

Initial Environmental Examination

Project Number: 48042-001
March 2021

Afghanistan: Panj Amu River Basin Sector Project

(Aqtepa, Chardara, Laqi, and Qala - I - Zal Secondary canals Systems – NCB006)

Prepared by the Ministry of Finance and the Ministry of Agriculture, Irrigation and Livestock for the Asian Development Bank.

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ACRONYMS

ADB	Asian Development Bank	OTJ	On-the-job Training
CPMO	Central Project Management Office (MAIL)	O&M	Operation and Maintenance
DAIL	Directorate of Agriculture, Irrigation, and Livestock	PARB	Punji Amu River Basin
EMP	Environmental Management Plan	PIC	Project Implementation Committee
EU	European Union	PMO	Project Management Office (MEW)
ES	Environmental Specialist	PPTA	Project Preparatory Technical Assistance
GIS	Geographic Information System	REA	Rapid Environmental Assessment
GoIRA	Government of the Islamic Republic of Afghanistan	RoW	Right of Way
HR	Head Regulator	RSP	Representative Sub-project
IA	Irrigation Associations	SSEMP	Site Specific Environmental Management Plan
IWRM	Integrated Water Resources Management	SWM	Solid Waste Management Plan
MAIL	Ministry of Agriculture, Irrigation, and Livestock	SBA	Sub-basin Agencies
MC	Main Canals	SBC	Sub-basin Councils
MEW	Ministry of Energy and Water	TOR	Terms of Reference
MOF	Ministry of Finance	TOT	Training of Trainers
MRRD	Ministry of Rural Rehabilitation and Development	WUA	Water User Association
NRM	Natural Resource Management	NEPA	National Environmental Protection Agency
		NWARA	National Water Affairs Regulatory Authority (Afghanistan)

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EXECUTIVE SUMMARY

1. This Initial Environmental Examination (IEE) studies has been for the NCB-06 subprojects and submitted as part of the Panj-Amu River Basin Project Sector Project in Afghanistan. The PARB continues and expands upon a long-term programme support to improve water allocation, enhance on-farm water management and protection of watersheds across the Panj-Amu River.
2. The PARB is implemented with the Asia Development Bank (ADB) as co-financier and administrator in partnership with the European Union (EU), and is part of a long-term program of to the Government of the Islamic Republic of Afghanistan (GoIRA). The importance of the PARB Project is in its impact on the well-being of rural communities in the basin, and in its support for Afghanistan's sector investment plan, the \$1.1 billion National Water and Natural Resources Development Program. Project proponents therefore are the GoIRA, ADB, and the EU. The Project Executing Agency (EA) is the Ministry of Finance. The Implementing Agencies (IA) are the Ministry of Energy and Water (MEW) and the Ministry of Agriculture, Irrigation, and Livestock (MAIL).
3. MAIL will be responsible for (i) the rehabilitation of NCB-06 secondary canals; to improve on-farm water management (OFWM), agricultural extension, land levelling etc; and improved watershed management.
4. This IEE has been prepared to identify and assess potential environmental impacts. Under (ADB) the Project is classified as Environmental Category B. Category B projects require environmental assessment in the form of an initial environmental examination (IEE). IEE findings are then used to determine if an environmental impact assessment (EIA) is needed. If it is not, the IEE becomes the final environmental assessment report.
5. The PARB project is fundamentally focused upon rehabilitation of existing infrastructure. As a result, it is expected that the major environmental impacts concern the site preparation including establishment of access roads, borrow pits, construction camps and the excavation and removal of established vegetation along existing secondary canals. Management of waste and spoil, along with rehabilitation of the site is also identified.
6. The IEE identifies each of these anticipated sources of impact, establishes an Environmental Management Plan (EMP), and accompanies the EMP with a Summary of Monitoring Requirements. Contractually, the Contractor will be obliged to prepare and submit to the employer's construction supervisor a Site Specific Environmental Management Plan (which will include a monitoring schedule), demonstrating the manner in which the Contractor will comply with the requirements of the clauses in the EMP including environmental protection and pollution control, and any particular environmental mitigation measures as stipulated in the Particular Specifications or Technical Specifications forming part of the Contract Documents.
7. A Rapid Environmental Screening RES Checklist has been completed which reveals that minimum impact can be expected from the construction for both subprojects. The single greatest issue is the replacement of existing vegetation removed from the site, and works completion rehabilitation.
8. The anticipated impacts and mitigation measures of this project have been discussed considering the following Three key phases of the project:
 - Design Phase
 - Construction Phase
 - Operation Phase
9. Consultation meetings were held with the potentially affected people, water association, Government authorities and etc, along the secondary canals. The objectives of the meetings were to share the project relevant information with communities and understand their concerns. The main concerns raised by the community elders were about the access to water, job opportunities for the local people and the resettlement compensation.

10. Impacts to ecological resources (wildlife, vegetation, aquatic biota, special status species, and their habitats) will be minimal and localized in all phases of the project because the secondary canals do not pass through ecologically environmentally sensitive areas. But as this secondary canals do not pass through a protected area or on the bird's migration path this impacts on bird safety is considered as low.

11. The study results suggest that overall the project will have low environmental impacts if the proposed mitigation measures and EMP are implemented properly. The secondary canals work impacts such as site characterization, secondary canals path survey and monitoring are generally temporary and of relatively lesser magnitude. The possible impacts include ground clearing (removal of vegetative cover), vehicular and pedestrian traffic, and fugitive dust, acoustic noise, visual and drilling to characterize subsurface conditions (e.g., soils, depth to groundwater). The mitigation measures mentioned in the report will help reduce and avoid these negative impacts.

12. The EMP covers all the potential impacts and mitigation measure during design, construction, and operation phases of the subprojects. The CPMO will have the responsibility to implement the EMP during the design and construction phase.

13. This IEE reveals that there will be both positive and negative impacts due to the construction activities and normal operations after the proposed construction. Mitigation measures have been discussed to mitigate the expected negative impacts. The major positive impact of the project will be economic development and access to water for irrigation. The agriculture will grow and will create short and long-term job opportunities for people.

14. After analysis of all environmental and social aspects of the project, it can be concluded that the project will not have adverse environmental impacts in case all the mitigation measures mentioned in this IEE have taken into the consideration.

A. BACKGROUND

15. The Panj-Amu River Basin Project Sector Project (PARB), Afghanistan Project will support improved water allocation and availability, enhanced on-farm water management, and protection of watersheds in the Panj-Amu River basin, through construction of water conveyance and irrigation infrastructure at 21 priority subprojects (construction costs approximately \$50 million); the establishment, strengthening, and support of subproject water user associations (WUAs) and irrigator associations (IAs); training on on-farm water management and improved agronomic techniques; implementation of watershed management plans at sites adjacent to the priority subprojects; and improved basin water resources planning and management.

16. Since 2004, the European Union (EU) has supported the Government of the Islamic Republic of Afghanistan (GoIRA) in its reconstruction efforts by funding integrated water management programmes in the Panj Amu River basin.

17. This IEE covers the NCB006 (Aqtepa, Chardara, Laqi, Alal I Zal) secondary canals which are located in Kunduz Province.

18. **Laqai.** The canal is the smallest canals of Ali Abad district Kunduz province, this canal starts from the Jalawgir Area and ended in Ali Abad district centre, this canal has more than 130 years history. Total length of this canal is around 15 Km and irrigated 163 Ha land in Ali Abad district. This canal flowing south to north side and irrigate the agriculture land east and west sides. At all in first part of canal the agriculture land has no problem of irrigation water. However, in mid and in final part of the canal have little bit problems because agriculture land is higher than canal bed level.

19. **Chardara.** The canal is the biggest canal of Chardara district Kunduz province, this canal starts from Lala Maidan village of Ali Abad district and ended in Hasan Abad village sandy area near Chardara and Qalezal district borders, this canal has more than 150 years history. Total length of this canal is around 61 Km and irrigated 15904 Ha land in Ali Abad and Chardara districts. This canal irrigated more land in East side also in the west side irrigated a little bit land that is not more than 5% of total irrigated land of this canal, generally this canal is flowing from south to north side and its elevation is higher from the irrigation land. The elevation of this canal is higher from the command area and also command area of this canal at all is level and can take water without any resistance only some areas of mid and end part of this canal, like Joi Naw Abad and Dagharoq areas the command area is higher from the canal bed, and that area don't take enough water.

20. **Aqtepa.** The canal takes water from Kunduz River its offtake\Head work located in Jangharoq Sabon Tapa area of Qalaezal district. In addition, this canal have 24 km length and 4269 Ha command area. All the command area of this canals belong to Qalaezal district center Aqtepa. And this canal have 150 years history, finally this canal ending in Sakhsa Qul sandy area near Kunduz river of Qalaezal district and coordinate of offtake\ Head work is: N36.893 E68.5902. This canal irrigated the agriculture land belong to Qalaezal district center Aqtepa area its head work located in Jangharoq Sabon Tapa area and finally ended in Sakhsa Qul sandy area. Mean both the start and ends of this canal located in Qalaezal district. The command area of this canals in some parts is level but in majority place land, bed is higher from the secondary and tertiary canals beds also in majority secondary canal have low slope due to which these canals need for cleaning four of five time per year. In addition, end part of canal does not get proper water for their crops.

21. **Qala I Zal.** Canal takes water from Kunduz River its offtake\Head work located in Tarboz Guzar area of Qalaezal district. Moreover, this canal has 23 km length and 4120 Ha command area. All the command area of this canal belongs to Qalaezal area of Qalezal district. And this canal has 150 years history, finally this canal ending in Qala sandy area of Qalaezal district and coordinate of offtake\ Head work is: N36.8982 E68.564. This canal irrigated the agriculture land belong to Qalaezal area of Qalaezal district its head work/Offtake located in Turboz Guzar area and finally ended in Qala sandy area. Mean both the start and ends of this canal located in Qalaezal district. The command area of this canal in some parts is level but in majority place land, bed is higher from the secondary and tertiary canals beds also in majority secondary canal have low slope due to

which these canals need for cleaning four of five time per year. In addition, end part of canal does not get proper water for their crops.

22. Subprojects such as (Aqtepa, Chardara, Laqi, Qala I Zal) continue this EU support in partnership with ADB as co-financier and administrator. This approach aims to improve Government's ownership of fund management and conform to EU policy in Afghanistan of moving funding on-budget or into co-financing arrangements, and to increase sustainability.

23. The importance of the PARB Project is in its impact on the well-being of rural communities in the basin, and in its support for Afghanistan's sector investment plan, the \$1.1 billion National Water and Natural Resources Development Program.

1. Purpose of Report

24. This Initial Environmental Examination (IEE) has been prepared for the NCB-06 subprojects of Panj-Amu River Basin Project Sector Project (PARB), Afghanistan. The IEE has been prepared to identify and assess the potential environmental impacts and provide suitable mitigation measure to eliminate the potential environmental impacts or reduce to acceptable limits. Under the Asia Development Bank (ADB) the Project is classified as Environmental Category B. Category B projects require environmental assessment in the form of an initial environmental examination (IEE). IEE findings are then used to determine if an environmental impact assessment (EIA) is needed. If it is not, the IEE becomes the final environmental assessment report.

2. Identification of Project and Project Proponents

25. The PARB continues and expands upon previous European Union (EU) support for irrigation development in the Panj-Amu basin. The Project will be financed through an ADB sector grant. It will have a seven-year implementation period and an estimated cost of \$76.75 million (\$50 million in EU funds and \$20 million in ADB funds and \$0.75 million in government in-kind contributions).

26. Project proponents are the GoIRA, ADB, and the EU. The Project Executing Agency (EA) is the Ministry of Finance. The Implementing Agencies (IA) are the Ministry of Energy and Water (MEW) and the Ministry of Agriculture, Irrigation, and Livestock (MAIL).

27. MEW will be responsible for (i) construction of civil works on main (primary) canals; (ii) establishment and strengthening of water user associations (WUAs) in such schemes; and (iii) strengthened water resources planning and management.

28. MAIL will be responsible for (i) construction of civil works on secondary and higher-order canals; improved on-farm water management (OFWM) including establishment and strengthening of irrigation associations (IAs), agricultural extension, land levelling etc. And improved watershed management.

3. Data Collection / Compilation

29. Baseline data referring to the physical, and socio-economic environment have been collected from previous studies, and through meeting of the following relevant authorities and agencies:

- (i) Kunduz Sub-Basins Agencies
- (ii) Panj Amu River Basin Authority
- (iii) NEPA Kabul and NEPA Kunduz
- (iv) Department of Culture Kunduz
- (v) Central Statistic Organization (CSO)
- (vi) Ministry of Agriculture, Irrigation and Livestock (MAIL)

30. Baselines survey for air, water, noise, flora and fauna for this IEE study were not conducted due to outbreak of COVID-19. The survey will be conducted and will be part of IEE study as appendix.

4. Scope of NCB006 IEE

31. The scope of this IEE covers the potential environmental impacts, the impacts of the planned project has been investigated. On the basis of the existing environmental situation in the Investigation area and the technical planning, the potential environmental impacts of the proposed project have been determined. Alternative routings and options, as well as appropriate mitigation and monitoring measures were considered to reduce possible adverse impacts to acceptable level.

32. The objectives of the NCB006 secondary canals irrigation IEE study include:

- (i) the larger-scale longer-term environmental baseline description (climate, hydrology, history of human occupation etc.) and impacts (cumulative, environment-on- project);
- (ii) province or district within which NCB-06 secondary canals are located for baseline description relying on secondary census data;
- (iii) the irrigation schemes command area (within which selected civil works will be constructed, rehabilitated, and upgraded) for the remaining environmental baseline description and the IEE public consultation;
- (iv) the NCB-06 irrigation civil work command areas (of the specific irrigation infrastructure to be rehabilitated and upgraded) for assessment and management of irrigation- and agriculture- related impacts;
- (v) Construction site and adjacent area for assessment and management of construction impacts; and Potential quarry sites and adjacent areas for assessment and management of quarrying impacts.

5. Methodology

33. This IEE follows the methodology outlined in the ADB Guidelines; ADB Safeguard Policy Statement, June 2009 (SPS 2009) and environmental Laws of the Government of Afghanistan. The experiences of other studies in preparing IEE documentation for Irrigation sector have also been reviewed. This IEE is prepared based on review of preliminary design, collection of selected primary data, review of secondary data and information, field visit and stakeholder consultations.

34. The baselines survey for air, water, noise, flora and fauna for this IEE study were not conducted due to outbreak or COVID-19. The survey will be conducted and will be part of IEE study as appendix.

a) IEE Information Sources and Limitations

35. A key limitation to the IEE study was the Outbreak of COVID-19 in all NCB-06 secondary canals areas which limited the data collection activity.

36. The field data for air quality, noise level/vibration, water quality etc and consultation will be carried out for this study before contractor mobilizes for work. These updated field data and consultation will be part of IEE study as appendix.

37. This IEE incorporates all information available at the time of writing.

b) Level of Detail and Comprehensiveness

38. The level of detail and comprehensiveness of an environmental assessment should be commensurate with project complexity and the significance of its potential impacts and risks. This IEE identifies and focuses on the limited potential impacts and risks of the NCB-06 secondary canals, relatively small schemes of Aqtepa 4269 Ha, Chardara 15904 Ha, Laqi 163 Ha and Qala I Zal 4120 Ha respectively, without a broad range of potential significant impacts and risks.

c) Structure of Report

39. This IEE follows the ADB guideline for content of an IEE:

- (i) Introduction
- (ii) This IEE follows the ADB guidelines for content of an IEE:
- (iii) Policy, legal, and administrative framework
- (iv) Description of the project

- (v) Description of the environment
- (vi) Anticipated impacts and mitigation measures
- (vii) Environmental management plan (EMP, i.e. mitigation plan and monitoring plan)
- (viii) Public consultation and information disclosure
- (ix) Grievance redress mechanism (GRM)
- (x) Findings and recommendations
- (xi) Conclusion

B. POLICY, LEGAL, AND ADMINISTRATIVE FRAMEWORK

40. The PARB project is embedded within the following framework, presented in brief outline format. For a detailed description of this framework refer to the IEE prepared for Aqtepa, Chardara, Laqi, Qala I Zal Afghanistan

1. Legal System

41. The following laws of GoIRA govern the way in which the environmental management of the project must be implemented, in order to proceed. Constitutional articles pertaining to environmental management are:

Article 40: Private Property

- (i) Property is immune from invasion.
- (ii) No person shall be forbidden from acquiring and making use of a property except within the limits of law.
- (iii) Nobody's property shall be confiscated without the provisions of law and the order of an authorized court.
- (iv) Acquisition of a person's property, in return for a prior and just compensation within the bounds of law, is permitted only for securing public interests in accordance with the provisions of law.
- (v) Inspection and disclosure of a private property are carried out only in accordance with the provisions of law.

Article 51: Compensation

- (i) Any person suffering undue harm by government action is entitled to compensation, which he can claim by appealing to the court.
- (ii) With the exception of situations stated in the law, the state cannot claim its right without the order of an authorized court.

Article 15: Environment

- (i) With the exception of situations stated in the law, the state cannot claim its right without the order of an authorized court.
- (ii) The state is obliged to adopt necessary measures for safeguarding forests and the environment.

2. International Environmental Agreements

42. The Constitution binds the state to abide by the UN charter, international treaties, international conventions that Afghanistan has signed, and the Universal Declaration of Human Rights (Article 7).

43. International agreements relevant to environmental management of water resources development to which Afghanistan is a party are (listed in order by the year in which each came into force):

- (i) Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES, 1975) – international cooperation to control trade in species threatened with extinction or in danger of becoming so; in species whose trade interferes with regulation of trade in extinction-threatened species; and in species identified by a party under national-level trade control to prevent/restrict exploitation, for which international cooperation is needed;
- (ii) Convention on the Conservation of Migratory Species of Wild Animals (also called Convention on Migratory Species, CMS, and the Bonn Convention, 1983) – conserve terrestrial, marine and avian migratory species throughout their ranges;
- (iii) UN Convention on Biological Diversity (1993) – objectives are to conserve biological diversity; promote sustainable use of biological diversity; and (iii) seek more fair and equitable sharing of the benefits of genetic resource utilization;

- (iv) UN Framework Convention on Climate Change (1994) – aims to stabilize greenhouse gases in the atmosphere at levels that will not change climate systems in dangerous ways;
- (v) UN Convention to Combat Desertification (1996) – aims to combat desertification and mitigate drought effects in countries experiencing serious drought or desertification;
- (vi) Kyoto Protocol (2005) – extends the Convention on Climate Change;
- (vii) Paris Agreement on Climate change (2015).

44. In addition, Afghanistan has signed but not ratified:

- (i) UNESCO Convention on the Means of Prohibiting and Preventing the Illicit Import, Export and Transfer of Ownership of Cultural Property (1970) – aims to protect cultural property against theft and promotes restitution of stolen items;
- (ii) Ramsar Convention on Wetlands (1975) – promotes conservation and sustainable use of wetlands;
- (iii) Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal (1992) – aims to reduce movement of hazardous waste between nations, prevent transfer of such waste from developed to less developed countries (LDCs); minimize waste amounts and toxicity; promote environmentally sound management at or near generation sites; assist LDCs in environmentally sound management of their wastes; does not address radioactive waste;
- (iv) Memorandum of Understanding Concerning Conservation Measures for the Siberian Crane (1993) – aims to protect the species (*Leucogeranus leucogeranus*) through concerted, coordinated actions to prevent disappearance of remaining populations;
- (v) UNIDROIT Convention on Stolen or Illegally Exported Cultural Objects (1995) – attempts to fill gaps in the UNESCO convention by making the final owner of a stolen cultural item who cannot show due diligence responsible for restitution;
- (vi) UNESCO Convention for the Safeguarding of the Intangible Cultural Heritage (2006) – safeguard, ensure respect for, and raise awareness at local, national, international levels, and provide international cooperation and assistance.

3. National Legislation, Policies, and Regulations

45. The GIROA adopted its first environmental framework, the Environment Act of 2005, with the goal of ensuring that environmental issues were addressed as an integral part of the development process, and the Act established the National Environmental Protection Agency (NEPA). Legislators continued this new theme, leading to the drafting of an enhanced Environmental Law in 2006, which was subsequently approved in 2007.

46. **Environment Act (2007)** sets forth national administrative roles and coordination with provincial authorities; establishes management frameworks for natural resource conservation, biodiversity, drinking water, pollution control, environmental education, and defines enforcement tools.¹

47. **National Environmental Impact Assessment Policy** (2007) follows on from the Environment Law and sets forth a policy vision, principles, strategy, and process for environmental assessment in Afghanistan. The emphasis is on ensuring that projects with potentially significant impacts are identified to the national environmental regulator, the National Environmental Protection Agency (NEPA), and follow adequate due diligence procedures. The document provides a range of additional useful information on NEPA and environmental assessment in the Afghanistan context.

48. **Environmental Impact Assessment Regulations.** Official Gazette No. 939 (Mar 2008). Schedule I that list project types likely to have significant impacts (Category 1) or potentially adverse impacts (Category 2); and the industries likely to give rise to pollution. Schedule II provides the clearance certificate application form.

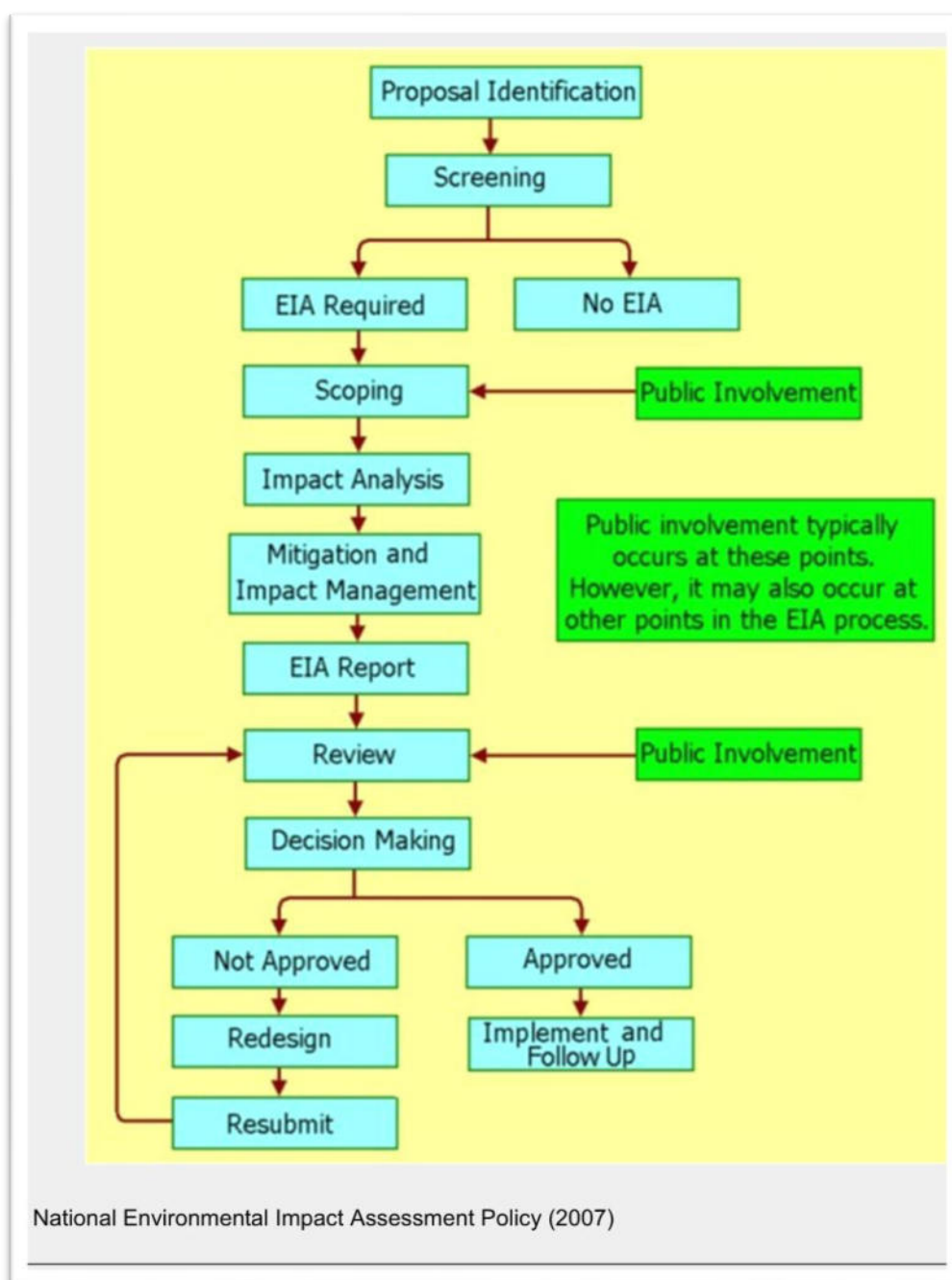
¹Taylor, D. A. 200). Policy: new environment law for Afghanistan. *Environmental Health Perspectives*, 114(3). <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1392251/>

49. The definition of EIA as described in the **Environmental Law** is: 'EIA refers to the procedures used for evaluating the likely environmental and consequent social impacts, both beneficial and adverse, of proposed projects, plans, policies or activities where there is a possibility of significant adverse effects arising as a result, in order to improve the quality and development impact of such projects by identifying ways of improving project selection, siting, planning, design and implementation'.

50. **National EIA Policy 2017:** These update the EIA Regulations (2008) and grant the NEPA formal oversight responsibility for the social impact assessment (SIA) in addition to the EIA. These are now merged into a single ESIA process. The updated regulations set out the administrative procedures for conducting ESIA. The regulations provide examples of projects expected to create adverse impacts (Category 1) and those that may create significant negative impacts (Category 2) before describing specific processes and procedures, as well as the required documents for each category. After receipt of the application form and other relevant documents, the NEPA will, according to the requirements, a) issue a CoC, with or without conditions, (b) advise the applicant in writing to review the technical reports and address the concern of the NEPA, or (c) refuse the CoC with written reasons. Once permission is granted, the proponent must implement the project within three years, failing which the permit expires. Implementation constraints include (a) effective application of ESIA procedures by private and public proponents; (b) monitoring of the implementation of the ESMP; (c) the expertise and means for quality analysis necessary to determine compliance reports; (d) the ownership of the EIA process by line ministries; and (e) limited knowledge, experience, and capacity of staff; and (f) the coordination, monitoring, and harmonization of various requirements by international agencies involved in technical and financial supports. 6. Specific guidelines have now been produced as part of the Environmental Management Act to deal with Environmental Impact Assessment. In theory there are several key stages in the assessment procedure as follows: 7. Any project, plan or policy of significant size or scope (no screening list defined as yet) shall submit to NEPA a brief containing enough information to enable NEPA to determine the potential adverse effects and positive impacts of the project, plan or policy. 8. After reviewing the brief and acting on behalf of the EIA Board of Experts NEPA will either: a. Recommend the project proceeds without further environmental assessment; or b. Submit an environmental assessment / comprehensive mitigation plan 9. The outline of the EA is roughly similar to that contained herewith, however, alternatives should also be considered, e.g. alternative design, technologies, routes etc. 10. Once the EA has been approved by the Executive Secretary General (acting on the advice of the EA Board of Experts) a permit is granted allowing continuation of the proposed project, plan or policy. If the permit is refused for whatever reason an appeal can be submitted within 60 days of the refusal. 11. The regulations also state that Public Participation should also be part of the EA process. Public participation in this sense includes distributing copies of the EA to affected persons and undertaking public hearings. 12. The definition of EIA as described in the Environmental Law is: 'EIA refers to the procedures used for evaluating the likely environmental and consequent social impacts, both beneficial and adverse, of proposed projects, plans, policies or activities where there is a possibility of significant adverse effects arising as a result, in order to improve the quality and development 17 | Page impact of such projects by identifying ways of improving project selection, siting, planning, design and implementation'. 13. National EIA Policy- An Integrated Approach to EIA in Afghanistan. NEPA created this policy to provide guidance to project proponents while undertaking development projects that may have potential impacts on the environment. They also provide guidance on how the public should be consulted and define the roles and responsibilities of various stakeholders in that process. 14. NEPA developed this policy to stipulate broad guidelines for project proponents on integrating EIA into the process of development, and identified procedures to address environmental consequences and involve necessary institutions in the process of project implementation. 15. The systematic process to identify, predict and evaluate the environmental effects of proposed projects, plans or policies given in the National EIA policy is described in Figure 1. The policy also describes the timeline for approval of different stages of EIA process as shown in Figure 2. 16. Under Article 20 of the Environment Law, NEPA shall appoint an EIA Board of Experts to review, assess and consider applications and documents submitted by proponents for obtaining permits and make technical

recommendations in regard to whether to issue permits, as well as the conditions that should be attached to any permit that is granted.

Figure 1: Schema for the EIA Process in Afghanistan



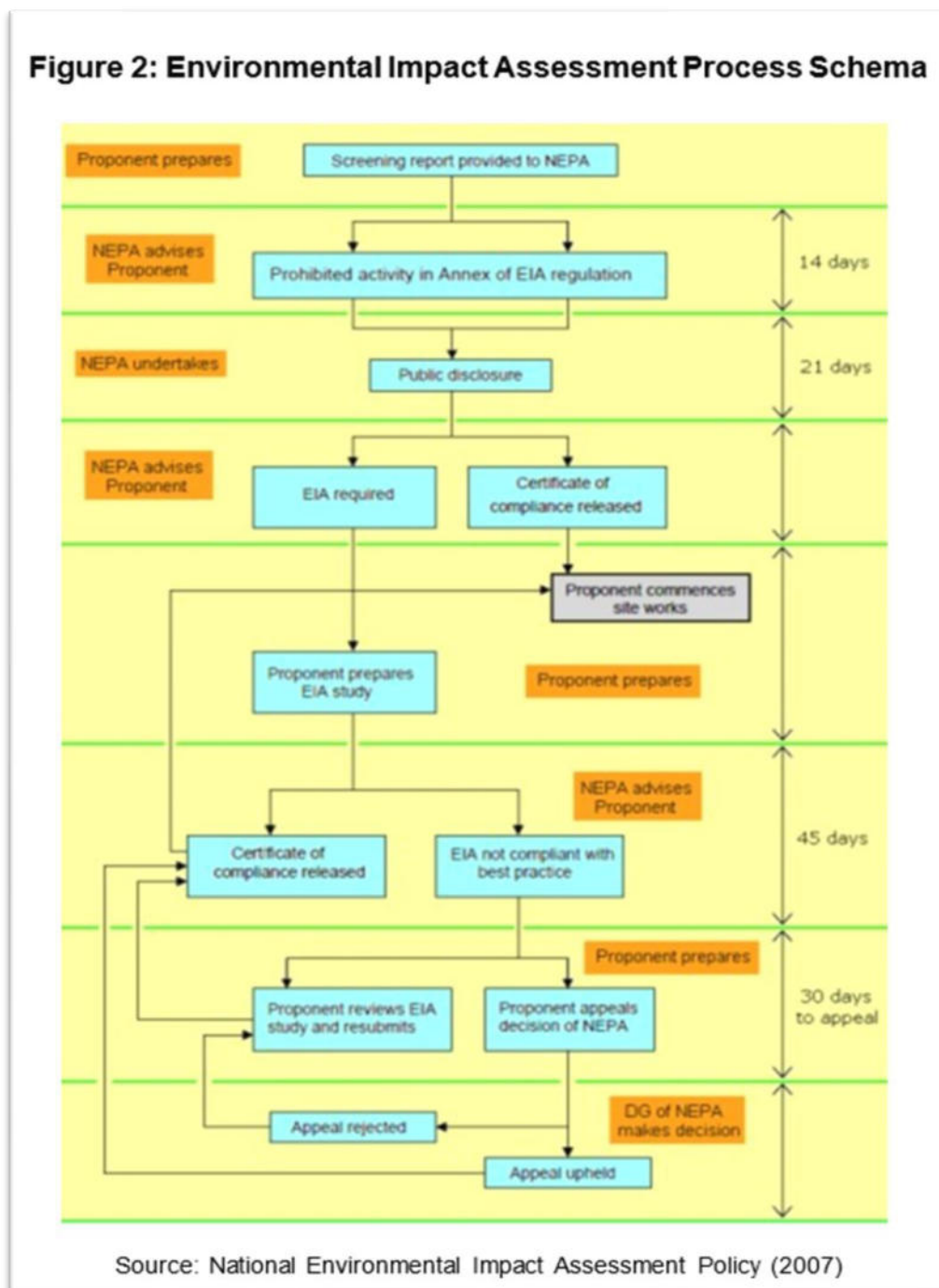
51. National EIA policy provides a project screening list which categorizes different projects based on the likelihood of the significance of the impacts stemming from particular projects. Projects with potentially adverse impacts are generally divided into the following two categories:

52. **Category 1 Activities:** Set out in the National EIA Policy 'Project Screening Lists', are those activities likely to have significant adverse environmental impacts that are sensitive, diverse, or unprecedented, and that will impact a broader area than the sites or facilities subject to the physical works of the activity.

53. **Category 2 activities:** Set out in the National EIA Policy 'Project Screening Lists', are those activities likely to have potential adverse impacts on human environments or environmentally

sensitive areas that are less adverse than those of Category 1 activities, are site-specific, and in most instances are not irreversible.

Figure 2: Schema for the EIA Process in Afghanistan



54. National EIA policy, Category 1, Section F: Water Supply and Treatment, states that water supply schemes and treatment plants with a total cost of \$400,000 USD as a project are likely to have significant adverse impacts.

55. Once the application form and other relevant documents are submitted to NEPA, according to the agency EIA regulations, NEPA will: (i) issue a Certificate of Compliance, with or without conditions, or (ii) advise the applicant in writing to review the technical reports and address the concerns of NEPA.

56. Administrative Guidelines for the Preparation of Environmental Impact Assessments (June 2008). These guidelines were prepared as a companion to the 2008 Regulations, to guide proponents on interacting with NEPA, on public consultation, and roles and responsibilities of stakeholders.

57. The Environmental Law establishes a clear legislative framework and defines the overarching role of NEPA as an independent agency for environmental governance in the country. NEPA has overall responsibility to address policy and legal issues as well as environmental management in coordination with other related departments.

58. In coordination with other government offices and external agencies, NEPA is in the process of drafting and updating environmental regulations and guidelines for the country's environmental management. Presently, there exist the following environmental laws, regulations, guidelines and policies:

- (i) Environmental Law (2005 and 2007), and;
- (ii) National Environmental Impact Assessment Policy "An Integrated Approach to Environmental Impact Assessment in Afghanistan," November 2007.

59. The Environment Act was approved by the Cabinet in December 2005. The Environment Act was developed by NEPA over a period of two years with the assistance of international experts, including extensive stakeholder consultation with concerned ministries, quasi-government agencies, civil society and other interested parties. The Environmental Law was approved by the National Assembly and became part of the Islamic Republic of Afghanistan Official Gazette No. 912, dated 25 January 2007.

60. The Act has been promulgated to give effect to Article 15 of the Constitution of Afghanistan and provide for the management of issues relating to rehabilitation of the environment and the conservation and sustainable use of natural resources, living organisms and non-living organisms.

61. The Environmental Law contains a specifically designed legal framework needed to sustainably manage Afghanistan's natural resources and rehabilitate its damaged environment. The law also clarifies institutional responsibilities and contains the compliance and enforcement provisions required to allow the Government to enforce the legislation. The law is a fundamental prerequisite to enable NEPA to fulfil its mandate. The primary objectives of the law are to:

- (i) Improve living conditions and protect the health of humans, fauna, and flora;
- (ii) Maintain ecological functions and evolutionary processes;
- (iii) Secure the needs and interests of present and future generations;
- (iv) Conserve natural and cultural heritages; and, facilitate the reconstruction and sustainable development of the national economy.

62. The Environmental Law (2007), Article 19, provides a legal framework for public consultation during environmental assessment.

63. Article 19, public participation²: Affected persons may express their opinion on a proposed project, plan, policy or activity, preliminary assessment, environmental impact statement, final record of opinion and comprehensive mitigation plan, before the approval of the project, plan, policy or activity, and the proponent must demonstrate to the NEPA that affected persons have had meaningful opportunities, through independent consultation and participation in public hearings, to express their opinions on these matters on a timely basis.

64. NEPA shall not reach a decision on any application for a permit until such time that the proponent has demonstrated to the satisfaction of NEPA that copies of the document has been distributed to affected persons, informed the public that the document is being made available for public review by advertising the document and displaying a copy of it for inspection, and convened and recorded the proceedings of a public hearing.

² The Environmental Law of the Islamic Republic of Afghanistan 2007.

65. After NEPA has reviewed the conditions set forth in item 3 above, NEPA shall reach a decision, inform the public of that decision and make available any relevant documentation or information for public review.³

66. In December 2014, the Access to Information Act was signed by the President of Afghanistan. It has four objectives:

- (i) To ensure the right of access to information for all citizens from the government and non-government institutions;
- (ii) To observe Article 19 of International Covenant on Civil and Political Rights (i.e. freedom to seek, receive and impart information and ideas of all kinds etc.) consistent with the tenets and provisions of Islam; Article 3, Afghanistan Constitution;
- (iii) To ensure transparency and accountability in the conduct of governmental and nongovernment institutions;
- (iv) To organize request processing and provision of information.

67. Water Law (2009). The Water Law states that water is owned by the public and that the Government is responsible for water protection and management. It assigns responsibilities to government institutions for management and protection of water resources, water ownership, and regulates water ownership fees, rights, permits, and usage.⁴

68. Afghanistan's water law is one component of the country's strategy to integrate its water systems and institutions. The water law recognizes the key role of local Water Users Associations in the protection and management of water resources. The MEW has responsibility for setting up Water User Associations (Article 10), and MAIL has the task of setting up Irrigation Associations (Article 11). Throughout years of conflict, NGOs developed and maintained strong links with rural communities in all provinces. The Afghanistan Urban Water Supply and Sewerage Corporation (AUWSS) proposes broadening their role to coach Water Users Associations and members of Community Development Councils in conservation techniques and water management systems. In particular, the AUWSS advocates end-user participation in decision making relating to water resource management, operation and maintenance of water supply systems and agreeing water use allocations.

69. Law on the Protection of Historical and Cultural Properties, Issue No. 828 (2004). After defining the material falling within its scope, the law sets forth the State's interest and rights in such materials, specifies prohibited and regulated activities involving such materials, and establishes enforcement measures such as penalties and fees.

70. Pesticide Regulations (1989). Afghanistan has had pesticide regulations since 1989, but they have never been enforced due to lack of resources. A draft Pesticide Law dating from 2009 has yet to be enacted.

71. Environmental Standards. Afghanistan has not established national environmental standards or guidelines for air quality, noise, or water quality in respect of human health, aquatic health, irrigation, soil, etc. In the absence of national standards, an accepted international practice is to follow the guidance provided by IFC (2007) Environmental, Health, and Safety Guidelines. The Ministry of Mining, for example, uses this publication in its environment, health, and safety regime. World Health Organization (WHO) standards are routinely used for drinking water quality.

72. The Law on Land Expropriation sets out the provisions governing the expropriation or acquisition of land for public interest purposes, such as the establishment/construction of public infrastructure or for acquisition of land with cultural or scientific values, land of higher agricultural productivity and large gardens.

6. Accordingly, the Law declares that:

³ Unofficial English translation

⁴ Ahmad, T.2013. *Legislation on use of water in agriculture: Afghanistan*. <http://www.loc.gov/law/help/water-law/afghanistan.php>

- (i) Acquisition of a plot or portion of a plot land for public use is decided by the Council of Ministers and is compensated at fair value based on current market rates (Article 2).
- (ii) The right of the owner or land user will be terminated three months prior to the start of civil works on the project and after the proper reimbursement to the owner or person using the land has been made. (Article 6); and
- (iii) The value of land, value of houses and buildings on the land and value of trees and other assets on the land will be considered for compensation (Article 8;) and compensation is determined by the Council of Ministers.

Table 1: Comparison of International and local Air Quality Standards*

Pollutants	USEPA		WHO/IFC		Afg. NEQS	
	Avg. Time	Standard	Avg. Time	Standard	Avg. Time	Standard
SO ₂	3 hrs	0.5 ppm	24 hr	20 ug/m ³	NA	NA
	1 hr	75 ppb	10 min	500 ug/m ³		
CO	8 hrs	9 ppm (11 mg/m ³)			NA	NA
	1 hr	35 ppm (43 mg/m ³)				
NO ₂	Annual	100 ug/m ³ (53 ppb)	1 yr	40 ug/m ³		NA
	Mean		1 hr	200 ug/m ³	NA	
	1 hr	100 ppb				
O ₃	8 hrs	0.07ppm (148 ug/m ³)	8 hrs	100 ug/m ³	NA	NA
PM ₁₀	24 hrs	150 ug/m ³	1 yr	20 ug/m ³	Annual Mean	401 ug/m ^{3**}
			24 hr	50 ug/m ³	24 hrs	247 ug/m ^{3**}
PM _{2.5}	Annual Mean	15 ug/m ³	1 yr	10 ug/m ³	NA	NA
	24 hrs	35 ug/m ³	24 hr	25 ug/m ³		

* Afghanistan has not established its own ambient AQ standards and the Government is still in the process of adoption of standards (Urban Air Quality Management Report, ADB, 2006). Therefore the **standards highlighted in green** for each respective pollutant are the most **stringent** based on a comparison between two international regulations i.e. USEPA and WHO/IFC and thus shall be applicable for the proposed project.

** High PM₁₀ concentrations have been measured in initial samples under the ADB Kabul Air Quality Management (KAQM) Project in 2004 and in previous short-term studies conducted during 2003 by an Environmental and Industrial Health Hazard (EIHH) Special Support Team (SST).

Table 2: Comparison of International and Local Noise Standards

Category of Area/Zone	Limit in dB(A) Leq			
	AFG- NEQS		WHO/IFC	
	Day Time	Night Time	Day Time	Night Time
Residential area (A)	NA	NA	55	45
Commercial area (B)	NA	NA	70	70
Industrial area (C)	NA	NA	70	70
Silence zone (D)	NA	NA	55	45

*The standards **highlighted in green** for each respective Area/Zone are the most **stringent** based on absence of local regulations and standards for Noise; therefore, international regulations shall be applicable for the proposed project.

4. Other Relevant Laws and Regulations

73. **Water Law (2009).** The Water Law states that water is owned by the public and that the Government is responsible for water protection and management. It assigns responsibilities to government institutions for management and protection of water resources, water ownership, and regulates water ownership fees, rights, permits, and usage.

74. Afghanistan's Water Law is one component of the country's strategy to integrate its water systems and institutions. The water law recognizes the key role of local water user associations in the protection and management of water resources. The MEW has responsibility for setting up water user associations (Article 10), and the Ministry of Agriculture, Irrigation and Livestock (MAIL) has the task of setting up irrigation associations (Article 11). Throughout years of conflict, non-governmental organizations (NGOs) developed and maintained strong links with rural communities in all provinces. The AUWSSC proposes broadening their role to coach Water Users Associations and members of Community Development Councils in conservation techniques and water management systems. In particular, AUWSSC advocates end-user participation in decision making relating to water resource management, operation and maintenance of water supply systems and agreeing on water use allocations.

5. ADB

a) Policies

75. **Safeguard Policy Statement (2009).** SPS 2009 is ADB's safeguards policy document. It describes the common objectives and policy principles of ADB's safeguards and outlines the delivery process for ADB's safeguard policy. SPS 2009 promotes sustainability through protection of people and the environment from the adverse impacts of projects, and by supporting the strengthening of country safeguard systems. It presents a consistent, consolidated framework for environment, resettlement, and indigenous people's safeguards.

76. **ADB Operations Manual, Safeguard Policy Statement**, Section F1/BP (Bank policies) and Safeguard Review Procedures, Section F1/OP (operational procedures) (2013). These documents operationalize SPS 2009. The policy sets forth the scope of SPS 2009 applicability to ADB operations, and the procedures describes the safeguards process and outputs, including consultation and disclosure requirements, through the various stages of project preparation.

77. **Public Communications Policy (2011):** guides ADB's efforts to be transparent and accountable to the people it serves, which it recognizes are essential to development effectiveness. The policy recognizes the right of people to seek, access, and impart information about ADB's

operations, and it aims to enhance stakeholders' trust in and ability to engage with ADB, through proactive disclosure, presumption in favour of disclosure, and recognition of the right to access and impart information and ideas, country ownership, limited exceptions, and the right to appeal.

b) Guidance

78. **Complaint Handling in Development Projects - Grievance Mechanisms: A Critical Component of Project Management (2010).** This document presents definitions, concepts, rationale, and history relevant to the ADB project grievance redress mechanism.

79. **Complaint Handling in Development Projects - Building Capacity for Grievance Redress Mechanisms (2010).** This document presents a framework and practical suggestions for building the capacity of an organization to manage an effective grievance redress mechanism.

80. **Environment Safeguards, A Good Practice Sourcebook (2012).** This draft working document aims to add clarity, provide technical guidance, and recommend good practices in SPS (2009) implementation. It updates the Environmental Assessment Guidelines (ADB 2003).

81. **Selected References for Good Practice in Environmental Safeguards Implementation (2014).** This internal Central and West Asia Department document presents internet hyperlinks to exemplary environmental safeguards documents (IEEs, EIAs, EARFs, etc.) prepared for projects in these countries.

6. IFC Environmental, Health and Safety Approaches for Hydropower Projects

82. The Environmental, Health, and Safety (EHS) guidelines of the International Finance Cooperation (IFC) are technical reference documents with general and industry specific examples of good international industry practice⁵. The EHS guidelines contain the performance levels and measures that are generally considered to be achievable in new facilities by existing technology and reasonable costs. EHS guidelines shall be used for environmental assessments.

83. The following environmental impacts are addressed:

- (i) Terrestrial habitat alteration;
- (ii) Aquatic habitat alteration;
- (iii) Electric and magnetic fields;
- (iv) Hazardous materials;
- (v) Revegetation of disturbed areas with native plant species;
- (vi) Removal of invasive plant species during routine vegetation maintenance;
- (vii) Avian and Bat Collisions and Electrocutions;
- (viii) Aquatic habitat alterations due to associated access roads;
- (ix) Removal of riparian vegetation;
- (x) Sedimentation and turbidity of water courses;
- (xi) Electric and magnetic fields;
- (xii) Storage and use of hazardous materials (PCB in transformer stations);
- (xiii) Occupational health and safety.

84. The following mitigation measures are proposed:

- (i) Transmission infrastructure and access roads shall be sited out of terrestrial habitats;
- (ii) Avoidance of construction activities during the breeding season;
- (iii) Revegetation of disturbed areas with native plant species;
- (iv) Avoiding clearing in riparian areas;
- (v) Avoiding use of machinery in the vicinity of watercourses;
- (vi) Aligning transmission corridors to avoid critical habitats (e.g. nesting grounds, migration corridors);

⁵ International Finance Cooperation (2018) Environmental, Health, and Safety Approaches for Hydropower Projects

- (vii) Maintaining 1.5 meter (60-inch) spacing between energized components and grounded hardware or, where spacing is not feasible, covering energized parts and hardware;
- (viii) Providing alternative sources of water;
- (ix) Assuring provision of adequate environmental flows;
- (x) Modifying operating regimes to ensure timely provision of critical services;
- (xi) Watershed management measures;
- (xii) Providing fish passages/ladders and supporting fish hatcheries to ensure fishing livelihoods and fish populations are maintained.

85. Environmental impacts related to rehabilitation and construction of irrigation canals are discussed in Section F. Mitigation measures are proposed in this Section using IFC EHS guidelines accordingly.

7. Environmental Screening and Categories

a) ADB

86. ADB water resources projects and subprojects are screened using a rapid environmental assessment checklist filled out for the components. This checklist captures the type; location, sensitivity, scale, nature, and magnitude of potential environmental impacts, and availability of cost-effective mitigation measures. Based on the checklist findings, the project or component is assigned to one of the following ADB environmental categories.

87. **Category A** – likely to have significant adverse environmental impacts that are irreversible, diverse, or unprecedented. These impacts may affect an area larger than the sites or facilities subject to physical works. An EIA, including an environmental management plan (EMP), is required. The raising of the Dahla Dam has been categorized as Category A, impacts are adverse and cannot be mitigated on site. An EIA report has been prepared accordingly. All hydropower developments are categorized as “Category A” according to ADB environmental assessment guidelines (2003).

88. **Category B** – Potential adverse environmental impacts are site-specific, few if any of them are irreversible, and in most cases mitigation measures can be designed more readily than for Category A projects. An initial environmental examination (IEE), including an EMP, is required.

89. **Category C** – A proposed project is likely to have minimal or no adverse environmental impacts. An EIA or IEE is not required, although environmental implications need to be reviewed.

b) Government of Afghanistan

90. NEPA brought the new regulation on Environmental and Social Impact Assessment in the beginning 2018 with annexes to follow while preparing the IEE and EIA reports. In addition to this regulation, other regulations that have been introduced recently are Noise Pollution Prevention and Control Regulation, Water Quality Prevention and Control Regulation; Hospital Waste Management Regulation. Regulation on Solid Waste (Domestic) Management and Hazardous Waste Management Regulations are in the final process of approval.

91. As per the Interim EIA Regulation 2008, (construction or upgrading of irrigation or drainage projects serving 15,000 ha or more) falls under Category I, requiring to prepare and submit the Screening Report to NEPA to determine whether the project needs to undertake the Environmental Assessment or can proceed with the approval of the Screening Report itself.

92. Recently in the beginning of 2018, NEPA promulgated the Environmental and Social Impact Assessment Regulation and as per this new regulation, irrigation projects with more than 15,000 ha command area put in Category II requiring to conduct IEE study.

93. As per this new regulation, the validity of environmental clearance is of three years and it is the responsibility of the project proponent to inform NEPA the date of initiation of the construction activities as well as the date of start of operation of the project.

94. The proponent of the following projects shall require conducting the IEE study and preparing a report as per the prescribed format (Annex VI of regulation), and in accordance with the

procedures outlined for IEE in this regulation, prior to application for environmental clearance to the authority or authorized concerned authority.

C. DESCRIPTION OF THE NCB006 SECONDARY CANALS

1. The Project

95. The NCB006 irrigation secondary canals are located Kunduz Province. **Figure 5** following pages illustrate the location of all secondary canals (Chardar, Aqtepa, Laqi and Qala I Zal). The NCB-06 secondary canals were selected from a shortlist of 21 candidate subprojects screened from a long list of 62 subprojects identified and prioritized by the Ministry of Energy and Water (MEW), the Panj-Amu River Basin Agency (RBA), and its Sub-Basin Agencies (SBAs). Shortlisting criteria included indicators of technical, economic, social and environmental viability and consistency with Project design. The process is described in more detail in the Environmental Assessment Review Framework (EARF).

a) Irrigation History

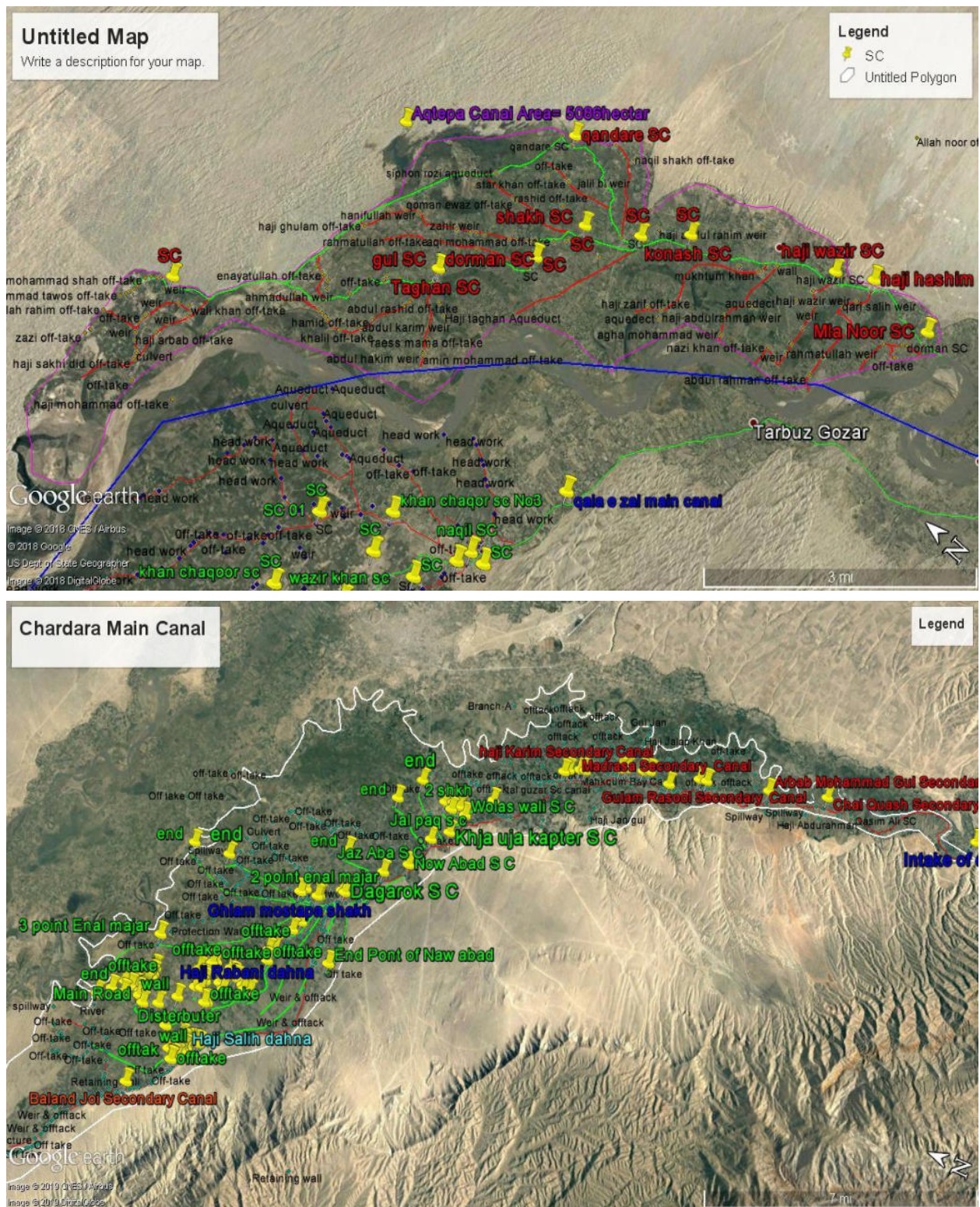
96. According to various sources, the history of irrigated agriculture in Afghanistan goes back more than 4,500 years to ancient settlement (ICARDA, 2002) and archaeological research claims a very early date for some of the irrigation canals in the region. Based on the age of artefacts recovered from settlements along the canals, farmers have been settled across the basin from 2500-1500 BCE.⁶ This history is significant to PARB as by default it flags the understanding and historical commitment of farmers to the importance of managing water.

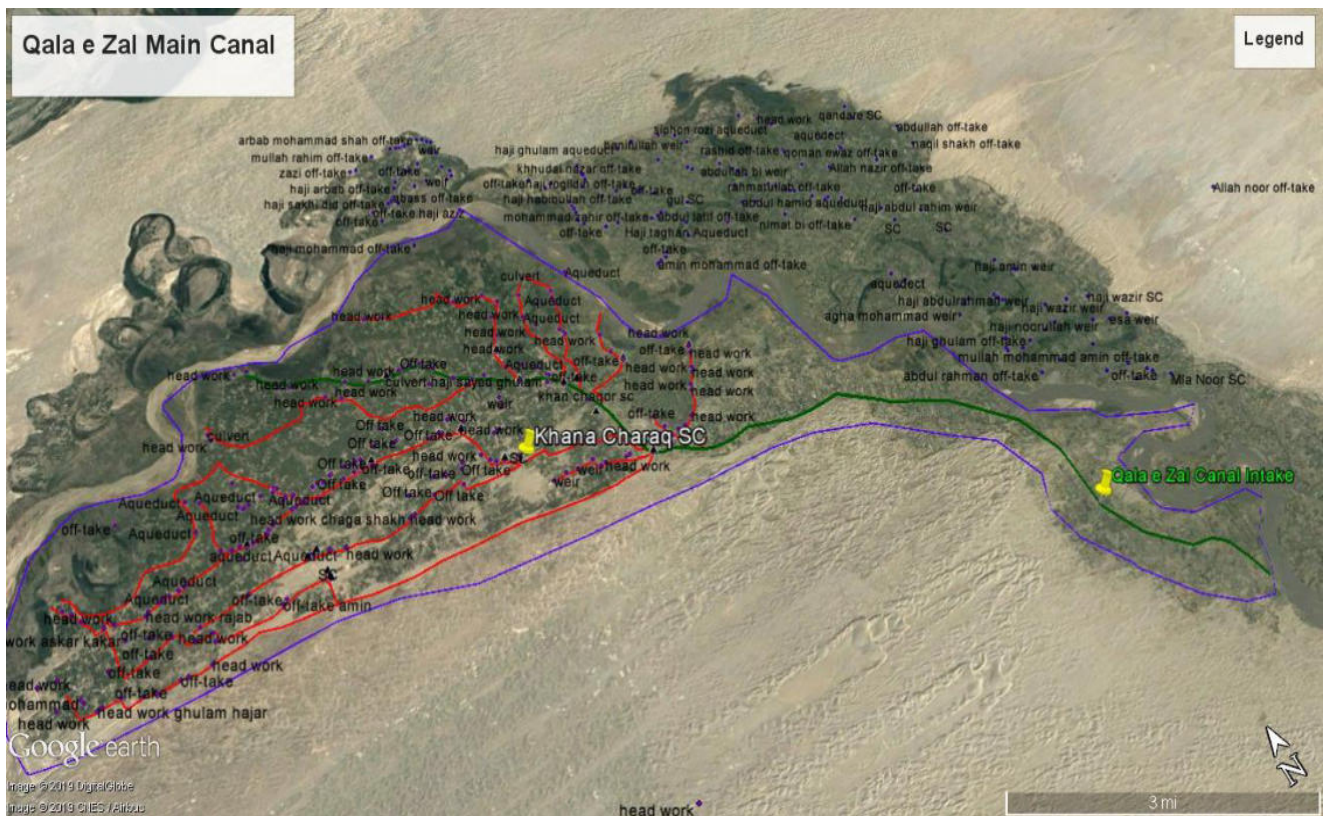
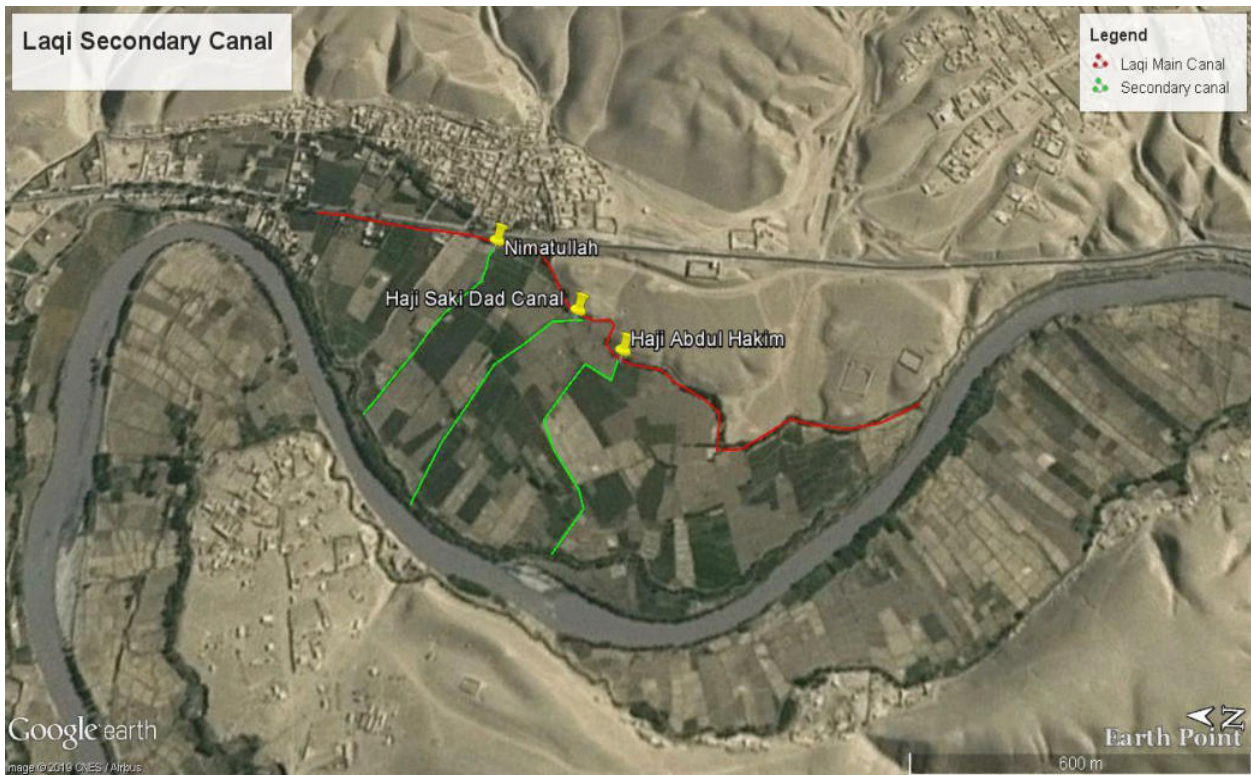
97. From a contemporary perspective, irrigation systems can be divided into two main categories: informal irrigation systems (surface water systems, karez, springs and wells) and formal irrigation systems. Informal systems are centuries-old and traditionally developed and managed by local communities within the constraints of local resources. They have undergone social and physical changes, and expand or contract based on water availability or challenges arising from years of conflict. Informal systems account for 88 percent of the country's irrigated area (Rout, 2008). Their prevalence largely results from widespread availability of both water resources from rivers and streams as well as adjacent land suitable for development, usually along river terraces and alluvial plains. Although relatively larger than many systems, NCB-06 are considered a long-term informal system developed to achieve local needs.

98. Although Afghanistan is located in a semi-arid environment, it is still rich in water resources mainly because of the Hindu Kush mountain range covered for a large part of the year with snow supplying over 80 percent of the country's surface water resources from altitudes of over 2000 m. The mountains function as natural water storage that supports perennial flow in all the major rivers (ICARDA, 2002).

⁶ have been attached to Archi Main Canals and Archi Nahre Khona / Old Canals in the Lower Kokcha Irrigation Project, and 1500-500 BCE to the Rud-i-Sharawan canals, the main canals of Sharawan, one of the subprojects of the PARB

Figure 3: Collage of Maps to Illustrate the Sub-projects Locations.





b) Description of Existing Irrigation Systems

99. **Laqai.** The canal is the smallest canals of Ali Abad district Kunduz province, this canal start from the Jalawgir Area and ended in Ali Abad district centre, this canal has more than 130 years history. Total length of this canal is around 15 Km and irrigated 163 Ha land in Ali Abad district. This canal flowing south to north side and irrigate the agriculture land east and west sides. At all in first part of canal the agriculture land have no problem of irrigation water. However, in mid and in final part of the canal have little bit problems because agriculture land is higher than canal bed level.

100. **Chardara.** The canal is the biggest canal of Chardara district Kunduz province, this canal start from Lala Maidan village of Ali Abad district and ended in Hasan Abad village sandy area near Chardara and Qalezal district borders, this canal has more than 150 years history. Total length of this canal is around 61 Km and irrigated 15904 Ha land in Ali Abad and Chardara districts. This canal irrigated more land in East side also in the west side irrigated a little bit land that is not more than 5% of total irrigated land of this canal, generally this canal is flowing from south to north side and its elevation is higher from the irrigation land. The elevation of this canal is higher from the command area and also command area of this canal at all is level and can take water without any resistance only some areas of mid and end part of this canal, like Joi Naw Abad and Dagharoq areas the command area is higher from the canal bed, and that area don't take enough water.

101. **Aqtepa.** The canal takes water from Kunduz River its offtake\Head work located in Jangharoq Sabon Tapa area of Qalaezal district. In addition, this canal has 24 km length and 4269 Ha command area. All the command area of this canals belongs to Qalaezal district center Aqtepa. And this canal have 150 years history, finally this canal ending in Sakhsa Qul sandy area near Kunduz river of Qalaezal district and coordinate of offtake\ Head work is: N36.893 E68.5902. This canal irrigated the agriculture land belong to Qalaezal district center Aqtepa area its head work located in Jangharoq Sabon Tapa area and finally ended in Sakhsa Qul sandy area. Mean both the start and ends of this canals located in Qalaezal district. The command area of this canals in some parts is level but in majority place land, bed is higher from the secondary and tertiary canals beds also in majority secondary canal have low slope due to which these canals need for cleaning four of five time per year. In addition, end part of canal does not get proper water for their crops.

102. **Qala I Zal.** Canal takes water from Kunduz River its offtake\Head work located in Tarboz Guzar area of Qalaezal district. Moreover, this canal has 23 km length and 4120 Ha command area. All the command area of this canal belongs to Qalaezal area of Qalezal district. And this canal have 150 years history, finally this canal ending in Qala sandy area of Qalaezal district and coordinate of offtake\ Head work is: N36.8982 E68.564. This canal irrigated the agriculture land belong to Qalaezal area of Qalaezal district its head work/Offtake located in Turboz Guzar area and finally ended in Qala sandy area. Mean both the start and ends of this canals located in Qalaezal district. The command area of this canal in some parts is level but in majority place land, bed is higher from the secondary and tertiary canals beds also in majority secondary canal have low slope due to which these canals need for cleaning four of five time per year. In addition, end part of canal do not get proper water for their crops.

103. **Water access points.** No modern water access points are present on the secondary canals only traditional access points available.

104. **Distribution network.** The offtakes from the sub-canals do not have modern water control structures. All these traditional offtakes, farmers emplace locally-available materials (sand, mud, brushwood) to raise water levels up to the offtakes and to control flow rates.

105. **Drainage.** The schemes have no drainage network as such. Any surplus water reaching the end of the sub-canals drains back into the river.

106. **Operation and maintenance arrangements.** There are a registered WUAs within the schemes which belong to established federations. These organizations manage the canals in collaboration with their SBA. Mirabs are responsible for O&M of the main canals, and kokbashis for

O&M of the secondary and tertiary canals. O&M activities are very basic and carried out without measuring the flow (no staff gauges).

107. **Current water management issues.** Current water management problems identified by beneficiaries in collaboration with the SBA, and potential civil works solutions considered during Project preparation.

108. **Vulnerability of Infrastructure requiring constant maintenance.** The existing secondary and tertiary canals are defined and lined using rock, clay/sand and brushwood. Canals structures are weak, vulnerable to flooding, and require hours of local labour to remedy the frequent breaks in the canals due to the impact of aggressive flooding.

109. Because of long time sedimentation, the NCB-06 canals beds are in general higher than the secondary canals beds. To make sufficient water available in the off-take canals, the farmers construct a local weir in the main canals every year using brushwood and sand bags.

110. A routine problem is that due to high sediment loads in water flows, sediments routinely build up in the canals, which requires manual cleaning. In some situations, the lack of available local labour is making impossible to maintain the flow of water and maintain the canals.

111. From the IEE perspective, the significance of the proposed NCB-06 secondary canals are the way in which both can improve upon the massive yearly impact upon the environment by the existing infrastructure and methods to maintain it. The demands upon local vegetation and the labour required to complete ongoing maintenance is a massive burden upon canals efficiency and environment.

112. The secondary canals offer a greatly improved system layout and design, the resources required to implement and the subsequent logistics to maintain the successful operation. Impact on surrounding vegetation and important biomass will be greatly reduced.

c) **Description of NCB – 06 secondary canals**

113. **Long-term informal system rehabilitated:** The NCB-06 secondary canals aim to take an area which has been long-term informal irrigation area and install infrastructure to improve efficiency, productivity and thus livelihoods and food security. Proposed NCB-06 Civil Works / Construction Activities include:

- Construction site clearance and preparation;
- (Re)excavation of foundations, borrow pits and canals;
- Management and disposal of excavation spoil;
- Temporary closure of irrigation canals;
- Temporary blockage of foot / vehicle paths / roads;
- Excavation of temporary canals (diversions);
- Sourcing construction materials from existing quarries or quarrying of such materials;
- Creation and management of on-site stockpiles of construction materials;
- Creation and disposal of solid and liquid waste;
- Operation and maintenance of vehicles and equipment;
- Creation of reinforced concrete structures;
- Decommissioning and clean-up of construction sites, including infilling temporary canals and borrow pits.

114. Of specific importance to this IEE is the amount of excavation, vegetation clearance and replanting required for each sub-site where construction of the rehabilitated canals will occur? These items are considered to be amongst the most important from the environmental management perspective.

115. **Operation.** Activities will comprise water management and irrigation through the new and upgraded irrigation structures with resultant knock-on changes to agriculture.

116. Proposed civil works for the project include:

- **Offtakes** – Upgrading of offtakes on the secondary canals;
- **Flow measurement infrastructure** – Provide a calibrated staff gauge at each upgraded offtake to support water distribution proportional to offtake command areas;
- **Cross-regulators** – Constructing cross-regulators in the secondary canals;
- **Head-regulators** – Constructing head-regulators in the secondary canals;

d) Details for Structures and Construction

117. **Major construction.** Major on-site work proposed for the irrigation canals concerns the construction of masonry regulators to control the flow and direction of irrigation water. The regulators consist of a number of spans separated by piers and operated by steel gates which are routinely aligned at 90° to the weir to control silt entry into the canals. (**Figures 6, 7 and 8** below illustrate these proposed cross and head regulators.)

118. Each regulator is constructed to manage (i) water levels in the upstream canals and (ii) the discharge passing downstream in order to:

- Feed off-taking canals located upstream of the cross regulator;
- Help water escape from canals in conjunction with escapes;
- Control water surface slopes in conjunction with falls;
- Control discharge of a canals into another canals or lake.

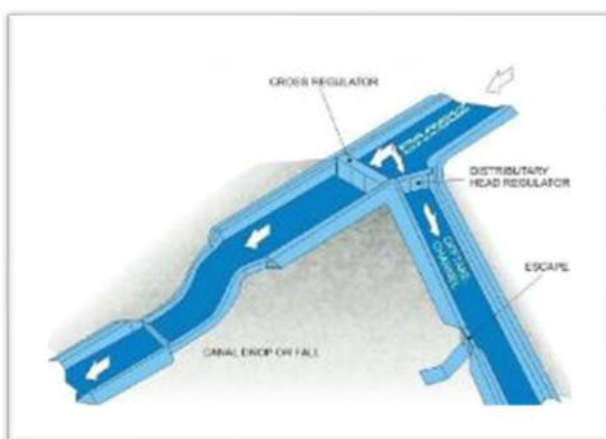


Figure 4: Schematic Lay-out of typical Cross and Head Regulator.



Figure 5: Typical Cross Regulator Front View.

Figure 6: Typical Head Regulator Front View.



119. Construction of each regulator is based on specific site conditions. Works begin with the site clearance which includes clearing of shrubs/grass and removal of trees, making sure that trees removal is minimum. For each site, construction drawings will clearly mark the earth excavation line and layout of the proposed structure.

120. **Temporary use of land:** Contractor will require access to land during construction. The community (WUA) will be requested to provide land during construction period to allow for (i) water diversion and (ii) storage. It is commonly required to establish a temporary diversion route to maintain irrigation during construction and this will require land. Secondly contractors will need common land for storage of materials and equipment (such as sand, gravel, stone, cement,

reinforcement bars and geo-textile filters), and will prepare/maintain access roads to construction sites making sure no settlement is disturbed. Site access, excavation, soil and vegetation removal and site rehabilitation will all be the responsibility of the contractor. The Minimal impact on adjoining farmer land is also expected.

121. **Site Specific construction materials:** Collection of some construction materials (e.g. sand, gravel and stone) will be carried out from the nearby river making sure that the quantity of materials taken from the river will not have adverse effect on the river regime (its longitudinal slope, size, flow etc.). During different periods the river flow will have aggradations and degradation to maintain its regime. It is the responsibility of the contractor to ensure that collection of materials for the construction work will proceed in a manner not have adverse effect on river flow (regime).

122. Since the construction work for an individual CR/HR may last for 6 months, removal of diversion work and land reinstatement will be done after 6 months. Depending on the area, making good and tree planting can be done after reinstatement.

123. Mechanical excavators are used for site clearance and foundation. Equipment movement will be restricted to the construction site and contractor will be required to use equipment less than 10-year-old to avoid pollution due to sound and gas. Excavated earth will be stored in the bank of canals or next to construction site.

124. A masonry foundation will be prepared with crushed stone/gravel, and above that stone masonry/concreting or reinforce concreting work is carried out as per construction drawings. At completion of structure, earth backfilling will be carried out using the excavated earth, the extra earth obtained after backfilling shall be used to maintain the depression (if any) of the canals bank or used in dressing of canals banks. After completion of the construction work, naked earthen-face of the structure will be turfed with the suitable species of grass/plant. The life of structure will be 25 years as per design.

e) **Screening and Categorization of Proposed-Sub-projects**

125. The construction of water resources infrastructure has potentially significant environmental impacts requiring management to achieve acceptable levels of residual impact. A screening checklist were completed for the NCB-06 Secondary canals (**Annex 1**) and they were assigned to ADB environment Category B.

f) **Potential Impact and Benefits**

126. Areas potentially affected by construction activities comprise the locations and alignments of temporary paths, roads, canals, and borrow pits; areas of existing quarries from which construction materials are sourced, and/or areas quarried by contractors to obtain such materials; structure construction sites; and adjacent and downstream / down-canals areas.

127. Areas potentially affected by operation-phase activities comprise the secondary and higher order canals and command areas of the offtakes; the main canals downstream and immediately upstream of the regulators.

128. **Impact.** Increased per-capita income and reduced poverty among rural and pastoral communities. Expected benefits comprise:

129. **Outcome and Outputs:** knock-on benefits including increased cropped area, improved cropping patterns, greater agricultural yields, culminating in an agricultural productivity increase and higher farm incomes. At the same time the subproject beneficiaries will benefit from the **three major PARB outputs**.

2. Project Implementation Arrangements

i. Project Management Offices (PMO)

130. PMO is established within the Kabul headquarter at MAIL. Each monitor and evaluate progress, procurement, accounting, and report findings regularly to MOF and the ADB.

131. MAIL PMO is based in the Irrigation Directorate, but includes the Output 3 Natural Resources Management (NRM) Coordinator based in the NRM Directorate, to avoid creating two MAIL PMOs. MAIL PMO staffing includes provision for a part-time environmental safeguards officer.

g) Project Implementation and Coordination Offices

132. MAIL PMO has established PIOs in the Project area DAILs. The existing MOF Project Coordination Office (PCO) will facilitate coordination among MOF and MAIL.

h) ADB Review Missions

133. ADB will conduct review missions twice annually during the first two years of Project implementation to:

- I. Assess implementation effectiveness and propose any necessary adjustments to the implementation arrangements;
- II. Monitor implementation progress against expectations, identify constraints, and define actions to address them; and
- III. Ensure compliance with ADB safeguards conditions set out in the grant agreement and financial framework agreement. In particular, EMP implementation will be scrutinized.

134. Three years following grant effectiveness, ADB will field a comprehensive midterm review mission (MRM) to assess performance, identify problems, and reach formal agreement with GoIRA on any needed changes to the scope of work or implementation arrangements to address shortfalls. MOF, MAIL, and ADB will jointly prepare full terms of reference for the MRM during the second year of implementation. Prior to MRM, and MAIL will each submit a detailed progress report on their respective components, including documentation of safeguards implementation.

D. ANALYSIS OF ALTERNATIVES

135. Under ADB's Safeguards Policy Statement (2009) there is a requirement to examine alternatives to the project's location, design, technology, and components and their potential environmental and social impacts and consider the no project alternative. During the project preparation, various alternatives have been proposed, screened against technical, economic, as well as environmental criteria. In terms of the environmental consideration for the alternatives, the primary objective was to identify and adopt options with the least adverse environmental impacts and maximum environmental benefits.

1. No-Project Alternative

136. In the no-project alternative, irrigation schemes in the Panj-Amu basin would likely be rehabilitated and upgraded by MAIL with funding from other sources in much the same manner as under the PARB. This is believed to be the case because (i) the PARB is designed to support Afghanistan and MAIL in implementing their pre-existing irrigation development plans, and (ii) the Project utilizes commonly-used technical options for irrigation rehabilitation and upgrading that would likely also be used in the no- project alternative (i.e. with alternative funding).

2. How Subproject Were Selected

137. In 2015 a long list of 408 potential subproject in all six sub-basins was identified by MEW and the preparation consultant to be considered for rehabilitation and upgrading (R&U) under the Project. This list was shortened into a priority list of 62 subproject selected by MEW, the RBA, and the SBAs, which, in turn, were screened first by eligibility criteria, then prioritized according to criteria like command area size and accessibility. The RBA and SBAs then prepared a priority list of 22 subproject.⁷

3. The project design alternative

138. The NBC-06 secondary canals involve rehabilitation of existing irrigation infrastructure and the technologies involved are fairly simple with few available options. The rehabilitation essentially puts the existing irrigation systems back into its full operational potential and the structural improvements will be optimized during detailed design. The interventions now have standard details available for each type, affected sections of the canals will be strengthened to withstand anticipated floods and landslides. For droughts irrigation scheduling will be done based crop water requirement. Hydrological analysis will be done to forecast the river flows, water availability and extreme floods/droughts.

⁷ See ADB website, <https://www.adb.org/projects/documents/afg-panj-amu-river-basin-sector-project-rfp>, Supplementary Document 11, Environment Assessment and Review Framework, pp. 5-6.

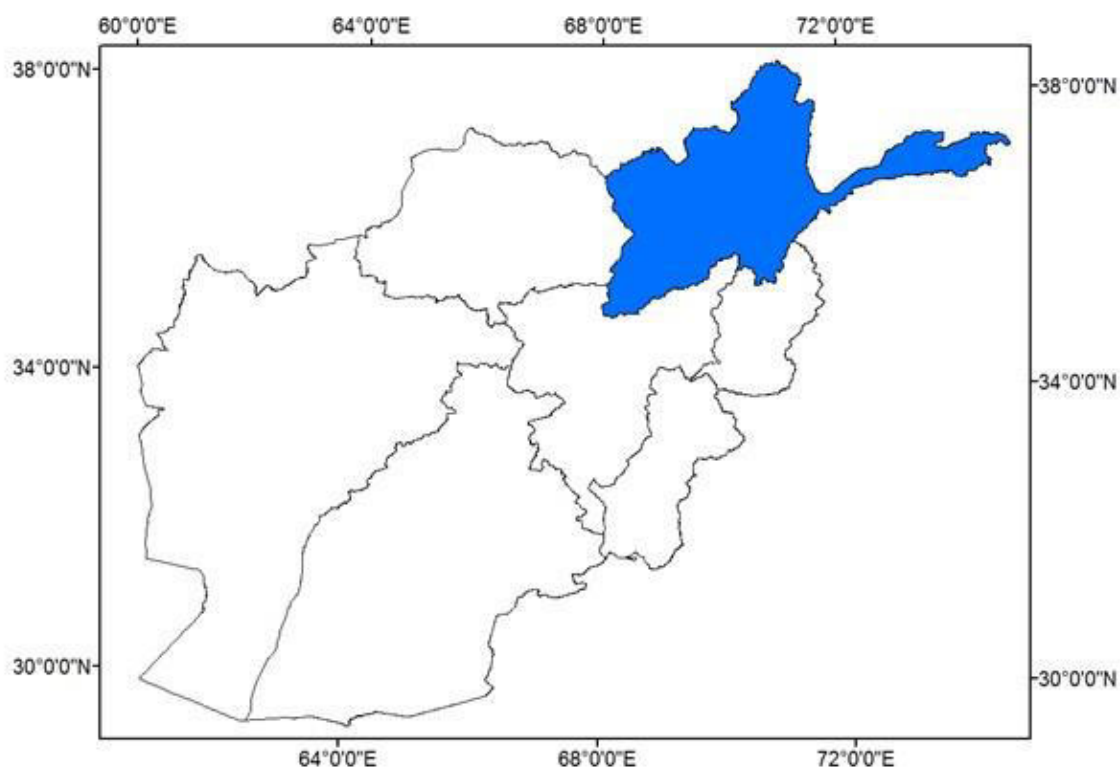
E. DESCRIPTION OF THE ENVIRONMENT

1. Physical Environment

a) Climate

139. **Climate Classification** - North-eastern Agro-Climatic Zone (NEACZ) is a mountainous area. It occupies 83534.01 sq. km. from a total 655,000 sq. km. area of Afghanistan. It is located between 35°00'00" N to 38°29'57" N and 68°00'00" E to 74°53'46" E. It consists of the four provinces, they are Badakshan, Baghlan, Kunduz and Takhar.

Figure 7: Map of Afghanistan with Northeastern agro-climatic zone.



140. **Kunduz** the climate in Kunduz is referred to as a local steppe climate. There is not much rainfall in Kunduz all year long. The climate here is classified as BSk by the Köppen-Geiger system. The temperature here averages 16.8 deg. C. Precipitation here averages 325 mm.

141. **Recent droughts.** Overall, respondents perceived Afghanistan as having a low level of drought during the period of 30 to 26 years ago. The Country experienced a severe drought in many areas during the period of 25 to 16 years ago. Respondents perceived the level of drought as being normal for the last 15 years. 30-26 years ago, the Southern zone has high drought situation. All other zones have low drought situation.

Table 1: The Summary of Drought Trend over 30 Years.

Drought Trend (in years)							
Zone	30-26	25-21	20-16	15-11	10-6	5-1	Present (Last 12 months)
Northeastern Agro-Climatic	Low	High	High	Normal	Normal	Normal	Normal
Afghanistan	Low	High	High	Normal	Normal	Normal	Normal

b) Geographical Location

142. The NCB-06 maps are presented in **Figure 5** and offers an overview of the topography, and the plane area in which the NCB-06 secondary canals are positioned. The NCB-06 is position in plane area surrounded by agriculture land.

143. **Environmentally sensitive areas.** As noted from the REA in Annex 1, the Aqtepa, Chardara, Laqi, Qala I Zal Subproject areas are not adjacent to or within any of the following environmentally sensitive areas: (i) Protected Area; (ii) Wetland; (iii) Buffer zone of protected area; (iv) Special area for protecting biodiversity.

c) Geology

144. Kunduz is a landlocked province, located in the northern part of the country next to Tajikistan. The Secondary canals are located in plane area which is surrounded by agriculture land.

d) Soils

145. Afghanistan soils have predominantly been formed under arid and semi-arid climatic conditions, most extensively developed in the lower part of the course of a river, forming floodplains and deltas. Textural soil classes can generally be considered as waterborne or 'alluvium', a general term for clay, silt, sand, gravel or similar unconsolidated detrital material deposited during comparatively recent geologic time by a stream or other body of running water. So, alluvial plains adjacent rivers basically comprise sediment. Soil organic matter is generally low, ranging from 0.2 to 2.5%.

146. From the predominant land use perspective, soil problems include high pH, low organic matter, high amounts of calcium carbonate, high erosion potential, poor soil structure, micronutrient deficiencies. The opportunity to improve these soils is high and recommendations include additions of organic matter (i.e., compost, cover crops, animal manures), mulches, conservation tillage, crop rotation and improved fallows, foliar application of nutrients, correct fertilizer timing, placement and amount, testing fertilizer quality, terracing and contour barriers.

e) Hydrology

147. **Rivers and water bodies:** The source of water body in the project areas are: rain and snow for agriculture propose whereas for domestic use the source of water is well. The source of surface water is canals which describe one by one below.

148. **Laqai.** The canal is the smallest canals of Ali Abad district Kunduz province, this canal start from the Jalawgir Area and ended in Ali Abad district centre, this canal has more than 130 years history. Total length of this canal is around 15 Km and irrigated 163 Ha land in Ali Abad district. This canal flowing south to north side and irrigate the agriculture land east and west sides. At all in first part of canal the agriculture land have no problem of irrigation water. However, in mid and in final part of the canal have little bit problems because agriculture land is higher than canal bed level.

149. **Chardara.** The canal is the biggest canal of Chardara district Kunduz province, this canal start from Lala Maidan village of Ali Abad district and ended in Hasan Abad village sandy area near Chardara and Qalezal district borders, this canal has more than 150 years history. Total length of this canal is around 61 Km and irrigated 15904 Ha land in Ali Abad and Chardara districts. This canal irrigated more land in East side also in the west side irrigated a little bit land that is not more than 5% of total irrigated land of this canal, generally this canal is flowing from south to north side and its elevation is higher from the irrigation land. The elevation of this canal is higher from the command area and also command area of this canal at all is level and can take water without any resistance only some areas of mid and end part of this canal, like Joi Naw Abad and Dagharoq areas the command area is higher from the canal bed, and that area don't take enough water.

150. **Aqtepa.** The canal takes water from Kunduz River its offtake\Head work located in Jangharoq Sabon Tapa area of Qalaezal district. In addition, this canal have 24 km length and 4269 Ha command area. All the command area of this canals belong to Qalaezal district center Aqtepa. And this canal have 150 years history, finally this canal ending in Sakhsa Qul sandy area near

Kunduz river of Qalaezal district and coordinate of offtake\ Head work is: N36.893 E68.5902. This canal irrigated the agriculture land belong to Qalaezal district center Aqtepa area its head work located in Jangharoq Sabon Tapa area and finally ended in Sakhsa Qul sandy area. Mean both the start and ends of this canals located in Qalaezal district. The command area of this canals in some parts is level but in majority place land, bed is higher from the secondary and tertiary canals beds also in majority secondary canal have low slope due to which these canals need for cleaning four of five time per year. In addition, end part of canal do not get proper water for their crops.

151. **Qala I Zal.** Canal takes water from Kunduz River its offtake\Head work located in Tarboz Guzar area of Qalaezal district. Moreover, this canal have 23 km length and 4120 Ha command area. All the command area of this canal belong to Qalaezal area of Qalaezal district. And this canal have 150 years history, finally this canal ending in Qala sandy area of Qalaezal district and coordinate of offtake\ Head work is: N36.8982 E68.564. This canal irrigated the agriculture land belong to Qalaezal area of Qalaezal district its head work/Offtake located in Turboz Guzar area and finally ended in Qala sandy area. Mean both the start and ends of this canals located in Qalaezal district. The command area of this canal in some parts is level but in majority place land, bed is higher from the secondary and tertiary canals beds also in majority secondary canal have low slope due to which these canals need for cleaning four of five time per year. In addition, end part of canal do not get proper water for their crops.

f) **Water Quality**

152. **River water quality.** Due to outbreak of Covid-19 no river and water quality of the study areas have been conducted and analysed. The water will be conducted and analysed from the subprojects areas prior to construction phase of the project and the results will be part of this IEE as appendix.

g) **Air quality and noise**

153. The Air quality and noise data for this IEE study were not conducted due to outbreak of Covid-19. The data will be collected prior to the commencement of construction activities incorporated in this IEE study as appendix.

2. **The Biological Environment**

154. The Biological environment data for this IEE study was not conducted due to outbreak of Covid-19. The data will be collected prior to the commencement of construction activities incorporated in this IEE study.

155. 144. **Protected areas.** Numbers of the protected area have been identified by the government of the Afghanistan. However, there is one protected area in Kunduz province by name of Imam Sahib (Wildlife managed Reserve) which is far from NCB-06 subprojects area.

3. **Social and Economic Conditions**

a) **Population**

156. Total population of NCB-06 secondary canals are 195783 people which is equal to 27969 families. In 2011, the total basin population was estimated to be 3.90 million (935,600 in Kunduz province and total 186,300 in the Panj-Amu basin. The main ethnic groups in NCB-06 are the Pashtun, Tajik, Uzbek, and Turcoman.

b) **Land Tenure and Rural Livelihoods**

157. In the absence of observations specific to the studied area, a description of the national situation with respect to land tenure and its implications for rural livelihoods is provided in the following paragraphs.⁸

⁸ The text in this section is a lightly edited version of pp. 4-6 of the excellent paper: L. A. Wily. 2004 (April). Putting Rural Land Registration in Perspective: The Afghanistan Case. Paper presented to Symposium on Land Administration in

158. In Afghanistan, agrarian land relations have feudal origins and remain complex and inequitable. A few large landlords likely still own around 40 per cent of farmland as was the case in the 1981. Most of the cropped area is farmed by smallholders, but with great variations in farm size by region. Rent-seeking absentee landlordism is common in many areas and has been reported to be a source of conflict within local populations.

159. Around one-quarter of the rural population is entirely landless, surviving on off-farm piecework, farm labouring, sharecropping, or some combination thereof. In some areas over half of all households are entirely landless. Farm labourers generally receive one-fifth of the crop as payment and sharecroppers, who tend to have more skills, up to one-third.

160. A large number of rural families are homeless as well as landless, and must depend upon landlords or relatives for shelter from one generation to the next. The men from these families form a significant body of mobile farm labour, going from landlord to landlord every year or two with their only capital asset, a small herd of karakul sheep. Although possibly numbering in the hundreds of thousands, these poorest of the poor are not considered a permanent part of (any) community and rarely appear in survey statistics.

161. Indebtedness is very high in the rural population with up to 92 per cent and 57 per cent of sample populations in 2002 borrowing respectively cash and wheat. Many landowners have their land under a form of mortgage that is to the full advantage of the creditor. These loans are typically taken up out of desperation, to buy food or cover health or bride price costs, not to invest in economically productive activities. Outright land sales by smaller farmers typically soar during droughts and other difficult times. Land purchases tend to be by those who already own land, suggesting continuing consolidation of holdings.

162. Those who lose their land find it difficult to re-acquire land and tend to end up in cities as unskilled domestic or market labour. For the better-off as well as the poor, periodic outmigration in search of work within and beyond Afghanistan (especially to Iran and Pakistan) is a well-established routine dating back to the 1960s, and may inflate or confuse figures of refugees and internally displaced persons (IDPs).

163. Rural society is intensely stratified, and its socio-cultural mores remain largely effective in perpetuating the status quo. Large and powerful socio-cultural barriers exist between those referred to as landlords, small farmers, and the landless (neither the rich nor labourers are referred to as 'farmers'), and especially between those with and without land. Farming, an artisan skill and the preserve of tenants and sharecroppers, is considered to be beyond the homeless and landless mobile labourer, who typically perceives landownership as not only financially impossible but as getting above his station or 'not permitted'. Very few of these mobile labourers were likely among the classified landless who benefited from the (short-lived) revolutionary land redistributions of 1978-1984.

164. Women are customarily barred from landholding despite religious law recognizing limited female land inheritance rights. This restriction affects the significant proportion of the population living in households that are woman-headed, either de facto due to male labour out-migration or by widows.

c) Rural Housing

165. People in the project area live in the traditional Afghan house or part of a shared house, occupied by an extended family. These conditions are quite uniform. Houses are made of traditional material and therefore it can be said that the age of the premises is relatively young.⁹

Post-Conflict Areas, hosted by the International Federation of Surveyors, 29-30 April, 2004, United Nations, Geneva.
[http://www.fig.net/commission7/geneva 2004/papers/lapca 06 alden wily.pdf](http://www.fig.net/commission7/geneva%202004/papers/lapca%2006%20alden%20wily.pdf)

⁹ SNC-Lavolin, 2013, Lower Kokcha Irrigation Project Feasibility Study.

d) Public Health

166. The common health issue in Kanduz province is acute bloody diarrhea, which take thousands of lives every year. Apart from these, other health related issues are very much alike for Kunduz province and other parts of the country.

167. In the centre of each subproject small clinic with basic health facilities is available and the residence of subprojects are using from health facilities base on need. For complex illness they refer to centre of province and Kabul.

168. **Acute bloody diarrhea.** Diarrhea with dehydration, acute watery diarrhea without dehydration and Malaria. Water-borne diseases are highly prevalent due to unsafe water and unsanitary conditions. While poor water quality is emphasized as a cause of water-borne disease alone, the impact of inadequate water quantity on personal and household hygiene may be as or more important.

169. Afghanistan is one of the world's countries with low Human Development Index (HDI) that shows less access to health facilities and very poor health infrastructure. Afghanistan still suffers from Polio-endemic. Current public health issues in Afghanistan are:

- **Infant and Maternal Health:** Maternal mortality ratio: 396 deaths/100,000 live births (2015)
- **Infant mortality rate:** total: 110.6 deaths/1,000 live births
male: 118 deaths/1,000 live births
female: 102.9 deaths/1,000 live births (2017)
- **Total fertility rate:** 5.12 children born/woman (2017)
Contraceptive prevalence rate: 22.5% (2015/16)
Mother's mean age at first birth: 19.9 years
Median age at first birth among women 25-29 (2015)
- **Life expectancy:** Total population: 51.7 years
male: 50.3 years
female: 53.2 years (2017)
- **Sanitation facility access:** Improved urban: 45.1% of population
rural: 27% of population
total: 31.9% of population
Unimproved urban: 54.9% of population
rural: 73% of population
total: 68.1% of population (2015)
- **Major Infectious Diseases:** Degree of risk: intermediate
Food or waterborne diseases: bacterial diarrhea, hepatitis A, and typhoid fever Vector-borne disease: malaria (2016) – Afghanistan is considered a high risk country for malaria. However, the total confirmed malaria cases decreased by 85% between 2003 and 2012.
- **HIV prevalence is low:** The most affected population is people who inject drugs:
Adult prevalence rate: <.1% (2016)
People living with HIV/AIDS: 7,500 (2016) and Deaths: <500 (2016)
- **No communicable diseases:** No communicable diseases account for 36.6% of all deaths; cardiovascular diseases account for 18.6%, cancers 6.2%, respiratory diseases 2.7% and diabetes mellitus 1.4% of all deaths – (2015)
- **Polio:** Nigeria, Afghanistan and neighboring Pakistan are the only remaining polio-endemic countries in the world. Insecurity and bans from anti-government militants such as DAESH/ISIS and the Taliban prevent successful implementation of polio vaccination campaigns in Afghanistan and Pakistan.

170. Mental health, drug addition, nutrition, disabilities and rehabilitation, and vaccination are other diseases in entire Afghanistan which take thousands people life every year in Afghanistan.

e) Domestic Water Supply

171. **Sources and availability.** The main sources of domestic water in the NCB-06 areas are river, and well.

172. **Links between domestic water supply and irrigation.** Domestic water supply and irrigation water distribution can be linked in several ways. Some communities use irrigation canals water for their domestic supply. Others use ground water, and in some cases ground water quantity and quality can be affected by irrigation water quantity and quality. Thus, irrigation system management can both directly and indirectly affect the domestic water supplies of individuals, families, and communities.

173. **Domestic water supply behaviours.** A study to understand unexpected behaviours around access to water supplies was commissioned by the NGO, DACAAR, which installed more than 24,000 wells to provide safe drinking water primarily to rural communities in south, east, and west Afghanistan between 1990 and the early 2000s. Though DACAAR's work area did not include northern Afghanistan, the study findings indicate the types of issues that could be in play in the LKIP area. The remainder of this section consists of an extended paraphrase from this study.¹⁰

174. **Owned space and water.** Land ownership has a substantial impact on how water supply is perceived and used. Three forms of village land ownership were identified: public, private and tribe or clan. Tribe or clan owned village land is considered to be the joint property of a group of families from one tribe or clan. The families sometimes compete in claiming temporary land ownership, and newly installed tube-wells can play a part in this process. There is less overt competition between families for control of private and public land but a family can enhance their relative social status by providing water to other families from their own private well, or by paying for the maintenance of a public well.

175. **Water supply and drought.** The drought in Afghanistan during the 1999-2002 had both direct and indirect impacts on drinking water supply. Wells ran dry and community-based maintenance was also affected. Traditionally wealthy families paid the maintenance costs of public wells; but they became less inclined to do so during the drought when funds were tight. Another factor is that wealthy families increasingly have their own private wells, which insulates them from the impact of public well breakdowns and reduces their motivation to pay public well maintenance costs.

f) Physical Cultural Resources

176. It has been established that there are no known historical sites in NCB-06 areas. However, during construction of the NCB-06 areas works the contractor and SBA site engineers will be vigilant for chance finds during excavation activities.

177. Local stakeholders stated that no physical cultural resources of importance to them (mosques, graveyards, etc.) were located in or near areas potentially affected by RSP activities.

g) Agriculture

178. The agriculture products in subprojects area are Crops (Wheat, Maize, Rice, cotton, Melon, Water melon), in vegetable (lettuce, tomatoes, Potatoes, Peppers, Cauliflower, lady fingers, eggplant, cucumbers, Pumpkin, Onions and garlic) and in Fruit (Apples, Grapes, Almond, Apricot, Peach, Pear)

¹⁰ Klijn, Floortje. 2002. Water Supply and Water Collection Patterns in Rural Afghanistan - An Anthropological Study. Kabul: DACAAR. <http://reliefweb.int/sites/reliefweb.int/files/resources/835738AA2919E2DBC1256BE50055F5D7-dacaar-afg-21jun.pdf>

F. ANTICIPATED IMPACTS AND MITIGATION MEASURES

179. Anticipated impacts and mitigation measures have been discussed considering the following three key phases of the project:

- Pre-Construction/Rehabilitation phase
- Construction phase
- Operation phase

180. Each phase environmental screening is done in consideration of its impacts on the physical environment, ecological environment, and socio-economic development.

181. The significance of potential impacts was assessed using the risk assessment methodology that considers impact magnitude and sensitivity of receptors, described below.

182. The potential implications of the project have been categorized as major, moderate, minor or nominal based on consideration of the parameters such as i) duration of the effect; ii) the spatial extent of the impact; iii) reversibility; iv) likelihood; and v) legal standards and established professional criteria.

183. The magnitude of each potential impact of the Project has been identified according to the categories outlined in Table 2.

Table 2: Parameters for Determining Magnitude

Parameters	Major	Moderate	Minor	Minimal
Duration of potential impact	Long term (beyond the project period)	Medium Term Lifespan of the project (within the project period)	Limited to construction period	Temporary with no detectable potential impact
Spatial extent of the potential impact	Widespread far beyond project boundaries	Beyond next project components, site boundaries or local area	Within project boundary	Specific location within project component or site boundaries with no detectable potential impact
Reversibility of potential impacts	Potential impact is effectively permanent, requiring considerable intervention to return to baseline	Benchmark needs a year or so with some responses to come back to baseline	Baseline returns naturally or with limited response within a few months	Baseline remains constant
Legal standards and established professional criteria	Breaches national standards and or international guidelines/obligations	Complies with limits given in national standards but violates international lender guidelines in one or more parameters	Meets minimum national standard limits or international guidelines	Not applicable
Likelihood of potential impacts	Occurs under typical operating or construction	Happens under worst-case (negative consequences) or best	Occurs under abnormal, exceptional or	Unlikely to happen

Parameters	Major	Moderate	Minor	Minimal
occurring	conditions (Certain)	case (positive impact) working conditions (Likely)	emergency conditions (occasional)	

Sensitivity of Receptor

184. The sensitivity of a receptor has been determined based on a review of the population (including proximity/numbers/vulnerability) and the presence of features on the site or the surrounding area. Each detailed assessment has defined sensitivity to the topic. Criteria for determining receptor sensitivity of the Project's potential impacts are outlined in Table 5.

Table 3: Criteria for Determining Sensitivity.

Sensitivity Determination	Definition
Very Severe	Vulnerable receptor with little or no ability to absorb proposed changes or minimal opportunities for mitigation.
Severe	Vulnerable receptor with little or no ability to absorb proposed changes or limited opportunities for mitigation.
Mild	Vulnerable receptor with some ability to absorb proposed changes or moderate opportunities for mitigation
Low	Vulnerable receptor with good ability to absorb proposed changes or/and excellent opportunities for mitigation

Assessing Significance

185. Following the assessment of impact magnitude and determining the quality and sensitivity of the receiving environment or potential receptor, Magnitude, spatial extent and duration of impact the significance of each potential impact was established using the impact significance matrix shown in Table 20.

Table 4: Criteria for Determining Impact Significance.

Magnitude of Impact	Sensitivity of Receptors			
	Very Severe	Severe	Mild	Low
Major	Critical	High	Medium	Negligible
Moderate	High	High	Medium	Negligible
Minor	Medium	Medium	Minor	Negligible
Minimal	Negligible	Negligible	Negligible	Negligible

186. The initial feasibility analysis is performed to make sure that the existing RoW is Presents minimal engineering challenges (e.g., avoids rock outcrops, steep slopes, water bodies, and other similar features to the extent possible) and results in the least impact to the existing public infrastructures and environment.

187. Carefully selection of the proposed structures to avoids or reduces major environmental impacts. Therefore, activities that could occur during the detailed design phase are field surveys for recording significant resources present in a potential project area (e.g., cultural resources, archaeological sites or wetlands). These surveys are typically of short duration and result in the limited disturbance.

188. All the essential permits must be obtained and regulatory requirements must be achieved before detail design. The subproject canals are surveyed to identify and specified the proposed

structures to be constructed generally, only small survey crews and survey equipment would be required. The below potential impacts might result from the project site evaluation activities.

Impacts and Mitigation Measures

a) Impacts and Mitigation Measures during the Pre-Construction Phase

189. The NCB-06 secondary canals sites evaluation and pre construction phase impacts such as preliminary survey site characterization, and monitoring are usually temporary and of relatively smaller magnitude. The impacts at this stage include vehicular, pedestrian traffic, interruption to the people especially women working in agriculture field are collecting water from canals.

190. The initial feasibility analysis is performed to make sure that the existing RoW is Presents minimal engineering challenges (e.g., avoids rock outcrops, steep slopes, water bodies, and other similar features to the extent possible) and results in the least impact to the existing public infrastructures and environment.

191. Carefully selection of the proposed structures to avoids or reduces major environmental impacts. Therefore, activities that could occur during the detailed design phase are field surveys for recording significant resources present in a potential project area (e.g., cultural resources, archaeological sites or wetlands). These surveys are typically of short duration and result in the limited disturbance.

192. All the essential permits must be obtained and regulatory requirements must be achieved before detail design. The NCB-06 secondary canals are surveyed to identify and specified the proposed structures to be constructed generally, only small survey crews and survey equipment would be required. The below potential impacts might result from the project site evaluation activities.

193. **Physical Environment - Impacts on Soils and Geologic Resources and Mitigation Measures:** Surface disturbance and use of geologic materials are minimal during the site assessment phase, and soils and geologic resources are unlikely to be affected. Site survey activities would also be unlikely to activate geological hazards or increase soil erosion.

Overall Mitigation Measures: Sitting and design considerations that mitigate impacts include:

- Identify soil properties, engineering constraints, corrosive potential, and facility design criteria.
- Consider the floodways for proposed structures in the detail design phase.
- Identify and avoid areas with unstable slopes and local factors that can cause slope instability (groundwater conditions, precipitation).
- Develop a site grading and management plan to identify areas of disturbance, areas of cut and fill, slope during and after grading, existing vegetation, and measures to protect slope, drainages, and existing vegetation in the project area.
- Develop an erosion control and re-vegetation plan to delineate measures to minimize soil loss and reduce sedimentation to protect water quality.

Impact of/on	Extent of impact
Soil	=Low
Geologic resource	=Low

Flooding and Erosion Impacts: Floods are the most frequent natural hazard in Afghanistan and result in the largest economic damage. Changes in precipitation patterns as well as earlier spring

snowmelt that are expected with climate change will increase risks for different types of floods (e.g. flash floods);

194. According to HDR/Afghanistan, 2011 "In the middle of the 20th Century, surveyors estimated the total forest cover in Afghanistan at 3.1 million to 3.4 million hectares. Today, woodlands occupy less than 1.0 million to 1.3 million hectares (2 percent of the total area of the country), while the north-eastern and eastern regions are prone to high-intensity floods. A remote sensing analysis undertaken in Kunduz and Takhar provinces in 1977 and then again in 2002 revealed that the forest cover had shrunk by more than 50 percent in the interim. If deforestation continues at the present rate, the country's woodlands will disappear in three decades." A comparison of forest land in 1977 and 2002 in the Kunduz and Takhar province in the northern Afghanistan is presented in **Error! Reference source not found..** Which shows more than 50% reduction in the forest area in this province, the project influence area

195. **Overall Mitigation Measures:** For flood management watershed has been constructed to prevent water flow and upgrade underground water surfaces. As Under output 3 (Water sheds are properly managed and protected) of Panj Amu River Basin project establishes 26 watersheds, out from them 17 are already completed. A part from that there are other complementary activities under mentioned output such as:

1. Watersheds management technical manual and guidebook development
2. Establishment of 26 Forest Management Associations (FMA)
3. NRM plans development (26)
4. Trainings for DAIL and CDCs members pertaining NRM management. These activities will help restore 10,500 ha of forestry and/or rangeland in the vicinity of 21 prioritized schemes and protect irrigation structures under output 1 and 2 from flash floods and sedimentation.

196. In addition to above the main objective of establishment of WUAs and IAs are to ensure long term sustainability of the project and to make the irrigation infrastructure last its economic life through promotion of active participation of irrigation users in their management, distribute equitable water among the farmers, efficient use of water in the system.

197. Based on Afghanistan water law all water users are responsible for preparation of the annual plan for usage of water in the 4 seasons of the year, also the Mirab, Mirab Bashi and Check Bashi are responsible for O&M of the main, secondary and tertiary canals during the year based on the action plan which prepared by the cooperation of all stakeholders and their approval.

198. One of the main tasks of the WUA and IAs is coordination between these two associations during seasonal flood and are noted as below:

WUA Responsibilities:

- Act based on RBA/SBA direction during flood
- Control water in the intake
- Inform all Mirabs along the main canal
- Inform all elders of the villages
- Inform all Secondary Canals Mirabs for the flood coming to close the secondary canal regulating gates.
- Open all spillways in the main canals
- Have regular contacts by phone/any other possible equipment's.
- Inform RBA and SBA from all damages done by flood
- Arrange necessary actions for repair of damage parts

IAs Responsibilities:

- Has full coordination with WUA
- Act based on WUA, RBA, SBA, DAIL directions during flood
- Inform all tertiary canals Mirabs

- Closing of SC regulating gates by order of Main canal Mirab
- Inform all farmers
- Have regular contact with all stakeholders
- Cleaning of SC after flood if there is silt coming by flood

199. So flood risk mitigation is part of the responsibilities of IAs and WAs. Project planning trainings to IAs and WAS where a long with other topics their capacity will be also boost up pertaining to flood risk management.

Impact of/on	Extent of impact
Flood erosion	=Medium

200. **Impacts on Health and Safety and Mitigation Measures:** Occupational and community health and safety risks normally associated with construction and outdoor activities exist, however, are very limited during the site assessment phase because of the limited range of activities. Siting and design considerations that mitigate impacts include:

- Conducting a safety assessment to describe potential safety issues (site access, construction, work practices, hazardous materials, security, transportation of heavy equipment, traffic management, emergency procedures, wildlife encounters, and fire control and management) and measures to mitigate them.
- Develop and implement a health and safety program for workers and the public, addressing all the safety issues identified in the assessment and all applicable safety standards.
- Address specific issues (e.g., school bus routes and stops) in a traffic management plan or in the health and safety program.

Impact of/on	Extent of impact
Health and Safety	=Low

b) Impacts and Mitigation Measures during the Construction Phase

201. The proposed NCB-06 secondary canals construction process includes the following steps:

202. The area of proposed structures would be cleared of vegetation, and other items that may prohibit construction. In addition to these activities, the establishment of access roads to some structures which have no access road or far from existing road would also be needed.

203. The activities during project's construction phase, potentially causing environmental impacts, include ground clearing and removal of trees and vegetative cover, loss of landscape, view shed value, habitat value due to tree removal, excavation, vehicular and pedestrian traffic, noise, dust water pollution and so on.

204. Environmental concerns of the NCB-06 sub canals can include the following:

- Terrestrial habitat alteration (as this project does not cross any forest so this impact is negligible)
- Aquatic habitat alteration
- Hazardous materials (IFC, 2007)

205. The following impacts, presented by resource, may result from the construction activity.

Impact of/on	Extent of impact
Health and Safety	=Low

206. Physical Environment - Impacts on Topography and Mitigation Measures: Land use during construction would be affected by intrusive impacts such as ground clearing, increased traffic, noise, dust, and human activity, as well as by changes in the visual landscape.

207. Vegetation removal and ground disturbance could result in visual impacts that produce contrasts of color, form, texture, and line. Excavation for foundations and ancillary structures; surfacing roads; clearing and leveling staging areas; and stockpiling soil and spoils (if not removed) would (1) damage or remove vegetation, (2) expose bare soil, and (3) suspend dust.

208. Specific mitigation measure recommended during the construction phase of the project are:

- Bring construction material from authorized sites.
- Avoid creating excessive slopes during excavation.
- Dispose of excess excavation materials in approved areas to control erosion and minimize leaching of hazardous materials.
- Save topsoil removed during construction and use to reclaim disturbed areas.
- Stabilize soils during final landscaping of project site.

Impact of/on	Extent of impact
Topography	=Medium

209. **Impacts on Acoustics (Noise) Environment and Mitigation Measures:** The sources of noise during construction would primarily occur from equipment (Excavator, heavy vehicle, and diesel engines). The additional noise sources include vehicular traffic and labor. In most cases, the NCB-06 secondary canals are passing away from residential areas. In places that the canals passes near residential areas such as villages, schools, and other sensitive receptors the noise levels from equipment must not exceed the allowable range. In some cases, the construction noise could exceed the permissible noise levels indicated in the World Bank General EHS guidelines but would be intermittent and extend for only a limited time.

210. **Noise Impacts on Workers and Mitigation Measures:** The noise of construction and transportation will have a negative impact on workers. Noise could cause hearing loss, impair the ability to communicate and hear high-frequency sounds and even permanent hearing loss. During construction of the proposed structures and excavation of foundation, there would be noise from construction equipment. The levels would range from about 70 decibels (dB) for a paving breaker to about 85 dB from large trucks. The noise must not exceed the OSHA all worker permissible exposure limit of 80 dBA for eight hours day. There are two main ways to reduce and control worker exposure to noise in the workplace where the noise is excessive:

- **Engineering Control:** this involves replacing or modifying equipment, or bringing relevant changes at the source of noise or along the noise transmission path. The contractor must make sure that the low noise level machinery and tools are utilized. Maintain and lubricate equipment and machinery (oil bearings) in accordance with its respective manufacturer recommended periods. Place a noise barrier such as curtains and sound walls between the employees and the noise source. And isolate or enclose the noise source.
- **Administrative Control:** this includes changes in the schedule or workplace that eliminate or minimize the labors exposure to noise. The contractor must schedule the noisy machinery operation when fewer workers are exposed in case possible, limit the time a worker spends near a noisy source, and provide a quiet area where employees can gain relief from noise sources. Furthermore, the control of the noise exposure through distance is often a simple, inexpensive and yet effective administrative noise control way. To be precise, for every

double of the distance between the workers and the noise source the noise could be reduced by 6 dBA (OSHA, 2017).

211. **Noise Impacts on Communities and Mitigation Measures:** Work outside the usual working hours/day will have negative impacts in terms of noise and disturbances in communities. Therefore, it is recommended that no construction should be allowed during nighttime (22:00-07:00); particularly the construction material transportation or night construction work could be limited to relatively quiet activities, such as interior work.

212. As this project does not require a huge amount of construction work at a specific location the impacts of noise will be minimal. However, if the noise still exceeds the allowable limits the above-mentioned mitigation measures should be taken. The contractor must have a sound level meter at the site to continuously monitor and record the noise level.

213. Additional key mitigation practices for noise impacts that could apply to all phases of this project include:

- Limit noisy activities to the least noise-sensitive times of the day (weekdays only between 07:00- 22:00).
- Whenever feasible, schedule different noisy activities to occur at the same time, since additional sources of noise generally do not add a significant amount of noise. That is, less-frequent noisy activities would be less annoying than frequent less-noisy activities.
- Heavy-duty equipment should have sound-control devices no less effective than those provided on the original equipment.
- Notify nearby residents in advance when noisy activities are required.
- To the extent feasible, route heavy truck traffic supporting construction activities away from residences and other sensitive receptors.

Impact of/on	Extent of impact
Noise	=Low

214. **Impacts on Air Quality and Mitigation Measures:** Emissions generated during the construction phase include diesel emissions from generators and large construction equipment, vehicle emissions; emissions from storage and transfer of fuels for construction equipment; and fugitive dust from various sources such as disturbing and moving soils (clearing, excavating, backfilling, dumping, and truck and equipment traffic), mixing concrete. Air quality impacts could also occur if cleared vegetation is burned. Therefore, measures need to be taken to mitigate these emissions.

215. The construction work of the project generates particulate matter, which can be a significant pollutant particularly in any nearby areas such as residential areas. During the construction of the project, fugitive dust comes from blowing exposed soil or other particles. Fugitive dust becomes an issue as the land is cleared and graded, and as delivery trucks and other vehicles and equipment travel on dirt or gravel roadways in the construction area. The dust becomes a nuisance in nearby neighborhoods, a face and lung irritant, or a visual obstacle in nearby streets. The dust must be suppressed, and this is usually done by spraying unpaved roads with water and stabilizing exposed soil areas.

216. Vehicle and diesel generator emission will have a negative impact on the environment. Therefore, vehicles and generators should be kept in good working condition and properly maintained, in order to minimize the exhaust emissions. The dust emissions should be minimized by methods, such as spraying water on soil, where required and removal of dirt and mud from vehicles

wheels before leaving the project site and the loading plants. In addition, the vehicle should move at a slow speed in the site and on unpaved roads to avoid excessive dust emissions. Attention should be given to conserve water during the construction. The construction and operation worker should be provided with liquefied petroleum gas (LPG) for cooking and heating if required, and the usage of fuel wood should not be allowed. Generators and vehicles used in this project should have exhaust mufflers to minimize the exhaust and noise.

217. The below mitigation measures are recommended in all phases of the project to control the air quality particularly during the construction phase:

- Use dust abatement techniques on unpaved surfaces to minimize dust and during earthmoving activities, prior to clearing, before excavating, backfilling, compacting.
- Introduce speed limits to reduce airborne fugitive dust from vehicular traffic.
- Limit access to the construction site and staging areas to authorized vehicles only through the designated treated roads.
- When possible, schedule construction activities during periods of low winds to reduce fugitive dust.
- Cover construction materials and stockpiled soils if they are a source of fugitive dust.
- Train workers to handle construction materials and debris during construction and dismantlement to reduce fugitive emissions.
- Keep soil moist while loading into dump trucks.
- Keep soil loads below the freeboard of the truck.
- Minimize drop heights when loaders dump soil into trucks.
- Tighten gate seals on dump trucks.
- Around the work area, the NO₂ (annual average concentration) must not exceed 0.053 ppm and Sulphur Dioxide (SO₂) - 0.14 ppm.
- Cover dump trucks before traveling on public roads (TEEIC, 2017).

Impact of/on	Extent of impact
Air quality	=Low

218. **Impacts on Cultural and Historic Resources and Mitigation Measures:** Direct physical disturbance through construction activities such as vegetation removal and earthmoving, or building renovation; indirect construction disturbance by blasting or vibration; increased human access; and operational impacts that include altering the amenity of a site or area by factors such as noise, vibration and reduction in scenic quality (ADB, 2012; Environment Safeguard a Good Practice Sourcebook).

219. Potential impacts to cultural resources include:

- Complete destruction of the resource if present in areas undergoing surface disturbance or excavation;
- Vandalism, theft and illegal export of movable Physical Cultural Resources (PCR), and of pieces of monumental PCR.
- Degradation or destruction of near-surface cultural resources on- and off-site resulting from changing the topography, changing the hydrological patterns, and soil movement (removal, erosion, sedimentation).
- Unauthorized removal of artifacts because of human access to previously inaccessible areas.
- Soil compaction, damaging buried PCR (archaeological and paleontological) on site.

- Vibration, air, soil and water pollution, leading to damage to natural and human-made PCR in the vicinity (ADB, 2012; Environment Safeguard a Good Practice Sourcebook).

220. To avoid adverse impacts to PCRs it is recommended to undertake the following mitigation measures:

- Searches need to be conducted to determine the presence of known archaeological sites and historic structures within the area of potential effect. Identify the need for an archaeological and/or architectural survey.
- Periodic monitoring of significant cultural resources near the development may be required to reduce the potential for looting and vandalism.
- An unexpected discovery of cultural resources during any phase of the project shall result in a work stoppage near the find until the resources can be evaluated by a professional archaeologist.
- Educate workers and the public on the consequences of unauthorized collection of artifacts.
- During all phases of the project, keep equipment and vehicles within the limits of the initially disturbed areas.
- Prepare and follow a cultural resources management plan, if cultural resources are present at the site or if areas with a high potential to contain cultural material have been identified.
- Use existing roads to the maximum extent feasible to avoid additional surface disturbance.

Impact of/on	Extent of impact
Culture and historical resource	=Low

PCR Chance Find Procedure

221. An unexpected discovery of cultural resources during any phase of the project shall result in a work stoppage near the find until the resources can be evaluated by a professional archaeologist. Chance finds must not be disturbed until avoidance, minimization or mitigating measures are developed by competent experts from Afghanistan Ministry of Information and Culture (MoIC). Workers should be educated on the consequences of unauthorized collection of artifacts.

222. The contractor must develop a cultural resources management plan. The plan should include:

- Definition of the PCR to which the procedure applies
- Ownership of the found artifacts: Ministry of Information and Culture
- Recognition procedure for identifying chance finds during project implementation
- Procedure upon discovery, a rapid response procedure to protect chance finds while minimizing disruption to project activities (i.e., stipulates the procedures for consultation with the authorities legally responsible for PCR, demarcation of the discovery site, chance finds report, arrival, and actions of cultural authority, and suspension/non-suspension/further suspension of work) (ADB, 2012; Environment Safeguard a Good Practice Sourcebook).

Impact of/on	Extent of impact
PCR change and find procedure	=Low

223. **Impacts on Water Quality and Mitigation Measures:** Use of or spills of chemicals could

result in contamination of surface and groundwater. There is always the risk of the spill which could result the soil and water contamination.

224. In addition, water would be required for making concrete, dust control and consumptive use by the construction workers. Depending on availability, it may be trucked in from off-site or obtained from local groundwater wells.

Water quality can be affected by:

- Activities that cause soil erosion;
- Weathering of newly exposed soils causing leaching and oxidation that can release chemicals into the water;
- Discharges of waste or sanitary water;
- Herbicide applications; and
- Contaminant spills, especially oil.

225. Following mitigation measures are recommended to reduce the adverse impacts on water quality:

- Save topsoil removed during construction and use it to reclaim disturbed areas upon completion of construction activities.
- For in-stream construction, use isolation techniques such as diversion to limit the exposure of disturbed substrates to moving water.
- Closely monitor construction near aquifer recharge areas to reduce potential contamination of the aquifer.
- Obtain borrow material from authorized and permitted sites.
- Dispose of excess excavation materials in approved areas to control erosion and minimize leaching of hazardous materials.
- Pollution of rivers by vehicles and waste shall be forbidden and controlled, (e.g. no car washing in the rivers, no oil spills, etc.).
- Where access roads would cross a dry wash, restrict the road gradient to 0% to avoid diverting surface waters from the channel specifically near the river and canals.

Impact of/on	Extent of impact
Water quality	Medium

226. **Waste and Hazardous Material Management:** Solid can be generated during construction activities. The solid wastes are expected to be nonhazardous and consist of mostly containers and packaging materials, miscellaneous wastes from equipment assembly and presence of construction crews (food wrappers and scraps). Industrial wastes would include minor amounts of paints, coatings, and spent solvents. Most of these materials would likely be transported off-site for disposal. Impacts could result if hazardous wastes were not properly handled and were released to the environment.
227. The secondary containment should be considered wherever wastes are stored in volumes greater than 110 Kg . The available volume of secondary containment should be at least 110 percent of the largest storage container, or 25 percent of the total storage capacity (whichever is greater), in that specific location. Provide adequate ventilation where volatile wastes are stored.
228. General mitigation practices and principles that could apply to all phases of this project

include:

- Implement plans for hazardous materials management, waste management spill prevention and response, and storm-water management.
- Train employees to promptly contain, report, and/or clean up any oil or hazardous material spill.
- Provide secondary containment for all on-site hazardous materials and waste storage, including fuel.
- Containerize and periodically remove wastes for recycling or for disposal at appropriate off-site permitted disposal facilities.
- Provide portable spill containment and cleanup equipment in all vehicles.
- Keep vehicles and equipment in good working order to prevent oil and fuel leaks.
- Document accidental releases as to cause, corrective actions are taken, and resulting environmental or health and safety impacts.
- All measures for waste management, waste storage, transportation, etc. mentioned in the IFC general EHS (2007) guidelines must be followed.

Impact of/on	Extent of impact
Waste and hazardous material	=Low

229. **Ecological Environment (Flora and Fauna):** The secondary canals proposed structures planned to be constructed at the canals right of way and has less impact on flora. However, a number of non-fruit trees should be removed, as well as some structures have no access road which needs to be passed by agricultural land, Therefore, mitigation measures need to be considered to avoid the excessive removal of the flora, the impacts of the construction process on fauna are not expected to be significant.

230. Dust settling on vegetation may alter or limit plants' abilities to photosynthesize and/or reproduce. Although the potential for an increase in the spread of invasive and noxious weeds would occur during the construction phase due to increasing traffic and human activity, the potential impacts could be partially reduced by interim reclamation and implementation of mitigation measures.

There are two major types of impacts on vegetation:

- **Direct impacts:** vegetation and trees removal or damage during construction activities.
- **Indirect impacts:** on vegetation from air pollution or surface water contamination during construction of the proposed structures along the canals right of way.

231. The ecological survey of the site confirmed lack of endangered and ecologically significant fauna and flora. Therefore, there are no serious biological concerns with the implementation of this project.

232. The following mitigation measures during construction are recommended to reduce the adverse impacts on the environment:

- Use existing facilities and disturbed areas (e.g., access roads, graded areas) to the extent feasible to minimize the amount of disturbance.
- Given that trees are supposed to be cut on the proposed structures it is recommended to compensate it by planting the similar type trees on at least 1:10 ratio at nearby free space.
- Conduct blasting for raw materials only within specified times and at specified distances from sensitive wildlife or surface waters as specified by IFC/NEPA.

- Refuel in a designated fueling area that includes a temporary berm to limit the spread of any spill. Use drip pans during refueling to contain accidental releases and under fuel pump and valve mechanisms of any bulk fueling vehicles parked at the construction site.
- Retain all ground-level vegetation and stumps left after cutting, unless their removal is necessary to install support structures or other ancillary facilities.
- Schedule construction activities to avoid important periods of wildlife courtship, breeding, nesting, lambing, or calving.
- Re-vegetation of disturbed areas with native plant species and unnecessary removal of plants should be avoided.
- Use dust abatement techniques on unpaved, un-vegetated surfaces to minimize airborne dust.
- If an endangered species is found during construction, work in the area will be stopped and NEPA and other relevant institutions should be immediately notified (TEEIC, 2017). Prior and During construction phase, monitoring and inspection of the sites will be done by the contractor and CPMO environmental focal points to notify if there are any endangered species or not. And this assessment will be part of SSEMP and will record the information in the SAEMRs too.

Impact of/on	Extent of impact
Flora and fauna	=Low

233. **Socioeconomic Environment and Land Use:** No new irrigation channels will be built so no communities will be split most land use impacts would be temporary, such as disruption of irrigation water supplies at in-canals construction sites, blockage of vehicle, pedestrian paving of access road, removal of livestock from grazing areas during periods of blasting or heavy equipment operations; curtailing hunting near work crews; or temporary effects to the character of a recreation area because of construction noise, dust, and visual intrusions. ROW clearing could result in the long-term loss of timber production there will be a positive impact on work availability due to the need for temporary construction staff from the local area during the construction period. There will be some potential adverse impacts like temporary water supply distribution problems Conflict over hiring of jobs, Privacy of the local communities i.e. ladies working in the field or at nearby during construction activities, Water use for washing and domestic use by local women Fetching of water by ladies from the canals or river, Canals and river quality issue during rehabilitation process, health and safety aspects of construction which will be mitigated by the construction contractors. There will be no impact on any public infrastructure such as transmission lines...etc. See a full list of mitigation measures below (Table) which address socio-economic impacts. During the consultation meeting with the villagers it was agreed that all labor will be local people hired from the project area, even the skilled workers that live in the villages. Also the contractor will work in coordination with the community head (CDC) and WUAs. Local water supply problems will be solved with a temporary canals with temporary water access points, and also after rehabilitation of the canals water access points will be constructed in the existing canals.

234. Siting and design considerations that mitigate impacts include:

- Establish a reclamation plan to ensure that all temporary impact areas are restored.
- The civil work's contractor will provide temporary irrigation channels and roads/paths.
- Where possible, the construction work will be prioritized during the late autumn and winter seasons, depending on the weather and accessibility.
- Consolidate infrastructure requirements (transmission, roads) for efficient use of land.

- Distribute a proposed schedule of construction activities to all potentially affected landowners and nearby residents so they know when they might experience construction-related disruptions.
- Minimize the amount of land disturbance, and develop and implement stringent erosion and dust control practices.
- Repair underground drainage tile damage on agricultural lands.
- Repair compacted or rutted agricultural lands.
- Dewater open trenches in a manner that does not damage the adjacent agricultural land. If this cannot be done, compensate the landowner appropriately.
- Compensate farmers for crop losses and restore compacted soils.

235. Direct positive socioeconomic impacts would include the creation of new jobs for construction workers and the associated increase in the yield. Indirect impacts would occur as a result of the new economic development and would include new jobs at businesses that support the expanded workforce or provide project materials, and associated income and taxes. Local people hiring will have positive socio-economic impacts on the community. It is, therefore, recommended to hire local labor for the construction phase of this project.

Impact of/on	Extent of impact
Socioeconomic	=Medium

Residual Impacts

236. As this canal rehabilitation project and haven't major residual impact; some temporary minor impact will be producing during the construction phase of the project and the proposed mitigation measures will be considered to minimized the level of impact. In the below table the summary of residual impact has been provided:

Table 5. Summary of Residual Impacts

S. No.	Activities /potential impacts	Nature of Impact / Significant	Mitigation Measures	Residual Impacts
1	Physical Environment (Soil, Geologic Resource)	Temporary, low	<p>Identify soil properties, engineering constraints, corrosive potential, and facility design criteria.</p> <p>Consider the flood ways for proposed structures in the detail design phase.</p> <p>Identify and avoid areas with unstable slopes and local factors that can cause slope instability (groundwater conditions, precipitation).</p> <p>Develop a site grading and management plan to identify areas of disturbance, areas of cut and fill, slope during and after grading, existing vegetation, and measures to protect slope, drainages, and existing vegetation in the project area.</p> <p>Develop an erosion control and re-vegetation plan to delineate measures to minimize soil loss and reduce sedimentation to protect water quality.</p>	The impact of the project on the soil and geologic resource are not expected to be significant. With the implementation of mitigation measures outlined above, the environmental potential impacts will be low in magnitude. Therefore, residual impacts are expected to be not significant.
2	Flood Erosion	Medium	<p>For flood management watershed has been constructed to prevent water flow and upgrade underground water surfaces. As Under output 3 (Water sheds are properly managed and protected) project establishes 26 watersheds, out from them 17 are already completed. A part from that there are other complementary activities under mentioned output such as:</p> <ol style="list-style-type: none"> 5. Watersheds management technical manual and guidebook development 6. Establishment of 26 Forest Management Associations (FMA) 7. 26 NRM plans development 8. Trainings for DAIL and CDCs members pertaining NRM management. 	Provided the proposed mitigative measures are implemented, the environmental effects will be temporary, and low in magnitude on Flood erosion. Therefore, no significant adverse residual environmental impacts are likely to occur.

			<p>These activities will help restore 10500 ha of forestry and/or rangeland in the vicinity of 21 prioritized schemes and protect irrigation structures under output 1 and 2 from flash floods and sedimentation.</p> <p>In addition to above the main objective of establishment of WUAs and IAs are to ensure long term sustainability of the project and to make the irrigation infrastructure last its economic life through promotion of active participation of irrigation users in their management, distribute equitable water among the farmers, efficient use of water in the system.</p> <p>Based on Afghanistan water law all water users are responsible for preparation of the annual plan for usage of water in the 4 seasons of the year, also the Mirab, Mirab Bashi and Check Bashi are responsible for O&M of the main, secondary and tertiary canals during the year based on the action plan which prepared by the cooperation of all stakeholders and their approval.</p> <p>One of the main tasks of the WUA and IAs is coordination between these two associations during seasonal flood and are noted as below:</p> <p>WUA Responsibilities:</p> <p>Act based on RBA/SBA direction during flood Control water in the intake Inform all Mirabs along the main canal Inform all elders of the villages Inform all Secondary Canals Mirabs for the flood coming to close the secondary canal regulating gates. Open all spillways in the main canals Have regular contacts by phone/any other possible equipment's. Inform RBA and SBA from all damages done by flood Arrange necessary actions for repair of damage parts</p>	
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			<p>IAs Responsibilities:</p> <p>Has full coordination with WUA Act based on WUA, RBA, SBA, DAIL directions during flood Inform all tertiary canals Mirabs Closing of SC regulating gates by order of Main canal Mirab Inform all farmers Have regular contact with all stakeholders Cleaning of SC after flood if there is silt coming by flood</p> <p>So flood risk mitigation is part of the responsibilities of IAs and WAs. Project planning trainings to IAs and WAS where a long with other topics their capacity will be also boost up pertaining to flood risk management.</p>	
3	Health and Safety	Temporary and low in magnitude	<p>Conducting a safety assessment to describe potential safety issues (site access, construction, work practices, hazardous materials, security, transportation of heavy equipment, traffic management, emergency procedures, wildlife encounters, and fire control and management) and measures to mitigate them.</p> <p>Develop and implement a health and safety program for workers and the public, addressing all the safety issues identified in the assessment and all applicable safety standards.</p> <p>Address specific issues (e.g., school bus routes and stops) in a traffic management plan or in the health and safety program</p>	A preventative health and safety program will be implemented for construction, operation, and decommissioning that ensures that the public and workers are not adversely affected during routine operations, and that contingency plans will be in place to prevent impacts during accidents, malfunctions, and unplanned events.
4	Waste Management	Temporary, Low	Throwing of waste in and nearby area of river should be avoided.	Provided the proposed mitigative measures are implemented, the environmental impacts will be low in magnitude, will be intermittent and

				short term. Therefore, the significance of the environmental impacts is expected to be not significant
5	Water quality	Temporary, Medium	<p>Save topsoil removed during construction and use it to reclaim disturbed areas upon completion of construction activities.</p> <p>For in-stream construction, use isolation techniques such as diversion to limit the exposure of disturbed substrates to moving water.</p> <p>Closely monitor construction near aquifer recharge areas to reduce potential contamination of the aquifer.</p> <p>Obtain borrow material from authorized and permitted sites.</p> <p>Dispose of excess excavation materials in approved areas to control erosion and minimize leaching of hazardous materials.</p> <p>Pollution of rivers by vehicles and waste shall be forbidden and controlled, (e.g. no car washing in the rivers, no oil spills, etc.).</p> <p>Where access roads would cross a dry wash, restrict the road gradient to 0% to avoid diverting surface waters from the channel specifically near the river and canals.</p>	<p>Provided the proposed mitigative measures are implemented, the environmental impact will be temporary, and low in magnitude on water quality, in the same time on aquatic ecosystem. Therefore, no significant adverse residual environmental impacts are likely to occur.</p>
6	Cultural and historical Resource	Temporary and low in magnitude	<p>Complete destruction of the resource if present in areas undergoing surface disturbance or excavation;</p> <p>Vandalism, theft and illegal export of movable Physical Cultural Resources (PCR), and of pieces of monumental PCR.</p> <p>Degradation or destruction of near-surface cultural resources on- and off-site resulting from changing the topography, changing the hydrological patterns, and soil movement (removal, erosion, sedimentation).</p> <p>Unauthorized removal of artifacts because of human access to previously</p>	<p>No significant adverse residual environmental impacts on cultural and historical resource are likely to occur.</p>

			<p>inaccessible areas.</p> <p>Soil compaction, damaging buried PCR (archaeological and paleontological) on site.</p> <p>Vibration, air, soil and water pollution, leading to damage to natural and human-made PCR in the vicinity (ADB, 2012; Environment Safeguard a Good Practice Sourcebook).</p>	
7	Land use and Access roads	Temporary, Low	<p>Specific mitigation measure recommended during the construction phase of the project are:</p> <ul style="list-style-type: none"> - Bring construction material from authorized sites. - Avoid creating excessive slopes during excavation. - Dispose of excess excavation materials in approved areas to control erosion and minimize leaching of hazardous materials. - Save topsoil removed during construction and use to reclaim disturbed areas. <p>Where access roads would cross a dry wash, restrict the road gradient to 0% to avoid diverting surface waters from the channel specifically near the river and canals.</p>	<p>Provided the proposed mitigative measures are implemented as suggested, the potential Impact is considered non-significant. Therefore; no significant adverse residual environmental impacts on soil, vegetation and agriculture are likely to occur.</p>
8	Noise	Temporary, Low	<p>Limit noisy activities to the least noise-sensitive times of the day (weekdays only between (07:00- 22:00)).</p> <p>Whenever feasible, schedule different noisy activities to occur at the same time, since additional sources of noise generally do not add a significant amount of noise. That is, less-frequent noisy activities would be less annoying than frequent less-noisy activities.</p> <p>Heavy-duty equipment should have sound-control devices no less effective than those provided on the original equipment.</p> <p>Notify nearby residents in advance when noisy activities are required.</p> <p>To the extent feasible, route heavy truck traffic supporting construction activities away from residences and other sensitive receptors.</p>	<p>Provided the proposed mitigative measures are implemented, the Noise impacts will be temporary, and low in magnitude. Therefore, no significant adverse residual environmental impacts are likely to occur.</p>

9	Air Quality	Temporary, Low	<p>Use dust abatement techniques on unpaved surfaces to minimize dust and during earthmoving activities, prior to clearing, before excavating, backfilling, compacting.</p> <p>Introduce speed limits to reduce airborne fugitive dust from vehicular traffic.</p> <p>Limit access to the construction site and staging areas to authorized vehicles only through the designated treated roads.</p> <p>When possible, schedule construction activities during periods of low winds to reduce fugitive dust.</p> <p>Cover construction materials and stockpiled soils if they are a source of fugitive dust.</p> <p>Train workers to handle construction materials and debris during construction and dismantlement to reduce fugitive emissions.</p> <p>Keep soil moist while loading into dump trucks.</p> <p>Keep soil loads below the freeboard of the truck.</p> <p>Minimize drop heights when loaders dump soil into trucks.</p> <p>Tighten gate seals on dump trucks.</p> <p>Around the work area, the NO₂ (annual average concentration) must not exceed 0.053 ppm and Sulphur Dioxide (SO₂) - 0.14 ppm.</p> <p>Cover dump trucks before traveling on public roads (TEEIC, 2017).</p>	<p>Provided the proposed mitigative measures are implemented, the impacts will be, temporary, and low in magnitude. Therefore, no significant adverse residual environmental impacts are likely to occur.</p>
10	Waste and Hazardous Material Generation & Management	Temporary, Low	<p>Implement plans for hazardous materials management, waste management spill prevention and response, and storm-water management.</p> <p>Train employees to promptly contain, report, and/or clean up any oil or hazardous material spill.</p>	<p>Provided the proposed mitigative measures are implemented, the environmental effects will be temporary, and low in magnitude. Therefore, no</p>

			<p>Provide secondary containment for all on-site hazardous materials and waste storage, including fuel.</p> <p>Containerize and periodically remove wastes for recycling or for disposal at appropriate off-site permitted disposal facilities.</p> <p>Provide portable spill containment and cleanup equipment in all vehicles.</p> <p>Keep vehicles and equipment in good working order to prevent oil and fuel leaks.</p> <p>Document accidental releases as to cause, corrective actions are taken, and resulting environmental or health and safety impacts.</p> <p>All measures for waste management, waste storage, transportation, etc. mentioned in the IFC general EHS (2007) guidelines must be followed.</p>	<p>significant adverse residual environmental impacts are likely to occur.</p>
11	Ecological Environment (Flora and Fauna)	Temporary, Low	<p>Use existing facilities and disturbed areas (e.g., access roads, graded areas) to the extent feasible to minimize the amount of disturbance.</p> <p>Given that trees are supposed to be cut on the proposed structures it is recommended to compensate it by planting the similar type trees on at least 1:10 ratio at nearby free space.</p> <p>Conduct blasting for raw materials only within specified times and at specified distances from sensitive wildlife or surface waters as specified by IFC/NEPA.</p> <p>Refuel in a designated fueling area that includes a temporary berm to limit the spread of any spill. Use drip pans during refueling to contain accidental releases and under fuel pump and valve mechanisms of any bulk fueling vehicles parked at the construction site.</p> <p>Retain all ground-level vegetation and stumps left after cutting, unless their removal is necessary to install support structures or other ancillary facilities.</p> <p>Schedule construction activities to avoid important periods of wildlife courtship, breeding, nesting, lambing, or calving.</p>	<p>Provided the proposed mitigative measures are implemented, the environmental effects will be temporary, and low in magnitude. Therefore, no significant adverse residual environmental impacts are likely to occur.</p>

			<p>Re-vegetation of disturbed areas with native plant species and unnecessary removal of plants should be avoided.</p> <p>Use dust abatement techniques on unpaved, un-vegetated surfaces to minimize airborne dust.</p>	
12	Socioeconomic Environment and Land Use	Temporary, Medium	<p>Establish a reclamation plan to ensure that all temporary impact areas are restored.</p> <p>The civil work's contractor will provide temporary irrigation channels and roads/paths.</p> <p>Where possible, the construction work will be prioritized during the late autumn and winter seasons, depending on the weather and accessibility.</p> <p>Consolidate infrastructure requirements (transmission, roads) for efficient use of land.</p> <p>Distribute a proposed schedule of construction activities to all potentially affected landowners and nearby residents so they know when they might experience construction-related disruptions.</p> <p>Minimize the amount of land disturbance, and develop and implement stringent erosion and dust control practices.</p> <p>Repair underground drainage tile damage on agricultural lands.</p> <p>Repair compacted or rutted agricultural lands.</p> <p>Dewater open trenches in a manner that does not damage the adjacent agricultural land. If this cannot be done, compensate the landowner appropriately.</p> <p>Compensate farmers for crop losses and restore compacted soils.</p>	<p>Provided the proposed mitigative measures are implemented as suggested, the potential Impact is considered non-significant.</p> <p>Therefore; no significant adverse residual environmental impacts on soil, socioeconomic and land use are likely to occur.</p>

G. ENVIRONMENTAL MANAGEMENT PLAN

237. The impacts and proposed mitigation measures as described above are summarized in the EMP **Table 6**. The mitigation plan will be reviewed and developed to a greater level of detail at several points during Project implementation.

238. Capacity building of MAIL institutions (DAILs and IAs) responsible to implement operation-phase measures at second/tertiary/farm levels, to mitigate the impacts of irrigation operation and knock-on agricultural changes, will be mainstreamed into the activities of Project Output 2, "Improved on-farm water management".

239. **Environmentally Responsible Procurement as a Mitigation Measure** Prior to sourcing construction materials from an existing quarry, or before creating a quarry from which to source construction materials, contractors will identify the quarry or potential quarry site to the relevant PIO. Procurement can proceed only after a PIO construction supervisor, advised and assisted by their PMO environment safeguards officer and field staff if necessary, has determined that no significant adverse impacts are posed by the quarry site or quarrying activities (e.g. sedimentation, erosion, or sliding adversely affecting water courses, settlements, roads, agriculture etc.). If significant adverse impacts are identified, mitigation measures at the proposed quarry / quarry site may be considered, or a different existing quarry / quarry site / quarrying activity can be substituted and assessed.

240. **Responsibility for Mitigation Implementation - Overview.** Responsibilities for mitigation implementation (pre-construction to operation) are shown in **Table 6**.

241. **Pre-construction phase.** Responsibility for implementing pre-construction mitigation measures will rest with MAIL PMO (**Table 6**).

242. **Construction phase.** Responsibility for implementing construction mitigation measures will rest with contractors selected to implement civil works packages, under the supervision and overall management of the responsible ministry's PIO and PMO respectively (**Table 6**).

243. **Operation phase.** Mitigation of operation-phase impacts involves, first, capacity building of sub-basin and RSP level institutions (SBAs, DAILs, WUAs, IAs), and then implementation of mitigation measures by the strengthened institutions. Capacity building to implement operation-phase mitigation will be planned by MAIL PMO with the advice and assistance of FSDC and ICS. The planned capacity building activities will be delivered by staff or contract trainers under their supervision to staff/members of the SBAs, DAILs, WUAs, and IAs, who will be responsible for implementing operation-phase mitigation (**Table 6**).

244. Some contractors may not have previously implemented works for ADB before. There is a need for all contractors to understand the implications of environmental management and their responsibilities in management of the site. A Site-Specific Environmental Management Plan (SSEPM) will therefore need to be developed by the contractor's Environmental Specialist, and be tabled to the satisfaction of the PMO and CPMO, 10 days before the commencement of any site works.

Table 5: Environmental Management Plan.

Potential impacts	Nature of impacts	Significance	Duration	Mitigation Measures	Cost	Responsibilities
1. Recommendation during project location, design and contract completion phase						
Non-compliance of the technical design to applicable national and international guidelines	- Quality of construction (i) to ensure structures and canals are not vulnerable to the anticipated increase in flash flooding with ability to withstand potential impact of increase in high velocity storms.	Medium	Long Term	- Final technical design of the building should take into consideration the following: (i) construction specifications to incorporate technical specification to withstand increase in uncharacteristic storm events anticipated with climate change. .	Included in the project cost	MAIL PMO
Need for vegetation / tree removal.	- Design layout may initiate need to remove existing vegetation.	Medium	Long-term	- Design should at all times aim to follow existing canals alignment so to minimise need for vegetation removal. - An SRP will be applied using template for any vegetation removal.	Included in the project design cost	MAIL PIO
Protected areas; Areas of ecological significance & historical and cultural monuments and values	- The sub project is located outside all of the protected areas and multiple use area. The surrounding land use is dominated by cultivated agricultural land. Thus, potential impact on local protected, ecological and cultural features is not envisaged.	Low	Long term	- It is specified in project documentation that an archaeological assessment will be completed prior to any on-site works. - In the event of unanticipated discoveries in the course of the work, contractor shall take all necessary measures to protect findings, notifying PIO and SBA representatives.	Included in the project cost	Contractor, PIO
Downstream impacts (Water Quantity)	- Increased irrigation could cause decrease in available water for downstream farmers but this project is CSA water management irrigation so risk is not likely	Low	Short	- As part of the environmental monitoring plan, water availability monitoring will be conducted in downstream villages during the wet and dry seasons to minimize any adverse impacts and take any	Project cost (capacity building & FWUC Package)	PMO/PIO/ WUAs Monitor by: MAIL, PIO

Potential impacts	Nature of impacts	Significance	Duration	Mitigation Measures	Cost	Responsibilities
	to be significant.			necessary remedial measures in a timely manner if necessary.		
Flooding and erosion	- Some sections of the project alignment could be vulnerable to flooding and erosion especially during intense melt-down periods.	Medium	Short Term	- Impacts will be reduced or avoided by appropriate qualitative design and skilled contractor together with environmental consideration including incorporation of bio-engineering factors like use of gabions and plantation of shrubs & tree along alignment where applicable. - flood management watershed to prevent water flow and upgrade underground water surfaces -	Cost of the plantation (in construction contract)	PMO/PIO
Contractor not aware of specific on-site EMP responsibilities.	- Contractors may not have previously been required to comply with environmental safeguards and there may not maintain standards.	High	Contract	- Contractor to develop and table a SSEMP 10 days minimum before commencing construction.	Contractor .	Contractor, PIO, PMO.
2. Impacts during Construction						
Confusion and anger by community regarding scope and size of construction activity.	- Lessons learnt from other projects indicate ignorance by farming community of size, scope and temporary impact from project activities.	Low	Short Term	- Communication regards the scope or activity should be shared with the Community using clear photographs, plans and sketches to illustrate works to be done across the site.	PIO and Contractor costs.	
Water pollution	- Currently, use of agricultural chemicals is available in the project area. The primary objective of the Project is to provide supplementary wet season irrigation and dry	Medium	Long Term	- Educational program on the fertilizer uses and environmental impacts should be provided. - Environmental monitoring of water quality is conducted by PMU to assess any negative impact on the	Training budget; monitoring budget	DOA Monitor by: PMO

Potential impacts	Nature of impacts	Significance	Duration	Mitigation Measures	Cost	Responsibilities
	season irrigation but the project scale is very small. Therefore, it is not likely to significantly increase the use of agricultural chemicals. However environmental consideration, especially about the toxic chemical used, must be considered.			<p>water bodies and collaborate with DOA to ensure appropriate use of agricultural chemicals.</p> <ul style="list-style-type: none"> - Water quality test will be conducted prior or during the construction phase 		
Creation of access to site & establishment of temporary storage sites	<ul style="list-style-type: none"> - Contractor will need to access the entire length of canals, thru farming land and crossing existing canals and rivers. - Crop damage could occur. 	Medium	Short Term	<ul style="list-style-type: none"> - Contractors will discuss and agree on specific vehicular access to each construction site with farmers & community prior to any on-site works. - Contractor will make good these tracks and storage areas at completion of works. 	Contractor shall absorb the costs of such activities into contract.	Contractor, PIO.
Land required for temporary canals diversion.	<ul style="list-style-type: none"> - Water flows maybe required during construction period and land will be required to establish canals. 	Low	Short Term	<ul style="list-style-type: none"> - Land and alignment of temporary canals. - Discussions with WUA and community before construction to get written agreements about location, size, and length of time for a diversion – 	Agreed with WUA's before commencement.	Contractor, WUA's, PIO.
Mature tree removal and general vegetation clearance	<ul style="list-style-type: none"> - During construction, there may be a need to remove existing vegetation and excavate existing soil profiles. Such activity will incur loss of view-shed, habitat, amenity, fuel wood source and existing erosion control. 	Medium to High	Medium to long term	<ul style="list-style-type: none"> - The contractor is obliged to exercise care to preserve the natural environment (including soils, water and vegetation). - All trees for removal will be quantified and replaced on a ratio 1:5 - Specific species, location and period of maintenance for establishment will be agreed with in 	<p>Contractor shall absorb the costs of such activities into contract.</p> <p>Costs for specific</p>	Contractor, PIO

Potential impacts	Nature of impacts	Significance	Duration	Mitigation Measures	Cost	Responsibilities
				collaboration with community members.	tree specimens & planting to be included in contract	
Excavation of existing canals for construction.	<ul style="list-style-type: none"> - Excavation will be required along canals length and at regulator sites. - Soil erosion could occur during earthwork and clearing along the line of irrigation canals. 	Low	Short term	<ul style="list-style-type: none"> - All excess spoil is to be relocated from site and relocated to the discretion of the community. - Good construction practices shall help to mitigate soil erosion and siltation - Top soil is to be kept separate from other. - At works completion, all excavations made good. 	Contractor - costed into construction contract (and requirement in contract docs)	Contractor Monitor: PIO/PMU
Impact from waste within and across the site	<ul style="list-style-type: none"> - Contractor activity will generate waste and will require management. 	Low	Short term	<ul style="list-style-type: none"> - On site need for Solid Waste Management (SWM) plan. 	Contractor obliged to manage.	
Dust from material transportation and construction and	<ul style="list-style-type: none"> - Impact from dust could occur during the construction thru improper construction management. . 	Low	Short Term	<ul style="list-style-type: none"> - Water shall be sprayed during construction if activity is located close 50 m to villages to ensure that dust is minimized in construction zones. - Dry material handling and transport generate large amounts of dust thus: - The Contractor shall prepare a dust control program. - Water shall be sprayed where dry materials are handled, crushed and transported. - Vehicles transporting materials are 	Costed into Costed into Construction contract (and requirement in contract docs)	Contractor Monitor: PIO/PMO

Potential impacts	Nature of impacts	Significance	Duration	Mitigation Measures	Cost	Responsibilities
				to be covered to reduce spills and dust.		
Air pollution and noise	- Vehicle and equipment emissions cause air pollution and noise. Adverse impact could occur during the construction phase in case of improper construction management but is not likely significant.	Low	Short Term	- Vehicles and equipment are to be maintained to meet emission and noise standards. - Construction within 100m of a village or town is to be limited to times agreed with community.	Costed into Construction contract (and in contract docs)	Contractor Monitor: PIO/PMO
Human waste from construction	- An adverse impact could occur if contractors have no designated on-site latrines during the construction phase. Informal latrines can generate flies and transmitted diseases which can result in unsanitary condition.	Low	Short Term	- Provision of sanitary facilities (latrines, burying, etc.) with proper waste disposal will be provided by contractors for the entire period of the on-site construction period. -	Costed into Construction contract (and in contract docs)	Contractor Monitor: PIO/PMO
Solid waste generation from construction, work sites and workers.	- Solid waste can create nuisance and bad odor, and encourage disease vectors. - Solid Waste Management (SWM) is recognized as an import indicator for contract success.	Low	Short Term	- An appropriate SWM plan is to be put in place by the contractor for construction camps and work sites. And be emptied daily, the waste being disposed of in an approved dump site. - Every camp and work site should be clean during stay and before moving to a new sites.	Costed into Construction contract (and in contract docs)	Contractor Monitor: PIO/PMO
Soil erosion	- Soil erosion could occur during excavation earthworks and clearing along the line of irrigation canals.	Low	Short	- Appropriate construction practices shall help to mitigate soil erosion and siltation.	Costed into Construction contract (and in contract docs)	Contractor Monitor: PIO/PMO

Potential impacts	Nature of impacts	Significance	Duration	Mitigation Measures	Cost	Responsibilities
Worker safety and health	- Some workers will be recruited for construction activities and workers' camp will be constructed. These will include non-skilled workers, operators and drivers as well as surveyors and construction supervisors. Since the works will be relatively small scale and expected to be completed within one-year, large numbers of workers are not expected. However, safety and health impacts will be also expected.	Low	Short Term	<ul style="list-style-type: none"> - Workers should wear protection equipment during works to ensure that they are safe and good health. - A contractor should develop a guideline on working mechanism, health and safety during construction. Manager should educate his workers on health and safety projection. 	Costed into Construction contract (and requirement in contract docs)	Contractor Monitor: PIO/PMO
Pollution from cement, fuels and black oil	- During the construction period there will be use of cement, fuels and oils for machinery. These materials could be spilt on site and there can be impact on surrounding agricultural land.	Low	Medium Term	<ul style="list-style-type: none"> - Secure storage of all toxic and hazardous materials including cement, fuels and oils. - Ensure mixing of concrete and maintenance of vehicles and plant is limited to designated sites. - Fuels & oils should be securely stored. 	costed into Construction contract (and requirement in contract docs)	Contractor Monitor: PIO/PMO
3. Environmental Impacts during Operation						
Inadequate O&M	- Poor and inadequate operation and maintenance (O&M) of the improved irrigation systems could cause unintended adverse environmental impacts.	Low	Medium Term	<ul style="list-style-type: none"> - Acceptable and appropriate O & M should be developed for sustainable operation and maintenance. - Sufficient training must be also provided so seed farm personnel will be able to manage, operate and maintain the irrigation in sustainability. 	Project Cost (in design, capacity building)	PMO/PIO/PIC

Potential impacts	Nature of impacts	Significance	Duration	Mitigation Measures	Cost	Responsibilities
				- WUA's to be given training in O&M.		
Hydrological changes Conflict of water utilization	<ul style="list-style-type: none"> - Change in timing, flows, flooding, drainage, erosion and sedimentation will occur by default with the project. - expected conflict on water use 	Low	N/A	<ul style="list-style-type: none"> - Irrigation works are well designed and constructed; - WUA's and RBA's are supported to achieve intended benefits while mitigating adverse impacts. 	N/A	RBA /management and PMO/PIO WUAs
Ground Water Resources	<ul style="list-style-type: none"> - The groundwater in project command area should benefit from construction. 	Low	N/A	- N/A	N/A	N/A

Table 6: Summary of Monitoring Requirements.

Mitigation measure	Monitoring parameters	Location	Measurements	Frequency	Responsibility	Cost
Pre-construction						
Incorporate water access points agreed with local communities into SP designs	Designs	(MAIL) office	Check designs against water access point list	Once, before signing off on designs	MAIL PMO	Included in design & support consultant costs
Incorporate standard construction contract environmental safeguard clauses (IEE Appendix 9) and EMP into tender documents	Tender documents	(MAIL) office	Check tender documents for required inclusions	Once, before signing off on tender documents		
Prepare and submit environmental clearance application to NEPA for each RSP. Track and respond to NEPA queries	Environmental clearance certificate progress	(MAIL) office	Query status of applications	Ensure they are obtained prior to planned construction start dates so certificate process continues to progress.	MAIL PMO	Included in MAIL staff & construction contractor costs
Investigate and accept/reject commercial quarries / proposed RSP local quarry sites for acceptable environmental impacts	Indications of erosion, landslides, landform & view shed damage	Candidate quarry sites	Photographs	Once for each site, prior to quarry selection	MAIL PIOs & construction contractors	Included in MAIL staff & construction contractor costs
Archaeology inspection of excavation sites, rescue archaeology / excavation monitoring as required, prior to commencing excavation	Archaeology test pit(s)	Excavation sites	Presence/absence of archaeological findings	Once at each site, prior to commencing excavation	Archaeology expert, respective ministry's design & support	Included in MAIL design & support consultant's staff costs

Mitigation measure	Monitoring parameters	Location	Measurements	Frequency	Responsibility	Cost
					consultant	
Construction						
Afforestation - tree plantation and on-going replacements ¹¹ .	Number of trees planted; trees surviving/died; tree growth and replacements.	Community-identified afforestation locations	Photographs; inventory; girth/height measurements; visual assessment	Included in construction supervisor site visits	MAIL PIOs & construction contractors	Included in MAIL staff & construction contractor costs
Routine construction housekeeping measures per contractor EMP	Noise, dust, air pollution PM 10, fuel/oil spills, improper liquid/solid waste disposal	Construction sites	Visual assessment of dust, liquid / solid found outside proper receptacles. Vehicle inspections to check exhaust and noise. Site visits	Once, before construction work; Every 6 months during construction phase	MAIL PIOs, Contractor	Included in construction contractor costs
Noise	Noise level in dBA	Near residents and inside the construction site	Average of 15 minutes measurement of the noise level in dBA	Once before construction and Daily during construction	MAIL PIOs, Contractor	Included in construction contractor costs
Air pollution	CO, NOx, Sox, PM10 and 2.5	Work area	Laboratory measurements of air samples	Monthly during construction	MAIL PIOs, Contractor	Included in construction contractor costs

¹¹ Note: the detailed has been requested from the site and it will be adding once the data received.

Mitigation measure	Monitoring parameters	Location	Measurements	Frequency	Responsibility	Cost
			Monitoring will be carrying out prior to start of construction			
Flora and fauna	<p>Respect for minimal ground clearance (1 km) in design.</p> <p>The extent of lay down areas and routing of new access roads</p> <p>Implementation of Avifauna protection measures</p>	Subproject ROW	<p>Regular visual inspection during construction</p> <p>Complete study area survey after construction</p>	<p>Six Monthly during construction</p> <p>General survey after construction</p>	MAIL PIOs, Contractor	Included in construction contractor costs
Waste	<p>Implementation of Sewerage and Waste Management Plan.</p> <p>Septic tanks at each construction campsite Measures to prevent spills of liquid wastes</p>	Work area	Design compliance, Visual control	Daily monitoring during construction process; EHS Audit	MAIL PIOs, Contractor	Included in construction contractor costs

Mitigation measure	Monitoring parameters	Location	Measurements	Frequency	Responsibility	Cost
	(i.e oil change of construction vehicles).					
Health and Safety	Compliance with EHS Plan (Work Safety / Sanitation, Noise)	Work area and workers camps	Visual Control of EHS Management Plan implementation	Daily monitoring during the construction	MAIL PIOs, Contractor	Included in construction contractor costs
Physical and culture resource	Implementation of the chance procedure	Work area	Visual Control, Records	Monthly during construction	MAIL PIOs, Contractor	Included in construction contractor costs
Grievance Mechanism	Implementation of an accessible grievance mechanism for APs to address complaints at the local level	Community level	Communication of GRM to stakeholders/APs'.	Daily during the construction process	MAIL PIOs, Contractor	Included in construction contractor costs
Select and manage soil disposal sites, in consultation with community	Soil disposal	Soil disposal sites	Photographs	Included in construction supervisor site visits	Included in MAIL staff & construction contractor costs	Included in construction contractor costs
Construct water access points agreed with local communities	Construction of access points per design	Design access point locations	Photographs	Included in construction supervisor site visits		
Temporary irrigation channels or roads/paths. Works prioritized, where possible in late autumn/winter	Water availability for farmers	Construction sites	Photographs; farmer interviews	Included in construction supervisor site visits	WUA's, MAIL PIO,	Included in construction contractor costs

Mitigation measure	Monitoring parameters	Location	Measurements	Frequency	Responsibility	Cost
Community consultation re. Road siting and timing. If significant impact, compensation to the affected.	Meeting reports & minutes.	Construction sites or adjacent community sites.	Reports and photographs of completed work.	At commencement of site work.	MAIL PIO, Contractor	Included in construction contractor costs
Routine construction housekeeping measures per contractor SEMP	Management of oils, fuels, solid waste, spoil etc.	Construction sites	Monthly reports, photographs.		Contractor	Included in construction contractor costs
Pits and redundant canals filled in	Quality of fill, making good.	Adjacent new canals works.	Photographs of before and after.	At completion of site works.	Contractor, WUA's.	Contractor.
Operation and maintenance						
Establish and strengthen RSP WUAs and IAs re: (i) improved management of water, soil, & agricultural pests / pesticides; increased resilience to climate & other variability and (ii) participatory monitoring	WUA and IA establishment status, date, place, training plans; training type trainers, participants vs plan targets	Training locations per training plan	Photographs, training sign- in sheets, training reports	As/when training occurs	MAIL PMO RBA SBA MAIL PMO DAILs MAIL design & support consultant	MAIL staff costs
Implementation of improved management of water, soil, & agricultural pests / pesticides; increased resilience to climate & other variability	Irrigation flow, crops grown, yields, soil quality, pesticide use, agricultural pests	Monitored locations in agricultural fields	Irrigation records; participatory / farmer self-reporting of other parameters	Monthly		
Afforestation – care and maintenance of tree plantations (ongoing watering, fertilizing, protecting from damage of	Trees surviving/died; tree growth	Afforested locations	Photographs; inventory; girth / height measurements; visual assessment	Included in WUA, IA or CMA monitoring work plans	MAIL PMO RBA, SBA; WUAs, IAs MAIL PMO DAILs, CMA	Included in (i) MAIL & MAIL staff costs (ii) WUA, IA or

Mitigation measure	Monitoring parameters	Location	Measurements	Frequency	Responsibility	Cost
afforested trees while initial saplings grown into mature trees)					MAIL design & support consultants	CMA budgets

c) **Estimated EMP Costs Summary**

Table 7: Preliminary cost estimate of the implementation of the EMP is given in Table below.

PROJECT STAGE	DETAILS	ESTIMATED COST (USD)
EMP IMPLEMENTATION TEAM	Salaries for 1-2 staff required for EMP implementation	15,000
AIR, NOISE, WATER TEST COST	Test costs for checking the quality of air, noise and water before, during and post project implementation	10,000
TRAINING OF STAFF	Training on data collection, data entry, data analysis and reporting	5,000
MONITORING AND REGULAR DATA COLLECTION	Regular data collection to gauge the quality of various environmental parameters	10,000
HEALTH AND SAFETY	Office operation cost such as stationary, internet, furniture, etc	5,000
TOTAL	450,00 \$	

245. **Monitoring activities** are shown in **Table 8**. The monitoring plan will be reviewed and developed further at several points during the Project.

246. **Pre-construction phase.** Responsibilities for pre-construction monitoring will rest with and MAIL PMO (**Table 8**).

247. **Construction phase.** Under the direction of the responsible ministry's PMO and with advice and assistance from ISC, monitoring of construction-phase impacts and mitigation will be integrated into the work plans of the responsible ministry's PIO construction supervisors. Schedules of monitoring activities, procedures, and checklists to be used by these supervisors will be prepared in collaboration with them. On-the-job training and backstopping of PIO construction supervisors will be provided as required by the PMO environment safeguards with support from the ICS national environment specialist (**Table 8**).

248. **Operation phase.** Monitoring of operation-phase impacts involves, first, capacity building of sub-basin and RSP level institutions (SBAs, DAILs, WUAs, IAs) to undertake participatory monitoring, and then the undertaking of monitoring activities the strengthened institutions. Capacity building to undertake operation-phase participatory monitoring will be planned by the PMOs with the advice and assistance of ICS. The planned capacity building activities will be delivered by staff or contract trainers under their supervision to staff/members of the SBAs, DAILs, WUAs, and IAs, who will in turn be responsible to undertake operation-phase monitoring (**Table 8**).

249. Note that due to the limited potential impact, no monitoring is planned for soil and water quality, and as such no baseline survey has been undertaken. Note however, that monitoring of water quality is a planned task of the river basin agency and sub-basin agencies. A separate ADB TA project (TA-9095 REG: Strengthening Integrated Water Resources Management in Mountainous River Basins) will likely provide assistance to the Panj-Amu RBA in undertaking a water quality baseline for the river environment, and build its capacity for follow-up water quality monitoring as part of its institutional mandate.

H. PUBLIC CONSULTATION AND INFORMATION DISCLOSURE

a) **Consultation and Disclosure**

250. The consultation meetings at up and downstream were held with the potentially affected

people along the NCB-06 subproject route. The objectives of the meetings were to share the project relevant information with communities and understand their concerns. The information shared included project activities, proposed hydraulic structures to be constructed and their expected impacts on the physical, biological and socio-economic conditions. In coordination with resettlement experts, the concerns of the affected population associated with the project were documented and understood.

251. Public consultation during the environmental screening process of development projects is increasingly considered an important imagination and requirements which increases the authenticity and acceptability of assessment itself but more importantly can possibly enhance the quality of decisions making as well. Stakeholder's consultation

252. /participation during various stages of developmental projects helps improve the decision making and ultimately leads towards sustainable development.

253. Stakeholder consultation is a two-way process. For stakeholders, the consultation process is an opportunity to obtain project information, to raise issues and concerns, and ask questions. For the project proponents, the consultation process offers opportunity to understand the stakeholders and their concerns about the project, their needs and aspirations, and also their suggestions that can potentially help shape the project. Listening to stakeholder concerns and feedback can be a valuable source of information that can improve project design and outcomes and help the project proponent to identify and control external risks.

254. The national legislation and ADB safeguard policies require consultations to be carried out particularly with the affected communities as part of the environmental assessment process. The consultation carried out during the present IEE and reported in this Chapter meet these requirements.

255. **Overview of public consultation programme.** Public consultation meeting have been holding since the beginning of the project related IEE by PIO team. Meeting conducted by participant of affected people, Community Development Councils head, NGOs working on water management and concern Government authority, Water User Association and Forest Associations. The dates, places, attendees, and records of these meetings are documented in **Annex 2**.

256. **Men's meetings:** The concerns expressed by men who attended meetings at the head, mid-canals, and tail areas of each RSP are shown in the combined **annexes**. All of these expressed concerns are incorporated in the RSP designs, with one exception – foot/vehicle bridges (a type of “community structure”) will not be provided, as this type of civil work is outside the scope of Project financing. Stakeholders will be advised of this exclusion as part of IEE local disclosure.

Table 8: Key concerns during the consultation meetings

257. The comments have been raised by community people, NGOs working on water management and concern government authority during the numerous meeting with them in 2018-2019 about the NCB-06 canals construction.

Number	Key Concern shared
1	When the project will start?
2	How and who will compensate the trees?
3	How much will be the cost of per tree?
4	How much is the project budget?
5	Who implement the project?

6	Could this project will create the job opportunity to community people?
---	---

258. **Women's meetings:** Due to security situation and cultural barriers female consultation meeting weren't conducted, and their view reflected by the family head the concerns expressed by family head attended meetings in each of the two RSPs focused on domestic water issues. Consistent across all the meetings, they stated that canals water is an important domestic water source, and therefore they face domestic water supply shortages when there is less water in the canals, typically during the May to Aug/Sep/Oct period. They expect the RSPs will result in more water in the canals during this period, which will benefit them. They expressed a need for domestic water supply physical works – wells or feeder canals to bring water from the irrigation canals to the settlement areas. RSP designs will include water access points for domestic water collection, laundry, and livestock watering. Water access point locations will be identified early in the Project implementation period in consultation with local stakeholders.

259. **On ADB Website.** The draft IEE will be disclosed on the ADB website. Any revised IEE received by ADB will be disclosed on the ADB website when it is received. If no revision is made to the IEE, the draft IEE becomes the final document.

260. Consultation and disclosure during EMP implementation will include:

- pre-construction stakeholder involvement in the design of mitigation measures (specifically, in selecting the locations of water access points and afforestation areas);
- notification to local communities when project activities are going to take place;
- provision for public participation in environmental monitoring;
- public consultation during the preparation of biannual environmental monitoring reports;
- disclosure of biannual environmental monitoring reports on the ADB website; and
- local disclosure of monitoring results to local communities.

261. **NCB006 Construction-Phase Consultation and Disclosure** Construction-phase environmental monitoring will be incorporated into the on-site work plans and checklists of PIO construction supervisors. These supervisors will be in regular contact with WUAs and IAs to exchange information about monitoring activities and results, construction schedules, activities, progress, complaints, and concerns. WUAs and IAs may arrange to participate in construction monitoring as and when they wish.

262. Construction supervisors will include environment-related matters in their regular reporting to PIO management. Management will in turn follow up with stakeholders as needed and appropriate to provide information and resolve issues.

263. Notification of upcoming construction and other PARB activities will be provided to WUAs and IAs for posting at construction sites (e.g. signboards) and in places readily accessible to local people.

264. Semi-annual environmental monitoring reports (SAEMRs) will be prepared documenting environment-related consultation and disclosure events during the reporting period. An example SAEMR outline is provided in **Annex 4**. WUAs and IAs will be consulted during SAEMR preparation. Monitoring results will be locally disclosed in an appropriate manner. SAEMRs will be disclosed on the ADB website.

265. **NCB006 Operation-Phase Consultation and Disclosure** - When NCB006 become operational, the EMP and operation-phase public consultation plan will be reviewed and revised. Public consultation and disclosure on impacts and mitigation of irrigation scheme operation and knock-on agricultural changes will be mainstreamed into the activities of Project Output 2, improved

on-farm water management, and into MEW activities related to operation and maintenance of water conveyance infrastructure and WUA establishment and capacity building.

I. GRIEVANCE REDRESS MECHANISM

266. A grievance redress mechanism (GRM), consistent with the requirements of the ADB Safeguard Policy Statement (2009) will be established to prevent and address community concerns, reduce risks, and assist the project to maximize environmental and social benefits. In addition to serving as a platform to resolve grievances, the GRM has been designed to help achieve the following objectives: (i) open channels for effective communication, including the identification of new environmental issues of concern arising from the project; (ii) demonstrate concerns about community members and their environmental well-being; and (iii) prevent and mitigate any adverse environmental impacts on communities caused by project implementation and operations. The GRM is accessible to all members of the community including workers of contractors.

a) Purpose of GRM

267. The main purpose of the GRM is to educate Project Affected Families (PAFs) about the grievance mechanism and to publicize the complaints procedures to the affected families. It will also inform PAFs about the present arrangement for grievance handling and to assist them to seek redress to unresolved grievance from land acquisition, resettlement dispute and it will also facilitate people who might have objections or concerns regarding the project activities to rise.

268. The GRM was introduced during community consultations and will be publicly available to stakeholders throughout the project and all parties should comply with it particularly the implementation contractor and EA. In the event of a grievance issue, up to three stages will be implemented, as follows;

269. **Stage 1** (maximum 7 days): If a concern arises during construction of the NCB-06 sub canals, the affected person may raise the issue with the contractor. All stakeholders including local residents and the contractors will be aware of the GRM and will be requested to immediately report any incidents to the Project owner. If the issue is resolved directly between the affected person and contractor, no follow-up is required. But the log/record shall be saved in the GRM logbook at the Project owner

270. **Stage 2** (maximum 15 days): If the issue is not resolved, the affected person can submit an oral or written complaint to the project authority or district officials. The district and the Project owner will reply within two weeks and keep a written record of the whole process.

271. **Stage 3** (maximum 15 days): If the issue is still not resolved, the project owner will, if agreed by the affected person, arrange a meeting with the district officials and relevant community representatives to identify a solution. If the issue still cannot be resolved it will be referred to the relevant higher-level authorities including the specialized inspection agency in the province. The project owner may report the process to ADB at any of Stages 1–3, but will do so immediately if Stage 3 is reached.

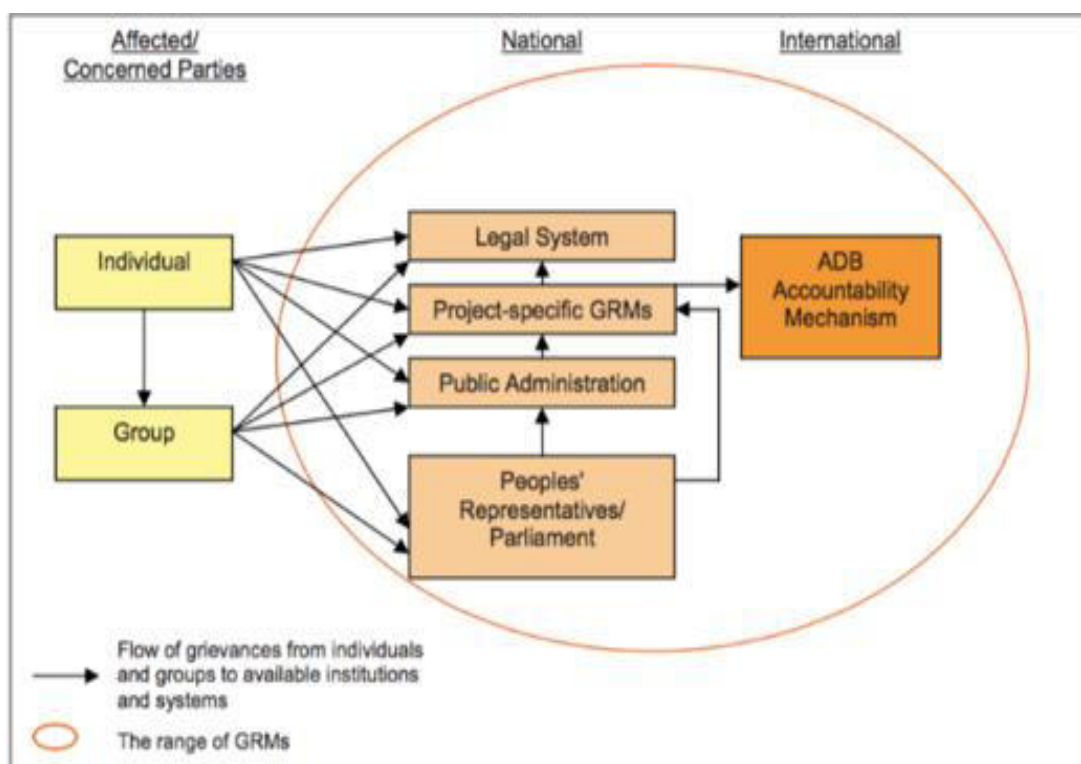
272. **Complaints on Similar ADB Water Resources Projects in Afghanistan** - As mentioned previously, the monitoring reports of four similar ADB projects report very small numbers of complaints made to their GRMs, most related to construction site waste management and were resolved relatively quickly.

273. **Model for construction-phase GRM.** The GRM arrangements of the Western Basin Project appear to provide a good model for the Project to adopt.

274. **Construction-phase GRM.** The GRM will be established prior to commencement of construction in PMOs at central level, PIOs at sub-basin / subproject level, and in the WUAs/IAs at

construction level. WUA/IA heads will be provided with logbooks for grieved individuals to record complaints and comments, and will be charged to inform their PIO of new logbook entries within one week. PIO will respond to complainants within two weeks of the complaint registration date. PIO construction supervisors will attempt to address the complaint at field level. If they are unsuccessful, they will refer the matter to the PIO director, who may communicate with or call a meeting of contractors, PMO and PIO staff, and/or ISC consultants. If this is unsuccessful, s/he will refer the matter to PMO for resolution. At any time, the complainant has the option of seeking legal remedy.

Figure 8: Grievance Redress Mechanist Process Flow Diagram.



J. FINDINGS AND RECOMMENDATIONS

275. **Project Justification** - The NCB-06 secondary canals are anticipated to create significant benefits for local people while having acceptable residual adverse after the implementation of feasible environmental management measures.

276. **Risks and Assurances** - Insecurity and weak governance are a risk to subproject sustainability. To mitigate this risk, PARB subprojects were selected where sustained engagement of project proponents with local government and communities, farmers, and traditional water managers is achievable; and longer-term impact of PARB institutional strengthening on local institutions is possible.

277. Existing and PARB-provided irrigation infrastructure, crops, and communities and their assets more generally are at risk from occurrences of low-frequency, large- magnitude environment-on-project impact events (floods, drought, and earthquakes). These risks are somewhat mitigated by event-resilient engineering design, and through the availability of Government and donor post-disaster relief and rehabilitation support to affected communities.

278. **During early PARB implementation** – as a priority task and as more complete PARB subproject construction information becomes available, PARB environment experts and those responsible for construction-phase subproject EMP implementation will review the subproject EMPs and consultation and disclosure plans, and finalize them to an implementation-ready level of detail.

EMP elements to be upgraded or added, on an as-needed basis, including (i) reporting responsibilities, (ii) EMP work plan, (iii) environmentally responsible procurement plan, (iv) detailed EMP costs, and (v) mechanisms for taking corrective action.

279. **During the transition from construction to early operation**, and then to full benefit realization in each PARB subproject, responsibility for EMP and consultation and disclosure plan implementation will be transferred from implementation-phase PARB environmental managers to operation-phase and ultimately post-PARB RBA environmental managers.

280. During this transition, **additional review and elaboration** of the operation-phase elements of these plans will be necessary, (i) to adjust them to both the NCB-06 environmental management capacity, or include capacity building in areas where this is needed, and (ii) to develop them to a realistically implementable state.

281. The baseline monitoring for air quality, noise and water quality will be carried out prior or during construction phase of the project and data will be including in the project SAEMR.

282. Stakeholder and public consultation meeting will be carrying out during and after the construction phase and will be properly record and reporting in the SAEMRs

K. CONCLUSIONS

283. Based on site surveys of the locations where structures will be built, and following a review of potential wider impacts following public consultation, the NCB - 06 secondary canals are not expected to have significant adverse impacts, given the small scale of the works and the fact that it is basically an exercise in rehabilitation and upgrading of an existing irrigation system. Therefore, the environmental impact of NCB-06 subprojects is expected to be minimal. The only impact of any note is the removal of the some trees which will need to be re- planted.

284. Rehabilitation/reconstruction of the NCB-006 sub-project is required to managed water at sub-canal level as well as on-farm level. There is no environmentally sensitive area adjacent to the canal alignment and it will not cause encroachment on to any precious ecology, and cultural area. This IEE concludes that the adverse environmental impacts arising from the project will be prevented, minimized, mitigated and managed to acceptable levels through the implementation of clearly identified mitigation measures. Therefore, the IEE is considered to be an adequate environmental assessment for the project. A monitoring program for the environment impacts and corresponding mitigation measures will be undertaken to ensure proper implementation of the project.

285. Considering the environmental setting and anticipated impacts due to the proposed improvement works on the NCB 006 sub-project is categorized as Category "B" as per ADB's safeguard policies. As per environmental screening and IEE, no significant adverse impact has been envisaged due to proposed canal rehabilitation and improvement. Anticipated potential impacts are localized and most of them would be limited during construction stage, and reversible. The project would be anticipated to have some moderate adverse impact anticipated on land use, air quality, water quality, noise environment, which will be limited to construction stage. Impact on other environmental attributes will be minor or negligible. Suggested mitigation measures along with the proposed institutional arrangement would ensure that all the adverse impacts are adequately mitigated and the results reported to various stakeholders. some positive impacts are also seen due to the project which may be as follows:

- Increased growth in the economy of the area.
- Temporary employment opportunities.
- Better life style and improved living conditions.
- Increase agriculture production through water management.

- Enhanced women status in the society.
- Reduced health risk.
- Reduced poverty and
- Enhanced Environmental skills and awareness level of the people living around the project.

ANNEX 1: - ENVIRONMENTAL SCREENING CHECKLIST FOR NCB-06 SUBPROJECTS**Instructions:**

- (i) The Project team completes this checklist for each potential subproject to support its classification as ADB environment category A, B, or C.
- (ii) The checklist focuses on environmental issues and concerns. Social screening instruments should be used to screen for social dimensions such as involuntary resettlement, indigenous peoples, poverty reduction, and gender.
- (iii) Complete checklist items for the “without mitigation” case to identify potential environmental impacts. Document potential mitigation measures in the “remarks” column.

Subproject name:**NCB-06****Subproject location:****Kunduz province**

Screening Questions	Yes	No	Remarks
<ul style="list-style-type: none"> Subproject Siting Is the Subproject area adjacent to or within any of the following environmentally sensitive areas? (Attach additional sheets if needed for remarks)			
<ul style="list-style-type: none"> Protected Area 		No	No nearby protected area in NCB-06 areas.
<ul style="list-style-type: none"> Wetland 		No	No wetland in NCB-06 areas.
<ul style="list-style-type: none"> Mangrove 		No	No mangrove in NCB-06 areas.
<ul style="list-style-type: none"> Estuarine 		No	No estuarine in NCB-06 areas.
<ul style="list-style-type: none"> Buffer zone of protected area 		No	No protected area Buffer zone in NCB-06 areas.
<ul style="list-style-type: none"> Special area for protecting biodiversity 		No	Not a special area for protecting biodiversity.
<ul style="list-style-type: none"> Potential Environmental Impacts Will the subproject cause...			
<ul style="list-style-type: none"> Loss of precious ecological values (e.g. result of encroachment into forests/swamplands or historical/cultural buildings/areas, disruption of hydrology of natural waterways, regional flooding, and drainage hazards)? 		No	The NCB-06 areas are not on or near such kind of ecologically valuable land.

Screening Questions	Yes	No	Remarks
<ul style="list-style-type: none"> Conflicts in water supply rights and related social conflicts? 		No	The objective of the PARB project is not just infrastructure rehabilitation and upgrading, but improved water management. This second objective will include training the WUA in improved water allocation canals management plan that will minimize historical inequities. Social conflicts here are largely irrigation water-related, so improved distribution of water will reduce such conflicts.
<ul style="list-style-type: none"> Impediments to movements of people and animals? 		No	The NCB-06 will not cause the impediment to movement of animals and people.
<ul style="list-style-type: none"> Potential ecological problems due to increased soil erosion and siltation, leading to decreased stream capacity? 	Yes		<p>The project not only improves irrigation command area canals structures, but also has a watershed catchment component to provide inputs to the upgrade watersheds that reduce erosion to the downgrade canals system and farmers' fields.</p> <p>Potential impacts:</p> <p>(i) Construction phase – during excavation & operation of diversion canals built to avoid irrigation interruption and construction in the dry.</p> <p>(ii) The project will reduce sedimentation from washes. Not a project impact, but landslides sometimes bring sediment into portions of canals sited at the foot of unstable slopes. This is an on-going maintenance problem for the community.</p>
<ul style="list-style-type: none"> Insufficient drainage leading to salinity intrusion? 		No	<p>Drainage is not a problem in this irrigation system.</p> <p>This impact presumably refers to salinity intrusion changes due to reduced flushing (i.e. rather than insufficient drainage per se) in coastal/estuarine etc. settings.</p>

Screening Questions	Yes	No	Remarks
<ul style="list-style-type: none"> Over pumping of groundwater, leading to salinization and ground subsidence? 		No	Groundwater pumping for irrigation is not a part of this project. Some households pump groundwater from shallow wells for domestic use.
<ul style="list-style-type: none"> Impairment of downstream water quality and therefore, impairment of downstream beneficial uses of water? 		No	The improved infrastructure in this project does not change historical water quality or quantity conditions for the downstream users. More efficient irrigation water usage can increase downstream supplies. Watershed protection inputs will reduce silt-laden runoff downstream.
<ul style="list-style-type: none"> Dislocation or involuntary resettlement of people? 	Yes		No people will be resettled. If privately-owned trees (on publicly- or privately-owned land) are removed during site preparation, owners will be compensated.
<ul style="list-style-type: none"> Disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups? 		No	The project will help the vulnerable people such as: women, children, poor families and etc.
<ul style="list-style-type: none"> Potential social conflicts arising from land tenure and land use issues? 		No	Land ownership disputes are not occurring or expected in this area. Land registration documentation in this area dates to >40 years ago and is functioning relatively well.
<ul style="list-style-type: none"> Soil erosion before compaction and lining of canals? 	Yes		This impact occurs when canals are re-sectioned and compaction/lining is delayed. No re-sectioning is proposed in this project
<ul style="list-style-type: none"> Noise from construction equipment? 	Yes		Contractor will discuss works schedule in consultation with farmers & WUA's.
<ul style="list-style-type: none"> Dust during construction? 	Yes		Contractor will discuss works schedule in consultation with farmers & WUA's.
<ul style="list-style-type: none"> Waterlogging and soil salinization due to inadequate drainage and farm management? 		No	Improved water management strategies imparted to the farmers through training given to the WUAs means that waterlogging and salinization problems will be less than in the past.

Screening Questions	Yes	No	Remarks
<ul style="list-style-type: none"> Leaching of soil nutrients and changes in soil characteristics due to excessive application of irrigation water? 		No	Will not be such environmental issue.
<ul style="list-style-type: none"> Reduction of downstream water supply during peak seasons? 		No	Not only will each irrigation subproject WUA be trained in better water management, but also the River Basin and Sub-basin Agencies will receive training in more efficient and equitable water allocations among the basin's irrigation systems. Both physical and non-physical interventions are expected to improve water supply to tail areas.
<ul style="list-style-type: none"> Soil pollution, polluted farm runoff and groundwater, and public health risks due to excessive application of fertilizers and pesticides? 		No	In the OFWM component of the project farmers will be trained to not overuse fertilizers and pesticides.
<ul style="list-style-type: none"> Soil erosion (furrow, surface)? 	Yes		This is a problem of over-watering due to poor agricultural practices, and will be dealt with in the training in OFWM component of the project.
<ul style="list-style-type: none"> Scouring of canals? 		No	The redesign of the canals system with improved hydraulic control structures will not result in scouring of canals. Canals design is based on maintaining a no-scour, no-degradation condition during canals operation.
<ul style="list-style-type: none"> Clogging of canals by sediments? 	Yes		This is an annual maintenance task of the irrigators. This issue will be addressed in O&M training given to the WUAs.
<ul style="list-style-type: none"> Clogging of canals by weeds? 	Yes		This is an annual maintenance task of the irrigators. This issue will be addressed in O&M training given to the WUAs.
<ul style="list-style-type: none"> Seawater intrusion into downstream freshwater systems? 		No	No sea in the project vicinity.
<ul style="list-style-type: none"> Introduction of increase in incidence of waterborne or water related diseases? 		No	The project will not increase this problem; waterborne or water related diseases is presented so long as animals and people are using canals water.

Screening Questions	Yes	No	Remarks
<ul style="list-style-type: none"> Dangers to a safe and healthy working environment due to physical, chemical and biological hazards during project construction and operation? 	Yes		Most work will be done using manual labour and tools, but limited amounts of equipment and vehicle related air pollution is possible. Fuel and lubricants; welding materials; concrete materials. Solid and liquid construction and domestic waste. Most will be away from settled areas. Contractor is obliged to manage, monitor and report on this.
<ul style="list-style-type: none"> Large population influx during project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)? 		No	The size of the contract is relatively small so the number of skilled labourers and engineer managers needed from outside the area is also small. They can easily fit into the local community for housing needs. Most unskilled labourers are local residents
<ul style="list-style-type: none"> Social conflicts if workers from other regions or countries are hired? 		No	Most unskilled labourers are local residents. Contractors know they must hire local labourers because this is one of the demands from insurgent groups in the area who are also part of the local communities. WUA rules require unskilled labour hired locally, contractor requirement. Labour can be allocated on a rotating basis so that more families benefit
<ul style="list-style-type: none"> Risks to community health and safety due to the transport, storage, and use and/or disposal of materials such as explosives, fuel and other chemicals during construction and operation? 	Yes		Limited amounts of equipment and vehicle fuel and lubricants.
<ul style="list-style-type: none"> Community safety risks due to both accidental and natural hazards, especially where the structural elements or components of the project (e.g., irrigation dams) are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and decommissioning? 	Yes		Safety infrastructure: large structure designs will include fences/gates, handrails etc. Unexploded ordinance: risks to workers and community members during construction and O&M. Mitigation-preconstruction mine clearance certification.


ANNEX 2: - IEE PUBLIC CONSULTATION MEETING RECORDS

PARB Sub-Project Community Consultation and Site Disturbance Data For NCB-06 Subprojects (Head, Mid & Tail)




ATTENDANCE LIST OF FGD CONSULTATION MEETINGS,

- Chal Dukhtayan -



ADB

Panj-Amu River Basin(P-ARBP)
Grant Number:0506/0507-AFG



Kochā e hesar consultation meeting attendance sheet (Men Group)
Project Location: Baharak district ,Badakhshan Province ,Afghanistan

No	Name	Accupation	Phone Nuber	Signature	Remarks
1	قورماندان نیکو				
2	سراج الدین				
3	امیر الدین				
4	احمد داود				
5	عبدالجبار				
6	جمال الدین				
7	غنی				
8	احمد الدین				
9	محمد اکبر				
10	نور				
11	علام				
12	عبدالصمد				
13	میرزا قاسم				
14	علام سخی				
15	احمد (کن)				
16	عبدالجلیل				
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حاضرین



Panj-Amu River Basin(P-ARBP)
Grant Number:0506/0507-AFG



Kocha e hesar consultation meeting attendance sheet (Men Group)
Project Location: Baharak district ,Badakhshan Province ,Afghanistan

No	Name	Accupation	Phone Nuber	Signature	Remarks
1	شریف				
2	نذیر محمد				
3	عبد القدر				
4	اروزی محمد				
5	مجیب رحمان				
6	شفیع محمد				
7	نور الدین				
8	حسن محمد				
9	محمد الیاس				
10	جمال الدین				
11	اسد الله				
12	بیتي خان				
13	نجیب الله				
14	بان محمد				
15	فضل الدین				
16	حامی محمد				
17	محمی الدین				
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حاضرین

ADB

Panj-Amu River Basin(P-ARBP)

Grant Number:0506/0507-AFG



Kocha e hesar consultation meeting attendance sheet (Men Group)

Project Location: Baharak district ,Badakhshan Province ,Afghanistan

No	Name	Accupation	Phone Nuber	Signature	Remarks
1	شريف				
2	نذير محمد				
3	عبد القدر				
4	اوزي محمد				
5	محب رکن				
6	شفير محمد				
7	نور الدين				
8	حسن محمد				
9	محمد ابراهيم				
10	جمال الدين				
11	اسد الله				
12	بيبي خان				
13	نجيب الله				
14	خان محمد				
15	فضل الدين				
16	حاجي محمد				
17	محيي الدين				
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Figure 9: NCB-06 secondary canals photos.





ANNEX 3: - IEE EXAMPLE; ENVIRONMENTAL MONITORING REPORT (EMR)

Project Number: {XXXXXX}
{Reporting period: Month Year}

{Full Country Name}: {Project Title}
 {(Financed by the <source of funding>)}

Prepared by {author(s)}

{Firm name}

{City, country}

For {Executing agency}
 {Implementing agency}

Endorsed by: (staff name of IA/PIU) and signature, submission date

- I. Introduction
 - a. Preamble
 1. This report represents the Semi - Annual Environmental Monitoring Review (SAEMR) for INSERT PROJECT NAME.
 2. This report is the (insert number of report, i.e. 1st, 2nd etc.) EMR for the project.
 - b. Headline Information
 3. Include a brief summary of significant outcomes of the project construction process and any specific areas of concern of which ADB should be informed.
- II. Project Description and Current Activities
 - c. Project Description
 4. Provide a brief description of the project. – This should not vary from one report to the next.
 - d. Project Contracts and Management
 5. Provide a list or table of main organizations involved in the project and relating to Environmental Safeguards. This should include lender, borrower, PIU, Main Contractor/s and significant sub-contractors, environmental staff of various organizations should be named, and contact details provided.
 6. Provide a description of how the contracts are being managed and names of key personnel.
 - e. Project Activities During Current Reporting Period
 7. Provide an outline of major activities which have been carried out during the current reporting period. Provide adequate information so the reader can understand what has been taking place on site. Include photographs (with date stamp) of activities where possible and relevant. Place bulk photographs into an annex to the main report or a separate photographic record.
 8. Where multiple work sites are involved provide information on which work sites have been active during the current reporting period. Provide map of work site areas if relevant.
 9. Provide details (chart) of worker numbers (maximum, Minimum) in the current reporting period and anticipated changes in staff in following period.
 10. Highlight any significant new activities commenced during the current reporting period.
 11. For the above make maximum use of charts, images and tables.
 - f. Description of Any Changes to Project Design
 12. Describe any changes to the project design from that which was assessed in the Impact Assessment phase of the project and is set out in the Initial Environmental

Examination/Environmental Impact Assessment. If none have taken place, please state – No changes.

13. Note if significant changes have occurred the PIU should have already informed ADB of this and made a decision on the need for updates to the EIA/IEE and/or Environmental Management Plans

g. Description of Any Changes to Agreed Construction methods

14. Provide a description and reason for changes to any construction processes, for example, blasting of rock rather than excavation, open channel rather than thrust boring at road crossings.

III. Environmental Safeguard activities

h. General Description of Environmental Safeguard Activities

15. Please provide a summary of the routine activities undertaken by environmental safeguard staff during the current reporting period. This should include the work undertaken by the contractor's environmental manager, the Environmental Supervisor and any informal visits by the PIU environmental staff.

i. Site Audits

16. Please provide details (table form preferred) of any formal audits undertaken by environmental safeguard process staff during the current reporting period. This would include Contractors Environmental Manager, Environmental Supervisor, PIU Staff and ADB staff during review missions.

17. Information required includes:

- Date of Visit
- Auditors Name
- Purpose of Audit
- Summary of any Significant Findings
- Cross reference to Audit Report which should be included as an annex.

18. Summarize Findings of Audits under taken in the current period, compare with previous periods and identify any trends or common issues.

j. Issues Tracking (Based on Non-Conformance Notices)

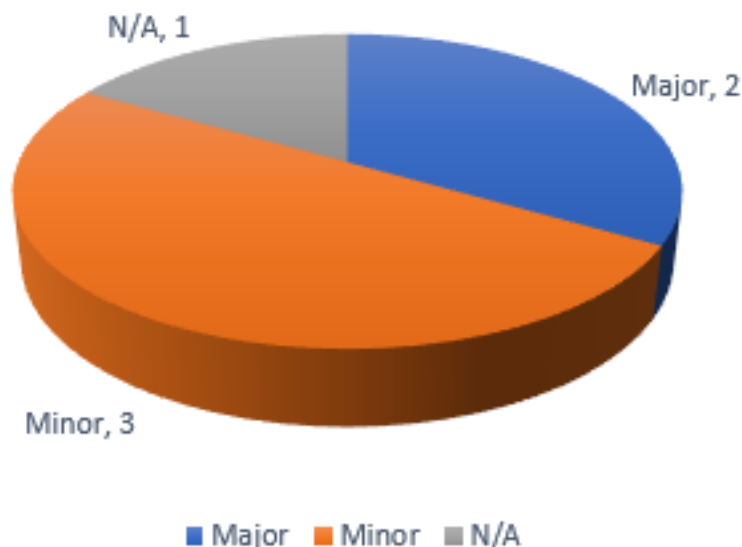
19. Provide an overview and description of issues tracked during the current period.
20. Provide commentary on key statistics based on graphs and tables which can be copied from the Environmental Safeguards Issues Tracing Workbook. For example -

Table 3-1: Summary of Issues Tracking Activity for Current Period

Summary Table	
Total Number of Issues for Project	6
Number of Open Issues	1
Number of Closed Issues	5
Percentage Closed	17%
Issues Opened This Reporting Period	5
Issues Closed This Reporting Period	4

Figure 0-1 - Summary of Issues by Non-Conformance

Non-conformance Level



21. Use data from workbook as required.

k. Trends

22. Use information from previous period reports and the current period information to identify trends in issues. For example -

Quarterly Report No	Total No of Issues	% issues Closed	% issues closed late
1	5	87	0
2	18	56	15
3	59	23	26

23. Provide a commentary on the trends, explain why they may be occurring and in the case of negative trends explain what steps have been taken to make corrections.

24. Provide a copy of all NCN's for all major Non-Conformances in an annex. If none state this.

l. Unanticipated Environmental Impacts or Risks

25. Document any unanticipated environmental impacts and risks which have been identified in the current period (as a reminder, these are impacts or risks which were not identified in the Impact Assessment process). State what actions were taken to mitigate the impacts and risks, were these successful.

IV. Results of Environmental Monitoring

m. Overview of Monitoring Conducted during Current Period

26. Provide a commentary on what environmental measurements have been undertaken during the current reporting period. Highlight any areas where agreed monitoring has not taken place.

27. Include sub sections for the report on those environmental media which have been measured, for example

- Noise
- Air Quality
- Water Quality

28. The sections should present highlights of the outcomes of the monitoring focusing on a comparison of the results with the agreed standards as set out in the Specific Environmental Management Plan and/or Monitoring Plan.
 29. In particular make clear where exceedances in the standards have occurred and provide reasons and actions which have been implemented to correct – refer to relevant NCN as appropriate.
 30. Detailed monitoring results should be presented as an annex.
- n. Trends
31. Based on the current and past periods of monitoring identify and discuss any trends which may be developing.
- o. Summary of Monitoring Outcomes
32. Provide any recommendations on the need for additional monitoring, or requests for ceasing/altering monitoring if activities have been completed or monitoring is showing no significant effects over long period.
- p. Material Resources Utilization

Current Period

33. Provide any recommendations on the need for additional monitoring, or requests for ceasing/altering monitoring if activities have been completed or monitoring is showing no significant effects over long period.

Cumulative Resource Utilization

34. Provide values (tables, graphs etc.) for cumulative resource utilization of power water etc., for whole project life. Identify trends or significant changes and provide reasons for any such changes.
- q. Waste Management
35. Provide summary of waste management activities during the current period. Provide waste contractors/s names and location of waste sites.

Current Period

36. Provide any recommendations on the need for additional monitoring, or requests for ceasing/altering monitoring if activities have been completed or monitoring is showing no significant effects over long period.
 - Type of Waste (description and classification – e.g. hazardous – non-hazardous;
 - Waste Source – what activity generated the waste and where;
 - Quantity of waste generated;
 - Treatment/disposal route – provide information on quantities of waste reused, recycled and sent to landfill or incineration; and
 - Final disposal sites for waste.

37. Provide commentary on results.

(i) Cumulative Resource Utilization

38. Using the above bullet points for waste develop cumulative waste generation results.
 39. Discuss trends and provide suggestions for waste reduction, increase in reuse and recycling if possible.
- r. Health and Safety

(ii) Community Health and Safety

40. Provide information on any incidents which have occurred during the reporting period which resulted in or could have resulted in Community Health and Safety issues. Include within this section traffic accidents.

(iii) Worker Safety and Health

41. Provide detailed statistics on accident rates, including Lost Time Incidents, Accidents and near misses.
42. Provide information on safety campaigns conducted during the reporting period.

s. Training

43. Provide information on all environmental safeguard related training activities undertaken in this period and cumulatively for project life to date. These may include specific training of environmental staff, HSE inductions of site workers etc.
44. Discuss the need for additional training and what training is planned for coming quarter.

V. Functioning of the SEMP

t. SEMP Review

45. Provide a commentary on the SEMP in terms of the ability of the contractor to implement fully the requirements set out. Highlight any areas where the contractor has not been able to implement mitigation or monitoring measures.
46. Is the SEMP effective, are mitigation measures set out still appropriate and are they working as intended – do they need changing?
47. Are there better alternative mitigation measures?
48. Can some mitigation measures be reduced or removed as the specific risk identified in the IEE/EIA and/or SEMP has not materialized?
49. Provide a table of requests for changes to the current mitigation measures for consideration by ADB. Note you can send these at any time during the project, there is no need to wait until the quarterly reporting period to be completed. If PIU has supplied requests to ADB, these should be listed along with ADB response. Where changes (additions/deletions and modifications) of mitigation or monitoring measures have been approved, the PIU shall ensure that the SEMP is updated to reflect these changes.

VI. Good Practice and Opportunity for Improvement

u. Good Practice

50. Provide an overview with charts, images etc. of examples of continuing good practice for the project. State why these have been implemented and how they are reducing environmental impacts or risks.

v. Opportunities for Improvement

51. Identify any areas which may be outside of the formal NCN process, but which changes to construction techniques, mitigation etc would result in an improvement in environmental, health and safety performance of the project.

VII. Summary and Recommendations

w. Summary

52. Provide a summary of the effective implementation of Environmental Safeguards during the reporting period and for the overall project construction period to date.

x. Recommendations

53. Provide any recommendations for consideration by the ADB for changes to the Environmental Safeguarding process for the project.