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AFGHANISTAN ALTERNATIVE LIVELIHOODS PROGRAM SOUTH (ALP/S)

**FLOUR MILL FEASIBILITY STUDY FOR HELMAND AND
KANDAHAR SOUTHERN AFGHANISTAN**

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15 April 2006

This publication was produced for review by the United States Agency for International Development. It was prepared by Chemonics International Inc.

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Contract Number	GS-23F-9800H
Task Order Number	306-M-00-05-00516-00
Task Order Duration	15 February, 2005 - 14 February, 2009
Contractor Name	Chemonics International Inc.
Cognizant Technical Officer	A Merkel
Contracting Officer	Margaret Kline
Total Task Order Budget	\$119,899,744
Geographic Coverage	Helmand and Kandahar Provinces

15 April 2006

The author's views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development or the United States Government.

CONTENTS

Abbreviations and Acronyms

Conversions

Executive Summary

1. Purpose

2. Methodology

3. Background – Afghanistan

3.1 Introduction

3.2 Wheat production

3.3 Regional wheat markets

3.4 Wheat storage & milling

3.5 Flour fortification

4. Provinces of Helmand & Kandahar – Findings, Analysis, and Opportunities

4.1 Introduction

4.2 Wheat Production vs. Usage in Helmand and Kandahar

4.3 Cost of Wheat

4.4 Wheat flour milling

4.5 Flour imports from Pakistan

4.6 Wheat and wheat flour prices in Helmand and Kandahar

4.7 Grain storage & marketing in Helmand and Kandahar

4.8 Bakery Industry and Market

4.9 Consumption Trends

5. Flour Mill Feasibility in Helmand and Kandahar

5.1 General

5.2 Industry Current review

5.3 Mill features

5.4 Possible Constraints

5.5 Comparison of long and short flow flour mill

5.6 Project Pre-requisites

5.7 Cost and income tables for recommended mill

5.8 Recommendations

6. Bibliography

6.1 List of Organizations and People Contacted During the Study

ABBREVIATIONS AND ACRONYMS

ALP-SR	Alternate Livelihoods Program-Southern Region
CADG	Central Asia Development Group
FAO	Food and Agricultural Organization of the United Nations
GIAI	Grain Industry Alliance International
GoA	Government of Afghanistan
ICARDA	International Center for Agricultural Research in Dry Areas
IFDC	International Center for Soil Fertility and Agricultural Development
IFHope	International Foundation of Hope
MADERA	Mission d'Aide au Developpementdes Economies Rurales en Afghanistan
MAAH	Ministry of Agriculture and Animal Husbandry
NGO	Non-Government Organization
RAMP	Rebuilding Agricultural Markets Program
RI	Relief International
UNAMA	United Nations Assistance Mission in Afghanistan
USAID	United States Agency for International Development
USDA	United State Department of Agriculture
WFP	United Nations World Food Program
Afs	Afghanistan Afghanis
Kg	Kilogram
KWh	Kilowatt-Hour
MH	Megawatt
MT	Metric Ton(s)
MMT	Million Metric Tons
CWT	Hundredweight of flour (100 pounds)

CONVERSIONS

US \$1 equals 49.75 Afghanis
US \$1 equals 59.75 Pakistani Rupees
1 jerib equals .494 acres
5 jeribs equals 1 hectare
Helmand/Kandahar maund = 4.5 Kg.
One metric ton equals 36.74 bushels
One metric ton equals 22.07 CWT

EXECUTIVE SUMMARY

This study was undertaken to determine the feasibility of additional private investment in flour milling in Helmand and Kandahar provinces. Private Afghan investors have approached USAID/ALP-South and other agencies with interest in leveraging their cash with investments from other sources including USAID assistance to invest in the flour milling industry. These interested parties have no previous or practical experience in flour milling. USAID and other international agencies are attempting to support licit businesses, which Afghanistan so desperately needs. For this reason, this report reviews existing flour milling in the region, flour imports, wheat production, population and consumption.

Major findings of the report can be summarized as follows

- Helmand is the only province in the south and west with surplus wheat production. There is adequate wheat production for sale to support a commercial milling facility of 120 MT/day in Helmand.
- Estimated gross profit per metric ton of flour produced would be \$25.00 for a 120 MT per day/ 300 day per year, flour mill operating in Helmand Province. (Table II)
- There is no economic justification for adding flour-milling capacity in Kandahar. There is a recently built (four year old) private flourmill operating in Kandahar, with rated optimum capacity of 220 MT/day. At the time of the survey, it was found to be operating only 1-2 days per week.
- Prices of wheat are lower and flour, higher in Helmand than in Kandahar. If a flourmill were operating in Helmand it would have a significant advantage over a flour mill in Kandahar in terms of wheat to retail flour prices. (Tables 7, 8).
- Pakistani flour from Quetta arriving in Lashkar Gah has a \$30.00 per ton transportation cost while transportation costs to Kandahar from Quetta are \$20.00 per ton of flour.
- There are no commercial sized flourmills in Helmand Province. Milling is accomplished through small stone grinders (Zirandas). Wheat is also sent from Helmand to other parts of the country and at times across the Pakistani border for milling.
- Afghanistan has a severe shortage of wheat milling capacity. The shortage of milling capacity to produce quality wheat flour in Afghanistan creates a market for surplus flour from Pakistan. The Afghanistan commercial flour market is dominated by Pakistan to the extent that flour is priced and sold in Pakistan rupees.
- Pakistan is a net importer of wheat in some years, due to inconsistent wheat production. The Afghan pricing structure is highly dependent on Pakistani surplus

supplies that are not always available. Therefore flour milling and grain storage requirements of Afghanistan are issues of national food security.

- A GIAI survey in Pakistan revealed that recently constructed mills under government industrial loans were hastily built using mismatched equipment. In the Haripur District of NWFP alone, only 11 of the 27 completed new mills were operating.
- Pakistan uses wheat washing or wet cleaning of wheat for milling. Introducing wheat washing in the desert region of Helmand where potable water is scarce would require an estimated 25,000 liters of water per day in a 120 MT/day mill. There are serious concerns about the environmental impact of wheat washing due to effluents, contaminants and proper elimination of wastewater.
- Environmental concerns about disposal of wastewater prohibit the practice of wheat washing in the U.S. Consequently, promotion of wet cleaning of wheat, especially in a desert location, would be an unacceptable recommendation using U.S. taxpayer support and is a critical issue in recommending dry cleaning and proper tempering of wheat for a mill in Helmand. The balancing of proper dry cleaning with tempering and milling favors a U.S. manufactured short flow flourmill even though it requires a higher original investment in equipment.
- Helmand and Kandahar consumers surveyed expressed concern with inconsistent flour for baking and house hold purposes. A key advantage of the U.S. made pre-constructed short flow mill is consistency of performance and product.

Introduction of new technology and efficiency:

It is well recognized that Afghanistan needs new technology and modern efficiency introduced to advance its industry. All flour mills in Afghanistan and the neighboring mills in Pakistan use large mill buildings, energy consuming long flow mills, high water usage wheat washing and little or no bulk storage and handling. The following looks at the financial viability of introducing a modern short flow, dry cleaning, bulk handling flour mill to Afghanistan.

1. Purpose

Chemonics International with the support of United States Agency for International Development USAID is implementing the Alternative Livelihood Program ALP/S (2005-2009) in the southern region of Afghanistan. Helmand and Kandahar provinces are two of the main poppy producing regions in Afghanistan. The ALP/S program has been launched to counter the effect of poppy cultivation by proposing alternate livelihood initiatives for sustainable agriculture and economic growth.

ALP/S has assigned Grain Industry Alliance International GIAI, to undertake a flour mill feasibility study in Helmand and Kandahar provinces.

2. Methodology

Afghanistan government departments are not maintaining sufficient databases for crop production, consumption, and industries in the southern region. Information was collected from other relevant studies conducted by RAMP, GIAI, FAO, FAHM and others. Much of the information obtained in this study is from secondary sources, key officials, and interviews in markets and households in Helmand and Kandahar provinces. Additional interviews were also conducted among farmers, traders, bakers, owners of “Zirandas”, flour millers and prospective private investor/sponsors for a flour mill in the southern region.

The data gathered from these sources was reviewed and discussed on day-to-day basis with ALP/S officials. The findings, analyses, opportunities, and recommendations were finalized and documented for submission to Chemonics International and ALP/S.

The GoP on wheat and wheat flour market in Helmand and Kandahar Provinces conducted an additional market survey in mid February 2006 to study the affects of the removal of 15% export duty.

3. Background - Afghanistan

3.1 Introduction

Nearly two decades of civil strife has virtually destroyed the industrial and export sectors and severely damaged agriculture marketing, storage and processing infrastructure in Afghanistan. Agriculture is the main source of national output, employment and income. Some 85% of country’s estimated 21 million people depend on agriculture for their livelihood.

3.2 Wheat Production

Wheat is the major food grain of Afghanistan. Most wheat is planted in November-December and harvested the following April-May. Annual per capita wheat consumption is 160 Kg¹ making this country among the highest wheat consumers in the World. Afghanistan experienced larger cereal production in the recent past, 2003 and 2005. In 2005, 4.3 MMT of wheat was grown in Afghanistan with an area of 2.34 million hectares. In 2004 production dipped considerably due to drought in some regions.

Table: 1² Afghanistan Wheat Production by Year

Year	1998	1999	2000	2001	2002	2003	2004	2005
Area*	2.15	2.03	2.08	1.77	1.74	2.31	2.2	2.34
Production*	2.8	2.5	1.5	1.6	2.7	4.4	2.3	4.3
Yield*	1.30	1.23	0.72	0.90	1.57	1.90	1.04	1.83

*Wheat Production in Million Metric Tons (MMT), Area in Million Hectares and Yield in MT/Hectare

It is estimated that total wheat production in 2006 will be around 4.6 MMT, or nearly the projected national wheat demand as revealed from the recent surveys on prevailing sowing patterns.

Afghan individual farmer landholdings for wheat production average about 3 jeribs or 0.6 hectares. It is estimated that an average Afghan family would require about 7.2 jeribs to grow the wheat required for self-consumption, in addition to land required for other foodstuffs and livestock.³ In Afghanistan, most household incomes are less than \$500 a year. A successful farmer earns \$100 from a hectare of wheat, but a hectare of drought-resistant opium could illegally earn a farmer approximately \$4,000.⁴

3.3 Regional Wheat Markets in Afghanistan

Food markets, linking domestic producers, and international suppliers to consumers. These markets have performed fairly well in Afghanistan under very difficult conditions of war, internal conflict and disruption of infrastructure. Nonetheless, transport and other marketing

¹ Annex 1 of Agriculture Prospects Report (August/September 2005) Ministry of Agriculture, Animal Husbandry and Food (FAAHM) Kabul, 12 October 2005 and Enhancing food security in Afghanistan; Private markets and public policy options, ARD/HDS/The World Bank, August, 2005.

² Agriculture Prospect Report, June/July 2005 by Afghanistan Ministry of Agriculture and Animal Husbandry, Food and Central Statistical Office, GoA, Afghanistan Food Security Bulletin May/June 2005 and Political Economy of Wheat Prices in Afghanistan (by Raphy Favre, January, 2005).

³ Seed and Crop Improvement Situation Assessment at www.icarda.org

⁴ FAO report / Assessment July, 2003

costs remain high, and improved efficiency of food markets can potentially benefit both producers and consumers.⁵

With the assistance of many donor agencies, especially WFP, Pakistan has supplied wheat flour to Afghanistan since the 1960's. There are a growing number of mills in the Afghan neighboring provinces of Pakistan (NWFP and Balochistan) to supply flour. The GoP often enforces laws to prevent inter-district and inter-provincial movement of wheat and to check smuggling of wheat out of the country. However, such bans do not prohibit movement of baked bread or other products across the border.⁶ GoP has been encouraging wheat flour export to Afghanistan. Recently, it has withdrawn the 15% regulatory duty on export of wheat flour to Afghanistan.

Kazakhstan has the largest wheat surplus in the region and exports to Russia, Iran and world markets including Afghanistan. Wheat from Kazakhstan, which has no common border with Afghanistan moves through Uzbekistan, Tajikistan or even Iran.⁷

Table: 2 Regional Wheat Markets in Afghanistan⁸

<i>Regional Market</i>	<i>Major Cities</i>	<i>Surplus/Deficit</i>	<i>Domestic Market Link</i>	<i>International Market Link</i>
North	Mazar-e-Sharif	Surplus	To west and central	From Uzbekistan through Mazar
West	Herat	Deficit	From North and South	From Iran and Pakistan
Central/East	Kabul, Jalalabad	Deficit	From north	From Pakistan (Peshawar)
Central-West Highland	None	Deficit	Weak links	Little or no trade
*South	Kandahar	Deficit	To west	From Pakistan (Quetta)

*Helmand (in the South) is a wheat surplus province, however when added with Kandahar, the region is wheat deficit. Please refer to table 6, for provincial wheat balance sheet comparisons.

3.4 Wheat storage and milling

Limited modern storage facilities in Afghanistan were destroyed during the long war period, leaving primarily traditional bag storage facilities in use. International donors like World Food Program, USAID RAMP/GIAI and FAO, etc. are assisting construction of farm level storage facilities in Afghanistan. At present some schools or old buildings are used for emergency storage. The food aid agencies have temporary warehouse facilities in Pakistan and Afghanistan for emergency food distribution.

⁵ Enhancing food security in Afghanistan: Private markets and public policy options, ARD/HDS/ The World Bank August 2005.

⁶ Ref: HK Shamsher, Crop Post Harvest Science and Technology Volume II, 2004, NRI, UK

⁷ Enhancing food security in Afghanistan: Private markets and public policy options, ARD/HDS/ The World Bank August 2005.

⁸ Ibid.

Afghanistan has a severe shortage of wheat milling capacity. There are eight flourmills functioning at some level in Afghanistan (Kabul, Kunduz, Mazar-E-Sharif, Kandahar and Herat) with an estimated capacity of 1085 MT/day. Three government owned mills are shut down and the other two are operating at far less than capacity due primarily to lack of government investment. Private mills also face stiff Pakistan and other import competition while suffering from lack of capital and reliable power. The shortage of milling capacity to produce quality wheat flour in Afghanistan creates a market for surplus flour from Pakistan and other suppliers.

There are about 3200 small bakers producing a variety of products. However, by far the most produced baked product is traditional Naan, the main staple diet of Afghans.

Grain storage, marketing, milling, baking and processing infrastructure are sorely underdeveloped. Major storage issues in Afghanistan include inadequate farm level and commercial storage facilities, grain losses, and deterioration of grain quality contributes to storage and handling costs. In Afghanistan prior to 1979, there was sizeable grain storage capacity in the public sector but almost two decades of strife has severely damaged the grain storage infrastructure. Development of grain storage and efficient flour mill infrastructure will encourage demand for more wheat while reducing Afghanistan's dependency on flour imports and international food assistance.

Table: 3⁹ Medium sized Milling Facilities in Afghanistan, 2004 – 2006

Facilities	Storage Capacity MT	Milling Capacity MT	Functional / Non Functional	Remarks
Public Mills				
Kabul	60,000	150	Yes	Part time
Kandahar	40,000	0	No	
Mazar-e-Sharif	40,000	60	Yes	Part time
Pol-e-Khumri	40,000	0	No	
Heart	66,000	220	No	
Private Mills				
Kabul Flour Mills	6,000	200	Yes	Part time
Syed Kamal (Mazar-e- Sharif)	3,000	60	Yes	
Syed Jamal (Mazar-e-Sharif)	2,000	45	Yes	
Kunduz Flour Mills	4000	200	Yes	One shift per day
Kandahar Flour Mills (Pvt)	2500	220	Yes, partly functional	Part time
Herat Company	45000	150	Yes	

⁹ Enhancing food security in Afghanistan: Private markets and public policy options, ARD/HDS/ The World Bank August 2005.

3.5 Flour Fortification in Afghanistan

In May 2005, the Afghanistan Ministry of Public Health held a public briefing to announce the results of the first ever-national nutrition survey in Afghanistan. In the briefing, Deputy Minister of Health, Dr. Khakhar stated that the “Number one method for prevention of malnutrition in Afghanistan would be flour fortification.”¹⁰ The main findings of the survey, which was conducted with support from UNICEF and Center for Disease Control (CDC), stated the following.

- Over half (54%) of Afghan preschool children are stunted (chronically malnourished), over a third (39%) are underweight and about 7% are wasted (acutely malnourished).
- 72% of children 6-59 months, 48% of non-pregnant women and 18% of adult men tested were classified as iron deficient.
- Both global malnutrition (micro-nutrients) and specific micronutrient deficiencies are prevalent in Afghanistan and are likely to contribute to the high infant, child and maternal morbidity; decreased learning capacity; lower productivity and higher mortality.

The Afghan Ministry of Public Health, UNICEF, WHO, and CDC among others have supported the concept and the need for flour fortification with vitamins and iron. If flour were fortified in Afghanistan, the result would be improved health, stamina, and mental and physical performance.

With the support of the World Food Program, if new flourmills come on line in the country, they would be provided with pre-mix feeders and fortificants. Then flour products would be providing not only the main source of complex carbohydrates, calories, and protein to the people of Afghanistan but also essential vitamins and minerals for a cost of US \$2.80 per MT of flour produced.¹¹

As Pakistani flour is a major part of the total flour consumption of Afghanistan, flour fortification initiatives taken in Pakistan will be of interest in Afghanistan. Pakistan’s Health Ministry signed a Global Alliance for Improved Nutrition (GAIN) project agreement in 2005. The GAIN supported project will set the stage for supporting the participation of 600 roller mills, reaching 45% of the Pakistan population with fortified wheat flour by Year 5. Similar initiatives are being suggested for Iran, Kazakhstan and Afghanistan.

¹⁰ Afghan Ministry of Public Health announcement on the importance of Flour Fortification, MOPH offices, Kabul, Afghanistan, May, 2005.

¹¹ Ibid.

4. Provinces of Helmand and Kandahar



4.1 Introduction

Helmand Province is one of the more fertile provinces of Afghanistan. It is in the south-west of the country. Its capital is Lashkar Gah and is considered the center of the cereal grain market in southern Afghanistan. The Helmand River flows through the mainly desert region, providing irrigation. It is the largest province of Afghanistan with 213,219 hectares irrigated and about 16,280 rain fed. There are more than 600 villages in the province. Helmand is producing surplus food, cash and industrial crops. Wheat, maize, and cotton are the major cash crops. Wheat production in the province during the past seven years was reduced due to drought, defective irrigation systems and poppy cultivation.

Kandahar is the second largest province of Afghanistan. It is a semi-arid southern province with an international border in the southeast with Pakistan and north eastern, northern and western borders with Zabul, Uruzgan and Helmand Provinces. There are 17 districts in the province. The total agricultural land under cultivation is estimated to be 158,000 hectares. The districts of Daman and Afghanistan are the breadbaskets of the province. Kandahar is one of the largest provincial producers of poppies.

According to the Agriculture Prospects Report, August/September 2005, Ministry of Agriculture, Animal Husbandry and Food, FAHHM, the 2005 population of Helmand Province is 785,700 and the population of Kandahar is 971,400.

4.2 Wheat Production and usage in Helmand and Kandahar¹²

Total wheat requirement in both the provinces (consumption 160 kg/person/year) is 276,900 MT (125,712 MT in Helmand and 151,188 MT in Kandahar). Total wheat production in both provinces was 311,000 MT in 2005 (213,000 MT in Helmand and 98,000 MT in Kandahar).

Table - 4¹³
Helmand Wheat Area, Production and Yield

Year	2002	2003	2004	2005
Area '000 (hectares)	63	74	74	80
Production ('000 MT)	164	211	122	213
Yield (MT/hectare)	2.6	2.83	1.65	2.66

Table - 5
Kandahar Wheat Area, Production and Yield

Year	2002	2003	2004	2005
Area '000 (hectares)	58	41	39	39
Production ('000 MT)	116	114	75	98
Yield (MT/hectare)	2	2.78	1.92	2.51

Annual seed requirement for wheat cultivation is currently 20,800 MT (14,000 MT in Helmand and 6,800 MT in Kandahar). Wheat varieties with average yield of 1.65 to 2.66 MT per hectare are sown in both provinces. Inconsistency in wheat production is partially due to the sowing of poor quality seed wheat. NGO's are providing good quality seed at selective places. Although more quality wheat seed is sown for the 2006 crop, at the same time cultivation of poppy is reported higher than previous years. As such, estimates for wheat production for the year 2006 will be similar to 2005.

The wheat balances sheet in (Table-6) shows that Helmand is the only province in southern Afghanistan that is surplus in wheat (by 41,000 MT.). The total deficit in southern Afghanistan is estimated as 150,000 MT. The accumulative deficit of 457,000 MT of wheat in Afghanistan is met in part though imports and WFP Food Aid (120,000 MT).

¹²Agriculture Prospects Report, August/September 2005, Ministry of Agriculture, Animal Husbandry and Food, FAHHM

¹³ Annex III, page 1 of 1, Agricultural Prospects Report August/September 2005, Ministry of Agriculture, Animal Husbandry and Food, FAHHM.

Table 6¹⁴
2005 Wheat Balance Sheet Southern Afghanistan

Province	Helmand	Kandahar	Zabul	Uruzgan	Ghazni	Ghor	Total South	Total Afghanistan
Total Availability	213	98	30	86	147	78	652	4266
Uses	126	152	41	106	152	82	659	3788
Seed Provision	14	7	2	6	10	7	46	295
Post- Harvest Losses	32	15	5	13	22	12	98	640
Total Utilization	172	173	48	124	184	101	802	4723
Surplus /Deficit	41	-75	-18	-38	-37	-23	-150	-457

4.3 Cost of Wheat

It is estimated that farmers in Helmand sell about 28% of their harvested wheat in the local markets. They also buy flour from the market for their consumption from time to time. However, farmers in Kandahar sell only an estimated 12 % of their wheat in the market. Kandahar farmers keep about 2/3rds of their harvested wheat for consumption. About 7% is kept for the following year's planting and about 15% can be attributed to post harvest losses. During the course of a year, farmers sell wheat to traders ranging from US \$149 to US \$254/MT¹⁵. These numbers do not account for the sale of straw and fodder for livestock feed that generate additional revenue for the farmer, but these numbers are low in comparison. In addition, some farmers receive wheat seed from NGOs free of cost.

4.4 Wheat Flour milling

There are no commercial sized flourmills in Helmand. It is estimated that there are about 600 Zirandas in Helmand and about 400 in Kandahar. According to GIA estimates based on survey market interviews, these Zirandas are milling about 82,680 MT of wheat annually. The mills can also grind corn and other grains. Traditionally (Zirandas) small grinding machines are operating with diesel-power or electricity. These mills are grinding wheat as (whole meal) without separating out the bran. However, usually bakeries and households do not prefer this ground wheat product over white flour such as that imported from Pakistan.

As advances take place in the milling industry in southern Afghanistan, these small stone millers (the only experienced grain processors in the region) would be in direct competition in wheat processing and may eventually be replaced by commercial mills. In order to work with these small millers instead of be in direct competition with them it would be beneficial to encourage the formation of an association of small millers that could possibly invest in commercial milling.

¹⁴ Agriculture Prospects Report (August/September 2005), Ministry of Agriculture, Animal Husbandry and Food, FAHMM.

¹⁵ ALP/S – based on a report on Poppy Survey, 2005, UNODG

4.5 Flour Imports from Pakistan

The flour milling industry in Pakistan is mainly dependent on the government and receives support in many ways. The GoP releases wheat to flour mills on an as needed basis. It also provides a financing facility to flourmills for the procurement of wheat and for milling operations. Some years Pakistan is a net importer of wheat due to inconsistent wheat harvests over the years. In 2005, Pakistan had a good wheat harvest. In order to sell their surplus wheat stocks as flour, the GoP made special arrangements for facilitating flour exports to Afghanistan. The GoP also sells wheat to Pakistan mills near the Afghan border at favorable prices, about \$5.50 (U.S.) below interior Pakistan prices.¹⁶

Several factors determine price fluctuation in Pakistani imported flour:

- Availability of Pakistan wheat.
- Government release prices to the flour mills¹⁷
- Waiver on taxes and duties by the GoP
- Variation in transportation costs.
- Wholesalers margin on sale of flour.
- Price variation also subject to the variation in quality of flour. There is no objective testing of the quality of flour; it is only market demand, which defines perceived “quality” of flour in the market.
- Fixing higher costs on various grades of flour and on byproducts may compensate lower prices of Pakistani flour.

GoP and Pakistan mills are making efforts to consume surplus stocks of wheat before the next harvest year (2006). Special measures, like withdrawal of regulatory duties on the export of flour and other concessions were given to flour mills to boost flour exports.

4.6 Wheat and wheat flour prices in Helmand and Kandahar¹⁸

In spite of large fluctuations in domestic production caused by drought, domestic grain prices in Afghanistan have been remarkably stable. A major reason for this relative stability in prices is imported grain flow that adds to total availability of grain. Imports have been a major stabilizing force. The marketing margin used in the following 3 tables approximates transport costs, differences in quality between Pakistan wheat/flour and the average quality in south markets, and the margin between wholesale and retail prices.

Wheat trade volume in Helmand and Kandahar provinces is approximately 88,120 MT¹⁹ (59,640 MT and 28,480 MT respectively). Supply and demand determines the flow of wheat from surplus to deficit regions. Table 7 describes the price level of wheat in Helmand and Kandahar at harvest and the rest of the year.

¹⁶ Survey of Pakistan mills by Shamsheer H. Khan, February, 2006

¹⁷ Release price of wheat in Pakistan (Balochistan, Sindh and NWFP) are lower (5.5-8 US\$) as compared in other province (Punjab). Most of the flour is imported in Afghanistan through NWFP and Balochistan provinces according to February 10, 2006 market survey by Shamsheer H.K

¹⁸ Based on surveys conducted with the traders, the numbers reported are not supported by other sources of data.

¹⁹ Ibid.

Table 7 Market prices of indigenous wheat (USD)²⁰

Months	Price in Helmand	Price in Kandahar
May – July 2005 (Harvest time)	150	168
August 2005 to January 2006	224	254

Table 8 Retail Prices of Pakistani Flour (fine) in Helmand and Kandahar Markets (USD)

Months	Price in Helmand	Price in Kandahar
(Jan 12 to Jan 27, 2006)	269 to 294	261 to 277

The wide spread of Pakistani flour (over these 2 weeks January 12 - 27, 2006) prices reflects the withdrawal of 15% regulatory duty on exports to Afghanistan which caused a decrease in flour prices from Pakistan at this time..

Table 9 Prices of Wheat & Flour in Pakistan - February 2006 (USD)

Province	Government Procurement Price (Wheat) Harvest 2005 Per MT	Government Issue price (wheat) to flour mills per MT	Wholesale Flour price in Pakistan Per MT
Punjab	167	183	209
Sindh / NWFP/Balochistan	167	177.5	202

Pakistan Market survey: February 7-10, 2006

GoP and Pakistan mills are making a concerted effort to mill and market surplus stocks of wheat before the 2006 harvest. Special measures like withdrawal of regulatory duties on export flour were provided to mills to boost flour exports to Afghanistan.

²⁰ Ibid

Imported Pakistan flour accounts for nearly 90% of Helmand and Kandahar markets. Due to withdrawal of 15% regulatory duty by GoP in January 2006 on export of wheat flour, prices of flour in the market declined as much as US\$ 20-30 per MT. The price of imported flour in the Kandahar market was marginally lower compared to Helmand in January, 2006. Kandahar is located closer to Quetta (Pakistan) and the cost of transportation of Pakistan flour is less to Kandahar compared to other provinces. Trader's prices of wheat in the Lashkar Gah and Kandahar market varied from US \$150 to US \$254/MT over the course of the year and depending upon the perceived quality of the wheat.

Wholesale to retail trader margins on wheat flour vary from US\$ 35-40 per MT in both Helmand and Kandahar.

4.7 Grain Storage and Marketing in Helmand and Kandahar²¹

On-farm storage facilities are primitive and include mud bins, metal drums, and straw structures. An efficient grain storage and marketing infrastructure is not in place. Therefore, farmers and small traders can not hold their stocks for longer periods. They are compelled to sell to intermediaries at or shortly after harvest.

In Southern Afghanistan, Lashkar Gah is considered the warehouse of wheat, due to relatively large wheat production. At present, the Lashkar Gah grain market is comprised of around 400 trading shops dealing with wheat, flour, corn and other commodities. The grain market uses the Pakistani currency for buying and selling, which indicates the influence of Pakistan exports on the market.

Prices of wheat in Lashkar Gah and Kandahar reflect marginal fluctuation on a day-to-day basis. Both Helmand and Kandahar wheat market are closely linked with corresponding markets in Quetta, Pakistan.

4.8 Bakery Industry and Market²²

There are about 200 bakeries in both the provinces. These bakeries are old-fashioned and use wood or coals fired ovens and typically employ 10 to 15 people in each bakery. Bakeries produce a variety of baked products including cakes, cookies, buns and other bakery products. They use about 154,606 MT of flour (86,000 MT in Helmand and 68,606 MT in Kandahar). The demand of white flour to mix into the higher cost baked products was strong. However, the cost of Naan was 12 Af (for double size) and 6 Af for the (Single size).²³

There is demand for commercially packaged biscuits and other bakery products, which is not being met locally, as all such products consumed in the region are imported. There is also demand for imported pasta and cereal products in southern Afghanistan.

²¹ Based on visits to farms and interviews conducted with ICARDA & WFP, by GIAI consultants.

²² Based on surveys conducted with the bakers, the numbers reported are not supported from other sources of data.

²³ Based on a market survey of Lashkar Gah and Kandahar bakeries by GIAI consultants on January 13, and January 16, 2006.

4.9 Consumption Trends²⁴

Household: Random household surveys show annual per capita wheat flour consumption is 160 kg.²⁵

The Food for Work (FFW) and Food for Asset Creation (FAC) programs had many local households working on projects which were aimed at providing potable water and water for irrigation. Through this program, a total of 25,000 beneficiaries received food stuffs including wheat, wheat flour and biscuits, etc.

5. Flour Milling Feasibility in Helmand and Kandahar

5.1 General

In the year 2005, wheat produced in Helmand was around 213,000 MT and in Kandahar 98,000 MT. Helmand had a surplus in wheat production of 41,000 MT. Kandahar was deficit by 75,000 MT. However, the total southern region was deficit in wheat by 150,000 MT. This deficiency is being met by import of wheat flour mainly from Pakistan.

A large network of 400 shops in Lashkar Gah (Helmand), and 150 shops in Kandahar are trading wheat, coarsely ground flour and fine flour which is mostly imported. Farmers regularly bring a major part of the wheat for commercial trade. Grain traders have inadequate storage facilities; therefore, a substantial quantity of wheat purchased is soon sold and transported to Kabul, Herat, Ghazni, Farah and other provinces. Supply and demand determines movement of wheat from production to consumption and from the surplus to the deficit provinces. Traders play an important role in wheat marketing, storage and supply to the various places.

There are two flourmills in the Kandahar province. However, one is a 40-year-old mill with a small capacity silo, which was damaged during war in the 1980s. Since then, this mill has not been in operation, but its structure and rusted equipment is still there. This mill is the property of the Government of Afghanistan GoA. Economics do not justify the repair or rehabilitation of this facility at this time.

Kandahar province has one private flourmill with a capacity of 220 MT/day, which is operating about 1-2 days in a week. The mill was reported to be suffering from insufficient supply of electricity and access to competitively priced wheat.

There is no commercial flourmill in the province of Helmand. Wheat that is milled is processed through small stone/disk grinding machines (Zirandas) mostly with diesel or electric power. Wheat is also sent to other parts of the country and at times to Quetta, Pakistan (350 KM from Helmand).

²⁴ Based on surveys among Helmand households, mid-January, 2006.

²⁵ Enhancing food security in Afghanistan; Private markets and public policy options, ARD/HDS/The World Bank, August, 2005.

5.2 Milling Industry Current situation

Flour milling industrial equipment is not manufactured locally. Afghanistan largely has to depend on neighboring countries for imports of industrial equipment and machinery of questionable quality.

Helmand and Kandahar provinces are deficient in production of electricity. At this time any commercial sized flour production will require purchase and operation of privately owned electric generators.

Unskilled poorly educated labor is readily available. According to the ALP/E feasibility report of flour milling in Nangarhar, it was estimated that 5% of the total population graduated from high school, and only about 15% of Afghans have a primary education. The remaining 80% have very little if any schooling. Therefore, short-term training programs and technical support will be required for the industry.

A lack of available credit will certainly limit the growth of industry in the area. Existing industries have not been able to expand through reinvestment of profits. There are no financial services available in Helmand and Kandahar.

5.2 Mill features

- A Helmand flour mill has good potential for sustainability, once established
- Helmand is a wheat surplus province. Wheat will be purchased from the farmers and the market. Growers will benefit directly from the additional wheat customer.
- Annual wheat requirements of a Helmand mill (36,000 MT) can be met locally.
- It will provide employment to people of this rural area
- It will bring an increase in wheat demand and may reduce poppy cultivation.
- ALP/S would provide technical assistance for the flourmill
- ALP/S plans to establish district level wheat cleaning and improve storability for the farmers associations.
- The project is proposed to be located in an Industrial Park, which shall be provided with power supplies, roads and basic infrastructure.
- Prospective investor(s) are ready to make investments.
- This proposed mill would be a model of the latest technological advancement.
- Fortification with micronutrients and iron in flour, in cooperation with the World Food Program, U.N. and other donors, will bring health benefits to the region.

5.4 Possible Constraints

The following are possible constraints that need to be taken into consideration before initiating the project:

- The proposed mill will face stiff competition from Pakistani imported flour, which will limit profit potential.

- The supply of publicly generated electricity is inconsistent for full-time operation and cannot be relied upon.
- Investment is needed for construction of additional storage facilities to allow purchases of wheat at favorable times.
- Procurement of around 10,000 MT of wheat at harvest time will require a more than \$1.5 million cash outlay.
- The staff of the mill will require extensive training.

5.5 Comparison of conventional long flow vs. short flow flour

CONVENTIONAL (LONGFLOW) FLOUR MILL



Comparisons of conventional flourmill equipment are based on the visits and survey of various flourmill machinery manufacturers in Pakistan and India in February 2006.

Cost of the machinery:	\$ 370000 (Indian Machinery) - \$ 870000 (Turkish Machinery)
Rational Capacity:	120 to 180 MTS (Actual output unknown)
Shipment Cost:	Not included
Cost of Building:	\$ 300000 (Four story building)
Water requirement:	25000 Liters / day
Operational staff:	6 persons/shift
Managerial Staff:	4 Persons
Operating Cost per ton:	\$ 20 per MT
Custom / duty:	\$ 30000
Extraction Rate:	85%
Flour Quality:	Inconsistent
Operation:	Manual
Project Time:	Building Construction: (One Year) Equipment installation: (6 months)
Technical Assistance:	After sale service varies with components

FEATURES

- Some long Flow Flour Mill Machinery is cheaper as compared the guaranteed performance of a U.S. made Short Flow Mill.
- A larger building is required to house the long flow mill
- Technical support is inadequate
- There are environmental problems associated with wet cleaning
- A substantial quantity of water is consumed on dry cleaning; therefore, there is scarcity water for human consumptions.
- Engineering, installation and compatibility of equipment is questionable
- Quality of flour is not consistent
- Cost of power is higher due to more equipment used in the long flow operation
- Performance of Afghan mills compared to the rated capacity of this type of equipment strongly indicates that the rated capacities are overstated.

- Many of the new mills using this type of equipment are not operational.²⁶

SHORT FLOW FLOUR MILL (production performance is guaranteed)

KSU Mill - (120 MTPD) 24 hrs wheat input



Modern Flour Mill (Short Flow)

FEATURES:

- Simplified method for producing No.1 fine flour.
- First KSU mill was commissioned in 1992 in California and working efficiently
- Fully automated and factory pre-assembled
- Automatic product monitoring and yield management system
- Cleaning house capacity (130 MTPD)
- Pneumatic conveying system
- Requires one story warehouse type building
- Environmental friendly machinery

Approximate Cost of the Mill:	US \$ 1,800,000
Cost of Cleaning House:	US \$ 575000
Shipment Cost:	Not included
Cost of Building:	US \$ 65,000 Single Story (10x20x11 meters.)
Flour Quality:	Consistent
Operation:	Fully Automated
Delivery of equipment:	6-8 months
Assembly time after delivery:	two weeks
Technical Assistance:	Pre-installation Training on the Mill Installation by experienced crew.
Residue:	Consistent mill feed

²⁶ A GIAI survey in Pakistan revealed that recently constructed mills under government industrial loans were hastily built using mismatched equipment. In the Haripur District of NWFP alone, only 11 of the 27 completed new mills were operating.

Typical Provisions:

Complete with floors, handrails, stairs, electrical/automation, motors, spouting, dust control, conveying systems,

5.6 Project Pre-requisites

Location and Land:

There will be 6-8 jeribs of land required. This may be provided in the proposed industrial park, which is in collaboration with ALP/S and the local Government.

Water:

Very few places in the world allow wet cleaning (wheat washing) of whole grain for flour milling. Introducing wheat washing in this desert region where potable water is scarce would not be advisable for U.S. taxpayer supported programs. An estimated 25,000 liters of water per day would be needed for wet cleaning or washing of the wheat. There are serious concerns about the environmental impact of wheat washing due to effluent, contaminants and proper elimination of wastewater. Therefore, GIAI recommends dry cleaning of wheat with appropriate tempering as provided by a balanced and efficient cleaning house.

Power:

The power will be obtained from the electrical supplies in the proposed Industrial park. However, the Short flow unit can run on less power than a long flow mill and the power estimate in the model is based on generator and diesel costs.

Staff:

ALP South will provide technical assistance and hands-on training to the staff.

Grain Storage Facility:

Bulk wheat storage bins are recommended for holding from 2 to 4 months of the mills annual processing requirements. There is a not adequate storage facility available in the public and private sector in Helmand province.

Introduction of new technology and efficiency:

It is well recognized that Afghanistan needs new technology and modern efficiency introduced to advance its industry. All flour mills in Afghanistan and the neighboring mills in Pakistan use large mill buildings, energy consuming long flow mills, high water usage wheat washing and little or no bulk storage and handling. The following looks at the financial viability of introducing a modern short flow, dry cleaning, bulk handling flour mill to Afghanistan.

5.7 Cost and income tables for recommended mill

Table 10

Cost per CWT Analysis

Hours per Day	24.00	Rolls Changed per Year:	13
Days per Month	26.00	Corrugate \$/Set of Rolls	200.00
CWT per Day	2000.00	New Sifter Cloths per Month:	10
Extraction %	0.85	Price per Cloth	18.50
KwHr/CWT	2.7	Bearings per Year:	6
\$/KwHr	0.06	Price per Bearing	575.00
Ingredients \$/YR	10000.00	Belts Changed per Year:	24
		Price per Belt	225.00
		Brushes Changed per Year:	24
		Price per Set	60.00
		Fumigation per Year:	1
		Price per Fumigation	12000.00

Operating Expenses	Daily	Monthly	Annual	Per CWT
1 Plant Manager	80.13	2083.33	25000.00	0.04
3 Millers	192.31	5000.00	60000.00	0.10
packing and loading staff	288.46	7500.00	90000.00	0.14
Service Items				
Replacement Parts	32.05	833.33	10000.00	0.02
Cleaning Supplies	3.21	83.33	1000.00	0.00
Sifter Cloth	7.12	185.00	2220.00	0.00
Bearings	11.06	287.50	3450.00	0.01
Belts	17.31	450.00	5400.00	0.01
Roll Brushes	4.62	120.00	1440.00	0.00
Rolls	8.33	216.67	2600.00	0.00
Fumigation	38.46	1000.00	12000.00	0.02
Total Service:	122.15	3175.83	38110.00	
Utilities				
Electric	324.00	8424.00	101088.00	0.16
Gas/H2O	20.00	520.00	6240.00	0.01
Selling/Admin				
1 Office Manager	70.51	1833.33	22000.00	0.04
Supplies	295.69	7688.00	92256.00	0.15
Phone	19.23	500.00	6000.00	0.01
Advertising	19.23	500.00	6000.00	0.01
Insurance	0.00		0.00	0.00
Depreciation	512.82	13333.33	160000.00	0.26
Total Operating Cost/CWT				0.72

Table 11 Income on Short Flow Mill

	Daily	Monthly	Annual	
Revenue:				
Sales:	21220.00	551720.00	6620640.00	220/t
Mill Feed Sales:5400	2294.12	59647.06	715764.71	132/t
Total:	23514.12	611367.06	7336404.71	
Cost of Goods Sold				
Wheat	20627.45	536313.73	6435764.71	178.77/t
Ingredients	32.05	833.33	10000.00	
Total	20659.50	537147.06	6445764.71	
Gross Profit	2854.62	74220.00	890640.00	

Operating Expenses

	daily	monthly	annual	per cwt
1 Plant Manager	80.13	2083.33	25000.00	0.04
3 Millers	192.31	5000.00	60000.00	0.10
loading and packing staff	288.46	7500.00	90000.00	0.14
Service Items				
Replacement Parts	32.05	833.33	10000.00	0.02
Cleaning Supplies	3.21	83.33	1000.00	0.00
Sifter Cloth	7.12	185.00	2220.00	0.00
Bearings	11.06	287.50	3450.00	0.01
Belts	17.31	450.00	5400.00	0.01
Roll Brushes	4.62	120.00	1440.00	0.00
Rolls	8.33	216.67	2600.00	0.00
Fumigation	38.46	1000.00	12000.00	0.02
Total Service:	122.15	3175.83	38110.00	
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Electric	324.00	8424.00	101088.00	0.16
water	20.00	520.00	6240.00	0.01
Selling/Admin				
1 Office Manager	70.51	1833.33	22000.00	0.04
Supplies	295.69	7688.00	92256.00	0.15
Phone	19.23	500.00	6000.00	0.01
Advertising	7.69	200.00	2400.00	0.00
Depreciation	512.82	13333.33	160000.00	0.26
Total Operating Cost/CWT				0.71

Total Operating Cost	1542.32	40100.33	\$481,204
Net Profit	1312.29	34119.67	\$409,436
		Tax Rate	3%
After Tax Income			\$399,200

Table 12**Key Assumptions:**

Hours per Day	24.00	Rolls Changed per Year:	13
Days per Month	26.00	Corrugate \$/Set of Rolls	200.00
CWT per Day	2000.00	New Sifter Cloths per Month:	10
Price per CWT	10.61	Price per Cloth	18.50
Extraction %	0.85	Bearings per Year:	6
Wheat Used per Day	235294.12	Price per Bearing	575.00
Price per Bushel	5.26	Belts Changed per Year:	24
Mill Feed Ton/Day	17.65	Price per Belt	225.00
Price per Ton	130.00	Brushes Changed per Year:	24
Ingredients \$/YR	10000.00	Price per Set	60.00
KwHr/CWT	2.7	Fumigation per Year:	1
\$/KwHr	0.06	Price per Fumigation	12000.00

Table 13**Estimated Costs - Additional Bulk Grain Storage**

Type	Major Manufacturers	Capacity	Price US \$	Remarks
Steel Silo	Butler, GSSI, Chief, York, Brock, GSI	10000 MT Or as required	475,000 - 600,000 Depends on the thickness of the material	Shipment costs not included - Bulk Silo will demonstrate a more efficient and cost effective means of quality control. It will allow a grain aeration system, bulk receiving, weighing, cleaning, temperature detection, drying and cooling.

Major Additional Flour Mill Project costs

Item	US\$
Land (8 jeribs)	\$ 40,000 (\$5,000/jerib)
Construction of mill Building	\$ 65,000
Cost of bag ware-house construction	\$ 180,000.00
Office furniture & computers	\$ 10,000.00
Vehicles	\$ 50,000.00
Pre-operating Expenses	\$ 5,000.00
Net Working Capital required for wheat and flour inventory purchases	\$ 1,500,000.00

5.8 Recommendations

- A flourmill is viable for Helmand province. There is adequate wheat supply available in the area for a flourmill with a milling capacity of 120 MT/day in Lashkar Gah.
- Based on proven, consistent operational performance and meeting environmental concerns a pre-assembled short flow US made flourmill is recommended. In contrast, approximately 25% of the long flow mills in the nearby provinces of NWFP and Punjab, Pakistan, stand with new buildings, and yet are not functioning because of inefficient equipment.²⁷
- The US made, KSU Short flow unit will produce a consistent quality of flour for baking European and western style products and traditional Naan.
- An assured consistency of flour will be possible with the proposed short flow unit and will satisfy the need of the consumers. The suggested milling machinery is efficient. It eliminates construction of a four-story building; power costs are lower as compared to the long flow flourmill. The KSU mill can be assembled within four weeks after the machinery is available.
- Major parts are pre-assembled and a team will provide hands on training and technical assistance during installation.
- A U.S. manufactured dry cleaning system in the mill is recommended even though it requires a higher original investment. Environmental concerns about disposal of wastewater prohibit the practice of wheat washing in the U.S. Consequently, promotion of wet cleaning of wheat, especially in a desert location, would be an unacceptable recommendation using U.S. taxpayer support and is a critical issue in recommending dry cleaning and proper tempering of wheat for a mill in Helmand.
- Assured quality of construction and consistency of flour will be assured with a KSU short flow unit. The suggested milling machinery is efficient. It eliminates construction of a four-story building and consumes less power for operations as compared to a long flow flourmill. KSU mill can be put up in less than 4 weeks after the machinery is available on site because major parts are pre-assembled. The KSU team will provide hands on training and technical assistance before and during installation.
- Construction of storage facilities for the mill will be required for optimizing profitability. At present, there is an acute shortage of grain storage facilities in the public or private sector. The investor needs to have sufficient working capital for procurement of a substantial quantity of wheat stocks.

²⁷ Based on surveys by Shamsher H.K with Pakistani flour millers and the officials of Directorate of Food, Punjab Province, Pakistan, February 10-12, 2006.

- Support should be considered for the farmers associations at the district level to supply wheat-cleaning equipment and on farm storage facilities. Having improved storability of the wheat will benefit farmers.
- Consistent supply of electricity is a prerequisite to run the mill efficiently and there is needed a public supply of electricity or the mill must purchase and operate generators.
- Flour fortification provided by World Food Program and other donors would help reduce micronutrient deficiencies of the public. If the Government of Afghanistan decides that all commercial flour sold in Afghanistan should be fortified, then this would prevent imports of unfortified flour currently coming from Pakistan.
- Work with the whole grain millers whose jobs will slowly be displaced as commercial milling is built in Afghanistan. These small grinding machine operators are the only experienced millers in the region. If an association of small millers is put together they would be a natural for development organizations to work with or to be recipients of a flourmill operation project.

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