

**AGRICULTURE PROJECT FOR SOUTHWEST
AFGHANISTAN**

306-0211-A-00-0961

MERCY CORPS INTERNATIONAL

QUETTA, PAKISTAN

FINAL REPORT

1990-1994



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**Cooperative Agreement 306-0211-A-00-0961
1990-1994**

Prepared By: Eng. Rahmatullah, Ag. Division Head
Daud, Engineering Coordinator
Abdul Hai, Horticulture Coordinator
Mohammad Lal, Cereal Coordinator
Dr. Shah Mohammad, DVM Animal Health
Dr. Chip Stem, DVM TUSVM Consultant
Mr. Idrees Parekh, MIS Director
Mr. John Kingsbury, Editor
Mrs. Tahira Roshani, Editor's Assistant
Mr. Tom Brown, Ag. Advisor

**Mercy Corps International
P.O. Box 314
House No. 10-9/450A
Near Officer Colony
Chaman Housing Scheme
Quetta, Pakistan**

**Telephone: (081) 832199-832838
Fax: (081) 832809**

**Mercy Corps International
3030 S W First Ave.
Portland OR 97201
United States**

**Telephone: (503) 242-1032
Fax: (503) 223-0501**

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Chapter 1

Introduction

MCI/Afghanistan

Introduction

The results of this partnership between Mercy Corps International, U.S. Agency for International Development/Office of the AID Representative for Afghanistan, and the people of Afghanistan have been fruitful and encouraging. In this final report for the grant, details of this partnership and its results are provided. Also discussed in detail are the processes by which these results have been effected. Each chapter of this report focuses on one of the major activities funded by the grant. Within each chapter is a discussion of, essentially, what we were supposed to do, how we did it, and the result.

Afghanistan, from a development perspective, presented a clean slate to NGO workers. Many of the activities which were undertaken during this grant had never been tried in Afghanistan before. There were opportunities for investigation and experimentation with new techniques and interventions. The Basic Veterinary Worker Program is a case in point. Prior to the war, there was little private sector animal health care available in Afghanistan, especially in the rural areas. Now, there is rudimentary animal health care available in every district of Southwest Afghanistan. However, there was no clear proof that this program would be successful at the outset. The same can be said of the Horticulture programs such as improved apricot drying and safe pest management practices. Where these activities had never been tried before, they are now becoming part of the annual agricultural routine.

The other project activities under this grant, Cereals Production and Engineering and Rural Rehabilitation, focussed more on the fundamental needs for survival; provision of water and seed for a sustainable staple food grain supply. Rather than attempt to effect change in these very basic structures in the cultural landscape, we attempted to simply regain the ground which was lost over the war. The innovativeness of these activities was more in the process of implementation rather than in the content of the intervention. It required consummate diplomatic skill to negotiate the passage and security of the many thousands of dollars of material inputs required to implement these two activities. The processes by which these activities were so creatively supported are discussed in the Lessons Learned Chapter, as well as in their respective chapters.

In support of these field activities were the MIS and Administrative/Management staff. These departments were well integrated with the field activities and carried out their less glamorous tasks with distinction. Indeed, these departments witnessed most clearly the growth of key local staff in their administrative and managerial capacities. It is likely that the ban on cross-border travel for expatriate staff bore fruit in the more rigorously exercised managerial abilities of the senior local staff.

In an environment like Afghanistan, where murder is commonplace, MCI staff have literally worked "under the gun." When this grant was finishing, many of the staff risked their lives to return AID purchased property to secure havens in Pakistan. They have demonstrated a deep commitment to creative and positive change in an environment of anarchy. This AID grant has been successfully implemented by these people. It is my hope that this report in some way provides them with the credit they are due.

Chapter 2

Cereals Production Assistance

MCI/Afghanistan



Green Revolution Cereals

Politically Incorrect Agronomy?

The wheat varieties which have been promoted by MCI in Afghanistan are direct descendants of the 'Green Revolution' cultivars which sprang from the loins of the Mexican dwarf varieties and other genetic material collected and evaluated at the CIMMYT cereal research center in Mexico. These cultivars have been developed from this CIMMYT material by breeders in Pakistan, and have been well received by farmers in Pakistan.

In certain genres of development literature, 'green revolution' varieties have come under a great deal of criticism for creating farmer dependence on foreign exchange because these varieties require far greater (often imported) inputs to maintain their comparatively higher yields on a long-term basis. These critics usually presume a single faceted breeding program seeking high-yielding varieties with no regard to pest or stress resistance.

It is true that these improved varieties are capable of extracting nutrient elements from the soil and processing them into dry matter with greater efficiency than local varieties or 'land races.' However, what is not mentioned in the critiques of improved plant materials, is that the lessons of the early mistakes made in single-purpose breeding have been learned.

The cultivars of wheat and maize which MCI has promoted in the last few years are from parent lines which have been screened for susceptibility to a variety of pests, stresses and other latent liabilities at hundreds of testing sites around the world. Only the varieties which have consistently outperformed all land races in all the testing sites are selected as parent lines. These lines are then crossed with land races in order to tailor the positive characteristics of the variety to local conditions. The result is a variety which is superior to the land races in nearly every aspect.

The cultivars which MCI have promoted are dramatically more disease resistant, yield higher with no fertilizer, and many have greater drouth tolerance than the land races of Afghanistan. Nonetheless, land races of good repute are always included in MCI variety trials to monitor the ongoing comparative performances of all varieties.

Thus, these introductions not only are well suited agronomically, but are preferable from the socio-economic perspective as well, increasing the number of economic options available to the farmer as a result of consistently higher yields, as well as improving his food security.

I. INTRODUCTION:

I.1. Program Summary and Justification.

Afghan agriculture was only just beginning to enjoy the benefits of the 'Green Revolution' at the time of the outbreak of the war with the Soviets in 1979. The enormous irrigation schemes which had been under construction for 30 years in the southern part of the country were nearing completion, the agricultural training institutions were turning out qualified specialists to deal with Afghanistan's particular problems, and improved cultivars of wheat, maize and other cereals were rapidly gaining credibility with a very conservative farming populace.

Hundreds of thousands of hectares of arid desert in Helmand, Kandahar, and Zabul provinces were opened to cultivation and settlement by the efforts of the Helmand and Arghandab Valley Authority (HAVA). On this land were planted the second generation cultivars of green revolution wheat, most memorable of which was Mexipak; a descendant of Mexican dwarf wheats crossed with South Asian breeder's stock. This variety became known in Afghanistan as "Mexipak Hajji" because the surplus wealth this variety brought, sent many farmers on the Haj to Mecca. Against this background of increased agricultural staples production potential, the settlement of families from all over Afghanistan took place in the various newly opened irrigation areas. These irrigation command areas were anticipated by the government of Afghanistan to be the birth-places of a new and more unified Afghanistan. It was hoped that the prosperity of these places would prevail over the traditional factionalism and inter-tribal conflict which has for so long characterized Afghan society.

In the last 15 years of war, an enormous amount of headway has been lost, in terms of human, infrastructural and technical resources. The litany of destruction need not be repeated here. It suffices to say that practically all of the cereals production potential that existed prior to the war has been lost. The description of activities that follows, is a record of how MCI and USAID worked in partnership with farmers in Southwest Afghanistan to rehabilitate and reinvigorate a cereals production system which had been nearly destroyed.

The MCI cereals program strategy took into account both the immediate needs of Afghans for food and the longer-term need of the Afghan agricultural economy to be self-sustaining. This strategy developed into a two-pronged approach. The first aim has been to provide relatively large amounts of improved wheat and maize seed and fertilizer to farmers at a reduced price, with the simple object of growing as much food grain as possible in as many places as possible. The second thrust of the cereals program has been more developmental in scope. The aim has been to provide training in cereal production to a limited number of farmers in many areas to insure

the sustainable future supply of high-yielding, disease resistant cereal cultivars. For details of average yields of improved seed and local seeds see Tables 2.3 and 2.4.

I.2. Accomplishment Statement.

- * In the course of this grant, MCI distributed more than 2000 MT of improved cereal seed (wheat and maize) in six provinces of Southwest Afghanistan. See Tables 2.1, 2.2 and Figure 2.1 for details.
- * From this amount of seed, an estimated 500,000 MT of wheat has been grown over the past three years by Afghan farmers. See Table 2.7.
- * More than 4000 farmers and extension workers have received rudimentary training in seed or grain production in six of provinces of Southwest Afghanistan. See Table 2.6.
- * In a related activity, MCI managed the disposition of more than 6500 MT of DAP and 2500 MT of improved wheat seed for sale by NGOs in the 1993 wheat planting season. See Figure 2.2.

II. PROGRAM OBJECTIVES:

(Excerpted from Amendment #7 of USAID/MCI Cooperative Agreement #306-0211-A-00 0961-07 dated: 28 September, 1992)

"Specific Objectives of the Cooperative Agreement.

- A. Seed Wheat Production and Distribution: The Recipient shall train and assist a minimum of 150 farmers in Southwest Afghanistan in the production, harvest and marketing of wheat seed with the long term objective of creating a private seed growers association that will produce certified or improved seed for use in Afghanistan. Assistance to farmers will include irrigation/karez rehabilitation and the provision of seed, fertilizer, wheat threshers, mechanical seed cleaners other commodities and support. The Recipient will establish distribution methods and prices of seeds, fertilizers, and other inputs compatible with other agricultural activities supported by O/AID/Rep and as agreed by O/AID/Rep. The seed produced in this activity will be purchased and distributed in a manner and to districts as jointly agreed by the Recipient and O/AID/Rep."

...(end of excerpt from Amendment #7)

III. PROJECT ACTIVITIES & INPUTS:

III.1. Farmer Training.

The prime activities in this project were training oriented. Afghan staff who had experience in agronomic extension work and an educational background in agriculture were recruited to provide technical assistance to farmers who purchased seed and fertilizer from MCI. An expatriate Crops Advisor was also employed to provide technical advice and managerial oversight.

Close relationships were maintained with other project implementors in the area, as well as with UNDP and FAO. This provided opportunities for coordination of seed and fertilizer distribution, and resulted in an equitable and more comprehensive availability of improved seed and fertilizer.

The majority of the training provided to Afghan farmers for either grain or seed production took place in the fields of Afghan farmers. This training was conducted by MCI field staff who themselves were given frequent refresher courses by MCI senior technical staff and were also sent to other agricultural training courses sponsored by the UN or USAID.

Training was mainly, but not exclusively provided to farmers who had purchased improved seed and fertilizer from MCI. The act of purchasing these non-traditional inputs was a practical statement by the farmer that he was interested in learning about other techniques of crop production. These farmers saw that after their initial investment in seed and fertilizer, spending time with and learning from MCI extensionists cost them nothing and usually resulted in a better harvest.

The MCI extension staff were trained in all aspects of agronomic production and therefore were capable of conducting on-going field training extemporaneously. They also conducted formal training sessions several times each season in each province of activity, during which timely topics or operations were discussed with farmers and staff of other NGOs. The general content of a typical course is listed in Appendix 2.1. See Table 2.6 for an overview of the numbers and the locations of cereal production trainees.

As a component of their agronomic training, participating farmers were offered the opportunity to use a variety of agricultural machinery on a nominal rental fee basis. The most successful of these pieces of equipment were the wheat threshers. Many farmers are reported to have purchased wheat threshers after a season of rental and now are hiring them out to other farmers. Please see Table 2.5 for more details.

III.1.1. Farmer Monitoring.

Each MCI extension worker was responsible for providing technical assistance to around 50 seed farmers per season. These farmers are each visited 2-3 times per month. Their names and locations are noted along with detailed relevant agronomic information. In the life of this grant, a significant data base has been built up which has the potential to reveal a variety of problems, trends and other agronomic data. This data resource has not been fully tapped, but is available for analysis. See Appendix 2.2 for a sample Pushtu/English monitoring form.

III.2. Seed and Fertilizer Inputs.

Integral to the fostering of sustainable cereal production in the southwest of the country, has been the distribution of large amounts of seed and fertilizer. These inputs were provided in large quantities by the O/AID/REP funded Ag. Sector Support Project (ASSP) implemented by Development Alternatives, Inc., (DAI). Also providing large amounts of inputs were the UN bodies FAO and UNHCR. The kinds of inputs themselves were selected based on a variety of consultants' reports, FAO and DAI sponsored variety trials, and the field reports of extension workers from various project implementors. Please see Appendix 2.3 for a description of the significant maize and wheat varieties used in this program.

III.2.1. DAP & Wheat Seed Monetization.

In June of 1993, MCI was approached by O/AID/REP to take responsibility for the disposition by sale of more than 6,500 MT of DAP and 2,500 MT of improved wheat seed. In consultation with O/AID/REP, this disposition was effected by the beginning of 1994. It involved sub-granting the bulk of the commodities to other international NGOs which are operational in Afghanistan, and accounting for the final sales and use of proceeds. For more details, please see Appendix 2.4 for the DAP/Wheat Seed Final Report.

IV. ACCOMPLISHMENTS & IMPACT:

IV.1 Farmers Trained.

The numbers of farmers trained under this grant have been shown above. Beyond this, there is no quantifying of the impact at this time. However, field reports from UN officials working in MCI project areas indicate that farmers have a growing appreciation for clean, pure seed and are now trying to produce it for both their own use and for sale.

MCI worked with farmers in Kandahar and Helmand provinces in 1992-93 to grow high-quality wheat seed. At harvest, the seed of farms which were selected by MCI extensionists, was purchased in a food wheat for seed exchange program. This seed was then cleaned, bagged, labelled and sold in areas which had not received any improved wheat seed. The seed was received enthusiastically by the farmers, who were not accustomed to paying anything for their seed. Thus, we see that most of the major components for a private sector seed production industry are in place. All that is lacking in the southwest is a breeding program which can supply contract growers with breeder's nucleus seed and can continue to infuse the seed system with improved plant material.

Nonetheless, there will soon be no need for large amounts of certified seed to be imported into Afghanistan from Pakistan. Seed of that quality is being produced by Afghan farmers at present. For the short-term future, however, basic and pre-basic seed will still be necessary to maintain crop quality. In the longer term, until breeding programs are set up and are operational in Afghanistan, there will be a need for a supply of breeder's nucleus seed from outside of the country.

IV.2 Tons of Food Produced.

In considering the impact of the cereal seed program, it is necessary to engage in a speculative exercise to realize the enormous food production potential of a relatively small amount of seed. If we assume (i) that 20% of a given harvest of wheat will be planted by someone in the following year as seed and (ii) that 1kg of improved wheat planted will produce 25kg at harvest, then some impressive figures emerge. In Table 2.7, it is conservatively estimated that more than 500,000 MT of wheat have been produced in Southwest Afghanistan over the life of this grant.

In Figure 2.2, the extent of DAP disposition in 1993 is depicted. This should be understood as only a portion of the fertilizer available in the fall of 1993. In fact, it is more an indication of where NGO-assisted seed production programs exist. It can be assumed that in the areas indicated, a significant portion of the wheat grown is an improved variety and that in those areas, some form of extension assistance to cereals farmers is operational.

IV.3 Future Impact.

At present, given the momentum from the USAID funded cereals program, it is probable that within five years, there will be a self-sustaining seed production industry that is supported by a UN-sponsored effort to provide basic breeding material for the contract growers. It is also likely that even at present, the southwest of Afghanistan is self-supporting in cereals production. In the future, it is anticipated that farmers

will continue to have an increased awareness of the value of improved seed and improved cereal production techniques.

V. PROGRAM CONSTRAINTS:

As with all of the activities described in this report, there were significant obstacles to implementation that had to be dealt with. Many of the problems are the same for each activity. General solutions to these are discussed in Chapter 8 LESSONS LEARNED.

The cereal project constraints can be broken into three categories; environmental, security, and socio-economic.

V.1. Environmental Problems.

Weather poses difficulties for both the farmer and the extension worker. In the northern part of the MCI project areas, winter weather often resulted in blocked roads and severe crop damage. For example, blocked roads prevented timely urea topdressing.

Disease prevalence in local varieties of wheat and maize, especially rust in wheat and 'southern blight' in maize, though a constraint to the farmer, provided motivation to adopt disease resistant improved varieties. Rust, in particular however, poses a constant threat to the wheat crop. As new varieties are replanted each year, the population's resistance to rust is quickly compromised, and new, more vigorously resistant varieties must be introduced.

The irrigation water delivery and drainage systems have been severely damaged over the entire MCI project area. Where water is scarce and if the local climate allows, farmers will often grow poppies because of its relatively high cash return per unit area of land.

Weeds are a serious problem for seed growers in all provinces. A great deal of land lay fallow for the duration of the war and a variety of weeds have become established which are difficult to eradicate.

V.2. Security Problems.

With the almost constant skirmishing between rival groups of Mujahideen, a variety of problems were manifest. Extension workers often had to walk for miles to visit farmers because motorbikes and vehicles would be commandeered by commanders. Sometimes the workers themselves were impressed into carrying water or ammunition

during battles. With the changes of local authorities that often resulted from these battles, contractual obligations which had been agreed upon prior to the change were reneged upon. This happened in 1992 when MCI contracted with maize farmers in Helmand to return a percentage of their production of maize seed at harvest. They refused to do so on the grounds that the government had changed and therefore all contracts made under the previous communist regime were null and void.

In general, security issues and avoidance of security problems resulted in enormous delays, frequent danger to staff and periodic loss of supplies and equipment to looting.

V.3. Socio-economic Problems.

Both high demand and low availability result in a high price for fertilizer of every kind in the Afghan market. There is also however, a high demand for food, but in the areas which have some semblance of political or military order, the commanders will not allow food prices to be market adjusted.

People in Afghanistan are mistrustful of one another. Though this condition has its most profound impact on the various social relationships which are requisite for a stable society, it also negatively effects the engendering of a trust-based industry such as the seed industry. In other words, farmers are reluctant to purchase seed from a man whom they do not trust, nor can they rely on a government for recourse if they see the government as being as untrustworthy as the seedsman.

Table 2.1

Distribution of Wheat Seed and Fertilizer, 1990-1993

Province	District	1990			1991			1992			1993		
		Wheat Seed MT	DAP MT	Urea MT	Wheat Seed MT	DAP MT	Urea MT	Wheat Seed MT	DAP MT	Urea MT	Wheat Seed MT	DAP MT	Urea
Kandahar	Arghistan	46.80	46.80	50	10	10		24.40	24.40	24			
	Arghandab				15	15							
	Dand	100	100	85.85	16.85	16.85	20	30	30	30	8	8	
	Maiwand	199.90	200	170.80	14.35	14.35	7.5	2	2	2	8.40	8.40	
	Panjwai				29.40	29.40		37	37	27	8.50	8.50	
	Maruf				15	15					10	10	
	Takhtpul				11	11							
	Boldak	126	126	73.70									
Helmand	Musa Qala										19	19	
	Bost										6.40	6.40	
	Baghran	200	200	300							5.25	5.25	
	Shamalann				40	40					10	10	
	Kajaki	116.70	116.70	120	40	40	8				5	5	
	Darwishan				140.50	140.50		10	10	10	5	5	
	Marja				57.70	57.70	35						
	Sangin										5	5	
Zabul	Sh.Safa	100	100		18	18	2	30	30	12	6	6	
	Minzan				56	56		48	48	20	9.5	9.5	
	Daichopan							80	80	80			
	Sioray										10	10	
Urozgan	Terinkot				77.50	77.50							
	Chorah				15	15		48	48	48	20	20	
	Khas Urozgan				30	30		37	37	37	10	10	
Farah	Bakwa										10	10	
											15	15	
Herat	Herat									20			
Total		889.4	889.5	800.35	586.30	586.30	72.5	346.4	346.4	290	191.05	171.05	

Table 2.2

Distribution of Maize Seed and DAP, 1992-1993

Province	District	Distribution, 1992		Distribution, 1993		Total Maize seed	Total DAP
		No. of Maize seed farmers	Average yield improve seed Kg/J	Av. Yield of local seed Kg/J	Av. Yield of improve maize seed Kg/j		
Herat	Maiwand	4	12	3.15	9.45		7.15
	Panjwai	4	12	4	12	8	24
	Dand			4.1	12.3	4.1	12.3
Helmand	Bost			7.35	22.05	7.35	22.05
	Marja	8	24			8	24
	Shamalan			3.89	11.69	3.89	11.69
	Darwishan			3.8	11.50	3.8	11.50
Urozgan	Chora			8	24	8	24
	Kh. Urozgan			7	21	7	21
Zabul	Shahrisafa			1	3	1	3
Total		16	48	42.29	126.99	58.29	174.99

Table 2.3

Average Yield of Wheat Seed

Province	District	No. of Wheat Seed Farmers	1990-1991		1991-1992		1992-1993	
			Av. of Improved Seed Kg/J	Av. of Local Seed Kg/J	Av. of Improved Seed Kg/J	Av. of Local Seed Kg/J	Av. of Improved Seed Kg/J	Av. of Local Seed Kg/J
Kandahar	Arghistan	50	475	280				
	Panjwai	50			440	206	720	378
	Dand	50			672	420	662	380
	Maiwand	50	585	315	538	251	710	365
Helmand	Darwishan	50						
Zabul	Shahrisafa	50					832	372
Total			530	297.5	550	292	731	374

Table 2.4

Average Yield of Maize

Province	District	1992			1993	
		No. of Maize Seed Farmers	Average Yield of Improved Seed Kg/J	Av. Yield of Local Seed Kg/J	Av. Yield of Improved Seed Kg/J	Average Yield of Local Seed Kg/J
Herat	Maiwand	50	1430	780	1010	960
	Panjwai	50			960	430
	Dand	50	1390	630	870	580
Helmand	Bost	50			1170	610
	Marja	50	1520	1015		
	Shamalan	50			1195	660
	Darwishan	50			1125	220 *
Urozgan	Chora	50			660	**
	Kh. Urozgan	50			610	**
Zabul	Shahrisafa	50			710	**

* Damaged by leaf blight fungus 17-8-94
** Damage by freezing on 9-10-1994

Table 2.5

Demonstration and Use of MCI Wheat Threshers, Seed Cleaners and Maize Shellers

Province	District	Thresher 1992		Thresher 1993		Seed Cleaner 1992		Seed Cleaner 1993		Maize Sheller 1992		Maize Sheller 1993	
		Hours	Farmers No.	Hours	Farmers No.	Hours	Farmers No.	Hours	Farmers No.	Hours	Farmers No.	Hours	Farmers No.
	Panjwai	333	62	1149	149	11.30	9	150	MCI purchased seed				
	Dand	102	22	96	16								
	Maiwand	229	47	387	55					102	10	16	9
Helmand	Darwishan			1010	211							28	11
	Shamalan			1006	222			110	MCI purchased seed			41.5	35
Zabul	Shahrisafa	200	54										
Total		864	185	3648	653	11.30	9	260		102	10	85.5	55

Table 2.6

MCI Cereal Seed Farmers Training Program

Years	Wheat Seed and General Farmers Trained						Maize Farmers Trained			Staff Trained	
	MCI Seed Farmers		MCI General Farmers		NGO's Farmers		MCI Seed Farmers	MCI General Farmers	NGO's Farmers	MCI Extension Workers	NGO's Extension workers
	In the Class	In the Field	In the Class	In the Field	In the Class	In the Field	In the Field				
1991		250		470							
1992		250		530				40	85	8	7
1993	120	130	220	520	240	530	320			30	42
Total	120	630	220	1780	240	530	320	40	85	38	49
Total farmers trained 3965											

Table 2.7

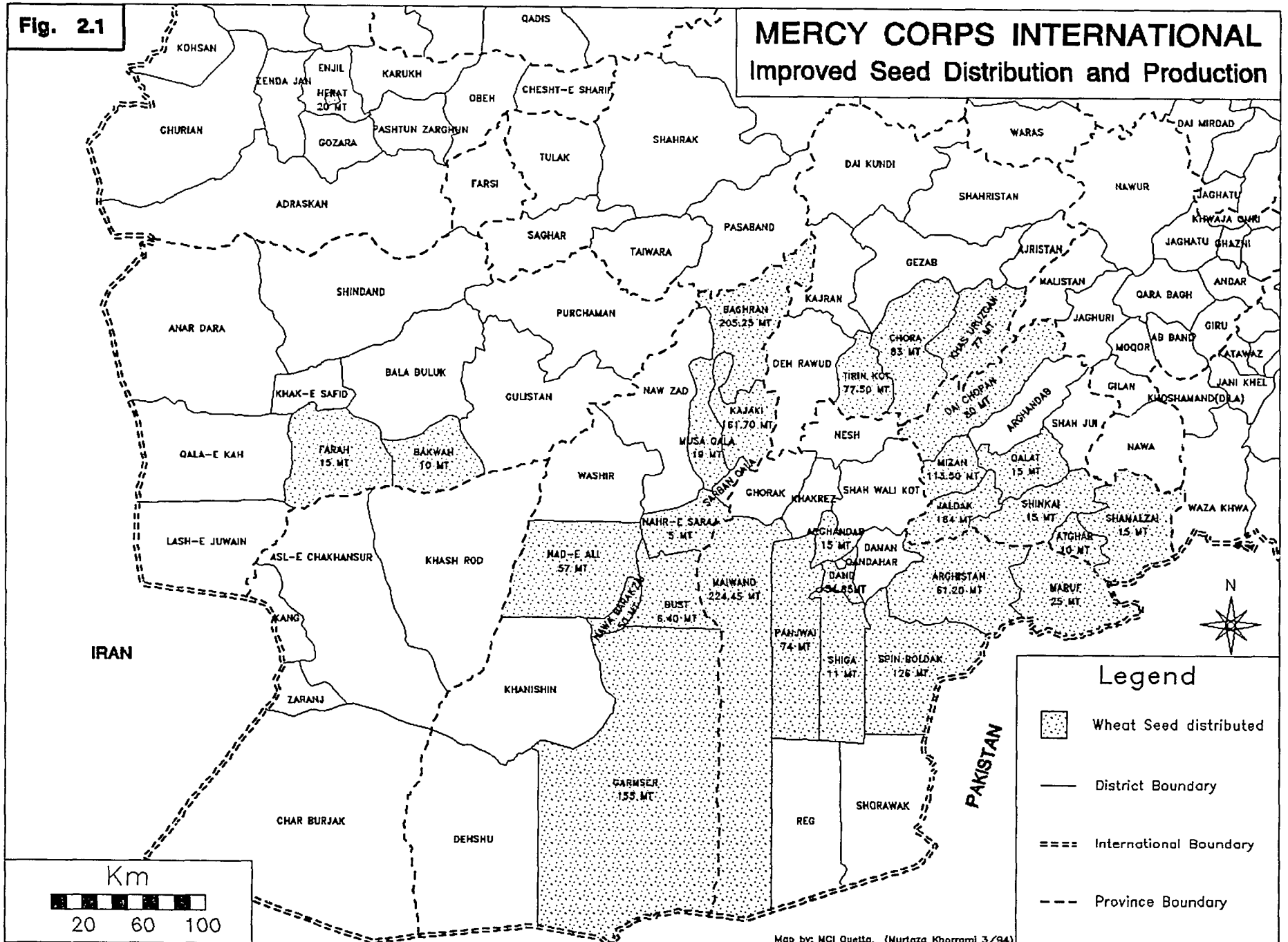
Cummulative Yield Estimates of MCI-Assisted Seed Farmers

Province	District	1990-1991		1991-1992		1992-1993	
		Dist	Yield	Amount Planted (MT)	Yield MT	Amount Planted (MT)	Yield MT
Kandahar	Panjwai			29.40	735	221.25	5531
	Maiwand	199.9	4997	1263.7	31593	7900	197500
	Dand	100	2500	641.85	16046	4041.5	101039
	Boldak	126.30	3157	789.3	19734	0	0
	Arghandab	0	0	15	375	93.75	2343.75
	Arghistan	46.80	1170	302.5	7562.5	1915	47875
	Maruf	0	0	15	375	93.75	2343.75
	Takhtpul	0	0	11	275	68.75	1718.75
Helmand	Shamalan	0	0	40	1000	250	6250
	Kajaki	116.70	2917.5	769	19225	4806.25	120156.25
	Marja	0	0	57.70	1442.5	360	9000
	Darwishan	0	0	140.50	3512.5	888	22200
	Baghran	200	5000	1250	31250	7812	195312
	Mosaqala	0	0	0	0	0	0
Zabul	Mezan	0	0	56	1400	398	9950
	Sh.Safa	100	2500	643	16075	4048.75	101218.75
	Daichopan	0	0	0	0	80	2000
Urozgan	Kh.Orozgan	0	0	30	750	224.5	7612.5
	Chorah	0	0	15	375	141.75	3543.75
	Terinkot	0	0	77.50	1937.5	484	12100
Total		889.7	22241.5	6146.45	153633	33827.25	847694.5 MT

Note: Amount planted equals actual MT seed distributed by MCI plus an estimated 25% seed from previous years harvest.

Fig. 2.1

MERCY CORPS INTERNATIONAL Improved Seed Distribution and Production



Chapter 3

Horticulture & Cash Crop Production Assistance

MCI/Afghanistan



The Kishmish Khana

Kandahar province of Afghanistan is famous for its grapes, fresh and dried. The most valuable of the many varieties of raisins are produced in *Kishmish Khana*; Persian for 'raisin house.

Kishmish Khana are long, adobe sheds roofed with brush and poles and built specifically for the purpose of shade drying green, seedless raisins. These raisins are the genetic ancestors of the Thompson Seedless raisin grown in the US. Kishmish Khana are built of units of adobe mud called *dai*, which is equal to .375 meters³. Mixing a dai of adobe mud and placing it correctly on the wall of the Kishmish Khana is colloquially considered in Kandahar to be the equivalent of one man-day's worth of work.

In the MCI/USAID Kishmish Khana Rehabilitation component of the cooperative agreement, a system was devised in which the beneficiary farmer would provide labor, some cash, and a satisfactory site for rehabilitation of a Kishmish Khana. MCI provided two shovels, some bamboo poles for roofing and food wheat and cash to pay part of the labor cost.

In the course of the program, nearly 3000 Kishmish Khana were re-built or newly constructed from 5,541,645 dai produced and placed; 4,127 metric tons of food wheat, and nearly \$ 100,000 was paid out to laborers.

The result of this program has been an estimated high-value green raisin production potential of 17,360 MT annually. This production has a very conservatively estimated wholesale value of approximately \$ 43 million annually.

I. INTRODUCTION:

I.1. Program Summary and Justification.

Fresh and dried fruits and nuts were among the major export items from Afghanistan prior to the war. Pre-war Afghanistan produced a significant portion (approximately 12%) of the world supply of raisins. Due to the disruption caused by the war this production was severely curtailed. Vineyards and Kishmish Khanas (see information box), out of which this produce issued, also provided shelter for Afghan Mujahideen and thus suffered damage as military targets. The earth trellised vineyards of Kandahar and the adobe walled Kishmish Khanas require a great deal of annual maintenance in order to keep them usable. Neglect and intentional military damage thus resulted in the rapid decline of the Kandahar viticultural production region.

The grape and raisin industry is the basis of the horticultural economy in the southwest part of Afghanistan. Subsidiary, but still extremely important are the other tree fruit and nut crops; especially apricots, apples and almonds. These orchards, too, were to a large extent destroyed from neglect and fighting during the war.

In response to the more limited irrigation water supply which resulted from the collapse of the government sponsored irrigation management system, farmers sought crops with a lower annual water demand which could still bring in an acceptable cash flow. The opium poppy (*Papaver somniferum*) was the most popular crop choice in many of the cooler parts of Southwest Afghanistan.

In 1991, Mercy Corps International in cooperation with The Office of the AID Representative for Afghanistan agreed to carry out a series of interventions which would aim to remedy or mitigate the above problems. Vineyards, orchards and Kishmish Khanas were targeted for immediate physical rehabilitation assistance in an effort to stimulate this essential sector of the agriculture economy.

Along with this relief and rehabilitation effort, activities for the enhancement of the cash income potential of small farms were developed and implemented. These included the apricot drying program, the black cumin introduction program, the introduction of improved orchard and vineyard management practices, and the assessment of Four-Winged Saltbush (*Atriplex canescens*), in collaboration with ICARDA/AZRI in Quetta. Further along in the project, activities were developed to increase the options available to farmers for protecting their crops, and for selecting crop varieties which better suit their particular agro-economic parameters.

I.2. Accomplishment Statement.

The above mentioned programs have been successfully implemented. All targets as outlined in the Cooperative Agreement for horticulture activities have either been met or surpassed.

II. PROGRAM OBJECTIVES:

*(Excerpted from Cooperative Agreement # 306-0211-A-00-0961
Amendment No. 1, 30 June, 1991)*

"Under the terms of this Agreement, Mercy Corps International, in collaboration with A.I.D, its contractors and grant recipients under the Agricultural Sector Support Project, shall undertake activities to restore agricultural capacity in Southwest Afghanistan. Eligible activities for support will be those which promote the production, marketing and processing of food grain and cash crops. The expansion of private sector capacities will be promoted to the extent that there are direct links to activities approved under this Agreement...

- A. Orchard and Vineyard Rehabilitation: The Recipient shall assist Afghan farmers with the rehabilitation of a minimum of 9,000 jeribs (approximately 4,500 acres) of vineyards and orchards with the long term objectives of increasing farmer income, increasing the availability of food, generating employment opportunities and to the extent possible, recapturing Afghanistan's prewar export markets. Assistance to farmers shall include:
- a. The sale of rootstock, fertilizer, hand tools and other commodities as agreed to by O/AID/Rep.
 - b. Support for the repair of irrigation systems, vineyard trellises and other related infrastructure as agreed by O/AID/Rep.
 - c. The establishment of nurseries and demonstration plots.
 - d. Assistance in marketing agricultural produce.
- B. Cash Crop Pilots: The Recipient shall implement cash crop pilot activities in a manner jointly agreed upon by the Recipient and O/AID/Rep. Pilot projects shall include cumin and caraway (black cumin) production, training and marketing assistance for improved apricot drying methods.

1. Assistance to cumin and caraway farmers shall include: a) the sale of seed; b) provision of extension services for production practices; c) growth monitoring; and d) cleaning seed with rented mechanical seed cleaners to enhance product marketability and price. MCI staff will compare caraway growth when planted from seed or from tubers and assess cumin and caraway viability as cash crops for Afghan farmers.
 2. MCI will assist farmers in the production of dried apricots through provision of extension services and training programs for MCI staff and farmers.
- C. The Recipient will continue to develop an information system to quantify, evaluate and coordinate MCI's agricultural activities in Afghanistan to support implementation of its agricultural projects. Information generated will be shared with A.I.D., its contractors and grant recipients."

.....(end of excerpt from Amendment No. 1)

III. PROJECT ACTIVITIES & INPUTS:

III. 1. Orchard & Vineyard Rehabilitation

III. 1.1 Orchard & Vineyard Rehabilitation Program Conception and Preparation.

With the object of providing stimulus to an important economic sector, vineyards and Kishmish Khana in the Kandahar area were targeted for re-digging and reconstruction. A program was developed in which exceptionally war-impooverished vineyard owners, widowed households, or vine-farming families with more than one handicapped member would be contracted to reconstruct their own Kishmish Khana, or re-dig their own vineyard. MCI would contract to pay the beneficiary 25% of the reconstruction cost in cash, and 50% of the cost in food wheat. The beneficiary contribution was for the remaining 25%. The inputs were to be provided at intervals outlined in the contract.

An agreement was made with the UN World Food Program to provide approximately 6000 MT of food wheat for this and similar activities. This wheat was provided from the UNILOG stores in Quetta, and was shipped to the MCI center in Panjwai district where it was stored and from which it was disbursed to contracting farmers.

To augment the renewed vineyards and orchards, MCI, in collaboration with FAO, established nurseries with the capacity to produce large numbers of fruit trees and vines of a definite type and variety. The nurseries were established on private farms with the object of providing the participating landowner/farmers with nursery

management training throughout the life of the first generation of trees. The participating farmer would receive the proceeds from the sale of the harvest of the first generation of trees, and from then onwards, outside input would be limited to provision of certified plant material.

A secondary objective in this activity is in response to the irrigation water shortage which has prevailed in most parts of the formerly well-irrigated southwest; namely to equip interested farmers with the skills to produce nursery stock as a cash crop requiring less land and water than an orchard, but generating a similar profit.

III. 1.2 Orchard & Vineyard Rehabilitation Program Implementation

Over the life of the grant, 11,317 jeribs (approx. 5,658 acres) of vineyard were re-dug and planted on 5,108 different vineyards in Kandahar province. A total of 5,279 MT of food wheat and approximately \$ 140,000 in cash was paid to the laborers who re-dug the vineyards (please see Table 3.1, and Map 3.1 which detail this activity).

During the same period, 2,396 Kishmish Khana were built or rehabilitated in Kandahar province, with 5,541,645 dai made to construct the buildings. As the MCI contribution, approximately \$ 100,000 in cash and 4,127 MT in food wheat was paid for labor.

Vineyards & Kishmish Khana Established & Rehabilitated by MCI in Kandahar Province from 1990-1993

Table 3.1

Year	No. of Vineyards Established & Rehabilitated	Inputs		No. of Kishmish Khana Rehabilitated	Inputs	
		In cash \$	In kind (food wheat) MT		In cash \$	In kind (food wheat) MT
1990	374	10,258	386	75	3,130	129
1991	3,027	83,027	3,129	1,097	45,784	1,889
1992	1,701	46,656	1,758	1,220	50,917	2,100
1993	2	57	3	4	167	7
Total	5,104	139,998	5,276	2,396	99,998	4,125

The monitoring of the ongoing construction of these vineyards and Kishmish Khanas was carried out by MCI staff based in the Panjwai, Maiwand, Dand, and Arghandab field centers. Information and tracking of contracts, cash disbursed, and work completed was carried out by the MCI Management Information System in Quetta.

During the establishment of improved fruit tree plantings and nurseries, 46,427 improved variety fruit trees were budded and sold in MCI and MCI - assisted private nurseries; 80,180 imported fruit trees were distributed in four provinces and 2000 imported MM 106 rootstock of apple were distributed.

In the teaching of improved orchard management practices, 2533 farmers attended demonstrations in which 27,632 trees were pruned on 516 farms in Helmand, Kandahar, Urozgan and Zabul.

Twenty-five extension workers and 75 farmers were trained during on-farm training programs carried out by extension workers. Hundreds of hours of hands-on training for staff was organized. MCI extension staff demonstrated to the program management staff their ability to perform the various improved nursery and orchard management practices which they disseminate among Afghan farmers.

Training handbooks for propagation, pruning and other orchard management issues were developed, illustrated by the MCI in-house training manual artist, and printed (see Appendix 3.1 for a list of these publications).

All field training and discussion was carried out in the orchards of interested farmers with the idea that the intervention would be more relevant to observing farmers when seen in action in their neighbor's planting.

Table 3.2 MCI Orchard Pruning Program 1992-1993

Province	No. of Farms	Numbers and Types of Trees Pruned					
		Almond	Apple	Apricot	Plum	Other	Total
Kandahar	254	60	274	290	83	382	1089
Zabul	92	159	33	43	3	0	238
Urozgan	170	714	136	561	77	18	1506
Total	516	933	443	894	163	400	2833

Note: Along with the above 24,799 saplings were pruned in various districts.

III. 1.2 Orchard & Vineyard Rehabilitation Program Conclusion & Sustainability

In perennial horticultural crops, such as vineyards and orchards, it is impossible to quantify yield data within the first three or four years of planting the crop. However, for the reconstruction of the Kishmish Khana, sustainable success was assured from the beginning simply because farmers agreed that this activity was necessary, but could not be accomplished with their war-depleted resources.

Both the re-establishment of vineyards and the reconstruction of Kishmish Khanas were relief oriented activities. It is of course not appropriate to rebuild all the infrastructure of all farmers whenever they solicit assistance. In the 1991-93 Afghan context, however, this activity was implemented in a timely and appropriate way.

In the period of implementation, refugee farmers were ambivalent about whether to return to Afghanistan and begin rebuilding their farms. The conditional reconstruction assistance which they received from MCI/USAID was sufficient to catalyze the return of many farmers, which in turn led to the return of other refugees and ultimately a more widespread re-investment of time and capital in the area.

Most of the vineyards and Kishmish Khana of the Kandahar area have been reconstructed now and are operational. This has occurred, to a large extent, as a result of the impetus which this reconstruction program provided in the area. There are now other horticultural activities, more developmental in scope, which are necessary for these growers.

It is these needs which the orchard/vineyard management and nursery production components of this program have begun to address. At the end of this grant, there are bridgeheads of both trained farmers and high quality, environmentally suitable plant material in the most remote sections of the MCI/USAID project area. The technology transfer is in mid-stage. The spring of 1994 will reveal to many hundreds of farmers the benefits of pruning their trees two years ago. Further project activities in orchard and vineyard management will be carried out under other funding to complete the work which was begun under this grant.

III. 2. Improved Apricot Drying (a Cash Crop Pilot Activity)

III. 2.1 Improved Apricot Drying Program Conception and Preparation.

Building on the previous work of consultants for the DAI Agriculture Sector Support Program, in 1991, MCI engaged a consultant to develop a pilot project for the training of Afghan fruit farmers in improved techniques of sulphuring and drying apricots for the international market. The program was designed to include an initial intensive, practical, extension worker training component, conducted in Quetta at the MCI training facility. This was followed by extensive field demonstrations in Afghanistan. This model included monitoring by extension supervisors and a reporting protocol which allowed farmer follow-up for evaluation.

Materials requisite for this activity were:

1. Wooden drying trays
2. Sulphur powder
3. Sheet plastic
4. Scales (for weighing apricots and sulphur)
5. Small metal pan for burning sulphur

All of the materials are readily available in the market.

III. 2.2 Improved Apricot Drying Program Implementation.

In the course of this grant, nearly 7 MT of dried apricots were produced from demonstrations in which 2694 farmers and 88 extension workers participated. This fruit was produced in 78 training courses in four provinces and at the MCI office in Quetta.

Table 3.3 Dried Apricot Production Activities, 1991-1993

Province	District	No. of Courses	Participants		Amount of Apricots	
			Extension Workers	Farmers	Fresh (kg)	Dried (kg)
Kandahar	Maiwand, Arghandab, Panjwai, Dand	11	5	804	6,650	1,680
Helmand	Nawzad	2	2	233	498	87
Zabul	Shahri-Safa, Mizan, Shahjoi, & Qalat	14	6	1,091	11,984	2,747
Urozgan	Chora Khas Urozgan Dehrawood & Terncote	51	10	566	10,691	2,486
Total	13	78	23	2,694	29,823	7,000

Note:- 65 Extension Workers from DAI Participated in 3 Courses in 1991 & 1992.

After the first course, preparations began on an illustrated Pushtu manual for producing high quality dried apricots. This manual was written by Dr. Abdul Wakil with assistance from the MCI program staff. The manual is designed to be used by the semi-literate Pushtu speaker and describes the process with clear illustrations from harvest to final packaging of the product. This manual is complete and is now available as an aid to extension workers and farmers.

In the last apricot drying training course held in Quetta in June, 1993, a slightly different training approach was used and proved to be dramatically successful. Along with the extension workers, some of the farmers considered by field staff to be highly entrepreneurial were invited to Quetta as well.

When the participants had all gathered, the group was divided into teams of three; each with two farmers and one extension worker. Each team was given several boxes of fresh apricots from the market and told from the beginning that the apricots belonged to them and they would be able to sell whatever they produced, and keep the money.

This approach from the beginning motivated the various teams to produce a higher quality batch of dried fruit. Indeed, the fruit produced was of a significantly higher quality than any produced up to that date in the project.

At the end of the course, a team took their fruit to the bazaar for test marketing. They returned, looking rather smug, and announced that they had sold all of their fruit for around \$1.00 per KG., about 3 times the market price for locally dried apricots.

At this point, another team took their fruit to the bazaar. They returned soon looking even more smug; they had sold theirs for approximately \$2.00 per KG. Having seen the income potential for these apricots, the other participants bundled their nicely packaged dried fruit up and, rather than selling it, they took it back to Afghanistan to, "show our families how much money can be made with these!"

III. 2.3 Improved Apricot Drying Program Conclusion & Sustainability.

This program has revealed to a small number of Afghan farmers the dramatic profit potential that exists in producing high-quality dried fruit. One of the farmers mentioned above, who returned to Afghanistan with his finished dried fruit from the June, 1993 course in Quetta, returned to Quetta 2 months later, having put into action what he had learned. His story is related below (III.6). There are now farmers scattered around the MCI project areas who are trained in this technology and will share their skills with their neighbors as well. Though it is encouraging to see individual success, the introduction of this very profitable technology has only begun. MCI will continue to provide improved apricot drying and marketing assistance in the future with support from other donors.

III. 3. Black Cumin Production (a Cash Crop Pilot Activity)

III. 3.1 Black Cumin Production Program Conception and Preparation.

In 1991 a plan was drawn up by a consultant engaged by MCI for the establishment of black cumin planting in areas of Southwest Afghanistan. The object of the plan was to investigate the feasibility of this crop being promoted as a substitute for poppy cultivation.

Little was known of the cultural techniques for this crop. Upon inquiry, Pakistani government horticulturists declared the crop to be impossible to cultivate. There was also considerable confusion about the actual genus and species of the black cumin which was being investigated. Another consultant, the following year, finally revealed the genus and species of the most sought after variety of black cumin, Carum bulbocastanum. This type of black cumin, actually a kind of caraway seed, grows on a perennial herbaceous plant with a fleshy, bulb-like root. It is planted as a fall or winter crop and spends at least two years in a vegetative phase. On rare occasion it flowers after the first year, but seed yield is minimum. It forms clumps of tubers which need to be divided to prevent plant senescence. Usually in the second spring after planting, and every spring thereafter, it flowers and then produces the seed. During the first two seasons the black cumin stand is intercropped with winter wheat and sometimes a leguminous forage crop like lucerne.

Surveys were conducted in refugee camps among Afghan farmers from Khakraiz district of Kandahar who had cultivated the crop prior to the war. MCI extensionists visited areas of black cumin cultivation and purchased seed and tubers for planting in Shahri Safa, Zabul. The farmers who received seed in Shahri Safa were monitored annually. The farmers who had neglected their crop were removed from the list of participants.

III. 3.2 Black Cumin Production Program Implementation.

Extension workers who had participated in the refugee camp surveying, were engaged to oversee the purchase, transport and distribution of black cumin seed from Khakraiz in Kandahar province to Shahri Safa, Zabul province. 411.75 KG of black cumin seed was distributed at a subsidized rate to 183 farmers whom MCI staff knew to be innovative. 183 jeribs were planted to black cumin in that first year.

The first harvest was carried out in June of 1993. A total of 2158 KG black cumin seed was harvested with an average yield of 74 KG per jerib. At harvest time the farm price for black cumin seed was Afg. 5000 per KG; the total value of the harvest then was: $74 \times 5000 = \text{Afg. } 370,000$. The harvest was considered to be very light, and increases are expected as the stands mature and fill in. Its present value per jerib exceeded by about 20% the value of a good wheat harvest from the same amount of land.

III. 3.3 Black Cumin Production Program Conclusion and Sustainability.

Prior to the introduction of black cumin to Shahri Safa, it had never been considered as a cash crop in the district. After this first harvest, albeit light, 18 new farmers have planted black cumin to 62 jeribs, and 29 of the original farmers have increased their plantings to a total of 200 jeribs.

This program has developed a momentum of its own. Farmers are now very interested in this crop and many will experiment with it on small plots. It is anticipated that within three or four years, the number of farmers planting black cumin in Shahri Safa district will

stabilize, as the local availability drives down the farmgate price. Production levels will only continue to increase after that point by farmers implementing their own marketing activity in Pakistan, skipping the traditional local produce buyer.

Black cumin will serve as a substitute for opium poppies for some farmers. But poppies do offer a quicker profit, though their labor requirement is higher. Thus, black cumin is not a panacea for the illicit drug problem. Black cumin cultivation offers an alternative to those farmers who may have felt compelled to grow poppies by their lack of sufficient arable land to sustain their families.

III. 4. Integrated Pest Management (a Cash Crop Pilot Activity)

III. 4.1 IPM Program Conception and Preparation.

The IPM program was developed in part as a result of the availability of nearly 2000 backpack sprayers intended for use in Southwest Afghanistan. In 1992, MCI was granted by O/AID/REP these sprayers along with funding to employ a consultant who could carry out a pest pressure survey in the MCI project area. The consultant was also charged with the task of developing training materials for communicating to farmers the 10 most serious diseases and insects for fruit crops, and methods for their safe management.

Implementing an IPM program at that point in the grant was a logical step after two years of providing material assistance to farmers to re-dig and re-plant thousands of hectares of vineyards and orchards. After the rehabilitation of the production infrastructure, pests presented the next most serious limiting factor to recapturing the regional cash-crop market share.

The central theme of IPM dovetails readily with the MCI orchard management/cash crop pilot activities: to increase the farmer's awareness of the constraints his crops are growing under and to educate the farmer in the options he has for managing those constraints in order to enhance his profit.

IPM promotes the use of a variety of interventions to change conditions from those in which a pest is economically harmful. This can involve using chemicals to destroy the pest, but will more likely involve the elimination of alternate host plants, appropriate soil water and fertility management, tree canopy management, encouragement of natural predators, and the use of crop varieties which are resistant to local environmental or pest stresses.

III. 4.2 IPM Program Implementation

The MCI integrated pest management program began with a survey of orchards in Kandahar, Zabul, Urozgan and Helmand provinces of Southwest Afghanistan in the fall of 1992. This survey was conducted by an entomologist consultant with the objective of determining the five most damaging insect pests and five most severe diseases in orchard crops in the MCI project area.

This survey also evaluated the pest management skills of fruit farmers in the region. After the results of this survey were completed, a plan was developed to present farmers with solutions to the identified problems. The plan placed an emphasis on the importance of training farmers and equipping them as much as possible to solve their own pest problems.

It was determined that the best way to reach fruit farmers with new information was to train extension workers from various fruit-growing districts to take information back to their areas, and provide practical on-farm demonstrations of some simple integrated pest management procedures.

Training materials such as a Pushtu IPM flip chart and a Pushtu integrated pest management field handbook describing the major fruit diseases and insect pests and appropriate control measures were developed for IPM extension workers.

These materials were designed to be used by a secondary education level extensionist for non-literate farmers. These materials have been used successfully now for one season. Farmers have received both formal and field training and have responded well to the information and techniques presented.

The results of the MCI integrated pest management program have so far been encouraging. (Table 3.4) The most successful IPM activity carried out by MCI this year was the introduction of home-made lime sulphur fungicide as a control measure for powdery mildew in grapes. The success of this activity is a result of several factors:

1. The problem is perceived as very serious by grape farmers in the project areas. Farmers consistently ask for assistance in dealing with this powdery mildew.
2. The solution to the problem is technologically attainable for the farmer; ingredients and equipment for producing lime sulphur at home are readily available in Afghanistan, and the backpack sprayers which MCI provided to farmers for this purpose are suitable for vineyard use.

3. The information transfer which was required for growers to learn about the life cycle of powdery mildew, lime sulphur production and use, and sprayer operation and maintenance, was all possible through simple demonstration and with flip charts designed for a non-literate audience.
4. Key farmers in the project areas voluntarily took the initiative to pass on information to others who did not attend training demonstrations and also established control plots in their vineyards where one or two vines were left untreated to demonstrate the effectiveness of lime sulphur.

Table 3.4

Province	No. of Farmers Trained in On-farm Demonstrations	Vineyards & Orchards Treated	Back Pack Sprayers Sold
Kandahar	1180	255	731
Zabul	99	30	232
Helmand	184	3	181
Urozgan	506	20	470
Ghazni	5	--	--
Wordak	7	--	--
Total	1981	308	1614

III. 4.3 IPM Program Conclusion & Sustainability

The above mentioned practical measures are immediately sustainable with no further outside inputs. For example, the dormant spraying of lime sulphur on grapes for powdery mildew is a practice which is imminently appropriate and is already spreading in the Kandahar area by its own merit.

However, improving air drainage for disease control in the orchard by pruning and orchard layout changes is a practice which will only be adopted after much farmer deliberation. This will probably happen eventually, as some farmers who have participated in MCI orchard programs have laid out test blocks with dwarfing rootstock trees, and have spaced and oriented their orchards to minimize the chances of airborne diseases. In five years, these farmers and their neighbors will very clearly realize the benefits of these interventions for orchard health.

The compelling justification for introducing IPM practices in Afghanistan is not that they are readily accepted. Rather, it is because the alternative, uncontrolled use of a cocktail of inappropriate pesticides, would prove detrimental to the long-term benefit of Afghan farmers and their agriculture.

MCI will continue to provide IPM training and other forms of assistance to farmers with support from other donors.

III. 5. Four-Winged Saltbush Trials (a Cash Crop Pilot Activity)

III. 5.1 Four-Winged Saltbush Trials Conception & Preparation

In the spring of 1992, in discussion with USAID representative Pat Peterson, MCI was urged to establish a closer working relationship with ICARDA/AZRI, another USAID funding recipient. Discussions centered around various types of dryland forage crops which ICARDA/AZRI promotes in the arid upland regions around Quetta.

In particular, the importance of the availability of high quality forage at ewe flushing time (autumn) was discussed. The lack of fodder other than wheat straw at this time is a prime limiting factor in the lamb/kid production cycle, and often results in malnutrition in the ewe which in turn leads to single lambing or miscarriage. Four-Winged Saltbush (*Triplox canescens*), a salt-tolerant dryland forage crop from the U.S., has proven to be an important component in the annual animal fodder cycle in Balochistan. ICARDA/AZRI specialists posited that saltbush could have a place in the Afghan fodder system as well. Accordingly, a plan was drawn up to establish five informal trial plantings of saltbush in Zabul and Kandahar provinces of Afghanistan. The parameters to be observed were:

1. Ease of stand establishment.
2. Response of livestock to a saltbush diet.

The MCI animal health staff and the crops department collaborated to develop a protocol and work plan for stand establishment and baseline data collection activities.

III. 5.2 Four-Winged Saltbush Trials Implementation.

In December of 1992, 1,978 seedlings of Four-Winged Saltbush were donated by the Arid Zone Research Center (AZRI) in Quetta for the establishment of five, one jerib pilot plantings of this species. Farmers who owned sheep or goats were engaged to participate in the trial. Each farmer donated one jerib of unirrigated land, and agreed to assist monitors in recording data on the saltbush stand and his flock of animals. Walls were built to enclose the plantings and the seedlings were satisfactorily planted.

Part of the arrangement with the participating farmer was that he must not allow his animals to use this forage crop until October 1993. The farmers' animals were counted and weighed prior to the planting and have been weighed and counted one time since. At the end of this trial it was hoped that an anecdotal relationship could be drawn between the use of this forage and health of a farmer's small ruminant livestock.

Plantings were established in Shahri Safa, Mizan, and Tarnak Pul. All the plantings were visited to check on stand survival and the monitors found that one planting had completely failed and the others had survived in the parts which had a fairly abundant water supply. Most of one planting succumbed to inordinately high soil salinity.

The results of this investigation indicated that future saltbush plantings should be:

- 1) Planted on less saline soils.
- 2) With less irrigation, or in areas with a low mean annual rainfall (250 mm or less).
- 3) Planted on deep soils (>50 cm).
- 4) Some cultivation is required.

III. 5.3 Four-Winged Saltbush Trials Program Conclusion & Sustainability

This trial is a first step towards establishing a scientific relationship between small ruminant flock size and saltbush forage consumption in the Southwest Afghanistan agro-ecological context. The trials were conducted in a highly informal manner, and the data generated are no more than indicative. Activities such as these are not intended to carry a great deal of sustainability potential. Rather, they are an effort to explore the resources at hand with the hope that a benefit or potential benefit will emerge for Afghan farmers and herders.

At least there are now stands of saltbush resident in parts of Afghanistan, which will provide much needed high protein fodder for animals at a critical, low-resource time of the year.

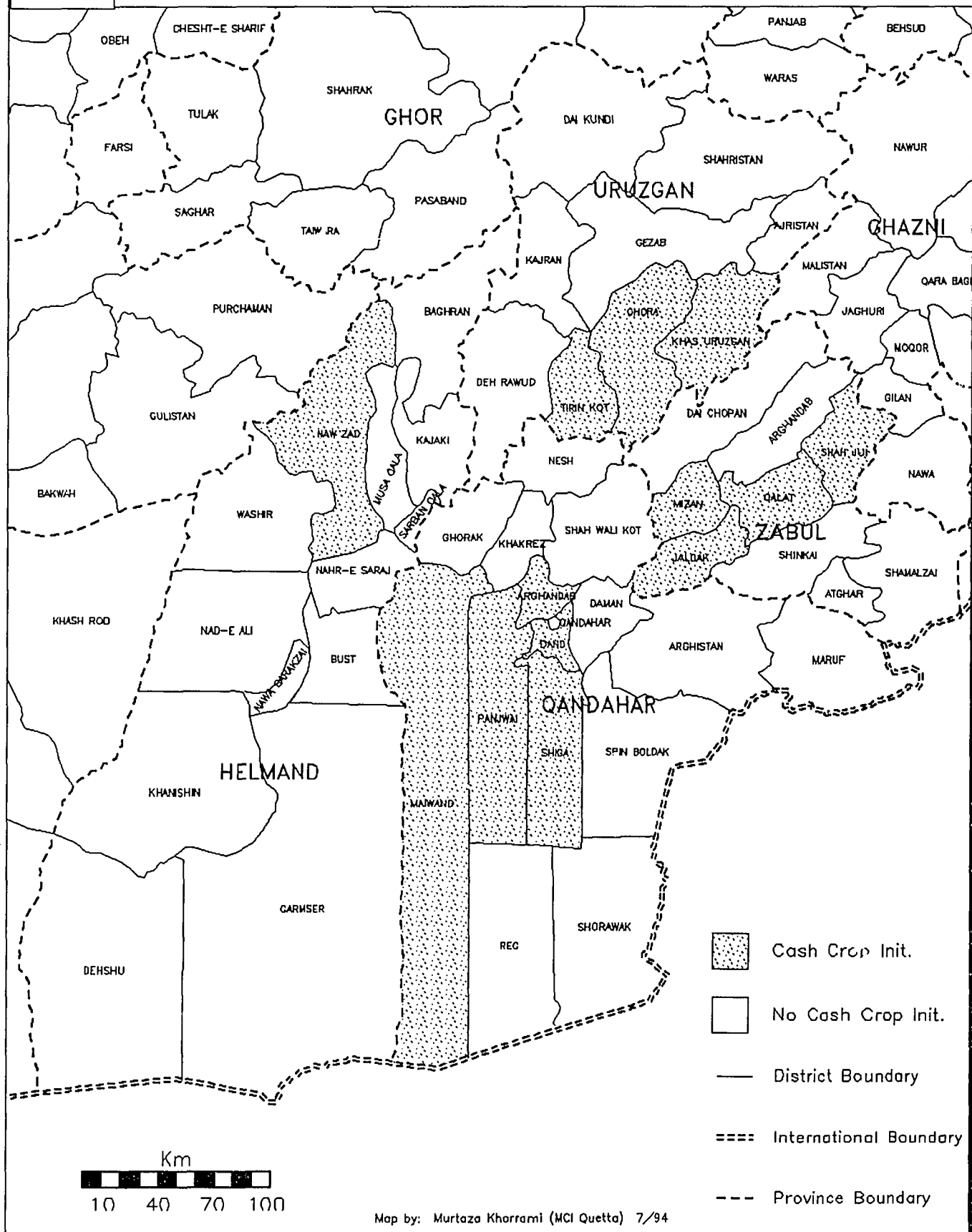
III.6 A Cash Crop Success Story.

H.A. Sattar, a farmer from Qalat district in Zabul province, was taught by MCI how to process his crop of fresh apricots by sulphuring and drying. From his 2,500 kg of fresh fruit he recovered 500 kg of dried apricots using his newly acquired skills. His total expenses for processing were about 900 rupees. He brought the high quality dried fruit to Quetta and sold 20 kg to people at the MCI office for 100 rupees a kilo. The remaining 480 kg were sold in the Quetta bazaar for 120 rupees a kilo. His gross income of nearly 60,000 rupees was five to ten times more than he could have expected to receive from selling his fresh apricots locally. Needless to say the farmer-entrepreneur left Quetta a very happy man. The positive experience has given him the motivation to continue processing dried apricots and he is active in encouraging other farmers to do the same.

The MCI Apricot Drying Program and the other activities described above, illustrate the potential for enhancing the cash income of small farmers in Southwest Afghanistan. While still not as lucrative as the ubiquitous opium poppy, these crops are an increasingly viable alternative to the very labor intensive poppy production.

**Map
3.1**

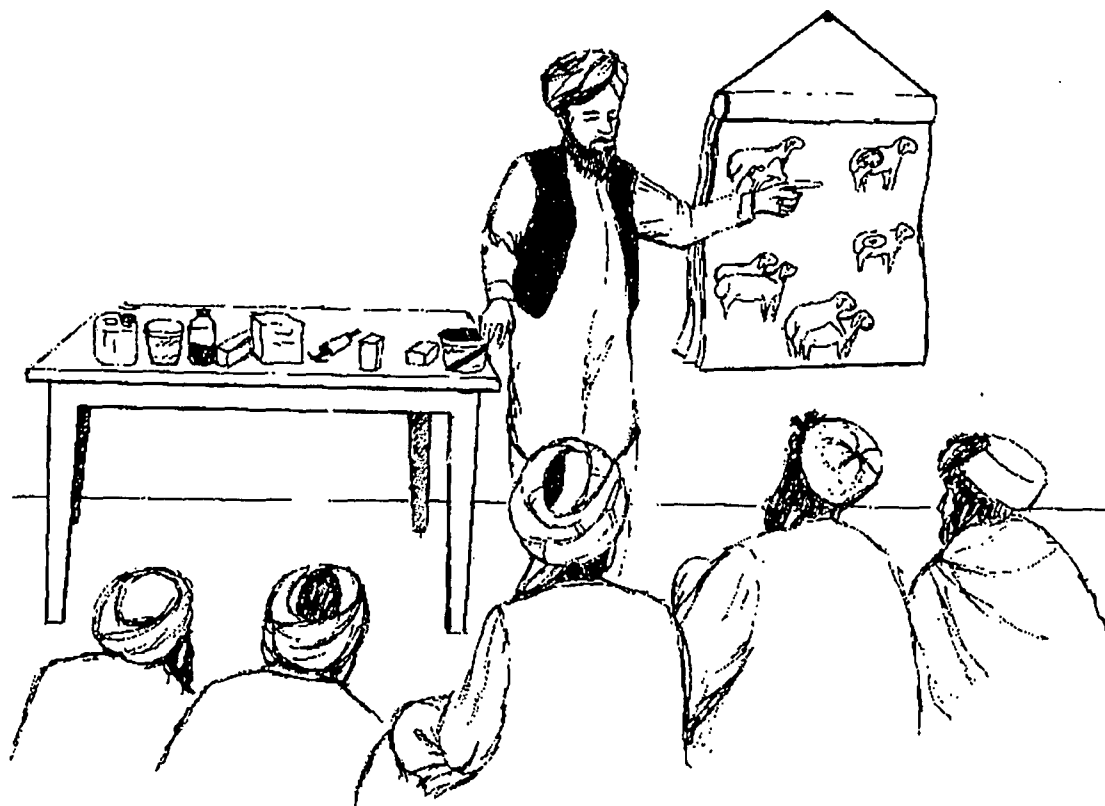
MCI CASH CROP INITIATIVES 1991 - 1994
Apricot Drying, Black Cumin Production, Four-Winged Saltbush Demonstration



Chapter 4

Private Sector Animal Health Initiative

MCI/Afghanistan



Horatio Alger with a Turban

One BVW's Success Story.

The BVW named Shahabuddin paused in his story to light an expensive imported cigarette. He was wearing a new turban and a heavily embroidered kameez. He was relating the path of his success as a basic veterinary worker entrepreneur to fellow participants in a BVW refresher course.

He had just finished the MCI/USAID sponsored BVW training course conducted in Quetta, he related, and was on his way back to his village to see if he could actually make any money with his newly acquired skills. He had received a kit filled with basic medicines and supplies; enough to get him established and perhaps to develop a bit of a regular clientele.

On his way, ahead of him, he saw a man standing next to the road with a horse. Even from that distance he could tell that the horse was suffering from a respiratory disease which could prove fatal if untreated. He had in his kit some antibiotics which he knew would solve the problem. He approached the man and asked him if he would like to sell his horse. The man, thinking this was a heaven sent opportunity to dispose of what he was sure would soon be good only for glue, sold the horse to Shahabuddin for a pittance.

Shahabuddin treated the horse and soon was using it to make his rounds to treat animals among the various farmsteads and nomad camps. Meanwhile, he trained two assistants in basic animal health care. It was not long before he realized he could cover more territory and make more money if he used a motorbike. He sold his horse, and made enough to buy a motorbike, which he fitted with large saddlebags to hold his BVW kit. He and his two assistants now make their rounds on motorbikes in Kandahar province and have begun travelling to Quetta from Afghanistan to purchase medicines and supplies, buying in greater volume than the MCI BVW supply units could handle.

"So, since you have done so well with your business," he was asked by the MCI BVW project manager, "why not let one of the less successful BVWs take the bicycle which you are entitled to after passing this refresher course? It would be a big help for him and you don't really need it do you?"

"Nothing doing," was his altruistic reply, "maybe you people want to help other BVWs, but this is a business for me; I want the bike."

Hmmm, perhaps **Michael Milkin with a Turban...**

I. INTRODUCTION:

I. 1. Program Summary and Justification.

The objective of this component was to provide selected Afghans with basic animal health-care training to enable them to provide sustainable animal health-care services for neighboring farmers.

With the onset of the war, the limited animal health service provided by the Afghan Government to rural areas ceased. As a result, herders and farmers with significant numbers of livestock in Kandahar, Helmand, Urozgan, Farah, and Zabul Provinces cited lack of animal health care as one of the most severe constraints to their livelihood.¹

Following a series of surveys and ethnoveterinary studies, and taking the uncertain security and lack of effective government into consideration, MCI/Tufts decided to take a private-sector approach to the provision of animal health care in its areas of activity in Afghanistan. Using methodologies developed by Tufts University School of Veterinary Medicine over the last decade in Niger, southern Sudan, Uganda, Somalia, and the Cameroon, a curriculum was developed and 219 Basic Veterinary Workers were trained, outfitted and supervised. Monitoring and impact studies carried out by project staff indicated that upon return to their villages and camps, the newly trained BVWs were able to provide quality animal health care to livestock owners living in their area.

I. 2. Accomplishment Statement.

A curriculum was developed, Afghan trainers trained, and 15 BVW training courses were held which trained a total of 219 Basic Veterinary Workers (BVWs)². Monitoring and supervision was carried out and refresher courses were held. The first course was held in Chaman, Pakistan. The succeeding 14 courses were held in Kandahar, Helmand, and Urozgan Provinces. To provide additional support at the community level following training, each BVW was monitored monthly for the three months immediately following training, and again, after 6 months. The first monitoring was intense refresher training lasting several days with the trainer providing on site technical assistance and community awareness activities. Toward the end of the project as the BVWs became more successful in their endeavors, in addition to purchasing drugs through MCI supply centers in Afghanistan, they began to purchase drugs from the local market. BVWs were cautioned to try and ensure that quality drugs were used, since

¹ A series of ethnoveterinary studies and agricultural surveys conducted jointly by MCI and Tufts from 1989-1991 is the basis for this statement. Readers may refer to reports by Cathy Findlen, Jeff Mariner, Peter Flanagan, Al Sollod, and Chip Stem.

² A 16th course was recently held in which 25 BVWs were trained for the UNDP.

adulteration of drugs is said to be common practice in the region.

Finally refresher courses were held to upgrade BVW capabilities and as an incentive, selected BVWs were provided with bicycles to assist them in what they identified as their biggest constraint, transportation. For the first two months following this refresher course and the provision of bicycles, average monthly drug purchases at MCI centers in Afghanistan, by 11 of those BVWs who received a bicycle, increased nearly 10 fold (from Af 15,134/mo to Af 143,649/mo per BVW). In addition, the frequency of restocking visits to MCI centers increased from 0.46/mo to 2.06/month. While it is unlikely that the extent of this increase will be sustained over the long term, the sudden increase supports the BVWs claim that lack of transportation is a significant impediment to increased animal health-care delivery in rural areas of Kandahar, Helmand, Urozgan, and Zabul Provinces. Moreover, it is an excellent display of their motivation, community acceptance, and the extent to which these individuals view the BVW program as an opportunity for self improvement and income.

An impact assessment initiated by the Tufts Technical Coordinator for the Project, was carried out between October '93 - January '94 among farmer beneficiaries of the program. This survey indicated that MCI/Tufts BVWs are quite successful at treating and preventing diseases in their service areas. In fact, farmers indicated that the MCI/Tufts BVWs provided superior animal health-care delivery than at any previous time, even prior to the Soviet invasion of 1979. Furthermore, the study verified the program monitoring reports which indicated that transportation was a major constraint impairing BVW efficiency and widespread animal health care delivery.

Most BVWs work part-time in addition to their other responsibilities as herders and farmers. However, several of them have become *full-time* professionals. These individuals all averaged over Af200,000 in drug sales per month after receiving a bicycle during the refresher course. One BVW was hired by Afghan Development Association (ADA) and is working as a Veterinary Field Unit Worker, a job generally exclusively reserved for veterinarians or paraveterinarians.

The impact of this program has been substantial and will continue to make important contributions to the economy of Kandahar, Helmand, Urozgan and Zabul Provinces. Based on drug sales, monitoring reports, and the impact study, it is estimated that the gross annual value of the animal mortality prevention services of the 160 BVWs operating at the end of the grant is nearly US\$ 2,000,000. When the cost of the inputs paid by the farmer are calculated, the net annual benefit is over US\$ 1,700,000. While these estimates are significant, they truly are only the tip of the iceberg since they exclude calculations on increased productivity, the increase in herd or flock size that would result in successive years, and the benefits accrued by the BVW himself through profits.

BVW profit is something that the project has not attempted to directly monitor or estimate. Discussions with officials of the UNDP in Peshawar who have interviewed MCI/Tufts BVWs indicate that monthly profits range from Rs 300 to Rs 2,000 (US\$10-67). It is assumed that those practicing full time would be closer to the upper limit. These figures compare quite

favorably with many other rural economic activities available to the farmers and herders of Afghanistan.

II. PROGRAM OBJECTIVES:

*(Excerpted from Cooperative Agreement # 306-0211-A-00-0961
Amendment No. 1, 30 June, 1991)*

"Private Sector Animal Health Initiative: The Recipient shall:

1. Train trainers of Private Veterinary Technicians (PVTs)³ who will hold training sessions within Afghanistan. Six trainers will be trained.
2. Train PVTs in basic animal health care to render service to members of their own communities. Fifty PVTs will be trained. The PVTs will be chosen on the basis of their active involvement in animal care, their capability for learning, and their potential for providing animal health care to the community from which they are chosen.
3. Establish an animal health commodities resupply network through private traders and market depots, building on existing private sector donor initiatives.
4. Establish an internal field supervision and support strategy capable of : (a) evaluating the effectiveness of project activities and PVT performance; (b) providing technical support to enhance the performance of PVTs; (c) acting as an inventory control on commodities; and (d) becoming a resource for facilitating PVT training at the end of the project, subject to additional local sources of funding.
5. Retrain and upgrade trainees. Based on the field supervision reports, the training program will be modified to achieve greater effectiveness in the field. The trainers will be recalled periodically to participate in a series of retraining sessions, which are anticipated to take place after the first PVT training course

³PVTs were later termed Basic Veterinary Workers (BVWs) while the term PVT is now used for para-veterinarians.

and again six months later. Future retraining will have two aims: (a) fostering higher level capabilities in effective PVTs; and (b) replacing expatriate staff with capable Afghan staff. Future activities will further aim at finding other training funding sources, such as from pharmaceutical suppliers."

..... (end of excerpt from Amendment No. 1)

III. PROGRAM INPUTS:

Inputs for this portion of the MCI Agriculture Program were quite modest when the annual return of the BVWs is considered. The total program budget for 3 years was approximately \$700,000 and as discussed above, a conservative estimate of the net annual return is \$1,700,000, which implies that the program has more than paid for itself by the end of the Cooperative Agreement.

III. 1. Private Sector Animal Health Care Initiative Activities.

III. 1.1 Curriculum Design.

A course curriculum and training manual for BVW trainers were developed by the Project's long-term technical consultant, from December 1991 through January 1992. As visual aids to instruction, simple drawings explaining disease processes, treatments, and preventions were developed in the form of flip charts. Once the BVW trainers were trained, the curriculum and training manual were to be used for Basic Veterinary Workers (BVWs). The training manual was designed in four parts: the lesson plan, a practical description of the known important diseases of livestock in Afghanistan, a treatment and pharmaceutical guide for medications provided to BVWs in their field kits, and a series of pictograms on animal health and diseases to assist teachers in training and the illustration of diseases to BVW candidates in the field. MCI animal health training publications are listed in Appendix 4.3.

A drug and equipment list for the BVW field kit was identified through a short-term consultant from Tufts. Local suppliers for the commodities were identified, commodities were procured, storage was arranged first at the MCI medical warehouse, an inventory and ordering system was developed and field kits were assembled. Once BVWs were active in Afghanistan, a main storehouse for veterinary supplies was established at the MCI Center in Kandahar and a trained paraveterinarian (PVT) has been placed in charge. Subsequently, additional smaller resupply sub-centers were established in Spin Boldak, Panjwai, Shahri Safa and Lashkargah of Kandahar, Helmand and Zabul Provinces.

III. 2. Training.

III. 2.1 Training of trainers.

A 12 day BVW trainers' course was offered for seven paraveterinarians selected for this program. Training sessions were 6 hours per day with morning classroom sessions including exercises in role playing, question & answer sessions, problem solving and practical teaching. Afternoon practical sessions including laboratories in animal restraint, physical examination, disease diagnosis, therapeutic techniques and autopsy demonstration. At the end of the course, oral and practical examinations were administered. Following successful completion of the course and examination, a certificate was awarded to each of the graduates.

III. 2.2 Training of BVWs.

The selection process for BVWs from interested farmers and herders was organized through MCI agricultural field staff officers and local community leaders, and then followed-up by MCI/Tufts paraveterinarians. Criteria for selection of BVWs included community respect for the prospective BVW, knowledge of animals and animal diseases, interest and motivation in learning more about how to treat and prevent diseases. In addition, it was decided that the distance between adjacent BVWs should be approximately 20 km. The first BVW training course was conducted in Quetta to evaluate the acquired training skills of the PVTs. The training was conducted by PVTs under the guidance and supervision of MCI teacher training staff. After the two weeks classroom and practical training, the PVTs and BVW trainees returned to the BVW home areas for an additional week of field training. Each PVT trainer was responsible for 2-3 trainees.

Field training emphasized hands on practical experience in strengthening clinical skills of animal restraint, physical examination, disease recognition, therapeutic selection and client education. In addition, this on site training and support was used to encourage community acceptance for this new profession.

Following initial training, the MCI/Tufts BVW training guide and lesson plan were both redesigned to complement the PVT Teacher Training Manual. The BVW training cycle was designed to be 5 weeks in length and carried out as follows:

- First Week: Trainers select BVW trainees in the field.
- Second Week: Group training of BVWs at MCI's center.
- Third Week: Group training of BVWs at MCI's center continued.
- Fourth Week: Field training of BVWs in their home areas.
- Fifth Week: Debriefing with trainers to review complete course.

The Basic Veterinary Workers (BVW) training activities continued serially. These activities were carried out in different centers in Quetta, Chaman, Lashkargah, Baghran, Chorah and Khas Urozgan. A total of 15 training courses were completed from February 17, 1992 through

September 30, 1993, with a total of 219 BVWs trained.

Drug and equipment kits were provided to each graduating BVW. BVWs were instructed to sell drugs at market prices and include an amount that they thought appropriate as profit. The contents of the BVW kits are detailed in Appendices 4.1 and 4.2.

In the light of monitoring reports, a refresher course was designed and organized and a curriculum and syllabus were prepared to reinforce and expand these skills of the BVW. New skills introduced during refresher training included pregnancy diagnosis and vaccination techniques. Invitations to the refresher course were given only to BVWs who had returned to MCI resupply stores at least twice after graduation to purchase medicine and to those verified by MCI/Tufts monitors to be actively working in the field and obtaining their resupplies through the private sector pharmacy in Afghanistan. A total of 120 BVWs were invited to the refresher course, but due to poor security conditions and winter weather, only 88 BVWs attended the course in Quetta. Based on the emphasis that the BVWs placed on lack of transportation as a constraint to increased activity, refresher course attendees were provided with a bicycle as an incentive. A review of the effects of the refresher course and bicycle indicated a very strong positive response as discussed under section IV Accomplishments and Impact, below.

As additional incentive and support to BVWs, MCI/Tufts with support from UNDP, has begun District-Based Veterinary Field Units (VFU) in 13 districts of Kandahar, Helmand and Zabul provinces. This program will help provide sustained support and informal continuing education to the BVWs which will lessen the effects of the premature end of this project.

III. 3. Monitoring and Evaluation.

Due to security concerns and restraints on expatriate site visits inside Afghanistan to monitor BVW field performance, it was necessary to develop a monitoring program using MCI veterinary staff as field monitors. The MCI veterinary staff were trained in field-level monitoring and interview techniques. Three questionnaires were developed to support the monitoring efforts. Those were:

1. BVW trainee biodata questionnaire:
This was filled out for each BVW that attends the training course. It provides biodata on that BVW that can be used for future analysis to learn what types of individuals have the greatest chance of succeeding as BVWs.
2. Questionnaire for working BVWs:
This form was filled out for each active BVW when they were visited by field monitors at 1,2,3 and 6 months after graduation.
3. Questionnaire for non-working BVWs:
This was used by monitors to interview trained BVWs who are found not to be

working as BVWs after training. Reasons for not working are determined, and an effort to work with the BVW to reduce or eliminate these constraints is made.

The entire program underwent an external evaluation by Dr. Tim Leyland, a veterinarian with prior experience in training PVTs and BVWs in Zabul province of Afghanistan. During Dr. Tim Leyland's consultancy (April 13 to June 4, 1992) a monitoring questionnaire for tracking BVW selection procedures and BVW field performance, and a computer program for their analysis were developed. As a result of this consultancy, significant progress was made in the implementation and follow up of the BVW program.

Store keeping and accounting forms were developed to track inventories and BVW purchase activity at the main warehouse in Kandahar and sub-stores in Afghanistan. Each store was visited and monitored monthly by a project administrative assistant. This approach provided valuable independent data on the success and activity of BVWs. However, as time went on, it became clear that many BVWs were not relying solely on MCI resupply centers for purchase of drugs. This welcome development is discussed in greater detail below.

IV. ACCOMPLISHMENTS:

IV. 1. Quantitative Results.

A total of 219 BVWs were trained, equipped, monitored and supervised under this program. Fifteen separate training courses were operated, with the majority of them being conducted in Afghanistan. The areas of BVW activity are summarized in the following table.

Provincial Location of Trained BVWs.

Table 4.3

Province	No. of BVWs Trained
Farah (1 district)	1
Helmand (9 districts)	72
Kandahar (11 districts)	82
Urozgan (5 districts)	36
Zabul (5 districts)	28
Total	219

After a total of 144 BVW monitoring visits by the end of June 1993, the average number of treatments that each BVW was performing per month is presented in the table below. Figures

are based on BVW monitoring visits and then verified by BVW drug purchases at MCI centers.

Table 4.4

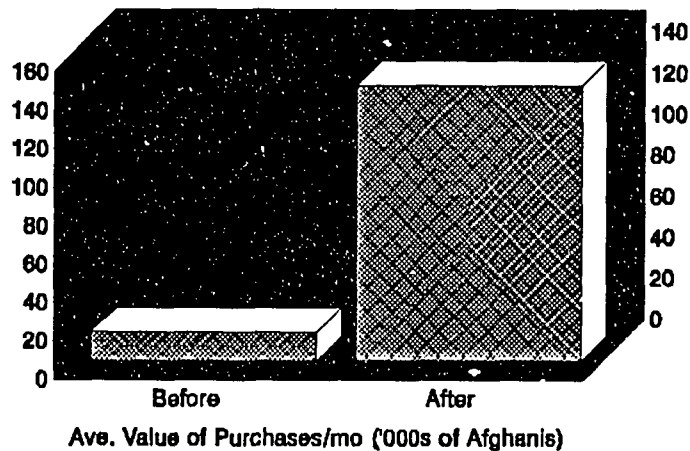
Animal Species	Average No. Treated/mo.
Sheep	236
Goats	80
Cattle	14
Camels	19
Donkeys	2.78
Horses	<1

After June 1993, this practice was discontinued because significant numbers of BVWs were purchasing drugs from private-sector pharmacies and there was no way to ensure confidence in the numbers of animals treated. However, subsequent monitoring indicated that the activities of most BVWs were actually increasing as they became more proficient and more accepted by their communities. Finally with the elimination of the primary constraint to increased activities as identified by BVWs, through the provision of a bicycle, BVW activity increased once again. This shift in buying habits, although more difficult for program monitoring was a welcome development because it helps ensure the long-term sustainability of this program.

The effect of the provision of a bicycle during the refresher course on BVW activity (as measured through drug purchases at MCI centers) is shown in Figures 4.1 and 4.2.

Figure 4.1

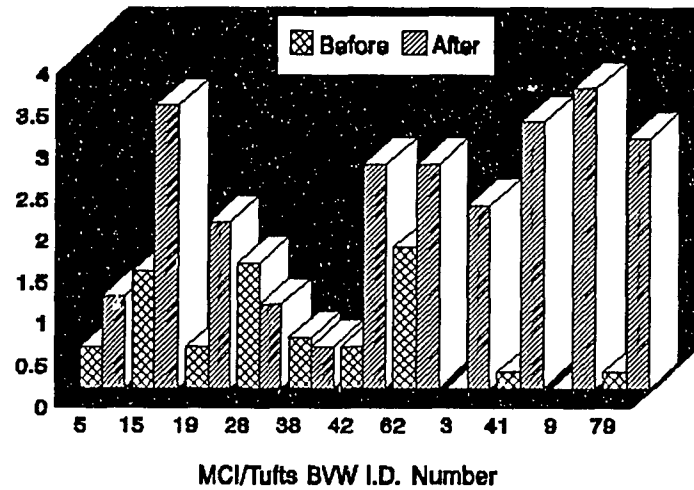
Effect of Refresher Course and Bicycle on BVW Drug Purchases
Drug Purchases/mo. from MCI Centers



Cost of bicycle = Af 143,750
Ave. purchases/mo. increased from .48 to 2.06 (11 BVWs)

Figure 4.2

Effect of Refresher Course and Bicycle on Drug Purchase
 Ave. No. of Drug Purchases/mo. from MCI centers



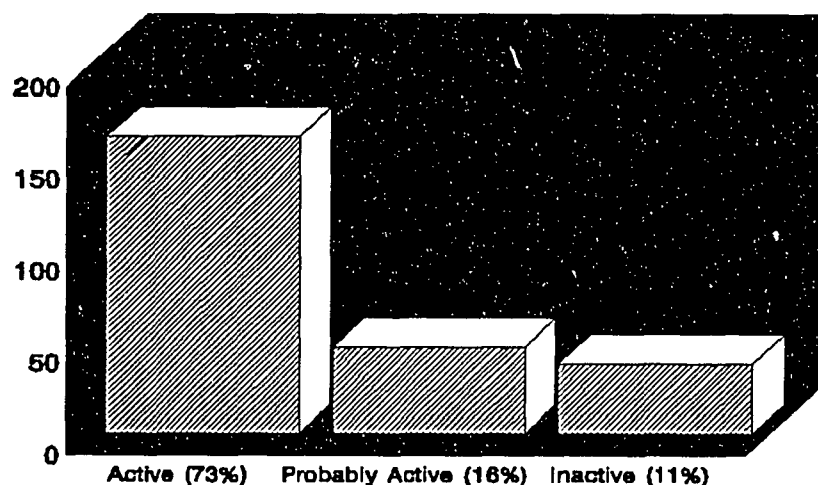
Combined ave. purchases before refresher were 0.46/mo, after refresher were 2.08/mo

BVW activity as of January 31 1994, is summarized in Figure 4.3. As can be seen, 73% of trained BVWs are still actively performing their duties either part-or full-time. This figure represents an increase that has begun over the past year. A year ago, the percentage of BVWs working was slightly less than 60%. This rate increased to 68% just prior to the refresher course. We believe that community acceptance played a significant role in this increase. More recently, since the refresher courses in which a bicycle was provided, the rate has increased even further. This is likely due to the direct incentive of the provision of a bicycle and the catalytic effect on those who have not received a bicycle, but were encouraged by the possibility. We would expect this rate to decrease slightly over the next several months and to stabilize around 68%.

Below is a list of the total amount of drugs sold to the working BVWs at MCI centers in Spin Boldak, Panjwai, Dand, Shahri Safa, Lashkargah and other VFUs which are located in Shorabak, Shega, Arghestan, Daman, Registan, Khakrez, Maywand, Nish and Kajaki. May 1, 1992 to February 10, 1994 with a total revenue of Afg. 40,061,728.

Figure 4.3

BVW Sustainability Number of Active BVWs



219 BVWs were Trained from Feb. '92 - Oct '93

<u>Name of Drug</u>	<u>Quantity</u>	<u>Total Revenue in Afghanis</u>
Fasinex, Jar of 80 boluses	1618.5	2,172,350
Panacur-250, Box of 50 boluses	471	3,274,920
Panacur-750, Box of 50 boluses	312	4,876,050
Neganol, 5 gram packet	7989	9,519,950
Ditrifon, 1 kg powder	208.5	1,672,149
Asuntart, Box of 1 kg powder	74	1,110,000
Resomycine-LA, 30 ml vial	4192	5,972,500
Combiotic, 5 gram vial	39	48,750
Tribercin,	202	232,300
Strinacin/Sulfadimidine, Box of 20/50 tablets	353	917,850
Vetamost, Intrmamary infusion tube	393	284,650
Eye Ointment, 3.5 gram tube	2534	210,730
Tincture of Iodine, 450 ml bottle	120.5	133,090
Valbazine, Box of 50 boluses	335	2,818,600

Oxafex, Bottle of 450 ml	549	6,039,000
Vermile, 1 liter bottle	4	18,800
Gentian Violet, 5 gram packet	128	12,780
Zinc Oxide, 300 gram box powder	160	75,415
Potassium Permanganate 300 gm packet	76	21,400
Magnesium Sulphate, Box of 300 gm powder	1071	223,005
Sodium Bicarbonate, Box of 300 gm powder	518	101,305
Kaolin, Box of 300 gram powder	293	62,244
Oral Rehydration solution, 1 packet salt	4173	243,980
Sablon, 1 liter bottle	13	19,910
Total		40,061,728

Number of BVWs who attended refresher courses:

Table 4.5

Number of Course	Starting Date	Number of BVW
1	01-17-93	20
2	11-07-93	15
3	11-29-93	20
4	12-20-93	15
5	01-16-94	18
Total		88

Diseases diagnosed by BVWs are a good indication of the current disease situation in rural Afghanistan. Indeed, it is likely that a better understanding of the principal diseases in Afghanistan is now emerging than at any previous time. However, caution should be used in drawing absolute conclusions from the observations of BVWs without statistically balanced epidemiological investigations. However, fortunately, in every species, the prominent animal diseases are those that BVWs can effectively prevent or treat. These are summarized in the figures below:

Figure 4.4

Most Common Sheep & Goat Diseases of SW Afghanistan

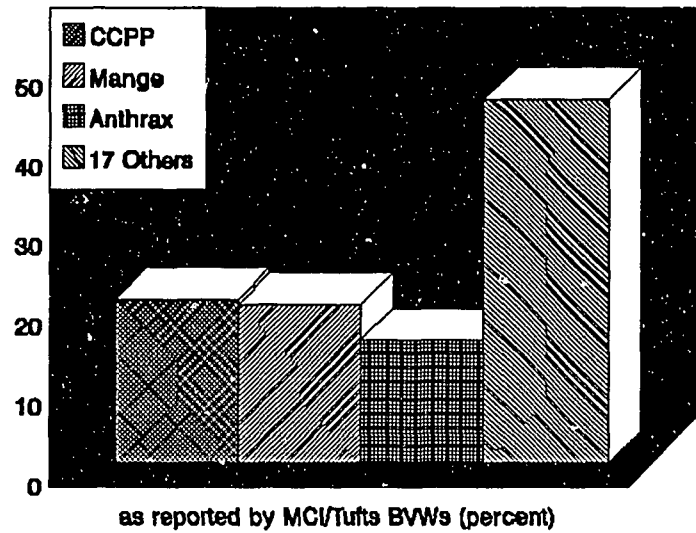


Figure 4.5

Most Common Cattle Diseases of SW Afghanistan

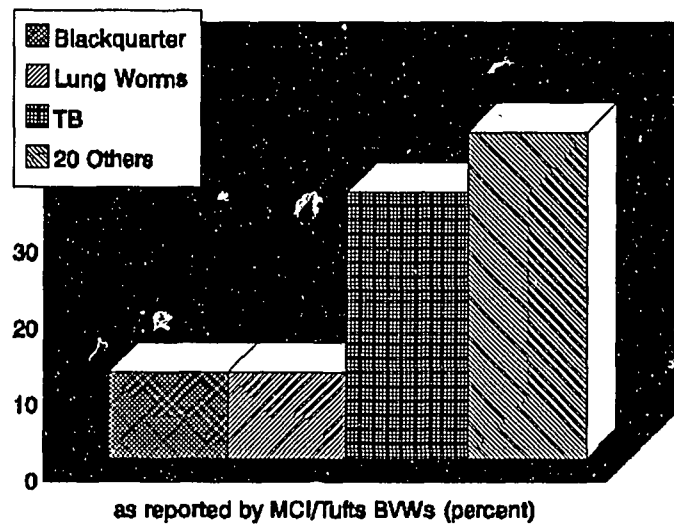


Figure 4.6

Most Common Camel Diseases of SW Afghanistan

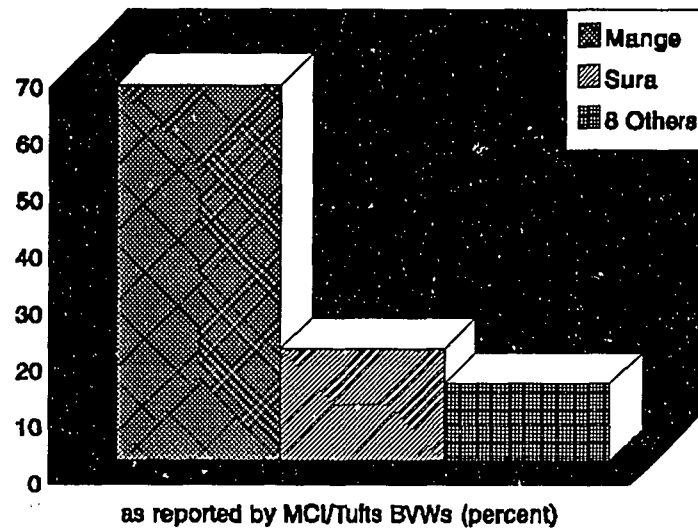
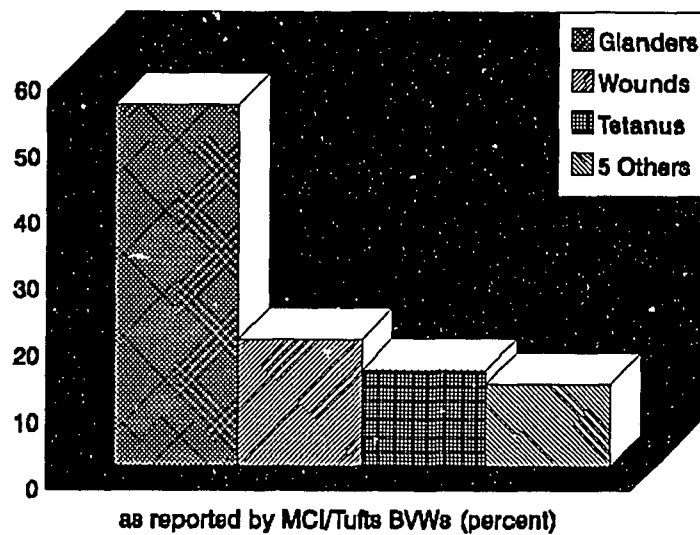


Figure 4.7

Most Common Horse Diseases of SW Afghanistan



While the BVWs can recognize, treat, and prevent many of the most important diseases in Southwest Afghanistan, there are still several other diseases which strike in epidemic outbreaks causing considerable mortality, morbidity, and production loss. Diseases that BVWs have identified as currently active, sometimes in epidemic proportions, include Foot and Mouth Disease and Sheep Pox. The effects of these epidemics often continue for years after the epidemic has ended. Diseases such as Foot and Mouth Disease, Rinderpest, Sheep and Goat Pox are often the most significant in terms of economic effects. Systems need to be developed which can effectively diagnose, and control these epidemics at onset. This requires a greater degree of organization and proficiency than can be provided by BVWs alone. MCI/Tufts believes that VFU workers at the district level can be adequately trained in disease surveillance and epidemic disease control, combatting these types of natural disasters.

It is this level of organization which generally the private sector does inefficiently and governments do best. Therefore it is hoped that when the future government arrives, the VFU workers will be readily incorporated into the district level animal disease control.

In the mean time, MCI/Tufts has provided Sheep Pox vaccine to try and prevent the epidemic from spreading further, but it is clear that more professional oversight is required if such epidemics are going to be cost-effectively addressed.

2. Beneficiary Profile.

The beneficiaries of this program are the farmers, herders, and their animals in rural Afghanistan. Secondary beneficiaries are the families of the farmers and herders. MCI/Tufts BVW Program contributes to the stability and resettlement of displaced Afghans.

Even in Kandahar Province, where security has been deplorable during recent months and cities and villages have been frequently the scenes of relentless fighting and ambushes, the BVWs are remarkably effective. Because they operate in the rural areas, among farms and *Koochi* camps, they are able to continue to provide almost *uninterrupted* service.

Now because drugs are becoming more available, this profession is rapidly approaching long-term stability. However, there is a real need to provide training and support to pharmaceutical suppliers to ensure that the BVWs have a proper array of choices and **quality unadulterated drugs**. This latter concern is real, because until now MCI's supply centers have provided a high standard of drugs quality as an alternative, should the private-sector market drugs lack quality. With future baseline operation funding for MCI uncertain and the lack of time to privatize this component, we fear that the future of the program could rest at the mercy of unscrupulous commercial agents.

The profile of the average successful BVW that MCI/Tufts has trained is detailed in the

following table:

Table 4.6

BVW Profile Criteria	Active BVWs with this criterion—%
Pushtun Ethnic Group	96%
Actively farm animals	58%
Actively herd animals	72%
Treated their own animals (prior to becoming a BVW)	76%
Treated animal of others (prior to becoming a BVW)	58%
Perform work outside farm	59%
Own their land	70%
Farm for other people	26%
Literate	56%
Were aware of Private-sector animal pharmaceuticals prior to BVW training	68%
20-30 years old	56%
Lived in their village more than 6 years	88%
Married	56%

V. PROGRAM IMPACT:

V. 1. Policy level.

The high quality of BVW training at MCI has been recognized and acknowledged by other NGOs and donor agencies. In December 1992, the UNDP as well as the German Afghan Foundation (GAF) at Peshawar requested the loan of MCI teacher trainers to train their own staff in the techniques of training BVWs. MCI veterinary staff were sent to Peshawar to train 4 UNDP and 3 GAF staff members. Management Sciences for Health (MSH) are also interested to follow the BVW program for training of Basic Health Workers (BHW) in human health services. In addition, our course materials and curriculum have been requested and

provided to the Afghan Dutch Committee (ADC) in Peshawar.

Recently, UNDP Quetta requested that MCI consider providing BVW and PVT teacher training services to other NGOs and organizations who are involved with the provision of animal health services in Afghanistan.

V. 2. BVW impact on farms.

A conservative estimate of the economic impact of this program was performed, based on the correlations between the results of BVW monitoring, drug sales at MCI drug supply centers, and an impact assessment carried out among farmers who were receiving the benefits of MCI/Tufts BVW services.

The following criteria and assumptions were used to assess the economic impact of these individuals:

- 219 BVWs trained, 73% active = 160 BVWs used as a basis for these calculations
- Average value of adult sheep, goats, cattle, camels, donkeys divided by 2 since about 65% of treatments are made on adults
- The Average Treatments provided by each BVW/mo, based on 144 monitorings conducted over a 13 month period from 6/92 - 6/93.

Sheep	236
Goats	80
Cattle	14
Camels	19
Donkeys	2.78

- The reduction in mortality among those animals treated is 7.88%⁴.
- Value of animals saved is calculated to be 50% of the average market value of adult animals in Kandahar during February 1994. A conservative figure of 50% of the average value is used since probably only about 60-75% of the animals treated by BVWs are fully mature. Animal values are as follows:

⁴ This figure based on an estimate of reduction in mortality of animals derived by an independent assessment of regions serviced by BVWs and paraveterinarians in Afghanistan (Schreuder, B.E.C., Livestock Mortality in Afghanistan in districts with and without a veterinary program (preliminary report), Dutch committee for Afghanistan, Peshawar, January 1993, 22pp). It is likely that the actual figure is nearly double because this survey dealt with all the farmers and their animals of a region serviced by BVWs, not the individual animals that were actually treated.

Sheep	US\$ 25.
Goats	US\$ 20.
Cattle	US\$ 97.
Camels	US\$192.
Donkeys	US\$ 92.

- Gross value of animals saved per year by the 160 BVWs is US\$1,930,803.

Cost to farmers for this service are estimated as follows:

- Cost of each intervention including profit to BVW US\$.25 This figure is four times greater than the average cost to the UNDP for drug/vaccine service delivery to Afghanistan. The increase (of over 300%) is to provide adequate coverage for profit to BVWs and private sector suppliers and to accommodate the high rates of inflation and variation in exchange rates.
- Total animals treated per BVW/per year
- Total cost of treatments and BVW profit
- Net return (value of animals saved by 160 BVWs operating in Kandahar, Helmand, Zabul, Urozgan, and Farah Provinces) = US\$ 1,761,949.

This means that the MCI/Tufts BVW program has already produced a significant economic return on AID's investment of approximately \$700,000. Moreover, this conservative estimate of economic impact does not consider several important economic benefits of this program. They include:

- the impact of the effects of mortality reduction on flock and herd growth and productivity in future years,
- the income generated by BVWs, and
- the production gains accrued to herds due to BVW treatments and preventions (analysis counted only mortality)

BVWs—the new professionals of Southwest Afghanistan.

As farmers and herders, the MCI/Tufts BVWs in general are quick to embrace this new profession. Once community skepticism wanes, they are able to command new respect among their peers and make significant contributions to the local economy through reducing disease-

related mortality and morbidity of livestock in their locales. The value of livestock mortality prevented as a result of their therapeutic and prophylactic endeavors is more than \$10,000/BVW/year.

In addition, those who practice this new profession virtually full-time can have quite significant income generating potential. UNDP-OPS estimates that the profit of some *full-time* BVWs is as much as \$67/month (\$800/year), a figure which is significantly higher than the average income of many of their peers.

Tufts experience elsewhere indicates that the majority of BVWs who are properly trained and have a sustainable supply of quality pharmaceuticals are likely to continue these activities on a permanent basis. In Niger, four years after all training and monitoring had ceased, 75% of the BVWs trained were still operational.

One of the surprising aspects of this program to donors, is how it can be so successful and sustainable during conditions of insecurity and lawlessness such as presently occur in Kandahar, our main area of BVW activity. However, once knowledge is imparted, there is little outside dependency created other than on the supply of drugs, which are becoming more widely available through the private sector. In addition, among livestock owners, access to quality *primary* animal health-care is one of the most important constraints cited by farmers and herders. Therefore the demand for these activities, once they are proven, is high.

V. 3. Future Program Impact.

We believe that with very little input, the MCI/Tufts BVWs of Kandahar, Helmand, Farah, Urozgan, and Zabul Provinces will remain operational. The foundation for the new profession has been laid; the considerable local knowledge of animal diseases among these people has been added to in a constructive, sustainable way.

However there are a couple of important constraints that potentially can affect the BVW's ability to effectively operate and perform his duties in an optimal way.

VI. PROGRAM CONSTRAINTS:

Security.

- Security, while less important in this profession than in many development/relief efforts, can still be an issue that can reduce the effectiveness of the BVW, especially in the movement of cash from point of sale to the BVW's home.

A quality drug supply.

- Continued supplies of quality pharmaceuticals is a concern, should MCI be unable to maintain their resupply centers. As discussed elsewhere in this section, there are increasing supplies of drugs available in the market place.
- However, at the moment, the majority of these may well be of black market origin. If this is the case, the supplies of such drugs are certainly not guaranteed over the long term—nor is their quality. It is possible that adulteration occurs and expiration dates are exceeded.
- It was the goal of the MCI/Tufts Program to assist in privatization of the drug supply. However, with the shortened time frame for this program and the reduced budget, this became an unrealistic goal. It is hoped that we can obtain sufficient funding to accomplish this important task.
- Many of the drugs that are currently available from the private sector are through the black market and are unsuitable due to problems and quality and range. However, due to the prices of these black market drugs, it is difficult for the superior quality products from Pakistan to effectively compete. We believe however, that it is important that there be a choice for the BVWs and farmers of Southwest Afghanistan. Moreover, since farmers and herders in general have an excellent economic sense and are well qualified to judge the comparative effectiveness of two products, we trust that once given the choice, they will be able to discern which particular drug is the best value for the need.

Support for epidemic disease control.

- It is beyond the scope of training and the resource reach of the MCI/Tufts BVWs to be able to effectively diagnose, and effectively control disease epidemics of significant proportions. This is a task which historically throughout the world, the private sector has not done well. A responsive public sector is best able to handle such situations and as everyone realizes, there is no such situation even on the horizon in Afghanistan.
- The UNDP through collaborations with MCI/Tufts and other NGOs has developed a provincial model of private/public sector animal health care delivery which involves low-cost disease surveillance and epidemic controls. The VFU concept can be a significant step toward addressing the remaining constraints to improved animal health in Southwest Afghanistan. Paravets or vets can be trained in animal disease surveillance, epidemic disease control (most cost-effective part of animal health), routine administration, and informal continuing education and support of BVWs. Like the BVW program, this program can effectively operate without the luxury of a stable, secure environment.
- The VFU workers, once properly trained and supported in a modest manner, could undertake animal disease surveillance activities and respond effectively to disease

outbreaks and epidemics through the techniques of mass vaccination and perhaps public awareness and quarantine measures.

- It is this area of animal disease control which is perhaps the most cost-effective, particularly as designed in the UNDP's program. We embrace the VFU concept and hope that appropriate donor funding is obtained to support this important and highly economic undertaking.

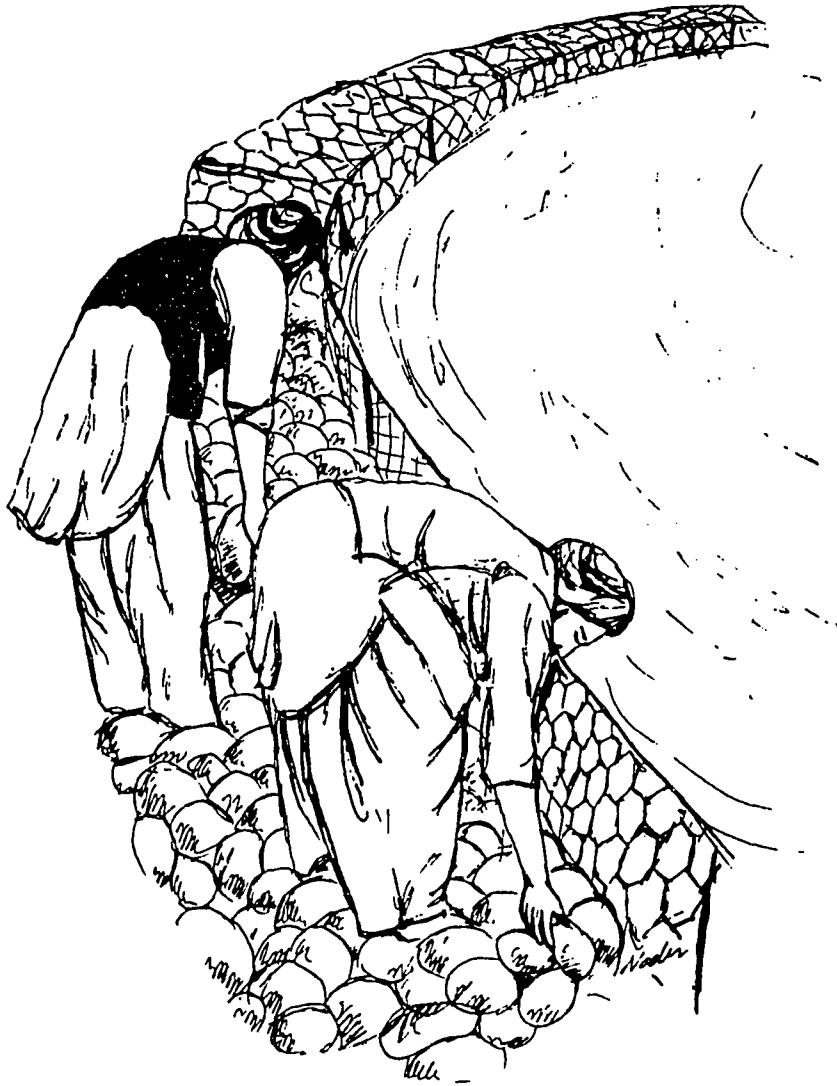
The MCI/Tufts **Private Sector Animal Health-Care Initiative Project** has made considerable progress in the establishment of a sustainable animal disease control program for Southwest Afghanistan.

The problems and constraints which were identified through monitoring activities during the implementation of the program were recognized as real, and creative responses led to solutions that resulted in an increase in BVW activity.

Chapter 5

Engineering and Reconstruction Assistance

MCI/Afghanistan



I. INTRODUCTION:

I. 1. Program Summary and Justification

During the 1950's the Government of Afghanistan embarked upon an ambitious plan to improve the agricultural and economic productivity of Southwest Afghanistan's provinces. Many major irrigation canals and drainage systems and many kilometers of primary and secondary roads were constructed.

Afghanistan has suffered from the destruction and neglect brought on by 14 years of conflict. Such critical infrastructure as main irrigation canals, main drains and main roads have been severely damaged due to fighting and neglect. During the war, the traditional procedure of irrigation system maintenance broke down as a result of social upheaval in many areas and from the flight of many of those who could catalyze community action. For those people who remained, there were often not enough who had a vested interest in the continued repair and upkeep of even traditional water conduits. Thus, hired labor rather than the traditional voluntary corvee was necessary to keep water flowing both into and out of the cropping areas. This situation effectively prevented most canals or drains from being cleaned, and they began silting at a rapid rate.

At the beginning of the present Cooperative Agreement, a simple plan for assisting irrigation dependent farmers by cleaning important small canals and drains, was developed by MCI. This first phase of MCI's infrastructure rehabilitation program provided a small contribution of food wheat for work to farmer/laborers. Communities agreed to supply laborers who would receive this compensation. Traditional canals and drains were cleaned with shovels and wheelbarrows. The earth was excavated by hand and dumped on the marge of the ditch. In the life of this grant, hundreds of kilometers of canal and drain have been cleaned in this simple way, with thousands of cubic meters of earth removed from the clogged waterways. Thousands of Afghans have earned food by providing their labor to rehabilitate this critical part of the Afghanistan infrastructure.

As MCI grew in its capacity to undertake more complicated engineering projects, an increase in funding for these activities was secured from USAID, thus initiating a second phase of MCI's infrastructure rehabilitation program. The engineering staff at MCI grew to meet the demands of these projects. An expatriate rural engineer was hired under the grant to provide technical assistance and field supervision when possible. A consultant was also engaged to carry out a Rapid Rural Appraisal (RRA) in the Helmand and Arghandab valleys to identify critical engineering needs to be addressed under this grant.

Engineering projects require relatively large inputs of equipment and personnel for appropriate implementation. Tenuous security in the areas of activity compounded the already complicated task of cross-border implementation. The success of the engineering projects described below can be attributed to the capacity of the MCI management and engineering staff to exercise diplomacy and shrewdness in an environment where contractual obligations have no legal foundation, and where possession of property, regardless of its source or method of acquisition, is 9.9 tenths of the law.

I. 2. Accomplishment Statement:

Over the course of this grant, MCI engineering activities have resulted in the rehabilitation of 2,361 kilometers of canals, drains and karezes¹ of various capacities in Kandahar, Helmand, Zabul and Urozgan provinces of Afghanistan. A major, seven gate, canal water distribution complex in Kandahar province was reconstructed. Seventy-four km of primary and secondary road were reconstructed in Kandahar and Zabul provinces. A seventy-meter span suspension bridge for foot traffic was completed in Kandahar.

The completion of these projects has brought a huge change in the lives of residents of the project areas. Agricultural land has been improved with provision of more irrigation water for crops and better drainage. Transportation of agricultural products to different parts of the country via rehabilitated roads has been markedly improved as well.

II. PROGRAM OBJECTIVES:

(Excerpted from Amendment # 7 of USAID/MCI Cooperative Agreement # 306-0211-A-00-0961-07 dated: 28 September, 1992.)

"General Objectives of this Agreement

Under the terms of this Agreement, Mercy Corps International, in collaboration with A.I.D, its contractors and grant recipients under the Agricultural Sector Support Project, shall undertake activities to restore agricultural capacity in Southwest Afghanistan. Eligible activities for support will be those which promote the production, marketing and processing of food grain and cash crops. The expansion of private sector capacities will be promoted to the extent that there are direct links to activities approved under this Agreement.

¹ An underground water channel which taps an aquifer for agricultural use, common throughout the Middle East.

... Specific Objectives of the Cooperative Agreement ...

- ... b. support for the repair of irrigation systems, vineyard trellises and other related infrastructure as agreed by O/AID/Rep....

IRRIGATION AND ROAD REPAIR AND MANAGEMENT

Irrigation Repair Work

7. Rambasi Drain/Kandahar Province

Move 23,220 cubic meters of soil to aid in drainage of 1,500 acres (3,000 Jerib) of presently saline crop ground.

9288 man days @ 7 kg per day = 65 MT of wheat.

9288 man days @ 900 Af per day = \$10,132.

8. Panjwai Drain/ Kandahar Province.

Clean 21 kilometers (2 man days/clean 1 lineal meter per day).

42,000 man days @ 7 kg per day = 294 MT of wheat.

42,000 man days @ 900 Af per day = \$45,818.

9. Arghandab River Canals - Six traditional canals north of river in Kandahar province require cleaning and intake structures.

Man days unknown.

10. Arghandab Canals and Drains - A network of field drains and supply line south of the river below Lashkargah, running from Senzaray to Spairwan. No site survey completed. Man days unknown.

11. Lashkari Bazaar Gharbi Drainage Project

To drain 3,000 Jerib of land for the benefit of 350 families.

Canal length 6,000 M x width 2 M x depth 0.5 M = 6,000 M³ .

Man days required = 3,000 x 900 Af/man day = \$3,272;

x 7 kg wheat/man day = 21 MT.

12. Lashkari Bazaar Sharqi Drainage Project

To drain 3,300 Jerib of land for the benefit of 200 families.

Canal length 8,000 M x width 2 M x depth 0.75 M = 12,000 M³ .

Man days required = 6,000 x 900 Af/man day = \$6,545;

x 7 kg wheat/man day = 42 MT.

13. Rahman Kaul Drainage Project

To drain 2,000 Jerib of land for the benefit of 120 families.

Canal length 10,000 M x width 1.5 M x depth 0.5 M = 7,500 M³.

Man days required = 3,750 x 900 Af/man day = \$4,090;

x 7 kg wheat/man day = 26.25 MT.

14. Lashkargah - Sarkar Canal Project

To clean canal to provide an additional 7,800 Jeribs of land for the benefit of at least 500 families. Of the total canal length of 25,000 M, 20,000 requires cleaning.

Canal length 20,000 M x width 3 M x depth 0.75 M = 45,000 M³

Man days required = 30,000 x 900 Af/man day = \$32,727;

x 7 kg wheat/man day = 210 MT.

15. Lashkargah - Karwandah Canal Project

To drain 1,000 Jeribs of land for the benefit of 300 families.

Canal length 20,000 M x width 2 M x depth 0.75 M = 30,000 M³.

Man days required = 20,000 x 900 Af/man day = \$21,818;

x 7 kg wheat/man day = 140 MT.

Farm to Market Road, Bridge and Grain Storage Repair Work

1. Shahri Safa - Mizan Road/Zabul Province

80 kilometers of road repair requiring 8 months work.

56,000 man days @ 7 kg of wheat per day = 392 MT of wheat.

56,000 man days @ 900 Af per day = \$61,090 (skilled labor).

2. Boldak Road/Kandahar Province

38 kilometers of road repair requiring 5 months work.

33,250 man days @ 7 kg of wheat per day = 232.75 MT of wheat.

33,250 man days @ 900 Af per day = \$36,272.

3. Arghistan Cable Bridge (Foot Traffic) /Kandahar Province

200 man days @ 7 kg of wheat per day = 1.4 MT.

200 man days @ 900 Af per day = \$ 225.

4. Seed Grain Storage Bins (made of stabilized soil cement) Construct 25 demonstration grain bins to store improved seed grains grown under MCI/AID Rep projects now underway.

1,750 man days per bin @ 7 kg of wheat per day = 12.25 MT.

1,750 man days per bin @ 900 Af per day = \$ 1,969.

..." (end of excerpt from Amendment # 7)

III. PROJECT ACTIVITIES & INPUTS:

All of the above projects which were approved by USAID for implementation required similar activities and inputs. In general, the steps to completion have followed this outline:

1. Receipt of a request for assistance for the resolution of a given infrastructure problem from a council of elders or other authority from the area in question.
2. A survey team is sent to the area where they meet those who have submitted the request for assistance and discern the level of practical contribution the community can make to the proposed project i.e. how much labor, aggregate, etc, will the community supply as its contribution?
3. Provided the local community can make the necessary contribution of labor, materials, security or whatever, the survey carries on with a detailed technical survey of the site, and then returns to Quetta for the completion of work calculations.
4. Procurement of supplies such as wheelbarrows, machinery, cement, steel bars, etc. is then carried out based on the work calculations. In some cases this process also includes the development and submission of a proposal to the World Food Programme (WFP) for food wheat to pay work crews.
5. These materials are then sent to the work site in Afghanistan. Movement of materials from Quetta to the project site has often proven problematic. The Pakistani government imposed a variety of restrictions on the movement of goods across the border from Balochistan to Afghanistan. The acquisition of route permits and the negotiation of the other bureaucratic obstacles to smooth shipment of engineering materials became a major task for the logistics officer employed for this purpose.
6. Once located at the work site, security of equipment and supplies become the most demanding task after project implementation itself. Security of property is nominally the responsibility of the beneficiary community. In actual fact, however, it is incumbent on the MCI Provincial Managers to carry out negotiations with local authorities to ensure either the security, or renewal of failed security of staff, equipment, and materials.
7. Project activities on site are supervised by a site engineer who reports to the MCI office in Kandahar or Helmand on a weekly basis. A site accountant is responsible for local petty cash and food wheat for labor disbursements.
8. At the end of each project, an inspection of the project is carried out by the Provincial Manager, Ag. Division Head, the Ag. Program Coordinator or by cooperating UN personnel. Results are reported in the quarterly report.

IV. ACCOMPLISHMENTS AND IMPACTS:

Phase 1 of the MCI infrastructure rehabilitation program resulted in the re-opening of approximately 91,300 jeribs of land (18,260 hectares or 45,120 acres) which had been derelict for want of irrigation water. In all, 913 canals and karezes were cleaned in Helmand and Kandahar provinces of Southwest Afghanistan.

After completion of Phase 2 of the MCI infrastructure program, 33,832 jeribs (6,766 hectares) of farmland re-opened for production with the repair of fifteen (15) canals in Helmand province; 14,660 jerib (2,932 hectares) of water logged farmland re-opened for crop production with the desalting of 3-drains in Kandahar and Helmand provinces; two main roads (84 km) were reconstructed and facilitated the transportation of goods and services in Kandahar and Zabul provinces; seven gates and one lifting hoist mechanism were installed and three old gates were repaired, in the Baba Wali distribution canal complex to control the wastage of water; one cable bridge was constructed over the Tarnak river to join and link 30 villages to Dand district and Kandahar city and shorten the distance between the north and south residents of Tarnak river.

IV.1 Quantitative Results:

The following tables summarize the engineering projects which were funded under this grant. Following the tables is a discussion of each project. Several projects mentioned in the grant document were substituted with other projects of similar scope, which for a variety of reasons such as security and logistic expedience were considered more suitable. These substitutions and additions are addressed below.

Table 5.1 Irrigation Repair Work Results

Project Title	Province	District	Length km	Earth Moved m ³	Food Wheat Used MT	No. Man Days	Est. No. Hectares of Lands Rehabilitated	Est. No. of Beneficiaries
Rambasi Drain	Kandahar	Panjwai	6	23,320	84	12,000	600	2,240
Panjwai Drain	Kandahar	Panjwai	4.5	22,265	78	11,133	1,932	4,221
Arghandab Canals								
Arghandab Drains								
Lashkari Bazaar Gharbi Drain	Helmand	Bust	6	9,600	45	6,429	600	2,450
Lashkari Bazaar Sharqi Drain	Helmand	Bust	8	12,800	60	8,571	720	1,400
Rahman Kaul Drain	Helmand	Nahri Saraj						
Lashkargah Sarkar Canal	Helmand	Bust	20	44,879	270	38,571	1,560	3,500
Karwandah Canal	Helmand	Bust	20	43,200	180	25,714	200	2,100
Rahman Canal	Helmand	Nahri Saraj	10	35,000	122	17,500	400	1,750
Malik Anwar Canal	Helmand	Nahri Saraj	2	1,750		875	200	280
Khushkaba Canals	Helmand	Bust	106	177,858	498	71,143	2,926	6,300
Sher Mohd Canal	Helmand	Bust	11	31,680	111	15,840		1,750
Nahri Sardar Drain	Helmand	Grishk	3	9,714	34	4,857	250	1,400
Phase One: Traditional Canal & Karezes			2,091	512,000	1,792	256,000	18,200	66,624
Totals			2287.5	924,066	3,274	468,633	27,588	94,015

Table 5.2 Road and Structures Repair Work Results

Project Title	Province	District	Length km	Earth Moved m ³	Food Wheat Used MT	No. Man Days
Shahri Safa - Mizan Road	Zabul	Mizan	47	95,321	504	15,364
Boldak - Kandahar Road	Kandahar	Spin Boldak	27	80,000	300	1,989
Tarnak Cable Foot Bridge	Kandahar	Dand	.80	202	0	0
			74.8	175,523	804	17,353

Irrigation Repair Work Results; Discussion

Phase One: Traditional Canals and Karezes:

These activities were completed as planned. They represent an enormous agricultural impact, as well as a refugee repatriation incentive.

Rambasi Drain:

This drain was cleaned as proposed with no problems.

Panjwai Drain:

This project proved to manifest more logistical problems than initially anticipated. Though a dragline was used, progress was much slower than planned. Four and one-half km of the drain were completed. The project is continuing with assistance from World Food Program (WFP).

Arghandab Canals, Arghandab Drain:

After initial survey, other NGOs, RIFRA, and ARR cleaned these water courses. These canals are a branch of the Zahir Shahi canal. Resources for these activities were reallocated for use in Helmand. However, the seven gates at the Baba Wali distribution complex were reconstructed and installed by MCI/USAID.

Lashkari Bazaar Gharbi Drain, Lashkari Bazaar Sharqi Drain:

These drains were cleaned as proposed with no problems.

Rahman Kaul Drain:

Due to local problems and lack of community participation this drain could not be accessed, so the Nahri Sardar drain was substituted.

Lashkargah Sarkar Canal:

This canal was cleaned and completed as planned.

Karwandah Canal:

Cleaned and completed as planned. This work reopened agricultural land which had been dry for the duration of the war.

Rahman Canal, Khushkaba Canal, Sher Mohammad Canal:

Substituted this activity for work in Arghandab. Project implemented with no problems.

Malik Anwar Canal:

Cleaned as a part of the Karwandah canal project.

Nahri Sardar Drain:

Replaced Rahman Kaul drain because it was more readily accessed.

Road and Structures Repair Work Results; Discussion:

Shahri Safa-Mizan Road:

The initial road design was longer due to demands by local commanders to service their constituent areas. The road design was changed by the Mizan Shoorā from Shahri Safa to Qalat, thus shortening the road from 80km to 47km.

Spin Boldak-Kandahar Road:

Road was repaired from Toor Kotal on the Boldak side to the Tarnak bridge beyond the airport on the Kandahar city end of the road. A spur of 2km was also repaired from the Kandahar Airport terminal to the Airport hospital.

Tarnak Cable Bridge:

Originally planned as the Arghistan Cable Bridge, the site was changed because of the construction of a dike next to the main Arghistan bridge. Many security problems were encountered by the various toll chains on the road to the work site.

The Grain Storage Bins:

Contacts were made and designs given to the Taxila Heavy Engineering Company, for manufacturing Cinva Ram stabilized cement block machines.

IV.2. Beneficiary Profile:

1. Direct:

- a. Project personnel who were employed from the project and its surrounding area. (Skilled and unskilled)
- b. Approximately 94,000 members of farming families who are presently living in the project areas.

2. Indirect:

The whole population of the project area will benefit indirectly from these projects. With the improvement of infrastructure, the project areas have become more suitable for refugee repatriation, and indeed, refugees have returned and repopulated areas which had lain derelict prior to the infrastructure rehabilitation carried out by MCI in these projects.

IV. 3. Program Impact:

The MCI engineering program has made a tremendous impact on the lives of thousands of Afghans resident in the project areas. The construction and rehabilitation of the Kandahar-Boldak road reduced the travel time from Spin Boldak to Kandahar (the most vital trade route in the southern part of the country) from 3 hours to 30 minutes. The Shahri Safa-Mizan road travel time was shortened from 4 hours to one hour. The process of canal and drain cleaning has supplied irrigable water to 33,832 jeribs of crop land. A further 14,660 jeribs of crop land has been drained and re-opened for cultivation. The Baba Wali distribution complex canal gates are repaired and the installation of the new gates has controlled the leakage and wastage of irrigation water.

V. PROGRAM CONSTRAINTS:

V.1. Security

Implementing engineering projects in the Afghanistan environment is almost by definition fraught with obstacles. Superseding all other engineering constraints is that of security. The managerial difference between engineering and other MCI agriculture activities is simply that more cash and expensive equipment are necessary on site for implementation, and furthermore, those assets are stationary, and thus even more vulnerable to theft or loss. An enormous amount of senior management time has been spent on ensuring the security of MCI personnel and material for the effective and efficient implementation of these projects. This time spent yielded the intangible result of things *not* happening.

As Southwest Afghanistan has descended ever deeper into anarchy, the phase-out of relatively high-profile USAID - funded engineering activities created an extremely volatile situation with respect to the security of equipment and staff. This situation was dealt with by the exercise of shrewd planning and safeguards which are more fully discussed in Chapter 8, LESSONS LEARNED.

V.2 Logistics

Procurement and placement of large quantities of construction materials and equipment was a task closely related to security issues. However, another factor in logistical support was conformance to a labyrinth of regulations and limitations placed by the Pakistan or Balochistan governments for the movement of goods across the border to Kandahar province. Route permits are required for the movement of essentially all construction materials which were granted by the Balochistan Home Secretary. The procedure for moving goods to the project sites which turned out to be reasonably successful was as follows:

- a) A route permit request was submitted to either RONCO (the USAID logistics contractor) or to UNILOG (the UN logistics organ), depending on whether items to be moved across border were from the UN funding or US funding. Either way, one of those two organizations submitted the route permit to the Balochistan Provincial Home Secretary. This procedure averaged 2 weeks from start to finish.
- b) Once the route permit was procured, the goods were shipped across the border. Often goods were stopped in spite of having route permits, and a certain amount of diplomacy was necessary for the release of the goods. This generally involved paying visits to Frontier Corps officials to explain the problem and request assistance in the release of

the shipment.

- c) Goods are almost always off loaded at the border inside Afghanistan, and transferred to Afghan vehicles, thence they are taken to the agreed upon delivery point. If the goods are being shipped by a hauling contractor, then negotiations with the various commanders and thieves on the way are his responsibility and at his expense.

V.3. Donor Bureaucracy

For the engineering project, the most significant constraint in this area was the bureaucratic inefficiency of the UN World Food Programme. It has been virtually impossible to coordinate shipments of food wheat for labor with WFP because of poor management of the Kandahar warehouse, lack of sufficient project paperwork to track shipments of wheat from source to site, and poor response to the variety of problems that are inherent in commodity handling programs.

The main constraint presented by USAID for these activities was the procurement limitations placed on material and equipment from designated countries. In particular, Russian tractors which are 1/2 the price, 30% more powerful, and more reliable than Pakistani tractors, were a missed opportunity for better project implementation due to item-source procurement restrictions.

V.4. Weather

Weather and the agricultural year both manifested difficulties for implementation. The best times for work, spring and fall, are also the favored times for fighting. Therefore security is also related to this constraint. Labor does not work as effectively in the 115 F. heat of the Kandahar and Helmand summers. In the 40 F. days of winter, standing bare-legged in a sloppy canal bottom and slinging mud over the berm is attractive to only the most destitute of laborers. Another practical consideration is the importance of crop irrigation in dry periods. Dry periods are also the best time to clean canals, and rehabilitate offtake structures, which usually results in a flow stoppage.

V.5. Availability of Appropriate Materials

Along with the standard problems of availability of hardware for construction, the poor availability of suitable soils, aggregate, and stones for gabion construction proved to be problematic. Without a sufficient clay fraction in a compacted soil, for example, the structure will be subject to premature compromise. The same is true of stones for gabion construction, and masonry. This problem is solved by spending funds which are sufficient to procure the appropriate materials. Because of the volume of these materials often needed, however, this can be a significant, but sometimes unanticipated expense.

Chapter 6

Administration

MCI/Afghanistan

INTRODUCTION:

The MCI-USAID Agriculture Rehabilitation Project for Southwest Afghanistan was developed to provide training and material assistance to Afghans for the rebuilding of the infrastructure and agriculture of Southwest Afghanistan. In support of this project, MCI/Quetta developed an administrative structure to oversee planning and management, as well as facilitate program operations. Communications with the host government - the Government of Pakistan, and with the myriad Mujahideen commanders and political parties active in Southwest Afghanistan (and Quetta) were additional important functions of MCI administration. Furthermore, ongoing frequent communication and cooperation with both MCI's Portland headquarters and with USAID were also required. Over the span of this project, MCI/Quetta created an administrative structure that achieved these goals. Furthermore, the inclusion of Afghan staff within the administration was an important contribution to sustainability.

OBJECTIVES:

1. To promote project goals by providing necessary planning, management, financial, and logistical support
2. To facilitate communications with the host Government of Pakistan regarding operations, expatriate personnel, financial and legal requirements
3. To facilitate communications with military and political leaders in Southwest Afghanistan
4. To maintain communication and cooperation with USAID
5. To maintain communications with MCI Portland headquarters
6. To establish a structure with potential for sustainability

ACCOMPLISHMENTS:

Development of an organizational structure for MCI/Quetta.

Implementation of the USAID Cooperative Agreement for Afghan Agriculture Rehabilitation resulted in a significant expansion of the administrative structure of the MCI Agriculture Department. As the complexity of the program increased, the organizational structure of MCI's administrative staff underwent successive alterations. When operating at full capacity,

this administrative staff included the Country Director and the Agriculture Division Head assisted by the expatriate Agriculture Program Coordinator, Crops Advisor, Animal Health Advisor, and Engineering Advisor. The Ag. Division Head and the Ag. Program Coordinator jointly supervised the expatriate advisors and the coordinators of the Animal Health, Crops and Engineering departments and Inside Operations. The Country Director devoted 50% of his time to the Agriculture project, while the remaining staff worked full-time on the project. This core staff was supported by additional administrative backup, including the finance department, the warehouse manager, and the MIS division.

Facilitation of communications with the Government of Pakistan.

It was recognized early in the course of MCI's operations in Quetta that good communication with the host government was essential to carry out the goals of the project. In the early days of the project, considerable difficulties were encountered with Pakistan governmental regulations regarding receipt of shipments of supplies and material from overseas, transport of these supplies over roads in Pakistan, border crossings between Afghanistan and Pakistan for personnel (Afghans and expatriates) and supplies and equipment, and various expatriate issues including visas, work permits, and assurances of safety. Various means were found to deal with these issues. For example, O/AID/REP assisted with obtaining a route-permit to allow transport by road of various equipment and supplies. Initially, extensive delays were encountered in receiving shipments through Pakistan customs.

Additional negotiations were necessary to approve transport of items across the Afghan border. Although a general approval was received in the second quarter of 1989, often these shipments had to be resolved on a case-by-case basis. Cross-border transport of personnel, particularly expatriates, was occasionally met with difficulties on the Pakistan side. These were successfully managed by an administrative staff member who met regularly with government and police officials to review visa status and work permits.

Facilitation of communications with military and political leaders in Southwest Afghanistan.

During the life this grant, Southwest Afghanistan was completely disrupted by war. At different times, various rival factions controlled different areas. During one time period, the section of road between the Pakistan/Afghanistan border (Spin Boldak) to Kandahar city was blockaded by no fewer than 70 chains, each controlled by Mujahideen demanding satisfactory "credentials" of any vehicles which wished to pass. To work successfully in these conditions was a challenge requiring the utmost sensitivity. These conditions affected all aspects of MCI's agriculture operations, including supply of inputs, project management, and cash flow. Security concerns for personnel (including students and monitors), and for supplies, equipment, and property were paramount. The general approach taken by the MCI administration was to maintain neutrality with all parties rather than to ally with the most powerful.

Communications and cooperation with USAID.

An essential component of the MCI-USAID Agriculture Rehabilitation Project for Southwest Afghanistan was the maintenance of ongoing communications and cooperation with the donor, USAID. This occurred at two levels of MCI's administration: Quetta and Portland. In Quetta, this communication included a number of elements: (a) weekly reports from the Agriculture section faxed to USAID Islamabad, with updates on the variety of programs under implementation inside Afghanistan (b) quarterly reports sent to USAID Islamabad, with detailed reports of all accomplishments and difficulties of the previous quarter, work plans for the coming quarter, and complete financial records, (c) regular phone contact with USAID Islamabad personnel regarding any issues or difficulties which arose in implementing the work plan, and (d) frequent face-to-face meetings of USAID and MCI staff to discuss and update the project implementation.

MCI's Portland Headquarters Staff were also involved in maintaining contact with Washington, D.C. based USAID officials regarding MCI/Quetta's programs for Afghanistan.

Communications with MCI Portland headquarters.

MCI's Quetta administration was further supported by MCI's Portland operations. This included the Portland Afghan Desk Officer, the Asia Regional Director, and the Vice-President for International Programs. Individuals in these positions provided ongoing advice and coordination of all programs, finance, and personnel activities between MCI/Portland and Quetta. The Portland Office determined appropriate field policies and procedures. The Asia Regional Director remained in close contact with the Country Director. MCI/Portland staff were also involved in maintaining contact with relevant US State Department and AID officials, congressional staff, and other contacts regarding MCI/Quetta programs for Afghanistan. USAID support for the position of Afghan Desk Officer was discontinued in July 1993.

Cooperation with other agencies.

An additional task of the administration was to enhance cooperation with other agencies working in the area. During the span of this project, there were numerous other agencies with interests in assisting Afghan refugees. To foster cooperation, rather than competition, MCI participated in several committees composed of representatives from various agencies. Two important examples of this were participation in SWABAC and ACBAR. In the first, agriculture assistance activities could be coordinated with other SWABAC-participating agencies. With ACBAR, discussions centering around the coordination of efforts and technical approaches were held in order to share information and to avoid unnecessary replication of effort.

In addition to these activities, frequent discussions occurred with the numerous other agencies active in the area. A partial list of these agencies includes: ICRC, SCA, IRC, RONCO,

WFP, ACBAR, UNDP/OPS, FAO, DCA, UNHCR, and UNOCA. Such work was critical to program development and implementation, and often resulted in cooperative arrangements beneficial to both parties. Furthermore, inter-agency cooperation enhanced MCI's role in the NGO community.

Establishment of a sustainable administrative structure.

Along with oversight of daily operations and planning program implementation, a main objective of the administrative team was to install and train Afghans in the various departments of operation. Over the span of this project, MCI succeeded in placing Afghan staff in management positions. Many additional Afghan staff gained administrative and managerial experience working on individual projects.

As part of its efforts to upgrade management skills of national staff, MCI conducted three in-depth seminars for a selected staff in the areas of grant management, budget procurement, and consultants/sub-contractors. These seminars were conducted in Quetta by the MCI senior staff from Portland headquarters.

CHALLENGES AND CONSTRAINTS:

Establishment of a workable administrative structure was a significant challenge given the climate of political turmoil, military instability, and lack of experience in the area. Although MCI surmounted these problems, some of this was (necessarily) accomplished by painstaking trial and error. One area of difficulty in the administration of MCI was the numerous staff changes. During the seven years of the project, there were four Country Directors. Similarly, there were numerous other changes in expatriate staff members both in Technical Advisory Staff, and Finance/Admin. positions. During some periods, these positions were vacant for months. Such episodes inevitably resulted in loss of momentum and continuity of program implementation, although with the excellent abilities of Afghan managerial and field staff, this was minimized. Some episodes, such as the evacuation of all expatriate staff during the Gulf War, were out of the control of MCI. Yet during that particular time, the MCI office remained open, functional and in fact, engaged in various emergency relief activities.

LESSONS LEARNED:

The successful partnership of MCI and USAID in implementing these programs is a reflection of the efforts on both sides to maintain good communication. With each renewal of the project proposal, care was taken by both sides to ensure understanding of the amendments. As difficulties arose, due to political or military action, close communication became even more essential.

The importance of inter-agency communication was also evident, in view of the large number of NGOs active in the area. Participation in cooperative committees such as SWABAC enhanced the cooperation between various NGOs, allowed sharing of useful information, minimized duplication of efforts, and resulted in improved projects for all participants.

ACTIONS FOR SUSTAINABILITY:

With the close of funding by USAID, the administrative structure of MCI necessarily will be reduced. Nevertheless, during the project period, numerous Afghan staff gained valuable experience in management, administration, finance and accounting, and logistical operations. Many staff developed or improved their English-language and computer skills. Seminars and workshops on grant-management, budgets, and consultants/subcontractor issues were conducted by senior Portland staff. Since the withdrawal of USAID funding, some proposals prepared by Afghan staff have already been successfully funded by other donors.

Chapter 7

Management Information Services

MCI/Afghanistan

INTRODUCTION:

In support of the MCI-USAID Agriculture Rehabilitation Project for Southwest Afghanistan, an MIS department was established in Quetta. This program eventually employed 11 people, and furthermore trained more than 60 individuals in basic computer literacy. Individuals with Pushtu and Dari computer skills were integral members of the MIS department. The program was established with the following specific aims:

OBJECTIVES:

1. To facilitate communications and record-keeping.
2. To support the various Agriculture Division training programs.
3. To support Afghanistan-based operations.
4. Provision of logistic support.
5. To enhance the computer literacy of MCI staff.

ACCOMPLISHMENTS:

Facilitation of communications and record-keeping.

The MIS department was instrumental in assisting the administrators and agriculture managers with their regular communications with USAID, Portland headquarters, and among the various cooperating agencies. In addition to assistance in preparing professional reports, the MIS department entered, organized, and analyzed a considerable amount of the data upon which these reports were based.

The MIS department also established, updated, and maintained personnel records for all MCI employees. This information included such items as date of hire, attendance, salary, vacation, benefits, and any performance reviews.

Support of Ag. Division Training Programs.

The support by the MIS department to the various Ag. Division training programs was two-fold. First, considerable assistance was rendered with the didactic component of the training programs. This included assistance in preparing the training material, such as booklets, handouts, lesson plans, diagrams, and flip-charts. In addition, the multilingual translators with knowledge of agricultural and veterinary terminology in the MIS department were responsible for translation of these materials.

Furthermore, the MIS department maintained records of all courses given, the students attending the courses, supplies utilized in training, and all records pertinent to the operation of the dormitory, as well the data which illustrates the results of the training programs.

Support of Afghanistan Operations.

One of the major objectives of the MIS department was to assist with the enormous volume of data necessary to track the activities of MCI administered agriculture activities inside Afghanistan. This included the numbers of farmers receiving training in a particular agricultural activity, locations and results. The schedules for the monitoring program was also the responsibility of the MIS department. Records of the dates of monitoring and debriefing were maintained by the MIS department.

A further function of the MIS department was in carrying out the mapping program as requested by USAID. This required a substantial leap in the computer skills of the staff. The use of sophisticated mapping software and hardware was mastered, and accurate mapping of all MCI facilities was obtained.

Support of logistical operations.

MCI's operations in Quetta and Afghanistan required considerable logistical support. MIS assisted by establishing, supervising, and "trouble-shooting" programs by which logistics staff maintained an updated inventory of supplies, a record of income and expenses (in conjunction with Finance Department), and a register of purchases.

Increase computer literacy of MCI staff.

As a by-product of the above activities, more than 60 individuals developed and upgraded their computer skills as well as their English language skills. These included members of the Agriculture Division staff, the MIS Staff, and the Management Staff.

CHALLENGES AND CONSTRAINTS:

The computer needs of MCI grew exponentially as the complexity, size, and scope of operations expanded. Initially, few skilled computer-literate individuals were available in the Quetta area. However, MCI was able to develop an internal training program which successfully allowed capable individuals to learn "on-the-job". These individuals strengthened their English language skills, database management, and proficiency with various types of software. The establishment of computer systems with sufficient sophistication and flexibility to accomplish the desired goals was a process of trial and error, as the needed outputs changed over time. Moreover, it was necessary to develop programs

with easy "accessibility", as many computer functions were needed by individuals with considerably less computer experience than the MIS staff. Development and use of multilingual computer programs was an initial difficulty which was surmounted. Not as easy to surmount was the problem of training field monitors to collect "computer-ready" data. Individual training sessions with field monitors was necessary to ensure correct data collection. An additional challenge was faced with some warehouse staff members with poor educational background. Again, review of data for accuracy prior to entry was necessary.

There was a great deal of interest amongst MCI staff in upgrading their computer skills. However, shortages of computer terminals for practice, and deficient English language skills were significant problems. Lack of technical support for the MIS staff was a major challenge. There was no assistance or backup for any software or hardware problems which arose in Quetta. Thus, the staff had to problem-solve without any support. This was a particular problem with the use of the PICK operating system, which was selected for the database management. Not only did this system turn out to be difficult to learn, but also difficult to trouble-shoot. PICK also turned out to be extra-sensitive to the frequent power shortages which are experienced in the Quetta area. Nonetheless, these problems fostered the growth of a talented, highly skilled group of information management specialists. In addition to their expert computer skills, this group of individuals also acquired a high degree of proficiency in service and maintenance of their machines, which resulted in substantial savings to the MCI and USAID.

LESSONS LEARNED:

Internal development of the staff was a successful strategy for the MIS department. This system developed loyal, knowledgeable and versatile employees. The "organic growth" of the division had the strength that the computer systems grew as needed, the quality of data was assured, and duplication of efforts and services was minimized. The major lesson was that needed output from MIS was not always planned in advance; improved definition of required output at the onset of a project would have resulted in a more even workflow.

ACTIONS FOR SUSTAINABILITY:

In addition to the development of a highly qualified MIS staff and the improvement in basic computer literacy of a large number of the other staff, the MIS division leaves a legacy of an enormous database cataloguing MCI's agricultural activities over the life of this grant. These data include the a wealth of information about agriculture in Afghanistan; tonnages of inputs, yields, varieties, extent of introduction of improved agricultural technology, and beneficiary records. All will continue to be used by MCI/Afghanistan for future activity planning and reporting.

Chapter 8

Lessons Learned

MCI/Afghanistan

I. INTRODUCTION:

In this discussion, "lessons learned" are to be understood as those significant ideas and experiences, which are applicable in different cultural and physical settings. We have asked ourselves, 'If we were to set up a cross-border relief and rehabilitation operation elsewhere, what are the essential components? What could an organization not do without?'

The following discussion is brief because it deals primarily with non-technical matters. A technical discussion would of necessity be lengthy, and mainly an exercise in re-inventing the wheel. Were the relief and rehabilitation of shattered nations and peoples, effected by following technical assistance guidelines, there would not be a Third World. There are many important steps to be taken prior to the implementation of technical activities, without which those activities will fail. Some of these are discussed below and they constitute what MCI has to offer to others in the form of the lessons we have learned in the course of this grant.

II. GENERAL LESSONS LEARNED:

II.1 Staff Relationships:

It is of course, highly subjective, though perhaps expected, for MCI to declare: 'This project worked, it was a success.' Indeed, in the preceding pages, a quantitative justification for this statement has been offered for each of the individual programs under the grant. In a fundamental sense however, the grant was successful, not so much in terms of the tangible technical implementation of the programs, important though this was; but more so with regard to the intangible relationships upon which all these activities were dependent.

General details establishing the importance of good intra-organization relations are perhaps unnecessary. As a comparatively large organization, it was incumbent upon MCI management to promulgate policies which addressed the standard organizational issues with fairness and impartiality. However, because this single project operated in Pakistan, Afghanistan, and to a lesser extent in the United States, with a rainbow of nationalities as employees, and an almost infinite variety of employee expectations, there were a great many issues which required exceptions to be made, and policies to be altered or at least stretched. Under these conditions employee loyalty and commitment to the rather chimerical cause of the reconstruction of Afghanistan were critical to the success of the project.

This was the case for every NGO which had as its primary mission the rehabilitation of some part of war-torn Afghanistan. The concept of fidelity to the ideal of impartial rehabilitation and equitable assistance is, though not incompatible with the Islamic traditions of the various cultures of Afghanistan, not evident in the milieu of the most highly prized sentiments of Afghan culture. Indeed, as in many non-western societies, Afghan culture traditionally

commends conditional patronage, and affirms partiality based on language, tribe, clan, or family.

Against this backdrop of culturally affirmed reciprocity, an assistance program needed to be managed which provided aid to people who had, because of their poverty, virtually no potential to return the favor. The reward or trade-off had to be simply the realization by the MCI Afghan staff that someone had been helped and that they perhaps would henceforth be able to help themselves. Staff who practically demonstrated their adoption of, and capacity to attain, this ideal, were rewarded with greater responsibilities, better pay, and with a variety of training opportunities. Those staff who demonstrated their inability to deal impartially with beneficiaries were removed.

Under this grant, where American citizens were funded as MCI staff, a restriction on the travel of these people inside Afghanistan was made by O/AID/REP. The result of this is that the most senior management staff were prevented from making work assessment and management missions to Afghanistan. Thus, the trustworthiness of Afghan senior management staff was especially critical for the success of this program.

The MCI senior Afghan management staff are not characterized by articulate speech in English, or high levels of technical skill or experience. Rather, the senior staff are all distinguished with well proven records of operational initiative and field experience. Prior to their installation as management staff, an expatriate filled their position. Individuals were not 'groomed' for management positions; their performance spoke for itself and they were promoted based on what they had done. This resulted in a core of Afghan staff who were distinguished more for their basic field operational capacities than for their technical skills (with the exception of the Animal Health Coordinator, who manifested both strong operations management and technical skills).

As will be discussed below, in this type of activity and with the technology level of the various interventions, a high degree of technical skill was not nearly so important as the capacity to reliably initiate, implement and report on simple technical interventions carried out beyond the managerial sphere of MCI expatriate management staff. Moreover, experience has shown that those staff who had the highest technical qualifications, were often the most reluctant to spend appreciable lengths of time inside Afghanistan where their skills were most needed.

The Lesson For Staff Relationships:

The character of the employee is more important than the skill level. The right person can learn the skills, simply by being provided with access to them, usually a simple task for her or his manager. The character of the employee must be judged based on the employer's understanding of the mission of the organization. If the organization is committed to a certain course of assistance, then the experience and interests of the person in question should reflect a similar commitment.

II.2. Relationships With Afghan Authorities:

Outside of the MCI organization, the most important kind of relationships were those with the authorities of the areas in which MCI was active. A fine balance was necessarily struck between the two problems of vulnerable obligation to local authorities, and alienation or even antagonism from local authorities. To a large extent, mujahideen commanders and their forces or local shooras represented the most plausible authority structures in the areas of MCI operations. Therefore, negotiations between MCI and these authorities were necessary to secure permission and guarantees of security for the activity in question.

Though commanders wield physical power, they often have little or no community respect. Though physically powerless, the local shooras, or councils often carry the respect and legitimacy of the community. Thus it has often occurred that a shoora and a commander of a body of mujahideen soldiers will overlap in the physical areas of influence and administration and hold sway over the same area. Or even that a single local shoora will have influence in more than one area which is militarily dominated by two or three hostile parties of mujahideen.

This is primarily due to the split allegiances of many Afghans to both party and tribe. The expression of party support is found in their associations with mujahideen commanders and their tribal allegiances are manifest in their deference to their local shoora. These relations can be further complicated by the fact that a commander may be a shoora member, or that other people in the community exercise authority via some other legitimacy, such as by being a celebrated religious leader, a war hero or a wealthy landowner.

A clear understanding of all these relationships and authority linkages has been necessary on the part of the MCI field staff in order to implement projects in more than one area of authority. With MCI's activities stretching across seven provinces in the southwest, an enormous amount of time has been spent in discussing project activities, with individuals and groups. Advantage was taken by the MCI provincial managers of all of their professional as well as ethnic linkages as they presented the various programs or issues to concerned parties. The object of these discussions was either to resolve a problem which was facing the MCI workers or to present the concept of an activity which was being posed for the given area, and to enlist support from local authorities for the provision of security, labor crews, land, water, or whatever was needed as the local beneficiary contribution. Perhaps the most diplomatically taxing part of the task was to present the requirements for community assistance to be provided by the local authorities with no compensation.

MCI's assistance under this grant did not take place in a vacuum. Other organizations, international and local, with diverse agendas were also active in the MCI project areas. This resulted in a variety of deals being cut between the assistance organizations and the local authorities. In general, the deal which proved to be the most advantageous to the local authority was the one which they attempted to replicate in discussions with MCI.

One of the more subtle tactics in these negotiations was to identify men of good repute, religious leaders, or simply 'good men' who might be related to someone who was 'not so good' (i.e. those who are less concerned with governance and more concerned with self-aggrandizement). These people provided a conduit of appeal in situations where direct approaches were ineffective. For example, if a mujahideen of a commander stole a motorbike from MCI, as happened on many occasions, the commander would be approached by the MCI provincial manager who would request its return. If he was refused, the MCI manager would talk to the commander's relative and elicit his assistance.

Until recently, when all authority structure in Kandahar province began to sink into anarchy, this technique never failed. A good working definition of anarchy is the absence of meaningful, widely held reciprocal social relationships. It is into this situation that a good part of Kandahar province has sunken. There is now little possibility for resolution of many of the issues which emerge in the course of project implementation. With the absence of the ability to negotiate settlements, the area becomes untenable for continued project activity.

The Lesson For Relationships With Local Authorities:

Though the immediate results are intangible, a great deal of time should be committed by high level management staff to carefully present the program plans and objectives to both important and seemingly unimportant local authorities. Diplomacy, as defined by the culture, is extremely important, as is the integrity of the staff member exercising the diplomacy. The objective of negotiations with local authorities is to minimize the obligation of the assistance organization to that authority, while maximizing operational capacity within that authority's area of influence.

II.3 Relationships With Pakistan Authorities:

The government of Pakistan sees itself as being patient with the Afghans in epic proportions. They believe that the Afghans constitute both a military and economic security threat to Pakistan and feel justified in placing controls on the movement of Afghans and goods related to the assistance of Afghans. Moreover, individuals, within both the federal and Balochistan provincial governments, feel slighted by the amount of high-profile aid flowing into Afghanistan.

In general, Pakistanis do not like or trust Afghans. They see them as terrorists, barbarians, or at best, humorous rustics to be derided. They see aid to Afghans as being nothing more than assistance to commanders who have already grown wealthy from war profiteering and plundering. Pakistanis usually consider the Afghan NGOs which reside in Pakistan to be completely corrupt and self-serving, and the international NGOs to be staffed with well-paid naive expatriates. They see the terminations of USAID assistance to Pakistan via the

Pressler Amendment as a cynical, imperialistic act somehow related to the US government's withdrawal of assistance to Afghanistan.

None of the above views are completely unwarranted. Some are very nearly correct. MCI's ability to work successfully with the Pakistani government, local and federal, is directly a result of the relationship which MCI had with USAID. MCI, as a partner in a Cooperative Agreement with USAID, was situated at just the right distance from the US Government; close enough to receive assistance in tasks such as acquisition of visas, No-Objection Certificates, and work permits from the Pakistani government, but not so close that all of our transport, procurement, and other logistical arrangements were subject to US government contractor regulations.

MCI has always recognized its situation with respect to the Pakistani government as being one of some dependence, if not vulnerability. On several occasions, international NGOs in Quetta and Peshawar have received letters from Pakistani authorities directing them to close their offices and terminate their operations with immediate effect. Though some of these directives have been reversed, many were consummated by the departure of the organization from Pakistan.

Common sense and courtesy have governed MCI relations with the Pakistani government. Officials whom MCI deals with on a frequent basis are always invited to public functions. Interestingly, they very often express a concern that MCI is offering a great deal of assistance to Afghans, but very little to Pakistanis. Given the prevalent attitude of Pakistanis towards Afghans, their identification of the assistance disparity is often strident. These moments call for a diplomatic, and mollifying approach. This again, is a point at which it is advantageous not to be a contractor with USAID. MCI, with its broad funding base, is capable of taking an active interest in assistance activities in Pakistan, and is able to express to concerned Pakistanis, that efforts are underway to find resources for projects in Pakistan.

The Lesson For Relationships With Pakistani Authorities:

This relationship has been effective because MCI used the USAID umbrella of credibility and bureaucratic assistance as much as possible to achieve good standing with the Pakistani government. In its direct relations with the Pakistani government, MCI has maintained a respectful, proactive position.

II.4 Relationships With USAID (O/AID/REP):

USAID, O/AID/REP has been much appreciated for the fiscal and managerial latitude it granted to MCI, to carry out some worthwhile activities in a very taxing environment. Proposals and project documents are notable in their brevity. Implicit in this brevity is a

remarkable flexibility which has allowed MCI to creatively solve the problems resident in the Afghan rehabilitation context.

However, over the course of the grant, this adaptability changed somewhat in character. As O/AID/REP became increasingly preoccupied with the demands of a phasing out office, its initial constructive flexibility towards MCI programs changed into a far more intense concern for issues which were peripheral to the grant objectives. It remains unclear whether this shift was the result of a policy decision, or whether it simply evolved unintentionally.

III. TECHNICAL LESSONS LEARNED:

III.1 Crops:

Two particularly important lessons were learned. Firstly, provide large numbers of very small on-farm demonstrations of whatever technique it is that is being promoted. Do not demonstrate techniques which require large commitments by the participating, but unconvinced farmers. For example, a micro-plot of an improved wheat variety of 100 meters² is sufficient to demonstrate the various advantages of that variety over the land races. One tree pruned properly in 100 is sufficient to show the advantages of pruning. As much as possible, demonstrations should be on private farms.

Secondly, as much as possible, train people who have a long-term vested interest in the innovation. Extension worker employees are less interested in a new idea than the targeted farmer. It is worth the extra expense and logistical problems to bring target beneficiaries to the training source to be trained alongside the extension workers. The function of the extension worker then becomes to facilitate the natural transmission of successful techniques from farmer to farmer by assisting in the organization of practical demonstrations on the properties of farmers who have successfully adopted a new innovation. His job is also to report to the main office the progress and problems of technology adoption.

III.2 Basic Veterinary Worker Training:

The most significant practical lesson learned is that the best basic veterinary workers are poor, semi-literate livestock owners. Those who are illiterate are unable to refresh their knowledge with books. Those who are not poor are unwilling to carry out the hard work that is required for a BVW to realize a profit from his new skills.

A further lesson learned was that facilitating simple transport will greatly increase the clientele access and hence the profit of the BVW. Thus, when MCI offered bicycles to BVWs who successfully passed examinations which concluded refresher courses, it was found that their activities increased significantly.

III.3 Engineering and Rural Rehabilitation:

Essentially, the success of these activities stemmed from the capacity of the MCI field management staff to move the requisite equipment to and from the work sites with mitigated security risks. Risk mitigation was achieved by discussions with all involved parties in an affected community as described above in section II.2. Once on site, the equipment was guarded by representatives of local authorities.

During the end of the USAID grant, the security of the AID-provided equipment was very tenuous as many of those who were responsible for it were aware that they were going to lose their jobs soon. No equipment was lost. This rather difficult achievement was effected by deception and by catching potential thieves off-guard in pre-emptive removal of the equipment. All major pieces of equipment were moved to secure stores in Spin Boldak or in Panjwai in Kandahar province. It is hard to imagine how this process could have been carried out had there not been a loyal core staff who could count on remaining employed by MCI after the end of the Cooperative Agreement.

Chapter 9

Appendices

MCI/Afghanistan

Appendix 2.1

Cereal Training Courses for Extension Workers and Seed Farmers inside Afghanistan

1. Levelling of land for planting and drainage
2. Importance of preparing land by deep plowing before planting
3. Selection of improved seed
4. Date and rate of seed planting
5. Irrigation and timing of irrigation
6. Fertilizer application and timing
7. Weeds and weed control, especially mechanical control
8. Importance of crop rotation
9. Disease and insect control
10. Roguing
11. Harvesting, threshing and other machinery application
12. Cleaning of seed
13. Storage

Province: _____ District: _____ Village: _____

Card No: _____ Harvest Year: _____

Farmer's Name: _____ Father's Name _____

Wheat Variety(s): PS85 _____ Jeribs; PAK81 _____ Jeribs;

Inqlab _____ Jeribs; Faisalabad(85) _____ Jeribs; Zarghoon _____ Jeribs;

Other Varieties: _____ Jeribs; Date Seed Received: _____

Seeding Date: ____/____/____. Seeding Rate: _____ Kg/Jerib.

DAP Applied (Y/N) ____ Date DAP Applied ____/____/____. DAP Rate _____ Kg/Jer.

Rate of Urea: _____ Kg/Jerib. Dates of Urea application: _____

_____.

Was field preirrigated before planting? Yes _____ No _____

Dates of Irrigation: _____.

Crop Grown last time: _____ Last total yield in Kg: _____

Current total yield in Kg: _____.

Stage of plant development at visit: 1 2 3 4 5 6 7 8 9 10 11

Dates of visits: 1) ____/____/____. 2) ____/____/____. 3) ____/____/____.

4) ____/____/____. 5) ____/____/____. Date of Roguing: _____.

* Use these dates of visit numbers to indicate the date an observation was made.

Problems: score for the percentage of damage to the crop in 10 square meters.

Weeds:	1%	3%	5%	10%	20%	30%	50%	70%	over70%
Insects:	1%	3%	5%	10%	20%	30%	50%	70%	over70%
Rust:	1%	3%	5%	10%	20%	30%	50%	70%	over70%
Flooding:	1%	3%	5%	10%	20%	30%	50%	70%	over70%
Salinity:	1%	3%	5%	10%	20%	30%	50%	70%	over70%
Hail:	1%	3%	5%	10%	20%	30%	50%	70%	over70%
Freezing:	1%	3%	5%	10%	20%	30%	50%	70%	over70%

General appearance of field.

Field Staff Name: _____ NGO: _____ (ashraf:c:\wp51\work\ag\lal\dam2)

NGO Field Staff Name: _____ NGO: _____

د غنمو د تخم د تولید معلوماتي پاڼه

ولایت: _____ اولسوالي: _____ کلي: _____
 د کارډ لمبر: _____ د ریبلو کال: _____
 د بزگر نوم: _____ د بزگر دپلار نوم: _____
 د غنمو ډولونه: PS 85 _____ جریبه، PAK 81 _____ جریبه،
 انقلاب ۹۱ _____ جریبه، فیصل آباد ۸۵ _____ جریبه، زرغون _____ جریبه
 د غنمو نور ډولونه: _____ جریب _____ ، _____ جریب
 د تخم د غنمو د تسلیمولو نیټه: _____ / _____ / _____
 د تخم ډکولو نیټه: _____ / _____ / _____ د تخم ډکولو اندازه _____ کیلو گرام په یوه جریب کېښي.
 DAP استعمال شوي دي؟ (هو / یا) _____ د DAP استعمالیدو نیټه: _____ / _____ / _____
 د DAP اندازه _____ کیلو گرام په یوه جریب کېښي.
 دیوریا استعمال اندازه: _____ کیلوگرام په یوه جریب کېښي
 دیوریا د استعمالیدو نیټي: _____ / _____ / _____
 آیا مځکه د مخه تر کرلو اوبه سوي وه؟ هو _____ ، یا _____
 دخروبولو (آبیاري) نیټي: _____ / _____ / _____
 پخواله دي کوم نبات کرل سوي و _____ پخواني حاصل ني _____ کیلوگرامه
 اوسني جمله حاصل په کیلو گرام _____
 د لیدونو، کتونو په وخت کېښي د نبات د انکشاف (نمو) مرحله: ۱ ۲ ۳ ۴ ۵ ۶ ۷ ۸
 ۹ ۱۰ ۱۱
 د لیدونو، کتلو نیټي: ۱ _____ / _____ / _____ ۲ _____ / _____ / _____ ۳ _____ / _____ / _____ ۴ _____ / _____ / _____ ۵ _____ / _____ / _____
 بيله د غنمو بوټو د کښت څخه د نورو بوټو کښلو (Roguing) نیټي: _____ / _____ / _____
 * کوم یوه مشاهده چي تاسو په کوم نیټه سره کړي وي نو لطفاً په پورته نیټو کي د هغه مشاهدي
 نیټه په نمبر سره وښیاست.

پراېلمونه: د خساري اندازه د فیصدي په اساس په لس (۱۰) متره مربع مځکه کېښي وښیاست.

هرزه واښه:	۱%	۳%	۵%	۱۰%	۲۰%	۳۰%	۵۰%	۷۰% اضافه تر ۷۰%
حشرات:	۱%	۳%	۵%	۱۰%	۲۰%	۳۰%	۵۰%	۷۰% اضافه تر ۷۰%
سرخي:	۱%	۳%	۵%	۱۰%	۲۰%	۳۰%	۵۰%	۷۰% اضافه تر ۷۰%
سیلاب وهنه	۱%	۳%	۵%	۱۰%	۲۰%	۲۰%	۵۰%	۷۰% اضافه تر ۷۰%
مالگین توب:	۱%	۳%	۵%	۱۰%	۲۰%	۳۰%	۵۰%	۷۰% اضافه تر ۷۰%
ژلي وهنه	۱%	۳%	۵%	۱۰%	۲۰%	۳۰%	۵۰%	۷۰% اضافه تر ۷۰%
یخ وهنه:	۱%	۳%	۵%	۱۰%	۲۰%	۲۰%	۵۰%	۷۰% اضافه تر ۷۰%

د کښت عمومي ظاهري وضعیت:

د ساحي دکارکونکي نوم: _____ NGO _____
 د NGO د ساحي دکارکونکي نوم: _____ NGO _____

Appendix 2.3

Description of Wheat Varieties

1. Pak-81 Semi dwarf; grains amber and hard; this variety has now become susceptible to leaf rust; recommended for Punjab, NWFP, Baluchistan provinces and Azad Kashmir; general purpose variety (wide adaptability).
2. Zarghoon-79 Semi dwarf; long duration; thick stem; grains amber and hard; good tillering capacity; recommended only for uplands of Baluchistan; resistant to rust virulences predominating in uplands of Baluchistan.
3. Pirasbak-85 Tall; normal duration grains amber and hard; spikes awned and dense; resistant to frost; recommended for whole of NWFP.
4. Inqilab-91 Medium tall; normal duration; grains amber and hard; resistant to leaf rust but moderately susceptible to yellow rust; not submitted to the VEC; only approved by the Provincial Seed Council; approved by cultivation in the Punjab.

Description of Maize Varieties

1. Sarhad (yellow) Pakistani variety; 100 day ripening period; open pollinated; resistant to leaf blight, smut and rust.
2. Arun II Thai variety; 90 day ripening period; resistant to leaf blight, smut and rust.
3. Sanheri Pakistani variety; 100 day ripening period; resistant to smut and rust; lodging resistance.
4. Pop 31 Mexican variety; 100 day ripening period; resistant to smut and rust; lodging resistance.
5. Shahin (white) Pakistani variety; 90 day ripening period; large grains.

Appendix 2.4

MERCY CORPS INTERNATIONAL
REPORT OF DAP SALES
MARCH 31, 1994

DAP BAG PRICE (AFS) : 13,500
DAP BAG DISPOS.(Rs) : 11
DAP BAG DISPOS.(Rs) : 19.40
DAP BAG DISPOS.(AFS): 1,500

Province	District	DAP With FAO Wheat Seed	DAP With MCI Wheat Seed	DAP General Sales	DAP TOTAL SALES	TOTAL DAP	DAP Disposition Costs Afghanistan Afs	Remaining	Exch.Rate	Exch.Rate	Date	Rs
		Bag	Bag		Bags	Afs	Afs	Afs	Exch.Rate			
Kandahar	DAND	60	0	3878	3938	53,163,000	5,940,000	47,223,000	60.20		5/12/93	780,523.22
	MAIWAND	50		5165	5215	70,402,500	7,850,000	62,552,500	60.20			1,039,078.07
	DAMAN			1000	1000	13,500,000	1,000,000	12,500,000	60.20			207,641.20
	PANJWAI	54	66	2437	2557	34,519,500	3,901,500	30,618,000	60.20			508,604.65
		16	14	1432	1462	19,737,000	2,209,500	17,527,500	61.90		5/12/93	283,158.32
	BOLDAK			1467	1467	19,804,500		19,804,500	61.90		5/12/93	319,943.46
	TAKHTA PUL			320	320	4,320,000	320,000	4,000,000	61.90		5/12/93	64,620.36
	SHEGA			1172	1172	15,822,000	1,758,000	14,064,000	61.90		5/12/93	227,205.17
	ARGHANDAB			643	643	8,680,500	964,500	7,716,000	61.90		5/12/93	124,652.67
				3405	3405	45,967,500	5,107,500	40,860,000	60.30		11/11/93	677,611.94
				18	18	243,000	27,000	216,000	60.30		12/12/93	3,582.09
	KHAKREZ			339	339	4,576,500	508,500	4,068,000	63.50		03/01/94	64,062.99
	KANDAHAR(6)			449	449	6,061,500	673,500	5,388,000	63.50		03/01/94	84,850.39
KANDAHAR(5)			521	521	7,033,500	781,500	6,252,000	63.50		03/01/94	98,456.69	
MARUF				200	21	2,983,500	453,000	2,530,500	63.50		03/01/94	39,850.39
ZABUL	SHARISAFI	120		1793	1913	25,825,500	3,082,860	22,742,711	63.50		03/01/94	358,152.93
	MIZANA	190		1170	1360	18,360,000	2,377,708	15,982,292	63.50		03/01/94	251,689.64
	KALAT/SIORY		169	846	1015	13,702,500	1,765,015	11,937,485	63.50		03/01/94	187,991.89
			31	154	185	2,497,500	321,985	2,175,515	62.30		08/01/94	34,919.98

Appendix 2.4

MERCY CORPS INTERNATIONAL
REPORT OF DAP SALES
MARCH 31, 1994

DAP BAG PRICE (AFS) : 13,500
DAP BAG DISPOS.(Rs) : 11
DAP BAG DISPOS.(Rs) : 19.40
DAP BAG DISPOS.(Afs): 1,500

Province	District	DAP With FAO Wheat Seed Bag	DAP With MCI Wheat Seed Bag	DAP General Sales	DAP TOTAL SALES Bags	TOTAL DAP Sales Afs	DAP Disposition Costs Afghanistan Afs	Remaining Afs	Exch. Rate	Exch. Rate Date	Rs
HELMAND	GRISHK		0	141	141	1,903,500	211,500	1,692,000	62.30	08/01/94	27,158.91
				287	287	3,874,500	430,500	3,444,000	61.80	08/12/93	55,728.16
			15	430	445	6,007,500	667,500	5,340,000	63.50	10/01/94	84,094.49
	NAHRISARAJ			775	775	10,462,500	1,162,500	9,300,000	63.50	10/01/94	146,456.69
	NAWABARAK	200			200	2,700,000	971,000	1,729,000	63.50	10/01/94	27,228.35
	DARWISHAN	100			100	1,350,000	495,500	854,500	63.50	10/01/94	13,456.69
FARAH	BUST		120		120	1,620,000	480,000	1,140,000	63.50	10/01/94	17,952.76
	BAGHRAN	125			125	1,687,500	670,186	1,017,314	63.50	10/01/94	16,020.69
	FARAH		300		300	4,050,000	1,242,000	2,808,000	63.50	10/01/94	44,220.47
URUZGAN	BAKWA		200		200	2,700,000	900,000	1,800,000	63.50	10/01/94	28,346.46
	URUZGAN			918	918	12,393,000	1,377,000	11,016,000	63.50	10/01/94	173,480.31
WISH				8,867	8867						1,950,740.00
WISH				9,079	9079						1,997,540.00
TOTAL		915	1,115	46,727	48,757	415,948,500	47,649,754	368,298,817		0	9,939,020.02
SWIDISH	KHASURUZGA	0		2,221	2221	29,983,500	3,986,500	25,997,000	63.44		409,788.78
	UNSOLD	100			100						
	CHORA	71	0	1,000	1071	14,458,500	1,372,267	13,086,233	63.44		206,277.31
		129	300		429	5,791,500	2,249,333	3,542,167	63.49		55,790.95
TOTAL	300	300	3,281	3,881	50,233,500	7,608,100	42,625,400		0	686,857	
GRAND TOTAL		1,215	1,415	50,008	52,638	466,182,000	55,257,854	410,924,217	0	0	10,625,877

PROOF OF NET AFGHANISTAN PROCEEDS: --> 11,545,293 - 919,416 = 10,625,877

Appendix 3.1

**Horticulture and Integrated Pest Management Books Published
in Pushto in 1993 and 1994**

- | | | |
|----|-------------------------------|-----------------------|
| 1. | Apricot Sulphuring and Drying | - By Dr. A. Wakel |
| 2. | Grafting of Fruit Trees | - By Dr. A. Wakel |
| 3. | Propagation of Fruit Trees | - By Mahmood Nazari |
| 4. | Saffron Culture | - By Mahmood Nazari |
| 5. | Integrated Pest Management | - By Dr. A.R. Saboury |

All illustrated by Nadir Kohzad

MCI BVW KIT CONTENTS

Appendix 4.1

MEDICINE	UNIT DESCRIPTION	# PER KIT
FASINEX	JAR OF 80 TABLETS	1
PANACUR 250	BOX OF 50 TABLETS	2
PANACUR 750	JAR OF 50 TABLETS	1
DIRIFON/NEGUVON	PKG OF 1 KG POWDER	1
SULFADIMIDINE	BOX OF 50 TABLETS	1
RASOMYCINE LA	30 CC BOTTLE	5
EYE OINTMENT	TUBE	4
VETIMAST	INFUSION TUBES	4
NAGANOL	FOIL POCKET	2
ZINC OXIDE	BOX OF 500 G POWDER	1
VASELINE	1/2 KG BAGS	2
TINC. IODINE	450 CC BOTTLE	1
POTASSIUM PERMANGANATE	50 G PACKET	1
MAGNESIUM SULPHATE	BOX OF 300 G SALTS	2
SODIUM BICARBONATE	BOX OF 300 G POWDER	1
KAOLINE POWDER	BOX OF 300 G POWDER	410
ORAL REHYDRATION SALTS	FOIL PACKETS	140
VALBAZEN	PACKET	1

Appendix 4.2

EQUIPMENT	UNIT DESCRIPTION	# PER KIT
BACKPACK	PIECE	1
BURDIZZO	PIECE	1
SCISSORS	PIECE	1
FORCEPS	PIECE	1
CLAMP	PIECE	1
SCAPEL	PIECE	1
L HOOF KNIFE	PIECE	1
R HOOF KNIFE	PIECE	1
PILLING TUBE	PIECE	1
ROUND FILE	PIECE	1
GRIND STONE	PIECE	1
SOLUTION BOTTLE	PIECE	2
OINTMENT JAR	PIECE	1
NEEDLE JAR	PIECE	1
MEASURING CUP	PIECE	1
THERMOMETER	PIECE	2
SM HYPODERMIC NEEDLES	PIECE	8
LG HYPODERMIC NEEDLES	PIECE	4
10 CC SYRINGE	PIECE	4
30 CC SYRINGE	PIECE	2
50 CC CATHETER SYRINGE	PIECE	2
COTTON WOOL	PIECE	1
ROLL GAUZE	PKG 12 ROLLS	1
ADHESIVE TAPE	PIECE	1
RUBBER GLOVES	PAIR	1
NOSE HOLDER	PIECE	1
FLIP CHART	PIECE	1
VACCINATOR	PIECE	1
TROCHAR/CANULA	PIECE	1

Appendix 4.3

Animal Health Training Publications

A. For the BVW Training:

1. BVW Training Manual (for original course).
2. BVW Training Picture Book.
3. Lesson Plan.
4. Narrative Descriptions for Liver Fluke, Gastro-intestinal and Lung Worm.
5. Narrative Descriptions for Animal Vaccination and Deworming Practice.

B. For Para-veterinarians and Veterinarians:

1. Teacher Training Manual to Train Trainers of Basic Veterinary Workers.
2. Lesson Plan (MCI PVT Teacher Training Course).

C. For Veterinary Pharmacy Management:

1. Veterinary Clinical Pharmacology Teaching Manual.
2. Veterinary Medicine Picture Manual.
3. Practical Management in Medicine Store Teaching Manual.
4. Accounting Teaching Manual.
5. Small Business Management.