TO: Engineer Fazal Umer
        ARM, UNOPS Kandahar

From: Engineer Hafizullah

Date: 06.08.2002

SUB: SURVEY REPORT

OF SHAMALAN CANAL HELMAND PROVINCE LASHKARGHA

Attached is the report of Shamalan canal survey that started on 07.07.2002 and completed on 05.08.2002 which kindly provide you for consideration and further action.

Best regard.

Rus. Sham. Branch Break
        21+350
          or
    ± 1 km from Road

II.   New Shamalan Canal or STA 10+700

New Shamalan canal is branch of old Shamalan canal and the source of water is old Shamalan canal with the length of 37 km and design capacity of 9.52 cum/sec for irrigation of higher land of Shamalan area. This canal is in sound condition but in intake and some other parts need around 1500 cum backfilling and at station 17+000 one radial gate and lifting device for waste way structure.

III.   Lashkargha Shamalan canal: ~Russian Shamalan~

The intake is near Lashkargha Bridge and the source of water is Helmand river with the length of 6. 00 km and capacity of 11 cum/sec. The canal is almost in sound condition and for control structure need five slide gate for 5 pipes with 48 inches diameter and five lifting devices and also it is needed to increase the capacity of canal for irrigation of Shamalan (24,000) hectares area from intake up to control structure or around 750m needs desilting of 8,000 cum and some blasting of conglomerate. A permanent and stable intake is needed otherwise around 20,000 to 30,000 jribs of land will have no enough water for irrigation.

Summary

S/NO	Station	Work description	Amount	Unit	Unit cost	Total cost	Gain or loss in USD
1	13+500	Gabion work	8879	Cum	40	355160	
		Excavation	3415	Cum	1	3415	
		Cost & income of protection land	100	Jribs	3807.5		
2	15+000	Gabion work	7440	Cum	40	297600	380,750
		Excavation& backfill	20028	Cum	1&2	37200	
		Cost and income of land	150	Jribs	3807.5		
3	27+150	Gabion work	9107	Cum	40	364280	571,125
		Excavation& Structure	Varies	diffrent	different	45139	
		Cost and income of protection	300	jrib	3807.5		
4	31+320	Gabion work	6887	cum	40	275480	1,142,250
		Excavation	2767	cum	1	2767	
		Cost & income of protection land	300	jrib	3807.5		
5	55+878	Gabion work	6096	cum	40	243840	992,250
		Excavation & protection of berm	12934	cum	1&2	25336	
		Cost and income of land	500	jrib	2060		
Total							1,030,000
10% Contingency						1,650,217	4,116,375
Grand Total						165,022	
						1,815,239	

All drawings sketches and dates are attached. will be sent to your office

Mission objective:

Technical survey of Shamalan canal, topography, general design and cost estimation.

Implementing mechanism:

The mission was comprised of the following members:

1. Engineer Hafizullah — Team leader
2. Engineer Ahmad Shah — Member
3. Abdul Wasi/A.Razaq — Driver

Mission Activities:

07.07.02
The mission departed Kandahar city at 13.00 P.M and arrived to Lashkargah, Helmand province at 16.00 P.M. Then we had a meeting with HAVA general director Mr. A.Khaliq Dawari and briefed him about the objective of our mission.

08.07.02
The mission had its second meeting with Mr.Dawari and discussed concerning the structure and chemistry of the survey team, then the team started a quick survey of Shamalan canal for identifying of critical section.

09.07.02 to 25.07.02
The team started quick survey for identification of the critical sections for one more day, at the meantime, started technical survey of the identified critical sections which continued up to 25.07.02 and also computing of collected data were going on.

26.07.02 upto 04.08.02
The team was busy on plotting of data, general design, cost estimation and writing of reports.

05.08.02
The mission team left Lashkargah city at 11.00 A.M. for Kandahar and arrived to Kandaahar city at 3.00 P.M.

Detailed descriptions:

Helmand and Arghandab valley is located in the southwest part of Afghanistan, which is known for its good quality of agricultural land and resource of water.

Helmand River is the second biggest river in Afghanistan flows through Helmand valley. Helmand Arghandab Development project has irrigation system or facilities on Helmand river like Kajaki reservoir for irrigation and producing of power, with the storage capacity of 1.7 milliard cubic meter of water and 50 Mega watt of power presently.

Boghra canal and intake, Darweshan canal and intake, Dahla or Arghandab reservoir, south or Al-Beroni canal and intake on Arghandab river and Turnak canal and also drainage system or facilities like main, sub main and spur drains and we can conclude as follows:

1. Total length of canals in Helmand province = 419.50 km
2. Total length of drains in Helmand province = 1263.00 km
3. Total length of waste way = 140.00 km

Boghra Canal

Boghra canal is the biggest canal with 93 km length, 72 cub m/sec capacity, 60.000 hectare command area, double crops planting and harvesting, direct beneficiaries of 42857 families, and indirect beneficiaries or population of the province 2,800,000 persons or 400,000 families. And it should be reminded due to lack of normal maintenance for long time, deposition of silt and damage of control and waste way gates, the canal has lost around 40% of its efficiency and about 50% of the canal needs desilting and the following structures needs repairing or replacement.

1. At station 0+000 repair of one intake gate.
2. At station 11+000 repair of one waste way gate.
3. At station 54+000 repair of one control gate and 2 lifting devices are required.
4. At station 70+000 one control gate, two waste way gates and lifting device are required.

In Shamalan area or Naw-e-Barakzai district, we have three canals,

I. **Old Shamaln** canal is a branch of Boghra canal which its intake is at station 31+800 of Boghra with commend area of 120,000 jribs (24000 hectare). This canal has problems and difficulties are found from survey as follows;

A.   The following mechanisms are needed,
   1. At station 0+000, for control gates, two lifting devices are required.
   2. At station 10+700, one lifting device is needed for control of gate.
   3. At station 13+500, two lifting devices for waste way gates.
   4. At station 13+500, two gates and lifting devices are required for control gates.
   5. At station 27+150, four radial gates with lifting devices after reconstruction of the structure.
   6. At station 42+000, one radial gate with lifting device.
   7. At station 52+000, one radial gate with lifting device.
   8. At station 63+000, one slide gate with lifting device.

As we are aware, old Shamalan canal after station 11+000, is almost parallel to Helmand river and this situation caused some problems as follows:

B.   At **station 13+500**, the canal has washed around 200 meters and 500 jirebs (100 hectares) of land has washed away by Helmand river that affected 100 families and they have lost land and its product estimated as follows;

1.	Cost of land	500x3500 USD	=1,750.000 USD
2.	First crop wheat 900 kg/jireb x 7000 Afs kg/40,000 USD/Afs x 500		=78,750 USD
3.	Second crop corn 1000 kg/jireb x 6000/kg/40,000 USD/Afs x 500		=75,000

Total Loss   1,903,750 USD

If we rehabilitate the breach at this station and keep the canal and land from further damage and destruction as an average 100 jribs or 20 hectare from washing by the flood and around 35 families from immigration we will gain as follows:

1.	Cost of 100 jribs	=	100x3500 USD=350,000 USD
2.	First crop income wheat	=	100 x157.5 = 15750 USD
3.	Second crop income corn	=	100x150 =15000 USD

Total   =   380,750 USD

Rehabilitation expenses:

1. Gabion work.	8879cum x40	355160 USD
2. Excavation.	3415 cum x1	3415 USD

Total .

358575 USD

C. At station 15+000, the canal has washed out by 350 m and 350 jribs (70 hectares) of land has washed by Helmand river and affected 70 families and the cost of damage is estimated as follows;

1.	Cost of land	350 x 3500 USD	=1,225,000 USD
2.	First crop wheat	157.50 x 350	=55,125 USD
3.	Second crop corn	150 x 350	=52,500 USD

Total Loss =1,332,625 USD

If we rehabilitate the breach at this station and keep the canal and land from further damage and destruction as an average 150 jribs or 30 hectares from washing by the flood and around 50 families from immigration we will gain as follows;

1.	Cost of land	150x3500 USD	=525,00 USD
2.	First crop wheat	157.50x150	=23,650 USD
3.	Second crop corn	150 x150	=22,500 USD

Total =571,150 USD

Rehabilitation expenses:

1. Gabion work.	7,740cum x40	297,600 USD
2. Excavation.	2,857 cum x1	2,857USD
3. Excavation and backfill	17,172 Cumx2	34,344 USD

Total

334,800USD

We consider protection of land as a first priority and canal as a second priority other wise the hole area or 9,000 jribs (1,800 hectares) will be washed by the flood gradually and totally 1,800 families will immigrate.

D. At station 27+150 the check and waste way structures have completely damaged and destroyed, rehabilitation is urgently need and the breach near station 28+250 is also very important the distance between the edge of the river and canal is not more than 60 m and also 300 jribs or 60 hectares of land has washed by flood and affected 60 families and they had lost the following;

1.	Cost of land	300x3500 USD	=1,050.000 USD.
2.	First crop wheat	900 kg/jireb x 7000 Afs kg/40,000 USD/Afs x 300	=47,250 USD.
3.	Second crop corn	1000 kg/jireb x 6000/kg/40,000 USD/Afs x 300	=45,000.

Total loss: =1,142,250 USD.

Land protection and canal protection at station 28+250 is very important otherwise 300 jribs of land will be washed by the flood and 60 families compelled to migration. And if we could not protect the canal at this station, 80,000 jribs of land will be out of irrigation and 16,000 families will compel to migrate.

2. First and second crops = 400kg/jrib x 6000 Afs kg/40,000 x 500 = 30,000 USD

Total: = **1,030,000 USD**

If the land at station 55+878 is protected, we will keep the property having the following cost:

1. Protection of 500 jribs of land from washing by the river.
2. Protection of drain berm from further destruction.
3. Protection of canal from cutting and we will gain as follows:

1. Cost of 500 jrib land =500x2000 =1,000,000 USD
2. First and second crop income =400kg/jribx6000 Afs/kg/40,000x500 =30,000 USD
   In the case of canal protection =400kg/jribx6000 Afs/kg/40,000x20000 =1,200,000 USD

Total: = **2,230,000 USD**

If the land and canal are not protected, we will loose the same amount and also around 20,000 Jribs of land will have no water for irrigation and 4,000 families will immigrate.

Rehabilitation Expenses:

Gabion work	= 6096 x 40	=	243,840 USD
Excavation	= 2532 x 1	=	2,532 USD
Two walk ways rehabilitation	=2000	=	2,000 USD.
Excavation and backfilling	=10402 x 2	=	20,804 USD
Total Expenses		=	269,176 USD

Conclusions for old Shamalan Canal:

As a result if the canal and land are not protected from further damage and destruction the damages will be as follows;

1. At station 13+500, 100 jribs (20 hectares) of land will be washed and 35 families will immigrate.
2. At station 15+000, 150 jribs (30 hectares) of land will be washed and 50 families will immigrate.
3. At station 27+150, 300 jribs (60 hectares) of land will be washed and 60 families will immigrate. If the canal washed at this station, and it is 95% possible in coming flood resulting and around 80,000 jribs (1,600 hectares) of land will be out of irrigation water and 16,000 families will compel to immigrate.

4. At station 31+320, 300 jribs (60 hectares) of land will be washed and 60 families will compel to migrate. If the canal is washed at this station, and it is 95% possible in coming flood, which will block irrigation water for 77,500 jribs (15,500 hectares) of land will have no water for irrigation and 15,500 families will compel to migrate.

5. At station 55+878, 500 jribs (100 hectares) of land will be washed and 100 families will compel to immigrate. If the canal washed at this station, around 20,000 jribs (4,000 hectares) of land will have no water for irrigation and 4,000 families will compel to immigrate.

So protection of canal and land at stations 15+000, 27+150, 31+320 and rehabilitation of intake and desilting of Lashkargah Shamaln canal prioritized as a first priority and stations, 13+500 and 55+878 as a second priority.

Rehabilitation expenses in this station estimates as follows:

1. Gabion work   =   9107 x 40   =   364,280 USD
2. Excavation   =   8139 x 1   =   8,139   USD
3. Station 27+150 structure Rehabilitation   =   37,000   USD

Total:

=   409,419 USD

If we rehabilitate the breach and the structure, the property having the following cost will be kept from future damages.

a. Cost of 300 jribs land   =   300 x 3500 USD =   1,050,000 USD
b. Income from 300 jribs first & second crops =   600 x 153.75   =   92,250 USD
c. Income from 80,000 jribs   =   80,000 x 87.5   =   7,000,000 USD

Total: ı

=   8,142,250 USD

E. At station 31+320, the river bank is coming very close to the canal bank not more than 30 meters, urgent rehabilitation is required. In this station about 400 jribs of land has been washed away by the flood and affected 80 families and they have lost as follows;

1. Cost of 400 jribs washed land   =400 x 3000   = 1,200,000 USD
2. First crop income wheat   =900 kg /jrib x 7000 Afs kg/40,000x400   = 63,000 USD
3. Second crop income corn   =1000 kg/jrib x 6000 Afs kg/40,000x 400   = 60,000 USD

Total:

= 1,323,000 USD

If the land at station 31+320 is not protected, 300 jribs of land will be washed away in the future and the following damages are expected and after that the canal will be washed.

1. Cost of 300 jribs land   =300 x 3000 USD   =900,000 USD
2. First crop income   =900 kg/jrib x 7000 Afs kg/40,000 USD/Afs x 300   = 47,250 USD
3. Second crop income   = 1000 kg/jrib x 6000 Afs kg/40,000 Usd/Afs x 300   = 45,000 USD

Total:

= 992,250 USD

If the canal is washed by the flood, 77,500 jribs of land will have no water for irrigation and 15,500 families will be compelled to migrate so the loss estimates as follows;

1. Income from first and second crop = 400 kg/jribs x 6000 Afs kg/40,000 USD/Afs x 77500 = 4,650,000 $
2. Total loss in case of no protection work of land and canal is = 900,000 + 47,250 + 45,000 + 4,650,000 = 5,642,250 USD

Rehabilitation expenses at station 31+320

1. Gabion work   =   6,887 x 40   =   275,480 USD
2. Excavation   =   2,767 x 1   =   2,767 USD

Total:

=   278,247 USD

F. The river at station 55+878 is very close to the Shamalan canal and 240 meters left berm of main drain H has washed by the river and around 500 jribs (100 hectare) land has washed by the flood which caused to migrate 100 families and the damage estimates as follows;

1. Cost of 500 jribs land   =   500 x 2000   =1,000,000 USD