Summary of Preparatory Study

1. Full Title of the Project
   Feasibility Study on Urgent Water Resources Development and Supply for Kabul Metropolitan Area in the Islamic Republic of Afghanistan

2. Type of the Study
   Feasibility Study

3. Categorization and Its Reason
   3.1 Categorization: A
   3.2 Its Reason
   The Study consists of the following three components:
   a. Feasibility Study of Panjshir Fan Aquifer Development
   b. Review of the Feasibility Study of Gulbahar Dam
   c. Pre-Feasibility Study of Salang Dam
   Component ‘a’ aims confirmation of large scale groundwater potential in Panjshir Fan Aquifer supplying to the planned Dehsabz New City by constructing candidate test wells or collecting gallery intakes, and investigate potential of planned capacity of 44.6 MCM/year to the New City.
   Component ‘b’ aims to review the on-going Feasibility Study of Gulbahar Dam which requires large scale involuntary resettlement and compensation for wide cultivated area.
   Component ‘c’ aims to carry out Pre-F/S level study. Salang Dam Project would also require large scale involuntary resettlement.
   In the project adoption, there is possibility of large scale groundwater development plan in cultivated, irrigated and fruits field area affecting on existing water usage, land subsidence and natural environment through the ground water drawdown. Two dam constructions affect on the residents livelihood thorough large scale involuntary resettlements and compensations. Therefore these possibilities recognize categorization as ‘A’.

4. Agency (or Institution) Responsible for the Implementation of the Project
   Dehsabz City Development Authority (DCDA)

5. Outline of the Project
   5.1 Objective:
   The objectives of the Study are:
   (1) To prepare the Feasibility Study of Panjshir fan aquifer development
   (2) To review the Feasibility Study of Gulbahar Dam currently being prepared by Afghan Ministry of Energy and Water (MoEW)
   (3) To prepare the Pre-Feasibility Study of Salang Dam
   (4) To review water resources development plan for the Dehsabz new city based on the above (1), (2) and (3)
   (5) To perform technology transfer to the Afghanistan counterpart personnel in the course of the Study.

   5.2 Location
   The Study will cover the following:
   (1) The Panjshir Fan Aquifer area (around confluence point of the Panjshir and Ghorband Rivers)
   (2) The planned site of Gulbahar Dam and its reservoir area
   (3) The planned site of Salang Dam and its reservoir area
   (4) Planned sites of conveyance lines from the water sources to Dehsabz new city and Transmission lines inside the Dehsabz new city
5.3 Scope of Study

5.3-1 Basic Study

(1) Review of Master Plan
   1) Review on water demand projection for the Dehsabz new city
      a) Confirmation of update on urban development plan for the Dehsabz new city, if any
      b) Review on expected spatio-temporal change of water demand for the Dehsabz new city
   2) Review on water supply plan including basic layout of water supply facilities such as treatment plant, transmission line and key reservoir in the Dehsabz new city
   3) Review on other groundwater sources for emergent water demand

(2) Review on relevant plans and projects including water demand projection, if any

(3) General Survey
   1) Preparation of high resolution satellite images and DEM
   2) Preparation of topographical map for the following area (Scale 1/5,000 – 1/10,000)
      a) The Panjshir fan aquifer area (around confluence point of the Panjshir and Ghorband Rivers)
      b) The planned site of Gulbahar Dam and its reservoir area
      c) The planned site of Salang Dam and its reservoir area
      d) Planned sites of conveyance lines from the water sources to Dehsabz new city and transmission lines inside the Dehsabz new city
   3) Collection of available meteo-hydrological data
   4) Observation of precipitation and flow discharge
   5) Survey for existing water use
   6) Survey for flooding condition and river channel movement
   7) Water quality analysis

5.3-2 Feasibility Study of Panjshir Fan Aquifer Development

The Study will cover the feasibility study of Phase 1 and Phase 2 and design of Phase 1 of Panjshir Fan Aquifer development project mentioned in the “Study for the Development of the Master plan for the Kabul Metropolitan Area in the Islamic Republic of Afghanistan”, as follows:

(1) Field Investigation (Stage I)
   1) Drilling of test wells
   2) Construction of pilot infiltration galleries
   3) Electric prospecting survey
   4) Pumping test at test wells and pilot infiltration galleries
   5) Observation of groundwater and surface water level
   6) Survey for springs

(2) Comparison of Water Conveyance Routes

(3) Groundwater Development Study
   1) Establishment of hydraulic model
   2) Study for groundwater development
   3) Layout of wells and/or infiltration galleries
   4) Study for influence of groundwater extraction to existing water users

(4) Field Investigation (Stage II)
   1) Route survey (conveyance and transmission)
   2) Topographic survey
   3) Drilling and sounding
   4) Soil laboratory test

(5) Preliminary Design
   1) Production wells
2) Infiltration galleries
3) Pumping stations
4) Conveyance line
5) Transmission line, water treatment and key reservoirs
6) Construction Planning and Cost Estimate
7) Study on Operation and Maintenance
8) Support for Environmental Impact Assessment (EIA)
9) Implementation Arrangement for Construction and O&M for Water Resources Development, Conveyance and Water Supply Facilities
10) Study on Water Supply Management
11) Project Evaluation (technical, economic, financial, socio-environmental)

5.3-3 Review of the Feasibility Study of Gulbahar Dam
1) Review of the Feasibility Study
   1) Water balance and water resources development plan for each purpose
   2) Geological survey and geotechnical study on the dam site and reservoir area
   3) Dam design and construction plan
   4) Relocation plan of the existing road
   5) Investigation on the construction material such as cement and aggregates
   6) Sediment analysis
   7) Environment Impact Assessment (EIA)
   8) Resettlement plan of affected residents
   9) Economic evaluation
2) Additional Investigation and Study if necessary
   1) Preliminary survey on Quaternary (active) faults at dam site
   2) Geological survey at dam site and around the reservoir area
3) Investigation and Study on Conveyance Line
   1) Comparison of alternative routes
   2) Preliminary plan of conveyance facilities
   3) Preliminary cost estimate for construction and operation/maintenance
   4) Support for Initial Environmental Examination (IEE)

5.3-4 Pre-Feasibility Study of Salang Dam
1) Water Balance and Water Resources Development Study
2) Selection of Dam Sites with Priority
3) Geological Investigation
   1) Preliminary surface geological survey on the dam site and reservoir area
   2) Geotechnical investigation such as seismic survey, core drilling, permeability test etc.
   3) Material survey for rock material, filter material, core material etc. including topographic survey, seismic survey, drilling, laboratory test etc.
4) Preliminary Design of Dam
   1) Dam body and foundation treatment
   2) Spillway and outlet
   3) Diversion work
   4) Relocated existing road
   5) Preliminary cost estimate
5) Investigation and Study on Conveyance Line
   1) Comparison of alternative routes
   2) Preliminary plan of conveyance facilities
   3) Preliminary cost estimate for construction and operation/maintenance
6) Support for Initial Environmental Examination (IEE)
7) Economic Evaluation
5.3-5 Review of Water Resources Development Plan for the Dehsabz New City

(1) Comparison of Alternative Water Resources for Long-term, based upon the Results in Item 5.3-1 to 5.3-4
Study on Optimal Water Resources Development

6. Legal Framework of Environmental and Social Considerations

Afghanistan’s ‘Environmental Impact Assessment Regulations, 2008’ was approved under ‘NATIONAL ENVIRONMENTAL IMPACT ASSESSMENT POLICY, 2007’. The regulation prescribes that any project should be submitted to National Environmental Protection Agency (NEPA) and be approved.

7. Provisional Scoping

(1) Checklist for Scoping

<table>
<thead>
<tr>
<th>Environmental Item</th>
<th>Rating</th>
<th>Reasons</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Involuntary Resettlement</td>
<td>A –</td>
<td>Involuntary resettlement is included in the dam construction plan.</td>
</tr>
<tr>
<td>2 Local economy such as employment and livelihoods, etc.</td>
<td>A –</td>
<td>Groundwater development might affect the hydrological balance and the livelihoods of existing farmers. This study requires local resident’s consciousness and explanation.</td>
</tr>
<tr>
<td>3 Land use and utilization of local resources</td>
<td>A –</td>
<td>The scale of intake facilities of the groundwater development is relatively small; however dam construction projects will cause involuntary resettlement which affect on agricultural land and livestock or other economic activities by removing their livelihood place.</td>
</tr>
<tr>
<td>4 Social institutions such as Social Infrastructure and local decision-making institutions</td>
<td>A –</td>
<td>The dam projects require involuntary resettlement. Local government manages and monitors the resettlement. In case of relocation and/or resettlement area locates in other provinces, arrangements among the relevant local governments will be required to prepare alternative houses, land and livelihood.</td>
</tr>
<tr>
<td>5 Existing social infrastructures and services</td>
<td>B–</td>
<td>Resettlement may cause some impact on existing social infrastructure and services of local community.</td>
</tr>
<tr>
<td>6 The poor, indigenous and ethnic people</td>
<td>C++</td>
<td>The Projects may provide positive/negative impact to the low-income earner as well. The issues regarding indigenous or ethnic people have not been mentioned.</td>
</tr>
<tr>
<td>7 Misdistribution of benefit and damage</td>
<td>B–</td>
<td>If farmers lose livelihood after involuntary resettlement, it might be misdistribution of benefit and damage.</td>
</tr>
<tr>
<td>8 Local conflict of interests</td>
<td>B –</td>
<td>The developed water will be used for new city area. The plan should be explained well to local residents of intake area and consider well benefit to them.</td>
</tr>
<tr>
<td>9 Gender</td>
<td>D</td>
<td>The Projects are expected to provide benefit to all citizens without regard to gender. (Screening can recognize this item out of relevance.)</td>
</tr>
<tr>
<td>10 Children’s Rights</td>
<td>D</td>
<td>The Projects contribute to all the family; children can also receive benefit from the plan. (Screening can recognize this item out of relevance.)</td>
</tr>
<tr>
<td>11 Cultural heritage</td>
<td>C</td>
<td>Cultural heritages have not been identified at the preparatory study stage. Further confirmation is necessary in the course of the study.</td>
</tr>
<tr>
<td>12 Infectious diseases such as HIV/AIDS</td>
<td>D</td>
<td>The Projects do not find causal association with infectious diseases. (Screening can regard this item out of relevance.)</td>
</tr>
<tr>
<td>13 Water Usage or Water Rights and Rights of Common</td>
<td>A –</td>
<td>Significant impact may occur for water usage and balance in both upstream and downstream of the river due to the Projects.</td>
</tr>
<tr>
<td>14 Sanitation</td>
<td>D</td>
<td>No significant affects on sanitation is expected. (Screening can recognize this item out of relevance.)</td>
</tr>
</tbody>
</table>
### Natural Environment

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>Waste of construction materials and solid waste of long stay workers activities will be generated during dam construction stage.</td>
<td>C–</td>
</tr>
<tr>
<td>16</td>
<td>The dam plan execution can expect the risk mitigation regarding drought and flood. (Screening can recognize this item out of relevance.)</td>
<td>D</td>
</tr>
<tr>
<td>17</td>
<td>The plan changes local topography by dam construction altering road and forming water reservoir which affects topography and geographical feature.</td>
<td>B–</td>
</tr>
<tr>
<td>18</td>
<td>Possible soil erosion will occur during dam construction stage at quarry sites.</td>
<td>B–</td>
</tr>
<tr>
<td>19</td>
<td>Intake from groundwater might lower the groundwater level. Total availability of groundwater should be investigated well so that the groundwater is rechargeable without affecting surface water for irrigation.</td>
<td>B–</td>
</tr>
<tr>
<td>20</td>
<td>Dam construction will affect on the balance of the downstream water quantity.</td>
<td>B–</td>
</tr>
<tr>
<td>21</td>
<td>The Project area is in the landlocked region. (Screening can regard this item out of relevance.)</td>
<td>D</td>
</tr>
<tr>
<td>22</td>
<td>The preparatory study did not identify any significantly special flora, fauna and biodiversity in the project site. Consideration for impacts to river fish in the dam projected area is necessary, however the operation is not expected to make major negative impacts on the flora, fauna and biodiversity.</td>
<td>C–</td>
</tr>
<tr>
<td>23</td>
<td>The large-scale construction which can affect meteorology is not included. (Screening can recognize this item out of relevance.)</td>
<td>D</td>
</tr>
<tr>
<td>24</td>
<td>Dam construction will affect landscape.</td>
<td>D</td>
</tr>
<tr>
<td>25</td>
<td>Dust will be generated during construction. However air pollution is not expected after the project execution.</td>
<td>B–</td>
</tr>
<tr>
<td>26</td>
<td>Water pollution is expected to occur during construction stage. Water quality may be deteriorated due to decrease of discharge to the river.</td>
<td>B–</td>
</tr>
<tr>
<td>27</td>
<td>Project does not raise soil contamination. (Screening can recognize this item out of relevance.)</td>
<td>D</td>
</tr>
<tr>
<td>28</td>
<td>Noise and vibration will occur during dam construction. However noise or vibration is not expected after shared use.</td>
<td>B–</td>
</tr>
<tr>
<td>29</td>
<td>The amount of water drawn from the ground is expected not to lead to ground subsidence however examination is necessary.</td>
<td>C–</td>
</tr>
<tr>
<td>30</td>
<td>There is no generation source of offensive odor. (Screening can recognize this item out of relevance.)</td>
<td>D</td>
</tr>
</tbody>
</table>

### Rating

- **A**: Serious impact is expected.
- **B**: Some impact is expected.
- **C**: Extent of impact is unknown (Examination is needed. Impacts may become clear as study progresses.
- **D**: No impact is expected. IEE/EIA is not necessary.

### Overall Evaluation Form

<table>
<thead>
<tr>
<th>Environmental Item</th>
<th>Evaluation</th>
<th>Study Plan</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Involuntary Resettlement</td>
<td><strong>A</strong></td>
<td>Grasp the resident’s consciousness and hold stakeholder meeting. Investigate well management and monitoring.</td>
<td></td>
</tr>
<tr>
<td>Local economy such as employment and livelihoods, etc.</td>
<td><strong>A</strong></td>
<td>Confirmation of involuntary resettlement management system. Detailed Investigation of compensation.</td>
<td></td>
</tr>
<tr>
<td>Land use and utilization of local resources</td>
<td><strong>B</strong></td>
<td>Confirm land use condition, owner and users.</td>
<td></td>
</tr>
<tr>
<td>Social institutions such as Social Infrastructure and local decision-making institutions</td>
<td>A</td>
<td>Coordinate among central and local governments which organize land acquisition committee and land use.</td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>Existing social infrastructures and services</td>
<td>B–</td>
<td>Take appropriate compensations and alternative infrastructures on both relocating areas and upper stream of reservoir area considering resident’s consciousness. Coordinate among relevant organizations for establishment of smooth replacement plan of infrastructure.</td>
<td></td>
</tr>
<tr>
<td>The poor, indigenous and ethnic people</td>
<td>C±</td>
<td>Appropriate compensations should be applied to local low-income earner.</td>
<td></td>
</tr>
<tr>
<td>Misdistribution of benefit and damage</td>
<td>B</td>
<td>Arrange carefully between water supplier side and demand side.</td>
<td></td>
</tr>
<tr>
<td>Local conflict of interests</td>
<td>B</td>
<td>Arrange carefully between land owner of the well points and irrigation area.</td>
<td></td>
</tr>
<tr>
<td>Cultural heritage</td>
<td>C</td>
<td>Detailed confirmation of existence of undiscovered heritages is necessary in the course of the study.</td>
<td></td>
</tr>
<tr>
<td>Water Usage or Water Rights and Rights of Common</td>
<td>BA</td>
<td>Arrange carefully between water supplier side and demand side along with water law and related.</td>
<td></td>
</tr>
<tr>
<td>Waste</td>
<td>C</td>
<td>Establish awareness activity plan for workers of dam construction.</td>
<td></td>
</tr>
<tr>
<td>Topography and Geographical feature</td>
<td>B</td>
<td>Well consideration on the alternatives.</td>
<td></td>
</tr>
<tr>
<td>Soil Erosion</td>
<td>B</td>
<td>Study mitigation and protection method during construction</td>
<td></td>
</tr>
<tr>
<td>Groundwater</td>
<td>B</td>
<td>Careful investigation should be done on the water level, reservoir potential and rechargeable capacity of ground water, establish monitoring arrangements. To take appropriate measure to make balance among intake volume of ground water and usage of surface water.</td>
<td></td>
</tr>
<tr>
<td>Hydrological Situation</td>
<td>B</td>
<td>Careful study on the water balance of the project areas should be carried out.</td>
<td></td>
</tr>
<tr>
<td>Flora, Fauna and Biodiversity</td>
<td>C</td>
<td>Detailed study on the existence of special species.</td>
<td></td>
</tr>
<tr>
<td>Landscape</td>
<td>B</td>
<td>Design environmentally harmonious dam.</td>
<td></td>
</tr>
<tr>
<td>Air Pollution</td>
<td>B</td>
<td>Plan appropriate protection measures for dust rising during construction stage.</td>
<td></td>
</tr>
<tr>
<td>Water Pollution</td>
<td>B</td>
<td>Plan appropriate water turbidity protection system during construction stage.</td>
<td></td>
</tr>
<tr>
<td>Noise and Vibration</td>
<td>B</td>
<td>Take appropriate protect measure for noise generation during construction stage.</td>
<td></td>
</tr>
<tr>
<td>Ground Subsidence</td>
<td>C –</td>
<td>Take carefully investigation on the water balance between amount of water drawn from the ground and surface water usage. Monitoring arrangements should be established for ground subsidence.</td>
<td></td>
</tr>
</tbody>
</table>

As the result of over all evaluation, the project is evaluated as ‘A’.