T0: 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. Skam. Branch Break

21+350

or

+2 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 jibs of land will have no enough water for irrigation.

### Summary

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<th>S/NO</th>
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<th>Work description</th>
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All drawings sketches and dates are attached.
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,
1. Old Shamalan canal is a branch of Boghra canal which its intake is at station 31+800 of Boghra with commend area of 120,000 jirebs (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  
   $500 \times 3500 \text{ USD} = 1,750,000 \text{ USD}$
2. First crop wheat $900 \text{ kg/jireb} \times 7000 \text{ Afs/40,000 USD/Afs} \times 500 = 78,750 \text{ USD}$
3. Second crop corn $1000 \text{ kg/jireb} \times 6000/ \text{kg/40,000 USD/Afs} \times 500 = 75,000 \text{ USD}$

Total Loss  
$1,903,750 \text{ USD}$

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

1. Cost of 100 jirebs  
   $100 \times 3500 \text{ USD} = 350,000 \text{ USD}$
2. First crop income wheat  
   $100 \times 157.5 = 15750 \text{ USD}$
3. Second crop income corn  
   $100 \times 150 = 15000 \text{ USD}$

Total  
$380,750 \text{ USD}$
Rehabilitation expenses:

1. Gabion work.  
2. Excavation.  

Total.

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  
2. First crop wheat  
3. Second crop corn  

Total Loss  

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  
2. First crop wheat  
3. Second crop corn  

Total  

Rehabilitation expenses:

1. Gabion work.  
2. Excavation.  
3. Excavation and backfill  

Total.

We consider protection of land as a first priority and canal as a second priority otherwise 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  
2. First crop wheat  
3. Second crop corn  

Total loss:  

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 = 400 kg/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:

- Cost of 500 jrib land = 500 x 2000 = 1,000,000 USD
- First and second crop income = 400 kg/jrib x 6000 Afs/kg/40,000 x 500 = 30,000 USD
  In the case of canal protection = 400 kg/jrib x 6000 Afs/kg/40,000 x 20000 = 1,200,000 USD

Total: = 2,230,000 USD

If the land and canal are not protected, we will lose 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 Shamal 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: = 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/40,000 x 400 = 63,000 USD
3. Second crop income corn = 1000 kg/jrib x 6000 Afs kg/40,000 x 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 = 273,480 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 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