases and to reduced demand for meat by consumers facing inflation and a difficult local economy, which in turn would have reduced their ability to pay for veterinary services. However, veterinarians reported higher profits for 2006 than in 2003 (which may be a result of better business management). As for farmers, even in the face of the difficult (and, one hopes, fairly unusual) circumstances, those who participated in the project had significantly higher profits in 2006 than farmers who did not receive support from the project.

## **Veterinarian Results: Impacts of the Mercy Corps BDS Project**

### **Impacts of BDS Training**

- Veterinarians who received BDS training directly from the Mercy Corps project
  - have a significantly higher number of clients than the veterinarians who did not receive the training
  - offer significantly more types of services (both medical and non-medical services) to farmers than veterinarians who did not receive training.
  - had a significantly higher calculated income in the previous month
  - had significantly higher estimated incomes, expenses and profits in 2003 (after 1 year of project implementation) but did not have significantly different estimated income, expenses or profits in 2006

### **Impacts of Demographics on Veterinarians’ Business**

- Age was not correlated with income or profits
- Veterinarians who have completed university training
  - have significantly more clients than veterinarians who have only completed technical school
  - had significantly greater calculated income, expenses and profits in the previous month
  - did not have significantly higher estimated income, expenses or profits during the full year of 2006

### **Impacts of Business Location and Initial Size on Veterinarians’ Performance**

- Veterinarians with a business located in a large town or in one of the regional capitals
  - had significantly higher incomes and profits in 2006 than those whose business is based in a remote village or small town
  - do not have significantly more clients

- Veterinarians with a larger volume of sales in 2003
  - did not gain significantly more customers by 2007 than veterinarians who had smaller businesses in 2003
  - do not have significantly greater profits in 2006 or a significantly better change in profits since 2003
  - had a significantly greater drop in business volume (sales and expenses) between 2003 and 2006

## **Farmer Results: Impacts of the Mercy Corps BDS Project**

### **Impact on Farmers of Mercy Corps BDS Training for Veterinarians**

- Farmers who participated in Farmer Clusters organized by Mercy Corps
  - have significantly higher incomes from sales and significantly higher profits in 2006 than those who did not participate in farmer groups
  - buy medicines significantly more frequently
  - spend significantly more on animal husbandry products (tools, equipment, and specialized feed)
- Increased use of veterinary services and inputs:
  - Farmers who purchase veterinary medical services and access veterinary non-medical services more frequently have significantly greater income from sales, expenses, and profits in 2006 than farmers who purchase fewer veterinary services
  - Farmers who spend more on veterinary medical services
    - have significantly greater income from sales in 2006 than farmers who purchase fewer veterinary services
    - do not have significantly greater profits from sales of animals and animal products
  - Farmers who raised animals for household use and who participated in farmer groups significantly increased their purchases of veterinary services and products, while participating farmers who raised animals for sale did not

## Impacts of Farmer Demographics

- Younger farmers
  - call a veterinarian for emergency care for sick animals significantly more frequently and spend significantly more on emergency care than do older farmers
  - do not access significantly more non-emergency animal husbandry services and inputs and do not spend significantly more on these
- Farmers with higher levels of education
  - purchase animal medicines significantly more frequently than farmers with lower levels of education
  - do not access services and inputs (besides medicines) significantly more frequently
  - do not spend significantly more on any services or inputs
- Gender
  - Women
    - do not purchase significantly fewer services or inputs than men
    - do not spend significantly less on services or inputs
  - Women participants in project-sponsored Farmer Clusters
    - spend significantly more on animal husbandry services and inputs than women who did not participate in a farmer organization
    - do not use any veterinary medical or non-medical services or purchase inputs significantly more frequently

## Farm Location and Size

- Farmers who live in remote areas
  - purchase medicines and medical services in general significantly fewer times than farmers who live closer to large towns
  - spend significantly less on medical services
- Farmers with higher numbers of poultry
  - get vaccines, medicines, emergency care, non-medical veterinary services, and animal husbandry inputs significantly more frequently than farmers with fewer poultry
  - spend significantly more on vaccines and animal husbandry inputs (specialized feed and tools)
- Farmers with higher numbers of cattle
  - get vaccines significantly more frequently than farmers with fewer cattle
  - spend significantly more on animal husbandry inputs (specialized feed and tools) and significantly more on ordinary feed
- Farmers who own and/or rent larger amounts of land get medical services and animal husbandry services and inputs significantly more frequently than farmers with less land

## BROADER CONSIDERATIONS

**Links between Frequency of access to Veterinary Services and Profits:** Ultimately, veterinarian profits are tied to farmer profits. Farmers' biggest limitation to increasing expenditures on veterinary input in both 2007 and 2003 was "I can't afford it. According to World Bank statistics some 68% of the people the southern region of Azerbaijan live below the poverty level. As such, lack of cash in hand (or poultry in hand, for that matter) for increasing their input purchases, can be a real factor.<sup>23</sup> However, "affordability" is to some degree a judgment. For farmers, the link to greater profits appears to be in the frequency of access to veterinary services rather than the amount spent on those services. Farmers who participated in the project used veterinary medical and non-medical services more frequently and had higher profits. Greater spending on veterinary inputs is not, however, linked to higher profits. It appears that one of the benefits of the project was in working with veterinarians to help farmers learn to assess both when they needed help and what kind of help they needed (and did not need) and so to use veterinary services both more frequently and more efficiently.

**Scale of Impacts on Participating Veterinarians:** The impact of the Mercy Corps BDS project on veterinarians may appear in this analysis to be more muted than it was. During the project's second year, Mercy Corps strongly encouraged the participating veterinarians to share their new skills and knowledge as well as their access to higher quality drugs with their non-participating counterparts, and the difference in business outcomes between the control and experimental groups may have been affected by this. This is certainly to be applauded in terms of project impact on the people in Massali and Lenkeran. However, it created a less than ideal context for this research.

**A Project's Potential for Skewing the Market:** Development projects, by the very nature of their limited resources, necessarily benefit some people more than others. At the same time, efforts should be made to minimize externalities such as potential inadvertent negative impacts on non-participants. In the case of a project like this one, efforts should be made to avoid any expansion of one veterinarian's (or other business) customer base at the expense of another's where this has occurred primarily due to access to project services on the part of the original participants. Clearly, we live in a world that views competition as good and in which those veterinarians (or other businesspeople) who have been able to expand their customer base can be judged as simply more successful businesspeople than those who have lost customers. However, unequal access to productive resources can artificially tip the balance in ways that are not necessarily favorable in broader terms of veterinary service coverage and poverty reduction - especially in the marginally areas that such projects are likely to target. It is recommended that shifts in customer bases or other potentially "zero-sum" factors be tracked (at a minimal level) by the project. The fact that Mercy Corps recognized this and addressed it was likely good for the veterinarians and farmers in the region.

**Gender:** One of the assumptions upon which the project was designed is that cultural constraints severely limit women's access to veterinarians. As such, this issue was afforded a good deal of

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<sup>23</sup> Note that while farmer poverty is certainly a serious factor in this region, the poverty does not appear to be as intractable a factor in the value chain here as it did in the region of Uganda that was the focal point for one of the companion studies in this assessment of BDS projects. In Azerbaijan, the market systems and infrastructure to enable farmers to sell their products, while not ideal and while still in transition from the former Soviet system, appear to be more functional than in the area of Uganda where the research was conducted.

attention in both the qualitative and quantitative elements of this research. Mercy Corps paid very close attention to gender issues in this project, and 37% of the project's clients were women. The project helped set up separate women's Farmer Clusters (farmer associations) and worked with veterinarians on how they could best provide support to women. Veterinarians interviewed for this research described few limitations on their work with women. At the same time, Mercy Corps staff reported in 2003 that there had been cases in the region where animals had died because a woman was alone at home and was waiting for her husband to call the veterinarian (though whether this was due to her reticence in speaking to the veterinarian or her level of decision-making control over family resources was not clear). When women described their own interactions with veterinarians, they described few impediments, saying that they felt comfortable taking an active role in calling a veterinarian for help and talking with him after he had arrived. However, when women described interactions with veterinarians when their husbands were present, women tended to show themselves taking a backseat role, saying, for instance, that "out of respect" the veterinarian would discuss animal health with their husband while the woman herself might "quietly milk the cow." This points to the importance not only of helping veterinarians and women find ways of communicating effectively with each other, but also of helping women and the men in their households better understand the value of the women's improved knowledge about animal care. One unanticipated result found here was it appears that men may have benefited more from participation in a Mercy Corps-supported Farmer Cluster than women did, at least in sense that participating men's profits were higher than participating women's profits were (even though they did not have significantly different numbers of cattle and poultry). This dynamic merits close attention in future projects of this type.

**Sustainability:** Since the second phase of this research was conducted more than a year after the project ceased its direct activities in Massali and Lenkeran, the fact that there are still strong differences between project participants and non-participants is both a testament to the success of the project and an early indicator for the sustainability of the project's impacts. At the same time, some of the project impacts that were apparent early on have diminished somewhat. For instance, the number of different types of medical and non-medical services that veterinarians provided in 2006 was lower than it was in 2003 (several months after the project had begun). Anecdotally, 2 farmers mentioned during in-depth interviews that their farmer cluster no longer meets. It appears that some of the participating veterinarians may not have continued the promotional and information-providing visits to farmers that they began under the project. Several farmers who had been in farmer clusters mentioned that visits from their veterinarian had fallen off. During a focus group of men in Atchalar who had participated in a farmer cluster, the recommendations that they gave for local veterinarians included several suggestions along the lines of "They should visit us periodically," "They should gather 4-5 people to their house and teach them," "If they do, we will have less sick animals," and "They should come to village and teach farmers, like Mercy Corps did."

## Annex 1

### Summary of the Results from Testing the BDS Hypotheses

As noted above, the hypotheses tested in this section were formulated for the overall BDS study that included research in India and Uganda as well as this research in Azerbaijan. The following is a list of research hypotheses. These details of these results are explored in sections VI.2 and VI.3 above.

#### 1. Veterinarians/Production Service Advisors

**Hypothesis 1:** Training veterinarians in BDS will lead to increased demand for their products and services they provide to farmers, to improve their access to quality drugs, and to expand their client base. While the fact that these ostensible business improvements did not result in significant increases in participating veterinarians profits over non-participating is unexpected, it may be at least somewhat related to the efforts that the project made to have participating veterinarians extend the information acquired from the benefits of the project training to non-participating veterinarians. While participating veterinarians rated the BDS trainings they received from the project very highly (86% of the ratings were “extremely satisfied”) and a number of veterinarians lamented the absence of sources of BDS outside of the project, when veterinarians were asked in a focus group whether they would pay for additional training, the response was negative: “we wouldn’t be able to pay because we have small incomes.”

- Both farmers and veterinarians – and both project participants and non-participants – reported lower incomes and expenses in 2006 than they had in 2003. The income declines seen by farmers are likely linked to the increase in animal deaths from contagious diseases and to reduced demand for meat by consumers facing inflation and a difficult local economy, which in turn would have reduced their ability to pay for veterinary services. However, veterinarians reported higher profits for 2006 than in 2003 (which may be a result of better business management). As for farmers, even in the face of the difficult (and, one hopes, fairly unusual) circumstances, those who participated in the project had significantly higher profits in 2006 than farmers who did not receive support from the project. Hypothesis 1A: Training veterinarians in marketing techniques will lead to increased demand for their products and services

**Supported:** Veterinarians who participated in Mercy Corps trainings on marketing techniques and other BDS skills had a significantly higher number of customers in 2007 than the veterinarians who had not received the training.

- Hypothesis 1B: Those retailers in the project who have had more levels of training will have better business and sales practices than those who have fewer. This will translate into more sales for the more completely trained retailers.

**Not Supported:** Veterinarians who participated in more BDS trainings did not have significantly higher business sales or profits for 2006 nor did they offer significantly more medical or non-medical services to their clients in 2006.

- Hypothesis 1C: Veterinarians who are trained by the project will be more likely to vary and improve the goods and services they offer (either for sale or embedded) than retailers who are not trained

**Supported:** Veterinarians who participated in BDS training supported by the project offer significantly more types of services (both medical and non-medical services) to farmers than veterinarians who did not receive training from the project.

However, while the initial impacts of BDS support were higher than the medium term impacts. Between 2003 (after the initial trainings) and 2006, veterinarians who participated in the trainings reported a significantly greater percentage drop in the number of types of non-medical services that they offered than did non-participating veterinarians.

- Hypothesis 1D: Veterinarians who are not trained by the project will have significantly lower sales and profits than those who are trained

**Partially supported:** In 2003 (shortly after the initial trainings), veterinarians who did not receive BDS training from the project had significantly lower **income** and showed a significantly lower **profit** than those who did receive training.

However, the effect did not hold steady over time.

- Veterinarians who did not receive BDS training did **not** have a significantly lower **income** or **profit** for **2006** than those who did receive training.
- Veterinarians who did not receive BDS training from the project had a significantly lower **income** in the previous **month** than veterinarians who had received the training – but this was not the case for the full previous year.
- Veterinarians who did not receive BDS training from the project had significantly lower **costs** in **2003** than veterinarians who received training but did **not** have significantly lower costs in **2006**.
- There was no statistically significant difference in the way that the veterinarians in the two groups reported their perceptions of their change in profits over time.

**Hypothesis 2:** Demographic characteristics will affect the degree to which veterinarians take advantage of BDS training

Note that in the 2007 survey, veterinarians reported *lower* incomes and expenses than they had reported in 2003. In 2007, they also reported offering fewer types of medical and non-medical services to clients than they had reported in 2003. Therefore, 2006 sales were compared as well. Note also that whether or not older veterinarians or veterinarians with higher educations were more *proactive* than their younger or less educated counterparts was not tested per se; tests were based on age and education level and sales and other aspects of veterinarian businesses.

- Hypothesis 2A: Younger veterinarians will be more pro-active and therefore will have larger increases in sales

**Not Supported:** Younger veterinarians did not have greater sales, greater increases in sale or greater percentage increases in sales than older veterinarians.

- Hypothesis 2B: Better educated veterinarians will be more pro-active and therefore will have larger sales

**Partially Supported:**

- Veterinarians who had completed university training did *not* have significantly greater **income** during **2006** than veterinarians who had only completed technical school.



- Veterinarians who had completed university training had significantly greater **income, expenses** and **profits** in the previous **month** than veterinarians who had only completed technical school.
- Veterinarians who had completed university training had **significantly more clients** during the last month and during 2006 than veterinarians who had only completed technical school.

**Hypothesis 3:** The location of a veterinary business and its size at project outset will affect the impact of BDS training

- Hypothesis 3A. Veterinarians with a business located closer to densely populated centers or who have easy access to suppliers will be more likely than those who do not to benefit from project interventions

#### **Partially Supported**

- Veterinarians with a business located in a large town or in one of the regional capitals had significantly higher incomes and profits in 2006 as well as a significantly better change in income and profits since 2003 than those whose business was based in a remote village or small town.
  - However, veterinarians with a business located in a large town or in one of the regional capitals did not have significantly more clients than those whose business was based in a remote village or small town.
- Hypothesis 3B. Veterinarians with a larger volume of sales at the outset are more likely than those at the lower end to be able to take advantage of new methods/options drawn from training and access to new marketing skills

#### **Not Supported**

- Veterinarians with a larger volume of sales in 2003 had a significantly greater drop in business volume (sales and expenses) between 2003 and 2006 than veterinarians who had smaller businesses in 2003.
- Veterinarians with a larger volume of sales in 2003 did not have significantly greater profits in 2006 or a significantly better change in profits since 2003 than veterinarians who had smaller businesses in 2003 – nor did they gain significantly more clients.

## **2. Farmers**

**Hypothesis 4:** As a result of this project, farmers will purchase increased amounts of inputs, find new market outlets and experience a greater volume of production, sales and profits

- Hypothesis 4A: Farmers who purchase more veterinary products and services will experience an increase in sales translating into an increase in the net profit of their business

**Partially Supported:** Farmers who made more frequent purchases had higher profits, but those who spent more did not.

- Farmers who purchase veterinary medical services and access veterinary non-medical services more **frequently** have significantly greater **income** from sales, **expenses**, and **profits** in 2006 than farmers who purchase fewer veterinary services.
  - Farmers who **spend** more on veterinary medical services have significantly greater **income** from sales in 2006 than farmers who spend less on veterinary services.
  - Farmers who **spend** more on veterinary medical services do **not** have significantly greater **profits** from sales of animals and animal products than farmers who spend less on veterinary services in 2006.
- Hypothesis 4B: Farmers will purchase an increased amount of goods and services as a result of better marketing strategies by veterinarians
  - Hypothesis 4Bi: Farmers who form clusters will be more likely to obtain veterinary services than will farmers who do not form clusters  
AND
  - Hypothesis 4Bii: Farmers in clusters will purchase more on average than those not in clusters

### **Supported**

- Farmers who participated in farmer clusters organized by Mercy Corps bought **medicines** significantly more **frequently** than farmers who did not participate in farmer groups.
  - Farmers who participated in farmer clusters organized by Mercy Corps **spent** significantly more on animal husbandry **products** (tools, equipment, and specialized feed) than farmers who did not participate in farmer groups
  - However, when only those farmers who reported having an income from their animals or animal products were included, there were **no** significant differences between farmers who participated in farmer clusters and those who did not in the number of times specific services or products or classes of services or products were accessed or in the amount spent on these.
  - Participating farmers who raised animals for their household use significantly increased their purchases of veterinary services and products, while participating farmers who raised animals for sale did not.
- Hypothesis 4C: Farmers in clusters will have higher income from sales and a higher profit margin than those not involved

**Supported:** Farmers who participated in farmer clusters organized by Mercy Corps had significantly higher incomes from sales and significantly higher profits in 2006 than those who did not participate in farmer groups.

**Hypothesis 5:** Demographic characteristics, location and farm size affect the likelihood of farmers purchasing inputs

- Hypothesis 5A: Younger farmers are more likely to purchase animal husbandry services and inputs

**Partially Supported:** Younger farmers access emergency services more frequently and spend more on emergency services, but not on other types of veterinary services or products.

- Younger farmers are significantly more likely call a veterinarian for **emergency** care for animals and they are likely to **spend** significantly more on that **emergency** care for animals than are older farmers.
  - Younger farmers are **not** significantly more likely to access **more non-emergency** animal husbandry services and inputs and are **not** likely to **spend** significantly more on them than are older farmers.
- Hypothesis 5B: Better-educated farmers are more likely to purchase animal husbandry services and inputs

**Partially Supported**

- Farmers with higher levels of education are likely to purchase animal medicines significantly more frequently than farmers with lower levels of education.
  - Farmers with higher levels of education are not likely to access services and inputs (besides medicines) significantly more frequently than farmers with lower education levels.
  - Farmers with higher levels of education are not likely to spend significantly more on any services and inputs than farmers with lower education levels.
- Hypothesis 5C: Gender affects project impact
  - Hypothesis 5Ci: Women are less likely to purchase inputs than men

**Not Supported:** Women did not purchase significantly fewer services or inputs or spend less on them than did men.
  - Hypothesis 5Cii: Project-affected women will be more likely than non-project-affected women to purchase veterinary services and inputs

**Not Supported:** Women participants in project-sponsored Farmer Clusters did **not** use any veterinary medical or non-medical services or purchase inputs significantly **more frequently** than women who did not participate in a farmer organization. However, they did **spend** significantly **more** on the products and services that they used.
- Hypothesis 5D: Farmers in remote areas are less likely to purchase animal husbandry services and inputs

**Supported:** Farmers who lived in remote areas purchased medicines and medical services in general significantly fewer times – and spent significantly less - than farmers who lived closer to large towns.

- Hypothesis 5E: Farmers with larger farms are more likely to purchase animal husbandry services and inputs

**Supported** (with variations depending on types of animals and amount of land)

- Farmers with higher numbers of **poultry** are likely to get vaccines, medicines, emergency care, non-medical veterinary services, and animal husbandry inputs significantly more **frequently** than farmers with fewer poultry.
- Farmers with higher numbers of **poultry** are likely to **spend** significantly more on vaccines and animal husbandry inputs (specialized feed and tools) than farmers with fewer poultry.
- Farmers with higher numbers of **cattle** are likely to get vaccines significantly more **frequently** than farmers with fewer cattle.
- Farmers with higher numbers of **cattle** are likely to **spend** significantly more on animal husbandry inputs (specialized feed and tools) and on ordinary feed than farmers with fewer cattle.
- Farmers who owned and/or rented larger amounts of **land** got medical services in general and animal husbandry services and inputs significantly more **frequently** than farmers with less land, but they did not spend more on them.