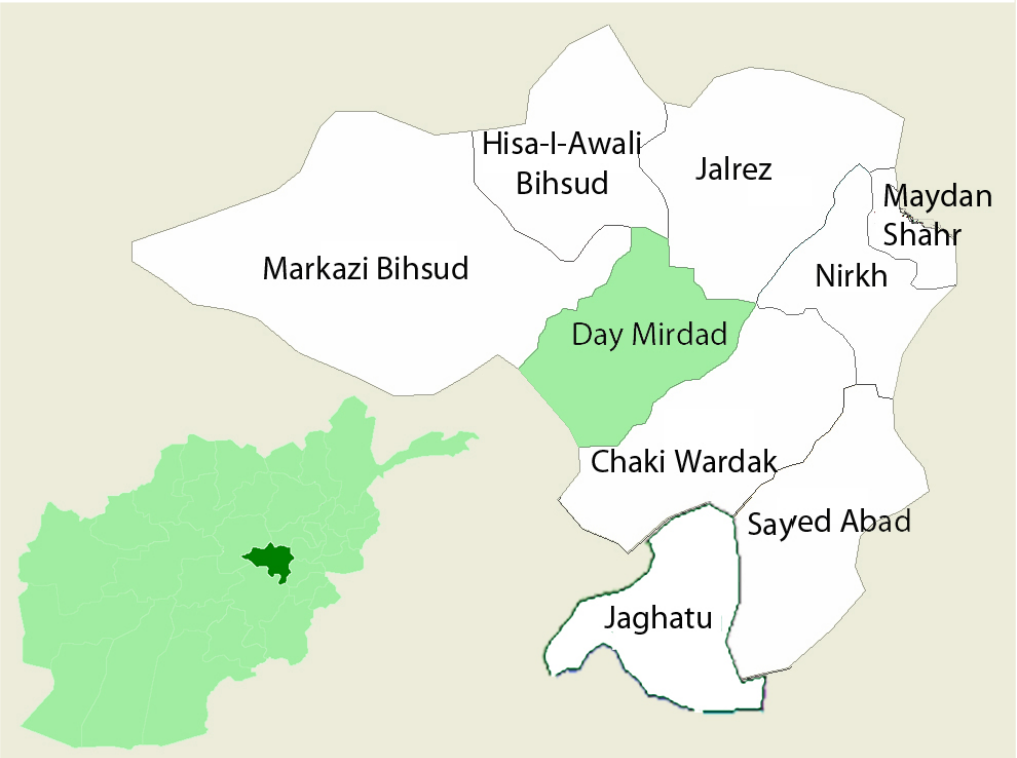
Wardak Watershed and Irrigation Survey Project



Day Mirdad District Report

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Day Mirdad District Water Report

1. Introduction

This report is one of a series of reports on a survey of watersheds and irrigation in the 9 districts of Wardak Province, Afghanistan. The purpose of the survey was to provide data on watersheds (drainage basins) and irrigation in Wardak so that allocation of donor money for improvements to the water supply can be prioritized for maximum impact on livelihoods.

Although the survey was conducted by watershed, the data has beans extracted for each district.

2. Methodology

The survey was carried out by a team of three local surveyors, interviewed and selected by GPFA staff in June 2010. The team members had no previous experience of this type of work, but were trained by GPFA staff in July and the survey started in November 2010 and ended in January 2011.

The survey took 25 days in November, 21days in December, 5 days in January 2011 - a total of 51 days. 51 villages were surveyed, at the rate of 1 – 2 villages per day.

The reason for lower productivity of the survey team in Day Mirdad is not clear. It is likely that it was due to a combination of security concerns, the difficult terrain covered and the shorter days in autumn. Transport was by local taxi and on foot. Interviews were held with leaders and with 5 elders from each village. All significant water structures (karez, wells, canals etc.) were visited in each village.

The teams recorded information manually in Dari/Pashto and it was later translated into English and entered into a database using MS Excel. As well as a notebook, the teams carried digital cameras with GPS facility to record location and altitude and to take representative photographs. Copies of the survey forms used are attached to this report.

51 villages were surveyed, but several of the villages surveyed do not have government id codes and do not appear on official maps. So the real percentage of villages surveyed is uncertain. In addition, the survey was based on watersheds (catchments) or micro-watersheds which meant that certain settlements were grouped together.

Because the survey teams were relatively inexperienced in watershed and catchment interventions, the photographs are extremely useful to experts analysing each sub-watershed. For the future, surveyors will be given better training on what to photograph. For example, a photo of the terrain above each karez mother-well would be very useful; also the off-take of each canal might be helpful. It may be possible to automatically record on each photo the GPS position of the photographer; if not, it will be done manually in future. This would give a better idea of where the surveyors were photographing from and a crosscheck on information recorded in the database. Nevertheless, the photographs from Day Mirdad are a valuable extra resource to aid project selection.

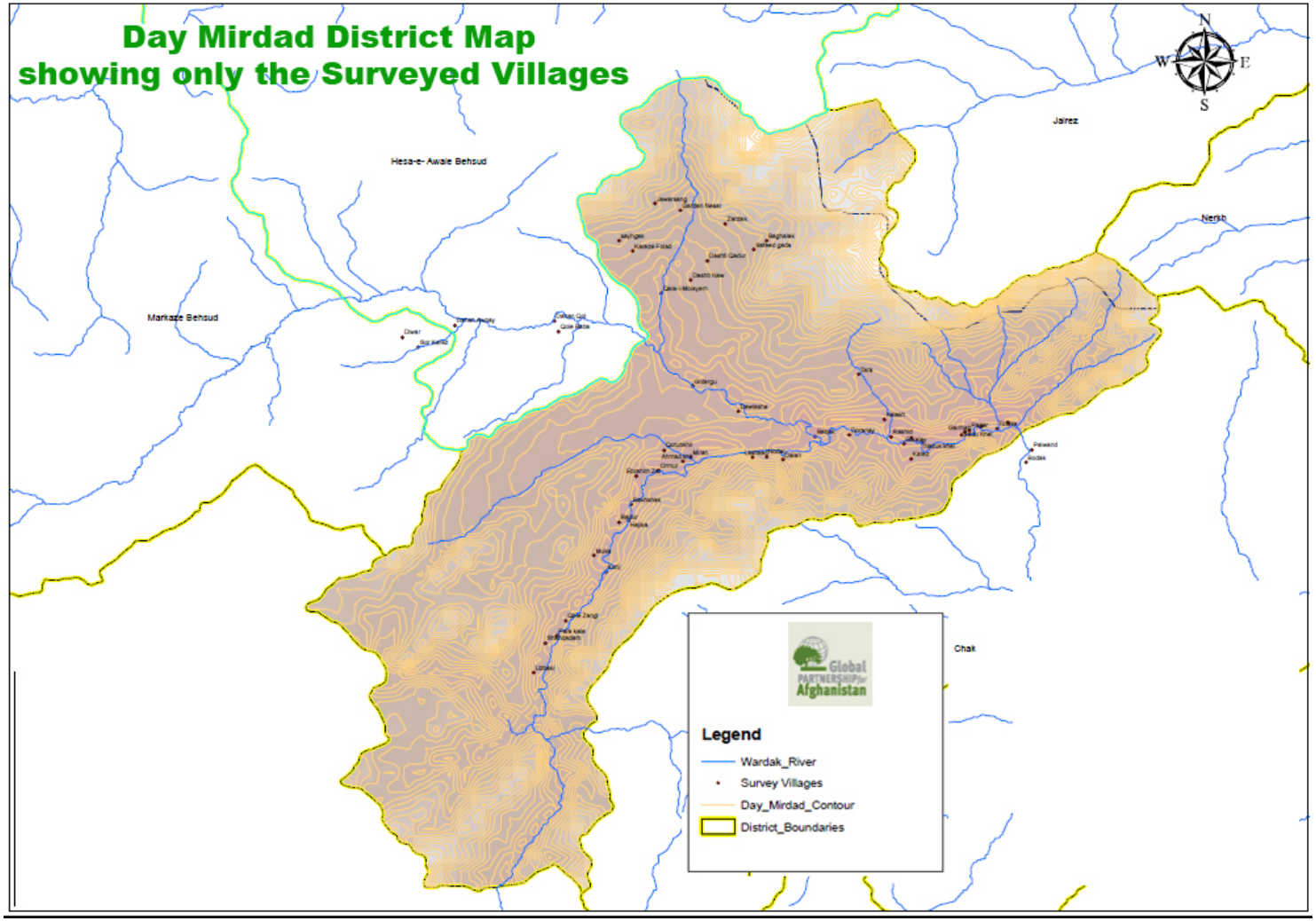
3. Watersheds & sub-Watersheds in Day Mirdad District

Day Mirdad District is entirely dependent on the main Chak River and its tributaries for water. The Day Mirdad River is the source of the Chak River after flowing Northeast through Syed Abad District into Logar Province. The Day Mirdad River itself rises from the mountain areas and Markaz Behsood and flowing to the Chak district then entering to the Sayed Abad District flowing in the Shikh Abad area to Tangee value to Logar Province, another tributary joins at Mirahmadkhel; downstream at Iwar, the Baksmand River joins the Chak River. All three tributaries have their cachment areas inside Chak District, but the major catchment for the Chak River itself is in Markazi Bihsud district with smaller catchments in Day Mirdad District and in Ghazni Province. There is no figure for the catchment area in Chak District itself, but the total watershed upstream of the Chak Dam[1] has an area of 4,054 km^2.

Peak flow in the Jalriz River comes from snowmelt and spring rains in April. However there are significant unpredictable flash floods in late summer too. Demand varies according to elevation and crops grown. For example, the wheat grown at high elevations will be harvested later than that at low elevation: thus its peak demand for water will also be later. Peak demand for wheat is about one month prior to harvest and falls off rapidly after grain milk stage (Zadoks 7-8). If soil conditions are good, wheat roots extend to 1m and if winter snow has fully replenished soil moisture, the plants can take about 150mm from a silt soil early in the growing season. But wheat may be using more than 7mm per day in the period Zadoks 3 to 7 and annual water demand by wheat may exceed 1,000mm: in the absence of summer rain, irrigation is essential. The peak water demand for maize will come later in the season when the water supply in some springs and streams will be dwindling. The will limit the growing of maize in certain areas. maize roots are much shallower than wheat which means that irrigation must be much more frequent, but in Wardak, as water from snow-melt diminishes, irrigation water supply to each farmer is often less frequent in late summer. For fruit crops, apples need water most from mid-July onwards whereas stone fruit may need irrigation earlier.

Altitudes of the villages surveyed vary from Ahmad Khil at 2,199 to Tara village 2,673 m. There is no obvious correlation between altitude and the percentage of wheat or fruit grown.

4. Day Mirdad District Map



5. Village Profile Examples

a. Hajika Village

Hajika village was selected for its remote location and high altitude (2,415 m). It is on the Hajika sub-watershed off the Bara Jilga River. The population is over 2,000 and there are 200 families. The total land area is 2,200 jeribs of which about more than half is agricultural (1400 jeribs) and irrigated (1000 jeribs) land. Each family has on average 5 jeribs of irrigated land. Water seems to be plentiful as distribution is hourly and each family gets water for some part of the day. There are 150 jeribs of wheat, 130 jeribs of maize and barley, 190 jeribs of animal feed and 90 jeribs of beans and potatoes. The major crop is fruit which occupies 370 jeribs of land. The 2,415 m elevation is at the extreme for successful fruit growing. There are 180 cows and an average 3 sheep or goats per family which is typical for an upland village with access to rangeland.

According to the five elders interviewed, the population has doubled in the last 30 years. Thirty years ago, there was more agriculture and more trees in the village and there were no sign of deforestation or soil erosion. Opinions were divided on the amount of rain and snow in the past, but they were unanimous that there was more water flow from the village spring. There was no mention of conflict within or between villages.

There is one village canal. The water is potable and the flow is moderate irrigating 6,000 jeribs of land and 390 families benefit from this canal. The canal is shared by 3 villages and its source is the Jilga River. The canal has leaks and has blockages. It is damaged and is full of mud and stone (see pictures 1, 3 and 4). There is one check dam which is 2m deep and 25 m wide. They use this check dam for irrigation only. It was built about 50 years ago and it has visible cracks and damage and leaks. It is full of mud and stone and needs cleaning and repairs and concreting (see picture 2).

Various interventions were requested by the village elders. In terms of water and irrigation needs, they suggested repairs to the canal and check dam and its channels damaged by flooding. These are a priority. The need for work on the canal and the check dam was confirmed by the survey team. The potential for improving ground-water replenishment was not noted by the survey, but looking at the photographs there is obviously potential for better rangeland and catchment management and some reforestation.

Non-water farming interventions requested were

- Certified seed distribution to the farmers.
- Improved road access and asphalting of that
- Fruit stores
- Medical Clinic
- Electricity
- Animal clinic in the village and primary school.
- Bee-keeping

Hajika Village Photographs

1. The Village Canal

2. The Check Dam

3. The Village Canal

4. The Village Canal

b. Dahan Awpay Village:

At an altitude of 2,465m, Dahan Awpay is located near to Taimoor sub-watershed which is a tributary of the Day Mirdad River. The soil is predominately silty and sandy. There are 30 households and a population of 300 supported on 700 jeribs of land. 300 jeribs of land are agricultural irrigated land. There are a further 400 jeribs of un-cropped land within the village area. Families have, on average, less land than neighbouring villages. There are 100 jeribs of wheat, 40 jeribs of other cereal crops and 85 jeribs of potatoes. There is no orchard. 70 jeribs is given over to fodder to support some 25 cows and 1,100 sheep and goats and 20 donkeys.

The water comes from a canal and a spring. The canal is called Jawe Lala Canal and its source is the Jilga River. The total length of the canal is 1,000m and 2 villages share it. 100 families benefit from this canal and 700 jeribs of land is irrigated from it. It leaks and has blockages and some damage. There are some trees and grass growing along the canal. The irrigation system is furrow and flood. The spring also needs some attention.

Water is distributed to each village every two days which is not frequent enough when the soil is silty and sandy. The Mirab is chairman of the water shura.

All the village elders interviewed recommended the cleaning, repair and concreting of the canal and spring and the concreting of the spring's reservoir. This will have positive effect on water.

There are no trees on the nearby mountains and there has been no planting of poplar woodlots to supply the villages' timber needs, but from the photographs there are some grasses and forestry trees in the damp areas near springs and the canal. There may be potential for planting woodlots on land which is subject to flooding.

The village elders mentioned several other needs, including clinic for livestock, improved certified seed and chemical fertilizer, chickens, reservoir for the karez and agricultural training.

Dahan Awpay Village Photographs

1. The village Canal

2. Another view of the village canal.

c. Tara Village:

Tara village was selected for its remote location and high altitude (2,673 m).

The population has increased from about 400 thirty years ago to 800 today. There are 65 households. The total land of this village is 2,500 jeribs and agricultural land is 900 jeribs and 600 jeribs of the land is irrigated. The average irrigated landholding by professional farmers is only 10 jeribs. The water distribution system in this time is by hours between farmers but in the past they have distributed water between farmers by day and night.

Wheat and other cereal crops take up some 300 jeribs of land. There are 10 jeribs of onions, 150 jeribs of fruit, 30 jeribs of potatoes and beans, 100 jeribs of animal feed and 10 jeribs of other vegetables. The village has 60 cows, 800 sheep and goats and 40 donkeys.

According to the villagers, the irrigation system is in a very bad state due to recent floods and the past drought and the two Karezes are damaged. The survey team thought that hard work was needed. Water is mainly by Karez, but a properly constructed reservoir and channel form the karez to the field would have a positive effect on irrigation for the village. General improvements to the Karezes systems were requested to clear blockages and prevent leaks. There are several inconsistencies in the data collected for the Karezes and it is suggested that the team return to check their readings.

The elders mentioned that the two karezes need cleaning and that the water channel leaks. It is damaged every year by floods. Concreting could solve this problem. They were concerned about a flood protection wall for the Karezes and building a reservoir for each Karez.

Apart from water issues, the villagers mentioned other needs including improved seed and modern technology. They said the village needs a hospital and primary school. Beekeeing was also mentioned as a possible project.

Tara Village Photographs

1. Wech Karez canal

2. Ster Karez canal

d. Toiaka Village:

Toiaka village is near to the Tanga Sayedan, Nazuk Khil and Khair Qala villages. The Jilga River is the source of the Jowe Toiaka Canal which supplies the mentioned village. The altitude is about 2,315m. The soil is silty and sandy and there is insufficient water to meet all its irrigation needs.

The village is of medium size with 40 households and a population of about 500. As in other villages surveyed, numbers have doubled in recent years. The survey reveals that this village has 1,500 jeribs of land in total, 500 jeribs of which is agricultural land, but only 500 jeribs is cultivated and irrigated. There was no mention of rain fed land being used.

Water is available from a canal and a karez. Toiaka village divides water by hours between the farmers and 3 villages share the canal. The karez is used only by this village.

There are 100 jeribs of wheat, 200 jeribs of fruits, 60 jeribs of animal feed, 50 jeribs of potatoes and 80 jeribs of other cereal crops. The village has 40 cows, 600 sheep and goats and 20 donkeys.

Water is sourced from karez and canal which are in poor condition with leaks, blockages and damage. Both canal and karez require cleaning and repair and perhaps concreting in some areas.

The village elders from Toiaka say that they need karez, canal and reservoir cleaning and repair. They would also like village improvements including a health clinic, greenhouses and one cold store.

Toiaka Village Photographs

1. Toiaka Village Karez

2. Toiaka Village canal

6. Village Irrigation in Day Mirdad District.

a. Villages located on the northern and eastern sides of the Bara Jilga Valley

Name: Village	Population Jeribs	GPS N E Altitude (M)	Village Description	Water Supply	Cost Estimate USD	Cost Per Bene-ficiary USD	Cost Per Jeribs Irrigated USD
Lashkari لشکری WD-DM-015	**Pop: 820** **Total: 2800j** **Irrig: 800 j**	N 34.21931 E 68.34078 Alt: 2345 m	70 out of 75 households depend on agriculture and benefit from irrigation. The soil types are sandy, 800 out of 2800 jeribs of land are irrigated and cultivated agricultural land The income of 60 families comes from growing cash crops. There are 160 jeribs of wheat, 230 jeribs of fruits, 120 jeribs of animal feed, 150 jeribs of potatoes, 110 jeribs of other cereal crops, 10 jeribs onions and 10 jeribs of other vegetables. There are 70 cows, 300 sheep and goats, and 18 donkeys.	The village has one canal and one tube well. The 2,100m long canal supplies 270 households and irrigates 3600 jeribs of land 3 villages share this canal, it has leaks and blockages and was damaged by floods. The tube well is 1m deep and 1 m wide . 32 households are supplied by this tube well. It needs cleaning and digging.	**Canal** **Tube well**		

Name: Village	Population Jeribs	GPS N E Altitude (M)	Village Description	Water Supply	Cost Estimate USD	Cost Per Bene-ficiary USD	Cost Per Jeribs Irrigated USD
Ormur اورمړ WD-DM-0013	**Pop: 700** **Total:1900j** **Irrig:500j**	N 34.21149 E 68.28529 Alt: 2449 m	50 out of 60 households depend on agriculture and benefit from irrigation. The soil types are sandy and salty. 900 out of 1,900 jeribs are agricultural land and 500 jeribs are irrigated. The income of 35 families comes from growing cash crops. There are 120 jeribs of wheat, 80 jeribs of maize and barley, 200 jeribs of fruit, 60 jeribs of animal feed, and 35 jeribs of potatoes. There are 60 cows, 600 sheep and goats.	The village has a check dam, one canal, one karez, one spring, one reservoir and one tube well. The spring supplies 20 households and irrigates 10 jeribs of lands. There is no soil erosion. The spring is full of mud and stones and needs a reservoir. The check dam has 1 m depth and 25 m width and it is made of stone, timber beams and soil and has leaks and damage. It needs enlarging and two side stone walls. The 1,100m long canal supplies 220 households and irrigates 2,500 jeribs of land. The canal is shared between 3 villages and has leaks, blockages and damage. It requires a stone wall in those areas which are regularly damaged by floods. The karez supplies 120 households and irrigates 10 jeribs of land. The soil types are gravel and the soil erosion is moderate. The channel of this karez has leaks and blockages	**Spring** **Canal** **Karez** **Tub well** **reservoir** **Check dam**		

Name: Village	Population Jeribs	GPS N E Altitude (M)	Village Description	Water Supply	Cost Estimate USD	Cost Per Bene-ficiary USD	Cost Per Jeribs Irrigated USD
				and its shafts are full of mud and stone and require cleaning. The reservoir has 4 m depth and 30 m width and 40m length. It supplies 1,200 people and irrigates 30 jeribs of land. It was built 100 years ago. The karez has blockages and is full of mud and stone. The reservoir has leaks and damage and needs enlarging and concreting. The tube well has a 17m depth. 1 m width. It was built 18 years ago and doesn't have a pump. The water is potable.			
Ibrahim Zai ابراهیم زی WD-DM-028	**Pop:750** **Total:2400j** **Irrig: 900 j**	**N** 34.21685 **E** 68.29963 **Alt:** 2199 m	60 out of 70 households depend on agriculture and benefit from irrigation. The soil types are sandy and silt, 900 out of 2400 jeribs are irrigated agricultural land and 900 jeribs are cultivated in the area. The incomes of 45 families comes from growing cash crops. There are 170 jeribs of wheat, 130 jeribs of maize and barley, 380 jeribs of fruits, 120 jeribs of animal feed, 80 jeribs of potatoes, and 10	The village has one canal one karez and one check dam. The check dam was built about 70 years ago and has a 1m depth and 30 m width. It is built from soil and stone and has leaks and cracks. It wastes a lot of water and need repairing or concreting. The 2,500 m long canal supplies 180 households and irrigates 2,000 jeribs of land. 3 villages share this canal. It has leaks and blockages and	**Canal** **Karez** **Check dam**		

Name: Village	Population Jeribs	GPS N E Altitude (M)	Village Description	Water Supply	Cost Estimate USD	Cost Per Bene-ficiary USD	Cost Per Jeribs Irrigated USD
			jeribs of other vegetables. There are 75 cows, 150 sheep and goats and 15 donkeys.	needs enlarging near the river area. It also needs cleaning and repairing or concreting. The karez supplies 120 households and irrigates 40 jeribs of land. The soil types are gravel and the soil erosion is moderate. The karez has blockages and damage and the canal of the karez has leaks and wastes much water.			
Bakhshak بخشک WD-DM-20	**Pop: 1780** **Total: 1700j** **Irrig: 700j**	N 34.19158 E 68.2693 Alt: 2368 m	70 out of 75 households depend on agricultural land and benefit from irrigation. The soil types are sandy and silt. 700 out of 1,700 jeribs of land are agricultural and irrigated land and also 700 jeribs of land are cultivated in the area. The income of 60 families comes from growing cash crops. There are 200 jeribs of wheat, 190 jeribs of fruits, 110 jeribs of animal feed,90 jeribs of potatoes,90 jeribs of other cereal crops, 10 jeribs of onions and 10 jeribs of other crops.	The village has one canal and one tube well. The 1,500 m long canal supplies 75 households and irrigates 700 jeribs of land and 700 jeribs of land are cultivated in the area. The canal is used only by this village and has leaks, blockages and damage. It needs cleaning and concreting of the leaks and damage. The tube well has a 18 m depth and 1 m width and supplies 30 families. A hand pump is required for the well.	**Canal** **Tube well**		

Name: Village	Population Jeribs	GPS N E Altitude (M)	Village Description	Water Supply	Cost Estimate USD	Cost Per Bene-ficiary USD	Cost Per Jeribs Irrigated USD
			There are 70 cows, 600 sheep and goats and 18 donkeys.				
Badur بادر WD-DM-0012	**Pop: 580** **Total: 1300j** **Irrig:600 j**	N 34.18082 E 68.26209 Alt: 2226 m	50 out of 57 households depend on agriculture and benefit from irrigation The soil types are sandy and silt. 600 out of 1,300 jeribs are agricultural and irrigated and 600 jeribs of land are cultivated in the area. The income of 40 families comes from growing cash crops. There are 100 jeribs of wheat, 70 jeribs of maize and barley, 240 jeribs of fruits, 80 jeribs of animal feed, 70 jeribs of potatoes, and 30 jeribs of rice. There are 60 cows, 300 sheep and goats, and 15 donkeys.	The village has canal and one tube well. The 900m long canal supplies 450 households and irrigates 2,500 jeribs of land and all of this land is cultivated. The canal leaks and has damage. The dam and water intake are damaged and the canal needs repair and cleaning. The tube well has a 14 m depth and 1m width and supplies 20 households and needs a pump.	**Canal** **Tube well**		
Hajika حاجیکه WD-DM-029	**Pop: 2000** **Total:2200j** **Irrig: 1000j**	N 34.18184 E 68.26761 Alt :2415 m	150 out of 200 households depend on agriculture and benefit from irrigation. The soil types are clay, sand, and silt. 1,400 out of 2,200 jeribs are	The village has one check dam and one canal. The check dam has a 2m depth and 25m width. It was built 50 years ago and has leaks and cracks and wastes much water.	**Check dam** **18,000** **Canal** **13,000**		

Name: Village	Population Jeribs	GPS N E Altitude (M)	Village Description	Water Supply	Cost Estimate USD	Cost Per Bene-ficiary USD	Cost Per Jeribs Irrigated USD
			agricultural land and 1,000 jeribs of land are irrigated agricultural land. 1,000 jeribs of land are cultivated. The income of 100 families comes from growing cash crops. There are 150 jeribs of wheat, 130 jeribs of maize and barely, 370 jeribs of fruits, 190 jeribs of animal feed, 90 jeribs of potatoes, 50 jeribs of other cereal crops, 10 jeribs of onions, and 10 jeribs of vegetables. There are 180 cows, 600 sheep and goats, and 60 donkeys.	The 1,900m long canal supplies 390 households and irrigates 6,000 jeribs of land 3 villages share this canal. It leaks and has visible cracks and damage and requires cleaning, repair and perhaps concreting in some sections.			
Muka موکه WD-DM-030	**Pop: 1500** **Total: 2000j** **Irrig: 800j**	N 34.16137 E 68.24724 Alt:2396 m	100 out of 120 households depend on agriculture and benefit from irrigation. The soil types are sand and silt. 800 out of 2000 jeribs of land are irrigated agricultural land. 800 jeribs of land is cultivated. The income of 60 households comes from growing cash crops. There are 130 jeribs of wheat, 45 jeribs of maize and barely, 255 jeribs of fruit, 150 jeribs of animal feed, 120 jeribs of beans and	The village has one spring, one check dam and one canal. The spring supplies 60 households and irrigates 15 jeribs of land. It is full of mud and stone and has some leaks and blockages. The check dam has a 3.5m depth and 4m width and is full of mud and stone and has some leaks and cracks. It is made of tone, mud and soil. It needs cleaning, concreting and	**Spring** **10,000** **Check dam** **22000** **Canal** **40,000**		

Name: Village	Population Jeribs	GPS N E Altitude (M)	Village Description	Water Supply	Cost Estimate USD	Cost Per Bene-ficiary USD	Cost Per Jeribs Irrigated USD
			potatoes, 70 jeribs of other cereal crops and 150 jeribs of onions. There are 130 cows, 550 sheep and goats and 60 donkeys.	repairing. The 1,800 m long canal supplies 800 households and irrigates 4,500 jeribs of land. It is shared between 5 villages. It has leaks and visible cracks and needs cleaning and repairing or concreting of the damaged areas.			
Qol Zangi قول زنگی WD-DM-033	**Pop:1300** **Total:2600j** **Irrig:500j**	N 34.12270 E 68.23063 Alt:2381m	100 out of 120 households depend on agriculture and benefit from irrigation. The soil types are sandy and silt. 500 out of 1,200 jeribs of land are agricultural and irrigated land and 580 jeribs of land is cultivated in the area. The income of 70 families comes from growing cash crops. There are 90 jeribs of wheat, 40 jeribs of maize and barley, 220 jeribs of fruit, 150 jeribs of animal feed, 60 jeribs of beans and potatoes and 5 jeribs of vegetables. There are 130 cows, 800 sheep and goats, and 40 donkeys.	The village has one canal, one check dam, and one surface well. The check dam has a 1.5m depth and 18m width and it was built 65 years ago. It has leaks and visible cracks and is full of mud and stone. It needs cleaning and repair of the damaged and leaking sections. The 2,900m long canal supplies 220 households and irrigates 1,200 jeribs of land. 1,200 jeribs of land are cultivated in the area. The canal is full of mud and stone and has visible cracks, blockages and damage. It needs cleaning and repairs. The surface well has a 20m depth and 1m width and was	**Check dam 25,000** **Canal 18,000** **Surface well 1500**		

Name: Village	Population Jeribs	GPS N E Altitude (M)	Village Description	Water Supply	Cost Estimate USD	Cost Per Bene-ficiary USD	Cost Per Jeribs Irrigated USD
				dug 20 years ago. 20 families benefit from this well and it needs cleaning and digging.			
Para kala پاره کله WD-DM-034	**Pop: 500** **Total:700 j** **Irrig:400 j**	N 34.11412 E 68.22538 Alt:2439 m	30 out of 40 households depend on agriculture and benefit from irrigation. The soil types are clay and sand. 400 out of 700 jeribs of land irrigate agricultural land and 400 jeribs are cultivated in the area. The income of 20 families comes from growing cash crops. There are 80 jeribs of wheat, 40 jeribs of maize and barley, 180 jeribs of fruit, 40 jeribs of animal feed, 50 jeribs of beans and potatoes, 4 jeribs of other cereal crops. There are 45 cows,400 sheep and goats and 30 donkeys.	The village has a canal, a check dam, and a surface well. The 2,000m long canal supplies 270 households and irrigates 1,800 jeribs of land and all 1,800 jeribs of land are cultivated. It has leaks and blockages and requires cleaning, enlarging and repair or concreting of the damaged areas. The check dam has a 1.5 m depth and 25m width and it has leaks and is full of mud and stone. It needs cleaning and repairing or concreting. The surface well has a 17m depth and 1m width and was dug 20 years ago. 25 families benefit from this well and it needs cleaning and digging.	**Canal** **35,000** **Check dam** **25,000** **1500**		

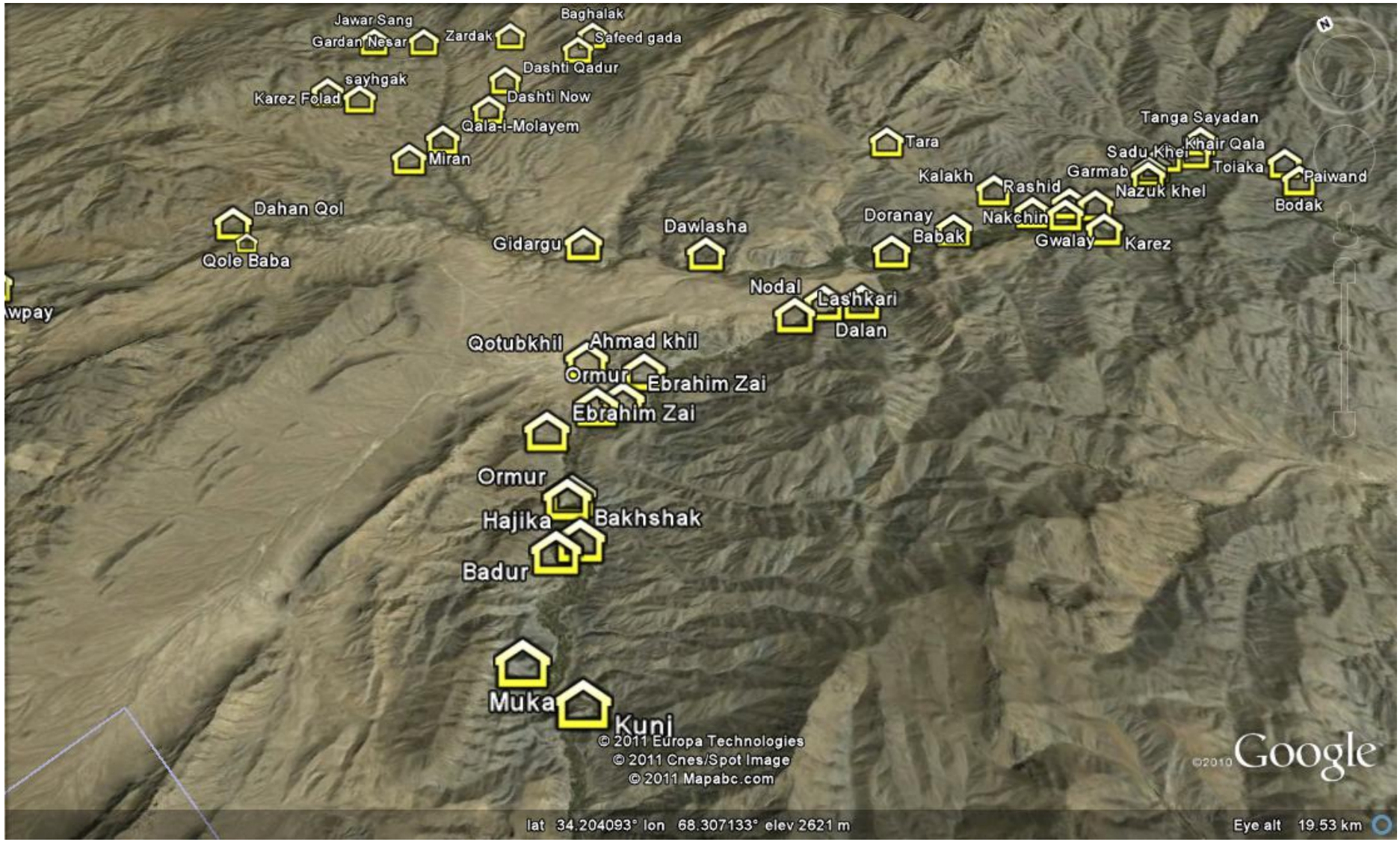
Name: Village	Population Jeribs	GPS N E Altitude (M)	Village Description	Water Supply	Cost Estimate USD	Cost Per Bene-ficiary USD	Cost Per Jeribs Irrigated USD
Shahqadam شاه قدم WD-DM-032	**Pop:800** **Total: 1200j** **Irrig:400j**	N 34.10958 E 68.21849 Alt: 2448 m	60 out of 70 households depend on agriculture and benefit from irrigation. The soil types are sand and silt. 600 out of 1,200 jeribs str agricultural land and 400 jeribs are irrigated and cultivated. The income of 35 families comes from growing cash crops. There are 100 jeribs of wheat, 50 jeribs of maize and barley, 100 jeribs of fruit, 90 jeribs of animal feed, and 100 jeribs of beans and potatoes. There are 80 cows, 650 sheep and goats, and 25 donkeys.	The village has one canal and one surface well. The 800m long canal supplies 150 households and irrigates 1,000 jeribs of land. 1,000 jeribs of land are cultivated in the area. It is shared between 2 villages. The canal is full of mud and stone and has some leaks and blockages and needs cleaning and repair. The surface well has a 17m depth and 1m width and it was built 20 years ago. 15 families benefit from this well. It needs cleaning and digging.	**Canal** **30,000** **Surface well** **1500**	**20000**	
Gidargu کودره گو WD-DM-006	**Pop: 800** **Total: 1400j** **Irrig: 800j**	**N** 34.26138 **E** 68.30542 **Alt.**2283.5m	80 households depend on agriculture and 80 households benefit from irrigation. The soil types are silt and sandy. 800 out of 1,400 jeribs are agricultural and irrigated land and 800 jeribs of this land are cultivated. The income of 70 families comes from growing cash crops. There are 150 jeribs of wheat, 130	The village has one check dam and one canal. Bodak Check Dam is located in the Gidargu village and has a 4m depth and 25m width. It has a 120 year history. It has leaks and is full of mud and stone. It's canal also has some leaks and blockages. The 3,000m long canal supplies 280 households and irrigates 4,500 jeribs of land and 4,500	**Check Dam** **Canal**		

Name: Village	Population Jeribs	GPS N E Altitude (M)	Village Description	Water Supply	Cost Estimate USD	Cost Per Bene-ficiary USD	Cost Per Jeribs Irrigated USD
			jeribs of maize and barley, 300 jeribs of fruits, 80 jeribs of animal feed, 60 jeribs of potatoes and beans, 70 jeribs of rice, and 5 jeribs of other vegetables. There are70 cows, 700 sheep and goats and 37 Donkeys.	jeribs are cultivated. The canal is shared by 4 villages. It has leaks and blockages and some flood damage and so it wastes much water. It needs cleaning and concreting of the damage.			
Bodak بودک WD-DM-004	**Pop:550** **Total:1800j** **Irriga:1200j**	N 34.21637 **E** 68.50207 **Alt.**2304.5m	45 out of 55 households depend on agriculture and 45 benefit from irrigation. The soil types are clay, sandy, and silty. 1,200 out of 1,800 jeribs of land are irrigated agricultural land and 1,200 jeribs are cultivated. The income of 40 families comes from growing cash crops. There are 120 jeribs of wheat, 100 jeribs of maize and barley, 500 jeribs of fruits, 200 jeribs of animal feeds, 80 jeribs of potatoes and beans. There are 50 cows, 300 sheep and goats and 30 donkeys.	The village has one check dam and one canal. The 4,500 m long canal supplies 180 households and irrigates 3,000 jeribs of land. 2 villages share this canal. It is full of mud and stone and has leaks and blockages and wastes much water. It needs cleaning and repairs.	**Check dam** **Canal**		

Name: Village	Population Jeribs	GPS N E Altitude (M)	Village Description	Water Supply	Cost Estimate USD	Cost Per Bene-ficiary USD	Cost Per Jeribs Irrigated USD
Qotubkhil كتب خيل WD-DM-0011	**Pop: 430** **Total: 1200j** **Irrig:500 j**	N 34.22339 E 68.28863 Alt: 2311 m	35 out of 40 households depend on agriculture and benefit from irrigation. The soil type is clay. 500 out of 1,200 jeribs are irrigated agricultural land and 500 jeribs of land cultivate in the area. The income of 30 families comes from growing cash crops. There are 80 jeribs of wheat, 50 jeribs of maize and barley, 180 jeribs of fruits, 70 jeribs of animal feed, 100 jeribs of potatoes, 10 jeribs of onions, and 10 jeribs of other vegetables. There are 45 cows, 450 sheep and goats, and 25 donkeys.	The village has one canal, one spring and one Karez and one Tube well. The spring supplies 20 households and irrigates 25 jeribs of land. There is no soil erosion. The spring is full of mud and stone and its canal has leaks and blockages. The 1,400m long canal supplies 180 households and irrigates 2,000 jeribs of land. 2,000 jeribs of land are cultivated. The canal has leaks and damaged sections and its two side walls and its intake need repair or concreting. The karez supplies 120 households and irrigates 40 jeribs of land. The soil types are gravel and the soil erosion is moderate in the area. The karez is full of mud and stones and has blockages and damaged sections. It needs cleaning and repair or concreting of the damage sections and its canal needs cleaning and repair. The tube well supplies 25 families and doesn't have a pump. It has a 20m depth and 1m width.	**Canal** **Karez** **Tube well** **Spring**		

Name: Village	Population Jeribs	GPS N E Altitude (M)	Village Description	Water Supply	Cost Estimate USD	Cost Per Bene-ficiary USD	Cost Per Jeribs Irrigated USD
Kunj كنج WD-DM-031	Pop:900 Total:1100j Irrig:500j	N 34.15173 E 68.25425 Alt: 2371 m	65 out of 80 households depend on agriculture and benefit from irrigation. The soil types are sand and silt and clay. 500 out of 1,100 jeribs of land are irrigated agricultural and cultivated land. The income of 35 families comes from growing cash crops. There are 60 jeribs of wheat, 40 jeribs of maize and barely, 170 jeribs of fruit, 90 jeribs of animal feed, 90 jeribs of beans and potatoes, 30 jeribs of other cereal crops, and 10 jeribs of onions. There are 85 cows, 400 sheep and goats, 20 donkeys.	The village has one spring, one canal and one reservoir. The spring supplies 12 households and irrigates 15 jeribs of land. It has visible cracks and blockages and its canal has leaks and wastes much water. The spring and its canal need cleaning and repair. The 1,000m long canal supplies 150 households and irrigates 1,200 jeribs of land. It leaks and has blockages and damaged sections. It needs a reservoir. The existing reservoir supplies 150 people and irrigates 35 jeribs of land. It has a 30m width, 20m length and 4m depth. It was built 65 years ago. It needs cleaning and repair of the damaged and leaking sections.	**Spring** **10,000** **Canal** **18,000** **20,000**		
Uzbaki ازبکی WD-DM-035	**Pop:380** **Total:800j** **Irrig: 400j**	N 34.09221 E 68.21161 Alt:2450 m	25 out of 30 households depend on agriculture and benefit from irrigation. The soil types are clay and sand. 400 out of 800 jeribs of land are agricultural and irrigated land and 400 jeribs are cultivated. The income of 10 families comes from growing cash crops. There are 70 jeribs of wheat, 50	The village has one canal. The 500 m long canal supplies 80 households and irrigates 650 jeribs of land. All 650 jeribs are cultivated. The canal leaks and has blockages and some visible cracks. It needs cleaning and repair.	**Canal** **21,000**		

Name: Village	Population Jeribs	GPS N E Altitude (M)	Village Description	Water Supply	Cost Estimate USD	Cost Per Bene-ficiary USD	Cost Per Jeribs Irrigated USD
			jeribs of maize and barley, 150 jeribs of fruit, 60 jeribs of animal feed, and 50 jeribs of beans and potatoes. There are 40 cows, 600 sheep and goats, and 20 donkeys.				



Photograph: Villages located on both sides of the Day Mirdad River.

b. Villages located on the northern side of the Jilga River.

Name: Village	Population Jeribs	GPS N E Altitude (m)	Village description	Water supply	Cost estimate USD	Cost per beneficiary USD	Cost per jeribs irrigated USD
Dahan Awpay دهان اوپی WD-DM-042	**Pop: 300** **Total : 700j** **Irrig: 300j**	N 34.29702 E 68.16530 Alt:2465 m	25 out of 30 households depend on agriculture and benefit from irrigation. The soil types are sand and silt. 300 out of 700 jeribs are agricultural and irrigated land and 300 jeribs are cultivate. The income of 10 families comes from growing cash crops. There are 100 jeribs of wheat, 70 jeribs of animal feed, 85 jeribs of potatoes, and 40 jeribs of other cereal crops. There are 25 cows, 1,100 sheep and goats, and 20 donkeys.	The village has one spring, one canal and one surface well. The spring supplies 10 families and irrigates 5 jeribs of land. Soil erosion is moderate in the area. The spring needs a reservoir and is full of mud and stone and needs cleaning. The 1,000 m long canal supplies 100 families and irrigates 700 jeribs of land. 700 jeribs of land is cultivated. The canal has leaks and wastes water. It is full of mud and stones. It needs cleaning and repairing. The surface well has a 17m depth and 1m width. It was built 5 years ago. 18 households benefit from this well. It needs digging and a hand pump	**Spring** **6,000** **Canal** **15,000** **Surface well** **18,00**		

Name: Village	Population Jeribs	GPS N E Altitude (m)	Village description	Water supply	Cost estimate USD	Cost per beneficiary USD	Cost per jeribs irrigated USD
Dahan Qol دهن قول WD-DM-045	**Pop:650** **Total: 600j** **Irrig:300 j**	N 34.29965 E 68.22390 Alt:2426 m	40 out of 60 households depend on agriculture and benefit from irrigation. The soil types are sandy and silt. 350 out of 600 jeribs of land is agricultural land and 300 jeribs are cultivated. The income of 15 families comes from growing cash crops. There are 50 jeribs of wheat, 40 jeribs of fruit, 70 jeribs of animal feed, 80 jeribs of potatoes, and 50 jeribs of other cereal crops. There are 50 cows, 600 sheep and goats and 25 donkeys.	The village has one canal and one check dam. The 450m long canal supplies 150 households and irrigates 1800 jeribs of land and a total 1,800 jeribs of land are cultivated. The canal leaks and is damaged in sections and so it wastes water. It needs cleaning and repairs. The check dam has a 1m depth and 15m width and is made of formed mud and stone. It leaks and has blockages and wastes water. It needs cleaning and repair/concreting.	**Canal** **8,000** **Check dam** **1,100**		
Gardan Nesar گردن نثار WD-DM-041	**Pop:350** **Total:500j** **Irrig:250j**	N 34.36493 E 68.29823 Alt:2311 m	20 out of 30 households depend on agriculture and benefit from irrigation. The soil type is sandy. 250 out of 500 jeribs are agricultural and irrigated land and 250 jeribs of this land are cultivated. The income of 10 families	The village has a check dam, canal and a surface well. The check dam has a 0.5 m depth and 15m width and it is made of mud and stone. It leaks and wastes water. It needs cleaning and updating to a modern system. The 1,000m long canal	**Check dam** **12,000** **Canal** **16,000** **Surface well** **2,000**		

Name: Village	Population Jeribs	GPS N E Altitude (m)	Village description	Water supply	Cost estimate USD	Cost per beneficiary USD	Cost per jeribs irrigated USD
			comes from growing cash crops. There are 60 jeribs of wheat, 50 jeribs of animal feed, 50 jeribs of potatoes, 30 jeribs of onions, 20 jeribs of other vegetables, and 40 jeribs of other cereal crops. There are 35 cows, 800 sheep and goats, and 20 donkeys.	supplies 80 households and irrigates 600 jeribs of land. 600 jeribs of land are cultivated. 2 villages share this canal. It leaks and wastes water. It is full of mud and stone and needs cleaning and enlarging. The surface well has a 17m depth and 1m width. It was built 5 years ago. 18 households benefit from this well. It needs digging and a hand pump.			
Safeed gada سفید گده WD-DM-050	**Pop:700** **Total:850j** **Irrig:380j**	N 34.34194 E 68.34152 Alt:2438 m	60 out of 75 households depend on agriculture and benefit from irrigation. The soil type is silt. 500 out of 850 jeribs are agricultural land and 380 jeribs of this land is irrigated and cultivated. The income of 25 households comes from growing cash crops. There are 60 jeribs of wheat, 100 jeribs of animal feed, 160 jeribs of potatoes, and 40	The village has one check dam, a canal and a surface well. The check dam has a 1.5m depth and 12m width, it is constructed from mud and stone. It leaks and wastes water and needs cleaning and repair. The 1,700 m long canal supplies 150 households and irrigates 700 jeribs of land. All this 1,700 jeribs is cultivated. The canal leaks and has blockages and so waste much water. It needs	**Check dam** **10,000** **Canal** **8,500** **Surface well** **1,800**		

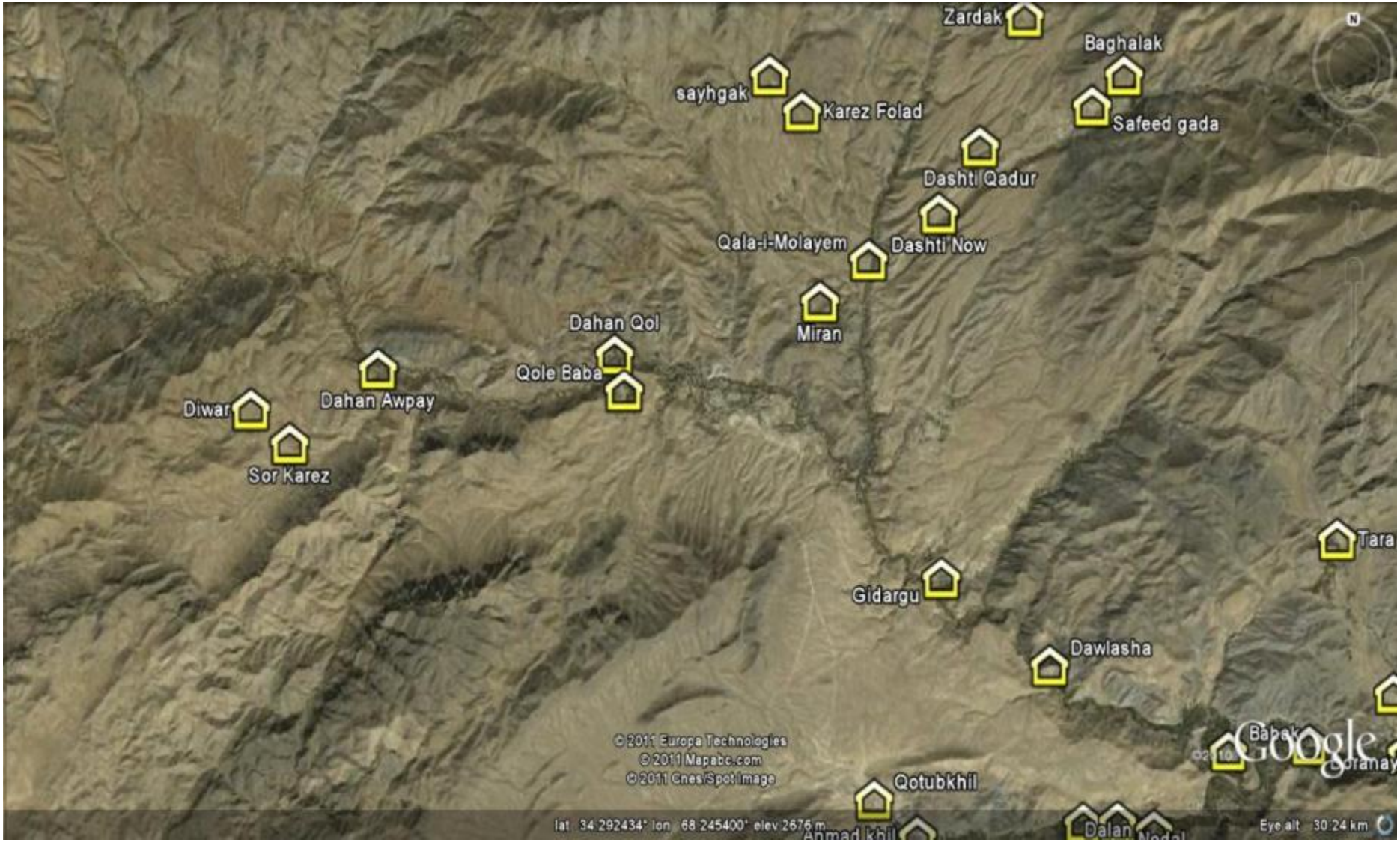
Name: Village	Population Jeribs	GPS N E Altitude (m)	Village description	Water supply	Cost estimate USD	Cost per beneficiary USD	Cost per jeribs irrigated USD
			jeribs of other cereal crops. There are 50 cows, 2000 sheep and goats and 100 donkeys.	cleaning and repair. The surface well has a 26m depth and 1m width and it is 5 years old. 25 families benefit from this well. It needs cleaning and diggings and needs a hand pump.			
Dashti Qadur دشت قادر WD-DM-049	**Pop:480** **Total: 750 j** **Irrig: 300j**	N 34.33516 E 68.31409 Alt:2408 m	30 out of 43 households depend on agriculture and benefit from irrigation. The soil types are sand and silt. 380 out of 750 jeribs are agricultural land and 300 jeribs are irrigated and cultivated. The income of 14 families comes from growing cash crops. There are 85 jeribs of wheat, 80 jeribs of animal feed, 100 jeribs of potatoes, and 30 jeribs of other cereal crops. There are 30 cows, 1800 sheep and goats and 15 donkeys.	The village has one spring, one canal, one reservoir. The spring supplies 20 households and irrigates 12 jeribs of land. The soil erosion is moderate. The spring is full of mud and stone and its canal leaks and has blockages. The 800 m long canal supplies 90 households and irrigates 600 jeribs of land. 600 jeribs of land is cultivated. The canal leaks and wastes water and has some blockages. The reservoir has a 15m length and 2.5m depth and supplies 900 people and irrigates 40 jeribs of land. It is 40 years old and is full of mud and stone and its canal	**Spring.** **6,000** **Canal** **13,000** **reservoir** **4,000**		

Name: Village	Population Jeribs	GPS N E Altitude (m)	Village description	Water supply	Cost estimate USD	Cost per beneficiary USD	Cost per jeribs irrigated USD
				has leaks and blockages.			
Baghalak بغلک WD-DM-037	**Pop: 450** **Total: 660j** **Irrig: 300j**	N 34.34703 E 68.34908 Alt:2329 m	30 out of 40 families depend on agriculture and benefit from irrigation. The soil types are sand and silt. 300 out of 660 jeribs of land are irrigated and cultivated agricultural land. The income of 10 families comes from growing cash crops. There are 70 jeribs of wheat, 80 jeribs of animal feed, 95 jeribs of potatoes, and 50 jeribs of other cereal crops. There are 35 cows, 1200 sheep and goats and 30 donkeys.	The village has one spring, one check dam and one canal. The spring supplies 10 households and irrigates 15 jeribs of land. It is full of mud and stone and its canal has some leaks and wastes much water. The check dam has a 1m depth and 10m width and was built 60 years ago. It is full of mud and stone and the canal has leaks and is wasting water. The 500m long canal supplies 100 households and irrigates 700 jeribs of land which is all cultivated. The canal is full of mud and has some leaks and blockages. It needs cleaning and repair or concreting of the damage sections. The canal also needs to be	**Spring** **5,000** **Check dam** **10,000** **Canal** **6,000**		

Name: Village	Population Jeribs	GPS N E Altitude (m)	Village description	Water supply	Cost estimate USD	Cost per beneficiary USD	Cost per jeribs irrigated USD
				enlarged.			
Miran میران WD-DM-040	**Pop: 1000** **Total: 1200j** **Irrig: 400j**	N 34.21938 E 68.30426 Alt:2318 m	60 out of 80 households depend on agriculture and benefit from irrigation. The soil types are sandy and silt. 600 out of 1,200 jeribs of land are agricultural and 400 jeribs are irrigated and cultivated. The income of 40 families comes from growing cash crops. There are 90 jeribs of wheat, 110 jeribs of fruit, 100 jeribs of animal feed, 50 jeribs of potatoes, 10 jeribs of onions, 30 jeribs of vegetable, and 10 jeribs of other cereal crops. There are 60 cows, 350 sheep and goats, and 15 donkeys.	The village has a spring, check dam, canal and karez. The spring supplies 10 households and irrigates 5 jeribs of land. Soil erosion is moderate in the area. The canal of this spring leaks and is blocked and it is full of mud and stone. It needs cleaning and repairs. The check dam has a 1.5m depth and 30m width and it is made of mud and stone and has leaks. It is full of mud and has visible cracks and require for cleaning and repairs. The 2,600 m long canal supplies 320 households and irrigates 1800 jeribs of land. 1,800 jeribs of land are cultivated. 4 villages share this canal. The canal	**Spring** **8,000** **Check dam** **35,000** **Canal** **15,000** **Karez** **15,000**		

Name: Village	Population Jeribs	GPS N E Altitude (m)	Village description	Water supply	Cost estimate USD	Cost per beneficiary USD	Cost per jeribs irrigated USD
				has leaks and blockages and wastes much water. It is full of mud and stones. Cleaning and repairs are needed. The karez supplies 20 households and irrigates 20 jeribs of land. The soil type is gravel and the soil erosion is heavy in the area. The karez has blockages and is full of mud and needs for cleaning and re-digging of its shafts well. It also needs reservoir.			
Qala-i-Molayem قلعه ملا یم WD-DM-046	**Pop:580** **Total: 1300j** **Irrig:400j**	N 34.31602 E 68.28700 Alt:2319 m	40 out of 55 households depend on agriculture and benefit from irrigation. The soil types are sand and silt. 500 out of 1,300 jeribs are agricultural land and 400 jeribs are irrigated and cultivated. The income of 15 families comes from growing cash crops. There are 110 jeribs of wheat, 80 jeribs of animal feed, 125 jeribs of potatoes, and 80 jeribs of other cereal crops.	The village has one check dam and one canal. The check dam has a depth of 1.5m and a width of 20m and it is constructed of mud and stone. It has leaks and a damaged section and its canal needs cleaning. The dam itself needs cleaning and repairs to the damaged sections. The 900m long canal supplies 120 households	**Check dam** **10,000** **Canal** **7,000**		

Name: Village	Population Jeribs	GPS N E Altitude (m)	Village description	Water supply	Cost estimate USD	Cost per beneficiary USD	Cost per jeribs irrigated USD
			There are 30 cows, 1500 sheep and goats and 30 donkeys.	and irrigates 600 jeribs of land and 600 jeribs of land is cultivated. This canal has leaks and blockages and need cleaning and repairs. 2 villages share this canal.			



Photograph: Villages located on the northern side of the Jilga River.

c. Villages located on both sides of the Koza Jilga River

Name: Village	Population Jeribs	GPS N E Altitude (M)	Village Description	Water Supply	Cost Estimate USD	Cost Per Beneficiary USD	Cost Per Jeribs Irrigated USD
Doranay درانی WD-DM-044	**Pop: 650** **Total: 800j** **Irrig: 400j**	N 34.23251 E 68.39778 Alt:2320 m	45 out of 55 households depend on agriculture and benefit from irrigation. The soil types are sandy and silt. 400 out of 800 jeribs of land are agricultural and irrigated land and 400 jeribs are cultivated. The income of 30 families comes from growing cash crops. There are 70 jeribs of wheat, 30 jeribs of Rice, 140 jeribs of fruit, 60 jeribs of animal feed, 30 jeribs of potatoes, and 60 jeribs of other cereal crops. There are 40 cows, 450 sheep and goats, and 20 donkeys.	The village has one check dam, one canal. The check dam has a 1.5m depth and 25m width and is made of mud and stone. It is 20 years old and has some leaks and damaged sections. It needs cleaning and repair of damage and leaks. The 1,500m long canal supplies 200 households and irrigates3500 jeribs of land. It has leaks and is wasting much water. It needs cleaning and repairs.	**Check dam** **15,000** **Canal** **23,000**		
Pagar فکر WD-DM-027	**Pop: 250** **Total: 800j** **Irrig: 500j**	N 34.23515 E 68.46866 Alt: 2361 m	20 families depend on agriculture and benefit from irrigation. The soil type is clay. 500 out of 800 jeribs are	The village has one spring and one canal. The spring supplies 20 households and it is full of mud and stone and needs cleaning	**Spring** **15,000** **Canal** **22,000**		

Name: Village	Population Jeribs	GPS N E Altitude (M)	Village Description	Water Supply	Cost Estimate USD	Cost Per Beneficiary USD	Cost Per Jeribs Irrigated USD
			agricultural and irrigated land. 500 jeribs of land are cultivated. The income of 20 families comes from growing cash crops. There are 120 jeribs of wheat, 40 jeribs of maize and barely, 180 jeribs of fruit, 70 jeribs of animal feed, 40 jeribs of beans and potatoes, and 40 jeribs of other cereal crops. There are 20 cows, 220 sheep and goats, and 10 donkeys.	and the canal has leaks and needs concrete. The 1,700 m long canal supplies 20 households and irrigates 500 jeribs of land. It has leaks and blockages and a damage section.			
Rashid رشید WD-DM-026	**Pop: 900** **Total: 1100j** **Irrig: 550j**	N 34.23119 E 68.42238 Alt: 2381.5m	70 out of 90 households 70 depend on agriculture and benefit from irrigation. The soil types are sandy and silt. 700 out of 1,100 jeribs of land are agricultural and 550 jeribs are irrigated. The income of 60 families comes from growing cash crops. There are 100 jeribs of wheat, 100 jeribs of other cereal crops, 200 jeribs of fruit, 50 jeribs of animal feed, 20 jeribs of	The village has a canal, a karez, a spring and a check dam. The spring supplies 90 households and irrigates 150 jeribs of land. It is full of mud and stone and its canal leaks and wastes water. The check dam has a 3m depth and 80m width and it was built 20 years ago. It has some leaks and damaged sections and needs repairs. The 2,800m long canal supplies	**Spring** **5000,0** **Check dam** **5000,0** **Canal** **315,000,0** **Karez** **45000**		

Name: Village	Population Jeribs	GPS N E Altitude (M)	Village Description	Water Supply	Cost Estimate USD	Cost Per Beneficiary USD	Cost Per Jeribs Irrigated USD
			potatoes, and 10 jeribs of onions. There are 80 cows, 520 sheep and goats, and 40 donkeys.	300 households and irrigates 6000 jeribs of land. 4 villages share this canal, it has leaks and blockages and a damage section and is full of mud and stone. The canal needs cleaning and repairs to the damaged and leaking sections. The karez supplies 85 households and irrigates 60 jeribs of land. The soil type is gravel and the soil erosion is moderate in the area. This karez has some blockages and its canal has some leaks and damaged sections.			
Paiwand پیوند WD-DM-024	Pop: 1200 Total: 1000j Irrig: 500j	N 34.22366 E 68.50535 Alt: 2293 m	80 out of 100 households depend on agriculture and benefit from irrigation. The soil types are silt and sandy. 700 out of 1,000 jeribs of land are agricultural and 500 jeribs are irrigated and cultivated. The income of 80 families comes from growing cash corps. There are 200 jeribs of wheat,	The village has one canal and one surface well. The 1,300 m long canal supplies 250 households and irrigates 1,500 jeribs of land . 1,500 jeribs of land are cultivated in the area. This canal has leaks and blockages and wastes water. It needs to be cleaned and repaired. The surface well has a 20m	**Surface well** **12000** **Canal** **112,500,0**		

Name: Village	Population Jeribs	GPS N E Altitude (M)	Village Description	Water Supply	Cost Estimate USD	Cost Per Beneficiary USD	Cost Per Jeribs Irrigated USD
			250 jeribs of fruits, and 50 jeribs of animal feed. There are 85 cows, 700 sheep and goats and 50 donkeys.	depth and 1m width and 50 families benefit from it. It was built 30 years ago.			
Khair Qala خیرقلعه WD-DM-023	**Pop: 300** **Total: 1200j** **Irrig: 400 j**	N 34.23764 E 68.4759 Alt: 2335.5 m	20 out of 25 households depend on agriculture and benefit from irrigation. The soil types are clay and sandy. 400 out of 1,200 jeribs of land are agricultural and irrigated and 400 jeribs are cultivated. The income of 20 families comes from growing cash crops. There are 100 jeribs of wheat, 40 jeribs of rice, 150 jeribs of fruits, 40 jeribs of animal feed, 40 jeribs of potatoes, 30 jeribs of vegetables, and 30 jeribs of other cereal crops. There are 25 cows, 400 sheep and goats and 10 donkeys.	The village has a check dam and one canal. The check dam has an 8m depth and 28m width and was built 25 years ago from stone and soil and mud. The 2,000m long canal supplies 25 households and irrigates 400 jeribs of land. 400 jeribs are cultivated. The canal is full of mud and stone and has some damaged sections and leaks in some sections.	**Check dam** **25000** **Canal** **180,000,0**		
Nazuk khel نازکخیل	**Pop: 600** **Total:**	N 34.22776 E 68.44062	50 households depend on agriculture and benefit from irrigation.	The village has one canal and one tube well. The 1,800 m long canal	**Canal** **20,000**		

Name: Village	Population Jeribs	GPS N E Altitude (M)	Village Description	Water Supply	Cost Estimate USD	Cost Per Beneficiary USD	Cost Per Jeribs Irrigated USD
WD-DM-021	**1800j** **Irrig: 1000j**	Alt: 2350 m	The soil types are clay and silt. 1,000 out of 1,800 jeribs of land are agricultural and irrigated and 1,000 jeribs are cultivated. The income of 60 families comes from growing cash crops. There are 200 jeribs of wheat, 400 jeribs of fruit, 100 jeribs of animal feed, 150 jeribs of potatoes, 35 jeribs of onions, 100 jeribs of other cereal crops, and 15 jeribs of vegetables. There are 55 cows, 300 sheep and goats and 18 donkeys.	supplies 100 households and irrigates 2000 jeribs of land. It has leaks and a damaged section. The tube well has a 19m depth and 1m width and was built 35 years ago. 40 families benefit from this tube well.	**Tube well** **1100**		
Sadu Khel سدو خیل WD-DM-19	**Pop: 1500** **Total: 2000j** **Irrig: 700j**	N 34.23248 E 68.46398 Alt: 2331 m	120 out of 140 households depend on agriculture and benefit from irrigation. The soil types are clay, sandy and silt. 1,000 out of 2,000 jeribs of land are agricultural and 700 jeribs are irrigated and cultivated land. The income of 100 families comes from growing cash crops. There are 130 jeribs of wheat,	The village has one canal. The 2,800 m long canal supplies 250 households and irrigates 2,800 jeribs of land all of which are cultivated. This canal is shared between 2 villages. It leaks and wastes a lot of water. It needs cleaning and concreting of the damaged section.	**Canal**		

Name: Village	Population Jeribs	GPS N E Altitude (M)	Village Description	Water Supply	Cost Estimate USD	Cost Per Beneficiary USD	Cost Per Jeribs Irrigated USD
			250 jeribs of fruit, 100 jeribs of animal feed, 130 jeribs of potatoes, 70 jeribs of other cereal crops, 10 jeribs of onions and 10 jeribs of vegetables. There are 150 cows.150 sheep and goats, 20 donkeys.				
Babak بابک WD-DM-017	**Pop: 530** **Total: 1600j** **Irrig: 700j**	N 34.23148 E 68.37763 Alt : 2328 m	50 out of 55 households depend on agriculture and benefit from irrigation. The soil types are sandy and salty. 700 out of 1,600 jeribs are irrigated and cultivated agricultural land. The income of 35 families comes from growing cash crops. There are 120 jeribs of wheat, 220 jeribs of fruit, 110 jeribs of animal feed, 85 jeribs of potatoes, 93 jeribs of onions, and 60 jeribs of other cereal crops. There are 56 cows, 200 sheep and goats, and 25 donkeys.	The village has two canals The first, Jowe Babak Payeen Canal, is 900m long and supplies 55 households and irrigates 600 jeribs of land. IT has leaks and blockages and a damaged section. The second, Jowe Babak Bala Canal, is 2,100 m long and supplies 250 households and irrigates 1700 jeribs of land. It has some leaks, blockages and damaged sections. It is shared by 3 villages.	**Two Canal**		

Name: Village	Population Jeribs	GPS N E Altitude (M)	Village Description	Water Supply	Cost Estimate USD	Cost Per Beneficiary USD	Cost Per Jeribs Irrigated USD
Dawlasha دولشه WD-DM-016	**Pop: 580** **Total: 1500j** **Irrig: 700j**	N 34.24638 E 68.3324 Alt: 2397 m	50 out of 55 households 50 depend on agriculture and benefit from irrigation. The soil type is sandy. 700 out of 1,500 jeribs are irrigated and cultivated agricultural land The income of 35 families comes from growing cash crops. There are 230 jeribs of wheat, 300 jeribs of fruit, 110 jeribs of animal feed, 90 jeribs of potatoes, 50 jeribs of other cereal crops and 15 jeribs of onions. There are 50 cows, 390 sheep and goats, and 25 donkeys.	The village has one spring, one tube well and one canal. The spring supplies 10 households and irrigates 12 jeribs of land. It is full of mud and stone and needs cleaning and digging. The 1,600 m long canal supplies 130 households and irrigates 1200 jeribs of land. It is shared by 2 villages and irrigates 1,200 jeribs of land. It canal leaks and wastes a lot of water. Some sections are damaged by flood and need repair or concreting. The tube well has a 16m depth and 1m width and was built 18 years ago. It supplies 20 households and needs a hand pump.	**Canal** **Spring** **Tube well**		
Lashkari لشکری WD-DM-015	**Pop: 820** **Total: 2800j** **Irrig: 800 j**	N 34.21931 E 68.34078 Alt: 2345 m	70 out of 75households 70 depend on agriculture and benefit from irrigation. The soil type is sandy. 800 out of 2,800 jeribs of land	The village has one canal and one tube well. The 2,100 m long canal supplies 270 households and irrigates 3,600 jeribs of land. 3	**Canal** **Tube well**		

Name: Village	Population Jeribs	GPS N E Altitude (M)	Village Description	Water Supply	Cost Estimate USD	Cost Per Beneficiary USD	Cost Per Jeribs Irrigated USD
			are irrigated and are cultivated agricultural land. The income of 60 families comes from growing cash crops There are 160 jeribs of wheat, 230 jeribs of fruit, 120 jeribs of animal feed, 150 jeribs of potatoes, 110 jeribs of other cereal crops, 10 jeribs of onions and 10 jeribs of vegetable. There are 70 cows, 300 sheep and goats, and 18 donkeys.	villages share this canal. It leaks and has blockages and sections of flood damage. The tube well has a 1m depth and 1m width and 32 households are supplied from it. It needs cleaning and digging.			
Dalan دالان WD-DM-009	**Pop:600** **Total: 2200j** **Irrig: 1100j**	**N** 34.21798 **E** 68.35871 **Alt:** 2326 m	50 out of 55 households depend on agriculture and benefit from irrigation. The soil types are sandy and silt. 1,100 out of 2,200 jeribs are irrigated agricultural land and 1100 jeribs are cultivated. The income of 35 households comes from growing cash crops. There are 220 jeribs of wheat, 100 jeribs of maize and barley, 420 jeribs of fruits, 80 jeribs of animal feed, 90 jeribs of	The village has one canal, one check dam and one tube well. The 2,900m long canal supplies 270 households and irrigates 3,600 jeribs of land. 3,600 jeribs are cultivated. This canal is shared by 3 villages. It has leaks and blockages and flood damage sections. It needs a flood protection wall were damage has taken place and repair or concreting of the leaking sections. It also needs cleaning.	**Canal** **Check Dam** **Tube well**		

Name: Village	Population Jeribs	GPS N E Altitude (M)	Village Description	Water Supply	Cost Estimate USD	Cost Per Beneficiary USD	Cost Per Jeribs Irrigated USD
			potatoes, 80 jeribs of rice and 5 jeribs of other vegetables. There are 50 cows, 250 sheep and goats and 15 donkeys.	The check dam is 25 years old and is 1.5m deep and 28m wide. It is constructed of stone and large pieces of wood. It leaks and has damaged sections. The canal itself leaks and is damaged in sections. It is badly damaged every year in the spring rains by flooding. It needs a stone wall to be built and its water intake should be concreted. The tube well has a 15m depth and a 1m width and was dug 30 years ago. It supplies 25 households.			
Nodal نودل WD-DM-008	**Pop: 430** **Total: 1400j** **Irrig: 600 j**	**N** 34.21969 **E** 68.34911 **Alt:**2368 m	All 40 households depend on agriculture and benefit from irrigation. The soil types are silt and sandy in the area. 600 out of 1,400 jeribs are cultivated and irrigated agricultural land. The income of 30 households comes from growing cash corps.	The village has one check dam and one canal. The check dam is 1.5m deep and 28 m wide. It is constructed from natural soil and stone and is full of mud and stone and has leaks and damage. Its canal has some blockages and leaks and needs concreting and cleaning. The 1,700 m long canal	**Check Dam** **Canal**		

Name: Village	Population Jeribs	GPS N E Altitude (M)	Village Description	Water Supply	Cost Estimate USD	Cost Per Beneficiary USD	Cost Per Jeribs Irrigated USD
			There are 100 jeribs of wheat, 50 jeribs of maize and barley, 220 jeribs of fruits, 80 jeribs of animal feed, 80 jeribs of potatoes, 50 jeribs of rice and 10 jeribs of other vegetables. There are 40 cows, 180 sheep and goats and 10 donkeys.	supplies 270 households and irrigates 3,600 jeribs of land and 3,600 jeribs of land are cultivated. 3 villages share this canal. The canal has leaks and blockages and the water intakes are damaged.			
Tanga Sayadan تنگه سیدان WD-DM-007	**Pop:** **Total: 1300j** **Irrig: 800 j**	**N** 34.23986 **E** 68.49127 **Alt:** 2356 m	100 out of 110 households depend on agriculture and 100 families benefit from irrigation. The soil type is clay. 800 out of 1,300 jeribs of land are agricultural and irrigated land. 800 jeribs of land are cultivated in the area. The income of 90 families comes from growing cash crops. There are 120 jeribs of wheat, 140 jeribs of maize and barley, 220 jeribs of fruits, 120 jeribs of animal feed, 120 jeribs of potatoes, 15 jeribs of onions, 150 jeribs of other vegetables and 50 jeribs of rice.	The village has one canal, one karez and one reservoir. The 300 m long canal supplies 110 households and irrigates 5,400 jeribs of land. 500 jeribs of land are cultivated. This canal has leaks and blockages and it is full of mud and stone. It needs cleaning, concreting and enlarging. The karez supplies 200 households and irrigates 300 jeribs of land. The soil type is gravel and soil erosion is moderate in the area. This karez has blockages and damage and its canal has some leaks and blockages. It needs	**Canal** **Karez** **Rereservoir**		

Name: Village	Population Jeribs	GPS N E Altitude (M)	Village Description	Water Supply	Cost Estimate USD	Cost Per Beneficiary USD	Cost Per Jeribs Irrigated USD
			There are 95 cows, 60 sheep and goats and 15 donkeys.	cleaning, concreting and repair of damage and leaks. The reservoir is 90 years and irrigates 1,500 jeribs of land. It supplies 600 people. It leaks and has cracks sections and wastes much water. Its canal also has leak and blockages.			

Phoptograph: Villages located on both sides of the Koza Jilga River

d. Villages that do not have canals but only karezes, springs or tube wells.

Name: Village	Population Jeribs	GPS N E Altitude (M)	Village Description	Water Supply	Cost Estimate USD	Cost Per Beneficiary USD	Cost Per Jeribs Irrigated USD
Tara ترہ WD-DM-001	Pop. 800 Total. 2500j Irrig. 600 j	N 34.26829 E 68.40327 Alt.2673 m	60 of 65 households depend on agriculture and 60 benefit from irrigation. The soil type is clay. 900 out of 2,500 jeribs of land are agricultural and 600 jeribs are irrigated and cultivated land. The income of 30 families comes from growing cash crops. There are 300 jeribs of wheat, 300 jeribs fruits, 100 jeribs maize and barley, 100 jeribs animal feed, 80 jeribs of beans and potatoes, and 10 jeribs of other vegetable. There are 60 cows, 800 sheep and goats, and 40 donkeys.	The village has two karezes. Ster Karez supplies 180 households and irrigates 450 jeribs of land. The soil type is gravel and soil erosion is moderate in the area. Its canal has leaks and blockages and has some damaged sections. Wech Karez supplies 110 households and irrigates 350 jeribs of land. The soil type is gravel and soil erosion is moderate in the area.	**two Karez**		
Kalakh کلاخ WD-DM-002	Pop.1200 Total. 3000j Irrig. 1500 j	N 34.24159 E 68.41846 Alt.2457 m	90 out of 100 households depend on agriculture and 90 benefit from irrigation. The soil types are clay, sand, and silt.	The village has one spring, one karez, and one reservoir. Rashid Spring supplies 80 households and irrigates 150 jeribs of land. There is no soil erosion and the canal of this	**Karez Spring reservoir**		

Name: Village	Population Jeribs	GPS N E Altitude (M)	Village Description	Water Supply	Cost Estimate USD	Cost Per Beneficiary USD	Cost Per Jeribs Irrigated USD
			2,000 out of 3,000 jeribs are agricultural land and 1,500 jeribs are irrigated and cultivated land. The income of 80 families comes from growing cash crops. There are 600 jeribs of wheat, 200 jeribs of maize and barley, 500 jeribs of fruits, 300 jeribs of animal feed, and 390 jeribs of beans and potatoes. There are 90 cows, 1000 sheep and goats, and 80 donkeys.	spring has leaks, blockages and visible cracks. Wach Karez supplies 160 households and irrigates 700 jeribs of land. The soil type is gravel and soil erosion is moderate. This karez needs cleaning and its shafts needs re-digging. The reservoir supplies 800 people and irrigates 180 jeribs of land. It needs enlarging, repairing or concreting and also its canal requires cleaning.			
Garmab کرم آب WD-DM-003	Pop: 750 Total: 2500j Irrig:700j	N 34.23420 E 68.46598 Alt:2338 m	65 out of 70 households depend on agriculture and benefit from irrigation. 1,000 out of 2,500 jeribs are agricultural land and 700 jeribs are cultivated and irrigated. The soil type is clay in the area. There are 250 jeribs of wheat, 80 jeribs of maize and barley, 360	The village has one spring, a reservoir and one surface well. The spring supplies 70 households and irrigates 300 jeribs of land. There is no soil erosion. The spring is full of mud and stone and its canal leaks and wastes water. It also and some damaged sections.	**Spring reservoir Surface well**		

Name: Village	Population Jeribs	GPS N E Altitude (M)	Village Description	Water Supply	Cost Estimate USD	Cost Per Beneficiary USD	Cost Per Jeribs Irrigated USD
			jeribs of fruits, 110 jeribs of animal feed, 180 jeribs of beans and potatoes, and 10 jeribs of other vegetables. There are 60 cows, 600 sheep and goats, and 50 donkeys.	The reservoir supplies 350 people and irrigates 220 jeribs of land. It is full of mud and stone and needs enlarging. It has some leaks needs concreting. The surface well supplies 30 households and needs re-digging and the installation of a hand pump.			
Gwalay کلی WD-DM-005	Pop: 900 Total:1800 j Irrig:500 j	N 34.22738 E 68.43000 Alt.2370 m	60 out of 80 households depend on agriculture and 60 families benefit from irrigation. The soil type are clay, sand, and silt. 800 out of 1,800 jeribs are agricultural land and 500 jeribs are irrigated and cultivated. The income of 40 families comes from growing cash crops. There are 200 jeribs of wheat, 80 jeribs of maize and barley, 220 jeribs of fruits, 120 jeribs of animal feed, 170 jeribs of potatoes and beans, and 5 jeribs	The village has one check dam, one karez and one reservoir. The check dam is 7m deep and 4m wide and has some leaks and blockages. It is full of mud and stone. It needs to be cleaned, repaired and enlarged. The karez supplies 120 households and irrigates 300 jeribs of land. The soil type is gravel and soil erosion is moderate in the area. The karez is full of mud and stone. Its canal has leaks and blockages and needs a	**Check Dam** **reservoir** **Karez**		

Name: Village	Population Jeribs	GPS N E Altitude (M)	Village Description	Water Supply	Cost Estimate USD	Cost Per Beneficiary USD	Cost Per Jeribs Irrigated USD
			of other vegetables. There are 70 cows, 800 sheep and goats, and 50 donkeys.	reservoir. The reservoir supplies 400 people and irrigates 80 jeribs of land. It is 100 years old and is full of mud and stone. Its canal has some leaks and blockages.			
Karez کاریز WD-DM-014	Pop: 700 Total:2500 j Irrig: 500 j	N 34.21839 E 68.4342 Alt: 2429 m	50 out of 60 households depend on agriculture and benefit from irrigation. The soil types are clay and sand. 1,200 out of 2,500 jeribs are agricultural land and 500 jeribs are cultivated and irrigated. The income of 40 families comes from growing cash crops. There are 85 jeribs of wheat, 200 jeribs of fruits, 55 jeribs of animal feed, 80 jeribs of potatoes, 40 jeribs of other cereal crops and 10 jeribs onions. There are 55 cows, 520 sheep and goats and 40 donkeys.	The village has a karez, tube well and reservoir. The karez supplies 60 households and irrigates 500 jeribs of land. The soil type is gravel and the soil erosion is moderate in the area. This karez has blockages and damaged sections and some parts of it are full of mud. The shafts of the karez need re-digging and cleaning. The reservoir supplies 650 people and irrigates 1,200 jeribs of land. It is 3m deep by 500m wide and 1500 m long, it was built 40 years ago. The two sidewalls of this reservoir need to ne concreted and	**Karez** **Tube well** **reservoir**		

Name: Village	Population Jeribs	GPS N E Altitude (M)	Village Description	Water Supply	Cost Estimate USD	Cost Per Beneficiary USD	Cost Per Jeribs Irrigated USD
				made higher. The tube well is 22 m deep and 1 m wide and was built 35 years ago. 30 households benefit from this well. It needs digging and cleaning and the installation of a pump.			
Qole Baba قولی با با WD-DM-022	Pop: 300 Total: 3000j Irrig: 400 j	N 34.29346 E 68.22629 Alt: 2468 m	20 out of 30 households depend on agriculture and benefit from irrigation. The soil types are silt and sand. 900 out of 3,000 jeribs of land are agricultural land and 400 jeribs are irrigated cultivated. The income of 10 families comes from growing cash crops. There are 100 jeribs of wheat, 140 jeribs of animal feed, 50 jeribs of potatoes, and 100 jeribs of other cereal crops. There are 15 cows, 1800 sheep and goats, 20 donkeys.	the village has one karez and one reservoir. The karez supplies 30 families and irrigates 200 jeribs of land. The soil type is gravel and there is no soil erosion in the area. This karez is full of mud and stone and its shafts need digging and the karez needs cleaning. The reservoir is 500 m wide by 1,500m long and 3 m deep and was built 50 years ago. 300 people are supplied by this reservoir and it irrigates 400 jeribs of land. It is full of mud and stone and its canal has leaks and damaged sections and needs repairing.	**Karez 9000 reservoir 15000**		

Name: Village	Population Jeribs	GPS N E Altitude (M)	Village Description	Water Supply	Cost Estimate USD	Cost Per Beneficiary USD	Cost Per Jeribs Irrigated USD
Nakchin نکچین WD-DM-025	Pop: 400 Total: 1000j Irrig: 400 j	N 34.23073 E 68.43449 Alt: 2362 m	30 out of 35 households depend on agriculture and 70 families benefit from irrigation. The soil type isclay in the area. 400 out of 1,000 jeribs of land are agricultural, irrigated and cultivated land. The income of 25 families comes from growing cash crops. There are 60 jeribs of wheat, 200 jeribs of fruits, 60 jeribs of animal feed, 20 jeribs of potatoes, and 20 jeribs of other cereal crops. There are 30 cows, 450 sheep and goats, and 20 donkeys.	The village has one karez and one reservoir. The karez supplies 90 households and irrigates 200 jeribs of land. The soil type is sandy and the soil erosion is moderate in the area. The karez is full of mud and stone and has some blockages and needs cleaning. It shafts needs re-digging. The reservoir is 25 m wide and 40 m long and 4 m deep and it was built 50 years ago. It serves 1,000 people and irrigates 220 jeribs of land. It is full of mud and stone and has cracks and leaks and needs repairs.	**Karez** **25000** **reservoir** **1,350,000**		
Zardak زردک WD-DM-036	Pop:500 Total: 900j Irrig:300j	N 34.35697 E 68.32472 Alt:2337 m	40 out of 50 households depend on agriculture and benefit from irrigation. The soil type is silt. 400 out of 900 jeribs of land are agricultural and 300 jeribs are irrigated and cultivated.	The village has a spring, a karez, a reservoir, and a surface well. The spring supplies 15 households and irrigates 30 jeribs of land. Soil erosion is moderate in the area. The spring is full of mud and stone	**Spring** **6,000** **Karez** **18,000** **reservoir** **10,000**		

Name: Village	Population Jeribs	GPS N E Altitude (M)	Village Description	Water Supply	Cost Estimate USD	Cost Per Beneficiary USD	Cost Per Jeribs Irrigated USD
			The incomes of 15 families come from growing cash crops. There are 70 jeribs wheat, 60 jeribs animal feed, 100 jeribs potatoes, and 60 jeribs other cereal crops. There are 40 cows, 1,500 sheep and goats, and 25 donkeys.	and its canals have leaks and blockages and waste water. The karez supplies 90 households and irrigates 200 jeribs of land. The soil type is gravel and there is no soil erosion in the area. The karez is full of mud and stone and has some blockages and it needs cleaning. Its shafts need re-digging. The reservoir supplies 100 families and irrigates 1,000 jeribs of land. It is full of mud and stone and its canal leaks and wastes water. It needs cleaning and concreting of the leaking sections. The surface well is 28 m deep and 1 m wide and 20 families benefit from this well. It needs re-digging and the installation of a pump.	**Surface well** **1800**		

Name: Village	Population Jeribs	GPS N E Altitude (M)	Village Description	Water Supply	Cost Estimate USD	Cost Per Beneficiary USD	Cost Per Jeribs Irrigated USD
Jawar Sang جا ورسنگ WD-DM-038	Pop: 280 Total: 600j Irrig: 220j	N 34.36903 E 68.28320 Alt: 2290 m	20 out of 25 households depend on agriculture and benefit from irrigation. The soil type is silt. 300 out of 600 jeribs of land are agricultural and 220 jeribs are irrigated and cultivated. The incomes of 10 families come from growing cash crops. There are 50 jeribs of wheat, 45 jeribs of animal feed, 90 jeribs of potatoes, 30 jeribs of other cereal crops. There are 30 cows, 1600 sheep and goats, 20 donkeys.	The village has one karez, one reservoir, and one surface well. The karez supplies 70 households and irrigates 300 jeribs of land. The soil type is gravel and there is no soil erosion in the area. This karez has blockages and damaged sections and it is full of mud and stone. It needs repairs, cleaning and concreting. The surface well is 17 m deep and 1 m wide and 15 families benefit from it. The well needs cleaning and re-digging and also needs a hand pump.	**Karez** **8,000** **Surface well** **1,000**		
sayhgak سیاه گک WD-DM-039	Pop:600 Total:1400j Irrig:400j	N 34.34705 E 68.26209 Alt:2307 m	40 out of 55 households depend on agriculture and benefit from irrigation. The soil type is silt. 600 out of 1,400 jeribs of land agricultural land and 400 jeribs are irrigated and cultivated. The incomes of 15 families come	The village has one karez and one reservoir. The karez supplies 70 households and irrigates 400 jeribs of land. The soil type is gravel and soil erosion is moderate. This karez is full of mud and stone and has some blockages. Its canal has some	**Karez** **7,000** **reservoir** **25,000**		

Name: Village	Population Jeribs	GPS N E Altitude (M)	Village Description	Water Supply	Cost Estimate USD	Cost Per Beneficiary USD	Cost Per Jeribs Irrigated USD
			from growing cash crops. There are 110 jeribs of wheat, 120 jeribs of animal feed, 115 jeribs of potatoes, and 50 jeribs of other cereal crops. There are 60 cows, 2500 sheep and goats, and 30 donkeys.	blockages and leaks. The reservoir supplies 600 people and irrigates 400 jeribs of land. It is 120 years old and is full of mud and stone and has some leaks and damaged sections. Its canal also has some leaks.			
Dashti Now دشت نو WD-DM-043	Pop:530 Total: 1100j Irrig: 300 j	N 34.32389 E 68.30420 Alt:2311 m	45 out of 55 households depend on agriculture and benefit from irrigation. The soil type is silt. 450 out of 1,100 jeribs of land are agricultural and 300 jeribs are irrigated and cultivated. The incomes of 20 families come from growing cash crops. There are 120 jeribs of wheat, 50 jeribs of animal feed, 88 jeribs of potatoes, and 40 jeribs of other cereal crops. There are 30 cows, 1,300 sheep and goats, and 120 donkeys.	The village have one karez, one reservoir and one surface well. The karez supplies 50 households and irrigates 300 jeribs of land. The soil type is gravel and there is no soil erosion in the area. The karez is full of mud and stone and has blockages. Its canal leaks and wastes water. The reservoir supplies 500 people and irrigates 200 jeribs of land. It leaks and has visible cracks and it is full of mud and stone. The surface well is 30 m deep and 1 m wide and was built 40 years ago. 30 families benefit	**Karez 9,000 reservoir 12,000 Surface well 18,00**		

Name: Village	Population Jeribs	GPS N E Altitude (M)	Village Description	Water Supply	Cost Estimate USD	Cost Per Beneficiary USD	Cost Per Jeribs Irrigated USD
				from this well. It needs cleaning, digging and a hand pump.			
Sor Karez سور کاریز WD-DM-047	Pop:400 Total: 900j Irrig: 300j	N 34.28420 E 68.14373 Alt:2482 m	30 out of 40 households depend on agriculture and benefit from irrigation. The soil types are sandy and silt. 300 out of 900 jeribs of land are agricultural, irrigated and cultivated land. The income of 10 families comes from growing cash crops. There are 50 jeribs of wheat, 40 jeribs of fruits, 90 jeribs of animal feed, 55 jeribs of potatoes and 60 jeribs of other cereal crops. There are 35 cows, 900 sheep and goats and 30 donkeys.	The village has one karez, one reservoir and one surface well. The karez supplies 40 households and irrigates 300 jeribs of land. The soil type is sand. Soil erosion is moderate in the area. This karez has blockages and is full of mud and stone. It needs cleaning and its canal needs cleaning and repair or damaged sections. The reservoir is 40 m long and 3 m deep and is 40 years old. It supplies 400 people and irrigates 300 jeribs of land. Its canal has some leaks and blockages and needs cleaning and concreting. The surface well is 15 m deep and 1 m wide and is 10 years old. 20 families benefit from this well and it needs re-	**Karez 8,000 reservoir 15,000 Surface well 1,100**		

Name: Village	Population Jeribs	GPS N E Altitude (M)	Village Description	Water Supply	Cost Estimate USD	Cost Per Beneficiary USD	Cost Per Jeribs Irrigated USD
				digging and the installation of a hand pump.			
Diwar ديوار WD-DM-048	Pop:480 Total: 1000j Irrig:300j	N 34.29001 E 68.13430 Alt:2419 m	30 out of 45 households depend on agriculture and benefit from irrigation The soil types are sandy and silt. 400 out of 1000 jeribs of land are agricultural and 300 jeribs are irrigated and cultivated. The income of 15 families comes from growing cash crops. There are 120 jeribs of land, 80 jeribs of animal feed, 20 jeribs of potatoes, and 70 jeribs of other cereal crops. There are 40 cows, 800 sheep and goats and 15 donkeys.	The village has one karez, one reservoir and one surface well. The karez supplies 40 households and irrigates 300 jeribs of land. The soil type is gravel and there is no soil erosion in the area. The karez is full of mud and has blockages and its canal has leaks and blockages and wastes water. It needs cleaning and concreting of the damaged sections. The reservoir is 30 m long and 3.5m deep and is 100 years old. It supplies 300 people and irrigates 300 jeribs of land. It has leaks and damaged sections and its canal has leaks and blockages. The surface well has 20 m deep and 1 m wide and 30 families benefit from this	**Karez** **10,000** **reservoir** **10,000** **Surface well** **1,100**		

Name: Village	Population Jeribs	GPS N E Altitude (M)	Village Description	Water Supply	Cost Estimate USD	Cost Per Beneficiary USD	Cost Per Jeribs Irrigated USD
				surface well, it needs digging and cleaning and installation of hand pump.			
Karez Folad كاريز فولاد WD-DM-051	Pop:420 Total: 1600j Irrig:400j	N 34.34104 E 68.27011 Alt:2326 m	30 out of 40 households depend on agriculture and benefit from irrigation. The soil type is silt. 600 out of 1600 jeribs are agricultural land and 400 jeribs are irrigated and cultivated. The income of 25 families comes from growing cash crops. There are 120 jeribs of wheat, 60 jeribs of animal feed, 160 jeribs of potatoes, and 50 jeribs of other cereal crops. There are 30 cows, 2500 sheep and goats, and 200 donkeys.	The village has one spring, one karez, and one reservoir, The spring supplies 20 households and irrigates 80 jeribs of land. Soil erosion is moderate. The spring is full of mud and stone and its canal leaks and has blockages and it wastes water. It needs cleaning and repair. The karez supplies 40 households and irrigates 300 jeribs of land. The soil type is gravel and there is no soil erosion in the area. The karez has blockages and is full of mud and stone. Its canal has leaks and wastes water. The reservoir is 50 m long by 4 m deep and is 180 years old. It irrigates 600 jeribs of land and serves 4,200 people. It leaks and is full of mud and stone.	**Spring** **5,000** **Karez** **6,000** **reservoir** **18,000**		

Name: Village	Population Jeribs	GPS N E Altitude (M)	Village Description	Water Supply	Cost Estimate USD	Cost Per Beneficiary USD	Cost Per Jeribs Irrigated USD
				Its canal leaks and has blockages. It needs cleaning and concreting of the damaged places.			

7. Physical Description of Canals, Karez and Other Components

Name: Village Item	Type	GPS (Of Exit) N E Altitude (M)	Description	Condition & Repairs Needed	Cost Estimate USD	Cost Per Beneficiary USD	Cost Per Jeribs Irrigated USD
Bodak	Bodak Canal	**N** 34.2123 E 68.50228 Alt:2300 m	This 4,500m long canal supplies 180 households and irrigates 3,000 jeribs of land. It is shared by 2 villages. There are shrubs trees along this canal. The irrigation system is furrow and flood. The water is potable.	The canal has leaks and blockages and wastes much water. Cleaning and repairing of the damaged place and concreting of that is needed.	30,000	**166 per families**	**10**
Kalakh	Wech Karez	N 34.27622 E 68.39969 Alt:2736 m	The karez supplies 160 households and irrigates 700 jeribs of land. The soil type is gravel and soil erosion is moderate There are some trees and grasses around this karez and canal. The irrigation system is shape and furrow and flood. The water is Potable.	The karez has blockage and its canal has leaks and damaged sections. It needs cleaning and digging of the karez shafts, repair of the damaged sections of the canal and concreting of the leaky sections.	22,000	**137.5**	**31,42**

Name: Village Item	Type	GPS (Of Exit) N E Altitude (M)	Description	Condition & Repairs Needed	Cost Estimate USD	Cost Per Beneficiary USD	Cost Per Jeribs Irrigated USD
Garmab	Garmab Spring	N 34.23586 E 68.46692 Alt: 2346 m	The spring supplies 70 households and irrigates 300 jeribs of land. Around of this spring and canal there are some trees and shrubs. The irrigation system is shape and furrow and flood. The water is potable.	The spring is full of mud and stone and the reservoir of this spring has some visible cracks and it is also full of mud and stone. Its canal has leaks and blockages and has some damaged sections. It needs cleaning and enlarging and also cleaning and repair of the reservoir. The spring's canal also needs cleaning and repairs.	45,000	**642.85**	**150**
Rashid	Rashid Check Dam	N 34.23188 E 68.42189 Alt:2370 m	The check dam is 3m deep and 80 m wide and was built 20 years ago from natural stone and mud. The water is potable.	The check dam is full of mud and stone and has some visible cracks and leaks. Its canal leaks and has damaged sections. The check dam needs cleaning and repairs and so does its canal.	50,000		
Toiaka	Karez Reservoir	N 34.23645 E 68.48561 Alt:2314 m	The reservoir supplies 2,000 people and irrigates 1,500 jeribs of land. It is 1,000m wide by 4,000m long and 4 m depth. It is 100 years old. The irrigation system is furrow	The reservoir is full of mud and stone and has some visible cracks and wastes water and its canal has leaks and blockages. The reservoir needs cleaning	30,000	**15/families**	**20**

Name: Village Item	Type	GPS (Of Exit) N E Altitude (M)	Description	Condition & Repairs Needed	Cost Estimate USD	Cost Per Beneficiary USD	Cost Per Jeribs Irrigated USD
			and flood in the area. Around of this reservoir there are some trees and grasses. The water is Potable.	and concreting of the leaking sections and the canal needs cleaning and repairs.			
Sadu khel	Mosque Tube Well	N 34.23852 E 68.4652 Alt:2328 m	The tube well is 23 m deep and 1 m wide and 50 families benefit from this well which is 25 years old. The water is Potable.	The tube well needs cleaning and digging and also needs the installation of hand pump.	1,200	**24/families**	
Muka	Masjid Well	N 34.16196 E 68.24718 Alt: 2383 m	The surface well supplies 60 households and is 25 m deep and 1 m wide. It is 60 years old. The water is Potable.	The surface well needs cleaning and digging.	1,500	**25/families**	
Gidargu	Canal Toghi	N 34.20789 E 68.5068 Alt:2275 m	This 3,000 m long canal supplies 280 supplies and irrigates 4,500 jeribs of land. The irrigation system is furrow and flood. There are some grasses and forest trees along the canal.	The canal has leaks and blockages and some damaged sections. It needs cleaning and repairs to the damaged and leaking sections.	80,000	**285,7/families**	**17**

Name: Village Item	Type	GPS (Of Exit) N E Altitude (M)	Description	Condition & Repairs Needed	Cost Estimate USD	Cost Per Beneficiary USD	Cost Per Jeribs Irrigated USD
			The water is potable.				
Tara	Ster Karez	N 34.27600 E 68.39968 Alt:2715 m	The karez supplies 180 households and irrigates 450 jeribs of land The soil type is gravel and soil erosion is moderate. There are some grasses and forestry trees around this karez and its canal. The water is Potable.	The karez is full of mud and stone and has blockages and damaged sections. Its canal also has leaks and blockages. The karez needs cleaning and its shafts need re-digging. It needs other repairs to damaged sections and also the cleaning and repairing of its canal.	18,000	**100/families**	**40**
Rashid	Rashid Spring	N 34.23012 E 68.4228 Alt:2374 m	The spring supplies 90 households and irrigates 150 jeribs of land. There are some grasses around the spring. The water is potable.	The spring is full of mud and stone and its canal leaks and has blockages and visible cracks. It requires cleaning and concreting of the damage and leaking sections .	250,000	**2777/families**	**1666**
Karez Folad	Karez Reservoir	N 34.34304 E 68.27514 Alt:2302 m	It takes 14 hours to fill this reservoir and its capacity is 6,000 liters. It was built 180	The reservoir is full of mud and stone and it has some damaged sections. It wastes water. Its canal leaks and	18,000	**4,28/Pearson**	**30**

Name: Village Item	Type	GPS (Of Exit) N E Altitude (M)	Description	Condition & Repairs Needed	Cost Estimate USD	Cost Per Beneficiary USD	Cost Per Jeribs Irrigated USD
			years ago. The reservoir supplies 4,200 people and irrigates 600 jeribs of land. There are some poplar trees around this reservoir. The irrigation system is furrow and ruler in the area. The water is potable	blockages and some damaged sections. It requires cleaning and repairs to the damaged sections and leaky sections and also cleaning and repair of its canals.			
Sadu khel	Mosque Tube Well	N 34.23852 E 68.4652 Alt:2328 m	The tube well is 23 m deep and 1 m wide and 50 families benefit from it. The well is 25 year old. The water is potable.	The well is full of mud and stone and has no pump. It requires cleaning and re-digging and also the installation of a hand pump .	1,200	**24/families**	
Muka	Masjid Well	N 34.16196 E 68.24718 Alt:2383 m	The surface well is 25m deep and 1 m wide. 60 families benefit from this well. It was built 60 years ago. The water is potable.	The well is full of mud and stone and needs cleaning and digging.	1,500	**25/families**	
Muka	Band Check Dam	N 34.16316 E 68.24863 Alt:2352 m	The check dam is 3.4 m deep and 40 m wide. The source of the check dam is Jilga River. It was built 175 years ago.	The check dam has leaks and visible cracks and some damaged sections. Its canal also leaks and wastes water.	22,000		

Name: Village Item	Type	GPS (Of Exit) N E Altitude (M)	Description	Condition & Repairs Needed	Cost Estimate USD	Cost Per Beneficiary USD	Cost Per Jeribs Irrigated USD
				It requires cleaning and repairs.			
Muka	Muka Canal	N 34.16928 E 68.24218 Alt:2385 m	This 1,800m long canal supplies 800 households and irrigates 4,500 jeribs of land. Its source is the Jilga River. There are some trees and grasses along the canal. The irrigation system is shape and furrow and flood. The water is potable.	The canal leaks and has visible cracks and blockages. It is full of mud and stone. It requires cleaning and concreting of the leaks and repairs to the damaged sections .	40,000	**50/families**	**8,88**
Tanga saydan	Toika Karez	N 34.23754 E 68.48683 Alt:2314	The karez supplies 200 households and irrigates 300 jeribs of land. The soil type is gravel and soil erosion is moderate. The irrigation system is shape and furrow and flood. There are some grasses and trees along the canal of this karez. The water potable.	The karez has blockages and is full of mud and stone. It has some damaged sections and its canal leaks and has visible cracks. It also needs a reservoir. The karez requires cleaning and repair of damaged and leaky sections and the building of a reservoir .	18,000	**90/families**	**60**

Name: Village Item	Type	GPS (Of Exit) N E Altitude (M)	Description	Condition & Repairs Needed	Cost Estimate USD	Cost Per Beneficiary USD	Cost Per Jeribs Irrigated USD
Kalakh	Rashidan Spring	N 34.23012 E 68.42280 Alt:2374 m	The spring supplies 80 families and irrigates 150 jeribs of land. The irrigation system is shape and furrow and flood in the area. There are some trees and grasses along the canal of this spring. The water is potable.	The spring is full of mud and stone and its canal is also full of mud and stone and leaks and has blockages. There are also some damaged sections. Its reservoir leaks and wastes water. It requires cleaning of the spring and concreting of the leaks and damaged sections as well as repairs to the reservoir.	12,000	**150/families**	**`80**
Tangasaydan	Karez Reservoir	N 34.23754 E 68.48683 Alt:2314m	The reservoir is 20 m wide by 15 m long and 3.5 m deep. Its capacity is 1,050 liters and it take about 7 hour to fill. 600 people are served by this reservoir and it irrigates 1,500 jeribs of land. The water is Potable.	The reservoir wastes a lot of water because it leaks and it was damaged by floods. It is also full of mud and stone. It requires repairs and cleaning, concreting of the reservoir and concreting of the damaged and leaky sections. A flood protection wall should be built to protect reservoir and canal against annual flooding.	13,000	**21,6/ Pearson**	**8.6**

Name: Village Item	Type	GPS (Of Exit) N E Altitude (M)	Description	Condition & Repairs Needed	Cost Estimate USD	Cost Per Beneficiary USD	Cost Per Jeribs Irrigated USD
Nazuk khel	Mosque Tube Well	N 34.22682 E 68.44031 Alt:2348 m	The tube well is 19 m deep and 1 m wide and was built 35 years ago. 40 families benefit from this tube well. The water is Potable.	The well needs digging and cleaning.	1,100	**27,5/families**	
Paiwand	Gawhar Masjid Surface Well	N 34.22748 E 68.50339 Alt: 2300 m	The surface well is 20 m deep and 1 m wide. 50 families benefit from this surface well It is 30 years old.	The surface well is full of mud and stone and needs cleaning and re-digging. A hand pump should also be installed.	1,200	**24/families**	
Bodak	Bodak Check Dam	N 34.21222 E 68.50218 Alt:2306 m	The check dam is 3m deep and 35 m wide and was built about 90 years ago. The source of this check dam is Jilga River. The water is used only for irrigation.	The check dam needs cleaning, concreting and enlarging.	50,000		
Badur	Badur Canal	N 34.18319 E 68.26844 Alt:2277 m	This 900 m long canal supplies 450 households and irrigates 2500 jeribs of land. It is shared by 4 villages. There are some grasses and	The canal leaks and has blockages and there are some damaged sections. The first dam of the canal was damaged by floods and its water intakes are also	22,000	**48,88/families**	**8,8**

Name: Village Item	Type	GPS (Of Exit) N E Altitude (M)	Description	Condition & Repairs Needed	Cost Estimate USD	Cost Per Beneficiary USD	Cost Per Jeribs Irrigated USD
			forest trees along the canal. The irrigation system is furrow and shape and flood in the village. The water is potable.	damaged. It needs cleaning and concreting of the leaking and damaged sections and the rebuilding of the first dam in concrete and the concreting of the water intake.			
Toiaka	Karez Toiaka	N 34.23754 E 68.48683 Alt:2314 m	The karez supplies 200 households and irrigates 300 jeribs of land. The soil type is gravel and there is no soil erosion in the area. There are some trees and grasses along the canal The irrigation system is flood and furrow in the village. The water is Potable.	Some shafts of this karez are full of mud and the karez itself has blockages. Its canal also leaks and wastes water and its intakes are destroyed. It requires the cleaning and repairing of the damaged and leaking sections perhaps in concrete to prevent future flood damage.	18,000	**90/families**	**60**
Muka	Muka Spring	N 34.16088 E 68.24938 Alt:2376 m	The spring supplies 60 households and irrigates 15 jeribs of land. The irrigation system is furrow and flood and shape in the village. There are some grasses around	The spring is full of mud and stone and its canal leaks and is blocked in places. The water intake has some problems. It requires cleaning and also cleaning and repairs of its canal and water intake.	10,000	**166/families**	**666**

Name: Village Item	Type	GPS (Of Exit) N E Altitude (M)	Description	Condition & Repairs Needed	Cost Estimate USD	Cost Per Beneficiary USD	Cost Per Jeribs Irrigated USD
			the spring. The water is Potable.				
Nakchin	Karez Reservoir	N 34.23418 E 68.43725 Alt:2353 m	The reservoir has 25m wide by 40 m long and 4 m deep. Its volume is 4,000 liters and it takes 10 hours to fill. It's source is the Nakchiband Karez. The reservoir supplies 1,000 people and irrigates 220 jeribs of land. There are some trees along the canal of this reservoir. The water is potable.	The reservoir is full of mud and stone, has leaks and its canal leaks and is blocked in places. It requires cleaning and concreting of the damaged sections and also cleaning and repair of its canal and water intake.	1,350,000		
Lashkary	Mosque Tube Well	N 34.21977 E 68.34031 Alt:2340 m	The tube well is 1m deep and 1m wide. It supplies 32 households. The water is potable.	The tube well needs cleaning and re-digging and also the installation of a hand pump.	1,100	**34,375/families**	

Name: Village Item	Type	GPS (Of Exit) N E Altitude (M)	Description	Condition & Repairs Needed	Cost Estimate USD	Cost Per Beneficiary USD	Cost Per Jeribs Irrigated USD
Dashti Now	Masjid Well	N 34.32450 E 68.30315 Alt:2309 m	The surface well is 30 m deep and 1 m wide and it is public well which was dug 10 years ago. The quantity of water expected is 10,000 liters and 30 families benefit from this well. The water is potable.	The well is full of mud and stone and doesn't have ahand pump. It needs cleaning and digging and a hand pump .	1,800	**60/families**	
Rashid	Rashid Canal	N 34.23112 E 68.42235 Alt:2,397 m	This 2,800 m long canal supplies 300 households and irrigates 6,000 jeribs of land. There are some trees and grasses along the canal. The irrigation system is flood in villages. The water is potable.	The canal is full of mud and stone, has blockages and wastes much water. Its water intake is damaged and leaks. It requires cleaning and repairs.	315,000,0	**1050/families**	**52,2**
Ahmad khil	Qutab Karez	N 34.23230 E: 68.28200 Alt:2,584 m	The karez supplies 120 households and irrigates 40 jeribs of land. There are no trees and grasses along the canal and karez. The irrigation system is furrow and flood and shape. The villagers are interested in a new	The karez has blockages and is full of mud. Some its shafts need re-digging and its canal leaks and is blocked. The karez water intakes are badly damaged. The karez requires cleaning and the re-digging of its shafts. Its canal also requires	18,000	**150/families**	**450**

Name: Village Item	Type	GPS (Of Exit) N E Altitude (M)	Description	Condition & Repairs Needed	Cost Estimate USD	Cost Per Beneficiary USD	Cost Per Jeribs Irrigated USD
			irrigation system. The water is potable.	repairs and cleaning.			
Karez Folad	Village Spring	N 34.34415 E 68.27187 Alt: 2,317 m	The spring supplies 20 households and irrigates 80 jeribs of land. The irrigation system is furrow. There are no trees along the canal and spring. The water is potable.	The spring is full of mud and stone and its canal has leaks and blockages and some damaged sections. It requires cleaning and concreting of the damaged and leaking sections as well as repairs.	5,000	**250/families**	**62,5**
Zardak	Karez Reservoir	N 34.35062 E 68.32426 Alt: 2,296m	The volume of this reservoir is 1,200 liters and it was built 120 years ago. It takes 10 hours to fill. It supplies 1,000 people and irrigates 100 jeribs of land. the irrigation system is furrow and ruler in the area. There are some trees around the reservoir. The water is potable.	The reservoir is full of mud and stone and has leak and wastes a great deal of water. Its canal has leaks and blockages and also wastes water. The water intake has some problems. It needs cleaning and repairs to the reservoir and its canal as well as to its water intake.	10,000	**10/Pearson**	**100**

Name: Village Item	Type	GPS (Of Exit) N E Altitude (M)	Description	Condition & Repairs Needed	Cost Estimate USD	Cost Per Beneficiary USD	Cost Per Jeribs Irrigated USD
Bakhshak	Mosque Tube Well	N 34.19238 E 68.26821 Alt:2,360	The tube well is 18m deep and 1 m wide and was made 20 years ago. 30 families benefit from this tub well. The water is potable.	The tube well needs a hand pump and re-digging and cleaning.	1,200	**40/families**	
Diwar	Masjid Well	N 34.29093 E 68.13418 Alt:2,408 m	This well is 20 m deep and 1 m wide and was dug 100 years ago. The quantity of water extracted is 7000 liters and 30 families benefit from this surface well. The water is potable.	The well needs re-digging and cleaning and the installation of a hand pump.	1,100	**36,6**	
Ahmad khil	Canal Check Dam	N 34.21151 E 68.28536 Alt:2,310m	This check dam is 1 m deep and 30 wide and its source is the Jilga River. It was constructed 70 years ago from natural stone and soil. It is used only for irrigation.	The dam requires cleaning and concreting of its damaged and leaking sections. It requires repairs to its canal.	60,000		
Nodal	Nodal Canal	N 34.21238 E 68.34342 Alt:2,320 m	This 1,700 m long canal supplies 270 households and irrigates 3,600 jeribs of land. There are some forestry trees and shrubs along this canal.	The canal is full of mud and stone and wastes a lot of water. Its water intake leaks and is damaged in places. The canal requires cleaning and repairs and its water	37,000	**137/families**	**10,27**

Name: Village Item	Type	GPS (Of Exit) N E Altitude (M)	Description	Condition & Repairs Needed	Cost Estimate USD	Cost Per Beneficiary USD	Cost Per Jeribs Irrigated USD
			The irrigation system is furrow and flood in the villages. The water is potable.	intake also requires repairs.			
Ormur	Ormur Karez	N 34.21950 E 68.29173 Alt:2533.5 m	The karez supplies 120 households and irrigates 10 jeribs of land. There are some grasses and forestry trees along the canal of this karez. The irrigation system is furrow and flood in the area. The water is potable.	The karez has blockages and its shafts are full of mud. Its reservoir is also full of mud and stone. This karez requires cleaning and digging of its shafts and cleaning of its reservoir and possibly the concreting of the damaged and leaking sections.	8,000	**66,6/families**	**800**
Zardak	Zardak Spring	N 34.35928 E 68.32761 Alt:2,310m	The spring supplies 15 households and irrigates 30 jeribs of land. There are some trees along the canal of this spring. The irrigation system is furrow and ruler in the village. The water is potable.	The spring is full of mud and stone and its canal leaks and is blocked in places. The water intake is damaged and wastes water. The spring requires cleaning and digging and repairs to its canal and water intake.	6,000	**400/families**	**200**

Name: Village Item	Type	GPS (Of Exit) N E Altitude (M)	Description	Condition & Repairs Needed	Cost Estimate USD	Cost Per Beneficiary USD	Cost Per Jeribs Irrigated USD
Sor Karez	Karez Reservoir	N 34.28822 E 68.14215 Alt:2,442m	The reservoir supplies 400 people and irrigates 300 jeribs of land. Its capacity is 3,600 liters and it takes 7 hours to fill. The irrigation system is furrow and flood. There are no plants along the canal or around the reservoir. The water is potable.	The reservoir has leaks and wastes much water. It has some damaged sections and its canal leaks and is blocked in places. The reservoir requires cleaning, concreting and enlarging. Its canal requires cleaning and repairs.	15,000	**37,5 / person**	**50**
Karez	Mosque Tube Well	N 34.21844 E 68.43433 Alt:2,431m	The tube well is 22m deep and 1 m wide and was dug 35 years ago. 30 families benefit from this well. The water is potable.	The tube well needs re-digging and cleaning and the installation of a hand pump.	1,500	**50/families**	
Safeed Gada	Masjid Well	N 34.34052 E 68.34128 Alt:2432 m	The surface well is 26 m deep and 1 m wide and was dug 5 years ago. The quantity of water extracted is 20,000 liters. 25 families benefit from this surface well. The water is potable.	The surface well needs digging and cleaning.	1,800	**72/families**	

Name: Village Item	Type	GPS (Of Exit) N E Altitude (M)	Description	Condition & Repairs Needed	Cost Estimate USD	Cost Per Beneficiary USD	Cost Per Jeribs Irrigated USD
Hajika	Hajika Canal	N 34.18741 E 68.26162 Alt:2,400 m	This 1,900 m long canal supplies 390 households and irrigates 6,000 jeribs of land. There are some grasses and trees along the canal. The irrigation system is shape, furrow, and flood in the area. The water is potable.	The canal has leaks, blockages and cracks and some sections are damaged. It requires cleaning, repair and concreting of the damaged and cracked sections.	13,000	**33/families**	**2,16**
Seyah Gack	Zaw Karez	N 34.34328 E 68.26499 Alt:2,298 m	The karez supplies 70 families and irrigates 400 jeribs of land. The soil type is gravel and soil erosion is moderate. There are some poplar trees along the canal of this karez. The irrigation system is furrow and ruler in the area. The water is potable.	The karez has blockages and is full of mud and stone and its canal has leaks, blockages and damaged sections. Its reservoir leaks badly and wastes water. The karez requires cleaning and repairs to its damaged sections, re-digging of its shafts and concreting and cleaning of its reservoir.	7,000	**100/families**	**17,5**
Dashti Qadur	Qadar Spring	N 34.33464 E 68.31612 Alt:2,399 m	The spring supplies 20 families and irrigates 12 jeribs of land. There are some trees along the canal and around the spring. The irrigation system is furrow in the village.	The spring is full of mud and stone and its canals leak and have blockages. Its reservoir also leaks and has damaged sections. The spring requires cleaning	6,000	**300/families**	**500**

Name: Village Item	Type	GPS (Of Exit) N E Altitude (M)	Description	Condition & Repairs Needed	Cost Estimate USD	Cost Per Beneficiary USD	Cost Per Jeribs Irrigated USD
			The water is potable.	and repairs to its canal and reservoir – perhaps using concrete.			
Kalakh	Spring Reservoir	N 34.23015 **E** 68.42270 **Alt:**2,374	The reservoir is 40m wide by 20 m long and 5 m deep. Its capacity is 4,000 liters. It was built about 80 years ago and takes 12 hours to fill. It supplies 800 people and irrigates 180 jeribs of land. There are some trees around the reservoir. The irrigation system is furrow and flood. The water is potable.	The reservoir leaks and is full of mud and stone. Its canal also leaks and has blockages which cause wastage of water. The reservoir needs cleaning, enlarging and possibly concreting. Its canal also requires repairs and cleaning.	60,000	**75/ people**	**333**
Dalan	Cohi Masjed Dalan Tube Well	N 34.21723 E 68.35825 Alt:2,318 m	The tube well is 15 m deep and 1 m wide and was dug 30 years ago. The quantity water extracted from this tube well is 3,000 liter and 25 households benefit from it. The water is potable.	The tube well needs digging and cleaning and the installation of good pump.	1,200	**48/families**	

Name: Village Item	Type	GPS (Of Exit) N E Altitude (M)	Description	Condition & Repairs Needed	Cost Estimate USD	Cost Per Beneficiary USD	Cost Per Jeribs Irrigated USD
Garmab	Mosque Well Surface Well	N 34.23393 E 68.46428 Alt:2,332 m	The surface well is 30 m deep and 1 m wide and it was dug 20 years ago. 30 families benefit from this surface well. The water is potable.	The surface well needs digging and cleaning and a hand pump.	1,200	**40/families**	
Miran	Band Jowe Check Dam	N 34.21227 E 68.30924 Alt:2,304 m	This dam was built about 65 years ago and was constructed to slow flood waters. It is 1.5 m deep and 30m wide and it is made of natural stone and soil .	The check dam needs cleaning and enlarging.	35,000		
Miran	Miran Canal	N 34.21549 E 68.30241 Alt:2,290 m	This 2,600 m long canal supplies 320 households and irrigates 1,800 jeribs of land. There are some grasses and trees along the canal. The irrigation system is furrow and flood in the area. The water is potable.	The canal is full of mud and stone and the water intakes have leaks and are wasting water. It requires the cleaning and enlarging of the canal and the concreting of the damaged and leaking sections .	15,000	**46/families**	**8**
Qutabkhil	Qutab Karez	N 34.23230 E 68.28200 Alt:2,584 m	The karez supplies 120 households and irrigates 40 jeribs of land. The soil type is gravel and soil	The karez is full of mud and stone and some of its shafts need re-digging and its canal is full of mud and stone. The water intake leaks and is	18,000	**150/families**	**450**

Name: Village Item	Type	GPS (Of Exit) N E Altitude (M)	Description	Condition & Repairs Needed	Cost Estimate USD	Cost Per Beneficiary USD	Cost Per Jeribs Irrigated USD
			erosion is moderate in the area. The irrigation system is furrow and flood. There are no trees or grasses around the karez. The water is potable.	wasting water. The karez requires cleaning and the re-digging of its shafts. Its canal needs cleaning and the water intakes need concreting.			
Ormur	Ormer Chena Spring	N 34.21215 E 68.28790 Alt:2,498 m	The spring supplies 20 households and irrigates 10 jeribs of land. This canal of the spring has some trees and grasses along it. The irrigation system is shape and furrow and flood. The water potable.	The spring is full of mud and stone and its canal is damaged and leaks. The spring needs a reservoir. The spring requires cleaning as does its canal. The canal also requires repairs. A reservoir should be built for the spring.	10,000	**500/families**	**1000**
Seyah Gack	Karez Reservoir	N 34.34120 E 68.26804 Alt:2,294 m	The volume of this reservoir is 6,300 liters and it was built 120 years ago. It take 13 hours to fill. 600 people benefit from this reservoir and it irrigates 400 jeribs of land. There are some poplar trees around the reservoir. The irrigation system is furrow	The reservoir is full of mud and stone and wastes some water. It also has some damaged sections. It requires cleaning and repairs and also cleaning of its canal.	25,000	**41/Pearson**	**62**

Name: Village Item	Type	GPS (Of Exit) N E Altitude (M)	Description	Condition & Repairs Needed	Cost Estimate USD	Cost Per Beneficiary USD	Cost Per Jeribs Irrigated USD
			and ruler in the area. The water is potable.				
Qutabkhil	Cohi Masjed Dalan	N 34.22967 E 68.28346 Alt:2,992 m	The tube well is 20 m deep and 1 m wide and was dug 20 years ago. The quantity of water extracted is 4,500 liters and 25 families benefit from it . The water is potable.	The tube well needs re-digging and cleaning and the installation of a hand pump.	1,200	**48/families**	
Para kala	Masjid Well Surface Well	N 34.11526 E 68.22281 Alt:2,430 m	The surface well is 17 m deep and 1m wide and was dug 20 years ago. The quantity of water extracted is 5,000 liters. 25 families benefit from this surface well. The water is potable.	The surface well needs digging and cleaning.	1500	**60/families**	
Doranay	Durani Canal	N 34.23423 E 68.39620 Alt:2,260 m	This 1,500 m long canal supplies 200 households and irrigates 3,500 jeribs of land. There are some trees and grasses along the canal. The irrigation system is shape	The canal has leaks and blockages and is full of mud and stone. Its water intake also leaks and waste water. It requires cleaning and repair of the leaks and its water intake.	23,000	**115/families**	**6,57**

Name: Village Item	Type	GPS (Of Exit) N E Altitude (M)	Description	Condition & Repairs Needed	Cost Estimate USD	Cost Per Beneficiary USD	Cost Per Jeribs Irrigated USD
			and furrow. The water is potable.				
Gwalay	Coz Karez	N 34.21981 E 68.43524 Alt:2,416 m	The karez supplies 120 households and irrigates 300 jeribs of land. The soil type is gravel and soil erosion is moderate. There are some trees and grasses along the canal of this karez. The irrigation system is furrow and flood in the area. The water is potable.	The karez has blockages and damaged sections and is full of mud and stone. Its reservoir leaks and has damaged sections. It requires cleaning and repair of the karez and also the cleaning of its reservoir and perhaps concreting it.	80,000	**666/families**	**266**
Qutabkhil	Cheshmi Qarya	N 34.22728 E 68.28127 Alt:2,320 m	The spring supplies 20 households and irrigates 25 jeribs of land. The irrigation system is furrow and flood. There are no trees or grasses along the canal. The water is potable.	The spring is full of mud and stone, its canal has leaks and blockages and a lot of water is wasted. The spring's reservoir is also is full of mud and stone and has damaged sections. It requires repair and cleaning of its reservoir, cleaning of the canal and cleaning of the spring.	16,000	**800/families**	**640**

Name: Village Item	Type	GPS (Of Exit) N E Altitude (M)	Description	Condition & Repairs Needed	Cost Estimate USD	Cost Per Beneficiary USD	Cost Per Jeribs Irrigated USD
Dashti Qadur	Band Spring Reservoir	N 34.33420 E 68.31653 Alt:2,395 m	The source of this reservoir is a spring and its capacity is 187.5 liters. It was built about 40 years ago and takes 9 hours to fill. 900 people benefit from this reservoir and it irrigates 40 jeribs of land. There are some trees along its canal. The irrigation system is ruler in the area. The water is potable.	The reservoir is full of mud and stone and has some damaged and leaking sections. Its canal has leaks and blockages. The reservoir requires cleaning and enlarging and perhaps concreting. Its canal needs cleaning.	4,000	**4/Pearson**	**100**
Ormur	Cohi Masjed Dalan Tube Well	N 68.28629 E 34.21138 Alt:2,489 m	The tube well is 17 m deep and 1 m wide and was dug about 18 year ago. The quantity of water extracted is 7500 liters. 20 families benefit from this tube well. The water is potable.	The well requires digging and cleaning and installation of a hand pump.	1,500	**75/families**	

Name: Village Item	Type	GPS (Of Exit) N E Altitude (M)	Description	Condition & Repairs Needed	Cost Estimate USD	Cost Per Beneficiary USD	Cost Per Jeribs Irrigated USD
Zardak	Masjid Well Surface Well	N 34.35520 E 68.32383 Alt:2,318 m	The surface well is 28 m deep and 1 m wide and was dug 10 years ago. 20 families benefit from this surface well. The water is potable.	The well needs cleaning, digging and the installation of a hand pump.	1,800	**90/families**	
Para kala	Para Check Dam	N 34.11198 E 68.22429 Alt:2,401 m	The check dam is 1.5 deep and 25 m wide and was built about 50 years ago from natural stone and soil. It is used for irrigation only.	The dam needs cleaning and repair of damaged and leaky sections.	25,000		
babak	Jowe Babak Bala Canal	N 34.23572 E 68.37958 Alt:2,301 m	This 2,100 m long canal supplies 250 households and irrigates 1,700 jeribs of land. There are some grasses and trees along this canal. The irrigation system is furrow and flood in the area. The water is potable.	The canal has leaks and blockages and some damaged sections. It needs cleaning and repairs to the leaks and damage and perhaps concreting the leaking sections.	45,000	**180/families**	**26.46**
Tara	Wech Karez	N 34.27552 E 68.39936 Alt:2,725 m	The karez supplies 110 households and irrigates 350 jeribs of land. There are some trees and grasses along the canal.	The karez is full of mud and stone and has some blockages and its shafts need re-digging. Its reservoir leaks and has damaged sections.	20,000	**181/families**	**57**

Name: Village Item	Type	GPS (Of Exit) N E Altitude (M)	Description	Condition & Repairs Needed	Cost Estimate USD	Cost Per Beneficiary USD	Cost Per Jeribs Irrigated USD
			The irrigation system is furrow and flood. The water is potable.	The karez needs cleaning and its shafts need re-digging along with repair of damaged sections. Its reservoir should be cleaned and concreted.			
Pagar	Pagar Spring	N 34.23514 E 68.46851 Alt:2,362m	The spring supplies 20 families. There are some grasses around the spring. The water is potable.	The spring is full of mud and stone and its canals leak and have blockages. Water is wasted. The spring requires cleaning and repair of damage and perhaps concreting to some of the damaged areas.	15,000	**750/families**	
` Ormur	Karez Reservoir	N 34.21955 E 68.29163 Alt:2,533 m	The source of this reservoir is Ormur Karez. It is 30 m wide and 40 m long and 4 m deep. It capacity is 4,800 liters, and it takes 18 hours to fill. It was built 100 years ago. 1,200 people benefit from this reservoir and it irrigates 30 jeribs of land There are forestry trees and grasses visible along the canal and around the reservoir. The irrigation system is furrow	The reservoir is full of mud and stone and it wastes a lot of water. Its canal has blockages, leaks and damaged sections. The reservoir requires cleaning, repair of the damaged and leaking sections and concreting. Its canal needs cleaning and repairs.	12,000	**10/Pearson**	**400**

Name: Village Item	Type	GPS (Of Exit) N E Altitude (M)	Description	Condition & Repairs Needed	Cost Estimate USD	Cost Per Beneficiary USD	Cost Per Jeribs Irrigated USD
			and flood in the village. The water is potable.				
Badur	Cohi Masjed Dalan Tube Well	N 34.12108 E 68.26118 Alt:2,236 m	The tube well is 14 m deep and 1 m wide and was dug 3 years ago. The quantity of water extracted is 1500 liters. 20 families benefit from this tube well. The water is potable.	The tube well needs digging, cleaning and installation of a hand pump .	1,500	**75/families**	
Gardan Nesar	Masjid Well Surface Well	N 34.36830 E 68.29622 Alt:2,304 m	The surface well is 17 m deep and 1 m wide and was dug 5 years ago. 18 families benefit from this surface well. The water is potable.	It needs digging and needs a hand pump.	2,000	**111/families**	
Qala-i-Molayem	Band Jowe Ali Check Dam	N 34.32129 E 68.27891 Alt:2,332 m	The source of this check dam is Jilga River. It is 1.5 m deep and 20 m wide and was built about 170 years ago. It is used only for irrigation.	It is full of mud and stone, has leaking and damaged sections, and its canal leaks and has blockages and damaged sections. The dam requires cleaning and repairs to the damaged	10,000		

Name: Village Item	Type	GPS (Of Exit) N E Altitude (M)	Description	Condition & Repairs Needed	Cost Estimate USD	Cost Per Beneficiary USD	Cost Per Jeribs Irrigated USD
				and leaking sections.			
Para kala	Para Canal	N 34.11722 E 68.22291 Alt:2,399 m	The canal is 2,000 m long. It serves 270 families and irrigates 1,800 jeribs of land. There are some trees and grasses along the canal. The irrigation system is furrow and flood in the area. The water is potable.	This canal is full of mud and stone and has leaks and blockages. A lots of water is wasted. It requires cleaning and repairs to damaged and leaking sections. It should also be enlarged.	35,000	**129/families**	**19**
Rashid	Tanaba Karez	N 34.27542 E 68.39827 Alt:2,727 m	The karez supplies 85 households and irrigates 60 jeribs of land. There are trees and grasses around the karez and along canal. The irrigation system is furrow and flood. The water is potable.	The karez has blockages and damage and its canal leaks. It needs cleaning and repairs.	45,000	**529/families**	**750**

Name: Village Item	Type	GPS (Of Exit) N E Altitude (M)	Description	Condition & Repairs Needed	Cost Estimate USD	Cost Per Beneficiary USD	Cost Per Jeribs Irrigated USD
Qole Baba	Karez Reservair	N 34.21144 E 68.22802 Alt:2,440 m	The source of this reservoir is Toiaka Karez. It is 500 m wide and 1,500m long and 3 m wide and was built about 50 years ago. It takes 7 hours to fill. It supplies 300 people and irrigates 400 jeribs of land. There are some trees around the reservoir. The water is potable.	The reservoir is full of mud and stone and has damaged and leaking sections. Its canal leaks and has blockages and damaged sections. The reservoir and its canal require cleaning and repairs.	15,000	**50/Pearson**	**37.5**
Dawlasha	Mosque Tube Well	N 34.24611 E 68.33121 Alt:2,328 m	The tube well is 16 m deep and 1 m wide and was dug about 18 years ago. 20 families benefit from this tube well. The water is potable.	The tube well needs digging and cleaning and the installation of a hand pump.	1,500	**75/families**	
Doranay	Durani Check Dam	N 34.2332 E 68.39618 Alt:2,300 m	This check dam was built about 20 years ago from local mud and stone and is 1.5 m deep and 25 m wide. Its source is the Jilga River, It is used for irrigation	It is full of mud and stone and some parts are very badly damaged. It needs cleaning and repairs.	15,000		

Name: Village Item	Type	GPS (Of Exit) N E Altitude (M)	Description	Condition & Repairs Needed	Cost Estimate USD	Cost Per Beneficiary USD	Cost Per Jeribs Irrigated USD
Dalan	Nodal Canal	N 34.21968 E 68.35879 Alt:2,309 m	This 2,900 m long canal supplies 270 households and irrigates 3,600 jeribs of land. There are some trees and shrubs along the canal. The irrigation system is furrow and flood in the area. The water is potable.	The canal is full of mud and stone, has leaks and blockages and both side walls are low and flood damaged. It requires cleaning and repairs to the two side walls for protection from floods. IT also requires repairs and concreting of the leaking and damaged sections.	35,000	**129/families**	**9,7**
Sor Karez	Sor Karez	N 34.28600 E 68.14232 Alt:2,445 m	40 families benefit from this karez and it irrigates 300 jeribs of land. There are some grasses and poplar tree around this karez and canal. The irrigation system is furrow and flood. The water is potable.	The karez is full of mud and stone and has blockages and damaged sections. Its canal leak and has blockages and damaged sections. It needs cleaning and repairs and perhaps concreting of the damaged and leaking sections. Its shafts require re-digging.	8,000	**200/families**	**26**
Garmab	Spring Reservoir	N 34.23580 E 68.46690 Alt:2,345 m	The source of this reservoir is a spring. It is 20 m wide by 15 m long and 2.5 m deep. Its volume 302.5 liters. It was built about 60 years ago and takes 9	It is full of mud and stone and some sections are damaged. Its canal has leaks and blockages. The reservoir and its canal	3,000	**5,5/Pearson**	**13**

Name: Village Item	Type	GPS (Of Exit) N E Altitude (M)	Description	Condition & Repairs Needed	Cost Estimate USD	Cost Per Beneficiary USD	Cost Per Jeribs Irrigated USD
			hours to fill. 350 people benefit from this reservoir and it irrigates 225 jeribs of land. There are some trees around the reservoir. The irrigation system is furrow and flood. The water is potable.	need cleaning and repairs. The reservoir should be made larger.			
Qol Zangi	Masjid Well Surface Well	N 34.12205 E 68.23091 Alt:2,392 m	This well is 20 m deep and 1 m wide and was dug 18 years ago. 20 families benefit from this surface well. The water is potable.	It needs digging and cleaning.	1,500	**75/families**	
Nodal	Nodal Check Dam	N 34.21801 E 68.34789 Alt:2,323 m	The check dam is 1.5 m deep and 28 m wide and was built about 25 years ago from local , stone and soil. Its source of that is Jilga River.	It is full of mud and stone and has leaks and wastes much water. It needs cleaning and repairs of damaged sections.	40,000		
Lashkari	Joee Now Dil Canal	N 34.21979 E 68.34526 Alt:2,304 m	This 2,100 m long canal supplies 270 households and irrigates 3,600 jeribs of land. There are some grass and trees	This canal has leaks and blockages and wastes much water. It is full of mud and stone and some sections are flood damaged.	40,000	**148/families**	**11**

Name: Village Item	Type	GPS (Of Exit) N E Altitude (M)	Description	Condition & Repairs Needed	Cost Estimate USD	Cost Per Beneficiary USD	Cost Per Jeribs Irrigated USD
			along the canal. The irrigation system is furrow and flood. The water is potable.	The canal requires cleaning and repairs and possibly concreting to prevent future flood damage.			
Jawar Sang	Baghi Karez	N 34.36612 E 68.28276 Alt:2,271m	The karez supplies 70 families and irrigates 300 jeribs of land. The soil type is gravel. There are some trees and grasses around this karez. The irrigation system is furrow and flood. The water is potable.	The karez has blockages and damaged sections and its canal has leaks and blockages. Its reservoir has damaged sections and it is also full of mud and stone. The karez, its reservoir and its canals need cleaning and repair of damaged sections and leaking sections.	8,000	**114/families**	**26**
Dahan Awpay	Village Spring	N 34.29321 E 68.16732 Alt:2,428 m	The spring supplies 10 families and irrigates 5 jeribs of land. There are no trees or shrubs around the spring. The irrigation system is furrow in the area. The water is potable.	The spring is full of mud and stone and needs cleaning and enlarging. Its reservoir also requires cleaning and repairs.	6,000	**600/families**	**1200**

Name: Village Item	Type	GPS (Of Exit) N E Altitude (M)	Description	Condition & Repairs Needed	Cost Estimate USD	Cost Per Beneficiary USD	Cost Per Jeribs Irrigated USD
Karez	Karez Reservoir	N 34.21841 E 68.43426 Alt:2,424 m	The reservoir is 1,500 m long by 500m wide and was built about 40 years ago. It take 13 hours to fill it. It serves 650 people and irrigates 1,200 jeribs of land. There are some trees along the canal and around the reservoir. The irrigation system is furrow and flood. The water is potable.	The reservoir is small and needs to be enlarged. It needs cleaning and repairs to the damaged sections. The two side walls should be made higher.	30,000	**46/Pearson**	**25**
Jawar Sang	Masjid Well Surface Well	N 34.36880 E 68.28350 Alt:2,294 m	This well is 17 m deep and 1 m wide and was dug about 20 years ago. 15 families benefit from this surface well. The water potable.	The tube well needs digging and installation of hand pump.	1,000	**66/families**	
Ibrahim Zai	Pakhshak Check Dam	N 34.19234 E 68.26963 Alt:2,321 m	This dam was built about 150 years ago and is 2.5 m deep and 20 m wide. Its source of that is Jilga River. It is used for irrigation.	It needs cleaning and repair of damaged and leaking sections.	25,000		

Name: Village Item	Type	GPS (Of Exit) N E Altitude (M)	Description	Condition & Repairs Needed	Cost Estimate USD	Cost Per Beneficiary USD	Cost Per Jeribs Irrigated USD
Nazuk khel	Jowe Takhta Caanl	N 34.2248 E 68.44344 Alt:2302	This 1,800 m long canal supplies 100 families and 2,000 jeribs of land. There are some trees and grasses along the canal. The irrigation system is furrow and flood in the area. The water is potable.	The canal is full of mud and stone and has blockages and leaking sections. It needs cleaning and repairs.	20,000	**200/families**	**10**
Karez folad	Karez Fulad Karez	N 34.34518 E 68.27364 Alt:2,304 m	The karez supplies 40 families and irrigates 300 jeribs of land. The soil type is gravel and there is no soil erosion in the area. There are some trees around the karez and along its canal. The irrigation system is furrow and flood. The water is potable.	The karez needs cleaning and repairs and should have flood protection for the future.	6,000	**150/families**	**20**
Dashti Now	Karez Reservoir	N 34.32318 E 68.30403 Alt:2,314 m	The source of this reservoir is a karez. It was built about 100 years ago and takes 10 hours to fill. It supplies 500 people and irrigates 200 jeribs of land. There are some poplar trees	The reservoir is full of mud and stone and has some damaged sections. It requires cleaning and repairs.	12,000	**24/Pearson**	**60**

Name: Village Item	Type	GPS (Of Exit) N E Altitude (M)	Description	Condition & Repairs Needed	Cost Estimate USD	Cost Per Beneficiary USD	Cost Per Jeribs Irrigated USD
			along the canal and around reservoir. The irrigation system is furrow and ruler. The water is potable.				
Dahan Awpay	Masjid Well	N 34.29618 E 68.16781 Alt:2,451m	It has 28 m deep and 1 m wide and it was dug about 40 years ago, 20 families benefit from this surface well, the water is potable.	It needs cleaning and digging and installation of hand pump.	18,000	**900/families**	
Ormur	Canal Check Dam	N 34.21463 E 68.28209 Alt:3,438 m	The source of this check dam is the Jilga River. It was built about 160 years ago and is 1 m deep by 25 m wide. It is constructed from national stone, soil and wood. It is used for irrigation and for protection against flood waters.	It needs enlarging, cleaning and repair the damaged sections. Both sides of the canal are damaged and require repair and perhaps concreting for long term protection.	25,000		
Sadu khel	Jowe Fasal	N 34.2295 E 68.45681 Alt:2,341 m	This 2,800 m long canal supplies 250 households and irrigates 2,800 jeribs of land There are some plants and trees along the canal. The irrigation system is flood	The canal is full of mud and stone and some parts are damaged. It needs cleaning and repairs.	35,000	**140/families**	**12.5**

Name: Village Item	Type	GPS (Of Exit) N E Altitude (M)	Description	Condition & Repairs Needed	Cost Estimate USD	Cost Per Beneficiary USD	Cost Per Jeribs Irrigated USD
			and furrow. The water is potable.				
Miran	Kitab Karez	N 34.21959 E 68.30498 Alt:2,377 m	The karez supplies 20 families and irrigates 20 jeribs of land. The soil erosion is gravel and soil erosion is heavy. There are some poplar trees along the canal of this reservoir. The irrigation system is furrow and flood. The water is potable.	The karez is full of mud and stone and has damaged sections. It does not have a reservoir. It needs cleaning and repairs and the building of a reservoir.	15,000	**750/families**	**750**
Baghalak	Payeen Spring	N34.34213 E 68.34516 Alt:2,306 m	10 families benefit from this spring and it irrigates 15 jeribs of land. There are some trees along the canal and around the spring. The irrigation system is furrow and ruler. The water is potable.	The spring needs cleaning and digging.	5,000	**500/families**	**333**

Name: Village Item	Type	GPS (Of Exit) N E Altitude (M)	Description	Condition & Repairs Needed	Cost Estimate USD	Cost Per Beneficiary USD	Cost Per Jeribs Irrigated USD
Jawar Sang	Karez Reservoir	N 34.36460 E 68.28570 Alt:2,267 m	The source of this reservoir is Karez Baghi. It was built about 65 years ago. It takes 12 hours to fill this reservoir. 500 people benefit from this reservoir and it irrigates 150 jeribs of land. There are some trees along the canal. The irrigation system is furrow and flood. The water is potable.	It is full of mud and stone and has some damaged sections. It needs cleaning and enlarging and possibly concreting of the damaged sections .	10,000	**20/Pearson**	**66**
Dawlasha	Dawlasha	N 34.24582 E 68.33616 Alt:2,312 m	This 1,600 m long canal supplies 130 families and irrigates 1,200 jeribs of land. There are some trees and grasses along this canal. The irrigation system is furrow and flood. The water is potable.	The canal is full of mud and stone and its wastes much water. Some parts of the canal are also flood damaged. It needs cleaning and repairs to damaged sections and perhaps concreting.	18000	**138/families**	**15**
Qole Baba	Village Karez	N 34.2123 E 68.22742 Alt:2,442 m	The karez supplies 30 families and irrigates 200 jeribs of land . The soil type is gravel. There are some trees and	The karez needs cleaning and its shafts need re-digging and other repairs to the damaged sections.	9000	**300/families**	**45**

Name: Village Item	Type	GPS (Of Exit) N E Altitude (M)	Description	Condition & Repairs Needed	Cost Estimate USD	Cost Per Beneficiary USD	Cost Per Jeribs Irrigated USD
			grasses along the canal and karez. The irrigation system is furrow and flood. The water is potable.				
Doranay	Durani Spring	N 34.23568 E 68.39318 Alt:2,338 m	10 families benefit from this spring and it irrigates 5 jeribs of land. The soil erosion is moderate. There are some poplar trees along the canal of this spring. The irrigation system is furrow and flood and sometimes they use ruler irrigation system as well. The water is potable.	The spring is full of mud and stone and some sections of canal are damaged. It needs cleaning and cleaning and repair of the spring and its canal.	12000	**1200/families**	**2400**
Diwar	Karez Reservoir	N 34.29215 E 68.13839 Alt:2,400 m	The reservoir takes 8 hours to fill and was built about 100 years ago. It servers 300 people and irrigates 300 jeribs of land. There are some trees and grasses around the reservoir. The irrigation system is flood	The reservoir is full of mud and stone and is leaking and has damaged sections. It needs cleaning and repairs.	10000	**33/families**	**33**

Name: Village Item	Type	GPS (Of Exit) N E Altitude (M)	Description	Condition & Repairs Needed	Cost Estimate USD	Cost Per Beneficiary USD	Cost Per Jeribs Irrigated USD
			and furrow. The water is potable.				
Shahqadam	Masjid Well	N 34.10881 E 68.21783 Alt:2,409m	The surface well is 17 m deep and 1 m wide and was dug 20 years ago. 15 families benefit from this surface well. The water is potable.	It needs cleaning and digging.	1500	**100**	
Dawlasha	Village Spring	N 34.24921 E 68.33324 Alt:2,314 m	10 families benefit from this spring and it irrigates 12 jeribs of land. There are some trees and grasses around the spring and along its canal. The irrigation system is furrow and flood. The water is potable.	The spring is full of mud and stone and its canal leaks and has blockages. It needs cleaning and repairs to spring and canal.	25000	**2500/families**	**2083**
Dashti Qadur	Jowe Mira Canal	N 34.33538 E 68.31372 Alt:2,391 m	This 800 m long canal supplies 90 households and irrigates 600 jeribs of land. There are some trees and grasses along the canal.	This canal is full of mud and stone and has leak and blockages and wastes water. It needs cleaning and repair of damaged sections.	13000	**144/families**	**21**

Name: Village Item	Type	GPS (Of Exit) N E Altitude (M)	Description	Condition & Repairs Needed	Cost Estimate USD	Cost Per Beneficiary USD	Cost Per Jeribs Irrigated USD
			The irrigation system is furrow and ruler. It is shared between 2 villages. The water is potable.				
Nakchin	Nakchiband Karez	N 34.23412 E 68.4372 Alt:2,354m	The karez supplies 90 families and irrigates 200 jeribs of land. The soil type is gravel and erosion is moderate. There are some grasses along the canal. The water is potable.	The karez needs cleaning and repairs to damaged and leaking sections. Its canal needs cleaning and repairs.	25000	**277/families**	**125**
Gwalay	Karez Reservoir	N 34.21968 E 68.43513 Alt:2,416 m	The source of this reservoir is the Gwalay Karez. It is 20 m wide by 15m long and 3 m deep. It was built about 100 years ago and takes 14 hours to fill. It supplies 400 people and irrigates 80 jeribs of land. The irrigation system is furrow and flood. The water is potable.	The reservoir is full of mud and stone and its canal has leaks, blockages and damaged sections. It requires cleaning and repairs to reservoir and canal.	20000	**50/Pearson**	**250**

Name: Village Item	Type	GPS (Of Exit) N E Altitude (M)	Description	Condition & Repairs Needed	Cost Estimate USD	Cost Per Beneficiary USD	Cost Per Jeribs Irrigated USD
Sor karez	Masjid Well Surface Well	N34.29720 E 68.22091 Alt:2,418m	This surface well is 15 m deep and 1 m wide and was dug 10 years ago. 20 families benefit from this surface well.	It needs cleaning and digging and needs hand pump.	1100	**55/families**	
Qutabkhil	Meran Canal	N 34.22967 E 68.28396 Alt:2,992 m	This 1,400 m long canal supplies 180 households and irrigates 2,000 jeribs of land. There are some trees, grasses and some shrubs along the canal. The irrigation system is furrow and flood. The water is potable.	The canal has leaks, blockages and some damaged sections and both sides of the canal are damaged. The canal needs repair of the the two side walls and of the damaged and leaking sections and leak sections as well as cleaning.	35000	**194/families**	**17.5**
Dashti Now	Karez Now	N 34.32289 E 68.30490 Alt:2,317 m	The karez supplies 50 families and irrigates 300 jeribs of land. There are some trees and grasses along the canal of this karez. The irrigation system is furrow and flood. The soil type is gravel and there is no soil erosion. The water is potable.	The canal has leaks, blockages and some damaged sections. The karez and its canal should be cleaned with leaks and damage repaired.	9000	**180/families**	**30**

Name: Village Item	Type	GPS (Of Exit) N E Altitude (M)	Description	Condition & Repairs Needed	Cost Estimate USD	Cost Per Beneficiary USD	Cost Per Jeribs Irrigated USD
Miran	Bedak Spring	N 34.21220 E 68.30813 Alt:2,300 m	The spring supplies 10 families and irrigates 5 jeribs of land. Soil erosion is moderate. There are some trees along the canal. The irrigation system is furrow and flood. The water is potable.	The spring needs cleaning and repair of the damaged sections and enlarging.	8000	**800/families**	**1600**
kunj	Hoawz China Reservoir	N 34.15270 E 68.25658 Alt:2,335 m	The source of this reservoir is the Kunje Spring. It is 30 m wide by 20 m long and 4 m deep and was built about 65 years ago. It takes 12 hours to fill. 150 people benefit from this reservoir and it irrigates 35 jeribs of land. There is some vegetation around the reservoir. The water is potable.	It needs cleaning and repair of the damaged sections.	20000	**133/Pearson**	**571**
Kunj	Kunj Spring	N 34.15273 E 68.25676 Alt:2,338 m	The spring supplies 12 households and irrigates 15 jeribs of land. There are some plants around	The spring is full of mud and stone and its canal has leaks and visible cracks. It needs cleaning and repair	10000	**833/families**	**666**

Name: Village Item	Type	GPS (Of Exit) N E Altitude (M)	Description	Condition & Repairs Needed	Cost Estimate USD	Cost Per Beneficiary USD	Cost Per Jeribs Irrigated USD
			the spring. The irrigation system furrow and flood. The water is potable.	of the damaged and leaking sections .			
Karez	Village Karez	N 34.21841 E 68.43426 Alt:2,424 m	The karez supplies 60 families and 500 jeribs of land irrigated by this spring, there are some trees and grasses along the canal of this karez, the irrigation system is furrow and flood, the soil type is gravel and the soil erosion is moderate in the area, the water is potable.	The karez needs cleaning and a shift of this karez needs digging and cleaning and repair of the damaged sections.	18000	**300/families**	**36**
Baghalak	Baghalak Canal	N 34.34761 E 68.3495 Alt:2,302 m	The canal supplies 100 households and irrigates 700 jeribs of land. There are some trees and grasses along the canal. The irrigation system is furrow and flood. The water is potable.	The canal is full of mud and stone and has some leaks and blockages. It needs cleaning and repair of the damaged sections.	6000	**60/families**	**8.5**
Diwar	Diwar Karez	N 34.29138 E 68.13721 Alt:2,403 m	The karez supplies 40 families and 300 jeribs of land irrigated by this karez, The soil type is gravel and there is no soil	The karez needs cleaning and digging and repair of the damaged sections .	10000	**250/families**	**33**

Name: Village Item	Type	GPS (Of Exit) N E Altitude (M)	Description	Condition & Repairs Needed	Cost Estimate USD	Cost Per Beneficiary USD	Cost Per Jeribs Irrigated USD
			erosion in the area, the irrigation type is furrow and flood in the area, the water is potable.				
Qol Zangi	Zangi Canal	N 34.12982 E 68.23428 Alt:2360	This 2,900 m long canal supplies 220 families and irrigates 1,200 jeribs of land. There are some trees and grasses along the canal. The irrigation system is furrow and flood. The water is potable.	The canal has leaks, blockages, visible cracks and some damaged sections. It needs cleaning and repair of the damaged sections and concreting for future protection.	18000	**81/families**	**15**
Zardak	Shah Qadam Karez	N 34.35185 E 68.32258 Alt:2,302 m	The karez supplies 90 families and irrigates 200 jeribs of land. There are some trees and grasses along the canal and karez. The irrigation system is furrow. The soil type is gravel and there is no soil erosion. The water is potable.	The karez needs cleaning and repair of the damaged sections and the re-digging of its shafts.	18000	**200/families**	**90**

Name: Village Item	Type	GPS (Of Exit) N E Altitude (M)	Description	Condition & Repairs Needed	Cost Estimate USD	Cost Per Beneficiary USD	Cost Per Jeribs Irrigated USD
Qala-i-Molayem	Jowe Ali Canal	N 34.31719 E 68.28218 Alt:2,299 m	This 900m long canal supplies 120 households and irrigates 600 jeribs of land. There are some trees and grasses along the canal. The irrigation system is furrow and ruler. The water is potable.	The canal has leaks, blockages and some damaged sections. It needs cleaning and repairs of the damaged sections and could be enlarged.	7000	**58/families**	**11**
Gidargu	Bodak Check Dam	N 34.20619 E 68.5055 Alt:2,290 m	The check dam was built about 120 years ago and is 25 m wide by 4 m deep. It is built from natural stone and soil. It is used only for irrigation.	The check dam has leaks and it is clogged with mud and stone. It has cracks and damaged sections. It needs cleaning and repair of the damaged and leaking sections and also concreting.	25000		
Uzbaki	Sabr Canal	N 34.09781 E 68.21692 Alt:2,380 m	500m long canal supplies 80 households and irrigates 650 jeribs of land. There are some trees and grasses along the canal. The irrigation system is furrow and flood. The water is potable.	The canal has leaks, blockages and is full of mud and stone so it wastes much water. It needs cleaning and repair or concreting of the damaged and leak sections.	21,000	**262/families**	**32**

Name: Village Item	Type	GPS (Of Exit) N E Altitude (M)	Description	Condition & Repairs Needed	Cost Estimate USD	Cost Per Beneficiary USD	Cost Per Jeribs Irrigated USD
Dalan	Dalan Check Dam	N 34.21718 E 68.34221 Alt:2,317 m	It was built about 25 years ago from stone, soil and large pieces of wood. It is 1.5 m deep and 28 m wide. It is used only for irrigation.	It leaks badly and has damaged sections and cracks and so causes wastage of water. It requires cleaning and repair of the damaged and leaking sections.	40000		
Gardan Nesar	Jowe Warsak Canal	N 34.36673 E 68.29053 Alt:2,290 m	This 1,000m long canal supplies 80 families and irrigates 600 jeribs of land. There are some trees and grasses along the canal. The irrigation system is furrow and flood. The water is potable.	This canal has leaks, blockages and damaged sections and it wastes water. It needs cleaning and repair of the damaged sections.	16000	**200/families**	**26**
Khair Qala	Shato Check Dam	N 34.2375 E 68.47608 Alt:2,330 m	The check dam was built about 25 years ago and is 2 m deep by 28 m wide. It is constructed of natural stone and mud. The dam is used only for irrigation.	The check dam has leaks and is full of mud and stone and wastes a lot of water. It requires cleaning and repair of the damaged sections and leak sections.	25000		
Dahan Awpay	Jowe Lala Canal	N 34.29105 E 68.16722 Alt:2,401 m	This 1,000 m long canal supplies 100 families and irrigates 700 jeribs of land. There are some trees and	The canal needs cleaning, enlarging and repairs to the damaged and leaking sections.	15000	**150/families**	**21**

Name: Village Item	Type	GPS (Of Exit) N E Altitude (M)	Description	Condition & Repairs Needed	Cost Estimate USD	Cost Per Beneficiary USD	Cost Per Jeribs Irrigated USD
			grasses along the canal. The irrigation type is furrow and flood. The water is potable.				
Hajika	Band Check Dam	N 34.18953 E 68.26172 Alt:2,400 m	It was built about 50 years ago and is 2 m deep by 25 m wide. It is made of local stone and soil and mud. it is used only for irrigation,	It needs cleaning and repair of the damaged and leaking sections .	35000		
Dahan Qol	Jowe Shir Canal	N 34.29956 E 68.22489 Alt:2,403 m	This 450 m long canal supplies 150 households and irrigates 1,800 jeribs of land. There are some trees and grasses along the canal. The irrigation system is furrow and flood. The water is potable.	The canal requires cleaning and repair of the damaged sections. The village would like to have a drip irrigation system.	8000	**53/families**	**4**
Qol Zangi	Band Zangi Check Dam	N 34.12138 E 68.23396 Alt:2,370 m	The check dam was built about 65 years ago and is 1.5m deep by 18 m wide. It is constructed of local stone and soil. It is used only for irrigation.	The dam has leaks, is full of mud and stone, and has cracks. It needs cleaning and repair of the damaged sections.	30000		

Name: Village Item	Type	GPS (Of Exit) N E Altitude (M)	Description	Condition & Repairs Needed	Cost Estimate USD	Cost Per Beneficiary USD	Cost Per Jeribs Irrigated USD
Safeed Gada	Jowe Nawar Canal	N 34.34712 E 68.34467 Alt:2398	This 1,700 m long canal supplies 150 households and irrigates 700 jeribs of land. There are some trees and grasses along the canal. The irrigation type is furrow and flood. The water is potable.	It has leak, blockages and some badly flood damaged sections. It requires cleaning and repair of the damaged sections.	8500	**56/families**	**12**
Baghalak	Jowe Check Dam	N 34.34385 E 68.3467 Alt:2,328 m	It was built about 60 years ago for protecting from flood waters. It is 1 m deep by 10 m wide and made from stone, soil and mud.	The check dam has leaks and damaged sections. It needs cleaning and repair of the damaged and leaking sections.	10000		
Tangasaydan	Tanga Canal	N 34.23746 E 68.49874 Alt:2,317 m	This 300 m long canal supplies 110 households and irrigates 5,400 jeribs of land. 500 jeribs are cultivated. There are some plants and forest trees along the two sides of the canal. The irrigation system is furrow and flood.	The canal needs cleaning and enlarging and repair of the damaged sections.	42000	**381/families**	**7**

Name: Village Item	Type	GPS (Of Exit) N E Altitude (M)	Description	Condition & Repairs Needed	Cost Estimate USD	Cost Per Beneficiary USD	Cost Per Jeribs Irrigated USD
Gardan Nesar	Band Jowe Warsak Check Dam	N 34.36274 E 68.29588 Alt:2,299 m	Source of this check dam is Day Mirdad River, it was built about 180 year ago, it has 0,5 m deep and 15 m wide and it is mad of from stone and mud.	The check dam needs cleaning and enlarging and concreting of the damaged sections and leak sections .	12000		
Ahmad khil	Meran Canal	N 34.21563 E 68.29267 Alt:2,230 m	2500 m long canal supplies 180 households and 2000 jeribs of land irrigated by this canal, there are some trees and grasses and shrubs are visible at the tow side of canal, the irrigation system is furrow and flood. The water is potable.	cleaning and repair of the damaged sections and leak sections and concreting of that and making near to the River area .	40000	**222/families**	**20**
Dahan Qol	Band Jowe Check Dam	N 34.29637 E 68.22213 Alt:2,420m	It was built about 50 years ago. Its source is the Jiga River. The dam is 1 m deep by 15 m wide and it is made from natural stone and mud. It is used only for irrigation	The dam has leaks, blockages and damaged sections. It needs cleaning and repairs to the damaged sections.	1100		
Ormur	Ormur Canal	N 34.21994 E 68.28402 Alt:2,430 m	This 1,100 m long canal supplies 220 families and irrigates 2,500 jeribs of land. There are forestry trees and grasses along the canal.	The canal has leaks, blockages, some damaged sections and some serious flood damage. It needs repairs and cleaning, and perhaps concreting to	18000	**81/families**	**7**

Name: Village Item	Type	GPS (Of Exit) N E Altitude (M)	Description	Condition & Repairs Needed	Cost Estimate USD	Cost Per Beneficiary USD	Cost Per Jeribs Irrigated USD
			The irrigation type is furrow and flood. The water is potable.	prevent future flood damage.			
Safeed Gada	Band Jowe Check Dam	N 34.3452 E 68.34272 Alt:2,418 m	The source of this check dam is Dai Mirdad River. The dam was built about 30 years ago and is 1.5 m deep by 12 m wide. It is made of natural mud and stone. The water is only used for irrigation.	This check dam has leaks, blockages and some damaged sections. It needs cleaning and repair of the damaged sections.	10000		
babak	Jowe Babak Payeen	N 34.23289 E 68.37459 Alt:2,285 m	This 900 m long canal supplies 55 families and irrigates 600 jeribs of land. There are some trees and grasses along the canal. The irrigation system is furrow and flood. The water is potable.	The canal has leaks, blockages and damaged sections. It needs cleaning and repair of the damaged sections.	15000	**272/families**	**25**
Toiaka	Jowe Toiaka	N 34.23618 E 68.48492 Alt:2,328 m	This 2,800 m long canal supplies 200 families and irrigates 5,600 jeribs of land. There are some trees and grasses around to this canal.	The canal is full of mud and stone and has some blockages and damaged and leaking sections. It needs cleaning and repair	52000	**260/families**	**9**

Name: Village Item	Type	GPS (Of Exit) N E Altitude (M)	Description	Condition & Repairs Needed	Cost Estimate USD	Cost Per Beneficiary USD	Cost Per Jeribs Irrigated USD
			The irrigation system is furrow and flood in the area. The water is potable.	of the damaged sections possibly concreting in places to prevent future damage.			
Bakhshak	Bakhshak Canal	N 34.19109 E 68.26841 Alt:2,256 m	This 1,500 m long canal supplies 75 families and irrigates 700 jeribs of land. There are some grasses and trees along the canal. The irrigation system is furrow and flood. The water is potable.	The canal is full of mud and stone and has some blockages and damaged and leaking sections. It needs cleaning and repair of the damaged sections possibly concreting in places to prevent future damage.	22000	**293/families**	**31**
Khair Qala	Shato Khair Qala Canal	N 34.23761 E 68.47618 Alt:2,329 m	This 2,000 m long canal supplies 25 families and irrigates 400 jeribs of land. There are some trees and grasses along the canal. The irrigation type is furrow and flood. The water is potable.	The canal has leaks, blockages and damaged sections. It needs cleaning and repair of the damaged sections.	180,000,0	**7200/families**	**450**
Paiwand	Paiwand Canal	N 34.22129 E 68.50404 Alt:2,293 m	This 1,300 m long canal supplies 250 households and irrigates 1,500 jeribs of land. There are some trees and	The canal needs cleaning, repair and concreting.	112500	**450/families**	**75**

Name: Village Item	Type	GPS (Of Exit) N E Altitude (M)	Description	Condition & Repairs Needed	Cost Estimate USD	Cost Per Beneficiary USD	Cost Per Jeribs Irrigated USD
			grasses along this canal. The water is potable.				
Pagar	Pagar Canal	N 34.23528 E 68.046892 Alt:23,60 m	This 1,700 m long canal supplies 20 families and irrigates 500 jeribs of land. There are some trees on the sides of the canal. The water is potable.	The canal needs cleaning and repair.	22000	**1100**	**44**
Ibrahim Zai	Pakhshak Canal	N 34.20983 E 68.27313 Alt:2,322 m	This 1800m long canal supplies 200 households and irrigates 2,800 jeribs of land. There are some trees and grasses along the canal. It is shared by 3 villages. The irrigation type is furrow and flood. The water is potable.	The canal needs cleaning and repair of the damaged sections.	28000	**140/families**	**10**
Kunj	Kunj Canal	N 34.15128 E 68.25927 Alt:2,291 m	This 1,000 m long canal supplies 150 families and irrigates 1,200 jeribs of land There are some trees and grasses along the canal.	The canal needs cleaning and repair of the damaged and leaking sections and concreting to protect from future damage. A reservoir is	18000	**120/families**	**15**

Name: Village Item	Type	GPS (Of Exit) N E Altitude (M)	Description	Condition & Repairs Needed	Cost Estimate USD	Cost Per Beneficiary USD	Cost Per Jeribs Irrigated USD
			The irrigation system is furrow and flood. The water is potable.	also needed.			
Shahqadam	Shahi Canal	N 34.10737 E 68.21318 Alt:2,361 m	This 800 m long canal supplies 150 households and irrigates 1,000 jeribs of land. There are some grasses and trees along the canal. The irrigation type is furrow and flood. The water is potable.	The canal has leak, blockages and cracks . It needs cleaning and repairs.	30000	**200/families**	**30**

8. Recent Water Intervention[2]

Village	Improvements
Ahmad khil	
Badur	
Gidargu	
Jawar Sang	
Paiwand	
Bodak	
sayhgak	
Qotubkhil	
Gardan Nesar	
Dashti Now	
Toiaka	
Miran	
Qala-i-Molayem	
Doranay	
Dalan	
Karez Folad	
Babak	
Baghalak	
Sadu Khel	
Khair Qala	
Zardak	
Garmab	
Ebrahim Zai	
Lashkari	
Nazuk khel	
Tanga Sayadan	
Pagar	
Nakchin	
Nodal	
Bakhshak	

[2] It is not possible to find this data in the Day Mirdad Survey. The questionnaire is being modified to cover it.

Gwalay	
Kunj	
Qol Zangi	
Rashid	
Muka	
Dawlasha	
Dashti Qadur	
Hajika	
Diwar	
Dahan Qol	
Karez	
Safeed gada	
Para kala	
Shahqadam	
Ormur	
Uzbaki	
Kalakh	
Dahan Awpay	
Qole Baba	
Sor Karez	
Tara	

9. Potential Water Projects

Water projects can be divided into four types:

a) Urgent repairs to structures – often to repair damage caused by 2010 floods.

b) Longer term watershed improvements to prevent future floods, generate ground water replenishment through infiltration, increase sustainable grazing and fuel-wood supplies and to check soil erosion. Interventions might include the creation of deliberate flood plains, check dams, warping dams, terracing, planting of trees and shrubs, alternative fuels and fodder and enclosure of livestock.

c) Longer term water storage. At the moment, small reservoirs accumulate one day's water from a karez or spring so that there is sufficient volume and flow to fill distribution channels and carry out traditional flood, furrow or senayee irrigation. However, water is plentiful in spring and short in late summer when most needed by maize and fruit crops: no attempt is made at long-term off-season storage to supplement groundwater.

d) Pumping. Water from main rivers is carried by long canals which leak and are expensive to maintain. No attempt is made to pump water using sustainable energy (hydraulic rams or solar) to high elevation storage.

10. Potential Community Projects (non water)

There is a lot of fruit grown in Day Mirdad District and many elders suggested beekeeping and cold stores to service the industry. There is also a needs input stores (Farm Service Centres) and for farmer training. Most of the fruit is grown on the rich alluvial soils of the valley: these are very susceptible to spring frost. In most countries, sloping ground is chosen for fruit production. Gentle slopes on the sides of the valleys are not used because the irrigation technology has not developed. Demonstrations of how to grow fruit on a sloping frost-free site would be beneficial.

There is potential for developing fish farming where water is plentiful.

In valley bottoms at high risk of flooding, poplar woodlots are a good choice. They can withstand substantial flooding after two years and are cheap to replace if flooded.

The high ratio of livestock to fodder crops[3] indicates potential for training in livestock nutrition and the promotion of intercrops in young or extensive orchards.

In the remote villages, there are often access problems and roads are needed to enable villagers to reach markets with their produce. Several villagers mentioned the lack of bridges over rivers and canals effectively isolating them from markets. As well as markets, the elders described the lack of health, veterinary and education facilities within reasonable distance. In general, the doubling of the population and rising expectations is putting all infrastructures under pressure.

We have not attempted a list of non-water projects, but if, for example, a bee-keeping project is proposed, it would be easy to search the database for those villages that had specifically mentioned it.

11. Annexes

Annexes should contain detailed tables of data collected on survey. Should be easy to pull these off the database into reports. Use standard format for each district, village or water feature report.

Make tables easy to put into Excel and manipulate – use minimum of merged cells, formatting etc.

Need to discuss what tabulated data would be really useful for decision making. Tables should be referred to in main text. For example, number of farm families and jeribs of land serviced by each canal would help in deciding priorities for repairs.

One table should show progress of survey – who was interviewed by whom, when and where.

One table should give contact details for each village.

12. Photographs

Photographs of key features in above report should be attached. They should be given a reference number so that they can be referred to in text above. ***All photos need checking to ensure the caption is correct. One photo there may be other errors which would make us look very foolish if published.***

Note: One or two photos may be included in text of report for interest. However we need to supply complete photographic record of each village, water feature and watershed. Suggest photos are supplied on separate disk for each district. Selection of photos important to show important points referred to in text.

[3] It is difficult to get a true figure for fodder as a lot of orchards are intercropped and maize may also be grown mainly for fodder.