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1970 FARM ECONOMIC SURVEY

HELMAND and ARGHANDAB VALLEYS of AFGHANISTAN

by

G. P. OWENS

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INTRODUCTION

BACKGROUND

The Helmand-Arghandab Valley Region is a large area. In 1971 it encompasses a cultivated area of about 360,000 acres (145,000 hectares) and has a potential net irrigable area estimated at not less than 540,000 acres (206,000 hectares). The region is one of the major desert irrigation areas of the world. The Helmand-Arghandab Valley Authority (HAVA) is the responsible agency of the Royal Government of Afghanistan for development of agriculture and irrigation in Helmand Province, which includes lands irrigated in the upper Helmand Valley. In addition, HAVA is responsible for irrigation and agricultural development in the portion of Kandahar Province irrigated under the storage dam on the Arghandab River. HAVA is also assisting in feasibility studies for development in the lower Helmand Valley and Siestan areas, which lie in Nimroz Province.

Starting in 1946, the Royal Government of Afghanistan has carried out a major program for development in the HAVA. To date, some $82 million has been expended on irrigation and agricultural development. Storage reservoirs were constructed on the Helmand and Arghandab rivers in the early 1950's. Major canals were constructed by the mid-1950's to supply water to project areas in the Darweshan, Shamalon, Nadi Ali, Marja and Girishk areas in Helmand Province and in the Arghandab and Dund-Daman areas in Kandahar Province. Irrigation and drainage facilities were provided in the project areas of Darweshan, Shamalon, Nadi Ali, Marja and Dund. While investments to date have provided a great deal of the basic irrigation facilities required, long-term development in the region will require continued investments by farmers, business and public authorities to bring the Valley to its full potential.

The RGA is taking into account continued investment requirements in its planning for the period 1351-56 (1972-77). To provide a better basis for this planning, a farm economic survey, the 1970 Farm Economic Survey as it has been designated, was begun in October 1970 at the request of H.E. Engineer Mohammed Akbar Reza, Governor of Helmand Province and President of HAVA, and Mr. A.R. Baron, USAID Assistant Director for the Helmand-Arghandab Valley Region (HAVR). At their request, the study was designed to provide a basis for comparison with a survey carried out in 1963/64 by Stevens and Tarzi. The 1970 study was also planned to provide more extensive coverage of farm economics than had hitherto been available. Thus, the farming areas of Nowzad and Zamin Dawar, kariz areas in the upper Helmand Valley, were included in the survey, as were Seraj and Khanishin areas, both irrigated by diversions from the Helmand. Little information on these four areas had been available since the HAVA Extension Department has not been able to include them in its programmed activities.

In all, 12 areas in Helmand Province and five in Kandahar Province were included in the study. These areas represent a total cropland of about 130,000 hectares. Brief descriptions of these project areas,

shown on the maps in Figures I and II, are provided in a later section of this chapter.

As a tool to provide data to be used in future planning and future evaluations of development, the study was designed to cover the following topics:

1. Farm size and tenure
2. Family size; age - sex distribution of farm families
3. Land use - cropping patterns, yields, etc.
4. Farm management practices - especially the use of modern farming methods and new inputs
5. Costs, returns and farm income
6. Farmer attitudes and problems.

As noted above, the 1970 FES was designed to yield information which can be compared directly with data for 1963-1964 as reported by Ira M. Stevens and K. Tarzi in Economics of Agricultural Production in Helmand Valley.

METHODOLOGY

Preliminary plans for the 1970 FES and the first draft of the field schedule were prepared in early November 1970. Plans and instruments through the tabulation and analysis stage were completed, enumerators and statisitcal clerks trained, and field work started by January 20, 1971. Interviews of over 800 farmers were completed by March 20, 1971. The bulk of tabulation and analysis was finished by early May, 1971.

The survey instruments used by Stevens and Tarzi were followed as closely as possible in designing the 1970 FES field schedule in order to obtain information directly comparable over the seven-year period separating the two surveys. The field schedule was written in English and translated to Pashto for pretesting. After changes suggested by pretest had been incorporated into Pashto draft, it was retranslated to English as a test, and finalized in Pashto. See Appendices I and II.

Twenty enumerators, most of whom had prior experience, were assigned from several HAVA departments and given a week's training. Some participated in the pretest. Four field supervisors received special training in addition to regular enumerator training.

A random sample of HAVA landowners, stratified by project area, was drawn from official government lists. These landowners were contacted by HAVA Extension personnel and asked to list all their tenants. Subsequently, the combined list of landowners and tenants was sampled at random to provide a list of respondents. A small alternate contingency sample was also drawn. The sample and number of usable schedules, are

as follows:

Area	Sample Size	Usable Schedules
Helmand	478	475
Nadi Ali	42	42
Marja	40	40
Shamalon	62	62
Darweshan	40	40
Khanishin	40	40
Seraj	48	47
Girishk	50	50
Sanguin-Kajakai	54	54
Musa Qala-Zamin Dawar	62	62
Nowzad	40	38
Kandahar	360	344
Maiwand	40	37
Dund-Daman	134	129
Arghandab	110	103
Panjwai	76	75
HAVA	838	819

Enumeration was conducted at pre-selected, centrally located sites in the project area. Respondents were contacted by Extension personnel and invited to share a meal with the enumerators on the appointed day. They were informed that they would be asked to help by giving information about their farms. This approach proved to be far superior to the standard procedure of contacting farmers at their homes for several reasons:

1. A great deal of time was saved in locating farmers when they were free to talk.

2. Farmers were much more cooperative after they had shared food with enumerators. They could see that their neighbors were also cooperating.

3. Enumerators worked under direct supervision at all times. Schedules were checked upon completion by field supervisors, eliminating costly follow-up work.

4. Supervisors were able to collect a great deal of valuable supplementary information from farmers waiting to be interviewed and from extension agents and officials.

The tabulation and analysis stage began when the first completed schedules were received from the field. After an office edit, the schedules were coded as to schedule number, location, and tenure. Data from schedules was then transferred to primary tab sheets from which counts, averages and ranges were derived. Secondary tabulations were necessary in some instances before summary sheets and tables for publication could be put together.

All data presented in this report is for the 1970 year of harvest unless otherwise noted.

LIMITATIONS OF STUDY

Inaccuracies in the listings of landowners used for sampling caused some problems. The principal difficulty was out-dated listings. When this was discovered, the lists were updated as far as possible. It was also found that some of the sampled landowners did not report all their tenant farmers. This was discovered during enumeration when respondents were again asked about their tenants. However, tenant farmers constitute only a small proportion of total farmers. Under-reporting of tenants by sampled landowners was found to be small (less than 15% in a check in the Shamalon). These limitations are considered minor and not invalidating the study.

Sampling stratification was carried out in terms of geographical project areas for three reasons:

a) Lists of landowners are maintained by these areas.

b) HAVA Extension Service has compiled crop acreages, yields and production by project area for many years.

c) The 1963-64 study reported information for seven of these areas.

A sampling procedure based on selection of farms by random selection of geographic coordinates was ruled out because of inadequate maps.

The procedure of sampling by project areas suffers a limitation because most project areas contain areas of both relatively high yeilds and output and relatively low yields and output. Thus, the Seraj project area contains five widely separated tracts with some very good land and farms in the northern tracts and large areas of poor, water-short land in the central and southern tracts. Averages shown for the Seraj area suffer from the limitations inherent in averaging results of good farming areas with less favored ones. Similar considerations apply to a somewhat lesser extent in other project areas.

Obviously, the reliability of the data is a function of the accuracy of the farmers in estimating their yeilds, acreages, family size and other data. Reliability of summarized data, as presented in this report, is postively related to number of farms reporting up to a certain point. For this reason, yields are not reported if fewer than three farmers reported acreage and production. Area and production data for crops such as peanuts, grown by only a few farmers, are less reliable than data for popular crops such as wheat, mung beans, etc.

PROJECT AREA DESCRIPTIONS[a/]

Figures 1 and 2 show the location of the Kajakai and Arghandab reservoirs, main canals and diversion dams and the outline boundaries of project areas in the Kandahar and Helmand provinces. With the exception of Nowzad and Musa Qala-Zamin Dawar, all the project areas are irrigated from either the Helmand or Arghandab rivers and have benefitted from the regulated flow of water made possible by the con-

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a/ By A.R. Baron

struction of the storage dams in 1952 and in 1954. Excluded from the studies are farming areas in the lower Helmand in Nimroz Province which are irrigated from the Helmand but which currently lie out of HAVA's jurisdiction. (In 1969/70, about 25,000 hectares of land are estimated to be under annual irrigation from the Helmand River in Nimroz Province, i.e. the lower Garmsel and the Siestan basin areas.)

According to HAVA data, the project areas in Helmand Province covered by the 1970 FES had about 90,000 hectares of cropland in 1969/70. See Table 38. Estimated potential irrigable area is 128,550 hectares.

The Nadi Ali project area as defined in the study includes the desert project development of Nadi Ali, first settled in 1951, and an older area on the right bank of the Helmand known as Baba-Ji. Both are irrigated from the Boghra canal. The potential irrigable area is estimated at 12,000 hectares, 9,000 hectares in Nadi Ali proper and 3,000 hectares in Baba-Ji. Cropland in 1969/70 is estimated to total 8,900 hectares, 2,200 in Baba-Ji and 6,700 hectares in Nadi Ali.

The Marja area is also a desert development first settled in 1957. It is irrigated by the Boghra canal. The potential irrigable area is estimated at 8,100 hectares. Cropland in 1969/70 is estimated at 6,300 hectares.

The area of Girishk is an older area on the right bank of the Helmand extending from above from Baba-Ji to the area of Musa Qala. It is watered by the Boghra canal and three older diversions. Potential irrigable area is believed to amount to 10,000-11,000 hectares. Cropland in 1969-70 is estimated at 9,200 hectares.

The Shamalon project area lies on the right bank of the Helmand River and is irrigated by the Shamalon canal which extends from its takeoff from the Boghra canal a few kilometers above Lashkar Gah some 60 kilometers downstream. The potential irrigable area is estimated on the basis of extensive surveys, to be 12,707 hectares, not including 4,500 hectares of lands classified as marginal for crop production but invested with water rights. Cropland in 1969/70 totaled an estimated 14,900 hectares.

The Darweshan project area lies on the left bank of the Helmand and is irrigated by the Darweshan canal, which extends some 50 kilometers downstream from the Darweshan diversion dam. The lower Darweshan extends to the area of Binadar, and is irrigated by farmer dug laterals connecting to the main canal. Based on soil surveys, the potential irrigable area equals 20,300 hectares. In 1969/70, cropland totaled an estimated 11,400 hectares.

The Khanishin area, sometimes known as the Garmsel (upper), extends below Darweshan on either side of the Helmand River to below the town of Deshu. The area studied ends at the border between Helmand and Nimroz provinces and is entirely irrigated by farmer diversions from the river. The potential irrigable area is not known for this portion of Garmsel. The Garmsel as a whole extends as far as the town of Deh Khaju in Nimroz Province and has a total potential irrigable area of 18,300 hectares, according to soils studies done in the 1950's. HAVA reported total registered farm land for tax purposes in 1971 at 21,800 hectares of irrigable land in the Khanishin area, of which an estimated 14,600 hectares of cropland were cultivated in 1969/70.

The Seraj area is made up of five separate tracts extending some 60 kilometers up river from Qala Bist and Lashkar Gah to the project area of Sanguin. The area is made up of tracts of land served by the Seraj canal whose construction was carried out in 1910-24. The potential irrigable area, based on the surveys carried out in the 1950's totals about 24,000 hectares. HAVA estimates total cultivable land in 1969/70 of 14,400 hectares and cropland in that year of 6,700 hectares.

Sanguin-Kajakai. This area lies on the left bank of the Helmand and extends above the Seraj area to the Kajakai storage dam. These are highly fertile river bottom lands (as are the lands of Baba-Ji, Shamalon, Darweshan and the northern tracts of the Seraj). Potential irrigable area is estimated roughly at 7,000 hectares. Cropland in 1969/70 is estimated at 6,020 hectares.

The Nowzad area. This area lies some 60 kilometers north of Girishk in the foothills of the Hindu Kush mountains. It is a water deficit area irrigated by numerous karizes. Population reportedly declined significantly during the drought years of 1970 and 1971. Soil surveys of the 1950's estimated the potential irrigable area at 3,000 hectares. HAVA reported total registered farm land for tax purposes in 1971 at 7,150 hectares and total cropland in 1969/70 of 2,860 hectares.

Musa Qala. This area borders about the Musa Qala river which empties into the Helmand river above Girishk. Irrigation is from numerous karizes and also from the Musa Qala River. The potential irrigable area, based on surveys in the 1950's is 8,100 hectares.

Zamin Dawar. This area lies northwest of Kajakai dam. It is irrigated by karizes. As in the case of Nowzad, significant declines in farming population have been reported as a result of the drought in 1970 and 1971. The potential irrigable area, as surveyed in the 1950's is reported to be 3,250 hectares (the area was then termed "West Kajakai").

Much of the project land in Kandahar Province consists of well-established orchards and vineyards. Kandahar is also well-known for vegetable production.

According to HAVA data, the project areas in Kandahar Province covered by the 1970 FES had about 40,000 hectares cropland (see Table 38). The U.S. Bureau of Reclamation Team estimates 61,500 hectares are potentially irrigable in this area.

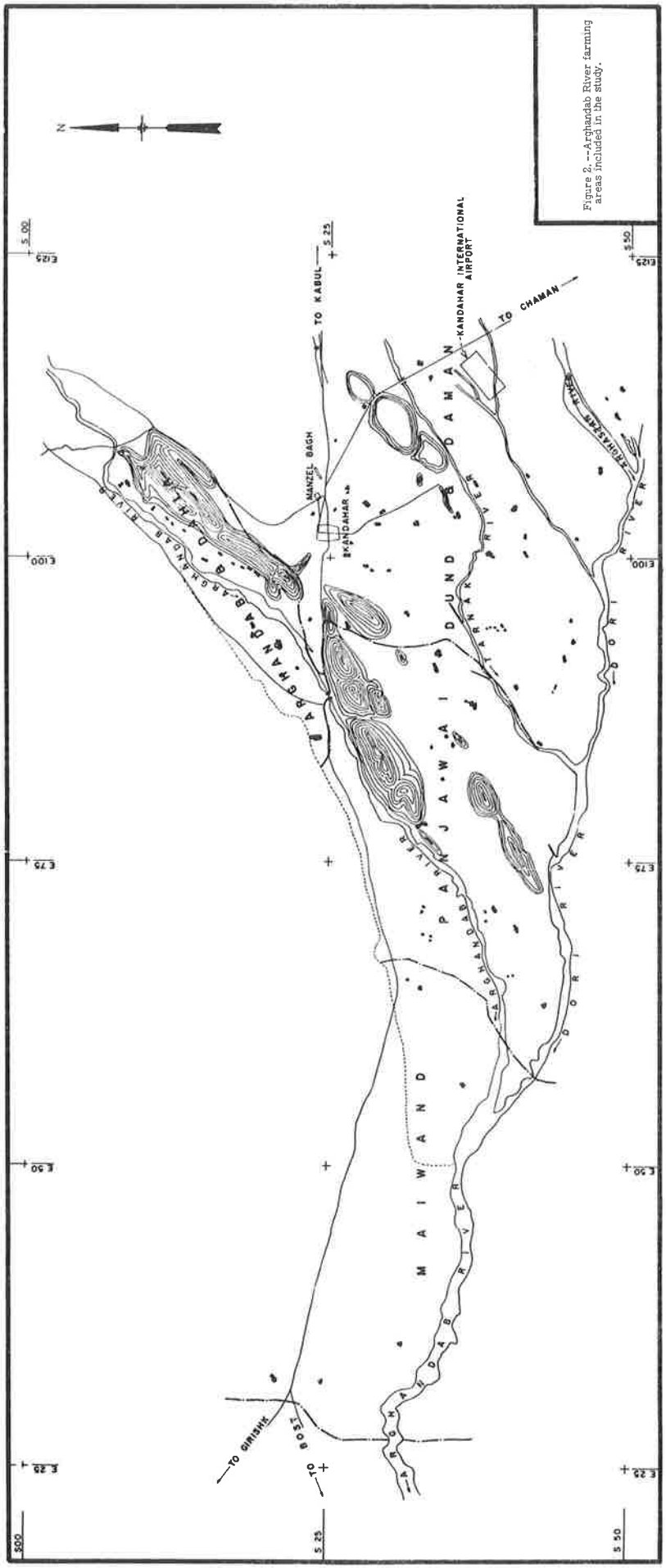


Figure 2.--Arghandab River farming areas included in the study.

CHAPTER I

TENURE, FARM SIZE AND FARM FAMILIES

Farms in the HAVA area tend to be small, owner-operated and to support large families. Differences exist among areas, due to type of farming, availability of water, degree of modernization and extent of recent settlement. Fruit growing, double cropping and vegetable growing are examples of intensive farming found in certain areas. Relatively small, intensive farms can support a family, whereas larger acreages are necessary when farming is extensive -- growing only one field crop per year.

Some areas in the study are more highly developed in terms of irrigation, drainage and land leveling. Some areas, however, are not adjacent to either of the major rivers and do not benefit from the regulated river flow. Some areas have only limited possibilities for intensive farming (fruit growing and double cropping.)

Farm size is affected by land settlement programs in some areas and in other areas by intensive operations.

Family size may have been influenced downward by settlement programs, but seems to be correlated mainly to current land productivity.

This chapter and those following will describe farmers and farming in HAVA by project areas as previously defined. (See Background section for description of areas.)

TENURE

Table 1 shows that over 90 percent of the farmers in HAVA are owner-operators or part-owners. The remaining 8.6 percent are tenant farmers (keshtegars). The study shows there are approximately 1.3 farm laborers (bazgars) per farm.

The newly settled areas of Marja and Nadi Ali have few tenant farmers because the land was parceled out to individual settlers with the understanding that they not resell for a specified period of time. Other areas, such as Seraj and Musa Qala-Zamin Dawar, have few tenant farmers because of limitations on irrigation water or poor quality land. The fruit growing areas in Kandahar Province have many bazgars but few keshtegars, apparently because labor is the major input which cannot be easily supplied by the landowner.

FARM SIZE

Table 2 shows average farm size by area, and Table 3 is a percent distribution of farm size. Table 4 shows changes which have occurred since 1963.

Project area farms are significantly larger in Kandahar Province than in Helmand. In Helmand Province, it is generally true that the more

TABLE 1. TENURE - NUMBER AND PERCENT, BY TENURE CLASSIFICATION, BY AREA

AREA	Owner-Operators		Part-Owners		Keshteqars		Bazqars[a/]
	No.	%	No.	%	No.	%	No.
HELMAND:	413	84.8	25	5.1	49	10.1	363
NADI ALI	38	90.5	2	4.8	2	4.8	26
MARJA	35	87.5	2	5.0	3	7.5	7
SHAMALON	59	90.8	1	1.5	5	7.7	49
DARWESHAN	31	72.1	4	9.3	8	18.6	42
KHANISHIN	22	50.0	-	-	22	50.0	56
SERAJ	43	91.5	3	6.4	1	2.1	44
GIRISHK	44	84.6	4	7.7	4	7.7	61
SANGUIN-KAJAKAI	47	87.1	5	9.2	2	3.7	16
MUSA QALA-ZAMIN DAWAR	59	95.2	3	4.8	-	-	44
NOWZAD	35	92.1	1	2.6	2	5.3	18
KANDAHAR:	307	87.7	20	5.7	23	6.6	677
MAIWAND	34	91.9	2	5.4	1	2.7	48
DUND-DAMAN	112	85.5	7	5.3	12	9.2	315
ARGHANDAB	90	84.2	10	9.3	7	6.5	162
PANJWAI	71	94.7	1	1.3	3	4.0	152
HAVA	720	86.0	45	5.4	72	8.6	1,040

a/ Bazgars are not considered as tenant farmers and therefore are not included in percentage calculations of tenure classification.

NOTE: In Tables 1 through 37, (excepting yield tables 11 through 14) averages for Helmand, Kandahar and HAVA are weighted on the basis of sample size. See Table 45 for averages weighted by estimated number of farms per area.

TABLE 2. FARMS REPORTING (N), AVERAGE FARM SIZE, CROPLAND PER FARM, AVERAGE FARM SIZE BY TENURE AND LAND VALUES BY TENURE, BY AREA

AREA	Average Farm Size			Cropland Per Farm			Average Farm Size - Hectares					Average Land Value		
	N	Hectares	Jeribs	Hectares	Jeribs	N	Owner Operators b/	N	Part Owners b/	N	Tenants	N	Afs Per Hectare a/	1963
HELMAND:	475	8.60	44.4	5.65	29.2	413	8.15	25	12.92	37	9.44	356	31,073	
NADI ALI	42	6.89	35.6	4.72	24.4	38	6.57	2	15.49	2	4.26	31	19,028	
MARJA	40	5.89	30.4	5.39	27.8	35	5.47	2	16.47	3	6.39	25	9,442	
SHAMALON	62	5.49	28.4	4.43	22.9	59	5.61	1	12.39	2	4.01	48	54,072	3,541
DARWESHAN	40	8.53	44.1	7.54	38.9	31	7.14	4	24.30	5	4.49	31	20,660	745
KHANISHIN	40	26.95	139.2	18.19	94.0	22	38.53	-	-	18	12.80	29	19,234	
SERAJ	47	10.79	55.7	6.07	31.4	43	9.82	3	22.26	1	2.03	36	16,368	
GIRISHK	50	7.39	38.2	5.33	27.5	44	7.11	4	4.55	2	18.68	38	46,759	
SANGUIN-KAJAKAI	54	2.51	13.0	1.89	9.8	47	4.46	5	4.12	2	1.84	44	33,068	
MUSA QALA-Z D	62	7.74	40.0	2.92	15.1	59	7.40	3	15.97	-	-	46	28,914	
NOWZAD	38	7.47	38.6	2.95	15.2	35	7.59	1	.58	2	9.00	28	20,994	
KANDAHAR:	344	14.87	76.8	7.79	40.2	307	16.01	20	6.78	18	5.18	311	70,302	
MAIWAND	37	18.29	94.5	8.32	43.0	34	19.06	2	13.60	1	9.10	30	28,872	
DUND-DAMAN	129	21.70	112.1	10.75	55.5	112	24.00	7	10.02	10	4.17	117	74,469	
ARGHANDAB	103	6.37	32.9	3.69	19.1	90	6.77	10	3.48	3	3.87	95	123,965	
PANJWAI	75	13.27	68.5	8.22	42.5	71	13.88	1	3.00	3	30.98	69	73,663	
HAVA	819	11.23	58.0	6.55	33.8	720	11.50	45	10.19	54	8.20	667	48,364	

a/ Average land values in 1970 were obtained after eliminating the three highest and the three lowest reports, including "ties."

b/ Land farmed by garow is included in owned land. It amounts to about 2% of total owned land.

productive areas have smaller farms. For example, Marja, Shamalon and Sanguin, areas of low average farm size, are among the most productive in the Helmand Valley, as will be shown in Chapters 2 and 4. Conversely, Khanishin, Seraj and Musa Qala-Zamin Dawar, areas of high average farm size, are among the least productive in the Helmand Valley.

Table 3, a percent distribution of farm size, is included for the convenience of future analysts who may wish to investigate how changes in average farm size come about: large farms becoming larger, small farms disappearing through consolidation, et cetera.

Cropland in the 1970 FES is defined as farm size less idle and waste land, pasture, house lot, roads and ditches. It does not, therefore, include double cropping and interplanting.

Differences between farm size and cropland among areas shown in Table 2 are largely accounted for by idle land not farmed for reasons such as lack of water, salinity or infertility. In the Helmand, the areas of Nowzad, Musa Qala-Zamin Dawar, Seraj, Khanishin and Nadi Ali have the lowest amount of cropland as percent of farm size and, with the exception of Nadi Ali, are among the least productive. Nowzad, Musa Qala-Zamin Dawar, Seraj and Khanishin are water-short areas. Nadi Ali has problems of salinity and water-logging. In Kandahar Province, lack of water in Maiwand and Panjwai at least partially explain the high ratio of idle land to farm size. In Dund-Daman and Arghandab, inadequate drainage appears to be a major factor explaining idle land.

Land values, shown in Table 2, are generally correlated with productivity. Kandahar values are more than twice as high as those in Helmand, primarily because of the concentrations of orchards and vineyards in Kandahar. The Arghandab area, which is nearest to the water source, has the highest land values of the survey. In Helmand Province, Shamalon and Girishk have the highest land value. Although both are highly productive areas, it is possible that an upward bias exists in Shamalon because of an impending land development program.

The pattern of land values in the 1970 FES appears internally consistant when compared to family size, yield data and value of production. However, there is no established land market in HAVA, and a "price" for land does not actually exist unless and until a sale occurs. Land ownership is seldom transferred except through inheritance, official programs, or garow (see Definition of Terms).

CHANGES IN FARM SIZE

Table 4 compares farm size and cropland per farm in 1963 and 1970. Farm size and cropland per farm increased in all areas except Shamalon and Darweshan in Helmand. The comparison for Dund-Daman and Panjwai-Maiwand may not be valid due to differences in coverage between the two surveys. The 1963 report covers only parts of Maiwand and Panjwai and only those parts which were most intensively farmed. See Economics of Agricultural Production in Helmand Valley, by Stevens and Tarzi. These areas were covered in their entirety by the 1970 FES, including water-short areas of extensive farming. The sharp decline in Darweshan can be partly explained by a government program which traded water rights for land.

TABLE 3. PERCENT DISTRIBUTION OF FARM SIZE, BY AREA

AREA	No.	Hectares									
		.0-.49	.50-.99	1.0-1.99	2.0-2.99	3.0-3.99	4.0-5.99	6.0-9.99	10.0-19.99	20.0-99.99	100+
HELMAND:	475	1.5	7.7	11.8	13.5	10.5	16.9	15.6	14.7	6.7	1.1
NADI ALI	42	-	-	-	2.4	7.1	28.6	45.2	14.3	2.4	-
MARJA	40	-	-	-	2.5	2.5	57.5	25.0	12.5	-	-
SHAMALON	62	-	1.6	11.3	19.6	17.7	17.7	8.0	17.7	6.4	-
DARWESHAN	40	-	10.0	12.5	5.0	15.0	22.5	10.0	15.0	10.0	-
KHANISHIN	40	-	-	2.5	-	-	12.5	17.5	47.5	15.0	5.0
SERAJ	47	2.1	6.4	8.5	8.5	17.0	10.7	17.0	19.2	8.5	2.1
GIRISHK	50	-	8.0	16.0	26.0	18.0	12.0	2.0	6.0	12.0	-
SANGUIN-KAJAKAI	54	-	22.2	27.8	24.1	11.1	5.6	7.4	-	-	1.8
MUSA QALA-Z D	62	1.6	11.3	14.5	24.2	8.1	6.4	17.7	8.1	6.4	1.7
NOWZAD	38	13.1	15.8	18.5	7.9	2.6	5.3	13.1	15.8	7.9	-
KANDAHAR:	344	2.3	9.0	19.5	9.0	9.0	10.7	15.5	8.7	13.1	3.2
MAIWAND	37	-	2.7	10.9	16.2	8.1	16.2	13.5	13.5	13.5	5.4
DUND-DAMAN	129	1.6	8.5	19.5	5.4	2.3	11.6	13.1	8.5	24.8	4.7
ARGHANDAB	103	3.9	13.6	20.4	12.6	8.7	7.8	21.3	6.8	3.9	1.0
PANJWAI	75	2.7	6.7	22.6	6.7	21.3	10.7	12.0	9.3	5.3	2.7
HAVA	819	1.8	8.3	15.0	11.6	9.9	14.3	15.5	12.2	9.4	2.0

TABLE 4. FARM SIZE IN HAVA - COMPARISON 1963 WITH 1970

AREA	Farm Size - Hectares		Cropland per Farm - Hectares	
	1963	1970	1963	1970
HELMAND				
NADI ALI	6.0	6.9	3.7	4.7
MARJA	4.6	5.9	4.3	5.4
SHAMALON	8.5	5.5	6.0	4.4
DARWESHAN	24.8	8.5	13.7	7.5
KANDAHAR				
ARGHANDAB	4.6	6.4	3.1	3.7
DUND-DAMAN	8.5	21.7	6.2	10.8
PANJWAI	7.2	13.3	4.5	8.2

HAVA Farmer with Prize-Winning Brussels Sprout

The Traditional and the Modern - Change comes to HAVA

The Boghra Canal. Nomads on the left, Farmers and Officials at right. Boghra Provides Irrigation Water for Marja, Nadi Ali and Shamalon

FARM FAMILIES

Detailed information on family size and composition is important to investigations of population movements and per capita income calculations.

Average family size is about 11 for HAVA, 9.5 for Helmand and 13 for Kandahar. There are slightly more females than males. Highest average family size is in Dund-Daman, the area around Kandahar city. Lowest average family size is in Khanishin in Helmand Province. Average number of males aged 13 years and older is only slightly higher than males younger than 13. See Table 5 for average family size and age - sex distribution, by area.

Family size is higher for owner-operators and part-owners than for tenants (keshtegars, not including bazgars), as might be expected. Family size is also larger on the larger farms, See Table 6. (holding productivity constant)

Family size has increased since 1963 in all areas reported by Stevens and Tarzi. Some of the increases seem very high due perhaps to differences in coverage by the two studies. See Table 7.

TABLE 5. FAMILY SIZE AND COMPOSITION, BY AREA

AREA	No. Males			No. Females	Average Family Size
	Age 0-12	Age 13 and Over	Total		
HELMAND:	2.26	2.46	4.72	4.77	9.49
NADI ALI	1.7	2.5	4.2	4.5	8.7
MARJA	2.0	2.2	4.2	4.4	8.6
SHAMALON	2.5	2.5	5.0	4.5	9.5
DARWESHAN	1.9	2.0	3.9	4.2	8.1
KHANISHIN	1.8	1.6	3.4	3.4	6.8
SERAJ	2.4	2.6	5.0	5.2	10.2
GIRISHK	2.8	3.1	5.9	5.2	11.1
SANGUIN-KAJAKAI	2.2	2.6	4.8	4.6	9.4
MUSA QALA-ZAMIN DAWAR	2.9	2.8	5.7	6.1	11.8
NOWZAD	1.9	2.1	4.0	4.8	8.8
KANDAHAR:	2.87	3.22	6.09	6.92	13.01
MAIWAND	2.3	3.4	5.7	5.8	11.5
DUND-DAMAN	3.1	3.5	6.6	8.3	14.9
ARGHANDAB	2.7	3.0	5.7	5.8	11.5
PANJWAI	2.9	2.8	5.7	6.9	12.6
HAVA	2.52	2.78	5.30	5.67	10.97

TABLE 6. AVERAGE FAMILY SIZE BY TENURE AND FARM SIZE, BY AREA

AREA	By Tenure						By Farm Size					
	Owner-Operator		Part Owner		Tenant		1-10 Jeribs		11-50 Jeribs		50 + Jeribs	
	No.	Av. Size	No.	Av. Size	No.	Av. Size	No.	Av. Size	No.	Av. Size	No.	Av. Size
HELMAND:	413	9.55	25	9.96	37	8.40	118	7.68	263	8.79	94	13.70
NADI ALI	38	8.5	2	13.5	2	10.0	-	-	35	7.9	7	13.7
MARJA	35	8.5	2	8.5	3	10.0	-	-	36	8.5	4	9.4
SHAMALON	59	9.5	1	10.0	2	8.5	16	8.5	38	8.8	8	14.8
DARWESHAN	31	8.4	4	6.0	5	7.2	7	7.0	22	6.2	11	13.0
KHANISHIN	22	7.3	-	-	18	6.3	1	6.0	14	5.9	25	7.4
SERAJ	43	10.5	3	7.0	1	8.0	8	7.5	24	8.5	15	14.6
GIRISHK	44	11.0	4	7.3	2	21.0	13	8.3	28	8.7	9	22.3
SANGUIN-KAJAKAI	47	9.1	5	11.2	2	14.0	29	8.6	25	10.4	-	-
MUSA QALA-Z D	59	11.5	3	18.3	-	-	25	7.2	31	12.4	6	28.0
NOWZAD	35	8.9	1	8.0	2	8.5	19	6.2	10	9.3	9	14.0
KANDAHAR:	307	13.20	20	13.10	17	9.12	147	8.57	147	10.46	80	20.11
MAIWAND	34	11.3	2	14.5	1	11.5	6	9.2	19	8.5	12	17.4
DUND-DAMAN	112	15.2	7	15.2	10	8.9	42	7.6	41	10.7	46	24.9
ARGHANDAB	90	11.9	10	10.6	3	7.7	42	9.1	50	11.2	11	23.1
PANJWAI	71	12.7	1	20.0	3	8.3	27	9.1	37	10.1	11	29.5
HAVA	720	11.11	45	11.36	54	8.63	235	8.12	410	9.39	174	18.49

TABLE 7. FARM FAMILY MEMBERS 1963 and 1970

AREA	No. Males		No. Females		Av. No. Family Members		% Increase
	1963	1970	1963	1970	1963	1970	
NADI ALI	3.6	4.2	3.6	4.5	7.2	8.7	20.8
MARJA	2.7	4.2	2.7	4.4	5.4	8.6	59.2
SHAMALON	4.1	5.0	4.3	4.5	8.4	9.5	31.1
DARWESHAN	3.6	3.9	4.4	4.2	8.0	8.1	1.2
ARGHANDAB	4.8	5.7	4.9	5.8	9.7	11.5	18.6
DUND-DAMAN	4.0	6.6	2.1	8.3	6.1	14.9	144.3
PANJWAI	3.1	5.7	2.1	6.9	5.2	12.6	142.3

CHAPTER II

LAND AND CROPS

Land use in HAVA is shown in Table 8. The average farm of 11.2 hectares consists of 6.6 hectares (58%) cropland and 4.7 hectares (41%) "idle land." "Idle land" includes fallow land, wasteland, pasture, house and barn lots, roads, ditches and fences. Very little arable, productive land is set aside for pasture in the study area. Animals graze mostly on fallow land and wasteland, and on public land.

On the average farm, double cropping is practiced on .4 hectares giving a total land in crops of 7 hectares, much of which is in wheat. Only in Arghandab does wheat account for less than 50% of the cropland.

Cropland plus area double cropped does not always equal land in crops (in most cases, land in crops is equal to or more than cropland plus area double cropped). This is partly due to errors in rounding and partly due to interplanting (mostly forage crops in orchards and vineyards). Data on double cropping was derived from an independent section of the field schedule, but is consistent with data for double cropping which can be derived from the cropland section of the schedule.

The typical farm in HAVA devotes more than half its land to wheat production, as in ages past. Some new trends are emerging, however. A significant amount of the wheat land is planted to improved, fertilizer responsive varieties. Corn is also an important crop in many areas and improved varieties are contributing to increases in production. The advent of cotton as an important cash crop since 1963 contributed to a breakdown of subsistence agriculture and helped usher in an era of farm business where capital formation can take place. Although it has not been possible to make a comparison of forage crops between 1963 and 1970, observers have noticed an increase in the amount of forage. This is primarily feed for work animals, but one can hope for a general improvement in the livestock industry through better nutrition.

The key to diversification and commercialization of HAVA farms seems to be the proliferation of improved corn and wheat. As yields and production increase, land can be diverted to the production of other cash crops, in part intensive crops such as fruits, vegetables and perhaps medicinal and cosmetic herbs. (Fruits and vegetables account for less than 6% of cropland in the Helmand Valley in 1969/70.)

When HAVA reaches its long run potential, wheat production may become much less important in the cropping patterns of the region. Cereal grain production is usually considered to be an uneconomical use of irrigated land. Plant scientists claim that most of HAVA has near optimum growing conditions. If this is so, most of the area should be devoted to higher value crops as soon as specialization can replace generalized subsistance farming.

Table 9 shows cropping patterns in detail as of 1970. From this base, planners can seek desireable changes and evaluate progress in future years.

TABLE 8. LAND USE IN HECTARES PER FARM, BY AREA

AREA	Farm Size	Cropland	Idle Land	Land in Crops				
				Wheat	Other Field Crops	Fruits, Nuts Vegetables	Total Land in Crops	Area Double Cropped
HELMAND:	8.60	5.65	2.95	4.60	1.26	.31	6.17	.52
NADI ALI	6.9	4.7	2.2	3.5	1.5	.4	5.4	.7
MARJA	5.9	5.4	.5	4.0	1.6	.5	6.0	.6
SHAMALON	5.5	4.4	1.1	3.4	1.4	.2	5.0	.7
DARWESHAN	8.5	7.5	1.0	5.7	2.0	.4	8.1	.4
KHANISHIN	27.0	18.2	8.8	17.7	1.0	.1	18.8	.2
SERAJ	10.8	6.1	4.7	5.2	.7	.3	6.2	.2
GIRISHK	7.4	5.3	2.1	3.5	2.8	.6	6.9	1.6
SANGUIN-KAJAKAI	2.5	1.9	.6	1.3	1.0	.1	2.5	.6
MUSA QALA-ZAMIN DAWAR	7.7	2.9	4.8	2.3	.5	.3	3.1	.1
NOWZAD	7.5	3.0	4.5	2.4	.2	.4	3.0	-
KANDAHAR:	14.87	7.79	7.08	4.87	1.08	2.15	8.10	.31
MAIWAND	18.3	8.3	10.0	6.3	1.0	1.0	8.3	.1
DUND-DAMAN	21.7	10.8	10.9	7.4	1.5	2.3	11.2	.5
ARGHANDAB	6.4	3.7	2.7	1.5	.8	1.7	4.0	.3
PANJWAI	13.3	8.2	5.1	4.4	.8	3.1	8.3	.1
HAVA	11.23	6.55	4.68	4.70	1.19	1.09	6.98	.43

TABLE 9a. AVERAGE AREA CROPPED PER FARM AND AREA CROPPED AS PERCENT OF CROPPED LAND PER FARM BY FIELD CROP, BY AREA

AREA	Wheat				Corn				Cotton		Alfalfa & Clover		Mung Beans		Barley	
	Local		Improved		Local		Improved									
	Hectares	%	Hectares	%	Hectares	%	Hectares	%	Hectares	%	Hectares	%	Hectares	%	Hectares	%
HELMAND:	4.22	67.4	.32	5.1	.46	7.3	.05	.8	.31	4.9	.20	3.2	.26	4.1	.11	1.8
NADI ALI	2.77	50.6	.77	14.1	.27	4.9	.06	1.1	.50	9.1	.17	3.1	.48	8.8	-	-
MARJA	2.99	49.5	.98	16.2	.24	4.0	.08	1.3	.80	13.2	.33	5.5	.13	2.2	.01	.2
SHAMALON	3.23	64.6	.12	2.4	.41	8.2	.08[a/]	1.6	.50	10.0	.31	6.2	.13	2.6	.01	.2
DARWESHAN	5.42	67.2	.27	3.3	.14	1.7	.25[a/]	3.1	.70	8.7	.14	1.7	.35	4.3	.44	5.4
KHANISHIN	17.64	94.2	-	-	.02	.1	-	-	-	-	.02	.1	.34	1.8	.61	3.2
SERAJ	5.25	84.3	-	-	.35	5.6	-	-	.17	2.7	.10	1.6	.04	.6	.04	.6
GIRISHK	2.50	36.3	1.00	14.5	1.84	26.7	.02	.3	.33	4.8	.48	7.0	.11	1.6	.03	.4
SANGUIN-KAJAKAI	1.16	47.0	.14	5.7	.66	26.7	-	-	.12	4.9	.19	7.7	.04	1.6	.01	.4
MUSA QALA-Z D	2.24	73.1	.02	.7	.30	9.8	-	-	.06	2.0	.12	3.9	.01	.3	.05	1.6
NOWZAD	2.38	80.0	-	-	.15	5.0	-	-	-	-	.02	.7	.01	.3	.06	2.0
KANDAHAR:	4.73	58.6	.12	1.5	.31	3.8	.02	.2	.04	.5	.36	4.4	.05	.6	.26	3.2
MAIWAND	6.34	75.8	-	-	.15	1.8	-	-	.29	3.5	.25	3.0	.01	.1	.31	3.7
DUND-DAMAN	7.16	64.2	.21	1.9	.39	3.5	.02	.2	.02	.2	.60	5.4	.05	.4	.29	2.6
ARGHANDAB	1.34	33.5	.12	3.0	.41	10.2	-	-	-	-	.21	5.3	.10	2.5	.03	.8
PANJWAI	4.36	52.8	-	-	.14	1.7	-	-	.02	.2	.15	1.8	.02	.2	.52	6.3
HAVA	4.44	62.8	.26	3.7	.40	5.7	.03	.4	.19	2.7	.26	3.7	.18	2.5	.18	2.5

a/ Relatively high area of improved corn in Darweshan due primarily to one sample farmer who had almost 10 jeribs of improved corn, and no local corn.

TABLE 9b. AVERAGE AREA CROPPED PER FARM AND AREA CROPPED AS PERCENT OF CROPPED LAND PER FARM, BY HORTICULTURAL CROP, BY AREA

AREA	Other Field Crops		Grapes		Pomegranates		Apricots		Other Fruits, Nuts & Melons		Vegetables		Average Hectares Cropped per Farm a/	
	Hectares	%	Hectares	%	Hectares	%	Hectares	%	Hectares	%	Hectares	%	Hectares	%
HELMAND:	.01	.2	.10	1.6	.02	.3	.03	.5	.14	2.2	.04	.6	6.27	100.0
NADI ALI	-	-	.13	2.4	.02	.4	.02	.4	.26	4.7	.02	.4	5.47	100.0
MARJA	-	-	.14	2.3	-	-	-	-	.18	3.0	.16	2.6	6.04	100.0
SHAMALON	-	-	.09	1.8	.01	.2	.01	.2	.06	1.2	.04	.8	5.00	100.0
DARWESHAN	-	-	.17	2.1	.04	.5	.05	.6	.07	.9	.04	.5	8.08	100.0
KHANISHIN	-	-	.04	.2	-	-	-	-	.08	.4	-	-	18.75	100.0
SERAJ	-	-	.15	2.4	.01	.2	.04	.6	.05	.8	.04	.6	6.24	100.0
GIRISHK	.01	.1	.10	1.5	.02	.3	.02	.3	.29	4.2	.14	2.0	6.89	100.0
SANGUIN-KAJAKAI	.03	1.2	.04	1.6	.01	.4	.01	.4	.06	2.4	-	-	2.47	100.0
MUSA QALA-Z D	-	-	.12	3.9	.02	.7	.02	.7	.10	3.3	-	-	3.06	100.0
NOWZAD	.01	.3	.07	2.3	.03	1.0	.10	3.4	.15	5.0	-	-	2.98	100.0
KANDAHAR:	.08	1.0	1.58	19.5	.15	1.9	.16	2.0	.13	1.6	.10	1.2	8.09	100.0
MAIWAND	.01	.1	.82	9.8	.01	.1	.01	.1	.08	1.0	.08	1.0	8.38	100.0
DUND-DAMAN	.16	1.4	1.72	15.4	.13	1.2	.19	1.7	.07	.6	.15	1.3	11.16	100.0
ARGHANDAB	.10	2.5	.66	16.5	.32	8.0	.28	7.0	.29	7.2	.14	3.5	4.00	100.0
PANJWAI	-	-	2.99	36.2	.02	.2	.02	.2	.03	.4	-	-	8.27	100.0
HAVA	.04	.6	.72	10.2	.08	1.1	.09	1.3	.13	1.8	.07	1.0	7.07	100.0

a/ Includes double cropping.

The Stevens-Tarzi report allows comparison of cropping patterns over a span of seven years for seven areas in HAVA. See Table 10.

Increases in production (probably the primary short term objective of HAVA) can come from increased yields, increased use of idle land and double cropping. Research results indicate an impressive potential for increased yields through use of improved varieties and fertilizer. In practice, improved varieties of wheat and corn are out-performing native varieties by 186 and 62 percent, respectively, in HAVA, and up to 220 percent for wheat in Marja. See Table 11.

Yields in Table 11 are reported for project areas only if three or more sample farms reported production and area planted. Average yields for Helmand, Kandahar and HAVA are calculated on the basis of total production and area planted and thus are weighted on the basis of the relative importance of the crop in each area. Although this averaging procedure does not take account of the number of farms per area, it is probably more realistic than average yeilds weighted by number of farms per project area as reported in Table 46.

Table 12 shows significant improvement in yields since 1963 and establishes a rather steep upward trend for some crop yields. The increases in wheat and corn yields are due in part to the increased use of improved varieties. Local and improved varieties were treated separately in the 1970 FES, but combined in Table 12 so that they are comparable to 1963 yields, for local varieties only, as reported by Stevens and Tarzi. If a comparison of local yields is desired, the reader can compare the 1963 columns for wheat and corn (Table 12) with appropriate data for local yields from Table 11.

Table 13, a percent distribution of yields, is presented here so that future comparisons can be made to show where the increases are coming from: top end, middle or low end of the range of yields. Table 14, yields by farm size for selected crops and areas, should be helpful in determinations of efficiency and farm size, in addition to analysis of changing yields.

TABLE 10. AREA PER FARM IN JERIBS, BY AREA, BY CROP COMPARISON 1963 WITH 1970

Crop	Nadi Ali		Marja		Shamalon		Darweshan		Dund-Daman		Arghandab	
	1963[a/]	1970	1963	1970	1963	1970	1963	1970	1963	1970	1963	1970
Wheat & Barley	16.0	18.3	14.2	20.6	18.2	17.4	42.0	31.7	12.5	39.6	6.8	7.7
Corn	-	1.7	-	1.7	1.5	2.5	.2	2.0	-	2.1	1.5	2.1
Rice	1.0	.1	-	-	-	-	-	-	-	-	-	.5
Cotton	.2	2.6	3.1	4.1	9.8	2.6	27.1	3.6	-	.1	-	1*
Mung Beans	1.1	2.5	.6	.7	1.3	.7	.4	1.8	-	.3	.4	.5
Alfalfa & Clover	1.2	.9	2.9	1.7	1.2	1.6	.6	.7	1.0	3.1	.3	1.1
Grapes	.7	.7	.4	.7	.4	.5	.8	.9	7.6	8.9	2.2	3.4
Pomegranates	-	.1	.3	1*[b/]	-	.1	-	.2	.2	.7	2.9	1.7
Apples	-	-	.1	-	-	1*	-	-	.6	.1	-	.3
Apricots	-	.1	.1	1*	-	.1	-	.3	2.2	1.0	2.3	1.4
Other Fruit	-	.5	-	.8	.5	-	-	.4	-	.2	-	1.1
Melons & Watermelons	.1	.9	-	.1	-	.4	.1	.2	-	.2	.1	.1
All Vegetables	-	.1	-	.8	.3	.2	.3	.2	-	.8	.5	.7
T O T A L	20.3	28.5	21.7	30.8	33.2	26.0	71.5	42.0	24.1	57.1	17.0	20.7

a/ 1963 data from Table 2, page 10 of Stevens-Tarzi Report.

b/ 1* - Insignificant amount.

TABLE 11a. AVERAGE YIELDS FOR MAJOR FIELD CROPS, BY AREA - IN MONS PER JERIB AND KILOGRAMS PER HECTARE

AREA	Wheat				Corn				Barley	
	Local		Improved		Local		Improved			
	MON/J	KG/HA	MON/J	KG/HA	MON/J	KG/HA	MON/J	KG/HA	MON/J	KG/HA
HELMAND:	33.1	755.0	101.9	2,324.2	68.3	1,557.9	102.7	2,342.5	18.7	426.5
NADI ALI	43.7	996.8	119.3	2,721.1	78.9	1,799.6	161.3	3,679.1	--	--
MARJA	33.6	766.4	107.2	2,445.1	39.5	901.0	95.3	2,173.7	--	--
SHAMALON	65.4	1,491.7	89.7	2,046.0	81.2	1,852.1	91.4	2,084.7	81.8	1,865.8
DARWESHAN	40.0	912.4	76.7	1,749.5	47.7	1,088.0	--	--	22.0	501.8
KHANISHIN	16.4	374.1	--	--	133.7	3,049.6	--	--	10.2	232.7
SERAJ	26.1	595.3	--	--	35.6	812.0	--	--	--	--
GIRISHK	41.5	946.6	89.3	2,036.8	65.7	1,498.6	116.6	2,659.5	35.0	798.3
SANGUIN-KAJAKAI	60.5	1,379.9	128.9	2,940.1	87.3	1,991.2	--	--	43.3	987.6
MUSA QALA-ZAMIN DAWAR	43.4	989.9	108.3	2,470.2	71.1	1,621.7	--	--	36.6	834.8
NOWZAD	27.8	634.1	--	--	53.0	1,208.9	--	--	24.0	547.4
KANDAHAR:	36.4	830.2	85.7	1,954.7	55.6	1,268.2	115.6	2,636.7	35.1	800.6
MAIWAND	47.9	1,092.6	--	--	15.9	362.7	--	--	33.9	773.2
DUND-DAMAN	33.2	757.3	76.0	1,733.5	50.2	1,145.0	--	--	46.5	1,060.6
ARGHANDAB	55.5	1,265.9	85.2	1,943.3	66.0	1,505.4	--	--	31.2	711.6
PANJWAI	29.2	666.0	--	--	60.7	1,384.5	--	--	24.8	565.7
HAVA	34.6	789.2	98.5	2,246.7	64.1	1,462.1	103.8	2,367.6	29.2	666.0

1 mon per jerib = 22.809 kg. per hectare, 1 kg. per hectare = .04384 mon per jerib

Yields not reported when no. farms reporting is less than 3. However, area and production for these farms are considered in subtotal calculations. Yields for Helmand, Kandahar and HAVA are properly weighted on the basis of area and production per area.

TABLE 11b. AVERAGE YIELDS FOR MAJOR FIELD CROPS, BY AREA - IN MONS PER JERIB AND KILOGRAMS PER HECTARE

AREA	Mung Beans		Rice		Cotton[a/]		Clover		Alfalfa	
	MON/J	KG/HA	MON/J	KG/HA	MON/J	KG/HA	MON/J	KG/HA	MON/J	KG/HA
HELMAND:	30.6	698.0	46.0	1,049.2	45.0	1,026.4	728.7	16,620.9	603.8	13,772.1
NADI ALI	33.5	764.1	--	--	37.5	855.3	523.1	11,931.4	595.7	13,587.3
MARJA	21.1	481.3	--	--	36.2	825.7	133.3	3,040.4	295.6	6,742.3
SHAMALON	22.1	504.1	--	--	55.6	1,268.2	694.2	15,834.0	604.9	13,797.2
DARWESHAN	43.1	983.1	--	--	39.3	896.4	60.0	1,368.5	274.0	6,249.7
KHANISHIN	13.6	310.2	--	--	--	--	--	--	290.0	6,614.6
SERAJ	18.9	431.1	--	--	60.7	1,384.5	--	--	449.5	10,252.6
GIRISHK	50.0	1,140.5	64.0	1,459.8	56.8	1,295.6	952.8	21,732.4	1,139.1	25,981.7
SANGUIN-KAJAKAI	44.5	1,015.0	31.7	723.0	34.8	793.8	769.2	17,544.7	536.0	12,225.6
MUSA QALA-ZAMIN DAWAR	19.7	449.3	--	--	42.9	978.5	455.1	10,380.4	520.3	11,867.5
NOWZAD	--	--	--	--	--	--	--	--	249.0	5,679.4
KANDAHAR:	35.6	812.0	173.2	3,950.5	58.6	1,336.6	--	5,549.4	1,683.9	38,408.1
MAIWAND	17.7	403.7	--	--	62.9	1,434.7	--	--	589.5	13,445.9
DUND-DAMAN	40.3	919.2	--	--	--	--	--	--	1,850.2	42,201.2
ARGHANDAB	32.4	739.0	173.2	3,950.5	--	--	--	--	1,637.4	37,347.5
PANJWAI	--	--	--	--	--	--	--	--	1,534.6	35,002.7
HAVA	31.6	720.8	151.2	3,448.7	46.1	1,051.5	704.8	16,075.8	1,306.3	29,795.4

a/ Seed cotton.

TABLE 11c. AVERAGE YIELD FOR MAJOR FRUITS, BY AREA - IN MONS PER JERIB AND KILOGRAMS PER HECTARE

AREA	Grapes		Pomegranates		Apricots		Peaches	
	MON/J	KG/HA	MON/J	KG/HA	MON/J	KG/HA	MON/J	KG/HA
HELMAND:	355.0	8,096.7	246.1	14,507.0	95.7	2,183.3	227.2	5,182.2
NADI ALI	355.4	8,105.4	344.2	7,850.9	445.6	10,162.6	--	--
MARJA	229.0	5,228.1	202.3	4,613.1	33.9	772.3	--	--
SHAMALON	641.0	14,621.2	623.8	14,228.3	462.1	10,540.0	72.0	1,642.3
DARWESHAN	437.8	9,986.2	53.9	1,229.2	6.0	136.9	--	--
KHANISHIN	215.4	4,913.1	--	--	--	--	--	--
SERAJ	112.3	2,561.8	143.0	3,261.7	43.4	989.9	--	--
GIRISHK	661.8	15,094.3	124.0	2,828.3	222.8	5,082.5	321.4	7,331.5
SANGUIN-KAJAKAI	776.3	17,705.5	200.3	4,567.5	112.5	2,566.0	--	--
MUSA QALA-ZAMIN DAWAR	264.2	6,026.1	335.5	7,652.4	271.6	6,194.2	--	--
NOWZAD	128.3	2,926.4	110.4	2,518.1	22.3	507.7	--	--
KANDAHAR:	265.5	6,054.6	332.6	7,585.6	217.8	4,966.9	91.1	2,078.4
MAIWAND	341.3	7,784.9	196.3	4,476.3	236.0	5,382.9	--	--
DUND-DAMAN	226.3	5,161.7	350.6	7,996.8	175.3	3,997.5	9.4	214.4
ARGHANDAB	283.4	6,463.4	371.7	8,478.1	208.8	4,763.2	121.5	2,772.0
PANJWAI	269.2	6,139.0	178.6	4,073.0	453.9	10,352.8	220.0	5,018.0
HAVA	302.6	6,901.3	457.3	10,429.4	148.2	3,380.5	124.5	2,840.6

TABLE 11d. AVERAGE YIELDS FOR MAJOR FRUITS, NUTS AND VEGETABLES, BY AREA - IN MONS PER JERIB AND KILOGRAMS PER HECTARE

AREA	Figs		Peanuts		Watermelons		Carrots	
	MON/J	KG/HA	MON/J	KG/HA	MON/J	KG/HA	MON/J	KG/HA
HELMAND:	175.0	3,992.0	19.5	443.9	328.2	7,485.0	326.7	7,451.0
NADI ALI	70.0	1,596.6	22.5	514.1	--	--	--	--
MARJA	16.6	377.7	17.6	401.7	98.5	2,245.6	--	--
SHAMALON	124.0	2,828.3	--	--	350.4	7,992.3	--	--
DARWESHAN	--	--	--	--	501.9	11,447.6	--	--
KHANISHIN	--	--	--	--	--	--	--	--
SERAJ	23.7	540.8	--	--	--	--	--	--
GIRISHK	491.4	11,209.0	--	--	284.0	6,477.8	--	--
SANGUIN-KAJAKAI	--	--	--	--	1,200.0	27,370.8	326.7	7,451.0
MUSA QALA-ZAMIN DAWAR	--	--	--	--	--	--	--	--
NOWZAD	31.7	722.4	--	--	--	--	--	--
KANDAHAR:	112.2	2,558.0	224.0	5,109.2	554.1	12,638.7	614.8	14,023.7
MAIWAND	17.7	403.0	90.0	2,052.8	177.8	4,055.0	--	--
DUND-DAMAN	121.0	2,759.9	--	--	406.2	9,265.2	991.7	22,619.7
ARGHANDAB	95.9	2,186.2	224.0	5,109.2	1,075.7	24,535.9	300.8	6,860.3
PANJWAI	51.1	1,165.8	--	--	--	--	--	--
HAVA	139.3	3,178.2	107.1	2,443.3	406.4	9,269.1	464.5	10,594.6

TABLE 12. YIELDS IN MONS PER JERIB BY AREA, BY CROP

COMPARISON 1963 WITH 1970

Crop	Nadi Ali		Marja		Shamalon		Darweshan		Dund-Daman		Arghandab	
	1963	1970	1963	1970	1963	1970	1963	1970	1963	1970	1963	1970
Wheat	7.3	61.5	18.0	52.1	41.1[a/]	66.2	31.0[a/]	41.7	71.5	34.7	41.3	57.9
Barley	5.4	--	20.0	--	--	81.8	--	22.0	49.1	46.5	31.4	31.2
Corn	--	95.8	--	55.5	52.7	83.0	26.6	79.0	16.0	52.9	40.3	64.0
Rice	9.6	--	--	--	--	--	--	--	--	--	--	173.2
Cotton	6.3	37.5	11.3	36.2	23.1	55.6	8.0	39.3	--	--	20.0	--
Mung Beans	5.2	33.5	10.2	21.1	18.1	22.1	11.9	43.1	--	40.3	15.9	32.4
Grapes	14.8	355.4	39.6	229.0	171.0	641.0	140.5	437.8	51.5	226.3	50.9	283.4
Pomegranates	33.3	344.2	60.0	202.2	79.0	623.8	--	--	36.0	350.6	119.9	371.7
Apples	--	--	--	--	--	--	--	--	13.3	236.6	36.1	188.7
Apricots	--	--	100.0	33.8	100.0	462.1	--	--	33.0	175.3	146.3	208.8
Melons & Watermelons	--	--	--	--	100.0	368.3	111.9	133.3	50.0	406.2	325.9	1,075.7
All Vegetables	--	--	--	--	220.0	--	--	--	--	--	198.6	268.0

a/ Wheat and barley yield figures for Shamalon and Darweshan, 1963 were combined in the Stevens-Tarzi Report.

TABLE 13a. PERCENT DISTRIBUTION OF YIELDS - IMPROVED VARIETIES, BY AREA

WHEAT

AREA	N	0-10 Mon/J	11-20 Mon/J	21-30 Mon/J	31-40 Mon/J	41-50 Mon/J	51-60 Mon/J	61-80 Mon/J	81-100 Mon/J	101-130 Mon/J	131+ Mon/J	Range of Yields Mon/J High	Low
HELMAND:	86	2.3%	2.3	5.8	5.8	11.6	4.6	17.5	16.3	15.1	18.7	225	8
NADI ALI	16	-	-	6.2	6.2	25.0	-	25.0	18.8	18.8	-	125	26
MARJA	24	8.3	-	8.3	8.3	12.5	8.3	29.2	-	4.2	20.9	200	8
SHAMALON	11	-	-	9.1	9.1	-	-	18.2	36.3	9.1	18.2	150	30
DARWESHAN	4	-	25.0	-	-	-	25.0	-	50.0	-	-	87	20
KHANISHIN	-	-	-	-	-	-	-	-	-	-	-	-	-
SERAJ	-	-	-	-	-	-	-	-	-	-	-	-	-
GIRISHK	14	-	-	14.2	-	14.3	7.1	14.3	14.3	21.5	14.3	225	25
SANGUIN-KAJAKAI	14	-	-	-	7.1	7.1	-	-	14.3	28.6	42.9	166	40
MUSA QALA-ZAMIN DAWAR	3	-	-	-	-	-	-	-	33.4	33.3	33.3	133	100
NOWZAD	-	-	-	-	-	-	-	-	-	-	-	-	-
KANDAHAR:	23	-	-	4.3	-	8.8	4.3	26.1	26.1	4.3	26.1	200	30
MAIWAND	-	-	-	-	-	-	-	-	-	-	-	-	-
DUND-DAMAN	12	-	-	8.4	-	8.3	8.3	25.0	25.0	-	25.0	150	30
ARGHANDAB	11	-	-	-	-	9.1	-	27.2	27.3	9.1	27.3	200	50
PANJWAI	-	-	-	-	-	-	-	-	-	-	-	-	-
HAVA	109	1.8	1.8	5.5	4.6	11.0	4.6	19.3	18.4	12.8	20.2	225	8

TABLE 13b. PERCENT DISTRIBUTION OF YIELDS - IMPROVED VARIETIES, BY AREA

COTTON[a/]

AREA	N	0-10 Mon/J	11-20 Mon/J	21-30 Mon/J	31-40 Mon/J	41-50 Mon/J	51-60 Mon/J	61-80 Mon/J	81-100 Mon/J	101-130 Mon/J	131+ Mon/J	Range of Yields Mon/J High	Low
HELMAND:	150	4.7%	14.0	12.0	17.3	14.0	4.7	14.0	10.6	4.0	4.7	150	1
NADI ALI	22	9.1	13.6	9.1	18.2	18.2	-	18.2	9.1	-	4.5	135	7
MARJA	32	3.1	25.1	12.5	18.8	12.5	-	15.6	3.1	6.2	3.1	150	1
SHAMALON	36	-	11.1	19.4	5.6	13.9	5.6	8.3	13.9	8.3	13.9	150	19
DARWESHAN	17	17.6	5.9	5.9	29.4	-	11.8	17.6	11.8	-	-	84	4
KHANISHIN	-	-	-	-	-	-	-	-	-	-	-	-	-
SERAJ	7	-	14.3	-	14.3	42.8	14.3	-	14.3	-	-	87	20
GIRISHK	18	-	-	5.6	33.3	11.1	5.6	22.2	16.6	5.6	-	106	26
SANGUIN-KAJAKAI	9	-	22.3	22.2	11.1	22.2	11.1	11.1	-	-	-	66	20
MUSA QALA-ZAMIN DAWAR	9	11.1	22.3	11.1	11.1	11.1	-	11.1	22.2	-	-	90	8
NOWZAD	-	-	-	-	-	-	-	-	-	-	-	-	-
KANDAHAR:	13	-	23.0	7.7	15.4	23.1	7.7	15.4	7.7	-	-	100	14
MAIWAND	11	-	27.2	9.1	9.1	18.2	9.1	18.2	9.1	-	-	100	14
DUND-DAMAN	2	-	-	-	50.0	50.0	-	-	-	-	-	44	33
ARGHANDAB	-	-	-	-	-	-	-	-	-	-	-	-	-
PANJWAI	-	-	-	-	-	-	-	-	-	-	-	-	-
HAVA	163	4.3	14.8	11.7	17.4	14.8	4.9	13.6	10.5	3.7	4.3	150	1

a/ Seed cotton.

TABLE 13c. PERCENT DISTRIBUTION OF YIELDS - IMPROVED VARIETIES, BY AREA

CORN

AREA	N	0-10 Mon/J	11-20 Mon/J	21-30 Mon/J	31-40 Mon/J	41-50 Mon/J	51-60 Mon/J	61-80 Mon/J	81-100 Mon/J	101-130 Mon/J	131+ Mon/J	Range of Yields Mon/J High	Low
HELMAND:	24	8.3%	8.3	8.3	4.2	12.5	-	4.2	16.7	29.2	8.3	200	5
NADI ALI	4	25.0	-	-	-	25.0	-	-	-	25.0	25.0	200	10
MARJA	5	-	40.0	-	-	20.0	-	-	-	40.0	-	127	16
SHAMALON	8	-	-	12.5	-	12.5	-	12.5	12.5	37.5	12.5	150	23
DARWESHAN	2	-	-	-	-	-	-	-	100.0	-	-	100	94
KHANISHIN	-	-	-	-	-	-	-	-	-	-	-	-	-
SERAJ	-	-	-	-	-	-	-	-	-	-	-	-	-
GIRISHK	3	-	-	33.4	33.3	-	-	-	-	33.3	-	125	26
SANGUIN-KAJAKAI	-	-	-	-	-	-	-	-	-	-	-	-	-
MUSA QALA-ZAMIN DAWAR	2	50.0	-	-	-	-	-	-	50.0	-	-	100	5
NOWZAD	-	-	-	-	-	-	-	-	-	-	-	-	-
KANDAHAR:	2	-	-	-	-	-	-	-	50.0	-	50.0	240	88
MAIWAND	-	-	-	-	-	-	-	-	-	-	-	-	-
DUND-DAMAN	2	-	-	-	-	-	-	-	50.0	-	50.0	240	88
ARGHANDAB	-	-	-	-	-	-	-	-	-	-	-	-	-
PANJWAI	-	-	-	-	-	-	-	-	-	-	-	-	-
HAVA	26	7.7	7.7	7.7	3.8	11.6	-	3.8	19.2	26.9	11.6	240	5

CHAPTER III

CULTURAL PRACTICES

A great deal of the progress in HAVA agriculture can be attributed to the adoption of modern farming practices by area farmers. Largest gains or potential gains are probably from the use of improved seed and fertilizer and from double cropping. Several other practices are also of demonstrable value for increasing yields and production: crop rotation, land leveling, fallowing, mechanization, irrigation timing and water management, use of chemicals for plant protection and animal health, and use of agricultural credit. These will become more and more important in HAVA as the easy gains from improved seeds, fertilizers, and double-cropping become more fully realized.

Improved seed, except for cotton, was virtually absent from the HAVA scene at the time of the Stevens-Tarzi report. By 1970, significant amounts of improved wheat (see Appendix IV) and corn seed were being used over much of the area. Table 15 shows the percent of wheat and corn farmers who reported use of improved seeds, and the area planted to improved seeds. In addition to wheat and corn, all cotton is grown from improved seeds. HAVA farmers are also using some improved vegetable and watermelon seeds, but this was not measured in the 1970 FES.

Table 16 shows the percent of farmers who used fertilizer on any crop, and the percent of farmers who used fertilizer on wheat, corn, cotton, and fruit. Amount and type of fertilizer was not determined by the 1970 FES. (This information is readily available from HAVA and was distributed through official channels. At any rate, fertilizer use has increased greatly since 1963. According to the Stevens-Tarzi report, 218 tons of fertilizer were distributed to HAVA farmers in 1963. Fertilizer distribution increased to 5447 metric tons in 1970. See Appendix IV.

The climate of HAVA is well suited to double cropping -- the growing season is sufficiently long and irrigation water is available in most areas. Major technical problems for double cropping are:

1. Timing. It is difficult for a farmer using bullock power to harvest and thresh his first crop (usually wheat) in time to plow and plant his second crop. Bullocks are important to the threshing operation which is very time-consuming, frequently drawn out for two months or more in Afghanistan. Threshing is sometimes delayed, at some inconvenience to the farmer and his family, while a second crop is planted.

2. Soil Fertility. Nutrients can be replaced by the use of chemical fertilizers on good land. If fertilizers are available it will generally be profitable for the farmer to use them. However, salinization and water-logging probably preclude profitable double cropping on a significant portion of HAVA, and water shortage will preclude double cropping in some areas.

Table 17 shows the percent of farms which practice double cropping of corn, mung beans, cotton, and other crops (mostly vegetables) and also

TABLE 14a. AVERAGE YIELDS, IN MONS PER JERIB, BY FARM SIZE[a/]

FOR SELECTED CROPS IN SIX AREAS

AREA	Wheat								Cotton			
	Local				Improved							
	0-5[a/]	6-10	11-19	20+	0-5	6-10	11-19	20+	0-5	6-10	11-19	20+
NADI ALI	--	--	25.6	44.7	--	--	85.0	120.1	--	--	40.0	37.5
MARJA	--	--	27.2	33.9	--	--	67.0	112.6	--	--	16.0	37.1
SHAMALON	37.4	48.0	66.1	61.0	35.0	--	84.0	90.9	30.0	43.0	67.3	52.9
DARWESHAN	51.8	80.0	48.3	38.6	--	--	--	76.7	40.0	72.5	43.3	38.2
GIRISHK	49.7	30.5	49.9	39.4	148.6	63.6	125.0	89.2	40.0	--	56.2	56.7
ARGHANDAB	44.6	71.0	47.6	35.6	50.0	180.0	100.0	76.8	--	--	--	--

a/ Ranges of farm size are in jeribs.

TABLE 14b. AVERAGE YIELDS, IN MONS PER JERIB, BY FARM SIZE[a/]

FOR SELECTED CROPS IN SIX AREAS

AREA	Corn								Grapes			
	Local				Improved							
	0-5[a/]	6-10	11-19	20+	0-5	6-10	11-19	20+	0-5	6-10	11-19	20+
NADI ALI	--	--	50.0	79.4	--	--	--	161.3	--	--	--	--
MARJA	--	--	--	39.5	--	--	--	95.3	--	--	300.0	225.5
SHAMALON	65.0	92.9	82.0	72.6	--	--	92.3	77.4	305.5	--	689.6	686.1
DARWESHAN	50.0	40.0	--	47.9	--	--	--	94.2	--	--	568.0	433.3
GIRISHK	41.5	73.6	53.0	72.5	35.0	--	22.0	125.0	1,800.0	960.0	440.0	975.0
ARGHANDAB	45.0	58.5	75.3	65.8	--	--	--	--	265.1	268.5	329.9	275.3

a/ Ranges of farm size are in jeribs.

TABLE 15. FARMS REPORTING USE OF IMPROVED SEED AND HECTARES PER FARM OF IMPROVED WHEAT AND CORN

AREA	No. Farms In Sample	Farms Reporting Use of Any Improved Seed		Wheat				Corn			
				No. Wheat Farms in Sample	Farms Reporting Use of any Impr. Wheat Seed		Average Hectares Improved Wheat Per Farm	No. Corn Farms in Sample	Farms Reporting Use of any Impr. Corn Seed		Average Hectares Improved Corn Per Farm
		No.	%		No.	%			No.	%	
HELMAND:	475	-	-	465	90	19.4	.32	-	25	-	.05
NADI ALI	42	17	40	40	17	43	.8	15	4	27	.1
MARJA	40	25	63	40	25	63	1.0	17	5	29	.1
SHAMALON	62	11	18	62	11	18	.1	37	8	22	.1
DARWESHAN	40	5	12	40	4	10	.3	9	2	22	.3
KHANISHIN	40	1	2	39	-	-	-	3	1	33	1*
SERAJ	47	1	2	47	1	2	1*[a]	14	-	-	-
GIRISHK	50	15	30	50	15	30	1.0	50	3	6	1*
SANGUIN-KAJAKAI	54	14	27	52	14	27	.1	44	-	-	-
MUSA QALA-ZD	62	4	6	62	3	5	1*	38	2	5	1*
NOWZAD	38	-	-	33	-	-	-	30	-	-	-
KANDAHAR:	344	18	5.2	250	18	7.2	.12	143	2	1.4	.02
MAIWAND	37	-	-	35	-	-	-	30	-	-	-
DUND-DAMAN	129	10	8	103	10	10	.2	21	-	-	-
ARGHANDAB	103	8	8	65	8	12	.1	39	2	10	1*
PANJWAI	75	-	-	47	-	-	-	53	-	-	-
HAVA	819	111	13.6	715	108	15.1	.26	-	27	-	.03

a/ 1*-Insignificant amount.

TABLE 16. FARMS REPORTING FERTILIZER USE BY CROP, BY AREA

AREA	No. Farms in Sample N	Farms Reporting Use of Any Fertilizer		Wheat			Corn			Cotton			Fruit		
				No. Wheat Farms in Sample	Farms Reporting Fertilizer Use on Wheat		No. Corn Farms in Sample	Farms Reporting Fertilizer Use on Corn		No. Cotton Farms in Sample	Farms Reporting Fertilizer Use on Cotton		No. Fruit Growers in Sample	Farms Reporting Fertilizer Use on Fruit	
		No.	%		No.	%		No.	%		No.	%		No.	%
HELMAND:	475	108	22.7	465	83	17.8	257	24	9.3	165	34	20.6	184	-	-
NADI ALI	42	26	62	40	20	50	15	6	40	23	9	39	19	-	-
MARJA	40	33	83	40	26	65	17	6	35	33	10	30	23	-	-
SHAMALON	62	11	18	62	9	15	37	1	3	40	3	8	27	-	-
DARWESHAN	40	12	30	40	5	13	9	4	44	19	8	42	14	-	-
KHANISHIN	40	1	2	39	1	3	3	1	33	2	-	-	5	-	-
SERAJ	47	1	2	47	1	2	14	-	-	7	-	-	22	-	-
GIRISHK	50	10	20	50	9	18	50	4	8	18	2	11	11	-	-
SANGUIN-KAJAKAI	54	13	24	52	11	21	44	1	2	11	2	18	13	-	-
MUSA QALA-Z D	62	1	2	62	1	2	38	-	-	12	-	-	32	-	-
NOWZAD	38	-	-	33	-	-	30	-	-	-	-	-	18	-	-
KANDAHAR:	344	64	18.6	250	25	10.0	143	16	11.2	14	-	-	272	33	12.1
MAIWAND	37	6	16	35	-	-	30	3	10	11	-	-	21	3	10
DUND-DAMAN	129	26	20	103	17	17	21	11	52	2	-	-	88	9	10
ARGHANDAB	103	25	24	65	7	11	39	2	5	-	-	-	91	15	16
PANJWAI	75	7	9	47	1	2	53	-	-	1	-	-	72	6	8
HAVA	819	173	21.1	715	108	15.1	400	40	10.0	179	34	18.1	456	33	7.2

TABLE 17. PERCENT OF FARMS DOUBLE CROPPING AND AVERAGE HECTARES DOUBLE CROPPED PER FARM BY CROP, BY AREA

AREA	% of All Farms Double Cropping	% of All Farms Double Cropping				Average Hectares Double Cropped per Farm				
	Any Crop[a/]	Corn	Mung Beans	Cotton	Other	Corn	Mung Beans	Cotton	Other	All Crops
HELMAND:	44	35	17	8	4	.35	.10	.06	.01	.52
NADI ALI	48	28	54	19	5	.17	.31	.17	.02	.67
MARJA	60	40	13	18	5	.24	.13	.14	.10	.61
SHAMALON	59	50	28	-	-	.43	.11	.11	.02	.67
DARWESHAN	37	18	20	-	5	.17	.21	-	-[b/]	.38
KHANISHIN	20	8	20	-	5	.02	.15	-	1*[b/]	.17
SERAJ	15	13	4	2	-	.21	.03	.01	-	.25
GIRESHK	82	80	18	7	2	1.38	.09	.09	1*	1.56
SANGUIN-KAJAKAI	70	59	6	7	2	.53	.01	.06	-	.60
MUSA QALA-ZAMIN DAWAR	31	31	18	2	2	.13	.01	-	1*	.14
NOWZAD	-	-	-	-	-	-	-	-	-	-
KANDAHAR:	14	11	4	1	3	.17	.04	1*	.09	.30
MAIWAND	16	11	-	5	-	.12	-	.02	-	.14
DUND-DAMAN	10	8	3	-	5	.29	.03	-	.17	.49
ARGHANDAB	24	19	11	-	6	.14	.10	-	.05	.29
PANJWAI	4	4	-	-	-	.06	-	-	-	.06
HAVA	31	25	11	5	5	.28	.07	.03	.05	.43

a/ Wheat is the first crop; corn, mung beans, cotton are assumed to follow wheat.

b/ 1*-Insignificant amount.

the area double cropped. Table 18 shows the percentage of each crop which is grown as a second crop and total area per farm double cropped as a percentage of cropland. It would seem, from Table 18, that there is considerable potential for expanding the area double cropped.

Stevens and Tarzi reported that double cropping was "not practiced widely in Helmand Valley" and presented data on percentages of farmers who did some double cropping and percent of land double cropped in seven areas. This data is compared with 1970 FES results in Table 19. Double cropping is on the increase, especially in Helmand, and is likely to continue to increase even more rapidly in the near future because of a concerted extension effort by HAVA.

Stevens and Tarzi showed farmers' reasoning for not double cropping more. These will be discussed in Chapter V, along with comparable findings in 1970.

Most HAVA farmers practiced land leveling, which is not surprising in a country where flood irrigation is practiced almost exclusively. (Each field must be practically dead level, even if it is on a hillside). As shown in Table 20, most land leveling is done by traditional methods - oxen power and human labor. HAVA has done quite a lot of land leveling on farms in Nadi Ali and Marja, and some in Shamalon and Darweshan, using heavy equipment. Some farmers have hired machines (usually farm tractors) for leveling, primarily in Kandahar Province.

Most HAVA farmers used some credit. Table 21 shows about two thirds of all farms had some credit during the year and that the major source was from friends and relatives. Credit from HAVA is primarily fertilizer loans, but credit from all other sources could be either producer or consumer credit. Traditionally, no distinction is made between the two. Credit from moneylenders (merchants, landowners, etc.) is sometimes expensive in terms of interest or repayment in kind, but credit from friends and relatives is sometimes interest-free.

Traditional farmers in Afghanistan generally follow a water policy based on scarcity -- they use all the irrigation water they can get. Although irrigation water in HAVA is more plentiful than in most other parts of the country, the water-short areas can be identified by how seldom they irrigate. See Table 22. This table also shows that cotton requires the highest number of irrigations followed by corn, mung beans and wheat. Kandahar farmers irrigate more often than farmers in Helmand.

Water pumps

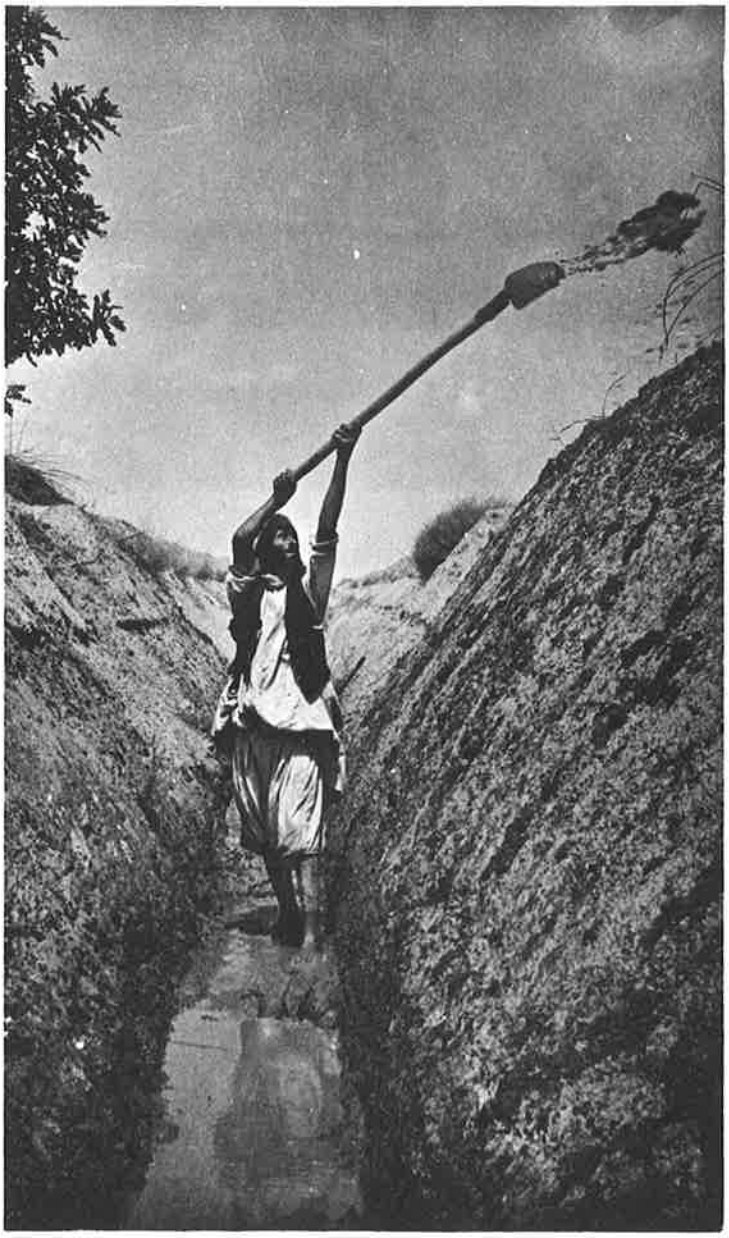
Only nine respondents (about 1 percent) in the entire 1970 FES reported owning tractors, five in Helmand and four in Kandahar. Three respondents reported owning water pumps; all in Kandahar. There were reports of four Polycultures in Helmand and five in Kandahar.

Most of the privately owned tractors in HAVA are known to be Massey-Ferguson 135's with a few Byelerous (Soviet) and International Harvester tractors. Most privately owned water pumps are diesel or gasoline powered four-inch transportable pumps from Pakistan (Beco is the most popular make). The Polyculture is an ox-drawn, multipurpose farm implement of French design made by the Jangalak Company in Kabul.

Stevens and Tarzi reported about 13 tractors in HAVA in 1963. There are probably over 200 in 1970. The number is beginning to increase rapidly as credit becomes available through the Agricultural Development Bank and the Agricultural Finance Agency of HAVA. Many farmers have both the money and inclination for tractor purchase.

HAVA Officials and Visitors Inspecting Improved Dairy Calves at Bolan Station near Lashkar Gah

HAVA Extension Agent and Area Farmers at Improved Corn Demonstration



HAVA Farmer Cleaning Drainage Ditch

Nothing was mentioned in the Stevens-Tarzi report about water pumps. No estimate of use of improved ox-drawn implements was given, although they reported research on and demonstration of such implements.

The use of gypsum, called "gotch" locally, as a soil amendment for alleviating salinization has been suggested. Only five farmers in HAVA reported the use of gypsum -- two in Sanguin and three in Dund-Daman. A considerable amount of "gotch" is produced in Southern Afghanistan for use in mortar and is available for use as a soil amendment.

A number of other new cultural practices, such as row culture, are coming to HAVA. Although not covered by the 1970 FES, these should be investigated in future studies.

TABLE 18. AREA DOUBLE CROPPED AS PERCENT OF LAND IN CROP FOR CORN, MUNG BEANS, COTTON; AND TOTAL AREA DOUBLE CROPPED AS PERCENT OF CROPLAND

AREA	Area Double Cropped As Percent of Land in Crop			Total Area Double Cropped As Percent of Cropland
	Corn	Mung Beans	Cotton	
HELMAND:	68.90	62.57	18.95	9.28
NADI ALI	52.0	63.8	34.9	14.4
MARJA	82.8	100.0	17.3	11.2
SHAMALON	86.7	75.6	21.6	15.1
DARWESHAN	46.2	58.3	-	5.0
KHANISHIN	100.0	40.0	-	1.0
SERAJ	59.3	50.0	4.6	3.9
GIRISHK	73.2	77.4	27.9	29.2
SANGUIN-KAJAKAI	80.9	36.4	54.8	33.9
MUSA QALA-ZAMIN DAWAR	44.1	50.0	-	4.7
NOWZAD	-	-	-	-
KANDAHAR:	52.02	73.02	4.54	9.17
MAIWAND	80.0	-	5.1	5.1
DUND-DAMAN	73.0	56.2	-	8.0
ARGHANDAB	35.2	98.1	-	18.7
PANJWAI	.4	-	-	.1
HAVA	63.60	64.65	17.80	9.23

TABLE 19. PERCENT OF FARMERS DOUBLE CROPPING AND PERCENT OF LAND DOUBLE CROPPED COMPARISON 1963 WITH 1970

AREA	Percent of Farmers Who Did Some Double Cropping		Percent of Land[a/] Double Cropped	
	1963	1970	1963	1970
NADI ALI	12	48	5	14.4
MARJA	37	60	6	11.2
SHAMALON	47	59	7	15.1
DARWESHAN	4	37	1	5.0
ARGHANDAB	25	24	10	18.7
DUND-DAMAN	7	10	4	8.0
PANJWAI	-	4	-	0.1

From Stevens-Tarzi Table V, page 14 and 1970 FES Tables 17 and 18.

a/ Percent of cropland double cropped in 1970. Presumably, it was the same in 1963, although this is not clear from the Stevens-Tarzi Report.

TABLE 20. FARMS REPORTING LAND LEVELING, AND METHOD BY WHICH LAND WAS LEVELED

AREA	Farms Reporting Land Leveling		Method by Which Land Was Leveled Percent of Farms Reporting Land Leveling[a/]		
	No.	%	HAVA[b/]	Custom Machine	Traditional
HELMAND:	313	66	10.9	1.3	86.6
NADI ALI	28	67	57	4	46
MARJA	30	75	63	3	33
SHAMALON	30	48	3	7	87
DARWESHAN	19	48	5	-	90
KHANISHIN	20	50	-	-	95
SERAJ	35	74	-	-	100
GIRISHK	43	96	-	-	100
SANGUIN-KAJAKAI	38	70	-	-	100
MUSA QALA-ZAMIN DAWAR	41	66	-	-	100
NOWZAD	24	63	-	-	100
KANDAHAR:	265	77	-	3.4	95.5
MAIWAND	28	76	-	-	100
DUND-DAMAN	100	78	-	3	98
ARGHANDAB	76	74	-	7	92
PANJWAI	61	81	-	2	93
HAVA	578	71	6.4	2.2	90.7

a/ May not add to 100% due to rounding and land being leveled by more than one method. Also, there was an insignificant number of reports of leveling by "other methods" and a few "no replies."

b/ See text for explanation of land leveling methods.

TABLE 21. FARMS REPORTING BORROWING AND SOURCES OF CREDIT

AREA	Farms Borrowing in 1970		Indicated Source of Credit By Percent of Borrowers[a]		
	No.	%	Friends & Relatives	HAVA[b]	Rich People (Moneylenders)
HELMAND:	302	64	45.0	40.7	17.5
NADI ALI	26	62	50	27	12
MARJA	30	75	73	37	13
SHAMALON	39	63	54	44	10
DARWESHAN	29	73	28	66	3
KHANISHIN	31	78	48	52	3
SERAJ	29	62	45	72	-
GIRISHK	20	40	50	55	-
SANGUIN-KAJAKAI	32	59	28	62	3
MUSA QALA-ZAMIN DAWAR	39	63	33	3	51
NOWZAD	27	71	44	-	70
KANDAHAR:	231	67	37.7	-	61.9
MAIWAND	31	84	32	-	64
DUND-DAMAN	81	63	43	-	59
ARGHANDAB	62	60	37	-	68
PANJWAI	57	76	33	-	58
HAVA	533	65	41.8	23.1	36.8

a/ May not add to 100% due to rounding or to borrowing from more than one source. Some reported borrowing from "other sources" (Not significant) and some borrowers did not indicate the source (also insignificant).

b/ In 1970, HAVA distributed fertilizer on credit.

TABLE 22. AVERAGE NUMBER OF IRRIGATIONS PER CROP PER YEAR, BY AREA

AREA	CROP			
	Wheat	Corn	Mung Beans	Cotton
HELMAND:	4.12	6.06	5.05	6.75
NADI ALI	5.3	5.9	6.5	8.3
MARJA	5.0	7.2	5.9	8.7
BHAMALON	4.0	5.5	5.4	6.1
DARWESHAN	3.8	5.2	3.5	5.2
KHANISHIN	3.3	2.0	3.1	2.5
SERAJ	2.8	5.8	4.9	6.2
GIRISHK	4.8	6.8	5.5	7.4
SANGUIN-KAJAKAI	4.0	6.1	4.3	6.0
MUSA QALA-ZAMIN DAWAR	4.2	5.8	5.0	4.0
NOWZAD	3.9	6.0	4.5	5.8
KANDAHAR:	4.70	6.51	5.74	8.88
MAIWAND	3.2	6.7	-	9.0
DUND-DAMAN	4.8	6.0	4.6	4.5
ARGHANDAB	5.8	6.8	6.6	8.0
PANJWAI	4.0	6.2	-	-
HAVA	4.32	6.17	5.21	6.91

CHAPTER IV

COSTS, RETURNS AND NET INCOME

Returns to farming, for purposes of the 1970 FES, come from three major sources: Value of production of field crops, of fruits and vegetables, and of livestock (excluding work animals). Total income is defined as value of production plus off-farm income.

Major categories of cost are seed, feed, depreciation and labor (both day labor and bazgar). The "Other Cost" category includes such items as taxes and interest on borrowed money.

Net income is defined as total income less costs of production and is the return to family labor, management and investment.

Table 23 summarizes Returns, Costs and Net Income. Highest net income per farm is in Dund-Daman and lowest is in Khanishin. Highest per farm income in Helmand is in the Girishk area. The study shows that net income is considerably higher in Kandahar than in Helmand, undoubtedly because much of Kandahar is an established fruit growing area, whereas large areas of Helmand are devoted to the production of extensive field crops.

Table 24 shows returns (value of production) in more detail. Table 25 is a breakdown of costs of production.

Actual costs per farm were not determined in the 1970 FES, but by a Supplemental Survey which was conducted at the same time as the 1970 FES by FES field supervisors. Table 25 shows average costs per farm. Depreciation schedules and other cost items as determined by the Supplemental Survey, are shown in Appendices VI and VII.

Prices used in valuing production were determined from the Supplemental Survey, The Sales Section of the 1970 FES and from Weekly Price Reports from HAVR. Income from livestock was determined by a separate Livestock Survey and from the Supplemental Survey. These elements of value of production are also shown in the Appendices.

Off-farm income, as shown in Table 24, is quite important to farmers in several areas.

Tables 26 and 27 show average amount of livestock and equipment per farm and value. Table 28 shows substantial increases in average per farm livestock numbers from 1963 to 1970.

Table 29 compares 1970 costs, returns and net income with data for 1963. The indicated increase in net income per farm over the seven-year period is encouraging. However, some of the increase can be attributed to inflation -- the foreign exchange rate went from 65 to 75 afs per U.S. dollar. (Very stable for this part of the world, considering that this is a free market exchange rate.) The general price structure has increased since 1963. The following comparison of farm

TABLE 23. COSTS, RETURNS AND NET INCOME IN AFS. PER FARM - BY AREA

AREA	Returns					Costs						
	Crops	Fruits and Vegetables	Livestock	Other Income	Gross Income	Seed	Feed	Depreciation	Labor	Other[c/]	Total Costs	Net Farm Income
HELMAND:						2,818	4,078	1,593	8,505	3,106	20,100	
NADI ALI	40,638	6,103	2,451	542	49,734	2,284	3,859	1,315	8,036	2,935	18,429	31,305
MARJA	38,195	5,699	2,500	755	47,149	2,581	2,712	1,223	4,458	4,400	15,374	31,775
SHAMALON	45,389	7,276	4,922	1,831	59,418	2,204	4,357	1,733	9,915	2,208	20,417	39,001
DARWESHAN	45,851	7,764	3,610	2,332	59,557	3,605	3,846	1,665	14,013	4,385	27,514	32,043
KHANISHIN[a/]	42,879	1,161	3,633	135	47,808	9,851	5,751	2,857	21,908	4,021	44,388	3,420
SERAJ	24,128	2,419	3,469	4,322	34,338	2,999	4,455	1,682	7,878	2,368	19,382	14,956
GIRISHK	52,123	10,654	4,531	4,843	72,151	2,619	5,652	2,047	17,013	4,423	31,754	40,397
SANGUIN-KAJAKAI	22,052	3,480	2,950	1,472	29,954	962	3,270	1,072	2,622	1,324	9,250	20,704
MUSA QALA-Z D	20,871	8,024	3,719	8,097	40,711	1,376	2,901	1,102	4,205	2,933	12,517	28,194
NOWZAD	10,738	1,846	2,371	1,755	16,710	1,353	2,092	863	2,576	2,894	9,768	6,942
KANDAHAR:						2,918	3,188	1,402	18,763	6,170	32,441	
MAIWAND	53,860	29,655	3,334	2,682[b/]	89,531	3,673	4,106	1,571	13,044	6,856	29,250	60,281
DUND-DAMAN	45,330	49,575	3,421	46,413[b/]	144,739	4,398	3,407	1,662	25,686	6,930	42,083	102,656
ARGHANDAB	25,027	39,711	2,497	12,317	79,552	1,019	2,207	953	10,977	4,368	19,524	60,028
PANJWAI	24,607	80,555	3,034	4,877	113,073	2,591	3,128	1,404	22,271	8,391	37,785	75,288
HAVA						2,854	3,690	1,513	12,814	4,393	25,264	

a/ Highly suspect cost figures - explained in texts. Labor costs are unrealistically high.

b/ High figure due primarily to large amounts of off-farm income of three farmers who own large blocks of income-producing property in Kandahar city.

c/ Fertilizer and chemicals, interest on borrowed money, and land tax.

TABLE 24a. VALUE OF PRODUCTION IN AFS., PER CROP, PER FARM - BY AREA

AREA	CROPS										
	Wheat		Corn		Barley	Mung Beans	Clover	Alfalfa	Cotton	Other Field Crops	All Field Crops
	Local	Improved	Local	Improved							
HELMAND:					87	600	443	865		31	
NADI ALI	17,506	12,337	2,530	1,050	10	2,075	262	798	4,070	--	40,638
MARJA	14,529	14,108	1,127	827	17	369	19	916	6,283	--	38,195
SHAMALON	30,551	1,446	3,956	794	92	387	381	1,751	6,031	--	45,389
DARWESHAN	31,354	2,782	794	2,615	101	1,939	24	274	5,968	--	45,851
KHANISHIN	41,843	--	317	--	64	612	2	41	--	--	42,879
SERAJ	19,816	--	1,481	--	52	94	6	440	2,239	--	24,128
GIRISHK	15,005	11,991	14,361	260	112	750	2,325	2,984	4,066	269	52,123
SANGUIN-KAJAKAI	10,150	2,423	6,845	--	43	222	738	515	907	209	22,052
MUSA QALA-Z D	14,059	2,909	2,535	--	183	49	273	302	559	2	20,871
NOWZAD	9,570	--	945	--	163	--	--	60	--	--	10,738
KANDAHAR:					954	306	7	2,239		1,892	
MAIWAND	47,058	--	234	--	1,078	57	3	1,474	3,956	-- [a/]	53,860
DUND-DAMAN	36,837	2,307	1,921	155	1,394	387	15	1,147	189	978 [b/]	45,330
ARGHANDAB	11,523	1,478	2,656	--	81	518	--	3,678	--	5,093	25,027
PANJWAI	19,728	--	834	--	1,335	--	4	2,517	189	--	24,607
HAVA					451	477	259	1,441		813	

a/ Tobacco

b/ Rice

TABLE 24b. VALUE OF PRODUCTION IN AFS., PER CROP, PER FARM - BY AREA - FRUITS, NUTS, MELONS, AND VEGETABLES

AREA	Grapes	Pome-granates	Apricots	Mul-berries	Peaches	Almonds	Other Fruits & Nuts	Melons	Water-melons	Vegetables[a/]	All Fruits Nuts and Vegetables
HELMAND:				6	13	26	898	75	191	300	
NADI ALI	4,056	570	1,012	--	19	--	66	--	380	--	6,103
MARJA	2,817	1,672	37	--	--	--	224	240	709	--	5,699
SHAMALON	5,066	515	526	--	44	--	210	184	251	480	7,276
DARWESHAN	6,552	178	33	--	--	--	450	--	51	500	7,764
KHANISHIN	758	--	--	--	--	--	--	--	403	--	1,161
SERAJ	1,479	118	198	--	--	--	64	--	--	560	2,419
GIRISHK	5,811	205	506	60	52	--	2,117	296	227	1,380	10,654
SANGUIN-KAJAKAI	2,727	165	128	--	--	--	412	--	48	--	3,480
MUSA QALA-Z D	2,783	554	618	--	--	--	4,069	--	--	--	8,024
NOWZAD	789	274	253	--	--	330	200	--	--	--	1,846
KANDAHAR:				458	299	86	299	3	117	994	
MAIWAND	27,466	182	293	99	900	640	7	25	43	--	29,655
DUND-DAMAN	38,198	4,237	4,128	752	--	--	501	--	179	1,580	49,575
ARGHANDAB	18,350	11,059	7,248	506	675	56	326	--	151	1,340	39,711
PANJWAI	78,975	330	1,126	63	--	--	61	--	--	--	80,555
HAVA				196	133	51	654	45	161	593	

a/ Does not include value of home gardens less than ½ jerib.

TABLE 24c. VALUE OF PRODUCTION IN AFS., PER FARM - BY AREA - LIVESTOCK

OTHER INCOME IN AFS. AND SOURCE OF OTHER INCOME IN PERCENT

AREA	Milk Cows	Sheep & Goats	Hens	Other Poultry	All Livestock	Total Value of Production	Other Income	Source of Other Income Percent of Reports[c/] N[a/]	HAVA	Business	Labor	Other[b/]
HELMAND:	2,378	864	267	1	3,510		2,862	95	12.4	14.3	49.5	23.8
NADI ALI	1,891	303	257	-	2,451	49,192	542	5	33	17	50	--
MARJA	1,501	799	200	-	2,500	46,394	755	3	--	33	67	--
SHAMALON	4,028	477	417	-	4,922	57,587	1,831	11	--	25	75	--
DARWESHAN	2,281	1,101	228	-	3,610	57,225	2,332	6	16	16	68	--
KHANISHIN	1,306	2,211	116	-	3,633	47,673	135	1	--	--	100	--
SERAJ	2,866	346	255	2	3,469	30,016	4,322	13	7	7	36	50
GIRISHK	3,276	921	330	4	4,531	67,308	4,843	14	23	18	35	24
SANGUIN-KAJAKAI	2,379	294	277	-	2,950	28,482	1,472	15	7	13	60	20
MUSA QALA-Z D	2,203	1,190	326	-	3,719	32,614	8,097	19	9	17	48	26
NOWZAD	877	1,363	130	1	2,371	14,955	1,775	8	22	--	56	22
KANDAHAR:	2,426	411	211	3	3,051		22,445	141	21.1	14.1	45.8	19.0
MAIWAND	2,106	969	259	-	3,334	86,849	2,682	13	15	--	46	39
DUND-DAMAN	2,671	544	202	4	3,421	98,326	46,413	65	31	14	43	12
ARGHANDAB	2,125	141	226	5	2,497	67,235	12,317	35	13	25	32	30
PANJWAI	2,574	278	182	-	3,034	108,196	4,877	28	16	6	68	10
HAVA	2,398	674	243	2	3,317		11,087	236	16.1	13.1	51.3	19.5

a/ N - number of respondents reporting other income

b/ Includes a significant number of reports of sale of firewood in Seraj and Arghandab; few reports in Girishk, Nowzad and Panjwai. If firewood is from their own farm, it should properly be considered farm income. This was not determined by the 1970 FES, but it is known that some farmers dig stumps on public lands and others sell dead trees from their own land.

c/ Columns may not add up to 100% as some respondents had more than one source of income.

TABLE 25a. COSTS OF PRODUCTION IN AFS, PER FARM - BY AREA

SEED, FEED, FERTILIZER, TAXES, INTEREST AND LABOR

AREA	Seed		Feed				Fertilizer and Chemicals	Land Tax	Interest on Borrowed Money	Labor	
	Wheat	Other	Oxen	Donkey	Camel	Horse				Part Time	Bazgar
HELMAND:	2,493	325	3,600	330	100	48	877	444	1,785	3,215	5,290
NADI ALI	1,897	387	3,550	285	--	24	1,716	356	863	2,813	5,223
MARJA	2,168	413	2,375	225	100	12	2,399	304	1,697	3,126	1,332
SHAMALON	1,843	361	3,975	261	55	66	903	284	1,021	2,605	7,310
DARWESHAN	3,089	516	3,175	456	185	30	1,574	441	2,370	4,220	9,793
KHANISHIN	9,593	258	4,750	456	485	60	26	1,392	2,603	9,795	12,113
SERAJ	2,818	181	4,050	300	105	--	219	557	1,592	3,230	4,648
GIRISHK	1,897	722	5,050	450	80	72	1,742	382	2,299	3,595	13,418
SANGUIN-KAJAKAI	704	258	2,925	333	--	12	335	130	859	1,303	1,319
MUSA QALA-ZAMIN DAWAR	1,247	129	2,450	318	25	108	103	400	2,430	1,615	2,590
NOWZAD	1,301	52	1,775	222	65	30	--	386	2,498	1,563	1,013
KANDAHAR:	2,639	279	2,725	381	10	72	1,344	768	4,058	2,065	16,698
MAIWAND	3,415	258	3,650	390	--	66	891	945	5,020	2,117	10,927
DUND-DAMAN	4,011	387	2,825	492	--	90	1,512	1,121	4,297	2,856	22,830
ARGHANDAB	813	206	1,850	291	--	66	1,034	329	3,005	1,020	9,957
PANJWAI	2,385	206	2,725	315	40	48	1,628	685	6,078	2,117	20,154
HAVA	2,547	307	3,225	351	60	54	1,073	580	2,740	2,732	10,082

TABLE 25b. COST OF PRODUCTION IN AFS. PER FARM - BY AREA

AREA	DEPRECIATION								Total Depreciation
	Livestock				Equipment				
	Oxen	Donkey	Camel	Horse	Plow	Mallah	Shovel	Other Equipment a/	
HELMAND:	851	94	98	31	181	3	94	241	1,593
NADI ALI	839	81	--	16	86	3	90	200	1,315
MARJA	561	64	98	8	182	5	75	230	1,223
SHAMALON	940	74	54	43	220	4	211	187	1,733
DARWESHAN	751	129	181	19	175	4	86	320	1,665
KHANISHIN	1,123	129	473	39	215	5	97	776	2,857
SERAJ	957	85	102	--	197	2	79	260	1,682
GIRISHK	1,194	128	78	47	272	2	100	226	2,047
SANGUIN-KAJAKAI	691	94	--	8	139	3	56	81	1,072
MUSA QALA-ZAMIN DAWAR	579	90	24	70	150	2	63	124	1,102
NOWZAD	420	63	63	19	116	7	47	128	863
KANDAHAR:	582	164	8	30	126	2	158	332	1,402
MAIWAND	780	168	--	28	135	4	102	354	1,571
DUND-DAMAN	603	212	--	38	144	3	202	460	1,662
ARGHANDAB	395	125	--	28	103	1	143	158	953
PANJWAI	582	135	33	20	125	4	156	349	1,404
HAVA	738	123	60	31	158	3	121	279	1,513

a/ Includes sickles, harness, other implements. Tractor depreciation is not included. If calculated at cost = 450,000 afs, life = 10 years and salvage value = 100,000 afs and averaged for all areas; tractor depreciation would be about 385 afs per farm.

TABLE 26. WORK ANIMALS AND EQUIPMENT, AVERAGE VALUE PER ITEM, AVERAGE NUMBER PER FARM, AND AVERAGE TOTAL VALUE PER FARM, BY AREA

AREA	Oxen		Donkey		Horse		Camel		Plow		Mallah		Shovel		Average Value/Farm
	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value	
HELMAND:	1.44	5,395.9	1.10	655.0	.08	3,656.3	.20	4,293.4	1.81	115.2	.18	32.4	2.95	50.6	9,571.2
NADI ALI	1.42	6,056	.95	800	.04	4,750	--	--	.86	198	.16	6	2.80	54	9,873
MARJA	.95	8,821	.75	819	.02	2,670	.20	3,000	1.82	127	.25	60	2.35	51	10,574
SHAMALON	1.59	6,433	.87	731	.11	3,254	.11	4,545	2.20	100	.20	35	6.58	32	12,202
DARWESHAN	1.27	3,248	1.52	630	.05	7,000	.37	5,135	1.75	90	.20	5	2.70	58	7,648
KHANISHIN	1.90	4,573	1.52	704	.10	4,500	.97	3,118	2.15	59	.27	61	3.02	73	13,597
SERAJ	1.62	4,557	1.00	560	--	--	.21	3,547	1.97	86	.10	40	2.48	50	8,985
GIRISHK	2.02	5,901	1.50	591	.12	3,000	.16	3,750	2.72	174	.12	36	3.14	45	14,384
SANGUIN-KAJAKAI	1.17	5,236	1.11	793	.02	1,850	--	--	1.39	148	.17	27	1.74	52	7,344
MUSA QALA-ZAMIN DAWAR	.98	4,938	1.06	628	.18	3,206	.05	6,120	1.50	88	.11	27	1.97	53	6,628
NOWZAD	.71	3,844	.74	222	.05	3,900	.13	4,254	1.16	78	.37	30	1.47	48	4,036
KANDAHAR:	1.09	5,436.0	1.27	972.2	.12	3,012.3	.02	3,000.0	1.29	141.7	.13	71.3	3.58	57.2	9,165.6
MAIWAND	1.46	5,350	1.30	612	.11	2,700	--	--	1.38	119	.19	58	2.32	61	9,220
DUND-DAMAN	1.13	6,577	1.64	1,226	.15	3,273	--	--	1.47	168	.14	86	4.60	54	10,443
ARGHANDAB	.74	4,573	.97	1,269	.11	3,854	--	--	1.05	108	.05	60	3.26	57	6,359
PANJWAI	1.09	4,701	1.05	306	.08	1,562	.08	3,000	1.28	154	.19	68	3.55	61	10,796
HAVA	1.29	5,412.8	1.17	788.2	.09	3,369.4	.12	4,079.8	1.59	126.3	.16	48.7	3.22	53.4	9,400.8

TABLE 27. INCOME PRODUCING LIVESTOCK, AVERAGE VALUE PER HEAD, AVERAGE NUMBER PER FARM AND AVERAGE VALUE OF ALL INCOME PRODUCING LIVESTOCK PER FARM, BY AREA

AREA	Milk Cows				Sheep		Goats		Chickens				Other Fowl		Average
	Local		Improved						Local		Improved				
	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value	
HELMAND:	1.20	3,795.8	.04	10,049.0	4.32	625.2	.70	389.1	3.54	45.1	.05	64.4	.08	168.6	7,653.1
NADI ALI	.88	4,605	.09	7,667	1.04	791	.59	771	3.15	44	.07	61	--	--	6,164
MARJA	.70	4,136	.07	13,214	2.82	410	1.52	299	2.25	42	.25	60	--	--	5,539
SHAMALON	2.04	4,090	.08	9,175	2.58	693	.09	522	6.93	53	.03	50	--	--	11,277
DARWESHAN	1.15	3,930	.02	15,000	5.75	545	.25	400	2.85	41	.18	50	--	--	8,255
KHANISHIN	.67	4,118	--	--	10.55	600	1.40	393	1.45	51	--	--	--	--	9,711
SERAJ	1.46	4,275	--	--	.68	650	1.45	254	3.19	44	--	--	.06	117	6,075
GIRISHK	1.58	3,476	.10	11,500	4.62	896	.36	389	4.12	45	.62	100	.62	100	11,228
SANGUIN-KAJAKAI	1.20	3,514	.02	5,550	1.35	755	.24	412	3.46	41	--	--	.04	100	5,593
MUSA QALA-ZAMIN DAWAR	1.13	3,211	--	--	6.05	547	.35	266	4.08	44	--	--	--	--	7,207
NOWZAD	.59	2,766	--	--	6.05	244	1.71	297	1.68	44	--	--	.05	420	3,715
KANDAHAR:	1.24	3,753.9	1*[a]	22,436.7	1.89	758.5	.29	553.0	2.64	49.4	.01	100.0	.01	100.0	6,464.1
MAIWAND	1.08	3,641	.03	13,500	3.27	630	.49	1,396	3.24	44	--	--	--	--	7,222
DUND-DAMAN	1.37	4,394	.13	25,000	2.83	677	.06	483	2.53	49	--	--	.09	100	8,486
ARGHANDAB	1.09	3,104	--	--	.73	945	.04	475	2.82	52	.01	100	--	--	4,240
PANJWAI	1.32	3,601	--	--	1.08	706	.15	273	2.27	49	--	--	--	--	5,667
HAVA	1.22	3,778.2	1*	14,578.5	3.30	681.2	.53	449.6	3.16	46.9	.03	75.2	.05	140.8	7,153.7

a/ 1*-Insignificant amount.

TABLE 28. LIVESTOCK, AVERAGE NUMBER PER FARM - COMPARISON 1963 WITH 1970

AREA	Work Animals								Income Producing Livestock							
	Oxen		Donkey		Horse		Camel		Cattle+		Sheep & Goats		Chickens		Other Poultry	
	1963	1970	1963	1970	1963	1970	1963	1970	1963	1970	1963	1970	1963	1970	1963	1970
NADI ALI	.63	1.42	.38	.95	.01	.04	.14	-	.60	.97	2.54	1.63	2.06	3.22	.03	-
MARJA	.88	.95	.46	.75	.04	.02	.02	.20	.99	.77	3.76	4.34	2.00	2.50	.07	-
SHAMALON	1.16	1.59	.52	.87	.09	.11	.10	.11	2.16	2.12	.76	2.67	2.90	6.96	.12	-
DARWESHAN	1.00	1.27	.51	1.52	.04	.05	.25	.37	1.52	1.17	1.80	6.00	1.60	3.03	-	-
ARGHANDAB	.75	.74	.55	.97	.04	.11	-	-	1.58	1.09	.30	.77	4.12	2.83	-	-
DUND-DAMAN	.53	1.13	.46	1.64	.04	.15	-	-	1.34	1.50	.23	2.89	.67	2.53	-	.09
PANJWAI	.69	1.09	.42	1.05	.03	.08	.04	.08	1.31	1.32	.58	1.23	1.75	2.27	-	-

TABLE 29. COSTS, RETURNS AND NET INCOME, COMPARISON 1963 WITH 1970

AREA	Gross Income		Total Costs		Net Income	
	1963[a/]	1970[b/]	1963	1970	1963	1970
NADI ALI	3,940	49,734	4,062	18,429	-122	31,305
MARJA	7,325	47,149	4,617	15,374	2,707	31,775
SHAMALON	21,934	59,418	15,492	20,417	6,442	39,001
DARWESHAN	27,473	59,557	20,315	27,514	7,158	32,043
ARGHANDAB	15,119	79,552	10,263	19,524	4,856	60,028
DUND-DAMAN	18,243	144,739	16,254	42,083	125	102,656
PANJWAI[c/]	13,379	113,073	8,554	37,785	5,299	75,288

a/ From Stevens-Tarzi Table VIII, page 44.

b/ From 1970 FES Table 23.

c/ In 1963, Stevens-Tarzi reported Panjwai-Maiwand combined; the 1970 FES treated them separately. For this table, 1970 data is for Panjwai only because Stevens-Tarzi had only a few interviews in Maiwand.

commodity prices in afs per mon shows the increase:

	1963[a/]	1970[b/]
WHEAT	15	28
CORN	9	23
COTTON	19	43
GRAPES	12	14
POMEGRANATES	6	12

Although commodity prices increased significantly, so did costs of production.

By no means all of the farms in HAVA are subsistence farms; most farms reported some sales. Wheat, fruit and cotton are the important cash crops, but many farms also produce other field crops, vegetables and livestock products for sale. Value of production is not affected by whether the farmer sold or consumed the production from his farm. However, average sales per farm are shown in Table 30, and compared with total value of production as a measure of the extent to which farms have become commercialized. Table 31 shows the amount of sales in mons, unit prices in afs and value of sales in afs (amount x price) for major commodities and value of sales for combined and miscellaneous categories.. If necessary, mons can be converted to kilograms as follows: 1 mon = 4.416 kg. Or 1 kg. = .2264 mon. U.S. $1.00 = afs 75 in 1970. Table 31 shows which crops are commercially important in each area.

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a/ Prices used by Stevens and Tarzi for value of production.

b/ Prices used by FES for value of production.

TABLE 30. SALES SUMMARY (AFS. PER FARM) AND SALES PER FARM AS PERCENT OF VALUE PRODUCTION PER FARM, BY AREA

AREA	Wheat	All Other Field Crops	Grapes	All Other Fruits, Nuts & Vegetables	Livestock Products	Misc.	TOTAL Value of Sales Afs	TOTAL Sales as % of Value of Production
HELMAND:								
NADI ALI	5,147	7,308	315	1,103	155	356	14,384	29
MARJA	3,279	7,291	375	460	5	23	11,433	25
SHAMALON	2,715	6,723	1,746	1,478	372	10	13,044	23
DARWESHAN	5,439	10,042	3,125	405	261	107	19,379	34
KHANISHIN	4,175	245	170	--	241	--	4,831	10
SERAJ	1,803	2,370	223	81	532	1,313	6,322	21
GIRISHK	5,197	9,319	160	1,259	1,107	486	17,528	26
SANGUIN-KAJAKAI	697	2,731	37	52	57	16	3,590	13
MUSA QALA-ZAMIN DAWAR	1,787	674	680	368	284	584	4,377	13
NOWZAD	625	18	--	1,251	38	7	1,939	13
KANDAHAR:								
MAIWAND	5,058	3,434	770	8,334	241	--	17,837	21
DUND-DAMAN	6,505	1,858	6,992	37,224	54	4,193	56,826	58
ARGHANDAB	1,036	1,926	10,657	21,606	97	1,282	36,604	54
PANJWAI	280	960	1,210	38,355	98	43	40,946	38

TABLE 31a. SALES--N[a/] AMOUNT, PRICE, AND INCOME FROM SALES PER FARM BY ITEM, BY AREA

AREA	Wheat				Corn				Mung Beans				Cotton				Other Field Crops	
	N[a/]	Amt. Mons[b/]	Afs Per Mon	Income Afs	N	Amt. Mons	Afs Per Mon	Income Afs	N	Amt. Mons	Afs Per Mon	Income Afs	N	Amt. Mons	Afs Per Mon	Income Afs	N	Total Afs
HELMAND:	138	114	26.1	2,965	80	63	23.5	1,481	49	9	25.5	237	148	97	41.8	4,061	2	5
NADI ALI	21	188	28	5,147	8	90	24	2,190	10	31	26	806	22	120	36	4,312	-	-
MARJA	16	115	28	3,279	4	33	34	1,109	5	8	19	158	29	137	44	6,024	-	-
SHAMALON	21	115	24	2,715	17	39	23	888	6	10	33	314	40	134	41	5,521	-	-
DARWESHAN	16	224	24	5,439	8	133	26	3,512	10	26	23	580	18	138	43	5,885	2	65
KHANISHIN	17	186	22	4,175	1	3	20	50	3	8	24	195	-	-	-	-	-	-
SERAJ	11	60	30	1,803	3	8	23	183	-	-	-	-	5	50	44	2,187	-	-
GIRISHK	10	192	27	5,197	21	246	21	5,206	10	11	26	293	17	97	39	3,820	-	-
SANGUIN-KAJAKAI	11	24	29	697	12	73	24	1,750	4	5	27	131	10	20	42	850	-	-
MUSA QALA-Z D	11	60	30	1,787	5	6	20	114	1	(.2)	27	7	7	13	43	553	-	-
NOWZAD	4	21	29	625	1	1	20	18	-	-	-	-	-	-	-	-	-	-
KANDAHAR:	44	110	30.6	3,359	53	46	25.3	1,164	16	8	33.9	252	13				3	61
MAIWAND	9	168	30	5,058	1	5	23	124	-	-	-	-	11	76	44	3,310	-	-
DUND-DAMAN	22	217	30	6,505	14	68	24	1,662	6	4	32	140	2	2	36	56	-	-
ARGHANDAB	10	28	36	1,036	27	64	16	1,056	10	20	34	667	-	-	-	-	3	203
PANJWAI	3	8	35	280	1	40	24	960	-	-	-	-	-	-	-	-	-	-
HAVA	182	112	27.0	3,131	133	56	24.1	1,348	65	9	28.5	243	161	60	41.9	2,518	5	29

a/ N = No. farms reporting sales.

b/ 1 mon = 4.416 kg. or 1 kg. = .2264 mon.
U.S. $1.00 = Afs. 75 in 1970. Stevens and Tarzi used exchange rate of U.S. $1.00 = Afs. 65 in 1963.

Note: Amount and price have been rounded for convenience. Figures in income column are products of amount times price before rounding. Amount is average amount sold per farm, Including farms that reported no sales (Total amount sold per area in mons divided by total number of sampled farms in that area).

TABLE 31b. SALES--N[a/], AMOUNT, PRICE, AND TOTAL INCOME FROM SALES PER FARM, BY ITEM, BY AREA

AREA	Grapes				Pomegranates				Apricots				Raisins				Other Fruits And Nuts	
	N[a/]	Amt. Mons	Afs Per Mon	Income Afs	N	Amt. Mons	Afs Per Mon	Income Afs	N	Amt. Mons	Afs Per Mon	Income Afs	N	Amt. Mons	Afs Per Mon	Income Afs	N	Income Afs
HELMAND:	27	33	18.4	617	7	5	12.9	62	7	2	22.9	42	3	1	17.7	14	35	378
NADI ALI	3	20	16	315	-	-	-	-	-	-	-	-	1	7	10	71	5	1,032
MARJA	1	38	10	375	-	-	-	-	-	-	-	-	-	-	-	-	3	460
SHAMALON	7	86	20	1,746	3	23	13	309	3	4	16	70	-	-	-	-	4	698
DARWESHAN	3	110	28	3,125	-	-	-	-	-	-	-	-	-	-	-	-	1	45
KHANISHIN	2	10	17	170	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SERAJ	2	10	22	223	-	-	-	-	-	-	-	-	-	-	-	-	1	81
GIRISHK	2	8	20	160	1	1	20	24	2	12	26	301	1	1	10	8	3	176
SANGUIN-KAJAKAI	1	4	10	37	-	-	-	-	-	-	-	-	-	-	-	-	3	52
MUSA QALA-Z D	6	68	10	680	2	5	10	50	-	-	-	-	1	1	70	56	5	262
NOWZAD	-	-	-	-	1	13	12	158	2	(.3)	35	11	-	-	-	-	10	1,082
KANDAHAR:	80	298	20.7	6,166	61	163	19.5	3,186	36	99	25.1	2,499	142	359	58.9	21,163	57	2,227
MAIWAND	4	54	14	770	2	9	12	108	1	1	20	22	9	77	107	8,204	-	-
DUND-DAMAN	25	274	26	6,992	17	133	19	2,560	11	81	23	1,872	43	592	55	31,317	11	455
ARGHANDAB	41	590	18	10,657	41	374	20	7,379	23	200	27	5,401	19	46	44	2,056	40	5,887
PANJWAI	10	55	22	1,210	1	1	10	7	1	40	20	800	71	525	69	36,209	6	1,339
HAVA	107	144	20.4	2,944	68	71	19.3	1,371	43	43	25.1	1,071	145	151	58.7	8,881	92	1,153

a/ N = number of farms reporting sales.

TABLE 31c. SALES--N[a/] AND TOTAL INCOME FROM SALES PER FARM, BY ITEM, BY AREA

AREA	Vegetables		Livestock		Miscellaneous[b/]	
	N[a/]	Income Afs	N	Income Afs	N	Income Afs
HELMAND:	7	161	48	320	33	302
NADI ALI	-	-	3	155	10	356
MARJA	-	-	1	5	2	23
SHAMALON	4	401	5	372	2	10
DARWESHAN	1	360	4	261	3	107
KHANISHIN	-	-	5	241	-	-
SERAJ	-	-	5	532	5	1,313
GIRISHK	2	750	8	1,107	6	486
SANGUIN-KAJAKAI	-	-	5	57	2	16
MUSA QALA-ZAMIN DAWAR	-	-	8	284	2	584
NOWZAD	-	-	4	38	1	7
KANDAHAR:	23	647	13	97	48	1,968
MAIWAND	-	-	3	241	-	-
DUND-DAMAN	11	1,020	2	54	36	4,193
ARGHANDAB	12	883	4	97	8	1,282
PANJWAI	-	-	4	98	4	43
HAVA	30	365	61	226	81	1,001

a/ N = number of farms reporting sales.

b/ Includes hides, wool, ghee, eggs, firewood, straw, etc. See Q.17, Appendix I.

CHAPTER V

FARMER ATTITUDES AND PROBLEMS

Many HAVA farmers appear to respond quite well to financial incentives, as evidenced by the rather widespread adoption of new farming practices in a few short years.

A marketing system exists through which incentive can operate, although many experts can see a great need for improvement as specialization and commercialization continue. Cotton, most fruits, some vegetables and a few specialty crops are primarily cash crops -- produced for sale through an established market. In addition, a significant part of the HAVA wheat crop is marketed, especially in good years. See Chapter IV.

The 1970 FES concerned itself to some extent with farmer attitudes and problems, as did Stevens and Tarzi in 1963.

MAJOR FARM PROBLEMS

Table 32 shows how farmers perceived their own problems (problems of farmers in their area). For HAVA and Helmand, water shortage was mentioned most often. In Kandahar, lack of capital seemed to be the major problem. Water shortage was the major problem only in areas without access, or with poor access, to major water sources. These include Khanishin, Seraj, Kajakai, Musa Qala-Zamin Dawar and Nowzad in Helmand and Maiwand and parts of Panjwai in Kandahar Province. Water shortage was mentioned as a problem in all areas; only in Nadi Ali and Arghandab could it be considered insignificant. It is probably true in this arid nation that water shortage is expected and therefore many farmers will mention it out of habit, even though modern developments have changed the traditional situation. In Marga, for example, where 18 percent of the respondents mentioned water shortage as a problem, it is known that adequate water was available and that more than the optimum amount of water was actually used. Inequities in distribution may have caused some needless shortages.[a/]

Lack of capital was the second most widely perceived problem. Unlike water shortage, it was rather uniformly recognized in all areas.

Salinization and its usual cause, high water table, was the third most important problem mentioned by HAVA farmers. According to Table 32, this problem was most serious in Darweshan, Dund-Daman, Girishk and Sanguin-Kajakai. It was not considered by farmers as significant in the water-short areas of Seraj, Musa Qala-Zamin Dawar, Nowzad and

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a/ Author's note. As this publication goes to press in the fall of 1971 there is an acute water shortage over most of Afghanistan due to two years of drouth. Arghandab reservoir became dry during the summer of 1971 and Kajakai is alarmingly low at present.

TABLE 32. MAJOR FARM PROBLEMS, IN PERCENTS, BY AREA

AREA	Poor Land	Salinization, High Water Table	Water Shortage Bad Dam	Lack of Capital	Weeds	Insects	Not Enough Land	Lack of Machinery	Other
HELMAND:	1.9%	21.9	54.7	27.4	2.9	0.8	1.7	9.3	12.0
NADI ALI	-	33	2	26	2	-	-	24	13
MARJA	5	20	18	35	8	-	-	-	15
SHAMALON[a/]	3	11	32	18	2	5	-	16	3
DARWESHAN	-	65	30	22	-	-	-	-	42[b/]
KHANISHIN	-	32	88	32	2	-	-	20	2
SERAJ	6	4	85	19	-	-	-	6	16
GIRISHK	2	42	30	40	-	-	8	12	4
SANGUIN-KAJAKAI	-	43	63	33	4	2	4	9	-
MUSA QALA-ZAMIN DAWAR	2	2	94	29	10	-	-	3	13
NOWZAD	-	-	100	18	-	-	5	-	
KANDAHAR:	7.0	34.3	29.6	41.3	24.7	2.9	3.8	4.6	7.6
MAIWAND	5	3	92	24	3	-	-	-	19[c/]
DUND-DAMAN	4	64	16	59	37	2	4	-	3
ARGHANDAB	16	11	5	27	34	8	6	11	14[d/]
PANJWAI	1	31	57	39	1	-	3	7	1
HAVA	4.0	27.1	44.2	33.2	12.1	1.7	2.6	7.3	10.1

Percentages by area may add to more than 100% because some farmers mentioned more than one problem. Question asked was "What are the major problems of farmers in this area?" (Question 27, Appendix 1) Question 27 was unstructured, replies categorized during editing.

a/ 10% of Shamalon farmers reported "No major problems," bringing the total to 100%.
b/ 35% "Bad Transportation."
c/ 14% "No improved seed and fertilizer."
d/ 10% "No improved seed and fertilizer."

Maiwand.

Problems of "poor land" and "not enough land" were mentioned by relatively few HAVA farmers. Only in Arghandab, an area of relatively high yields, did a significant number of farmers perceive poor land as a major problem.

Weeds as a problem were perceived mostly in Dund-Daman and Arghandab in Kandahar Province -- in the fruit growing area.

Insects were seldom mentioned as a problem -- only in Arghandab and Shamalon to any significant degree.

In the "Other" category, farmers in Khanishin complained about the lack of transportation in their area, and farmers in the Kandahar areas of Maiwand and Arghandab claimed improved seeds and chemical fertilizer were not sufficiently available to meet their needs.

REASONS FOR WATER SHORTAGE

Table 33 shows that over half the farmers in HAVA felt that they did not have enough water and the main reason was that there just wasn't enough water to go around during the summer months. Water shortage seemed to be more acute in Kandahar than Helmand, although essentially all farmers in Khanishin, Seraj and Musa Qala-Zamin Dawar reported water shortage.

Many farmers in areas where there had been little or no irrigation development complained of a poor (diversion) dam.[a/] Farmers in developed areas who had insufficient water sometimes complained of being discriminated against because they were near the end of the irrigation ditch.

Kariz irrigation is practiced to a significant extent only in Musa Qala-Zamin Dawar, Nowzad and Maiwand, where there were significant reports of "Dry Karizes."

Economic problems causing water shortage were mentioned mostly in Arghandab and Dund-Daman. This refers primarily to lack of funds for purchasing water pumps or to pay labor for maintaining irrigation ditches.

The fact that significant numbers of farmers in developed areas (where water is adequate) reasoned their water shortage problems were due to their being near the end of the irrigation ditch (juei) seems to point to a need for better water policies. This sort of reasoning strikes terror into the thoughts of many development workers because it implies needed changes in local customs and power structures. However, it is an example of worthwhile gains in productivity which can be obtained through administrative and policy channels. It is encouraging to note that HAVA and particularly HAVR are aware of this problem and have mounted a campaign to institute water policy and water management reforms.

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a/ Traditional diversion dams are rather temporary structures and frequently wash out with spring floods.

TABLE 33. WATER AVAILABILITY, PERCENT OF FARMS REPORTING INSUFFICIENT WATER

REASONS FOR SHORTAGE AS A PERCENT OF THOSE REPORTING NOT ENOUGH WATER AND PERCENT OF FARMS REPORTING SALINIZATION PROBLEMS, BY AREA

AREA	Percent of Farms Reporting Insufficient Water	Reasons For Shortage								Percent of Farms With Salinization Problems
		Lateral Too Small	End of Juei	Dry Kariz	Poor Dam	Shortage In Summer	Economic Problems	Other	No Reply	
HELMAND:	49.9	8.0%	8.0	19.9	41.8	62.0	3.0	14.8	-	48.6
NADI ALI	14.3	16	67	-	-	-	-	-	17	71
MARJA	15.0	-	67	-	-	-	-	40	-	68
SHAMALON	32.2	-	25	-	10	20	-	30	15	36
DARWESHAN	37.5	7	-	7	7	60	-	13	6	55
KHANISHIN	100.0	8	-	8	90	38	8	10	-	82
SERAJ	95.7	18	-	-	53	47	-	27	-	53
GIRISHK	40.0	10	-	-	50	25	10	15	-	58
SANGUIN-KAJAKAI	59.3	-	-	-	67	-	-	-	33	54
MUSA QALA-ZAMIN DAWAR	93.5	-	12	33	52	92	3	3	-	11
NOWZAD	100.0	10	-	63	5	97	-	8	-	10
KANDAHAR:	64.5	9.9	3.9	4.1	10.8	32.0	33.1	2.3	-	51.5
MAIWAND	97.3	25	14	33	6	64	8	13	-	30
DUND-DAMAN	77.5	7	-	1	14	58	34	2	-	73
ARGHANDAB	29.1	23	-	-	30	10	37	7	-	16
PANJWAI	76.0	20	9	2	21	46	2	5	-	75
HAVA	56.0	11.5	6.3	13.0	29.6	56.0	26.4	16.6	-	49.8

Percentages by area may add to more than 100% because some farmers mentioned more than one reason for the water shortage. Question was unstructured and replies were categorized in editing.

REASONS FOR NOT USING ALL LAND

Farmers who did not grow crops on all land gave water shortage as the major reason for not doing so. Economic problems were the only other overall significant reason. Poor land was mentioned in several areas, and fertilizer shortage was given as an important reason in Marja and Seraj. See Table 34.

REASONS FOR NOT USING CHEMICAL FERTILIZER

Reasons for not using chemical fertilizer were given as too expensive, not enough water, and fertilizer not available; in that order of importance. See Table 35

REASONS FOR NOT DOUBLE CROPPING

Respondents were asked about double cropping -- reasons for not double cropping were ascertained from those who reported no double cropping and reasons for not double cropping more land were ascertained from those who reported some double cropping. See questions 11, 12 and 13, Appendix 1.

Table 36 shows that "lack of water" was the major reason for not double cropping, followed by "poor land" and "lack of capital." "Salinization" was specifically mentioned to a significant extent, and could be considered about the same as "poor land." "Reluctance" was the fifth most important reason for not double cropping. Lack of fertilizer and weed problems were mentioned by a significant number of farmers. As the farmer's awareness of modern cultural practices increases, he can be expected to recognize more and more the importance of chemical fertilizer, herbicides, pesticides and insecticides as measures enabling him to farm more intensively.

At the HAVA level, reasons for not double cropping more land followed the same pattern as reasons for not double cropping any land. "Poor land" and "lack of capital" were relatively more important. See Table 37

Water shortage has shaped up as the major problem, even though HAVA is certainly beset by water shortage to a much lesser extent than Afghanistan as a whole. As previously mentioned, many farmers probably complain of water shortage out of habit, or according to tradition. However, water shortage, in its several manifestations, is still a major problem in HAVA.

TABLE 34. PERCENT OF FARMS W/CROPS ON ALL IRRIGABLE LAND AND REASONS FOR THOSE NOT GROWING CROPS ON ALL LAND, IN PERCENTS, BY AREA

AREA	Percent Crops On All Land	Reasons for Not Growing Crops on All Land							
		Labor Shortage	Water Shortage	Seed Shortage	Fertilizer Shortage	Poor Land	Economic Problems	Other	No Reply
HELMAND:	37.0	1.4%	47.3	1.4	6.0	8.6	7.1	8.5	24.8
NADI ALI	40	4	4	4	4	9	-	17	57
MARJA	48	-	25	6	25	12	-	-	32
SHAMALON	48	4	30	-	7	11	11	11	52
DARWESHAN	55	-	22	-	-	-	28	22	28
KHANISHIN	40	2	54	2	5	2	8	10	17
SERAJ	28	-	88	-	20	6	-	12	-
GIRISHK	40	3	38	-	3	31	3	7	14
SANGUIN-KAJAKAI	43	-	36	3	3	16	13	-	42
MUSA QALA-ZAMIN DAWAR	16	-	69	-	-	-	-	2	29
NOWZAD	13	-	60	-	-	7	13	7	17
KANDAHAR:	37.2	1.4	56.1	1.4	2.8	8.4	15.1	25.8	4.2
MAIWAND	8	-	81	-	3	6	6	-	6
DUND-DAMAN	28	-	71	1	3	3	8	39	-
ARGHANDAB	56	7	27	2	2	11	27	29	16
PANJWAI	39	-	38	2	2	22	24	15	-
HAVA	37.1	1.4	51.5	1.4	4.7	8.5	10.5	16.0	16.0

Area percentages may add to more than 100% as some respondents cited more than one reason.

TABLE 35. REASONS FOR NOT USING CHEMICAL FERTILIZER, IN PERCENTS, BY AREA

AREA	Didn't Know a/	Too Expensive	Not Available	Poor Land	No Water	Used Manure	Other	No Reply
HELMAND:	-	17.7%	21.3	1.7	18.1	2.1	9.0	30.1
NADI ALI	-	7	27	7	-	-	20	39
MARJA	-	14	71	-	-	-	14	11
SHAMALON	-	31	6	2	22	20	4	-
DARWESHAN	-	50	25	21	-	-	4	-
KHANISHIN	-	3	41	-	10	-	28	18
SERAJ	-	6	24	-	69	-	-	15
GIRISHK	-	42	18	-	2	-	5	33
SANGUIN-KAJAKAI	-	24	47	-	17	-	12	-
MUSA QALA-ZAMIN DAWAR	-	28	22	-	40	-	10	-
NOWZAD	-	10	42	-	37	-	5	16
KANDAHAR:	20.4	33.1	19.0	3.0	29.0	3.0	7.1	-
MAIWAND	10	20	3	-	77	-	13	-
DUND-DAMAN	20	24	21	9	39	5	4	-
ARGHANDAB	23	45	23	-	6	4	5	-
PANJWAI	24	38	19	-	19	-	10	-
HAVA	8.7	27.3	24.0	2.5	25.9	2.8	8.2	6.2

Area percentages may add to more than 100% as some respondents cited more than one reason.

a/ Not informed about the advantages of chemical fertilizer.

TABLE 36. REASONS FOR NOT DOUBLE CROPPING, IN PERCENT OF THOSE NOT DOUBLE CROPPING, BY AREA

AREA	Lack of Water	Poor Land	Reluc-tance	Lack of Fertilizer	Lack of Capital	Salini-zation	Weeds	Other	No Reply
HELMAND:	61.5%	19.1	4.3	2.5	11.5	9.0	-	9.7	3.2
NADI ALI	9	41	-	9	23	9	-	9	-
MARJA	12	19	-	6	44	31	-	75	-
SHAMALON	29	34	-	-	6	-	-	29	9
DARWESHAN	12	32	4	4	24	16	-	4	8
KHANISHIN	84	9	3	3	12	34	-	9	-
SERAJ	95	2	-	-	5	2	-	-	-
GIRISHK	22	56	33	-	-	11	-	11	-
SANGUIN-KAJAKAI	100	31	38	6	6	6	-	-	-
MUSA QALA-Z D	86	7	2	-	-	-	-	-	7
NOWZAD	80	10	-	2	12	-	-	-	2
KANDAHAR:	44.9	20.7	2.5	1.1	4.0	3.2	1.8	13.3	13.3
MAIWAND	55	13	6	3	-	6	3	-	16
DUND-DAMAN	64	17	-	-	1	5	3	5	5
ARGHANDAB	22	40	1	2	9	-	-	37	1
PANJWAI	38	7	6	-	4	3	4	4	45
HAVA	53.1	19.9	3.4	1.8	7.6	6.0	.9	11.7	8.2

Percents may add to more than 100% because some respondents reported more than one reason for not double cropping.

TABLE 37. REASONS FOR NOT DOUBLE CROPPING MORE LAND, IN PERCENT OF THOSE DOING SOME DOUBLE CROPPING, BY AREA

AREA	Lack of Water	Poor Land	Reluc-tance	Lack of Fertilizer	Lack of Capital	Salini-zation	Weeds	Other	No Reply
HELMAND:	22.5%	19.6	7.6	4.8	12.4	4.3	9.5	3.8	23.9
NADI ALI	15	30	-	10	45	10	-	-	-
MARJA	-	4	8	16	29	4	-	21	16
SHAMALON	5	14	11	3	8	-	-	5	54
DARWESHAN	13	41	13	-	13	20	-	-	-
KHANISHIN	88	25	-	-	-	-	-	-	-
SERAJ	43	14	14	-	14	-	-	-	29
GIRISHK	22	39	2	5	5	5	5	2	15
SANGUIN-KAJAKAI	13	10	16	3	5	3	-	-	50
MUSA QALA-Z D	84	-	-	-	-	-	-	-	16
NOWZAD	-	-	-	-	-	-	-	-	-
KANDAHAR:	28.8	33.9	1.7	5.1	16.9	27.1	16.9	23.7	6.8
MAIWAND	67	-	17	-	-	-	-	-	17
DUND-DAMAN	28	40	-	4	20	44	40	48	16
ARGHANDAB	21	42	-	8	21	12	-	-	-
PANJWAI	25	-	-	-	-	50	-	25	-
HAVA	23.9	22.8	6.3	4.8	13.4	9.3	4.5	8.2	18.6

Percents may add to more than 100% because some respondents reported more than one reason for not double cropping more land.

CHAPTER VI

EXPANSION OF SAMPLE DATA

Data from the Farm Economic Survey, as reported in the foregoing chapters, was obtained from a random sample of HAVA farms, and reported on a per farm, or average per farm, basis. In order to obtain data for the universe (HAVA) the total number of farms must be known, or estimated. Unfortunately, this statistic is not available. However, HAVR has what are believed to be reliable estimates of cropland for the ten Helmand areas and four Kandahar areas. When total cropland per area is divided by average cropland per farm (FES Table 8) an estimate of number of farms is obtained, as shown in Table 38.

For expansion purposes, number of farms per sub-area, obtained by division, are assumed to be correct, and are added to obtain number of farms for Helmand, Kandahar and subsequently for HAVA. The reader will note that number of farms in Helmand, Kandahar and HAVA, obtained by addition, do not agree with the number as obtained by dividing total cropland by cropland per farm for Helmand, Kandahar and HAVA. This is because average cropland per farm for Helmand, Kandahar and HAVA, as reported in Tables 8 and 9, are averages weighted by sample size. Since sample size is not in proportion to number of farms per area or to amount of cropland per area (these were unknown quantities at time of enumeration), a more appropriate weighting of cropland per farm can be obtained by dividing total cropland by number of farms in Helmand, Kandahar and HAVA as obtained by addition. See Table 38 for derivation of number of farms and adjusted average cropland per farm figures. Table 45 shows other adjusted statistics for Helmand, Kandahar and HAVA; reweighted by estimated number of farms.

POPULATION

Table 38 also shows how number of farms is used to expand FES data, in this case - average family size from Table 5. Family size times number of farms by areas within Helmand and Kandahar yields farm population by area. These are added to obtain subtotals and total for HAVA, and, when divided back by the appropriate numbers of farms, provide revised averages of family size for Helmand, Kandahar and HAVA. These revised averages differ from those in Table 5 in that they are weighted by estimated number of farms rather than by sample size.

Population figures shown in Table 38 do not include bazgars, bazgar families or farm laborers, nor do they include the non-farm population (urban or city dwellers, rural artisans, officials, etc.). Although many farm laborers and some bazgars have already been counted as members of farm families, an estimate of bazgar families might give

TABLE 38. DERIVATION OF NUMBER OF FARMS AND EXPANSION OF FARM FAMILY SAMPLE DATA IN HAVA, BY AREA - 1970

'75 - Land owned

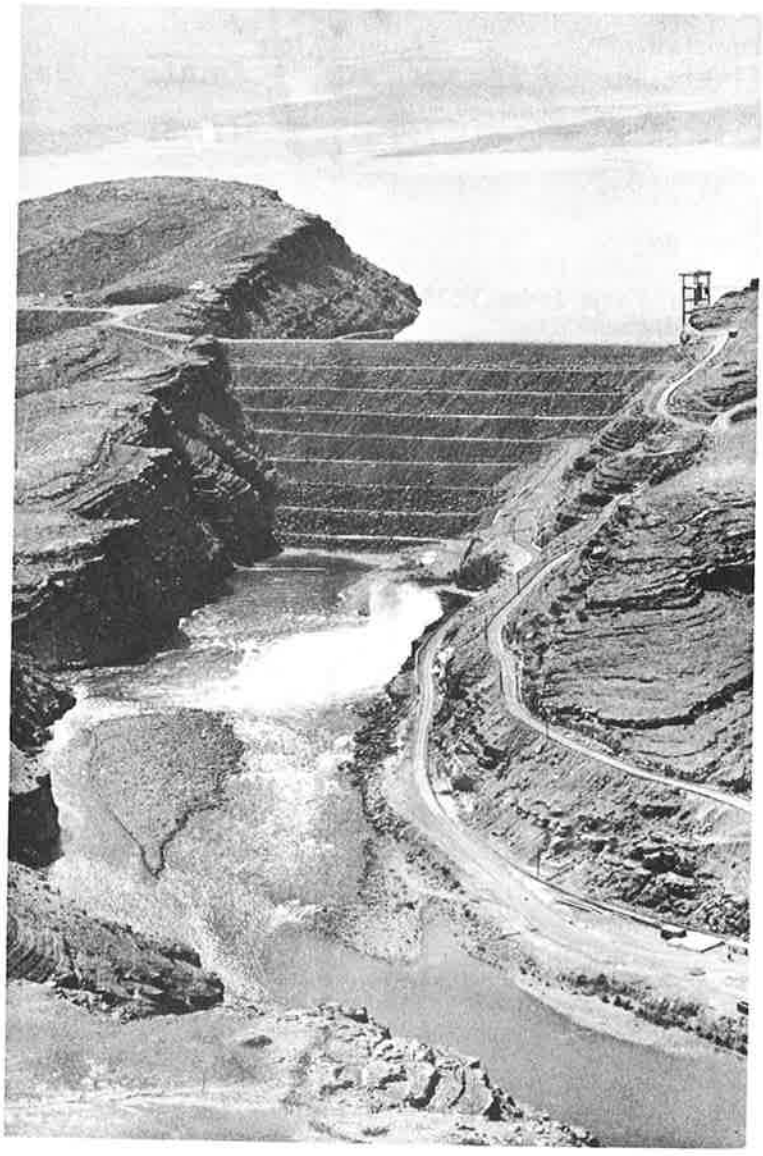
AREA	Total Cropland Hectares[a/] (1)	Average Cropland per Farm Hectares: Table 8, FES (2)	Average Cropland per Farm Hectares: Adjusted (3)	Number of Farms: First Approximation (4)	Number of Farms: Final Adjustment (5)	Expansion of Farm Families: Av. Family Size (6)	Expansion of Farm Families: Av. Family Size-Adj. (7)	Expansion of Farm Families: Farm Family Population[b/] (8)
HELMAND:	90,100	5.65	4.90	15,947	18,387	9.49	9.54	175,502
NADI ALI	9,190	4.72	4.72 · 6.24	1,947	1,947	8.7	8.7	16,939
MARJA	6,300	5.39	5.39 · 5.37	1,169	1,169	8.6	8.6	10,053
SHAMALON	14,900	4.43	4.43 · 4.96	3,363	3,363	9.5	9.5	31,949
DARWESHAN	11,500	7.54	7.54 9.19	1,525	1,525	8.1	8.1	12,353
KHANISHIN	14,500	18.19	18.19 38.25	797	797	6.8	6.8	5,420
SERAJ	9,350	6.07	6.07	1,540	1,540	10.2	10.2	15,708
GIRISHK	9,200	5.33	5.33 6.87	1,726	1,726	11.1	11.1	19,159
SANGUIN-KAJAKAI	6,100	1.89	1.89 3.22	3,228	3,228	9.4	9.4	30,343
MUSA QALA-ZAMIN DAWAR	6,200	2.92	2.92 8.74	2,123	2,123	11.8	11.8	25,051
NOWZAD	2,860	2.95	2.95 6.39	969	969	8.8	8.8	8,527
KANDAHAR:	39,960	7.79	6.54	5,130	6,111	13.01	12.43	75,937
MAIWAND	5,100	8.32	8.32	613	613	11.5	11.5	7,050
DUND-DAMAN	13,440	10.75	10.75	1,250	1,250	14.9	14.9	18,625
ARGHANDAB	10,890	3.69	3.69	2,967	2,967	11.5	11.5	34,121
PANJWAI	10,530	8.22	8.22	1,281	1,281	12.6	12.6	16,141
HAVA	130,060	6.55	5.31	19,856	24,498	10.97	10.26	251,439

a/ Total cropland estimates provided by HAVR.

b/ Not including bazgars and hired laborers.

Pomegranates in the Marja Area

Demonstrating an Improved Ox-Drawn Plow to HAVA Farmers



Kajakai Dam and Reservoir Regulate the Flow of the Helmand River, Assuring an Even Supply of Irrigation Water to Thousands of HAVA Farmers and Providing Electrical Power for a Large Portion of Southern Afghanistan

a clearer picture of farm population in HAVA.

Area	Farm Population (Table 38)	Bazgar Population a/ No. per Farm	Bazgar Population a/ Total	Farm Population Including Bazgars
Helmand	175,502	.764	112,381	287,883
Kandahar	74,301	1.968	96,211	170,512
HAVA	249,803	---	208,592	458,395

a/ No. bazgars per farm from 1970 FES. Estimated bazgar family size = 8 provided by HAVR.

LAND USE

Table 39 is an expansion of parts of Table 8, showing total cropland in HAVA by area, land in wheat and other field crops, land in fruits - nuts - vegetables and area double cropped. Total land in farms and idle land can be easily obtained, if necessary, by multiplying number of farms in each area (col. 5, Table 38) times data in the appropriate column of Table 8. Data for subtotals and total must be obtained by addition rather than multiplication, as explained above.

LAND IN CROPS

Expansion of data from Table 9 was done for all areas in HAVA.

See Table 40 for total land devoted to production of various crops in 1970.

LIVESTOCK NUMBERS

Expansion of data from Tables 26 and 27 shows only livestock owned by farmers, excluding livestock owned by nomads. Most of the camels in HAVA are owned by nomads, as are a large proportion of the cattle and even fewer draft animals.

See Table 41 for estimates of farm livestock holdings in HAVA.

VALUE OF PRODUCTION, NET FARM INCOME AND SALES

Table 42 shows the value of important crops and income producing livestock in HAVA, by province and project area. Total value of production and net farm income are also shown. Expanded data for value of other crops, for costs of production, gross farm income, and off-farm income can be obtained by multiplying number of farms (Table 38) times average farm data in Tables 23, 24 and 25. Adjusted data for Helmand, Kandahar and HAVA are shown in Tables 45 and 46. Table 42 shows total value of production of over 1.3 billion afs and a net farm income in excess of .9 billion afs. Table 43 shows farm sales of almost .43 billion afs which is about one third of total value of production.

TABLE 39. LAND USE - HECTARES PER AREA

AREA	Cropland	Wheat	Other Field Crops	Fruits, Nuts & Vegetables	Land in Crops	Area Double Cropped
HELMAND:	89,943	71,150	23,740	5,572	100,694	10,406
NADI ALI	9,151	6,814	2,920	779	10,513	1,363
MARJA	6,313	4,676	1,870	584	7,014	701
SHAMALON	14,797	11,434	4,708	673	16,815	2,354
DARWESHAN	11,438	8,692	3,050	610	12,352	610
KHANISHIN	14,505	14,107	797	80	14,984	159
SERAJ	9,394	8,008	1,078	462	9,548	308
GIRISHK	9,148	6,041	4,833	1,036	11,910	2,762
SANGUIN-KAJAKAI	6,133	4,196	3,228	323	8,070	1,937
MUSA QALA-ZAMIN DAWAR	6,157	4,883	1,062	637	6,582	212
NOWZAD	2,908	2,326	194	388	2,908	-
KANDAHAR:	40,070	23,198	5,887	12,503	41,588	1,704
MAIWAND	5,088	3,862	613	613	5,088	61
DUND-DAMAN	13,500	9,250	1,875	2,875	14,000	625
ARGHANDAB	10,978	4,450	2,374	5,044	11,868	890
PANJWAI	10,504	5,636	1,025	3,971	10,632	128
HAVA	130,013	94,348	29,627	18,075	142,282	12,110

Area figures may not add across due to rounding.

TABLE 40. LAND IN CROPS - HECTARES PER AREA

AREA	Wheat		Corn		Cotton	Alfalfa & Clover	Mung Beans	Barley	Other Field Crops	Grapes	Pome-granates	Apricots	Other Fruits, Nuts & Melons	Vege-tables
	Local	Impr.	Local	Impr.										
HELMAND:	65,281	5,681	9,043	896	6,005	3,859	2,747	1,513	124	1,867	287	417	2,218	726
NADI ALI	5,393	1,499	526	117	974	331	935	-	-	253	39	39	506	39
MARJA	3,495	1,146	281	94	935	386	152	12	-	164	-	-	210	187
SHAMALON	10,862	404	1,379	269	1,682	1,043	437	34	-	303	34	34	202	135
DARWESHAN	8,266	412	214	381	1,068	214	534	671	-	259	61	76	107	61
KHANISHIN	14,059	-	16	-	-	16	271	486	-	32	-	-	64	-
SERAJ	8,085	-	539	-	262	154	62	62	-	231	15	62	77	62
GIRISHK	4,315	1,726	3,176	35	570	828	190	52	17	173	35	35	501	242
SANGUIN-KAJAKAI	3,744	452	2,130	-	387	613	129	32	97	129	32	32	194	-
MUSA QALA-Z D	4,756	42	637	-	127	255	21	106	-	255	42	42	212	-
NOWZAD	2,306	-	145	-	-	19	10	58	10	68	29	97	145	-
KANDAHAR:	22,397	619	1,975	25	229	1,718	392	1,308	503	8,441	1,144	1,101	1,035	652
MAIWAND	3,886	-	92	-	178	153	6	190	6	503	6	6	49	49
DUND-DAMAN	8,950	263	488	25	25	750	63	363	200	2,150	163	238	88	188
ARGHANDAB	3,976	356	1,216	-	-	623	297	89	297	1,958	949	831	860	415
PANJWAI	5,585	-	179	-	26	192	26	666	-	3,830	26	26	38	-
HAVA	87,678	6,300	11,018	921	6,234	5,577	3,133	2,821	627	10,308	1,431	1,518	3,253	1,378

TABLE 41. LIVESTOCK - NO. BY AREA

AREA	Milk Cows		Sheep	Goats	Chickens		Other Fowl	Oxen	Donkey	Horse	Camel
	Local	Improved			Local	Improved					
HELMAND:	23,504	1,065	62,386	10,755	71,054	1,645	1,339	25,202	19,861	1,329	2,772
NADI ALI	1,713	175	2,025	1,149	6,133	136	-	2,765	1,850	78	-
MARJA	818	82	3,257	1,777	2,630	292	-	1,111	877	23	234
SHAMALON	6,865	269	7,802	303	23,306	101	-	5,347	2,926	370	370
DARWESHAN	1,754	301	8,769	381	4,346	46	-	1,937	2,318	76	564
KHANISHIN	534	-	8,408	1,116	1,156	-	-	1,514	1,211	80	773
SERAJ	2,248	-	1,047	2,233	4,913	-	92	2,495	1,540	-	323
GIRISHK	2,727	173	7,974	621	7,111	1,070	1,070	3,487	2,589	207	276
SANGUIN-KAJAKAI	3,874	65	4,358	775	11,169	-	129	3,777	3,583	65	-
MUSA QALA-ZAMIN DAWAR	2,399	-	12,844	743	8,662	-	-	2,081	2,250	382	106
NOWZAD	572	-	5,862	1,657	1,628	-	48	688	717	48	126
KANDAHAR:	7,300	347	7,943	686	16,424	30	113	4,747	5,917	683	102
MAIWAND	662	184	2,005	300	1,986	-	-	895	797	67	-
DUND-DAMAN	1,713	163	3,538	75	3,163	-	113	1,413	2,050	188	-
ARGHANDAB	3,234	-	2,166	119	8,367	30	-	2,196	2,878	326	-
PANJWAI	1,691	-	234	192	2,908	-	-	243	192	102	102
HAVA	30,804	1,412	70,329	11,441	87,478	1,675	1,452	29,949	25,778	2,012	2,874

TABLE 42. VALUE OF PRODUCTION - BY ENTERPRISE, BY AREA (000 Afs)

AREA	Wheat	Cotton	Corn	Grapes	Pome-granates	Apricots	Milk Cows	Sheep & Goats	Hens	Total Cost of Production	Net Farm Income [a]
HELMAND:	443,210	59,232	86,589	66,605	7,575	6,980	46,777	13,488	5,251	350,405	507,020
NADI ALI	58,104	7,924	6,970	7,897	1,109	1,970	3,682	590	500	35,881	60,951
MARJA	33,476	7,345	2,285	3,293	1,955	44	1,755	934	234	17,972	37,145
SHAMALON	103,228	20,283	15,974	17,037	1,733	1,768	13,546	1,604	1,402	68,662	131,160
DARWESHAN	52,058	9,102	5,197	9,991	271	50	3,479	1,679	348	41,959	48,866
KHANISHIN	33,349	-	253	604	-	-	1,041	1,762	92	35,377	2,726
SERAJ	30,516	3,447	2,281	2,280	182	305	4,414	533	393	29,848	23,032
GIRISHK	46,596	7,017	25,237	10,029	353	873	5,654	1,590	570	54,807	69,725
SANGUIN-KAJAKAI	40,586	2,928	22,095	8,802	532	412	7,679	949	894	29,859	66,833
MUSA QALA-Z D	36,023	1,186	5,381	5,908	1,175	1,312	4,677	2,526	692	26,574	59,856
NOWZAD	9,274	-	916	764	265	245	850	1,321	126	9,465	6,727
KANDAHAR:	141,624	2,904	11,815	220,207	38,647	23,642	14,231	2,048	1,315	176,864	439,819
MAIWAND	28,847	2,425	143	16,837	111	179	1,290	594	159	17,930	36,952 [b]
DUND-DAMAN	48,930	236	2,595	47,747	5,297	516	3,339	680	252	52,604	128,320 [b]
ARGHANDAB	38,575	-	7,881	54,456	32,813	21,505	6,305	418	671	57,928	178,103
PANJWAI	25,272	242	1,197	101,167	427	1,442	3,297	356	233	48,403	96,444
HAVA	584,834	62,136	98,404	286,812	46,222	30,623	61,008	15,536	6,566	527,270	946,839

a/ Includes off-farm income.

b/ Unusually large amount of off-farm income in Dund-Daman (58,016,250 Afs).

TABLE 43. SALES - BY ENTERPRISE, BY AREA (000 Afs)

AREA	Wheat	All Other Field Crops	Grapes	Other Fruits, Nuts & Vegetables	Livestock	Miscellaneous	Total
HELMAND:	53,003	90,869	14,006	12,734	5,703	5,077	181,392
NADI ALI	10,021	14,229	613	2,148	302	693	28,006
MARJA	3,833	8,523	438	538	6	27	13,365
SHAMALON	9,131	22,609	5,872	4,971	1,251	34	43,868
DARWESHAN	8,294	15,314	4,766	618	398	163	29,553
KHANISHIN	3,327	195	135	-	192	-	3,849
SERAJ	2,777	3,650	343	125	819	2,022	9,736
GIRISHK	8,970	16,085	276	2,173	1,911	839	30,254
SANGUIN-KAJAKAI	2,250	8,816	119	168	184	52	11,589
MUSA QALA-ZAMIN DAWAR	3,794	1,431	1,444	781	603	1,240	9,293
NOWZAD	606	17	-	1,212	37	7	1,879
KANDAHAR:	14,665	11,372	42,381	164,877	630	9,100	243,025
MAIWAND	3,101	2,105	472	5,109	148	-	10,935
DUND-DAMAN	8,131	2,323	8,740	46,530	68	5,241	71,033
ARGHANDAB	3,074	5,714	31,619	64,105	288	3,804	108,604
PANJWAI	359	1,230	1,550	49,133	126	55	52,453
HAVA	67,668	102,241	56,387	177,611	6,333	14,177	424,417

FARMS USING IMPROVED SEEDS AND FERTILIZER

In 1970, 4,212 HAVA farms (about 17 percent) used improved seeds and 5,632 (23 percent) used chemical fertilizer, according to Table 44 which is an expansion of data in Tables 15 and 16. This is probably far above the national average for fertilizer and improved seed use.

TABLE 44. NUMBER OF FARMS USING IMPROVED SEEDS AND FERTILIZER

AREA	All Crops		Wheat		Corn		Cotton[a/]	Fruit
	Improved Seed	Chemical Fertilizer	Improved Seed	Chemical Fertilizer	Improved Seed	Chemical Fertilizer	Chemical Fertilizer	Chemical Fertilizer
HELMAND:	3,875	4,457	3,799	3,483	899	876	1,269	-
NAD! ALI	779	1,207	779	935	195	273	428	-
MARJA	736	970	736	760	93	175	292	-
SHAMALON	605	605	605	504	437	67	168	-
DARWESHAN	183	458	152	198	46	92	183	-
KHANISHIN	24	24	-	24	24	24	-	-
SERAJ	31	31	31	31	-	-	-	-
GIRISHK	518	345	518	311	104	138	69	-
SANGUIN-KAJAKAI	872	775	872	678	-	65	129	-
MUSA QALA-ZAMIN DAWAR	127	42	106	42	-	42	-	-
NOWZAD	-	-	-	-	-	-	-	-
KANDAHAR:	337	1,175	337	412	59	220	-	714
MAIWAND	-	98	-	-	-	49	-	49
DUND-DAMAN	100	250	100	162	-	112	-	88
ARGHANDAB	237	712	237	237	59	59	-	475
PANJWAI	-	115	-	13	-	-	-	102
HAVA	4,212	5,632	4,136	3,895	958	1,096	1,269	714

a/ The 1970 FES assumes all, or nearly all cotton seed in HAVA is of an improved variety.

TABLE 45a. REVISED DATA FOR HELMAND, KANDAHAR AND HAVA

AVERAGE PER FARM

WEIGHTED BY ESTIMATED NUMBER OF FARMS PER AREA

	HELMAND	KANDAHAR	HAVA
Average Farm Size - Hectares	7.33	12.15	8.53
Cropland per Farm - Hectares	4.90	6.54	5.31
Area Double Cropped - Hectares	.57	.28	.49
Land in Crops - Hectares	5.48	6.81	5.81
Family Size - No. Persons	9.54	12.43	10.26
Area Planted - Hectares:			
Wheat - Local	3.55	3.67	3.58
Wheat - Improved	.31	.10	.26
Corn - Local	.49	.32	.45
Corn - Improved	.05	-	.04
Cotton	.33	.04	.25
Alfalfa & Clover	.21	.28	.23
Mung Beans	.15	.06	.13
Barley	.08	.21	.12
Other Field Crops	-	.08	.03
Grapes	.10	1.38	.42
Pomegranates	.02	.19	.06
Apricots	.02	.18	.06
Other Fruits, Nuts and Melons	.12	.17	.13
Vegetables	.04	.11	.06
No. Animals Per Farm:			
Milk Cows - Local	1.28	1.19	1.25
Milk Cows - Improved	.06	.06	.06
Chickens - Local	3.86	2.59	3.57
Chickens - Improved	.09	1*a/	.07
Sheep	3.39	1.30	2.87
Goats	.58	.11	.47
Oxen	1.37	.78	1.22
Donkeys	1.08	.97	1.05

a/ 1*-Insignificant amount.

TABLE 45b. REVISED DATA FOR HELMAND, KANDAHAR AND HAVA

AVERAGE PER FARM

WEIGHTED BY ESTIMATED NUMBER OF FARMS PER AREA

	HELMAND	KANDAHAR	HAVA
Value of Production - Afs:			
Wheat	24,257	23,135	23,977
Cotton	3,253	397	2,541
Corn	4,671	1,877	3,974
Grapes	3,489	32,189	10,791
Pomegranates	430	5,803	1,770
Apricots	480	4,173	1,401
Milk Cows	2,544	2,329	2,490
Sheep & Goats	734	335	634
Hens	286	215	268
Livestock - Total	3,564	2,883	3,394
Costs of Production - Afs:			
Seed	2,455	3,243	2,652
Feed	3,977	2,836	3,692
Depreciation	1,515	1,312	1,464
Labor	9,228	14,823	10,623
Other	1,983	4,743	2,672
Sales Per Farm - Afs:			
Wheat	2,883	2,400	2,762
Other Field Crops	4,942	1,861	4,173
Grapes	762	6,935	2,302
Other Fruits, Nuts & Vegetables	693	26,980	7,250
Livestock	310	103	259
Miscellaneous	276	1,489	579
Total	9,865	39,769	17,325
Total Value of Production - Afs	43,890	84,148	53,934
Other Income - Afs	2,742	16,765	6,240
Gross Income - Afs	46,632	100,913	60,174
Costs of Production - Afs	19,057	28,942	21,523
Net Farm Income - Afs	27,575	71,971	38,651

TABLE 46. YIELDS FOR MAJOR CROPS - IN MONS PER JERIB

AVERAGE PER FARM

WEIGHTED BY ESTIMATED NUMBER OF FARMS PER AREA[a/]

AREA	HELMAND	KANDAHAR	HAVA
Local Wheat	45.9	48.1	46.5
Improved Wheat	104.5	82.5	99.7
Local Corn	70.9	56.6	67.4
Improved Corn	113.8	-	113.8
Barley	45.0	33.3	41.4
Mung Beans	31.1	32.6	31.4
Rice	43.0	173.2	91.7
Cotton	45.6	62.9	46.2
Clover	576.5	-	576.5
Alfalfa	539.7	1,554.3	792.8
Grapes	460.2	274.6	414.9
Pomegranates	272.6	309.3	282.0
Apricots	220.8	256.1	229.9
Peaches	156.6	119.0	137.1
Figs	138.9	83.8	118.9
Peanuts	20.7	201.1	117.1
Watermelons	583.3	788.5	645.9
Carrots	326.7	503.5	428.0

a/ In case of average yields, weighting by number of farms per area, as in this table, may be less appropriate than weighting by relative importance of crop per area. See Table 11.

APPENDIX I

1970 FES FIELD SCHEDULE English Version

Code No._____ Schedule No._____

Interviewer's Name:_____ _____

1. Village _____ Region _____
   Area _____ Province _____
2. Number in Family _____
3. Males: 0-12 years _____ 13 and over _____
4. Able to work in fields: 0-12 _____ 13 and over _____

*

6. For Tenants Only:

	YES	NO
Do you provide seed?	___	___
Do you provide oxen?	___	___
Do you provide labor?	___	___
Do you provide water?	___	___

7. Number Jeribs farmed, not owned _____
   Number Jeribs rented in _____
   Number Jeribs shared in _____
   Number Jeribs garowed in _____

8. For Owners Only:
   No. jeribs owned _____
   No. jeribs rented out _____
   No. jeribs shared out _____
   No. jeribs garowed out _____
   No. jeribs planted by owner _____
   No. jeribs planted by others _____
   No. jeribs idle land _____
   No. keshtegars _____
   No. bazgars _____

9.

Crop	Jeribs	Yield	Total Production	Tenant's Share
Local Wheat				
Improved Wheat				
Barley				
Cotton				
Rice				
Clover				
Alfalfa				
Chick Peas				
Local Corn				
Improved Corn				
Mung Beans				
Other				

Fruits	Jeribs	No. Vines/Trees	Yield/Tree	Total Production
Grapes				
Pomegranates				
Apricots				
Peaches				
Figs				
Almonds				
Peanuts				
Other				

* No Question 5 due to mistake in numbering.

10.

VEGETABLES	Jeribs	Sq. Meters	No. Plants	Yield	Production	Tenant's Share
Carrots						
Onions						
Watermelon						
Melon						
Spinach						
Cucumber						
Squash						
Eggplant						
Lettuce						
Pepper						
Turnips						
Chambarkial						
Leeks						
Radishes						
Okra						
Tomatoes						
Other						

11. Did you double crop last year? YES ___ NO ___

12. How many jeribs: Corn _____
Cotton _____
Mung Beans _____
Other _____

13. a) If yes, why not more?
b) If no, why not?

14. Did you have any income from sources other than farming? YES___ NO___
How much? _____
Source of income or place of employment _____
(Be sure to list all sources)

*

16.

LIVESTOCK	NUMBER	VALUE
Oxen		
Local Cattle		
Improved Cattle		
Sheep		
Donkeys		
Horses		
Camels		
Goats		
Local Chickens		
Improved Chickens		
Turkeys		
Geese & Ducks		
Other		

17. S A L E S

PRODUCT	Quantity	Unit	Unit Price	Total Price	Sold To
Wheat					
Cotton					
Corn					
Barley					
Rice					
Mung Beans					
Grapes					
Raisins					
Pomegranates					
Apricots					
Dried Apricots					
Peaches					
Figs					

* Due to mistake in numbering, there is no question 15.

17. S A L E S continued

PRODUCT	Quantity	Unit	Unit Price	Total Price	Sold To
Almonds					
Peanuts					
Other Fruits					
Watermelon					
Melon					
Carrots					
Tomatoes					
Eggplant					
Other Vegetables					
Sheep					
Hides					
Wool					
Meat					
Ghee					
Chickens					
Eggs					
Firewood					
Straw					
Other					

18. Did you use commercial fertilizer last year? YES ___ NO ___
    a) If yes, on what crops? _____
    b) If no, why not? _____
    c) Did you use gypsum on your land last year? YES ___ NO ___

19. Did you use improved seed last year? YES ___ NO ___
    a) If yes, how many jeribs wheat? _____
    b) If yes, how many jeribs corn? _____
    c) If yes, how many jeribs cotton? _____

20. Has your land ever been leveled? YES ___ NO ___
    If yes, by whom and by what method? _____

21. Did you borrow money last year? YES ___ NO ___
    a) If yes, for what purposes: Consumption ___ Production ___
       Fertilizer ___ Seed ___ Other ___
    b) If yes, from what sources: Friends and relatives _____
       Bank _____ Rich People _____ HAVA _____

22. EQUIPMENT

ITEM	NUMBER	VALUE
Plow		
Mallah		
Land Leveler		
Tractor		
Tractor Implements		
Water Pumps		
Shovel		
Spade		
Yoke		
Donkey Bags		
Border Maker		
Scythe		
Polycultor		
Other		

*

24. Last year how many times did you irrigate: Mung Beans _____?
    Cotton _____?
    Wheat _____?
    Corn _____?

25. Do you have enough water? YES ___ NO ___
    a) If no, why not? _____

* No question 23 due to mistake in numbering.

26. How much could you sell your irrigated farm land for?
_____ Afghanis.

27. What are the major problems of farmers in this area?

28. Do you grow crops on all your land? YES ___ NO ___
a) If no, why not?_____

29. Has salt lowered the productivity of your land? YES ___ NO ___

APPENDIX II

د ګرونده ګروسره د مصاحبې پاڼه

رياست عمومي وادي هلمند وارغنداب

مديريت عمومي پلان واحصائيه

کوډنمبر

د مصاحبه کونکي نوم .... نېټه ....

١ کلي .... ناحيه يا منطقه .... ساحه .... ولايت ....

٢ د کورني د ټولو غړو شمېر ....

٣ د ناريښو شمېر سن ١ ــــــ ١٢ ١٣ ــــــ اولور

٤ په محکه کي څو نفره کارکوي ....

٥ ګرونده ګر ....

الف . څښتن .... کښتګر ....

٦ کښتګر لپاره

	هو	نه
	....	....
الف . غنم ته سرابروي	.....	....
ب . غوائي رر رر	....	....
ج . مزدور رر رر	....	....
د . اوبه رر رر	.....	....

٧ د کښتګر لپاره :ـ د محکي ټوله جريب چي کرل سويده ....

الف . د غه محکه چي تاکرليده څوجريب ئي اجاره ده .... جريب

ب . دغه محکه چي تاکرليده څوجريبه ئي ګرويده .... رر

ج . دغه محکه چي تاکرليده څوجريبه ئي په برخه اخيستا، شويده .... رر

محکه

٨ د محکي له څښتن لپاره د کښتګري يا د اجاري محکه .

الف . ټوله محکه چي له ـــــــ ري ئي .... جريب

ب . ټوله محکه تاپه اجاره اخستي ده . ... رر

ج . ټوله محکه چي د په برخه اخستـــــيده .... رر

د . ټوله د ګروي محکه چي د ي ګرليــــــده .... رر

هـ . ټوله محکه چي تا ګرليــــــده .... رر

و . ټوله محکه چه کښتګر ګرليــــــده .... رر

ز . ټوله محکه چه کــــرل ســــوي نده .... رر

ح . د کښتـــــګر شمېـــــر .

تعداد کښتګر ....

رر بزګر ....

۹ غلې او میوې موجه پروبنز کال ۱۳٤۹ (ورق ۲) کښې اخستی دي .

محصول		جریب	د یو جریب حاصل	تولهتولید ات په‌منه	برخه ٪	تفصیلات
غنم	وطنی					
	اصلاح شوي					
اوربشی						
پنبه						
وریجې						
شوتل						
پ ښ پښتی						
نخود						
جوار	وطنی					
	اصلاح شوي					
ماش						
نور						
میوې		جریب	د تاکیاونو شمیر	د یوې ونې حاصل	تولید ات تول په‌منه	
انگور						
انار						
زرد الو						
شفتالو						
انځر						
بادام						
پلی (بد امزمینی)						
نور						

ورق ۳

۱۰ سبزیجات چې په پروسږ کال ۱۳٤۲ کښې اخستي دي . نوټ . که له نیم جریب نه لږ وي بوازې ✓ ولیکئ .

محصول	تواه جریب	مترمربع	د بوټو شمیر	حاصل	تول تولیدات	برخه ٪
زردکی						
پیاز						
هندوانه						
خټکی						
پالك						
بادرنګ						
کدو						
بانجن						
کاهو						
مرچك						
شلغم						
حمیر خیال						
ګندنه						
ترب						
بینډي						
هوږه						
رومیان						
او نور						

ورق (۴)

۱۱- تر اوسه ... دډوبی کوم فصل په همه ملکی کی کر لیدي چه دهغه ملکی شخه ... د هر کال کی بل حاصل هم اخستی دي. هو .... نه ....

۱۲- هغه ملکې د جریب شمیر چې دوحاصله کرل سویده :- جواري .... جریب

ما ش .... رر

پنبه .... رر

اونور .... رر

۱۳- الف [illegible] دغه موتر پيلو ورسته دي سا [illegible] ملکه تنده کرلي ....

ب - که دي کرلي ده نو ولي دي د بيره تنده کرلي ....

۱۴- دملکې له پاره کوم بل مايد موتر کال در لوده   هو ____   نه ____

الف - د مايد اندازه ______________ افغاني

ب - د مايد منبع او د استعدام عاي ....

مثلاً - د وادی هلمند په رياست کی مشغوليت د دکانداري - نوکري خوشول - لاهی کارونه او نور

۱۶- مالـــــــــداري

ډول		شمیر	ټوله قیمت
غوايي			
د شيدو غواوي	وطني		
	خارجي		
پسونه			
خره			
اسان			
اوښان			
وزګري			
چرګې	وطني		
	[illegible]		
[illegible]			
[illegible]			
اونـور			

ورق ۵

۱۷ د گنبت د تولیداتو خرڅلاو . لکه غله . میوه . مالداري او د مالداري او ځنګلو محصولات چه په نقدو پیسو موخرڅ کړي دي .

محصول	خرڅ شوي مقدار	واحد	د یو واحد قیمت	توله قیمت	په چاباندې خرڅ سوېدي	حمل ونقل: نوع	فاصله	قیمت
غنم								
پنبه								
جواري								
وربشې								
وریجې								
ماش								
انګور								
کشمیش								
انار								
تازه‌زرد الو								
کشته								
شفتالو								
انځر								
بادام								
پلی (بادامزمنی)								
نور میوه‌جات								
هندوانې								
خټکې								
ګازرې								
رومیان								
بادنجان								
نورسبزیجات								
پسونه								
پوستکي								
وړۍ								
غوښې								
غوړي								
چرګې								
د چرګې هګۍ								
لرګي								
پروره								
او نور								

ورق (٦)

نسه	هو	
....	....	۱۸ کله‌موگمیاوي سره استعمال کـــړي‌د ه

که هو الف . پـرکوم فصـــــل ....

ب . که ــ نه ــ نو ولی ....

....

ج . گج مواستعمال کړي د ي ....

نه	هو	
....	....	۱۹ تا ســو اصلاح سوي تخم‌کـر لیږد ي

که‌هو الف . کوم جنـــــس‌غنم ....

جواري ......

پنبه ......

نه	هو	
....	....	۲۰ تاسي په‌خپاله یا وادي هلمند ستاسونه مځکه‌هموار کاري کـ ــــــــــ ـــــــــي د ه .

که هو الف تـ په‌څه توگـه او چاکــړي‌دي ....

....

....	....	۲۱ تیرکال مو پیسې په پـــور اخستي د ي

که هو . دځه مقصد لپاره . تولیـــد .... مصرف‌غـذا ......

کمیـــا وي سره .... تخـــم .... او نور ....

د چاڅخه موپور کــړي دي . خپلوانو څخـــه .... با نک څخه ......

د پیســـه دارانـــو څخـــه .... د وادي هلمند څخه ....

د پـــور اندازه څــو وه ــــــــــــــــ افغانی .

۲۲ دکښــــت ابـــزار او وسائـــل .

د ول	تعداد	توله‌قیمت
رختاوتیش		
ماله		
مجلي ماله		
تراکتـــور		
د تراکتور ابزار		

د ول	تعداد	توله‌قیمت
واتریمپ		
یـــوم		
کیج بیل		
جـــغ		
غراري		
د ل (پل‌کشر)		
لـــور		
پولي کلتور		
نـــور		

APPENDIX III

VILLAGES SURVEYED

Number of Villages, by Area

AREA	NUMBER
Helmand	152
Nadi Ali	11
Marja	16
Shamalon	15
Darweshan	16
Khanishin	8
Seraj	8
Girishk	9
Sanguin-Kajakai	13
Musa Qala-Zamin Dawar	32
Nowzad	24
Kandahar	126
Maiwand	27
Dund-Daman	44
Arghandab	33
Panjwai	22
HAVA	278

APPENDIX IV

FERTILIZER AND IMPROVED WHEAT SEED DISTRIBUTION

AREA	Urea		D.A.P.		Improved Wheat In Mons (10 lbs.)	
	Bags	Metric Tons	Bags	Metric Tons	Mexipak	17778
Nadi Ali	21,133	1,056.65	10,750	537.50	6,200	5,672
Babaji	3,500	175.00	1,500	75.00	---	---
Marja	11,250	562.50	5,350	267.50	5,660	2,152
Shamalon	6,000	300.00	3,000	150.00	22,400	3,186
Darweshan	2,661	133.05	1,420	71.00	13,000	4,675
Girishk	6,783	399.15	3,463	173.15	9,750	1,177
Sanguin	10,279	513.95	5,109	255.45	3,000	---
Kajakai	2,248	112.40	1,133	56.65	3,130	---
Musa Qala	1,168	58.40	584	29.20	4,140	---
Seraj	738	36.90	269	13.45	2,926	---
Kandahar	7,000	350.00	3,600	180.00	16,000	2,300
	72,760	3,638.00	36,178	1,808.90	86,240	19,162

Total No. 50 kg. bags of urea & D.A.P. = 108,938

Total No. metric tons of urea & D.A.P. = 5,446.9

Total muns improved wheat distributed = 105,402

Total metric tons improved wheat distributed = 479

Data provided by Shah Mohammed, Director General of Agriculture Extension & Forestry - January 1971

Distributed in 1970 during planting season Oct.-Dec. for wheat crop harvested in May 1971

APPENDIX V

SCHEDULE OF PRICES USED IN EVALUATING PRODUCTION FOR 1970 FES[a/]

	HELMAND	KANDAHAR
Local Wheat	28	30
Improved Wheat	26	28
Local Corn	23	19
Improved Corn	21	17
Cotton	42	42
Mung Beans	25	32
Barley	20	20
Forage	2	2
Tobacco	100	100
Rice	60	60
Grapes	17	19
Pomegranates	16	18
Apricots	22	24
Mulberries	12	12
Peaches	15	15
Almonds	100	100
Apples	15	15
Melon	3	3
Watermelon	2	2
Carrots	4	4
Onions	15	15
Cucumbers	15	15
Eggplant	11	11
Tomatoes	12	12
Spinach	5	5
Leeks	30	30
Garlic	12	12
Okra	20	20
Pepper	40	40

a/ Afs per mon.

APPENDIX VI

Helmand Depreciation Schedules[a/]

	Cost	Salvage Value	Useful Life	Depreciation Afs Per Year
Oxen	7,400	2,140	8.9	591
Donkey	871	105	9.0	85
Camel	7,014	1,593	11.1	488
Horse	5,480	621	12.7	388
Plow	253	43	2.1	100
Mallah	50	43	2.0	19
Shovel	75	43	2.0	32

Kandahar Depreciation Schedules[b/]

	Cost	Salvage Value	Useful Life	Depreciation Afs Per Year
Oxen	6,567	1,973	8.6	534
Donkey	1,537	243	10.0	129
Camel	6,000	1,825	10.1	413
Horse	5,600	1,900	14.7	251
Plow	344	30	3.2	98
Mallah	72	12	3.2	19
Shovel	84	10	1.7	44

a/ Based on about 35 observations - Supplemental Survey - 1970 FES

b/ Based on about 16 observations - Supplemental Survey - 1970 FES

(Polyculture & water pumps - 15 afs per farm)

Note: "Other Equipment" (Harness, tools, etc.) is depreciated on the basis of 8.25 afs per jerib of cropland or 42.61 afs per hectare of cropland. Other items calculated by straight line method on the basis of data from Supplemental Survey, as shown above.

APPENDIX VII

COST FACTORS

Wheat Seed - 105 afs per jerib ($3\frac{1}{2}$ seers per jerib times 30 afs) or 542 afs per hectare times average land in wheat in Helmand and Kandahar.

Other Seed - 50 afs per jerib or 258 afs per hectare times average land in field crops other than wheat.

Livestock Feed - Cost (see below) times average work animals per farm, by area.

oxen - 2,500 afs	camel - 500 afs
donkey - 300 afs	horse - 600 afs

Note: Cost of feed for income producing animals (milk cows, sheep, chickens, etc.) has been considered against gross income per head to provide a net income per animal for the Returns Section of Chapter IV.

Fertilizer and Chemicals - 250 afs per jerib or 1,290 afs per hectare times average land in improved wheat, improved corn and cotton in Helmand. Kandahar same as Helmand but add 100 afs per jerib or 517 afs per hectare times average land in fruits, nuts and vegetables.

Land Tax - 10 afs per jerib or 51.65 afs per hectare in Helmand and Kandahar.

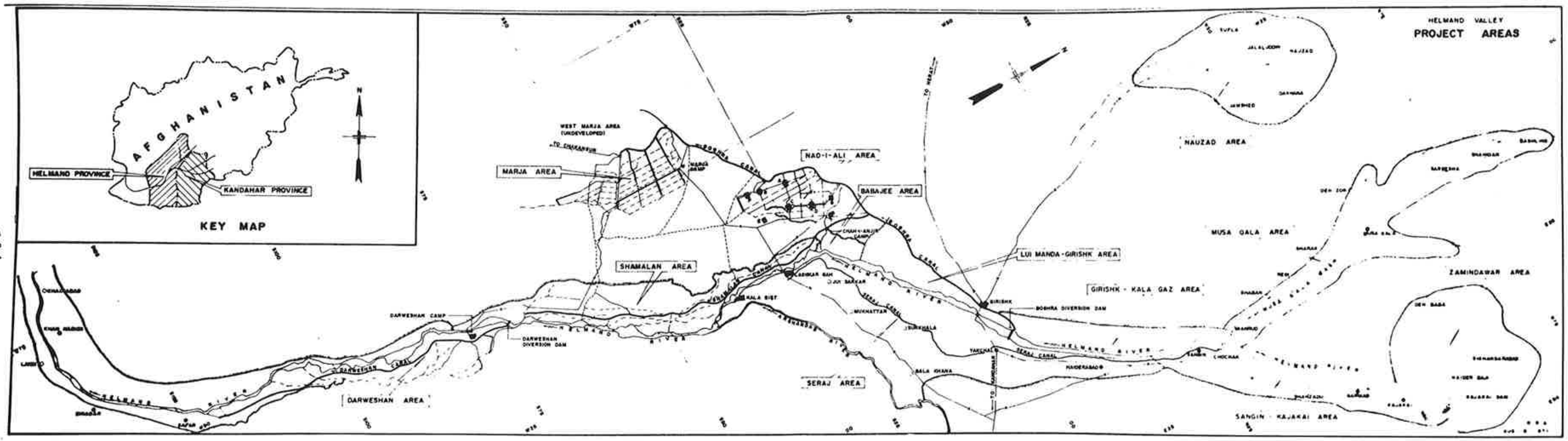
Interest on Borrowed Money - 20 percent per annum in Helmand and Kandahar.

Hired Labor

	Daily Rate	Man-days per jerib	afs jerib	afs hectare
Helmand	39.48	2.56	101.0	521
Kandahar	38.92	1.27	49.4	255

The above rates are applied to average cropland per farm by area.

Bazgar Labor - Helmand - 20 percent of Value of Field Crops, Melons and Vegetables times average number of bazgars per farm.
Kandahar - 10 percent of Total Value of Production times average number of bazgars per farm.



HELMAND VALLEY
PROJECT AREAS
AFGHANISTAN
HELMAND PROVINCE
KANDAHAR PROVINCE
N
KEY MAP
WEST MARJA AREA (UNDEVELOPED)
TO CHAKANSUR
MARJA AREA
NAD-I-ALI AREA
BABAJEE AREA
SHAMALAN AREA
LUI MANDA-GIRISHK AREA
GIRISHK - KALA GAZ AREA
NAUZAD AREA
MUSA GALA AREA
ZAMINDAWAR AREA
DARWESHAN CAMP
DARWESHAN DIVERSION DAM
DARWESHAN AREA
SERAJ AREA
SANGIN - KAJAKAI AREA
KALA BIST
GIRISHK
BOGHRA DIVERSION DAM
SERAJ CANAL
MUKHATTAR
BALA KHANA
HAIDERABAD
TO HERAT
TO KANDAHAR