

PNABT422

MERCY CORPS INTERNATIONAL

AGRICULTURE IN THE MIDDLE HELMAND RIVER VALLEY

*A survey of irrigation infrastructure, cropping patterns, farm power,
livestock production, security, and the political situation.*

Submitted By

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SURVEY SUMMARY: Findings, and Recommendations

Most Important Constraints

The agriculture assessment study conducted by Mercy Corps International (MCI) between October 1990 and July 1991 has identified the following major constraints to agriculture productivity in the wake of thirteen years of disruption by war and neglect:

- Lack of water for irrigation due to clogged canals and drains, canal side-wall damage, control gate damage, and canal drop damage;
- Lack of crop inputs including improved seed, fertilizer, pesticides, and fungicides;
- Shortage of farm power and farm implements;
- Shortage of labor due to the exodus of much of the population to refugee camps;
- Formal trade restrictions enforced by Pakistan border authorities and informal border harassment;
- Low morale from 13 years of disturbance, the recent severe flood damage, and now the threat of the entire irrigation system on brink of collapse.

Critical Problems

Three critical problems have been identified from the assessment:

- Damage to the Boghra Diversion dam,
- Damage to the Darweshan Diversion dam,
- Damage to the Hazarjuft Bridge.

If not rectified, these problems will lead to a collapse of the entire irrigation system and a new wave of exodus from the region.

Poppy Cultivation

In the 1990/91 crop season, poppy cultivation was very limited and in some areas non-existent. Because this crop is grown intensively, it requires less water than other agriculture crops, and cultivation will likely increase if the irrigation systems are not repaired.

Recommendations

Based on the findings of the agriculture assessment, the following interventions are recommended for MCI:

- Establish three agricultural field centers at Benader-Safar, Laki, and Marja;
- Initiate and participate in a cooperative effort to address critical problems;
- Repair and clean primary irrigation canals, using local labor and "cash/commodity-for-work" programs as much as possible;
- Introduce agricultural extension services with emphasis on improved cultivation practices for traditional crops, demonstration of appropriate farm equipment and introduction of high-value cash crops (eg. pomegranates and cumin);
- Introduce a livestock health service training program.

INTRODUCTION

The Helmand Valley irrigation scheme in the middle Helmand Valley¹ was the best and most developed agriculture development scheme of pre-war Afghanistan resulting from over 35 years of U.S. and Afghan government investment. The area produced good yields of wheat, and farmers responded readily to extension programs promoting improved seed and fertilizer use, and alternate crops such as cotton. The irrigation scheme was adversely effected by salinity, waterlogging and drainage problems, but the subsequent installation of a drainage canal network was an effective remedy.

The irrigation scheme is sustained by two large dams; one controlling the Helmand River in Kajaki district, in the north of Helmand province, and one controlling the Arghandab river (a tributary of the Helmand river) in Arghandab district, in the center of Kandahar province. The irrigation scheme has two major diversion dams which give rise to three major canals; the Boghra, Shamalan, and Darweshan (see map in Annex 2). Each of these canals provides water to major planned irrigation schemes as follows:

Boghra Canal

- Nadi-Ali
- Marja
- Sistani

Shamalan Canal

- Shamalan
- Nawa

Darweshan Canal

- Garmser/Hazarjuft/Hazara
- Laki/Lakeri
- Benader and Safar (traditional irrigation system)

¹ Middle Helmand River Valley refers to the area of the Helmand River in Helmand Province between the Kandahar - Herat national highway and the western border of Helmand province.

Before the war, the Helmand Valley was one of the main regions of agricultural production for Afghanistan. Wheat, cotton and fruit were the principal products of the region. The American-built irrigation schemes had opened up large tracts of previously un-cultivated land to agricultural production. The government of Afghanistan, through settler schemes, provided land to those who were previously landless, as well as significant numbers of *koochi* nomads. Many of these people had little or no previous experience with irrigated agriculture, but with the introduction of appropriate technology and extension training activities, yields increased, and in general the standard of living and economic well-being of the region's inhabitants steadily improved.

In some locales, however, due to a lack of adequate pre-development soil surveys and occasional design flaws, the irrigation system created some salinity and drainage problems which resulted in declining yields. The salinity and water-logging problems were particularly severe in Nadi-Ali and Marja. With the development of proper drainage systems and increased agricultural extension, the conditions stabilized somewhat, and yields in selected areas began to increase once again.

The war period resulted in a mass exodus of residents from the region, and the area remains only partially resettled on a permanent basis. As a result, the irrigation infrastructure has suffered a decline due to neglect, and the severe labor constraints have, in many cases, prevented even the most routine maintenance. Major irrigation canals such the Boghra, Shamalan and Darweshan have severe problems with silt accumulation and are partially or nearly completely blocked in some areas. Many flood gates are in disrepair and sidewalls of minor canals occasionally have been bombed or have deteriorated due to lack of maintenance.

In an effort to assess the extent of lost agriculture productivity in the region and the constraints to rehabilitation of that productivity, MCI, with funding from the Office of the AID Representative for Afghanistan, initiated an assessment study of the region. For this study, a consultant was hired with responsibility to design the assessment survey instruments, select and train surveyors, evaluate the survey information together with information from other sources, and compile the assessment report.

The terms of reference for this study were to assess:

- 1) The current status of the irrigation systems;
- 2) Agricultural production and cropping patterns;
- 3) Farm power and livestock production;
- 4) The security and political situation in the Middle Helmand Valley.

METHODOLOGY

The survey system was designed from the perspective that collection of reliable information was difficult to ensure. Without personal on-site visits by the consultant, or better yet, the opportunity to participate in data collection in the Helmand Valley, the potential for problems with data reliability was significant. To this end, the survey system was designed with several checks and balances to ensure the collection of useful and reliable data for this report.

First, a small survey team of several experienced individuals was chosen in preference to a large team which may have lacked experience and would have been more difficult to monitor.

Second, at least half of the survey team was from the Helmand Valley area and therefore already familiar with the situation, both before the war and at the present time.

Third, individuals with sufficient education and appropriate background were recruited for survey team members. For example, the Afghan technical team leader of the survey team was an agricultural graduate who was on the faculty at Kabul University as a plant biologist for several years. This individual also had post-invasion survey experience inside Afghanistan with the Swedish Committee. The other survey team members either had previous survey experience or technical or agricultural degrees from Afghan institutions.

Fourth, a third-country employee of MCI, Matthijs Toot was chosen as an on-site survey monitor and data analyst. Toot is a Dutch national and was actively involved in the MCI information system based on the "Pick" operating system now used by MCI in Quetta. He participated in the survey instrument training sessions and the administration of the pre-test in refugee camps. In addition, he provided the survey team members with training in irrigation damage assessment and map drawing through site visits here in Pakistan. Finally, Toot performed initial debriefings individually and in groups as survey team members returned. This qualitative information was collected on a debriefing form and forwarded to the consultant in Sutton, MA as survey teams would return.

Fifth, Myron Jespersen, Rahmatullah and Salam Jan of MCI's Agricultural Division participated in debriefing the survey team as they returned from survey implementation in the Helmand Valley.

Sixth, an Afghan irrigation engineer was recruited to make a technical analysis of the critical points of damage.

Seventh, the Consultant was in frequent contact with the MCI office in Quetta through facsimile throughout the survey implementation process.

Finally, and most importantly, the *basic* survey instrument was designed in the form of four different questionnaires; the Helmand Valley Farmer Survey (HVF), the Village Bazaar Survey (HVB), the Refugee Camp Farmer Survey (RC), and the Pakistan-Afghanistan Trader Survey (PAT).²

This division of the surveys "lightened the load" of the questionnaire from the implementation point of view so that any one survey was not unduly long and cumbersome to conduct, thereby increasing the reliability of the data.

Moreover, the four questionnaires permitted an examination of several sectors and perspectives of the agricultural production system while including cross-checks for data reliability between the questionnaires. The HVF survey examined the perspective of the individual farmers resident and active in the Helmand Valley. The HVB survey provided general village-level information such as market activity and availability of goods and services. The PAT survey identified the market mechanisms at work for the import of supplies and export of produce, as well as the logistical and infrastructural constraints to economic activity. The RC survey indicated the perceptions of those who have fled the region and the factors restraining their repatriation.

The questionnaires were designed to provide a qualitative overview of both the modern irrigation systems and many of the traditional irrigation systems in the Helmand Valley. Current conditions and major constraints were qualitatively and quantitatively identified in an effort to assess the overall needs and requirements of particular locales in the valley. The survey team visited every major irrigation canal in the Helmand Valley south of the Herat-Kabul highway and all principal minor canals. The location of damage sites was identified and placed on site sketches which were later transformed into the maps seen in Annexes 2-4.

Representative surveys of the villages and farmers residing along the major and minor canals were performed to meet the overall survey requirements. Because security was excellent, repeated trips into the Helmand Valley were made, which permitted the assessment to evolve over time. A total of 288 farmers were interviewed in the HVF survey, and 200 in the RC survey. The HVB survey interviewed 50 traders and shopkeepers in Afghanistan, and the PAT survey interviewed 48 Pakistan traders.

Following the successful implementation of the four surveys, a preliminary analysis was performed, and a Focused Survey was conducted to assess in greater detail the particular needs of three areas which, due to security, political, agricultural, and infrastructural reasons, appeared to be likely sites for future MCI agricultural programs. These sites were Benader-Safar and Laki in the Garmser District to the south, and Marja in Nadi-Ali District in the north of the survey zone. A focused survey (FSA) was then designed and implemented in these areas.

² The survey instruments are on file at the MCI Quetta office and the O/AID/REP office in Islamabad and are available on request.

Additionally, in response to the catastrophic flood caused by heavy winter snowfalls, followed by an early melt and unseasonably heavy rains, a Flood Damage Assessment was performed (FDA). The extent of the flood was greater than any in recent memory, with the waters of the Helmand river rising several meters above the normal high water mark. Entire villages located along the river were swept away in the torrents and there was considerable damage to crops and agricultural fields. The FDA involved site visits to flood damaged villages where interviews and observations were made to verify the damage described by the respondents. The FDA also made damage assessments of the irrigation systems since many changes had occurred which have resulted in the identification of three areas in critical need of intervention to prevent the collapse of the entire Middle Helmand Valley irrigation system.

The qualitative and quantitative data were then analyzed over a five week period beginning mid-June and are the basis for the recommendations of this report. The findings are, therefore, based on the quantitative data analysis and the qualitative assessments made by the Consultant, the Study Monitor, senior staff at MCI, and reports and debriefings provided by the survey team.

GENERAL FINDINGS

Critical Needs

Deterioration of irrigation infrastructure is undeniably the most serious constraint to agricultural production in the Helmand Valley. A combination of lack of routine maintenance, the effects of war, particularly aerial bombardment, and floods over the past 13 years have reduced the system to the brink of irreversible disrepair.

The situation has reached a critical state. In particular, there are three critical needs, the first two of which need to be addressed if irrigation is to be practiced in most, if not all areas of the middle Helmand next year. Number three, while not critical in preventing total system collapse and outward migration of the remaining population in the middle Helmand River Valley, can make an important difference in contributing to the normalization of this agricultural area.

- 1) The gates at the intake of the Darweshan canal are inoperable and the bund of the canal has broken down and is now open to the Helmand River. If these are not repaired before the next high water season, the canal system will likely suffer destruction so severe that with the resulting change of course of the Helmand River, it will be necessary to totally rebuild large sections of the system in order to continue irrigated agriculture in the Garmser, Darweshan, Laki, Benader, and Safar regions in the future.
- 2) The gates at the intake of the Boghra canal which also supplies the Shamalan canal providing water for Nadi-Ali, Marja, and Nawa, are damaged and the canals are badly silted. If the canal is not cleaned, the silt that has accumulated will completely shut off flow of water to these three major irrigation areas.
- 3) The Hazarjuft bridge, the main bridge crossing the Helmand River from the South has been washed out. At the moment, the bridge structure only reaches about 2/3 of the way across the river. This is a major supply route for areas of Nawa, Marja, and Nadi-Ali, which require the presence of transport links to obtain crop inputs and permit shipment of agricultural products to markets.

Fortunately, none of these critical needs are impossible to accomplish. Much of this work can be done with a "low tech" approach which, although it will require occasional maintenance, can provide long-term results. This would prevent total collapse of the tremendous investment that the Government of Afghanistan and the United States have made during the 30-year period from 1946 - 1975. In addition, it would prevent untold human and material costs that could result with the displacement of most of the remaining populations in the area. Many of these people have settled in Helmand only after the irrigation system was built. Their displacement would make them landless once again and certainly would aggravate the current

long-standing refugee problem in Pakistan and Iran, which has recently come under intense pressure from host governments and donors alike.

The Darweshan Diversion Dam and Canal

The Darweshan Canal Project extends 53 kilometers from the town of Kwaja Hassan Baba to Katori, providing irrigation water to the areas of Hazarjuft, Garmser, Darweshan, Laki, and Katori. This area has been exceptionally productive, and even throughout most of the war has been an area of great agricultural diversity with its cereal grains, vegetables fruits and orchards providing food for local consumption, as well as significant contributions to agricultural exports.

Like other canals in the middle Helmand valley, the Darweshan has suffered from lack of routine maintenance, the effects of which have been increasingly felt over the past several years. Local farmers cite this as an important reason for decreasing agricultural production, and a contributing factor discouraging former residents from returning. At minimum the canal requires de-silting and various structures along its length require repair.

The diversion dam, located on the left (East) bank of the Helmand river has three control gates. Two of the gates are missing as a result of civil disturbances some years ago, therefore it is not possible to control the flow of water into the canal. Until this year, the damaged gates did not pose a problem because the canal had sufficient capacity to handle the usual flow rate during high water times in the late winter and spring. This year however Helmand River flood waters rose to greater heights than in recent memory causing unchecked entry of river water into the canal. In March, when the MCI Survey team visited the site, the western sidewall of the canal had eroded to the point where only 2 meters separated the river from the canal. On a return trip in mid-May, the survey team found that about 200 meters of the canal wall had completely washed away allowing the river to pour into the canal through the breach. Meanwhile, above the diversion dam, the flood waters provoked a change in the river's course, such that it now skirts around to the west of the diversion dam, before turning eastward to flow directly into the canal.

The Darweshan diversion infrastructure is said to be in good condition, except for the absence of two of the three gates at the canal intake. The two missing gates will have to be re-manufactured and some heavy equipment may be required to transport and set the new gates into the intake. Local residents say that the third gate is completely intact (it was underwater when the survey team visited the site), but repair of the lift mechanism is required.

Boghra Canal Diversion

The Boghra Canal Diversion located on the right or West bank of the Helmand River near Grishk supplies the 75 Km Boghra canal and the 66 km Shamalan canal. The Boghra canal supplies water to the Nadi-Ali, Marja, and Sistani irrigation schemes in Nadi-Ali District and

the Shamalan Canal supplies the Shamalan, and Nawa irrigation schemes in Nawae-Barakzae District.

Due primarily to lack of routine maintenance, the canal became heavily clogged with silt, drastically reducing water flow such that the Nadi-Ali scheme was for a time during the fall of 1990 and the late spring of 1991 the only area receiving any water on a regular basis. A site visit that the MCI Survey Team made in mid-May of this year confirmed that in early May the Afghan government sent a team of engineers and two cranes to the area where they worked for 3-5 days partially removing silt and once again establishing a limited flow as far as Marja. Desilting of the Boghra canal can be done either by heavy equipment as the Government supplied for a short time in May, or perhaps better, by large scale manual labor crew guided by an experienced engineer. Aside from being logistically easier, this approach carries a higher chance of success because it is not so dependent upon the political situation and the whims of the government. Furthermore, a "cash/commodity-for-work" program would stimulate the local economy, involve more people and provide necessary and valuable agricultural inputs to assist them in the next planting season.

The gates of the Boghra diversion are inoperable and repair of the lift mechanism is required. Substantial work is also required to repair the rock weir on the diversion to improve the water intake to the canal.

The Bridge at Hazarjuft

The Hazarjuft Bridge suffered a fate similar to the Darweshan Diversion Dam during the unusually severe spring flood of 1991. A portion of the bridge on the right (Northwest) bank was washed away and the river changed its course somewhat westward necessitating either a build up of the right bank and a river diversion or extension of the bridge length.

Recently, now that the river is low, a simple earthen causeway has been put in place which connects the left bank to the remaining part of the bridge. This is only a temporary repair which will wash out when the river flow increases.

Political Situation

Power and control change quickly in the middle Helmand, like elsewhere in Afghanistan. Fortunately, this state of flux rarely affects field-level interventions, except for example, when fighting breaks out in an area of direct active intervention. This rarely occurs in the middle Helmand valley and there is often advance warning to permit non-contesting individuals and organizations to withdrawal. In each district of the middle Helmand valley, there is a court comprised of mullahs representing all the major commanders of the district. The court is the highest authority in the districts and seems to be working effectively to maintain order and security under the circumstances.

The political situation changed a number of times in the course of the assessment. This period was marked by the gradual extension of control over the region by Mullah Mohd. Rasool Akhonzada of the Harakat Inqilab Islami Afghanistan Party. By early July 1991, he had established complete and uncontested (for the moment) control of the middle Helmand, all the way to the Pakistan border near Girdi Jungle Refugee Camp. This was accomplished with remarkably little fighting. In fact, there was a brief skirmish only with Commander Hafizullah Khan (Hizbe-Islami) of Sistani in Nadi-Ali. The general focus of this drive on the part of Mullah Rasool has been the elimination of commanders associated with the Hizbe-Islami party and the reduction of this party's influence in southwest Afghanistan. All non-cooperating commanders associated with Hizbe-Islami have fled to Pakistan leaving the area in a much more stable and peaceful condition than at any time since the start of the war. Local commanders from a variety of political parties continue to have authority over their respective areas, although Mullah Rasool has set up representative posts at strategic locations in middle Helmand and has appointed one representative to serve on each district court.

In the assessment areas, the major political leaders (commanders) and their party affiliations are as follows:

<u>District</u>	<u>Commander</u>	<u>Party</u>
Nadi-Ali/Marja:	Farahi	Harakat
	Gul Mohd.	Itehad
	Mullah Qader	Harakat
	Mawin Alladad	Itehad
	Sadiqi	Harakat
Nawa Barakzai	Gul Ahmed Akhundi	Jamiat
	Malang Khan	Harakat
	Malim Shawali	Itehad
	Mullah Sharif	Hizbe-Islami
Garmser	Abdullah Jan	Harakat
	Akhundi	Hizbe-Islami
	Wakil Mohd. Omar	Nijat

The MCI Survey Team undertook six separate surveys, five of them in Afghanistan, for this study. There were no security incidents and no close calls to report. The team proceeded from the south making the appropriate preparatory contacts with district courts as well as village elders. In every case they received written attestations to the willingness of the courts and village leaders to cooperate with the survey and with any field implementation activities that MCI decides to conduct in the middle Helmand Valley. The survey team was made to feel very welcome and their movements and work were facilitated by the local authorities. When an implementation plan is finalized for work in this area, MCI will make work agreements with the

district courts and sub-agreements with individual village leaders to ensure the security of staff and integrity of programs.

Poppy Production

Unfortunately, the extent of poppy production in the middle Helmand Valley was perhaps the most difficult aspect of this survey to accurately assess. None of the farmers surveyed responded that they were cultivating poppies either at the present time, or in the past. This may very well have been the case, since all indications are that poppy cultivation in the middle Helmand Valley is indeed very limited, probably cultivated by less than 1% of farmers. The survey teams' comments about poppy cultivation during debriefing with three MCI senior staff (Salam Jan, Myron Jespersen, Matthijs Toot) and the consultant all corroborated. During the visit of the consultant to Quetta in June, he discussed poppy production independently with each MCI Helmand Valley Survey Team member. Once again their statements were very similar. In addition, MCI senior staff member Salam Jan made a trip to the middle Helmand Valley from May 4 - 20, 1991 during which, among other responsibilities, he surveyed the poppy production situation. Due to the sensitive nature of this issue, it is very difficult to say with certainty the level of poppy cultivation, without an extensive site visit by one or more third country nationals.

It is clear that poppy production increases as one moves further north in the Helmand Valley. In the areas of Bagut, Benader, Safar, Laki there is almost certainly no poppy production. Further north in Darweshan, Marja, and Nawa there is limited poppy production, with Nadi-Ali apparently having the most in the area surveyed. Everyone involved who made trips to Helmand stated that even where there was poppy cultivation, it was quite limited because none of the middle Helmand valley farmers have traditionally raised poppies and, not being experienced, most farmers who did choose to cultivate poppies did so in a risk adverse fashion, cultivating poppies only as a marginal crop.

An important factor which was noted is that where poppies were cultivated, farmers remarked that they did not require as extensive irrigation as most other agricultural crops. And, since water is *the most limiting agricultural constraint in the Helmand Valley*, farmers may very well choose to increase poppy cultivation in the coming years because it may carry less risk than other crops which rely more heavily on frequent irrigation; unless of course the irrigation system is brought back into reliable service.

Population and Agriculture

The 1990 UNIDATA population estimates for Nadi-Ali, Garmser and Nawae-Barakzae Districts of Helmand Province are among the lowest for Afghanistan, especially Nawae-Barakzae and Garmser. However, as may be seen in Figure 1, pre-war house occupation rates for all three districts in 1991 are all 75% or higher. In fact these figures are not contradictory to the UNIDATA population estimate, rather they tend to emphasize the unique demographics of the Afghan war and refugee problem. Debriefings of our Survey Team members revealed that in many cases occupied houses have far fewer family members living permanently in the middle Helmand Valley than before. Occupation may in some areas be seasonally high, for example, during planting and harvesting, as family members return from camps to help relieve the pressing labor constraints faced by resident farmers.

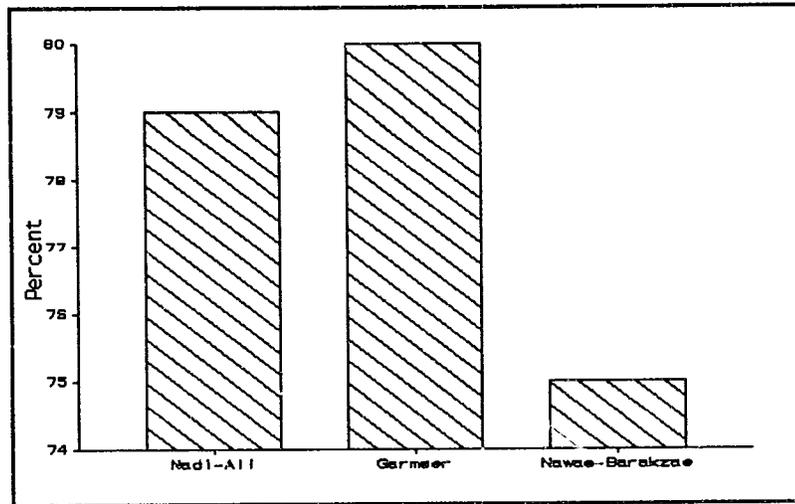


Figure 1. Percent of pre-war houses occupied by district in 1991.

Figure 2 shows that a high percentage of farmers in Garmser and Nawae-Barakzae have families in refugee camps, particularly in Pakistan. Less than 1/3 of Nadi-Ali's families on the other hand, have relatives in refugee camps. This likely speaks to the greater relative security of this region, its more dependable supply of water for irrigation, and the wider availability of goods and services found in Nadi-Ali.

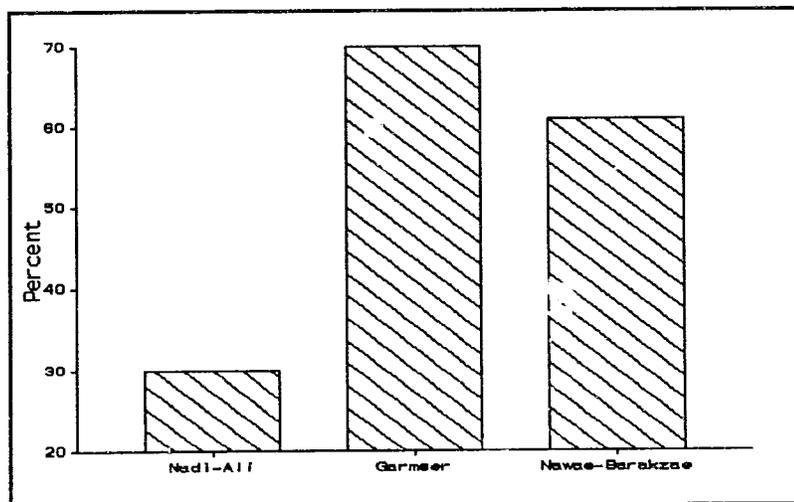


Figure 2. Percentage of farmers with families in refugee camps by district.

Although this survey interviewed farmers, not all of those who consider themselves to be farmers are indeed active farmers. For the purposes of this study, active farmers were defined as those who in 1990 cultivated crops or herded livestock in one of the three districts surveyed. Figure 3 shows the percentages of farmers who are active by district. More than 80% of farmers living permanently in the middle Helmand Valley are active. However, as can be expected, the percentage of active farmers is considerably lower in refugee camps. Garmser has the greatest percentage of farmers who are not active among both its refugee camp and Helmand Valley residents. Figure 7 below, shows one possible explanation. The principal source of income for Garmser residents is not agriculture-related as in Nadi-Ali and to a lesser extent Nawae-Barakzae, but is derived from a combination of refugee camp aid, food for work programs and aid from commanders.

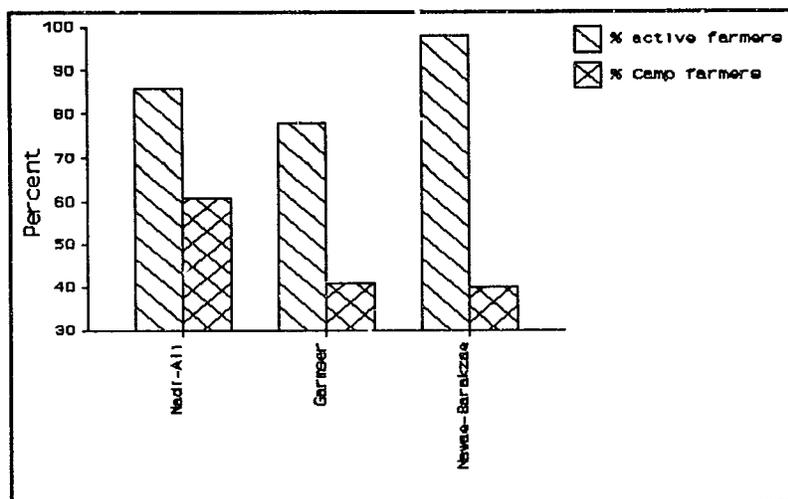


Figure 3. Percent of farmers and refugee camp residents interviewed who are active farmers.

Figure 4 shows the percentage of land area cultivated in 1991 as compared to just before the war. Nadi-Ali, and to a lesser extent Garmser is striking when compared to Nawae-Barakzae, where only about 2/3 of the prewar acreage is currently cultivated. This may speak to the greater security risk that Nawae-Barakzae has in its proximity to government held land. In addition, until this year, the Shamalan Canal has proved to be less reliable as a supplier of irrigation water than the Boghra or the Darveshan Canals have.

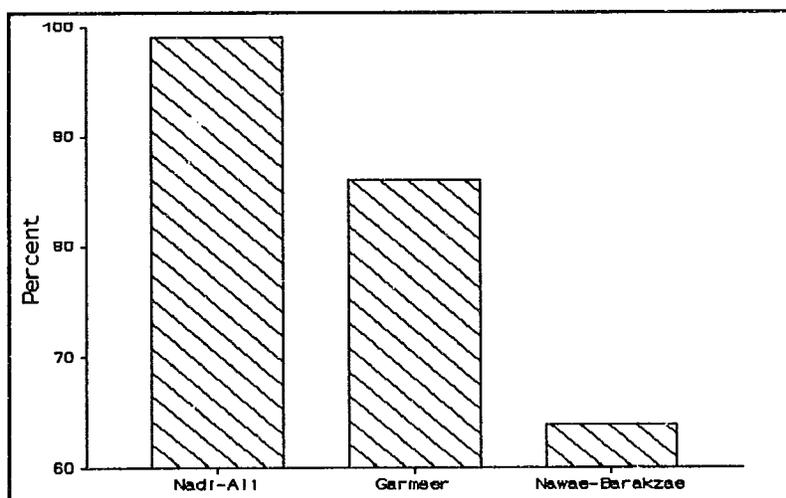


Figure 4. Percent of pre-war land area cultivated in 1991.

Figure 5 shows average farm size for each district at the present time. Compared to 1975 figures, it appears that fewer farmers are attempting to farm considerably more land in Garmser (42.5 cultivated jeribs³), and about the same in Nadi-Ali (30 jeribs) and Nawae-Barakzae (22.5).

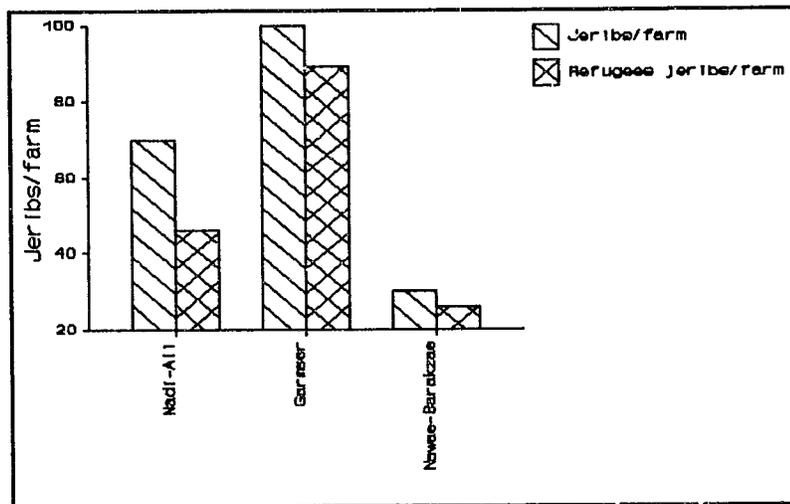


Figure 5. Average jeribs/farm by District. Sample size: 167 active farmers in Nadi-Ali, 53 active farmers in Garmser, and 40 active farmers in Nawae-Barakzae. Refugee camp sample size: 37 active farmers from Nadi-ali, 11 from Garmser, and 8 from Nawae-Barakzae.

Figure 6 shows the remarkable diversity shown by Garmser farmers, especially when compared to Nawae-Barakzae farmers. This may be due to greater pre-war diversity or because of the close proximity of Garmser farms to major Pakistan refugee camps and the demand for diverse agricultural goods, although many of the less-grown commodities were grown in small quantities.

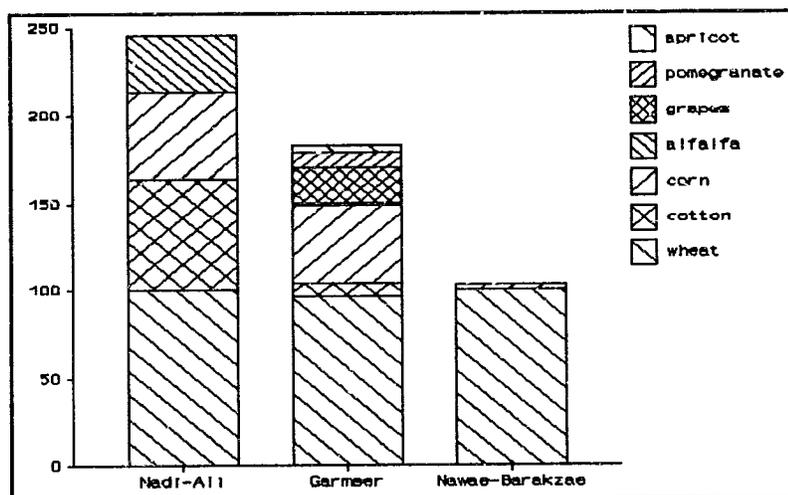


Figure 6. Crops grown by farmers in percent. In addition, 2% of Garmser farmers grow cumin, mung beans, beans, sesame, almonds and apples.

³ One jerib is approximately 0.5 acre and 0.2 hectare.

The principal source of income is shown in Figure 7. Nadi-Ali, with the greatest number of active farmers has the highest percentage of agriculture-related income. This figure is more than five times that of Garmser and nearly twice Nawae-Barakzae.

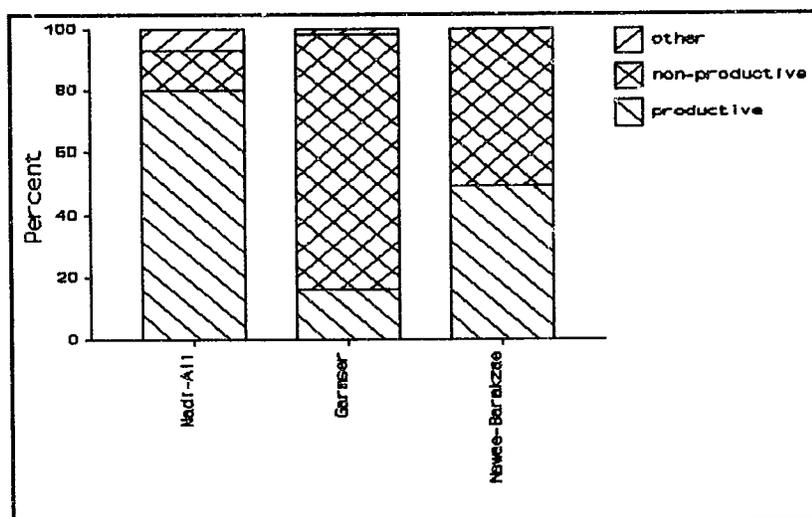


Figure 7. Primary source of remittance by district. "Productive" is agricultural-related, "non-productive" is aid from camps, commanders and food-for-work, "other" is work in Pakistan or Iran.

Farm Power

Farm power continues to be an important constraint in the middle Helmand Valley. Although generally not listed as the most important constraint by farmers, it is almost invariably a leading secondary or tertiary constraint to increased agricultural production. Of those villages with oxen teams or tractors present, the number of households per oxen or tractor is very high. Significant numbers of villages are without tractors, oxen or both. Figure 8 gives these values by district.

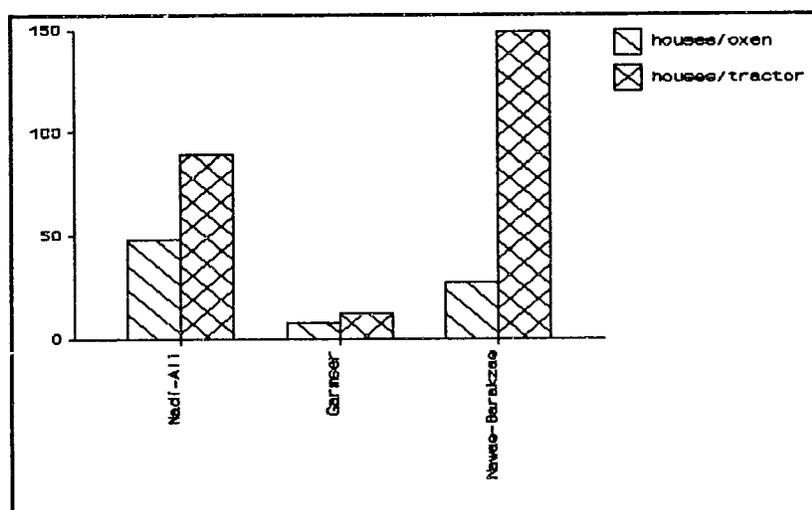


Figure 8. Households per oxen team and tractor by districts. Note that in Nadi-Ali, 36% of 28 villages sampled had no oxen and 9% had no tractor. In Garmser, 29% of 28 villages sampled had no oxen and 18% had no tractors. In Nawae-Barakzae, 44% of 9 villages sampled had no oxen, but all villages had at least one operational tractor.

Figure 9 shows that oxen and tractor use by farmers in Helmand is by no means universal. In addition, the extent of use is very limited except for those who actually own the oxen or tractor involved.

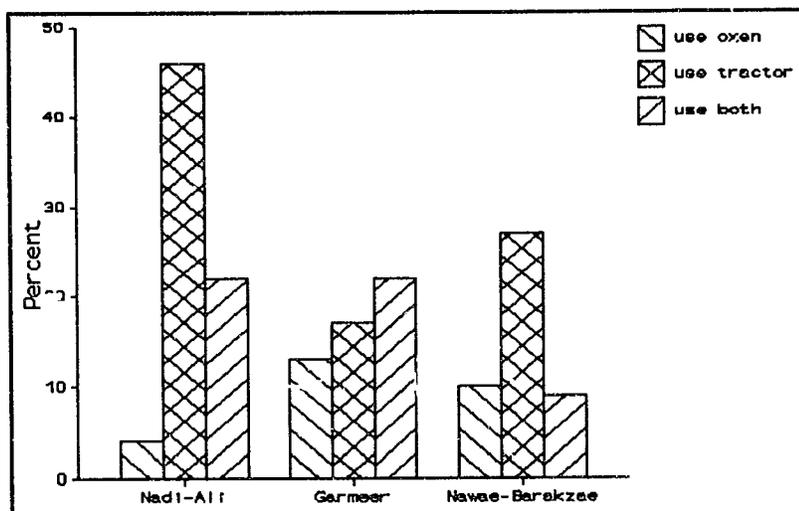


Figure 9. Farm Power use by district. Twenty eight villages were sampled in Nadi-ali and Garmser and nine villages were sampled in Nawae-Barakzae.

Figure 10 compares rental costs between districts. Tractor rental costs are quite similar, but oxen rental costs vary considerably between districts, reflecting supply and demand at the various locales.

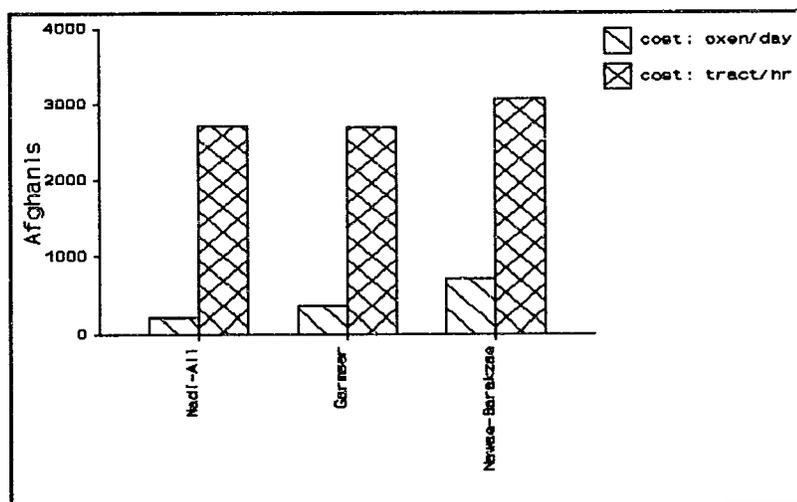


Figure 10. Average cost of oxen and tractor rental by district. Twenty-eight villages were sampled in Nadi-ali and Garmser and nine villages were sampled in Nawae-Barakzae.

The Spring Flood of 1991

A combination of heavy winter snows and excessive rains caused the waters of the Helmand River to rise considerably higher than what is normal for the high-water period of late winter and early spring. Reports reached Quetta of mass destruction in some areas. The MCI Survey Team performed a rapid Flood Damage Assessment Survey and verified that in specific locales, the flood damage had been severe. In particular, the Darweshan Diversion Dam and

Hazarjuft Bridge which are discussed elsewhere in this report, require major attention to prevent destruction of the Darweshan irrigation system and to allow trade with the Marja and Nadi-ali areas.

As could be expected, areas along the banks of the river suffered most from the flooding. Nadi-Ali was hardly effected, whereas in certain areas of Garmser and Nawae-Barakzae, entire villages were destroyed. Figure 11 shows the percentages of houses destroyed in the villages surveyed.

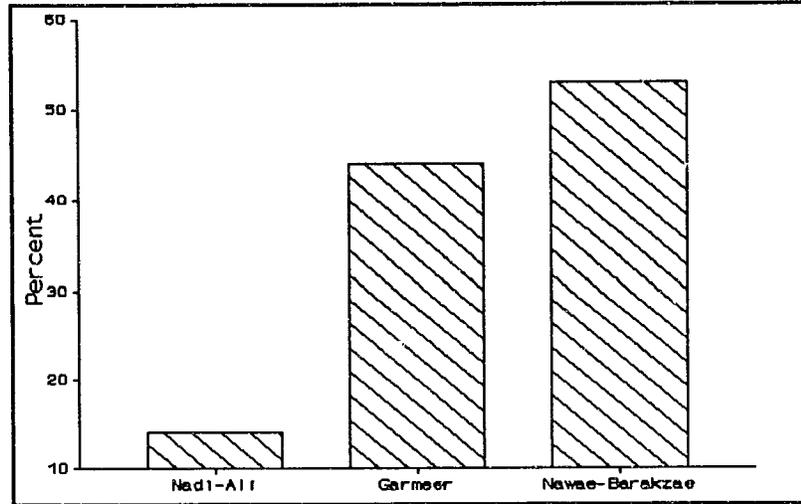


Figure 11. Percent of houses destroyed by 1991 spring floods and verified by MCI Survey Team. Twenty-eight villages in Garmser and Nadi-Ali and nine villages in Nawae-Barakzae were surveyed.

Figure 12 shows the flood damage to fields. Damage in some cases meant that actual land was lost and in others, the field was inundated with water and the winter wheat crop was lost or damaged.

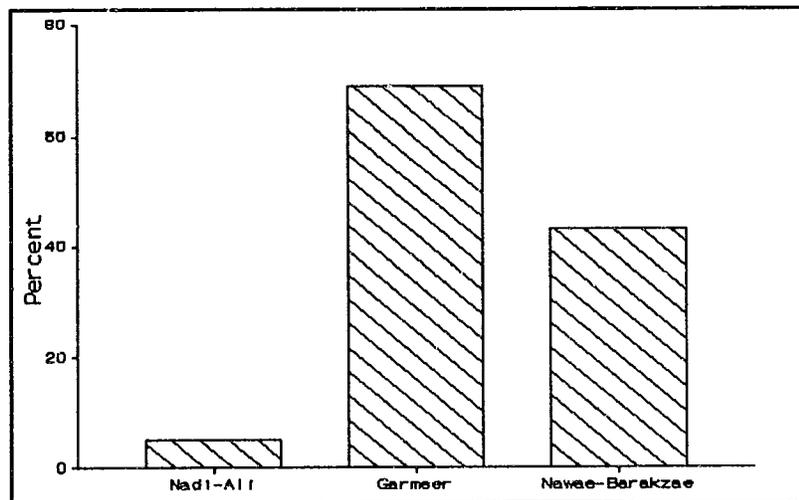


Figure 12. Percent of jeribs damaged by district in 1991 spring floods. Parentheses indicate number of villages surveyed per district.

FINDINGS BY DISTRICT

Nadi-Ali District

Farmers Living in Nadi-Ali

Farmer Profile⁴

- Farm Type: ● Nearly all are mixed farmers (86%), 13% cultivate only, whereas only 2% have livestock only.
● 98% own land and do not rent land or sharecrop.
- Crops: ● Active farmers (98% grew crops last year and 86% say they will plant in 1991).
● Only four crops are grown: everyone grows wheat, 2/3 grow cotton, about 1/2 grow corn, and 1/3 grow alfalfa.
● Crops grown by less than 10% of Nadi-Ali farmers surveyed include grapes and melon.
- Wheat ● Average wheat production: 26 jeribs (per farmer per year). Approximately 1 bag of white fertilizer⁵ was used per 1.5 jeribs (1% use none) and 1 bag of gray fertilizer⁶ is used per 5 jeribs of wheat (10% use none).
- Corn ● Average corn production: 28 jeribs. Fertilizer if used (10% of farmers), is applied at the rate of 1 bag of white fertilizer per 4 jeribs (60% use none) and 1 bag of gray fertilizer is use per 6 jeribs (88% use none).
- Cotton ● Average cotton production: 26 jeribs. Less than half of farmers use fertilizer on cotton. For those who fertilize, 1 bag of white fertilizer is used per 4.5 jeribs (56% use none) and 1 bag of gray fertilizer is used per 12 jeribs (75% use none).
- Alfalfa ● Average alfalfa cultivation: 26 jeribs. Fertilizer is used by about half of farmers who are growing alfalfa. For those who use fertilizer, 1 bag of white and 1 bag of gray fertilizer is used on 12 jeribs (40% do not use white and 48% do not use gray).

⁴ 170 farmers surveyed in 31 villages.

⁵ Urea

⁶ Phosphate fertilizer, usually di-ammonium phosphate (DAP).

- Irrigation:**
- 100% of Nadi-Ali farmers attempt irrigation for wheat cultivation, 60% for corn, 75% for cotton and 88% for alfalfa.
 - Salinity in irrigated lands is prevalent with half of the farmers interviewed (54%) reporting the presence of salt in their fields. Of those reporting salinity, most said they have had the problem for about 10 years, with one respondent reporting that salinity has been present for 44 years or since construction of the irrigation system. However no farmer reported this as one of the top three constraints. The reason may be that the effects of salinity on crop yields is gradual and farmers don't tend to notice until there is a significant reduction in yields. More important, perhaps is that there are at the present time other more pressing constraints such as water for irrigation, farm power, and fertilizer.

In Blocks 2C, 3C, and 6F in Marja, our team noted during implementation of the Focused Survey that several farmers have begun irrigating from water that is standing in plugged drains, and salinity is on the rise. However, once irrigation canals and drains are cleaned, this practice will be abandoned. Farmers using this technique noted that grapes and orchards fare better under the increased salinity conditions present when drain water is used for irrigation purposes.

- Livestock:**
- Livestock raising is more important among farmers in Nadi-ali than in either Garmser or Nawae-Barakzae. Fully 86% of Nadi-Ali farmers are mixed farmers profitably combining livestock raising activities with crop farming. Of those farmers who own livestock,
 - 78% own cattle
 - 61% own sheep
 - 49% own goats
 - 41% own donkeys
 - 8% own camels
 - 8% own horses

Crop

- By-products:**
- Approximately 60% of farmers feed forage and crop by-products to their livestock. Roughage in the form of straw is fed by 56% of farmers, whereas crop by products higher in protein are fed in the following frequency: alfalfa (60%), cottonseed cake (28%) and clover (22%). Less than 10% of Nadi-ali farmers feed their livestock corn or barley by-products.

Refugee

Status:

- 30% have family in camps, none of which have returned to permanently reside in Nadi-Ali during the past year. Only about 25% of families return from camps one or more times per year (average. 1.5 times/year). When they do return, they stay for 1-3 months, assisting in agriculture.

Income:

- The single most important source of income for farmers in Nadi-Ali District is from livestock sales (53%), with crop sales reported as the second single most important source of income (15%). Food- and cash-for-work was reported as the third single most important source of income (11%). Other less important sources of income included aid from commanders, transport, trading, relatives working in Iran and Pakistan and tractor rentals.

Constraints:

- The overwhelming constraint of primary importance by Nadi-Ali farmers is lack of water for crop irrigation (92%). Important constraints of secondary and tertiary importance are lack of farm power, especially tractors (54%) and fertilizer (36%). War was listed as an important constraint by less than 1% of the respondents.

Farmers from Nadi-Ali Living in Refugee Camps

Refugee Profile⁷

Farm Type:

- Fewer refugees are active farmers⁸ than in Nadi-Ali (61% versus 86%). Virtually all farmers from Nadi-ali in Pakistan refugee camps are mixed farmers having crops and livestock.

Crops:

- Crops raised by refugees residing in Pakistan refugee camps tend to be similar to their colleagues in Nadi-Ali. Of those who do farm, wheat is cultivated by everyone (100%), cotton by 46%, alfalfa and melon by 32%. Crops cultivated by less than 10% of active refugee camp farmers include grape, pomegranate, and apricot.

Wheat

- The average refugee from Nadi-ali planted 8 jeribs of wheat last year. Fertilizer use was considerably heavier than reported by those farmers

⁷ A total of 61 refugees in Pakistan camps from 19 villages in Nadi-ali were interviewed.

⁸ Refugee farmers continue to be active by sending some family members back to their home district in Afghanistan to plant, tend and harvest their crops before returning to join the rest of the family in the refugee camps.

residing in Nadi-Ali, with 1.25 bags of white fertilizer used per jerib (22% used none) and 1 bag of gray fertilizer used per 1.2 jeribs (24% use none).

Cotton ● The average refugee from Nadi-ali planted 20 jeribs of cotton, although only 18% use white fertilizer and 12% used gray fertilizer. For those who do fertilize, 1 bag of white fertilizer per 3 jeribs and 1 bag of gray fertilizer per 3.5 jeribs is used.

Alfalfa ● Those farmers who grew alfalfa, had 3 jeribs under cultivation last year. Only 17% of those farming alfalfa use fertilizer at the rate of 1 bag of white and 1 bag of gray per jerib.

Melon ● An average of 16 jeribs of melon was planted and once again, fertilizer use was very limited with only 24% of melon farmers using fertilizer. 1 bag per 1.5 jeribs of white fertilizer is used and 1 bag per 8 jeribs of gray fertilizer is used.

Irrigation: ● Irrigation was used by virtually all farmers in all crops (>92% for wheat, cotton, alfalfa, and melon). Most of the irrigation canals used have not been cleaned since 1978 or 1979 and visible soil salinity is reported to be present by 64% of farmers, although once again it was not listed as one of the three most important constraints. There were no mines reported in the irrigation canals used.

Livestock: ● Livestock distribution among refugee camp inhabitants was significantly less than their colleagues residing in Nadi-Ali, as only about 1/3 of refugees from Nadi-Ali district are mixed farmers.

- 8% own cattle
- 12% own sheep
- 26% own goats
- 2% own donkeys

Crop

By-products: ● Crop by-products likely reflect availability in and around camps. Straw is rarely fed (5%), alfalfa is fed by 92% of farmers, clover 64%, corn 46%, and barley by 26% of farmers. Cottonseed and oil cake are not fed by Nadi-Ali farmers in refugee camps.

Refugee

Status:

- Of the 288 farmers interviewed in refugee camps, 31% were from Nadi-Ali District. The average size of Nadi-ali families in Pakistan refugee camps is 15 individuals (family size ranges from 3-40). Of these, on average 13 (84%) reside in camps with 3 (17%) residing on farms in Helmand. Only 25% of those interviewed from Nadi-Ali had family members permanently there. Of

those who had family members there however, nearly 40% of the family were permanently in Nadi-Ali. Most families return to Nadi-Ali one or more times per year (average twice) staying for a period of 3 months.

Reasons for Not

Returning: ● Crop inputs (42%) and war (40%) were the major reasons stated by refugees for not returning permanently to Nadi-Ali, although it should be noted that among those farmers permanently in Nadi-Ali, less than 1% of farmers in Nadi-Ali listed security or war as one of three principal constraints. Other reasons of lesser importance were lack of fertilizer, farm power, seed and housing.

Constraints: ● Constraints to farming in Nadi-Ali as reported by refugee camp inhabitants from there were irrigation-related problems (44%) and war (33%). Other constraints of lesser weight are similar to refugees reasons for not returning to Nadi-Ali: lack of fertilizer, seeds and farm power.

Farm Power

- Farm power is an important constraint to normalization of agricultural production in Nadi-Ali. Specifically, lack of tractors was listed more than half of the time by farmers as the second most important constraint to increased agriculture in Nadi-Ali. Animal traction is also important, although tractors are definitely more desirable because they are faster and can be easily rented out providing an additional source of income.
- In 1990 there was an average of 48 households per oxen team in 7 villages that had one or more teams. Fully 36% of the villages surveyed did not have oxen. This is a sharp decrease in available oxen from a rate of 21 households per oxen team in villages that had oxen in 1989. Only 4% of Nadi-Ali households were using oxen as a means of animal traction in 1991. Oxen rental data was very difficult to obtain in Nadi-Ali. The survey had only one respondent reporting oxen rental during 1990. The daily fee was 200 Afs.
- At the same time, in villages where tractors were operational, there were 90 households per tractor. Nine percent of the villages surveyed do not have an operational tractor. This figure remains unchanged from the rate in 1989. The percentage of households which reported that they were using tractors in 1991 in Nadi-Ali was 46%. Several farmers reported that income from tractor rental was a significant secondary and tertiary income earner. The mean price for tractor rental in Nadi-Ali is 2,716 Afs/hour.

Trader Security

- One half of the traders interviewed in Nadi-Ali villages indicated that security was a problem and two reported that they had goods stolen. One theft was in 1989 and one in 1990. Goods stolen included sugar, sweets, petrol and cloth.

Markets and Bazaars

- Goods supplied to traders and shop keepers interviewed at 10 Nadi-Ali markets include:

● animal feed	4 markets
● cement	1 market
● cloth	10 markets
● farm tools	10 markets
● gray fertilizer	5 markets
● house constr. material	4 markets
● household items	8 markets
● medicines	7 markets
● petrol/diesel fuel	8 markets
● seed grain	9 markets
● shovels, hoes	8 markets
● tractor spares	5 markets
● veterinary supplies	4 markets
● white fertilizer	10 markets

- The single most important constraint to increased trading and marketing listed by traders in Nadi-Ali was the Pakistan government. Border crossing has always been difficult, but recently it has been increasingly so. Frequently, goods are held up at various border crossings and informal fees or bribes are levied, particularly by the Pakistan Militia. The second most important constraint is the Afghan government and related security problems. The third most significant problem is thieves. Lack of transport and poor roads account for lesser constraints.

Garmser District

Farmers Living in Garmser

Farmer Profile⁹

Farm Type: ● Garmser farmers are primarily cultivators and mixed farmers with 50% of those surveyed being crop farmers only and 3% having livestock only. Mixed farmers account for 28% of those actively engaged in agriculture (78% of those surveyed). Virtually all resident Garmser farmers own some land (96%) but a significant number (23%) rent land. The occasional Garmser farmer participates in sharecropping activities either by sharing another's land or his own (5% for each activity).

Crops: ● Virtually all farmers actively growing crops in Garmser, cultivate wheat (96%), 45% grow corn, and 19% grow grapes. Garmser farmers are the most diverse farmers of the three districts concentrated on in this survey, although this relative variety accounts for only a small percentage of total Garmser cropping activities. Pomegranates are grown by 9%, cotton by 7.5%, and apricots by 4% of Garmser farmers. Alfalfa, cumin, mung beans, beans, sesame, almonds and apples are all grown by approximately 2% of Garmser farmers. This likely points to a high degree of pre-war crop variability with Garmser's relative access to export markets to the south. In addition, much of the Garmser area surveyed has traditional irrigation systems as compared to the modern irrigation systems in Nadi-ali and Nawae-Barakzae Districts to the north of Garmser.

Wheat ● Active Garmser farmers grow from 3-700 jeribs of wheat, with an average of 92 jeribs. 25% of Garmser farmers grow more than 100 jeribs of wheat. Fertilizer is used by most farmers; 96% use white fertilizer (1 bag per 3 jeribs) and 76% use fertilizer gray (1 bag per 9 jeribs).

Grapes ● When cultivated by active Garmser farmers, an average of 4 jeribs of grapes are tended. Fertilizer is applied sparingly and used by only 20% of farmers. White fertilizer is applied at the rate of 1 bag per 2 jeribs) and only 1 bag of gray fertilizer is used per 4 jeribs.

Corn ● Last year, Garmser farmers who grew corn planted an average of 19 jeribs. White fertilizer was applied at the rate of 1 bag per 10 jeribs and gray fertilizer was applied at the rate of 1 bag per 5 jeribs.

⁹ A total of 74 farmers in Garmser were interviewed from 25 villages.

Pomegranate ● Pomegranates, grown by nearly 10% of active Garmser farmers are tended at the average rate of 4 jeribs per farmer. White fertilizer is used by about 40% of farmers at the rate of 1 bag per 4 jeribs.

Irrigation: ● A combination of traditionally-developed and American project-based irrigation systems are present in Garmser. The modern irrigation systems extend about half of the length of the Garmser district area surveyed by this study (total approx. 100 km.). Virtually all farmers use irrigation for all crops grown (grapes, wheat, corn, cotton, alfalfa, pomegranate, cumin, mung beans, beans, almonds, apricots, and apples).

● Salt accumulation was reported by 85% of the respondents in Garmser. It has been present for a decade or less, with most individuals reporting it present for the past 6-9 years. The majority of this salt accumulation may be due to plugged drains.

● 7% of the respondents report that the irrigation canals are mined, which is the highest reported for among the three districts emphasized in this study.

● The intake of the major irrigation canal near the village of Khwaja Hassan Baba is in urgent need of repair. Due to high flood waters this year in the Helmand River, an area of land 200 m. long just below the intake of the canal has been washed out. This needs to be repaired if the entire Darweshan is to remain functional in the future.

Livestock: ● Livestock ownership is somewhat less than in Nadi-Ali and only 28% of Garmser farmers own animals. Of those who do keep livestock,

- 62% own cattle
- 43% own sheep
- 29% own goat
- 14% own camels
- 5% own donkeys
- 5% own horses

Crop

By-products: ● Crop by-products and forages are widely used to feed livestock. Roughage in the form of straw is fed by 85% of farmers. Other crop by-products used are corn (15%) and barley (3%). High quality forages are fed by the majority of farmers including alfalfa (74%), clover (55%), and cow peas (18%).

Refugee Status:

● Family members in refugee camps were reported by about 70% of Garmser farmers. Of those interviewed, 10% reported returning from camps to settle permanently in Garmser. About 70% of those with families in camps report

that they return one or more times a year (ave. twice) and stay for a 2-3 month period.

- Income:**
- Principal sources of income among Garmser residents appear to be the result of assistance rather than productive agricultural or other activities. Fully 80% report one or more forms of assistance as their principal means of income (66% aid from refugee camps and 33% food/money for work). This is in fact likely due to the close proximity of Garmser to Pakistan refugee camps as opposed to Nadi-Ali and Nawae-Barakzae.
 - Productive, agriculture related work is split fairly evenly between sale of crops, sale of livestock, tractor rentals, and trading activities. Work abroad (3%) was reported to be as important as any single agricultural activity (i.e. sale of crops or livestock).
- Constraints:**
- Irrigation problems were listed as the single biggest constraint by 51% of Garmser farmers. War at 20% and fertilizer at 15% were the two other primary constraints frequently specified. Important constraints of secondary and tertiary importance for Garmser farmers include lack of farm power, specifically tractors, lack of houses, and insect crop damage.

Farmers from Garmser Living in Refugee Camps

Refugee Profile¹⁰

- Farm Type:**
- Pakistan refugee camp residents from Garmser are currently less involved in agriculture (41%) than those from Nadi-Ali. Of those surveyed, 26% had livestock and 19% had mixed farms. Virtually all Garmser farmers in refugee camps own their own land and do not rent or sharecrop.
- Crops:**
- Of the refugees who are actively farming all grow wheat, 73% melon, 27% alfalfa, 18% cotton, and 9% tend grapes.
- Wheat**
- On average, wheat is planted on 74 jeribs. However when the two top producers (18% of the active farmer sample) are removed, the average land planted in wheat is 17 jeribs. Fertilizer is used sparingly by these farmers with an average of 1 bag of white fertilizer used per 5 jeribs and 1 bag of gray fertilizer per 15 jeribs.

¹⁰ A total of 27 refugees from 14 villages in Garmser District were interviewed in Pakistan refugee camps.

- Cotton ● Cotton is grown on an average of 7 jeribs with 1 bag of white fertilizer and 1 bag of gray fertilizer used per 7 jeribs.
- Alfalfa ● Alfalfa is grown on an average of 7 jeribs with 1 bag of white fertilizer used per 7 jeribs if used (only 33% use white fertilizer). Gray fertilizer is not used by Garmser farmers in refugee camps who grew alfalfa.
- Melon ● Melon was planted in an average of 15 acres by Garmser refugee camp farmers. For farmers who use white fertilizer, an average of 1 bag per 1.5 jeribs is used, although 50% of farmers do not use fertilizer. Nearly 2/3 of the farmers interviewed do not use gray fertilizer on melons. Those who do, use it at a rate of 1 bag per 3 jeribs.

Irrigation: ● All farmers from Garmser who were residing in Pakistan refugee camps surveyed irrigate all crops. A large percentage (85%) of refugee camp residents from Garmser mentioned that salt accumulation occurred in their fields. Salinity has been a chronic problem in Garmser; nearly half of the respondents reported that salinity problems had occurred over periods of time greater than 10 years, with 10% of respondents saying that salinity has been present for nearly 40 years.

Livestock: ● About 2/3 of Pakistan-based refugee camp residents who are active farmers from Garmser are livestock owners, most of which are mixed farmers. Of livestock owners from Garmser:

- 43% own cattle
- 57% own sheep
- 57% own goats
- 14% own donkeys
- 14% own horses

Refugee Status: ● Family size of Garmser refugees averages nearly 14 people, with 12 (86%) located in refugee camps. About 40% of families surveyed did not have any family in Helmand at the time of the survey (Dec. 1990). Approximately 60% of families had one or more family members in Garmser (2/3 of the families only had 1 family member in Garmser). Length of stay upon return varies from 2-4 months.

Reasons for Not Returning: ● The most important reasons farmers provided for not returning to Garmser were war and security (64%) and lack of an Islamic government (19%). Lack of crops, no income, and poverty were all cited by 4% of the respondents as the principal reason for not returning to Garmser.

- Constraints: ● Primary constraints to farming in Garmser were listed as water (56%) and war (25%). Other less important constraints listed were lack of fertilizer, tractors and good roads.

Farm Power

- Farm power is a constraint in Garmser, but nowhere near to the extent as in Nadi-Ali. Nearly 1/3 of Garmser farmers list lack of farm power as the second most important constraint, compared to over 50% for Nadi-Ali farmers.
- In 1990, there were 8 households per oxen team. This number is consistent with 1989 figures as reported by farmers in this survey. The number of households that are using oxen this year as a source of farm power is 13%. Farmers from 22% of Nadi-Ali households report that they will use both animal traction and farm power this year. Oxen rental costs average 361 Afs. per day in Garmser. There was marked price variability between several Garmser villages interviewed.
- Tractor use in Garmser, as in other Helmand districts is quite limited. There were 12 households per tractor in 1990, a 25% improvement over last year when there were 16 households per tractor. However, only 17% of the households use a tractor at the present time. Despite a greater number of tractors in Garmser than in Nadi-ali, rental costs are slightly higher averaging 3304 Afs./ hour, compared to about 2700 Afs./hour for Nadi-Ali.

Trader Security

- All shopkeepers and traders interviewed in 17 Garmser villages said that security was a problem in the district. More than 75% of them have experienced theft over the past two years. Items stolen included sugar, sweets, money, a motorcycle, tea, watches, food, bicycle tools, shovels and cloth.

Markets and Bazaars

- Availability of goods in the 17 Garmser markets surveyed leaves much to be desired.

● cement	1 market
● cloth	11 markets
● farm tools	11 markets
● gray fertilizer	2 markets
● household items	8 markets
● medicines	9 markets
● petrol/diesel fuel	4 markets
● shovels, hoes	10 markets
● sugar	1 market
● sweets	1 market
● tractor spares	4 markets
● white fertilizer	3 markets

Nawae-Barakzae District

Farmers Living in Nawae-Barakzae

Farmer profile¹¹

- Farm Type:** ● Farmers surveyed who are residing in Nawa are virtually all active (98%). Half of Nawa farmers are mixed farmers possessing livestock. Virtually all (98%) of Nawa's farmers own their own land, only 5% rent land from others. Sharecropping was not reported.
- Crops:** ● Nawa farmers practice a virtual mono-culture of wheat. Only 1 of the 40 farmers in Nawa surveyed (2.5%) grows another crop, in this case corn.
- Wheat** ● An average of 31 jeribs of wheat is planted by Nawa farmers. Nearly half of Nawa farmers do not use fertilizer. Among those that do, 1 bag of white fertilizer is used per 3 jeribs and 1 bag of gray fertilizer is used per 8 jeribs.
- Irrigation:** ● All crops in Nawa are currently irrigated. Salinity was noted by 88% of the Nawa respondents. It has been noted for approximately 5 years, with the earliest sightings not more than 10 years ago. As in the other districts surveyed, this may be due to non-functional drains. The most recent canal cleaning reported was in 1978 and 1979, with very limited cleaning reported in 1983.
- Livestock:** ● Livestock ownership in Nawa is distributed as follows:
- 94% own cattle
 - 61% own sheep
 - 33% own goats
- There were no reports of donkey, horse or camel ownership in Nawa.
- Refugee Status:** ● Nearly 2/3 (61% of Nawa farmers have family in refugee camps, 15% of which have returned to Nawa to live permanently. Those who return on a temporary basis, do so 1-2 times per year and stay in Nawa between 2-5 months.

¹¹ A total of 31 Nawa farmers were interviewed in 7 villages.

Income: ● Non-productive-related income, aid from refugee camps (21%) food/cash-for-work (18%) and aid from commanders (13%) are reported by a greater number of farmers as their primary sources of income than farm-based earned income (sale of crops 40% and sale of livestock 3%). Other less important sources of income are tractor rentals, trading and transport.

Constraints: ● Lack of water for irrigation (68%) and war (25%) are the two greatest constraints, as reported by Nawa farmers. Other primary constraints of less importance are fertilizer, roads and transport. Significant secondary and tertiary constraints are farm power (animal and tractor) and lack of housing.

Farmers from Nawa-Barakzae Living in Refugee Camps

Refugee Profile¹²

Farm type: ● Only about 40% of refugees in Pakistan camps from Nawa are active farmers at the present time. Nawa refugees in Pakistan camps tend to be more often livestock raisers (38%) than crop farmers (26%), although only 16% are mixed farmers. All Nawa farmers living in Pakistan refugee camps that were interviewed have their own land. None of them rent land or sharecrop.

Crops: ● Nawa refugees demonstrate more crop diversity than their counterparts who permanently reside in Nawa. All Nawa refugees grow wheat (100% of active farmers), 38% grow melons and 13% grow beans, sesame, or cotton.

Wheat ● An average of 15 jeribs of wheat are planted and 1 bag of white fertilizer is used per 3 jeribs (25% used none), with 1 bag of gray fertilizer used per 7 jeribs.

Melon ● Farmers from Nawa living in Pakistan refugee camps who grew melons planted 17 jeribs and used 1 bag of white fertilizer per 5 jeribs and 1 bag of gray fertilizer per 8 jeribs (33% did not use gray fertilizer).

Irrigation: ● All crops grown by Nawa refugees were irrigated. Salinity was reported by 83% of the Nawa refugees. Problems were seen as long term with more than half of the respondents reporting salinity visible in fields for 10 years or longer.

¹² A total of 41 refugees from 9 villages in Nawa were interviewed in Pakistan camps.

- Livestock**
- Livestock are important to Nawa refugees. In fact, more refugees keep livestock than participate in cropping activities. Of the Nawa farmers residing in Pakistan refugee camps,
 - 42% own cattle
 - 17% own sheep
 - 75% own goats
 - 17% own donkeys

- Refugee Status:**
- Family size of Nawa refugees averages 16, ranging from 6-45. As with other districts, nearly all family members are in camps (88%). Each family averages 1 person permanently in Nawa. Family members generally return to Helmand 1-2 times per year (9% of families do not return at all) and remain in Nawa for up to 6 months.

- Reasons for Not Returning:**
- Primary reasons for not staying permanently in Nawa are security (58%) and war (10%). Poverty and economic problems were cited by 13% of the respondents.

- Constraints:**
- The single most important primary constraints to improved agriculture reported by Nawa refugees is lack of water for irrigation (87%). War, lack of hand tools and seed were other primary constraints listed. Important secondary and tertiary constraints reported were fertilizer and tractors.

Farm power

- Farm power is severely limited in Nawa as it is in other districts. As in Garmser, farm power is listed as the second most important constraint to increased agricultural production by about 25% of Nawa farmers.
- Survey respondents reported that in Nawa there was an average of 27 households per oxen team in villages that have oxen. Fully 44% of the 9 villages interviewed did not have oxen. 10% percent of households interviewed in Nawa are using oxen this year. Nearly 9% percent will use both oxen and tractors. Once again, oxen rental rates are quite variable, probably due to the effects of market forces on a limited supply. The average daily rental rate for a team of oxen in Nawa is 712 Afs. which is more than double the rates for Nadi-Ali and Garmser.
- There were nearly 150 households per tractor in the nine Nawa villages surveyed. All villages had at least one tractor which was operational. These figures remain unchanged since 1989. Nearly 27% of households surveyed will use tractors this year. The average tractor rental rate for Nawa is 3067 Afs/hour.

Trader Security

- All nine traders and shopkeepers surveyed in 7 villages in Nawa said that security was a problem. Two-thirds of this group have had things stolen since 1986, while nearly half of the shopkeepers and traders reported having had goods stolen prior to 1886. Items which were stolen included sugar, money, house construction materials, tractors, tea, soap, and cloth.

Markets and Bazaars

- As in the other districts, goods are rather scarce in the bazaars of Nawa. Basic provisions are available in most places, but risk of transport and heavy informal and formal fees imposed at the Pakistan/Afghanistan border and lack of long term security hinder expanded trade in Helmand Valley.

- Availability of goods in the 9 Garmser markets surveyed leaves much to be desired.

● animal feed	1 market
● cloth	2 markets
● farm tools	1 market
● gray fertilizer	4 markets
● house constr. material	1 market
● household items	2 markets
● medicines	7 markets
● petrol/diesel fuel	6 markets
● seed grain	1 market
● shovels, hoes	4 markets
● tractor spares	7 markets
● white fertilizer	2 markets

RECOMMENDED INTERVENTIONS

Areas Where Timely Intervention is Imperative

Obviously, the situation in the Helmand Valley is at a critical point. There are several places that require immediate attention to prevent the entire system from collapsing and risk losing the huge investment made over a 35 year period.

The three most critical areas needing attention are the Darweshan Canal Diversion Dam, the Boghra Canal Diversion Dam and the Hazarjuft Bridge. These three sites are absolutely critical to the economic recovery of the entire region. Without their repair, another mass exodus to refugee camps in Pakistan and Iran will be difficult to prevent, since all major canal systems in the entire middle Helmand Valley will essentially be inoperable. The 1990 UNIDATA population estimates total populations of roughly 50,000 people from each of the three districts. Nadi-Ali district has nearly 2/3 of its population presently at home and 1/3 in refugee camps, primarily in Pakistan. Nawae-Barakzae has only 1/3 of its population at home and 2/3 in camps. Garmser has 20% or less of its population at home. Our survey data agrees with the trends published by UNIDATA.

Repair of each of these structures will require a coordinated, concerted effort between several organizations. Through its good contacts and respected work, MCI is in a good position to coordinate these arrangements between the various parties involved and provide for efficient logistical management. The specific contacts made through the implementation of six separate surveys in the current study will prove to be invaluable in arranging effective field-level operations and ensuring that the overall goals of any effort are met. However, the scale of the work involved is quite large, especially if labor-intensive approaches are used. This will most likely require the collaboration of several agencies and NGOs. To date, MCI has held informal discussions with other NGOs working in the area such as INDOORS, HAFO, and DAI as well as VITA and DACAAR who are not now working in the area, but may be willing to provide engineering expertise. Discussions have also been held with WFP, UNDP, UNHCR and UNOCA regarding their interest to develop a comprehensive reconstruction program in the region.

In addition to the areas which need critical attention outlined above, there are several specific areas of the middle Helmand Valley, in which activities that MCI is experienced at implementing could make a beneficial impact over a short period of time.

Areas of Suggested Field-level Interventions

MCI has experience in successfully implementing a wide range of labor-intensive, low-technology interventions which have significant impact on health and agriculture productivity. By maintaining consistency of implementation, MCI has become one of the more respected cross-border NGOs working in Pakistan today. Its ability to respond rapidly to changing situations, effectively meeting critical needs of the people residing in target areas has resulted in strong support for the organization by Afghan peasants in particular, as well as controlling commanders and village elders.

Aside from the major critical needs discussed above, if refugees are to be encouraged to leave camps in Pakistan and elsewhere, and if long-term economic agricultural viability is to return to the middle Helmand Valley, a few well-directed interventions are necessary. These include the kinds of assistance which are part of MCI's regular program of agriculture rehabilitation such as:

- Assisting farmers in repair and cleaning of all primary and some secondary irrigation canals and drains,
- Provision of quality seed wheat, fertilizer and other crop inputs such as safe, but effective pesticides and fungicides,
- Traction demonstration and assistance programs,
- Orchard and vineyard rehabilitation programs,
- Animal health assistance programs.

MCI has learned that the most effective way to provide consistent, priority interventions to any locale is to establish a small operational center. These centers, staffed with permanent MCI employees, provide a constant bi-directional conduit of communication between farmers and the MCI headquarters in Quetta, that have proved to be invaluable in MCI's field-level assistance programs. The center staff become keenly aware of the evolution of important constraints faced by local farmers and they are better able to judge how MCI's programs and policies are effective in restoring agricultural productivity. Furthermore, with a long-term local presence, MCI is seen as serious in its efforts to assist local farmers in rebuilding their former productive lives. This of course makes further contributions to the effectiveness of MCI's programs.

The assessment process has identified three sites which MCI should consider for establishing regional agriculture centers. These sites were picked as a result of analysis of the data collected from the six surveys implemented in this study, an assessment of security of the areas, need of local inhabitants, potential for rapid return to economic productivity, access to bazaars and local transport, extent of poppy cultivation (areas of greater poppy cultivation were avoided), the

receptiveness of local leaders and farmers to the MCI Helmand Valley Survey Team, and the "goodness of fit" between MCI's experience and the needs of local farmers.

Benader and Safar

Benader and Safar areas in the southern part of the Valley are areas of traditional irrigation systems which were built after the modern projects were completed. In fact, the water for the Benader and Safar canals is drawn from the terminus of the Darweshan canal, which was built with American funding. These low-input systems are quite efficient and the people of the Benader-Safar areas have, in the past, shown great resourcefulness in the development and maintenance of their irrigation systems. However, since the war and the resulting exodus of people from these areas, the irrigation system has fallen into a general state of disrepair. Canals are plugged with silt, some of the gate systems are inoperable and inefficient, and drains have become silted and now have considerable woody vegetative growth making cleaning a truly laborious process.

Respondents surveyed on-site in Benader and Safar and those from the area in refugee camps stated that a significant problem was lack of labor to clean the canals and drains and put the gates in working order. Refugee camp residents say they would be very willing to return to Benader and Safar, but lack improved seed, fertilizer, basic farm implements and capital to return to farming in an economic fashion. MCI, through cash/commodity-for-work programs could assist these people in resettlement and cleaning their canals and provide seed and fertilizer in time for winter crop planting. The first year, efforts should be directed toward crops with rapid and productive payback such as wheat, cotton, and perhaps black cumin. One way in which this may be organized is through the establishment of indigenous NGOs for which MCI could be an umbrella and support organization.

In future years, extension activities should be increased and orchards, vineyards, and fruit crops could be re-introduced to provide economic diversity to the region. Livestock raising continues to be an important secondary activity making significant contributions to family income. The practical nature of MCI's recent activities in animal health may lend themselves to application here, where a minimal amount of cost-effective disease control and production extension could result in a significant boost in family income. In addition, the survey data collected for this report demonstrated that even in these difficult times, the inhabitants of the Garmser District have maintained more crop diversity than their counterparts in Nadi-Ali, Marja, Nawa and Shamalan to the north. Finally, Benader-Safar is an area where everyone is in agreement that poppies have not been cultivated.

Local transport is reasonable for the area and there are a sufficient number of bazaars present locally, although at the present time stock is rather minimal. Security is currently good and local farmers are extremely anxious for assistance. They have already volunteered local labor and are confident of their ability to assist in repatriation from refugee camps provided that crop inputs are made available in exchange for canal cleaning and irrigation repair labor. Elders

have stated that assistance is needed only for cleaning and repairing major primary and important secondary canals and drains. The Focused Survey team confirmed that there was little serious damage to the traditional irrigation system other than extensive silting of canals and drains (see maps for specific damage assessment). Land ownership patterns are more variable in Benader and Safer than in the resettled areas to the north, but over 90% of the respondents in these areas stated that they own their land.

Before any work in Benader and Safar can have a lasting economic impact on the region, the Darweshan Diversion Dam must be repaired and the Darweshan Canal must be thoroughly cleaned.

Laki

Laki, also in Garmser, could be another area in which the type of assistance that MCI provides could be very useful. Laki is located near the middle of the Darweshan canal system and the Flood Damage Assessment survey has revealed that the area has not been as severely effected by the disastrous floods of the spring of 1991 as areas further to the North (Tobi, Kharko, Sorkh Doz, Ajiti, and Mangalzai). MCI assistance here can help contribute to a rapid return to economically viable agriculture.

The major and minor canals and drains are in great need of cleaning and routine maintenance. The Focused Survey Assessment determined that, with a few exceptions, the structural integrity of most of the canal length is still good. There are several areas however, which require significant labor investments to restore the integrity of the canal system. In one case near the bifurcation of the Darweshan canal into the Benader and Safar canals near Katori (lat 30.45, long. 64.07), recent flooding has caused the high-water course of the Helmand River to come within 60 meters of the irrigation canal. This area will likely have to be protected by the installation of gabions to deter Helmand flood-waters from eroding the western side-wall of the Darweshan canal.

Local markets are functioning, and for more major items people have the choice of traveling north to the bordering market of Lakeri, or even to the nearby markets of Zinzir and Hazarjuft.

As in Benader, the people of Laki have been able to maintain a remarkable diversity of crops which, due to the variation in labor demands inherent in crop diversification, has permitted these people to be remarkably resilient in the face of severe and continued adversity. Land tenure is well-balanced, as virtually all farmers interviewed own their land. Poppy production in Laki is said to be much less than in other areas to the north.

It must be pointed out however, that in order for the people of the Benader-Safer and Laki areas to be constructively helped, the entire Darweshan canal and its major drains need attention. In particular, the flood gates at the Darweshan Diversion Dam and the related wash-out where the canal and the high-water level of the river have merged, must be repaired.

Marja

A third area where MCI could be productively useful is in the Marja region. Here the major problems relate to a severe lack of canal and drain maintenance. The situation is so bad in some areas where we carried out the Focused Survey, that farmers were seen pumping salt-laden drainage canal water into their fields for irrigation. Cash/commodity-for-work activities could help to bring this area back to productivity. As in Garmser District, to be successful, work in Marja must be supported by a more general effort to clean the intake of the Boghra Canal and the major canal and drains must be cleaned.

Bazaar conditions are relatively good here, with a wide availability of goods. Transport is likewise good, but will be seasonally limited unless the Hazarjuft Bridge repairs are reinforced.

Farmers in this area all own their land and are frequently mixed farmers, with livestock sales being a major contribution to income, especially seasonally. Crops here are predominately wheat, cotton and corn. Poppies are grown less here than in the surrounding areas of Nadi-Ali, Nawa, Shamalan and toward Grishk.

The integrity of all primary and secondary canals is intact. The Focused Survey Assessment determined that many of the gates on the secondary canals are inoperable, and in need of repair and in some cases, refitting. Side-wall damage is generally minimal, but a few places in the Boghra Canal need immediate attention if major damage and erosion are to be avoided (see damage assessments on maps). Drains in Marja are particularly silted with heavy brush growth in several places. Before any localized work can be effective over the long term, the Boghra Canal Diversion Dam must be repaired and the entire length of the Boghra to Marja must be cleaned.

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ANNEXES

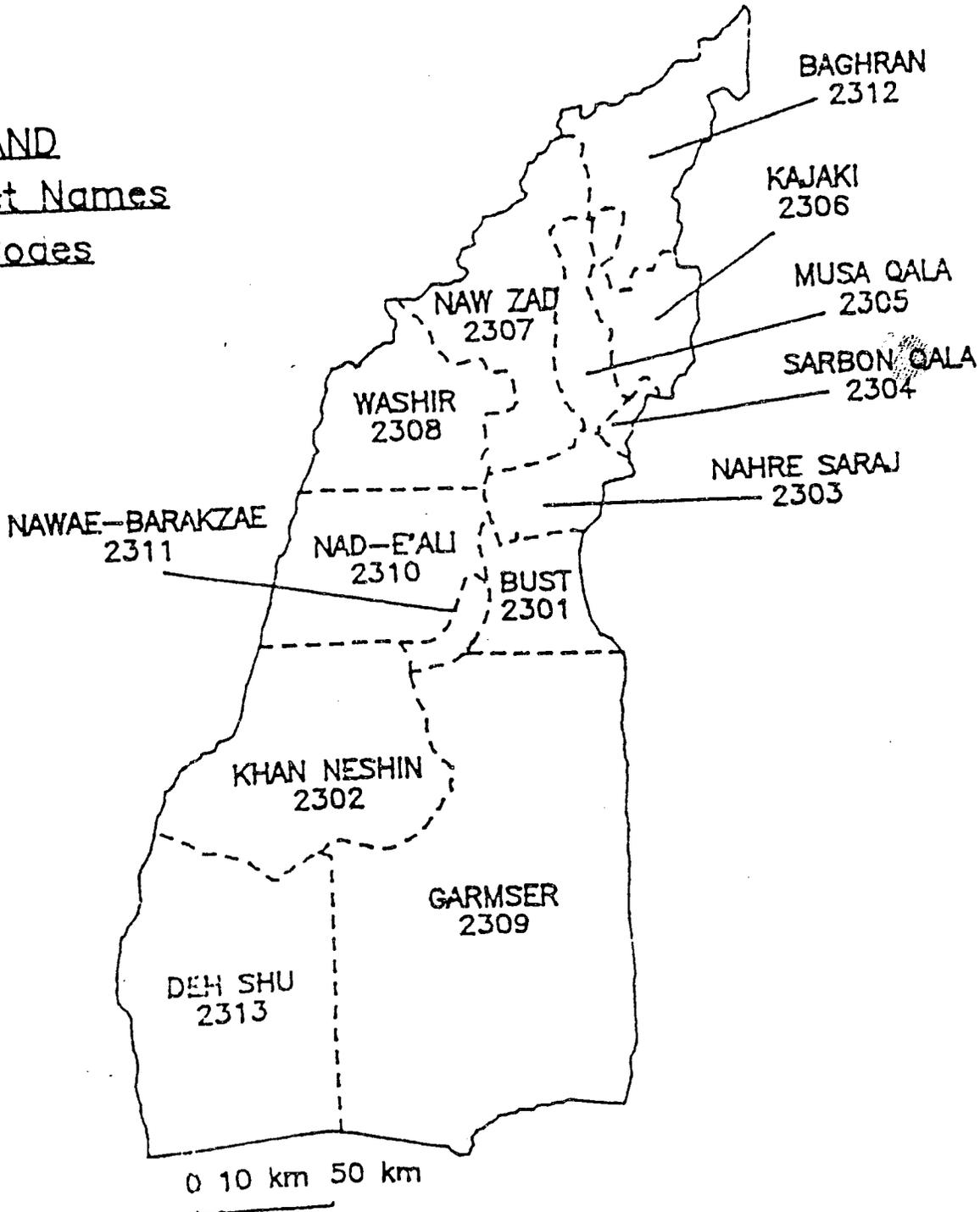
Annex 1. Helmand Province, District Map

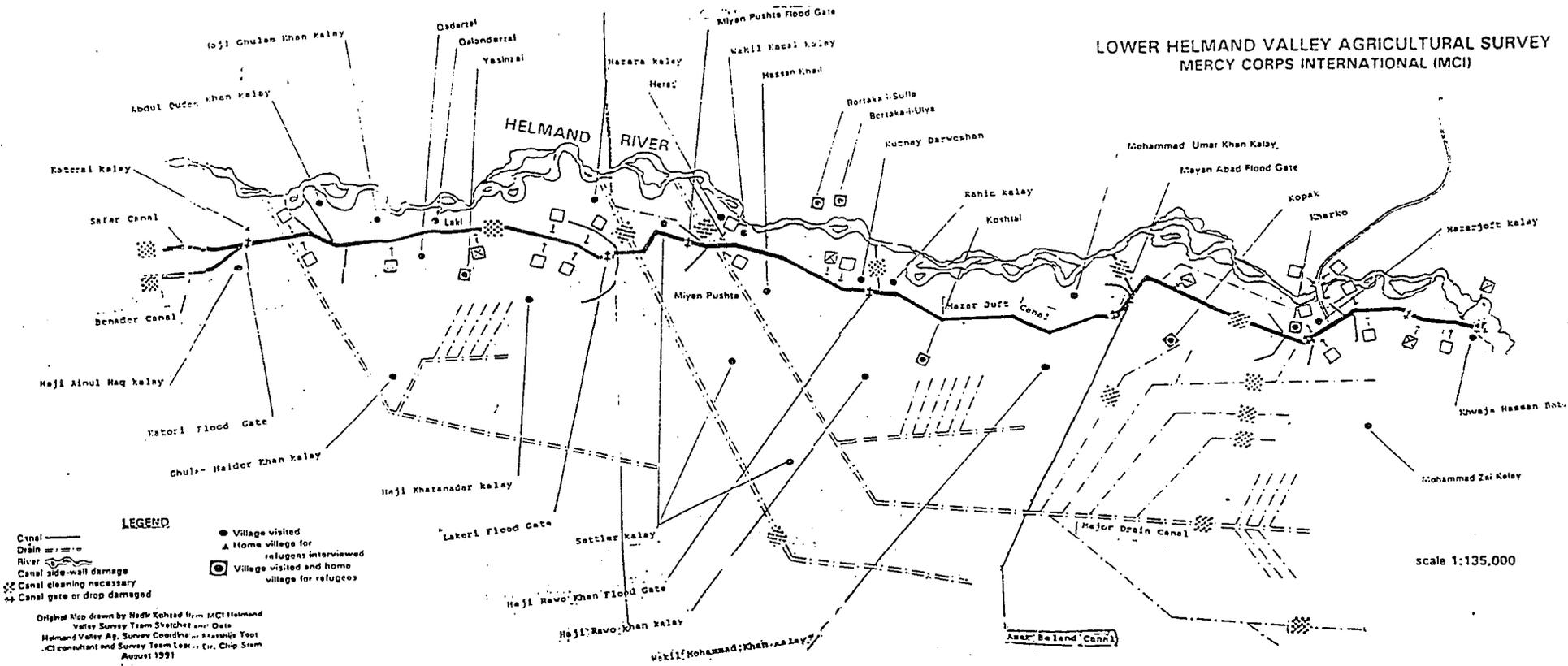
Annex 2. Middle Helmand Valley Irrigation Projects Map

Annex 3. Darweshan Canal Map

Annex 4. Benader and Safar Area Map

HELMAND
District Names
and Codes





LOWER HELMAND VALLEY AGRICULTURAL SURVEY
MERCY CORPS INTERNATIONAL (MCI)

LEGEND

-  Canal
-  Drain
-  River
-  Canal side-wall damage
-  Canal cleaning necessary
-  Canal gate or drop damaged
-  Village visited
-  Home village for refugees interviewed
-  Village visited and home village for refugees

scale 1:150,000

Damage Assessments placed from MCI Helmand Valley Survey Team Sketches and Data
Helmand Valley Ag. Survey Coordinator Matthijs Toot
MCI consultant and Survey Team Leader Dr. Chip Stem
August 1991

