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**AFGHANISTAN RESOURCE  
CORRIDOR DEVELOPMENT:**

**WATER STRATEGY**

**FINAL KABUL RIVER BASIN  
REPORT**

Version 4.0

## EXECUTIVE SUMMARY

The World Bank has recently set up a team to help the Government of the Islamic Republic of Afghanistan prepare a “Resource Growth Corridor” strategy anchored to oncoming large mining investments. Aynak and Hajigak, with Kabul as a central node. The first major mine moving towards production is the Aynak copper mine, together with the oil blocks in Amu Darya, to be followed by Hajigak iron ore development and potentially the gas blocks in Sheberghan.

This report relates to a review of previous documents concerning water supply for Kabul and the copper mine at Aynak and their impact on a formal strategy for the Kabul river basin.

The Kabul river basin can be divided into three main sub-basins; Logar-Upper Kabul, Panjshir and Lower Kabul. The key sub-basin Logar-Upper Kabul provides only 2.5% of the average annual flow of the basin at the border with Pakistan, Panjshir provides roughly 14%, with the Lower Kabul and its significant tributaries providing the major part of the annual flow of this river. Transferring water from the Lower Kabul basin to supply Kabul is possible but implies significant technical and financial issues; this means that short and medium term solutions have to rely on the available water resources of the Logar-Upper Kabul basin or by transfer from the Panjshir basin.

The Master Plan for Kabul has projected significant population expansion at over 100% within 10-20 years with a corresponding increase in per capita water demand of up to 300%. This increase in water demand would be met by providing storage, extraction and transfer of water from the remote source of the Panjshir valley, both capital and annual operating costs of such a scheme are significant.

### **Water Supply and Demand**

A possible balance of demand and supply for the 20 year period is provided in the following tables A, B and C:

**Table A: Kabul City - Population Estimates**

The following range of population estimates has been determined from the ranges quoted within available data from the references in given in Section 2.1:

Kabul City Population	2012	2022	2032
Low-range	3,200,000	3,900,000	4,800,000
Mid-range	4,000,000	5,000,000	6,000,000
Upper-range	5,000,000	6,100,000	7,000,000

**Table B: Kabul City – Summary of Water Demand Estimates**

The following range of total water demand including private wells has been estimated using the ranges of per capita demand based on the available data from the references given in Section 2.1. Figures are gross including network losses and unaccounted water:

Kabul City Water Demand	2012 (m3/day)	2022 (m3/day)	2032 (m3/day)
Low range	98,800	198,000	485,800
Likely	125,000		
Upper range	154,000	323,300	792,500
<b>Aynak Mine Water demand</b>			
Estimated		35,000	35,000
<b>Total (mid range)</b>	<b>125,000</b>	<b>296,000</b>	<b>674,000</b>

**Table C: Potential Water Supply**

The following summary of potential water supply is taken from the sources listed in section 3.4, Table 3.5:

Total Water Supply	2012 (m3/day)	2022 (m3/day)	2032 (m3/day)
Available following investment	112,380	461,000	621,000
<b>Total Potential yield</b>	<b>121,700</b>	<b>714,500</b>	<b>1,287,500</b>

The city of Kabul currently relies on ground water from 4 aquifers in the Logar-Upper Kabul river basin. It is expected that the proposed copper mine and its ore processing facilities will also rely on an aquifer from the same river basin. If realistic demand projections are accepted and fresh water make-up for Aynak copper mine is minimised

then sufficient water could be supplied for Kabul City and Aynak Copper Mine for a medium term 10 year period utilising the following resources:

- existing ground water sources immediately surrounding Kabul;
- plus the provision of an impounding reservoir for surface water storage (Shatoot);
- and further use of the Logar river aquifers

It is only when significant investment has been delivered for water and sewerage infrastructure within the Kabul urban area, thus encouraging an increase in demand, that expensive transfer schemes from the Panjshir valley would be required.

With regard to Aynak copper mine the fresh water make-up should be minimised to the lowest level possible based on the latest technology for recycling process water. The initial water source would come from the Middle Logar aquifer and would be shared with Kabul City whilst the mine was being constructed and developed. Such an approach is dependent on further studies to determine the reliable yield from this aquifer and the impact of pumping on local users including irrigation in the vicinity of the potential well field. Investments associated with the mine should be used to provide additional storage on the Logar river or its tributaries. This storage would be used to compensate for mine extraction and river/aquifer recharge during dry weather or to counter supply and demand imbalances.

One major issue that must be resolved urgently is the increased level of pollution to the central aquifer supplying water to the majority of the inhabitants of Kabul. With virtually no wastewater collection and treatment infrastructure any increase in demand and extension of the piped potable water network will simply lead to even faster pollution of existing ground water sources. Extending the potable water network without equivalent expenditure for sewerage and associated treatment facilities should not be accepted.

The current unfunded Medium Term Program (MTP) for potable water infrastructure for Kabul has an estimate of 186 MUSD which could be completed within a maximum of 5 years. This investment would totally rely in existing ground water capacity from Kabul local aquifers. The medium term investment program to be completed within a 10-15 year period would include significant investment for wastewater collection and treatment and require a total budget including estimates for the MTP of around 953 MUSD. This investment would rely on new storage facilities and additional extraction from the middle and upper Logar river aquifers.

A long term program (20 years ahead and more) to provide potable water and wastewater collection and treatment for the majority of Kabul population has a budget estimate of almost 1,700 MUSD including the MTP and the medium term investments. Demand projections indicate that significant transfers from Panjshir basin would be required.

The short term investments for key studies have been budgeted at around 7MUSD. These studies are vital to finalising existing plans and gathering sufficient data to take appropriate decisions both for Kabul and also for Aynak.

### **Investment Funding**

Finally but importantly it will be necessary define the funding mechanisms for the various schemes and the likely capital and operating cost investments required.

It should be noted that funding provided through the World Bank and other international agencies may be delayed through consideration of issues relating to a new Trans-Border agreement for the Kabul – Indus river basin between the Afghanistan and Pakistan governments. References have been made in news articles (e.g. Pakistan Today 22.01.12) to a meeting of the Pakistan Afghanistan Joint Economic Commission where commitments were made to negotiate a new “Kabul River Treaty” but this remains a contentious issue. This agreement may define certain limits on projects to be undertaken within the Kabul River Basin, based on concerns to maintain the flow in the River Indus and the terms negotiated between the parties.

### **Government Regulations: Licensing and Monitoring**

#### **Abstraction Licensing**

The situation on water licensing is unclear from the reports and studies that have been reviewed. Environmental permits and licensing are the responsibility of the Afghan National Environmental Protection Agency (NEPA), but no specific reference exists for water licensing which should now be within the responsibilities of the Ministry of Energy and Water (MoEW).

To avoid unplanned depletion of water resources and to manage competition for water resources the government should implement a regime of water licensing and abstraction monitoring for all public, industrial, commercial and irrigation supplies. This will require a

licensing agency under the MoEW which should implement an agreed methodology for setting the available yields from water resources and sharing licensed quotas.

### **Charging for water**

Tariffs for water and sewerage charges are in place through AUWSSC, however few customers actually pay the charges. (reference: meeting with Director General AUWSSC, Kabul, 08.04.12.) The tariffs will need to be applied within the framework of the current legislation with a clear methodology to account for income from charges.

The greatest challenge will be the ability of water customers to pay charges. It may be expected that when the public water network is extended the use of private wells will continue in order to minimise any liability for charges. In setting the level of charges the government is likely to take recognition of the difficult economic circumstances of the majority of the population.

### **Pollution prevention and enforcement**

Pollution of groundwater and the local rivers is a major concern for the Kabul City area. Simple steps are needed to control pollution from sewage and encourage protection of the groundwater, which provides the only means of water supply for up to 4 million people. The sources of pollution are widely dispersed and will only be controlled with the support of the majority of the population.

A regime of regulation and enforcement will be needed within the new government regulations, but this will not be effective until practical measures have been taken to enable people to dispose of sewage from earth latrines and other waste in a safe manner.

### **Public Health Monitoring**

From the information available within the various studies it appears that little or no monitoring is carried out for water quality, either for public supplies or to monitor for environmental risks. This is most likely caused by a lack of suitable laboratories, equipment and trained personnel to analyse samples.

The 2008 DACAAR analysis of water quality within aquifers beneath Kabul City indicates severe quality problems. In order to protect public health as far as practicable, public and private supplies must be analysed in a systematic way to determine levels of risks from contaminants.