Initial Environmental Examination

February 2025

Tajikistan: Improving the Science, Technology, Engineering, and Mathematics Secondary Education Project

Prepared by the Project Administration Group for the Ministry of Education and Science of the Republic of Tajikistan for the Asian Development Bank.

CURRENCY EQUIVALENTS
(As of 01 January 2025)

CURRENCY UNIT – SOMONI (TJS) TJS 1.00 = $ 0.0914
$1.00 = TJS 10.9355

ABBREVIATIONS

ADB	–	Asian Development Bank
BOQ	–	bill of Quantities
AP	–	affected person
CACT	–	Committee for Architecture and Construction of Tajikistan
CAREC	–	Central Asia Regional Economic Cooperation
CEP	–	Committee for Environmental Protection under the Government of the Republic Tajikistan
CSC	–	construction supervision consultant
CSO	–	civil society organization
DPC	–	Dushanbe Pedagogical College
DRS	–	Districts of Republican Subordination
DSC	–	design and supervision consultant
EHS	–	environmental, health, and safety
EIA	–	environmental impact assessment
EMP	–	environmental management plan
EMoP	–	environmental monitoring plan
ES	–	environmental safeguards
ESO	–	environmental and social safeguards officer
ERP	–	emergency response plan
FGD	–	focus group discussion
GBAO	–	Gorno Badakhshan Autonomous Oblast
GDP	–	gross domestic product
GHG	–	greenhouse gas
GoT	–	Government of Tajikistan
GRC	–	grievance redress committee
GRM	–	grievance redress mechanism
HSO	–	health and safety officer
HSP	–	health and safety plan
IEE	–	initial environmental examination
AIEE	–	Addendum to the initial environmental examination
IES	–	International environment specialist
IFC	–	International Finance Corporation
LARP	–	land acquisition and resettlement plan
LGRC	–	local grievance redress committee
NES	–	national environment specialist
MOES	–	Ministry of Education and Science
MOEDT	–	Ministry of Economy, Development and Trade
MOF	–	Ministry of Finance
NBS	–	National Bureau of Statistics
MOLME	–	Ministry of Labor, Migration and. Employment
MNPHI	–	Ministry of National Planning, Housing, and Infrastructure

NGRC	–	national grievance redress committee
PAG	–	project administration group
PAP	–	project affected person
PCR	–	physical cultural resources
PMU	–	project management unit
PMCSC	–	project management and construction supervision consultant
PWD	–	person with disabilities
PPE	–	personal protective equipment
QPR	–	quarterly progress report
REA	–	rapid environmental assessment
SAEMR	–	semi-annual environmental monitoring report
SanPiN	–	sanitary rules and norms (standards)
SEE	–	state ecological expertise
SEA	-	strategic environmental assessment
SES	–	socioeconomic survey
SSEMP	–	site-specific environmental management plan
SOMP	–	standard operation and maintenance plan
SNiP	–	Construction Norms and Rules of Tajikistan
SPRC	–	source pathway receptor consequence model
SSDDR	–	social safeguards due diligence report
SPS	–	safeguard policy statement
STEM	–	science, technology, engineering and mathematics
STIs	–	sexually transmitted infections
TOR	–	terms of reference
TSPU	–	Tajik State Pedagogical University
UNEP	–	United Nations Environment Program
VER	–	valued environmental receptor
VOC	–	volatile organic compounds
WHO	–	World Health Organization
WMP	–	waste management plan

WEIGHTS AND MEASURES

dBA	–	A-weighted decibel
km	–	kilometer
km^2	–	square kilometer
Ha	–	hectare (10,000 square meter)
m	–	meter
^oC	–	degrees Celsius
PM10	–	Particulate Matter 10
PM2.5	–	Particulate Matter 2.5
NO2	–	nitrogen dioxide
SO2	–	Sulphur dioxide
VOC	–	volatile organic compounds
µg/m3	–	microgram per cubic meter

NOTE

In this report, "$" refers to United States dollars.

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1. This document serves as an Addendum to the Initial Environmental Examination (AIEE)[1] report concerning the renovation of the Project Administration Group (PAG) office. The PAG office is situated in the Sino district of Dushanbe, within the grounds of the International Presidential School.

2. The Republic of Tajikistan is the smallest of the Central Asian countries. It is a mountainous (93% of the land area), landlocked country, bordered by Kyrgyzstan and Uzbekistan to the north and west, Afghanistan to the south, and the People's Republic of China to the east.

3. Tajikistan's major natural resource is hydro-power fed by the numerous glacial mountain rivers. Current hydro-electric projects include building and operation of the Rogun Hydropower Plant on the upper reaches of the Vakhsh River which will generate surplus electricity that can be exported. In addition, the reservoir created by the dam will irrigate 300,000 hectares of arid land and reduce sedimentation in the existing Nurek Dam. Tajikistan is affected by frequent disasters such as earthquakes, floods, landslides, and avalanches. In July 2021, an earthquake in the Rasht Valley completely destroyed 4 schools with another 4 schools requiring urgent rehabilitation.

4. One of the main challenges for Tajikistan's socio-economic development is low labor productivity. Most jobs in Tajikistan are either in low productivity sectors, and many of the 19% of workers in high-productivity fields such as services, manufacturing and construction account are constrained in achieving very high productivity because they do not have the technical and/or ICT knowledge to boost their outputs. The project will focus on the improvement of science, technology, engineering and mathematics (STEM) secondary education (i.e., ISTEMSEP).

5. Project outputs and main activities

6. Output 1: Quality of and focus on STEM education improved.

7. Output 2: Access to and completion of general secondary education increased.

8. Output 3: Sector governance and management strengthened.

9. Output 4: Climate change education and disaster resilience capacity enhanced.

10. Output 5: STEM education system transformed with orientation and empowerment for women and girls.

11. The project will focus on the improvement of science, technology, engineering and mathematics (STEM) secondary education (i.e., ISTEMSEP). The PAG office will locate on the second floor of Additional building of International Presidential Lyceum (IPL). The subproject site is situated in flat land in the north-west side of Dushanbe within Sino District (ref. sections 3.1, 3.2, 3.3)

12. The assessment of impacts is based on the Source – Pathway – Receptor – Consequence Model (SPRC). The magnitude of impacts is determined based on the size, extent, duration, frequency, probability, and reversibility of the impact. The significance of effects is determined based on the magnitude of the impact and the value/sensitivity of the receptor (ref. section 5.2).

13. Mitigation measures are proposed based on the hierarchy of avoidance, minimization, and offsetting of impacts. The mitigation measures are incorporated into the Environmental Management Plan (ref. section 5.5).

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[1] Original Initial Environmental Examination (IEE) - https://www.adb.org/projects/documents/taj-54299-001-iee

14. The appointed Contractor will prepare the requisite SSEMP based on the IEE, AIEE, construction methodology, schedule of works, and site conditions. The SSEMP will include various sub-plans (ref. section 6.1).

15. Environmental monitoring will be carried out during the pre-construction, construction, and operational phases of the project. The contractor will submit monthly environmental compliance progress reports to the DSC, which will be consolidated into quarterly progress reports by the PAG and submitted to MOE and ADB (ref. section 6.2).

16. The Project has proposed to establish a Grievance Redress Mechanism (GRM) for the International Presidential School site to provide a time-bound and transparent mechanism to voice and resolve social and environmental concerns related to the project (ref. section 7).

17. Discussion and consultation activities surrounding the establishment of the Project Advisory Group (PAG) office within the International Presidential School's Kindergarten building have been ongoing since the initial stages of project identification (ref. section 8).

After approval of the IEE, this document will be made available at public locations in Russian language and will be disclosed to a wider audience via the ADB and MOES website. During construction stage, consultations will be held at the IPL site to provide updated information and clarifications to the public and other interested stakeholders on as need basis (ref. section 8.1).

I. INTRODUCTION

1.1. Project Background

18. The Republic of Tajikistan is the smallest of the Central Asian countries. It is a mountainous (93% of the land area), landlocked country, bordered by Kyrgyzstan and Uzbekistan to the north and west, Afghanistan to the south, and the People's Republic of China to the east.

19. Tajikistan's major natural resource is hydro-power fed by the numerous glacial mountain rivers. Current hydro-electric projects include building and operation of the Rogun Hydropower Plant on the upper reaches of the Vakhsh River which will generate surplus electricity that can be exported. In addition, the reservoir created by the dam will irrigate 300,000 hectares of arid land and reduce sedimentation in the existing Nurek Dam. Tajikistan is affected by frequent disasters such as earthquakes, floods, landslides, and avalanches. In July 2021, an earthquake in the Rasht Valley completely destroyed 4 schools with another 4 schools requiring urgent rehabilitation.2

20. In 2023, the population of Tajikistan was about 10.29 million people and was the fastest growing of the Central Asia countries. The growth rate in 2023 was 2.1% (annual change). It is an agrarian country with 70.9% of the population living in rural areas. In 2023, the labor force was 2.732 million people with employed numbering 2.625 million people (unemployment rate 3.7%). Of the employed population, 61.6% were in agriculture, forestry and fishing 0,5% in mining and quarrying, 3.5% in manufacturing, 1.1% in Electricity, gas, steam, and air-conditioning supply; water supply; sewerage, waste management, and remediation activities, 3.9% in construction, 6.1% in Wholesale and retail trade; repair of motor vehicles and motorcycles, 2.2% in Transportation and Storage (including information and communications), 0.7% in Accommodation and food service activities, 0.8% in Financial and insurance activities, 0.2% in Real estate activities, 9.6% in Education and 9.5% in Other activities.[3] Among the top three occupational groups, some 27% were unskilled workers, 15% professionals and 11% service and trade workers (11%).

21. Currently, the Tajikistan economy does not create enough jobs for a growing workforce - for example, despite a significant increase in GDP, official employment increased by only slightly more than 8% in the period 2010-2019. Women are concentrated in a limited number of occupations which is confirmed by the occupational segregation index that amounted to 0.62 % in favor of men. Women are disproportionately represented in sectors such as healthcare (58.7%) and education (53.7%), in which average wages are lower than other professions. They are also concentrated in agriculture and low-skilled occupations.

22. At the same time, as of 2017, 74.9% of official unemployment is in the countryside, and 51.8% of all unemployed have not completed secondary education.[4] Thus, the growth rates of the country will most likely remain unsustainable unless a strong link is re-established between the national education system and the domestic labor market.

23. Tajikistan has a young population (median age 22 years): 36.4% of the population is under 15 years old, 15–24-year-olds make up 17.9% of the total population, 25–49-year-olds 32.6%, and only 13.0% is aged over 50 years.[5] The trend of high growth of the under-25s creates a demographic setting where the young-age dependency ratio is relatively high and old-age dependency ratio low, with many young workers entering the labor force. This "youth bulge" will require Government policies and actions to ensure that education and employment opportunities

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[2] UNICEF Tajikistan, 13 July 2021, Dushanbe.

[3] Key Indicators for Asia and the Pacific 2024, Asian Development Bank. https://www.adb.org/publications/key-indicators-asia-and-pacific-2024 accessed 30.01.2025

[4] Republic of Tajikistan. 2020. *National Strategy for Education Development of the Republic of Tajikistan for the period until 2030* (Approved by the Resolution of the Government of the Republic of Tajikistan on 29 September 2020, #526)

[5] United Nations Department of Economic and Social Affairs Population Dynamics (UN estimates July 1, 2022), accessed 27.03.2023

exist and that a “demographic divide” does not materialize. The youth bulge will expand the demand for public services and the need for human capital investments. The creation of more and better jobs and business enabling environment is thus a continuing policy priority for Tajikistan.

24. Slow but sustained growth has significantly reduced the share of the population living in poverty. The NSD 2030 noted that poverty has been reduced almost 2-fold from 53% in 2007 to 31% in 2015 and the level of extreme poverty has fallen from 20% in 2012 to 16.8% in 2014. In 1999, based on the living standards survey, 81% of the population was classified as poor. Based on the household budget survey, which factors seasonal changes, 47% of the population was classified as poor in 2009 and 35.6% in 2012.

25. In recent years, Tajikistan has experienced several severe economic downturns. However, GOT is pursuing greater trade links with its neighbors and the World Bank cited Tajikistan as a ‘top reformer’ in its Doing Business 2020 Report. There is recognition that “better skilled labor will be needed to propel Tajikistan in the early stages of modernizing its economy” (UNDP Small Grants Program, 2020). The intended move towards a more knowledge-based, innovative economy translates to the workforce being confronted with multiple tasks, more responsibility and lower hierarchies and the need to constantly improve their competencies to keep abreast with latest technological developments, in particular with regard to learning at the workplace. The workforce is not appropriately qualified to support necessary innovation as required under Tajik development plans. The demographic growth puts additional pressure on the education system’s capacity to guarantee access to quality education at all levels, especially for women and other disadvantaged groups. As was the case internationally, the COVID-19 pandemic reversed some of Tajikistan’s gains in terms of both educational and economic development.

26. Furthermore, climate change, disability and gender issues are some of the themes that are not yet taken properly into consideration in the development of the education sector. For instance, it is recognized that the likelihood of natural disasters is high (Tajikistan is ranked as Central Asia’s most vulnerable country to the adverse effects of climate change, according to the University of Notre Dame Global Adaptation Initiative, 2020)[6] and these have been responded to by the government’s risk reduction and climate adaptation strategies, but the subject should be better addressed during the design and implementation of education projects. Currently, the Tajikistan education system is not aligned with the demands of the 21st century including greater connection with the demands of the job market, sustainable education, competence based and learner-based pedagogical approaches, teaching methods and curricula, greater digitalization and integration of gender and climate change perspectives.

1.2. Scope and location

27. This document serves as an Addendum to the Initial Environmental Examination (AIEE)[7] report concerning the renovation of the Project Administration Group (PAG) office. The selection of the PAG office location was made by the implementing agency, the Ministry of Education and Science, in collaboration with pertinent government entities. It is important to note that the specific location of the office was not detailed in the original IEE.

28. The PAG office is situated in the Sino district of Dushanbe, within the grounds of the International Presidential School. The proposed construction and renovation activities will take place on this school’s premises. The building designated for the PAG office is a two-story structure that was completed in 2012; since its inauguration, no renovation work has been undertaken.

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[6] Notre Dame Global Adaptation Initiative (ND-GAIN) rankings for 2020. accessed at https://gain.nd.edu/our-work/country-index/rankings/ on 30.03.23

[7] Original Initial Environmental Examination (IEE) - https://www.adb.org/projects/documents/taj-54299-001-iee

29. The site is bordered to the north by Karamova Street, providing convenient access to the area. To the east, there is a sports boarding school, while residential buildings are located to the south and west of the complex. This diverse surrounding environment contributes to the overall accessibility and functionality of the PAG office location.

30. The planned construction activities will encompass several essential improvements, including minor repairs to office spaces, the establishment of a parking area for vehicles, and the installation of an elevator to enhance accessibility for individuals with disabilities. These renovations aim not only to improve the operational efficiency of the PAG office but also to ensure compliance with accessibility standards, thereby fostering an inclusive environment for all users.

31. Detailed information on site and their location can be found in Chapter III.

II. POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

2.1. ADB Safeguard Policy Statement (SPS 2009)

32. ADB's Safeguard Policy Statement (SPS 2009) sets the safeguards requirements and due diligence process for all projects funded by ADB. The SPS 2009 prescribes that the projects funded by ADB loans or grants undergo an environmental review process to ensure that they do not cause environmental harm, health, or safety hazards, and are designed in compliance with national regulatory requirements.

33. The SPS 2009 is underpinned by the ADB Operations Manual, Bank Policy (OM Section F1/BP, October 2013). The SPS (Principle 9) also promotes the adoption of International Good Practices as reflected in the International Finance Corporation's (World Bank Group) Environmental, Health and Safety Guidelines - IFC (WBG) EHS Guidelines. This AIEE and EMP are designed to meet ADB SPS 2009 requirements.

34. ADB SPS 2009 environmental assessment requirements specify that:

(i) At an early stage of project preparation, the borrower/client will identify potential direct, indirect, cumulative, and induced environmental impacts on and risks to physical, biological, socioeconomic and cultural resources and determine their significance and scope, in consultation with stakeholders, including affected persons (APs) and concerned non-government organizations (NGOs). If potentially adverse environmental impacts and risks are identified, the borrower/client will undertake an environmental assessment as early as possible in the project cycle.

(ii) The assessment process will be based on current information, including an accurate project description and appropriate environmental and social baseline data.

(iii) Impacts and risks will be analyzed in the context of the project's area of influence.

(iv) Environmental impacts and risks will be analyzed for all relevant stages of the project cycle, including preconstruction, construction, and operations.

(v) The assessment will identify potential transboundary effects as well as global impacts.

(vi) Assessment encompasses associated facilities that are not funded as part of the project (funding may be provided separately by the borrower or by third parties), and whose viability and existence depend exclusively on the project and whose goods or services are essential for successful operation of the project.

(vii) Assessment encompasses existing facilities and/or business activities that already exist (for which) the borrower will undertake an environment and/or social compliance audit, including on-site assessment to identify past or present concerns related to impacts on the environment, involuntary assessment and indigenous peoples. The objective of the audit is to determine if actions were in accordance with SPS and to identify and address outstanding compliance issues.

35. Other requirements of ADB SPS 2009 included in the AIEE include:

(viii) Analysis of Alternatives. There is a requirement to examine alternatives to the project's location, design, technology, components and their potential environmental and social impacts and consider the no project alternative. SPS 2009 states that this is only for projects which have ''significant adverse environmental impacts that are irreversible, diverse, or unprecedented'' i.e., category A projects. This does not apply to this category B projects but is included for completion.

(ix) Consultation and participation. The borrower/client will carry out meaningful consultation with APs and other concerned stakeholders, including civil society and facilitate their informed participation. This AIEE includes an “activity outline for consultations” to ensure that the APs, other concerned stakeholders and the civil society can provide meaningful consultations into the project detailed design and implementation.

(x) Information disclosure. Environmental information on the project will be translated into local language (Tajik) and made available in accessible locations (e.g., project construction field offices, local authorities office - Jamoat – as well as at MOES designated focal points with the PAG) in accordance with ADB’s Access to Information Policy (September 2018) and ADB SPS (2009). The draft AIEE will be disclosed on ADB’s project website (www.adb.org) prior to Board approval, and the final AIEE after detailed engineering design and safeguards monitoring reports during implementation.

(xi) Grievance redress mechanism. The borrower/client will establish a mechanism to receive and facilitate resolution of project APs’ concerns, complaints, and grievances about the project’s environmental (and social) performance.

(xii) Monitoring and Reporting. The Borrower/ Client will monitor, measure the progress of implementation of the EMP and safeguards tender requirements for the contractors and report as required by the ADB SPS 2009.

2.2. National Environmental Policy and Legislation

36. The main environmental legislation of Tajikistan is the 760/2011 Law on Environmental Protection (replacing the Tajikistan Framework Environment Law that was adopted in 1993, enacted in 1994, and successively amended in 1996, 1997, 2002, 2004, and 2007).

37. A host of environmental laws have been adopted since 2010 focusing on issues that were relatively new to Tajikistan, such as:

- the 2011 Law on Environmental Audit, setting provisions for mandatory and voluntary environmental review to be performed by licensed environmental audit organizations.
- The 2012 Law on Ecological Expertise introducing a streamlined mechanism and requirements for environmental assessment by projects, including procedures for state ecological expertise (SEE) and environmental impact assessment (EIA).
- The 1448/2017 Law on Environmental Impact Assessment, further establishing the legal framework for Environmental Impact Assessment.
- the 2010 Law on Environmental Education of the Population, stating the need for training civil servants on environmental protection-related issues. Training is occasionally delivered at the Institute of Public Administration, while regular training and in-service training schemes for civil servants on environmental issues are not in place.
- The Water Code was enacted in 2000 and amended in 2008, 2009, 2011 and 2012, with the introduction a new chapter on basin water management.

38. The table below contains a summary of Tajikistan environmental laws and policies that are relevant to this project.

Table 1: Relevant Environment, Health, and Safety Laws in Tajikistan

Law	Description	Responsible Agency
760/2011 Law on Environment Protection Enacted in August 2011 last amended in 2022	The Law defines the state principles of environmental protection and sustainable social and economic development, guarantees of human rights for healthy and friendly environment, law enforcement strengthening, prevention of negative impact of business and other operations on the environment, management of rational use of nature resource and securing environmental safety. Chapter 6 deals with Environmental Impact Assessment requirements and Chapter 7 specifies requirements for the location, design, construction, reconstruction and commissioning of enterprises, buildings, and other facilities.	Committee for Environmental Protection (CEP) and its subdivisions at district level
1448/2017 Law on Environmental Impact Assessment Enacted on 18 July 2017	The Law establishes the legal and organizational framework for assessing environmental impacts, and relationship with the State Environmental Expertise (SEE), and the procedures environmental impacts classification	CEP and its subdivisions at district level
707/2011 Law on Environmental Monitoring Enacted 25 March 2011, last amended in 2014	Defines the organizational, legal, economic and social bases for ensuring environmental monitoring in the Republic of Tajikistan and regulates relations between state authorities, self-government bodies of settlements and villages, public associations and citizens in this area.	CEP and its subdivisions at district level
705/2011 Law on Environmental Information Enacted 25 March 2011	The Law defines the legal, organizational, economic and social basis for the provision of environmental information in Tajikistan, promotes the right of legal entities to receive complete, reliable and timely environmental information, and regulates relations in this area.	CEP and its subdivisions at district level
818/2012 Law on State Environmental Expertise Enacted 16 April 2012	This Law defines the principles and procedure for conducting environmental expertise and is aimed at preventing the harmful impact of planned economic and other activities on the environment.	CEP and its subdivisions at district level
326/1996 Land Code of the Republic of Tajikistan Last amended in 2022	Land legislation governs the relations of land use and protection, land use and property relations arising from land use rights.	Committee on Land Management and Geodesy and its subdivisions at district level
788/2011 Law on Special Protected Areas Last amended in 2014	The Law defines the legal, organizational, and economic principles of specially protected natural areas and establishes related responsibilities, activities, operations, and zoning.	State Institution on Specially Protected Natural Areas of Forestry Agency and its subdivisions in the districts
1567/2019 Law on Plant Quarantine and Protection Enacted 2 January 2019	The Law defines the legal, organizational, and economic basis for plant quarantine and protection, conducting quarantine phytosanitary measures, and is aimed at preserving agricultural products, protecting the health of people, animals, and the environment	CEP and its subdivisions at the districts; Ministry of Agriculture (MOA). Forestry Agency; Tajikistan Academy of Sciences (TAS)
31/2004 Law on Protection and Use of Flora	The Law establishes the state policy on the protection and efficient use of plants, and defines legal, economic, and social principles governing the preservation and reproduction of plants.	CEP and its subdivisions at the districts; MOA; and TAS

Law	Description	Responsible Agency
Enacted 17 May 2004, last amended in 2008		
761/2011 Forestry Code of the Republic of Tajikistan Enacted 2 August 2011	The Law regulates the protection, possession, sustainable use, and management of forests in Tajikistan. It defines prohibited activities, regimes and conditions in protected forest zones.	Forestry Agency; CEP and its subdivisions at the districts; MOA
178/2006 Law on Conservation and Usage of Historical and Cultural Heritage Enacted 3 March 2006, last amended in 2017	The Law provides the legal framework for conservation and use of historical and cultural heritage objects in Tajikistan.	Ministry of Culture; TAS; CEP; Forestry Agency
983/1994 Law on Subsoils Enacted July 1994, last amended in 2013	The Law regulates the use and protection of subsoils for present and future generations.	Geology Head Office; CEP
555/2009 Law on Soil Conservation Enacted 16 October 2009	The law defines main principles of state policy, legal framework of public authorities, individual and legal entities for the efficient and safe use of soils, preservation of quality, fertility and soil protection from negative impacts and regulates the variety of relationship related to soil protection.	CEP; Committee on Land Management and Geodesy; MOA
1688/2000 Water Code Enacted 02 April 2000	The Water Code focuses on: (i) protection of state water fund and state water fund lands for the improvement of the population's social condition and environment; (ii) water pollution control, impurity, depletion, prevention, and control of water adverse effects; (iii) enhancement and protection of water objects; (iv) strengthening legality and rights protection of individuals and legal entities in water management.	CEP, Ministry of Energy and Water Resources, MOA; Geology Head Office; MOH
915/2012 Law on Protection of Atmospheric Air Enacted December 2012 28	The Law regulates the relations of individuals and legal entities, irrespective of ownership form, with the aim of conservation, rehabilitation of atmospheric air, and environmental safety	CEP; MOH; Hydro-meteorology Agency
1413/2017 Public Health Code Enacted 30May 2017, last amendedin 2021	The Code regulates public health relations and aims to implement constitutional rights and health protection of citizens. Chapter 17 of the Code secures sanitary and epidemiological safety.	MOH
44/2002 Law on Production and Consumption Waste Enacted on 10 May 2002, last amended in 2011	The Law regulates the relations arising from the process of waste generation, collection, storage, utilization, transport, and deactivation and landfilling of wastes and state management, supervision and control of waste management. It aims to prevent the negative impact of production and consumption wastes on the environment and human health, and when handling these, their involvement in economic and production turnover as an additional stock source.	CEP; MOH; State Unitary Enterprise on Municipal Housing and Utilities

Law	Description	Responsible Agency
1269/2015 Law on Inspection of Economic Entities Enacted on 25 December 2015, last amended in 2020	The Law establishes the legal basis for conducting inspections, the procedures or conducting them, the rights and obligations of business entities, officials of inspection bodies, and is aimed at protecting the health, legal rights, and interests of citizens, the environment, national security, and protection of the activities of the audited business entities, regardless of ownership forms.	State Inspection of Technical Supervision, CEP, MOLME
53/2004 Protection of Population and Territories from Natural and Manmade Emergencies Enacted on 15 July 2004	The Law defines the organizational and legal framework for the protection of the population and persons without citizenship in the territory of the Republic of Tajikistan, as well as the lands, interiors, water, airspace, animals and plants, and other natural resources of Tajikistan; and environment from natural and manmade emergencies. It regulates public relations on prevention, occurrence and development of emergencies, reduction of damages and losses, elimination of emergency situations and timely notification of populations in danger zones during natural and man-made emergencies.	Committee for Emergency Situations and Civil Defense and its structural subdivisions
354/2008 Law on Wildlife Enacted on 5 January 2008	The Law regulates protection, restoration, and reasonable use of wildlife; and establishes the legal, economic, and social framework for the protection and restoration of wildlife resources	CEP; MOA; Academy of Sciences; Forestry Agency
1329/2016 Labor Code of the Republic of Tajikistan Enacted on 23 July 2016, last amended in 2022	The Code regulates labor and other relations and is directly aimed at the protection of the rights and freedoms of the parties in labor relations, securing minimal guarantees of labor rights and freedoms.	MOLME; Ministry of Health and Social Protection of the Population
363/2008 Law on Fire Safety Enacted on 20 March 2008, last amended in 2010	The Law defines the general legal, economic, social, and organizational principles of fire prevention in Tajikistan; regulates the relations between state authorities, local authorities, organizations, other legal entities irrespective of organizational and legal forms as well as between public entities, officials, and citizens of the Republic of Tajikistan, foreign citizens, and persons without citizenship.	Main Department of the State Fire Prevention Agency of the Ministry of Internal Affairs

2.3. Legislative and Administrative Framework and Responsibilities

39. This section outlines how responsibilities for environmental management, health and safety are distributed at central and local government level.

40. At central level, ministries, committees and other entities have the following responsibilities:

- CEP (Committee on Environmental Protection) responsibilities include environmental and natural resources management, including control of waste, atmospheric air, and water.
- National Agency for Hydrometeorology deals with the implementation of the national policy in the area of hydrometeorology and environmental pollution monitoring, reports and provides data to other government bodies.
- Committee for Environmental Conservation is the central government authority dealing with the implementation of policy in the area of environmental conservation, hydrometeorology, and rational nature use and ensures state control over environmental protection and nature use.

- Ministry of Energy and Water Resources of the Republic of Tajikistan formulates and carries out the public policy and fulfills regulatory functions in the area of fuel, energy and water resources.
- Ministry of Agriculture, Ministry of Agriculture is responsible for elaboration and implementation of the common national agricultural policy.
- Ministry of Health (MOH), development and implementation of policy, regulations, and norms on public health.
- Ministry of Education and Science, responsible for the integration of environment and climate change topics in the school curriculum
- Ministry of Labor, Migration and Employment of Population: formulation and implementation of policies on employment, labor, and migration.
- Committee of Women and Family Affairs, dealing with gender and family related policies.
- Committee for Architecture and Construction of Tajikistan (CACT): is a central executive body responsible for implementing activities related to the state policy, regulatory framework, provision of government services, and state control in the field of architecture and construction.;
- Tajik GOST Standards: setting, among others, air, ambient noise, and drinking water quality standards;
- Statistical Agency under President of the Republic of Tajikistan is responsible for the statistical and economic analysis of the country.

41. The following bodies have environmental responsibilities at local level:

(i) Hukumats, or municipality, are government bodies on a district or city level, and are headed by a chairperson appointed as a local representative of the President, with responsibility for national policy implementation and administration of State services and regulations;

(ii) Jamoats (or district level) are the third level administrative divisions of Tajikistan, covering a smaller area than a Hukumat. It is responsible for organizing community-based delivery of some basic public services. It has no budgeting authority and has a very limited independent role.

2.4. Environmental Assessment Requirements of Tajikistan

42. There are three laws in the country that stipulate all aspects of environmental assessment:

(i) Law on Environmental Impact Assessment

(ii) Law on Environmental Protection (2011); and

(iii) Law on Ecological Expertise

43. Chapter V, Articles 3539 of the Law on Environmental Protection (2011), introduces the concept of state ecological review (literally, state ecological expertise or SEE), which seeks to examine the compliance of proposed activities and projects with the requirements of environmental legislation and standards and ecological security of the society.

44. The following activities and projects are subject to state ecological review:

- Draft state programs, pre-planning, pre-project, and design documentation for economic development;

- Regional and sector development programs;
- Spatial and urban planning, development, and design;
- Environmental programs and projects;
- Construction and reconstruction of various types of facilities irrespective of their ownership;
- Draft environmental quality standards and other normative, technology, and methodological documentation regulating economic activities; and
- Existing enterprises and economic entities.

45. An EIA is a component of the SEE, as set out in the 2011 Environmental Protection Law and in the 2012 Law on State Ecological Expertise, which comprise both the department within the CEP and the process. Conducting the EIA is the responsibility of the project proponent. The state ecological review, which comprises the process component only for all investment projects, is the responsibility of the CEP and its regional offices. Furthermore, according to the 2012 Law on State Ecological Expertise, all civil works, including rehabilitation, should be assessed for their environmental impacts, and the proposed mitigation measures should be reviewed and monitored by the CEP.

46. According to the 2012 Law on Ecological Expertise, ecological expertise is intended to prevent negative impacts on the environment as a result of a proposed activity, forecast impacts from activities that are not considered as necessarily damaging to the environment, and create databases on the state of the environment and knowledge about human impact on the environment.

47. The Law on Ecological Expertise and the Law on Environmental Protection envisage two types of ecological expertise: SEE and public ecological expertise, which are not given equal importance. While SEE is a prerequisite for beginning any activity that may have an adverse environmental impact, public ecological expertise becomes binding only after its results have been approved by a SEE body.

48. The SEE body is authorized to invite leading scientists and qualified outside specialists to participate in the review. Approval should be issued within 30 days, unless the project developer agrees to an extension, and remains valid for two years, if the decision is positive. For very complicated projects, the term of consideration and approval can be extended till 60 days.

49. According to the Law on SEE, the public ecological expertise of economic activities or other activities, the implementation of which can negatively impact the environment or population living in the relevant area, can be carried out by any public organization and citizen. They have the right to send the proposals to the responsible government bodies concerning environmental issues of implementing planned activities and to receive information on the results of the conducted SEE from relevant responsible bodies.

50. The materials reflecting the public expertise delivered to the experts' commission should be taken into consideration in the preparation of the conclusion of SEE and decision making on the realization of the SEE object. Public ecological expertise is carried out under the state registration of application of public organizations. The registration can be done by local executive authorities (within seven days) in place where the expertise activities are planned. Public organizations, which are organizing the SEE, should inform the population of the initiation of the expertise and its results.

51. The legal and regulatory system for EIAs also includes:

- the Procedure of environmental impact assessment (adopted by the Resolution of the Government of the Republic of Tajikistan as of 01.11.2018 №532): Guidelines on the composition, order of development, coordination and approval of design estimates for

construction of facilities, buildings and structures and EIA chapters, state expertise appraisal and feasibility documents;

- Procedure to implement SEE (approved by the Resolution of the Government of the Republic of Tajikistan No. 697 of 3 December 2012);
- Guidelines on the composition and order of development of content and structure of the documentation to be submitted for review (SEE), as well as coordination and approval of all projected budget or investment estimations, design drawings or documentation that must be developed in coordination with the SEE, buildings and structures and EIA chapters, Strategic Environmental Assessment (SEA) and feasibility documents; and
- A List of objects and kinds of activity for which preparation of documentation for environment impact assessment is mandatory (adopted by the Resolution of the Government of the Republic of Tajikistan as of 01.11.2018 №532). The List is very extensive: it contains 180 types of activities, grouped according to four environmental impact categories: from A (in Cyrillic sounds A) "high risk" to Г (in Cyrillic sounds G) "local impact"). If the facility/activity is not included in the list, then it is not required to pass either an EIA or a SEE.

52. The elaborated existing normative legal base is intended for determination of legal basis for project implementation and their compliance with state requirements for environmental protection and mitigation of environmental impact.

53. In the Republic of Tajikistan, the organizations with most responsibility for environmental monitoring and management are the CEP, the Sanitary Inspectorate of MOHSPP, the Inspectorate for Industrial Safety, and the Mining Inspectorate. An environmental licensing system exists in relation to handling hazardous waste and mineral extraction. An environmental permitting system regulates the use of natural resources.

54. The Environmental Protection Law states that a SEE should be conducted by CEP, which is the authorized state environmental protection body. The CEP has a comprehensive mandate that includes policy formulation and inspection duties. It has divisions at the oblast (region), city, and rayon (district) levels in the form of Departments of Environmental Protection within the Khukumat (local administration) at each city or rayon/district.

2.4.1. EIA Procedure

55. *Basic EA Laws.* There are two laws in the country that stipulate all aspects of the EA: (a) Law on Environment Protection; and (b) Law on Ecological Expertise and (c) Law on the Environmental Impact Assessment. The Chapter V, Articles 35-39 of the Law on Environment Protection (2011), introduces the concept of state ecological review (literally, state ecological "expertise" – SEE) which seeks to examine the compliance of proposed activities and projects with the requirements of environmental legislation and standards and ecological security of the society. The mentioned laws stipulate the mandatory cross-sectoral nature of SEE, which shall be scientifically justified, comprehensive, and objective and which shall lead to conclusions in accordance with the law. SEE precedes decision-making about activities that may have a negative impact on the environment.

56. Financing of programs and projects is allowed only after a positive SEE finding, or conclusion, has been issued. The following activities and projects subject to state ecological review: a) draft state programs, pre-planning, pre-project, and design documentation for economic development; b) regional and sectoral development programs; c) spatial and urban planning, development, and design; d) environmental programs and projects; e) construction and reconstruction of various types of facilities irrespective of their ownership; f) draft environmental

quality standards and other normative, technology, and methodological documentation that regulates economic activities; g) existing enterprises and economic entities, etc.

57. The laws stipulate that all types of economic and other activities shall be implemented in accordance with existing environmental standards and norms and shall have sufficient environmental protection and mitigation measures to prevent and avoid pollution and enhance environmental quality. The EA studies analyzing the short- and long-term environmental, genetic, economic, and demographic impacts and consequences shall be evaluated prior to making decisions on the sitting, construction, or reconstruction of facilities, irrespective of their ownership. If these requirements are violated, construction will be terminated until necessary improvements are made, as prescribed by the Committee for Environmental Protection and/or other duly authorized control bodies, such as sanitary, geological, and public safety agencies.

58. *Environmental Impact Assessment.* An Environmental Impact Assessment (EIA) study is a component of the State Ecological Expertise, as set out in the 2011 amendments to the Environmental Protection Law. In 2012 the new Law "On Environmental Expertise" was adopted. In pursuance of this law, the Government subsequently adopted the following:

59. the Procedure of environmental impact assessment (adopted by the Resolution of the Government of the Republic of Tajikistan as of 01.11.2018 №532): Guidelines on the composition, order of development, coordination and approval of design estimates for construction of facilities, buildings and structures and EIA chapters, SEA and feasibility documents;

60. A List of objects and kinds of activity for which preparation of documentation for environment impact assessment is mandatory (adopted by the Resolution of the Government of the Republic of Tajikistan as of 01.11.2018 №532). The List is very extensive: it contains 180 types of activities, grouped according to four environmental impact categories: from A (in Cyrillic sounds A) "high risk" to Г (in Cyrillic sounds G) "local impact"). If the facility/activity is not included in the list, then it is not required to pass either an EIA or a SEE.

61. The EIA is the responsibility of the project proponent. The Procedure for carrying out the EIA (Government Resolution No. 532 of 2018) establishes general requirements for the contents of the EIA documentation. The State Ecological Expertise for all investment projects is the responsibility of the Committee for Environmental Protection under Government of Tajikistan (CEP) and its regional offices. Furthermore, according to the 2012 Law on the State Ecological Expertise, all civil works, including rehabilitation, should be assessed for their environmental impacts and the proposed mitigation measures reviewed and monitored by the CEP.

62. The Law “On Ecological Expertise” and the “Procedure on Environmental Impact Assessment” of 2013 lays down the principles of performing the EIA in Tajikistan. According to this law, capital construction activities are considered activities with potentially high environmental risk. Hence requires an Environmental Impact Assessment (EIA) studies to be prepared by the entity developing such a project.

63. Together with a detailed project description, the EIA study is the basis to go for the environmental permit and must be submitted to the Committee. As a rule, the Committee prepares an expertise to the project within one month. In preparation of this expertise, all subdivisions that might be involved in the project do participate. With this expertise, the permission is given, is not given or given with requirements and obligations that must be followed by the company during construction and/or during operation. If the Committee concludes that an environmental permit cannot be given because e.g. limit values are exceeded or other environmental aspects are not sufficiently mitigated, the developer can change its design and submit the impact assessment again.

64. *Types of Ecological Expertise.* According to the 2011 Law on Ecological Expertise, ecological expertise is intended to prevent negative impacts on the environment as a result of a proposed activity, forecast impacts from activities that are not considered as necessarily damaging to the environment and create databases on the state of the environment and knowledge about human impact on the environment. This Law and the Law on Environment Protection envisage two types of ecological expertise – State ecological expertise and public ecological expertise, which are not given equal importance.

65. While State ecological expertise is a prerequisite for beginning any activity that may have an adverse environmental impact, public ecological expertise becomes binding only after its results have been approved by a State ecological expertise body. The State Ecological Expertise is authorized to invite leading scientists and qualified outside specialists to participate in the review. Approval should be issued within 30 days, unless the project developer agrees to an extension, and remains valid for two years, if the decision is positive. For very complicated projects the term of consideration and approval can be extended till 60 days.

66. According to the Law on SEE the public ecological expertise of economic activities or other activities, whose implementation can negatively impact the environment of population which live in relevant area can be carried out by any public organization and citizen. They have right to send the proposals to the responsible government bodies concerning environmental issues of implementation planned activities; to receive information on results of conducted state ecological expertise from relevant responsible bodies. The materials reflecting the public expertise delivered to the experts' commission should be taken into consideration under preparation of conclusion of state ecological expertise and decision making on realization of expertise object.

67. The public ecological expertise is carried out under the state registration of application of public organization. The registration can be done by local executive authorities (for 7 days) in place where the expertise activities are planned. The public organizations which are organizing this expertise, should inform the population of initiation of expertise and then on its results.

68. *Screening categories.* The laws on Environment Protection and EE stipulate the Government will approve a list of activities for which the Environmental Impact Assessment is mandatory. The List of 2018 contains 180 types of activities, grouped according to four environmental impact categories (from (A) "high risk" to (Г (in Cyrillic)) "local impact"). The current system of environmental impact assessment does not provide for any preliminary assessment of the project to decide on the need for an EIA (screening), nor to define the scope of the issues covered and the content of EIA materials as specific procedural steps. The List of objects and activities for which the development of EIA materials is required is very detailed and, in the opinion of government bodies, for this reason there is no need to procedurally consider the issue of carrying out an EIA in each specific case.

69. *EA administrative framework.* The Environmental Protection Law states that a SEE should be conducted by the CEP, which is designated as a duly authorized state environmental protection body. It has a comprehensive mandate that includes policy formulation and inspection duties. The CEP has divisions at oblast (region), city and rayon (district) level, in the form of Departments of Environmental Protection (DEPs), within the Hukumat (local administration) at each city or rayon. A small unit in the ministry is entrusted with guiding and managing both EIA and SEE. EIA preparation is the responsibility of the proponents of public- and private-sector projects, who, in addition to complying with various environmental standards, procedures, and norms, shall meet the standards of other sectors and environmental media line agencies, such as sanitary-epidemiological, geological, water, etc.

70. *Public participation.* Article 12 of the Environment Protection Law proclaims the right of citizens to live in a favorable environment and to be protected from negative environmental impacts. Citizens also have the right to environmental information (Article 13), as well as to participate in developing, adopting, and implementing decisions related to environmental impacts (Article 13). The latter is assured by public discussion of drafts of environmentally important decisions and public ecological reviews. Public representative bodies have an obligation to take into consideration citizens' comments and suggestions.

71. The Law on the EE also provides the rights to the citizens to conduct a Public Environmental Expertise (art. 7). On 17 July 2001 Tajikistan acceded to the 1998 Aarhus Convention, the provisions of which have priority over domestic law that also stipulates the rights for Public EE. The public has the right to request public hearings to be carried out. For category "A" and "B" projects, the authorized state body should develop a stakeholder engagement plan with the possibility of conducting consultations and taking into account the opinions of citizens.

72. In Tajikistan disagreements are resolved through Jamoats' (Hukumats') grievance mechanism or appeal to court. A grievance redress mechanism (GRM) capable of receiving and facilitating the resolution of affected persons' concerns and grievances related to the project is required as a formalized way for the PAG to identify and resolve concerns and grievances.

73. *Environmental norms and standards.* Norms are set for air and water pollution, noise, vibration, magnetic fields and other physical factors, as well as residual traces of chemicals and biologically harmful microbes in food. The exceeding of their thresholds results in administrative action, including financial sanctions. Several ministries determine environmental quality standards, each in its field of responsibility. For example, admissible levels of noise, vibration, magnetic fields and other physical factors have been set by the Ministry of Health and social defense of population.

74. *Implementation and compliance.* Several legal acts establish liability for violations of environmental laws, which can be enforced by several State bodies. In particular, the 2010 Code of Administrative Violations establishes administrative liability for organizations, their officers and individuals for a range of violations, from the careless treatment of land to violation of the rules for water use or water protection or failure to comply with a State ecological expertise.

75. The administrative sanctions for environment related violations can be imposed by the administrative commissions of Hukumats, courts, the CEP's inspectors, the Veterinary Inspectors of the Ministry of Agriculture, and the State Committee for Land Management and Geodesy. The most common administrative sanction is a fine of up to 10 minimal monthly salaries for individuals and up to 15 minimal salaries to officers of organizations. The 1998 Criminal Code covers crimes against ecological safety and the environment, such as violations of ecological safety at work, poaching, and spoiling land, violation of rules for the protection and use of underground resources. The maximum fine is up to 2,000 minimal monthly salaries and the maximum sentence is up to eight years in prison.

76. When detecting violations of environmental legislation, the CEP authorities apply penalties in accordance with the following articles of the Administrative Code of the Republic of Tajikistan. Namely:

- Article 223. Violation of standards, rules, regulations, instructions and other environmental requirements for the protection of the environment and the rational use of natural resources;
- Article 224. Release (discharge) of polluting substances into the environment with excess of standards or without a permit, waste disposal, physical and other harmful effects

- Article 232. Violation of environmental protection requirements during transportation, disposal, use, disposal (dumping) industrial, household and other wastes into the natural environment.

77. The fines can only be witnessed by the local CEP authorities.

2.4.2. Environmental Permits and Licenses

78. The Law on the permission system[8] is a comprehensive piece of legislation that sets out the rules and regulations governing the permits system in Tajikistan. It covers various aspects such as the legal, organizational, and economic framework for permits, as well as the procedures for obtaining them.

79. One of the key features of this law is its definition of activities that require a permit. It clearly outlines the specific activities that individuals or organizations must obtain a permit for. This helps to ensure that all necessary permits are obtained and that activities are carried out in compliance with the law.

80. The law also provides detailed information on the procedure for obtaining a permit. It specifies the documents and information that applicants need to provide, the relevant deadlines, and the process for reviewing and approving permit applications. This ensures transparency and consistency in the permitting process.

81. Furthermore, the Law on Permitting categorizes different types of permits based on the nature of the activity. It distinguishes between various permit types, such as environmental permits, construction permits, business permits, and many others. This classification helps to streamline the permit system and make it more efficient.

82. One of the significant achievements of this law is the reduction in the number of permit types. Prior to its implementation, Tajikistan had over 600 permit types, an excessive number that created unnecessary bureaucracy and delays. However, through the permit system reform, this law successfully reduced the number of permit types to just 78. This simplification has made it easier for individuals and businesses to navigate the permitting process and obtain the necessary permits. In relation to environmental management, seven types of permits are issued by the Committee for Environmental Protection (CEP).

83. Given the limited scope of work to be performed within an urbanized area, obtaining a state environmental assessment report is not required for projects involving minor repairs and construction[9]. This exemption is typically applicable when the activities are small in scale, have minimal environmental impact, and do not involve significant alterations to the natural environment or ecosystems. Since the works of renovation of the Project Administration Group (PAG) office is confined to an already developed area, it is unlikely to disrupt local habitats, water sources, or air quality. However, it is essential to ensure that all other relevant regulations and permits are adhered to, and any potential environmental concerns are addressed responsibly to maintain compliance with local and regional guidelines.

84. Table 2 outlines a list of permits that may be required by the Project prior to commencement of civil works and after construction.

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[8] The Law on the permission system No.1968 enacted on 22 July 2023

[9] The procedure for conducting the State environmental expertise dated December 3, 2012, No. 697

Table 2: Indicative List of Permits and Licenses Applicable to the Project

Description of Authorization Document	Date of Issue	Issuing Authority
Design Stage: Project Feasibility Study and Initial Environmental Examination		
Conclusion of the State Ecological Expertise for the Minor repair and Additional works of the office of PAG	n/a	According to the Procedure for Conducting the State Environmental Expertise, dated December 3, 2012, No. 697, obtaining a state environmental expertise conclusion is not required for projects involving minor repairs or construction activities with a limited scope of work, provided they are carried out within urbanized areas.
Conclusion of the State Ecological Expertise on the project	Final IEE Report after completed design of STEM buildings	Committee for Environmental Protection under the Government of the Republic of Tajikistan (CEP RT)
At the Construction Stage: Permits and Licenses		
License to conduct the type of activity	Prior to construction	Ministry of Industry and New Technologies of the Republic of Tajikistan
Permission for special water use	Before and during construction	CEP RT, Tajikgeology (technical water), Ministry of Health and social defense of the population of the Republic of Tajikistan (drinking water)
Permission for Waste disposal	Before and during construction	CEP RT, Local authorities (Hukumats)
Permission to cut down trees and shrubs	At the construction stage	CEP RT
Permission for emissions of harmful substances into the atmosphere (MPE) from stationary and mobile sources	At the construction stage	CEP RT
Permission for land acquisition for temporary storage of construction waste (substandard soil, dismantled concrete products, etc.)	At the construction stage	CEP RT, Local authorities (Hukumats)
Permission to remove construction and household waste for storage in specially designated areas (disposal areas)	As required	Local authorities (Hukumats)

2.5. Tajikistan Environment, Health, and Safety Standards

85. Norms are set for air and water pollution, noise, vibration, magnetic fields and other physical factors, as well as residual traces of chemicals and biologically harmful microbes in food. The exceeding of their thresholds results in administrative action, including financial sanctions. Several ministries determine environmental quality standards, each in its field of responsibility. For example, admissible levels of noise, vibration, magnetic fields and other physical factors have been set by the Ministry of Health.

86. Environmental quality standards in Tajikistan are based on GOST, SNiP and SanPiN. GOST (Tajiki: Стандарти давлатӣ) refers to a set of technical standards maintained by the Euro-Asian Council for Standardization, Metrology and Certification (EASC), a regional standards organization operating under the auspices of the Commonwealth of Independent States (CIS). SNiP mean Technical Standards (Tajiki: Меъёру қоидаҳои сохтмон) - a building code, a set of rules that specify the minimum standards for constructed objects such as buildings and nonbuilding

structures. SanPiN (Tajiki: Қоидаҳо ва меъёрҳои санитарӣ) are sanitary rules and norms (standards).

87. Environmental quality standards in Tajikistan ensure both MPC (Tajiki: ПДК) and MPE (Tajiki: ПДВ). The maximum permissible concentration (MPC) is approved by law hygienic standard. Under MPC refers to a concentration of chemical elements and their compounds in the environment, which in everyday impact for a long time on the human body does not lead to pathological changes or diseases established modern research methods in any time of life of present and future generations.

88. The maximum permissible (or allowable) emissions (MPE) is standard of maximum permissible emissions of harmful substances (pollutants) into the air, which is set for a stationary source of air pollution in accordance with technical standards for emissions and background air pollution. It provides non-exceeding of the hygiene and environmental air quality standards, limits (critical) loads on ecological systems and other environmental regulations requirements.

89. Table 3 provides an overview of the National Standards and regulations that are applicable for the project.

Table 3: National standards and regulations applicable to the Project

Sl. No.	**Title - National Standards - GOSTs**
1.	31431—2011. Protection of nature. Air. Set of Maximum Permissible Emissions (MPE). 29 November 2011
2.	31434—2011 Protection of nature. Air. Determination of parameters of efficiency of dust collection systems. 29 November 2011
3.	IEC 61241-0—2011 Electrical equipment used at areas containing flammable dust. Part 0. General requirements. 29 November 2011
4.	GOST 17.0.0.01-76 (ST SEV 1364-78) (in edition of 1987) System of standards for environmental protection and improvement of natural resources usage. General provisions
5.	General provisions GOST 17.0.0.04-80 (1998) Protection of nature. Environmental passport (certificate) of industrial facility. General provisions
6.	GOST R IS014001-98 Environmental management systems. Requirements and guidelines.
7.	GOST 17.0.0.02-79 (1980) Protection of nature. Provision of metrological control of air, surface water and soils pollution.
8.	GOST 17.1.1.01-77 (ST SEV 3544-82) Usage and protection of water. General terms and definitions.
9.	GOST 17.2.1.01- 76 Classification of emissions (content).
10	GOST 12.1.014-84 (1996) SSBT. Air at workplace. Methodology of measuring of pollutants concentration using indication tubes.
11	GOST 12.1.005-88 (1991) SSBT. General sanitary and hygiene requirements to air at workplace.
12	GOST 17.2.2.05-97 Norms and methods of emissions measuring containing spent diesel gases, tractors and self-propelled agricultural machines.
13	GOST 21393-75 Diesel motorcars. Exhaust gas opacity. Norms and methods of measurement.
14	GOST 17.2.2.03-77 Concentration of carbon monoxide at exhaust gases of motorcars with gasoline engines. Norms and measurements methodology.
15	GOST 17.2.2.03-87 Norms and methods of measurements of carbon monoxide at exhaust gases of motorcars with gasoline engines.
16	GOST 17.4.2.01-81 Nomenclature of sanitary condition parameters
17	GOST 17.4.1.02-83 Classification of chemical substances for monitoring of contamination.
18	GOST 12.1.003-83 (1991) SSBT. Noise. General safety requirements
19	GOST 12.1.023-80 (1996) SSBT. Noise. Methods of threshold noise levels for stationary machinery.
20	GOST 12.1.029-80 (1996) SSBT. Means and methods of noise protection. Classification.

21	GOST 12.1.036-81 (1996) SSBT. Noise. Allowable levels of noise within residential and public buildings.
22	GOST 12.1.007-76 (1999) SSBT. Harmful substances. Classification and general safety requirements.
23	GOST 12.4.119-82 SSBT. Means of respiratory PPE. Methods of protective features assessment for aerosols.
24	GOST 12.4.125-83 (1985) SSBT. Means of collective protective equipment from mechanical factors. Classification.
25	SNiP 2.05.02-85 (1985) Construction norms and rules on Roads for auto transport
Sanitary norms and regulations (SanPins)	
26	SanPiN 2.1.4.559-96 Drinking water. Hygienic requirements to the quality of water from centralised systems of drinking water supply. Quality control
27	CH 2.2.4/2.1.8.562-96 Noise at working places, indoors of residential and public buildings and the territories of residential areas
28	Resolution of the Government of the Republic of Tajikistan dated June 26, 2023 No. 287 "On standards of maximum permissible concentrations of pollutants in atmospheric air and the level of harmful physical and other effects on it"

2.5.1. Noise, Water and Air Quality Standards

90. Tajikistan has standards for permissible noise levels[10], air quality[11] and water quality[12]. These standards are provided in Table 4, Table 5, Table 6 and Table 7. In addition the standards are compared with international guidelines and standards.

91. The ADB Environmental Safeguards also require comparison with appropriate international standards, such as World Bank Group[13], World Health Organization[14] [15]etc. For the current project comparison has been made with relevant international standards as shown in Table 4, Table 5, Table 6 and Table 7. The ADB require that the most stringent standard is used.

Table 4: Drinking Water General Analysis Content and Limits

Parameter	Units	Tajikistan Standard [16]	WHO Standard [17]	EU Standard[18]	Project Standard[19] (mg/l unless stated otherwise)	
Physical Quality						
pH	—	6-9	6-9	6.5-9.5	TJS	6-9
Total Dissolved Solids	mg/l	1000	—		TJS	1000
Hardness	Mg-eqv/l	7.0	—		TJS	7.0
Turbidity	EMF (formasine) or mg/l (caoline)	1.5	—	Acceptable to consumers and no abnormal change	TJS	1.5
Inorganic Chemical Quality						
Aluminum (Al)	mg/l	0.5	—	0.2	EU	0.2
Ammonium ion (NH_4)	mg/l		—	0.5	EU	0.5

[10] CH 2.2.4/2.1.8.562-96 Noise at working places, indoors of residential and public buildings and the territories of residential areas
[11] Resolution of the Government of the Republic of Tajikistan dated June 26, 2023 No. 287 "On standards of maximum permissible concentrations of pollutants in atmospheric air and the level of harmful physical and other effects on it"
[12] SanPiN 2.1.4.559-96 Drinking water. Hygienic requirements to the quality of water from centralised systems of drinking water supply. Quality control
[13] https://www.ifc.org/content/dam/ifc/doc/2023/ifc-general-ehs-guidelines.pdf
[14] https://iris.who.int/bitstream/handle/10665/345329/9789240034228-eng.pdf
[15] https://iris.who.int/bitstream/handle/10665/375822/9789240088740-eng.pdf
[16] SanPin 2.1.4.1074-01.
[17] https://iris.who.int/bitstream/handle/10665/39989/9241540249_eng.pdf
[18] EU Council Directive 98/83/EC of 3rd November 1998
[19] Project standard represents most stringent for each parameter

Parameter	Units	Tajikistan Standard [16]	WHO Standard [17]	EU Standard[18]	Project Standard[19] (mg/l unless stated otherwise)	
Antimony (Sb)	mg/l	0.05	0.02	0.005	EU	0.005
Arsenic (As total)	mg/l	0.05	0.01	0.01	EU	0.01
Barium (Ba)	mg/l		0.7	—	TJS	0.7
Beryllium (Be)	mg/l		—	—	TJS	
Boron (B)	mg/l		0.5	1.0	WHO	0.5
Cadmium (Cd)	mg/l	0.001	0.003	0.005	TJS	0.001
Chloride ion (Cl‘)	mg/l	350	—	250	EU	250
Chlorine (Cl)	mg/l	0.3-0.5 (free) 0.8-1.2 (bounded)	5	—	TJS	0.3-0.5 (free) 0.8-1.2 (bounded)
Chromium (Cr^{+6}) (Cr^{+3})	mg/l	0.05 0.5	0.05	0.05	TJS	0.05 0.5
Copper(Cu)	mg/l	1.0	2	2.0	TJS	1.0
Cyanide (CN)	mg/l		0.07	0.05	EU	0.05
Fluoride ion ($F^{=}$)	mg/l		1.5	1.5	EU	1.5
Flydrogen Sulphide (H_2S)	mg/l		...	...	TJS	
Iron (Fe)	mg/l	0.3	...	0.2	EU	0.2
Lead (Pb total)	mg/l	0.03	0.02	0.01	EU	0.01
Manganese (Mn)	mg/l		0.4	0.05	EU	0.05
Mercury (Fig)	mg/l		0.001	0.001	EU	0.001
Molybdenum (Mo)	mg/l		0.07	...	WHO	0.07
Nickel (Ni)	mg/l	0.1	0.02	0.02	EU	0.02
Nitrate ion (as $N0_3$)	mg/l	45	50	50	TJS	45
Nitrite ion (as $N0_2$)	mg/l		3 or 0.2	...	TJS	3.0
Phosphate ion ($P0_4^{2+}$)	mg/l	3.5	...	...	TJS	3.5
Selenium (Se)	mg/l		0.01	0.01	TJS	0.01
Silicon (Si)	mg/l	10	....	....	TJS	10
Silver (Ag)	mg/l		...	...	TJS	0.05
Sodium (Na)	mg/l		...	200	TJS	200
Sulphate ion ($S0_4^{2+}$)	mg/l	500	...	250	EU	250
Strontium (Sr)	mg/l		...	...	TJS	...
Uranium (U)	mg/l		0.015	...	WHO	0.015
Vinyl Chloride (C2H3Cl / H_2C)	mg/l		0.0003	0.0005	WHO	0.0003
Zinc (Zn)	mg/l	5.0	...	...		5.0
Other quality parameters						
Petrochemicals	mg/l	0.1		0.1-5	TJS	0.1
Sufactants (anionic)	mg/l	0.5		....	TJS	0.5
COD	mg/l	....		150-400	EU	150-400
Permanganate oxizability	mg/l	5		....	TJS	5
Specific electrical conductivity	2x1 O'3			— -	TJS	$2x10^{-3}$

Table 5: Environmental Standards for Water Quality and Discharges to Water

Topic	National Standards / Requirements Tajikistan[20]	IFC/World Bank Guidelines / Standards IFC Environmental, Health, and Safety General Guidelines[21]	Adopted Project Standard	Rationale
Discharge to surface water: Effluent water	List of MPC quality of water at surface water bodies (Requirements to water quality in fishery water bodies)	Temperature of wastewater prior to discharge does not result in an increase greater than 3°C of ambient temperature at the edge of a scientifically established mixing zone which takes into account ambient water quality, receiving water use and assimilative capacity among other considerations. For treated sanitary wastewater:	pH 6.5-8.5	Tajik MPC as most stringent standard supplemented by IFC where needed for comprehensive suite
			BOD 30	
			COD 125	
			Tital Nitrogen 10	
	pH 6.5-8.5		Total Phosphorus 2	
	Aluminium (Al) 0.04		TSS 50	
	Iron (Fe) 0.1		Total Coliform bacteria 400/100 ml	
	Cadmium (Cd) 0.005		Aluminium (Al) 0.04	
	Copper (Cu) 0.001		Iron (Fe) 0.1	
	Nickel (Ni) 0.01		Cadmium (Cd) 0.005	
	Lead (Pb) 0.006	pH 6-9	Copper (Cu) 0.001	
	Zinc (Zn) 0.01	BOD 30	Nickel (Ni) 0.01	
	Chromium (Cr^{+6}) 0.02	COD 125	Lead (Pb) 0.006	
	Chromium (Cr^{3+}) 0.07	Total nitrogen 10	Zinc (Zn) 0.01	
	Oil and petrochemicals 0.05	Total Phosphorus 2	Chromium (Cr^{+6}) 0.02	
	Arsenic (As) 0.05	Oil and grease 10	Chromium (Cr^{3+}) 0.07	
	Calcium (Ca) 180	TSS 50	Oil and petrochemicals 0.05	
	Silicon (Si032) 1.0	Total coliform bacteria 400/100ml	Arsenic (As) 0.05	

[20] Procedure of Environmental Impact Assessment accepted by Resolution No 464 of the Government of the Republic of Tajikistan dated 3 October 2006, Annex 3
[21] https://www.ifc.org/content/dam/ifc/doc/2010/aimm-sfb-water-waste-water-consultation.pdf

Table 6: Air Quality Standards

	National Standards / Requirements [22]Tajikistan standards , mg/m^3:	**IFC/World Bank Guidelines / Standards**[23]	**Adopted Project Standard (mg/m^3)/ supplementary standards are marked bold** mg/m^3:	**Rationale**
Air Quality - Human population protection (at receptors)	PM 0.15	H2S: 5 mg/Nm3	PM 0.15	Tajikistan and supplemented by WHO as necessary to achieve most comprehensive suite
	NO 0.06	WHO standards	NO 0.06	
	$N0_2$ 0.04	WHO guidelines, µg/m^3:	$N0_2$ 0.04	
	$S0_2$ 0.05	$PM_{2.5}$ 10 (1 yr)	$S0_2$ 0.05	
	Ammonia 0.06	$PM_{2.5}$ 25 (24 h)	CO 3.00	
	Benzopyrene 0.1	PM_{10} 20 (1 yr)	Ammonia 0.06	
	Benzene 0.1	PM_{10} 50 (24 h)	Benzopyrene 0.1	
	Acetone 0.35	Ozone 100 (8 h)	Benzene 0.1	
	Petrol 1.5	$N0_2$ 40 (1 yr)	Acetone 0.35	
	V_20_5 0.002	NO_z 200 (1 hr)	Petrol 1.5	
	Vinyl acetate 0.15	$S0_2$ 20 (24 h)	V_2O_5 0.002	
	HCI 0.2	$S0_2$ 500 (10 min)	Vinyl acetate 0.15	
	HF 0.005		HCI 0.2	
	Fe_20_3 0.04		HF 0.005	
	$HN0_3$ 0.4		Fe_20_3 0.04	
	H_2SO_4 0.1		HNO_3 0.4	
	Xylol 0.2		H_2SO_4 0.1	
	Manganese and its oxides 0.001		Xylol 0.2	
	Copper oxides 0.002		Manganese and its oxides 0.001	
	Magnesia 0.05		Copper oxides 0.002	
	Nickel oxide 0.001		Magnesia 0.05	
	Inorganic dust ($SiO_2$70 %) 0.05		Nickel oxide 0.001	
	$Si0_2$ = 70 % - 20 % 0.1		Inorganic dust ($Si0_2$ 70 %) 0.05	
	$Si0_2$ is less than 20 % 0.15			
	Lead and its compounds 0.0003		$Si0_2$ = 70 % - 20 % 0.1	
	Lead sulfur 0.001		$Si0_2$ is less than 20 % 0.15	
	Hydrogen sulfide, H_2S 0.008		Lead and its compounds 0.0003	
	Turpentine 1		Lead sulfur 0.001	
	Ethyl alcohol (ethanol) 5.0		Hydrogen sulfide, H_2S 0.008	
	Butyl alcohol (butanol) 0.1		Turpentine 1	
	Propane alcohol (propanol) 0.3		Ethyl alcohol (ethanol) 5.0	
	Methyl alcohol (methanol) 0.5		Butyl alcohol (butanol) 0.1	
	Styrene 0.003			

[22] Procedure of Environmental Impact Assessment accepted by Resolution No 464 of the Government of the Republic of Tajikistan dated 3 October 2006, Annex 3

[23] https://www.ifc.org/content/dam/ifc/doc/2023/ifc-general-ehs-guidelines.pdf

	Soot 0.05		Propane alcohol (propanol) 0.3	
	CO 3.0		Methyl alcohol (methanol) 0.5	
	Phenol 0.01		Styrene 0.003	
	Formaldehyde 0.003		Soot 0.05	
	Fluoride (HF, SiF4) 0/05		Phenol 0.01	
	Freon (all brands) 10		Formaldehyde 0.003	
	Chromium trioxide 0.0015		Fluoride (HF, SiF4) 0/05	
	Chlorine 0.03		Freon (all brands) 10	
	ZnO 0.05		Chromium trioxlde 0.0015	
	Ethylene oxide 0.03		Chlorine 0.03	
			ZnO 0.05	
			Ethylene oxide 0.03	

Table 7: Relevant Noise Standards

Topic	National Standards / Requirements Tajikistan[24]	International Guidelines / Standards IFC Environmental, Health, and Safety General Guidelines[25]	Adopted Project Standard	Rationale
Night time noise limits for human protection	Noise emissions at the night time (23:00-07:00) should not exceed the following levels (SanPin 2.2.4/2.1.8.562-96): ➢ Inside residential and public buildings: • Hospital and sanatorium's wards, and operating rooms: 25 dB(A); • Residential rooms in apartments, rest houses, boarding houses, houses for the elderly and disabled, sleeping rooms in kindergartens, and residential schools: 30 dB(A); • Rooms in hotels and hostels: 35 dB(A); ➢ In residential and other areas: • Recreational areas immediately adjoining hospital buildings and health centres: 35 dB(A) • Areas immediately adjoining residential buildings, policlinics, dispensary, rest houses, homes for the elderly and disabled, kindergartens, schools and other educational institutions, libraries; 45 dB(A); • Areas immediately adjoining hotel and dormitory's buildings: 50 dB (A)	Noise emissions should not exceed the following levels or result in a maximum increase in background levels of 3 dB at the nearest receptor location off-site: Outdoor: Residential; institutional, educational: Night time (22:00-07:00): 45 dB(A) Industrial, commercial: Night time (22:00-07:00): 70 dB(A)	Tajik standards apply with night time defined as 22:00-07:00 in line with IFC EHS General Guidelines. Exception 1: IFC standard will prevail from 22.00 to 23.00 Exception 2: areas adjoining hotels and dorms where IFC standard is more stringent 45 dB (A)	Most stringent and provides more comprehensive measurement criteria

[24] According to International Sanitary Norms adopted by CIS countries (SanPin 2.2.4/2.1.8.562-96)
[25] https://www.ifc.org/content/dam/ifc/doc/2023/ifc-general-ehs-guidelines.pdf

Daytime noise limits for human protection	Noise emissions at the day time (07:00-23.00) should not exceed the following levels (SanPin 2.2.4/2.1.8.562-96): ➢ Inside residential and public buildings: • Hospital and sanatorium's wards, and operating rooms: 35 dB(A); • Consultation rooms of policlinics, ambulant clinics, dispensers, hospitals, and sanatoria 35 dB(A). • Classrooms, teachers' common room, school and other educational organization's auditoriums conference halls, and public reading rooms 40 dB(A). • Residential rooms in apartments, rest houses, boarding houses, houses for the elderly and disabled, sleeping rooms in kindergartens, and residential schools: 40 dB(A); • Rooms in hotels and hostels: 45 dB(A); • Halls of cafes, restaurants, eating rooms: 55 dB(A); • Shops trade halls, passenger halls in airports and stations, consumer services centres: 60 dB(A); ➢ In residential and other areas: • Recreational areas immediately adjoining hospital buildings and health centres: 45 dB(A) • Areas immediately adjoining residential buildings, policlinics, dispensary, rest houses, homes for the elderly and disabled, kindergartens, schools and other educational institutions, libraries: 55 dB(A); • Areas immediately adjoining hotel and dormitory's buildings: 60 dB (A) • Rest areas at the territory of hospitals and sanatoria 35 dB (A) • Recreation areas at the territory of micro-districts, and residential areas, rest houses, houses for the elderly and disabled, children's playgrounds in kindergartens, schools and other educational institutions: 45 dB (A)	Noise emissions should not exceed the following levels or result in a maximum increase in background levels of 3 dB at the nearest receptor location off-site: Outdoor Residential.; institutional, educational.: Daytime (07:00-22:00): 55 dB(A) Industrial, commercial: Day time (07:00-22:00): 70 dB(A).	Tajik standards with daytime defined as 07:00-22:00 in line with IFC EHS General guidelines. Exception: areas adjoining hotels and dorms where IFC standard is more stringent 55 dB (A)	Most stringent and provides more comprehensive measurement criteria

2.6. Comparison of ADB and National Environmental Safeguards Requirements

92. This section outlines how ADB environmental safeguards (ES) policies compare to Tajikistan's national environmental requirements. In general, there are no significant differences between Tajikistan legislations and practices and ADB policies regarding the environmental safeguards as ADB SPS (2009) requirements are incorporated and in use at other projects in Tajikistan.

93. Table 8 presents a comparison of ADB and GoT environmental safeguards policy and legislation requirements.

2.6.1. ADB Safeguard Policy Statement's Environmental Requirements

94. ADB SPS requires the consideration of environmental issues in all aspects of ADB's operations, and the requirements for environmental assessment are described in ADB SPS, 2009. This states that ADB requires environmental assessment of all ADB investments.

95. Screening and Categorization. ADB uses a classification system to reflect the significance of a project's potential environmental impacts. A project's category is determined by the category of its most environmentally sensitive component, including direct, indirect, cumulative, and induced impacts in the project's area of influence. Each proposed project is scrutinized as to its type, location, scale, and sensitivity and the magnitude of its potential environmental impacts. Projects are assigned to one of the following four categories:

Category A. A proposed project is classified as category A if it is 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 environmental impact assessment is required.
Category B. A proposed project is classified as category B if its potential adverse environmental impacts are less adverse than those of category A projects. These 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 is required.
Category C. A proposed project is classified as category C if it is likely to have minimal or no adverse environmental impacts. No environmental assessment is required although environmental implications need to be reviewed.
Category FI. A proposed project is classified as category FI (Financial Intermediary) if it involves investment of ADB funds to or through a FI.

96. **Environmental Audit of Existing Facilities.** ADB SPS requires an environmental audit, if a subproject involves facilities and/or business activities that already exist or are under construction, including an on-site assessment to identify past or present concerns related to impacts on the environment. The objective of this compliance audit is to determine whether actions were in accordance with ADB's safeguard principles and requirements for borrowers/clients, and to identify and plan appropriate measures to address outstanding compliance issues.

97. SPS environmental safeguard policy principles require conservation of physical cultural resources, and, avoid destroying or damaging them by using field-based surveys employing qualified and experienced experts during environmental assessment. It also emphasizes the use of "chance find" procedures that include a pre-approved management and conservation approach for materials that may be discovered during project implementation.

98. **Environmental Management Plan.** An EMP, which addresses the potential impacts and risks identified by the environmental assessment, shall be prepared. The level of detail and

complexity of the EMP and the priority of the identified measures and actions will be commensurate with the project's impact and risks.

99. **Public Disclosure.** ADB will post the safeguard documents on its website as well as disclose relevant information in accessible manner in local communities:

1. for environmental category A projects, draft EIA report at least 120 days before Board consideration;
2. final or updated EIA and/or IEE upon receipt; and
3. environmental monitoring reports submitted by the implementing agency during project implementation upon receipt.

100. **Consultation and Participation.** Meaningful consultation shall be carried out with affected people and other concerned stakeholders including civil society and facilitate their informed participation. The consultation process and its results are to be documented and reflected in the environmental assessment report.

101. **Grievance Redress Mechanism.** PAG shall establish a mechanism to receive and facilitate resolution of affected people's concerns, complaints and grievances about the subproject's environmental performance. The grievance mechanism shall be scaled to the risks and adverse impacts of the subproject.

102. **Occupational Health and Safety.** ADB requires that the borrowers shall ensure that the workers are provided with a safe and healthy environmental, considering risks inherent to the sector and specific classes of hazards in the subproject areas including physical, chemical, biological and radiological hazards.

103. **Unanticipated Environmental Impacts.** Where unanticipated environmental impacts become apparent during the implementation, PAG shall update the EMP to assess the potential impacts, evaluate the alternatives and outline mitigation measures and resources to address those impacts.

104. **ADB SPS International Best Practice Requirements.** Following requirements of ADB SPS, PAG shall apply pollution prevention and control technologies and practices consistent with international good practice. When the Government of Tajikistan regulations differ from these levels and measures, PAG shall achieve whichever is more stringent. If less stringent levels or measures are appropriate in view of specific subproject circumstances, PAG will provide full and detailed justification for any proposed alternatives that are consistent with the requirements presented in ADB SPS.

Table 8: Comparison of ADB and Legislation Requirements of Tajikistan

Aspect	ADB	Legislation of Tajikistan
Environmental and Social Policy and Regulations	ADB's SPS (2009) sets out the policy objectives, scope and triggers, and principles for three key safeguard requirement areas: (i) Environmental safeguards, (ii) Involuntary resettlement safeguards, and (iii) Indigenous people's safeguards	Environmental assessment and permitting procedure in Tajikistan are set out in the Law on Environmental Impact Assessment, Law on Environmental .
Screening	Project screening and categorization at the earliest stage of project. Four categories are defined category A, B, C, FI. Rapid environmental assessment checklist is used for categorization.	Project screening is done at early stage of the project. Environmental Assessment The Law provides list of A and B category activities. For category B project need of EIA is defined based on the scoping procedure by CEP.
Alternatives	Examination of financially and technically feasible alternatives to the project location, design, technology and components, their potential environmental and social impacts. Consider no project alternative.	Alternative assessments are to be carried out for the project location and design.
EIA Report	For category A projects EIA (that includes EMP describing mitigation and monitoring issues) is obligatory. For category B projects – AIEE is required to determine whether significant environmental impacts warranting an EIA are likely. If an EIA is not needed, the AIEE is regarded as the final environmental assessment report. Guidelines and the outline of an EIA report are provided in SPS (2009).	EIA report is required for Annex 2 point 3 and 4 listed objects. The content of the EIA report is structured so to cover requirements indicated in the Environmental Assessment Code. The EMP is a part of the EIA document.
Public Consultations and public meetings	NGOs early in the project preparation and ensure that their views and concerns are made known and understood by decision makers and considered. Continue consultations with stakeholders throughout project implementation as necessary to address environmental assessment- related issues. Minimum two consultations are required. Presence of ADB representative at official meetings with stakeholders is obligatory.	Publication of information in national and regional mass-media. Arrange one public meetings at the scoping stage. Another one meetings and consultations with stakeholders during EIA process. Consultation not later than 10 days from the date of publication. All stakeholders are invited for the meetings.
Public Disclosure	Draft EIA will be published in ADB website for 120 days before project approval by the Board.	The scoping document is available for public review for 130 days before public consultations. - No requirement to analyze stakeholders - No formal plan required

2.7. International Treaties and Legal Commitments

105. Under the Republic of Tajikistan legal system, once international agreements and treaties are ratified or acceded to by the Government, have the same force as national legislation.

106. Tajikistan is a party to a number of international environmental conventions and protocols and has passed state laws aimed at implementing them, with the provision that the international treaties to which Tajikistan is a party shall prevail if it is inconsistent with its national legislation.

107. International Environmental Conventions. The key international environmental conventions that Tajikistanhas acceded to are shown in Table 9 below.

Table 9: Relevant International Environmental Conventions

International convention/Agreement	Year of Accession
UN Convention on Biological Diversity	1997
Cartagena Protocol on Biosafety to the Convention on Biological Diversity,	2004
Nagoya Protocol on Access and Benefit-sharing (CBD)	2013
Aarhus Convention on Access to Information, Public Participation in Decision making and Access to Justice in Environmental Matters	1998
UNFCCC - UN Framework Convention on Climate Change, 1998; Kyoto Protocol update accessed on 29 December 2008 and entered into force on 29 March 2009.	1998
UN Convention on Combating Desertification	1997
Vienna Convention for the Protection of the Ozone Layer	1996
Protocol on Substances that Deplete the Ozone Layer (Montreal),	1998
London Amendments to Montreal Protocol on Ozone Depleting Substances,	1998
Copenhagen Amendments to Montreal Protocol on Ozone Depleting Substances	2009
Montreal Amendments to Montreal Protocol on Ozone Depleting Substances	2009
Beijing Amendments to Montreal Protocol on Ozone Depleting Substances	2009
Convention on International Trade in Endangered Species (CITES) of Fauna and Flora	2016
Stockholm Convention on Persistent Organic Pollutants	2007
Working Environment (Air Pollution, Noise and Vibration) Convention	1977
Occupational Safety and Health Convention	1981

III. DESCRIPTION OF THE PROJECT

3.1. Rationale

108. One of the main challenges for Tajikistan's socio-economic development is low labor productivity. Most jobs in Tajikistan are either in low productivity sectors, and many of the 19% of workers in high-productivity fields such as services, manufacturing and construction account are constrained in achieving very high productivity because they do not have the technical and/or ICT knowledge to boost their outputs. Industrial enterprises especially lack engineering and technical workers. The school education system in Tajikistan does not sufficiently prepare students for high-productivity sectors due to its limited quality and focus on STEM education.

109. A recent survey of general secondary schools showed that over 60% of students were not able to reach the basic level of competency in applying sciences and mathematics knowledge to real-world situations. The students often lack interest in studying STEM. These influence their pursuit of further education or career – (i) for initial vocational education and training (VET) where courses are mainly on engineering, manufacturing and construction, the enrollment has decreased from 27,000 in school year 2015/16 to 23,000 in 2020/21; and (ii) only 12.7% of secondary VET students and 16.4% of higher education students are enrolled in a field related to science and technology.

110. Lack of STEM teachers and difficulty in hiring qualified teachers to fill vacant positions at general secondary schools exacerbate the difficulties of providing STEM education. Lack of quality STEM education at schools exacerbates the profile of higher education on STEM, which in turn dampens further STEM education at school level: there are 41 institutions of higher education, including universities, with 239,539 students, 89,565 of whom are girls (37%).

111. Girls in particular tend not to take degrees in STEM subjects as the professions attached to STEM are considered to be 'male territory'. Scholarships awarded by Districts do not differentiate between STEM and other subjects.

112. The proposed project will support improvement of the foundation of human capital for transitioning to higher labor productivity to increase country competitiveness through strengthening the learning outcomes of secondary education students on STEM subjects and their basic understanding of climate change.

113. The project will focus on the improvement of science, technology, engineering and mathematics (STEM) secondary education (i.e., ISTEMSEP). It will entail the reconstruction of general secondary schools for enhanced disaster resilience, the setup of school-level information system to include profiles on climate change and natural hazard profiles surrounding schools, and the integration of climate change and natural disaster risk preparedness in school teaching and learning.

3.2. Project outputs and main activities

114. **Output 1: Quality of and focus on STEM education improved.** This output will support (i) developing and contextualizing competency-based teaching and learning materials, including e-materials for STEM subjects from grades 5 to 11; (ii) providing science laboratories, ICT applications, and data packages for selected schools, which will serve as hubs (resource centers) for teachers and students in neighboring schools; (iii) developing an e-learning platform for STEM teachers' need-based competency development and linking the platform to the EMIS (output 3); (iv) training STEM teachers on competency-based education approach, knowledge of subject and block of subjects,

formative assessment, and using laboratory practical application and technology; (v) strengthening peer-learning mechanisms for teachers by developing lead teachers on STEM subjects and subject blocks, and implementing classroom-based mentoring and monitoring; (vi) strengthening school-level exams for STEM subjects; (vii) piloting updated pre-service STEM teacher education with selected universities; (viii) providing career guidance service and soft skills training for students; and (ix) partnership with internationally well-performed schools and teacher education universities on STEM.

115. **Output 2: Access to and completion of general secondary education increased**. (i) This output will support improvement of the learning environment through upgrading infrastructure and adding classrooms for 20 selected schools, especially in rural areas, with sex-segregated water, sanitation and hygiene facilities, and energy-saving and disaster-resilient buildings and facilities. Design and construct the STEM blocks[26] in each of the project schools. Each of the 20 project schools will receive a modern STEM block (building) consisting of at least laboratories to cover key subjects (chemistry, physics, biology, mathematics, geography, technology). The laboratories will be built to modern specifications with key health and safety features throughout. In addition, a modern digital laboratory consisting of computers, projectors and other where possible additional space for workshop/makerspace, will be made available as well as a requisite number of classrooms will be constructed to ensure class learning activities in one shift. The buildings will integrate energy saving techniques to ensure comfortable learning environments both in the heat of summer and cold of winter. (ii) The project will help girls continue to grades 10 and 11, and encourage them to pursue STEM learning through targeted support. (iii) It will prevent possible dropouts by developing and applying a system to monitor students' school attendance using the improved SIS. (iv) The project will improve distance learning opportunities and results by applying appropriate teaching and learning materials.

116. **Output 3: Sector governance and management strengthened**. This output will support improving the SIS by incorporating the students' school attendance and learning results; (ii) building capacity of the Ministry of Education and Science in analyzing the SIS data to inform decision-making; (iii) updating STEM teachers' competency standards; (iv) updating pedagogic program for pre-service STEM teacher candidates in line with skills-based education requirements under the State Standards for Secondary Education (2015); (v) improving the linkage of teachers and students to the real professional world related to STEM; and (vi) strengthening the capacity of local education departments in academic supervision and reporting.

117. **Output 4: Climate change education and disaster resilience capacity enhanced.** This output will (i) support integrating climate change-related topics, concepts, knowledge points, and good practices in the secondary education curricula, textbooks, and teaching and learning materials for the STEM subjects; (ii) train in-service teachers and teacher trainers on climate change knowledge and practices; (iii) develop climate change contents, material and modules for the pre-service STEM teacher education program and for training teacher educators; (iv) survey students' and teachers' understanding of climate change and basic ideas of climate change adaptation actions; (v) reconstruct and/or extend a representative school facility compliant with the disaster resilience requirements; (vi) provide training on supervision of works for ensuring the compliance with disaster resilience requirements; and (vii) build capacity for school facility users and maintenance staff on good practices for disaster-resilient responses.

[26] A STEM block in this context is to bring in the concept of a single classroom/laboratory and other learning facilities building that will bring all STEM related school activities under one roof in a modern, safe and enticing environment.

118. **Output 5: STEM education system transformed with orientation and empowerment for women and girls.** (i) Renovate the main teaching building by reconstructing existing laboratory facilities at TSPU and by adding a STEM block comprising biology, chemistry and physics laboratories, informatics rooms and STEM project and multipurpose activity workspaces at DPC (to encourage integration of maths, sciences, geography and engineering activities) with adequate water supply, drainage, ventilation system. (ii) Upgrade selected dormitories for female students with internet connection and ICT rooms (currently TSPU provides dormitory accommodation for 663 girls and 455 boys in 5 dormitories, and DPC provides accommodation for 120 girls in one dormitory). (iii) Provide updated scientific lab equipment and experiment materials and establish internet connected–ICT labs for selected STEM faculties. (iv) Provide scholarships for enrolling female students in STEM specializations and research assistantship for training in-service secondary school female teachers to operate scientific and ICT labs, by prioritizing rural areas, PWDs and the specializations where teachers are most lacking at secondary schools.

3.3. Project location

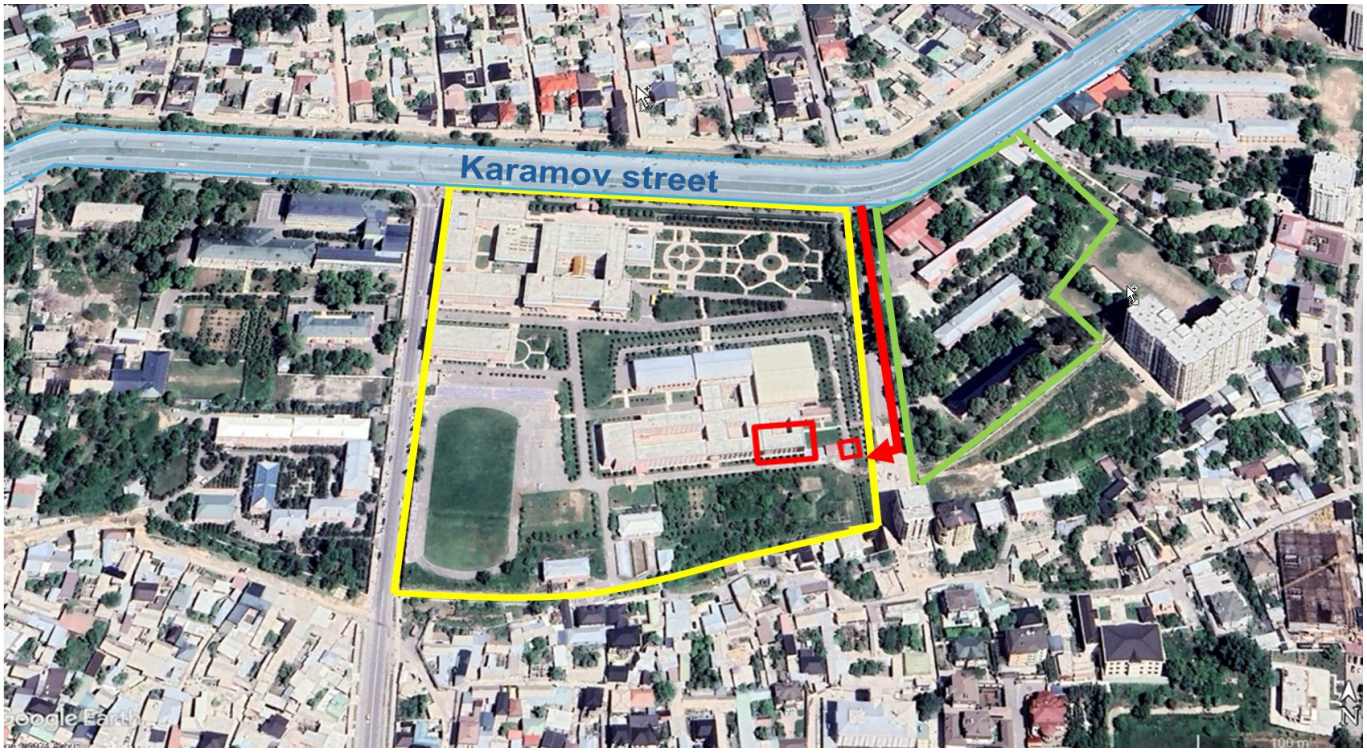
119. The chapter describes the geographical and environmental features of the PAG office and provides information on the location where the PAG office site is located.

120. The PAG office will locate in the second floor of Additional building of International Presidential Lyceum (IPL).

121. The subproject site is situated in flat land in the north-west side of Dushanbe within Sino District. This plot of land is situated within the Campus of International Presidential Lyceum the northern side. The lyceum campus itself is bounded on the north by a 4-lane bi-directional Karamov street and on the east and west by a 2-lane feeder local road.

122. In terms of land use, the IPL campus is surrounded by institutional, residential, commercial uses. Right adjacent to it, on the east side is the Sports Boarding School. Residential and mixed residential-cum-commercial buildings are primarily found on the east of the campus and also on the southwest direction across Karamov Street.

123. The above-mentioned land use tracks are shown in the map below.



Legend

- Campus of International Presidential Lyceum
- Campus of Sports Boarding School
- Location of PAG office
- Entrance for supplying materials and equipment

Figure 1: Prevailing Land use surrounding the Current Subproject site

124. Photos below illustrate current status of the plot which is being proposed for rehabilitation.

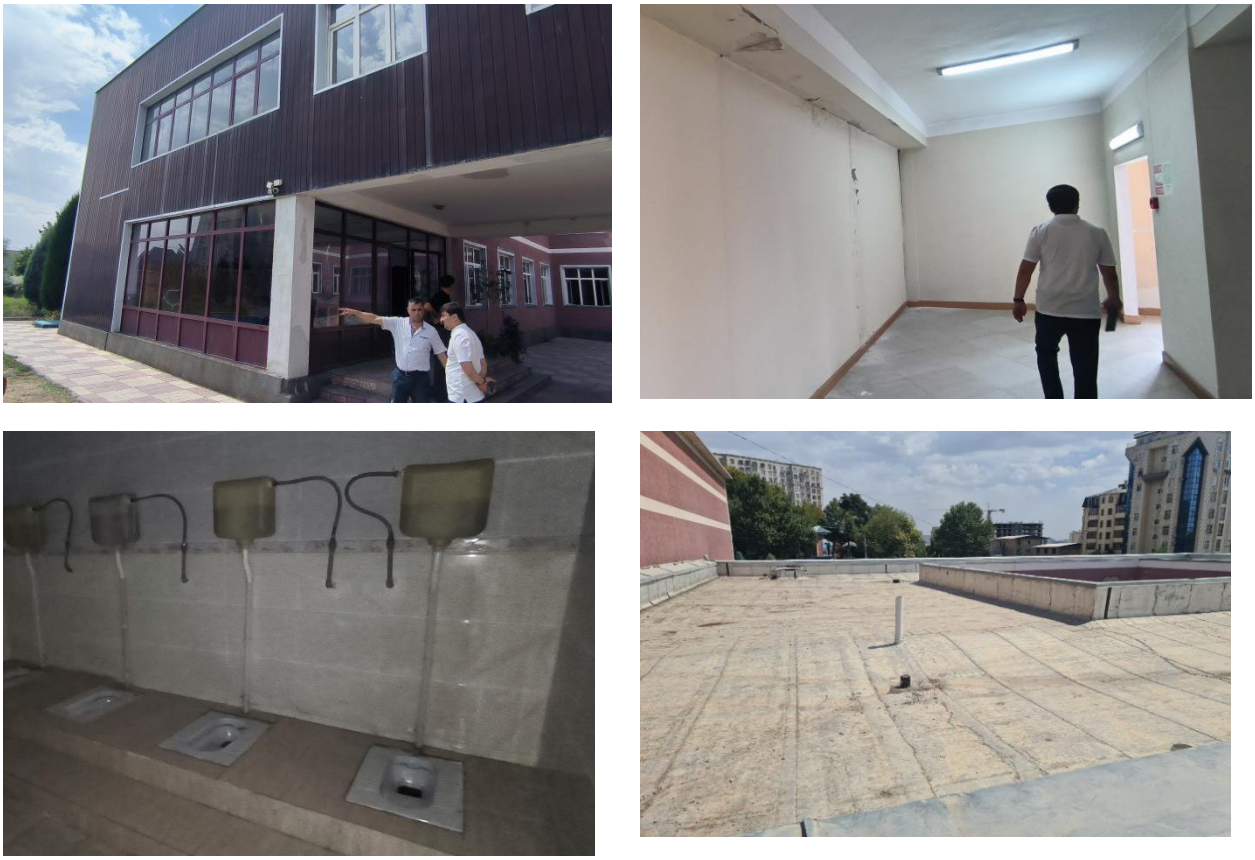


Photo 1: Current condition of the building

Photo 2: Location where elevator will be deployed

Photo 3: Location where will be built carport, no trees will be cut

Photo 4: Classroom to be rehabilitated

125. A building was designated for the use of the PAG, but it was in need of significant repairs before it could be fully operational. The structure showed signs of wear and tear, including issues with the roof, plumbing, and electrical systems. To ensure a safe and functional environment for meetings and activities, a comprehensive assessment of the building's condition was necessary. Plans were proposed to undertake the required renovations, which would not only enhance the building's safety and accessibility but also create a more welcoming atmosphere for community engagement. The timely completion of these repairs would enable the PAG to effectively fulfill its mission and serve the public more efficiently.

126. Furthermore, supplementary initiatives have been suggested to enhance the functionality and user experience of the PAG office. By prioritizing the improvement of access routes and parking facilities, we can greatly increase the overall efficiency and convenience for both visitors and employees.

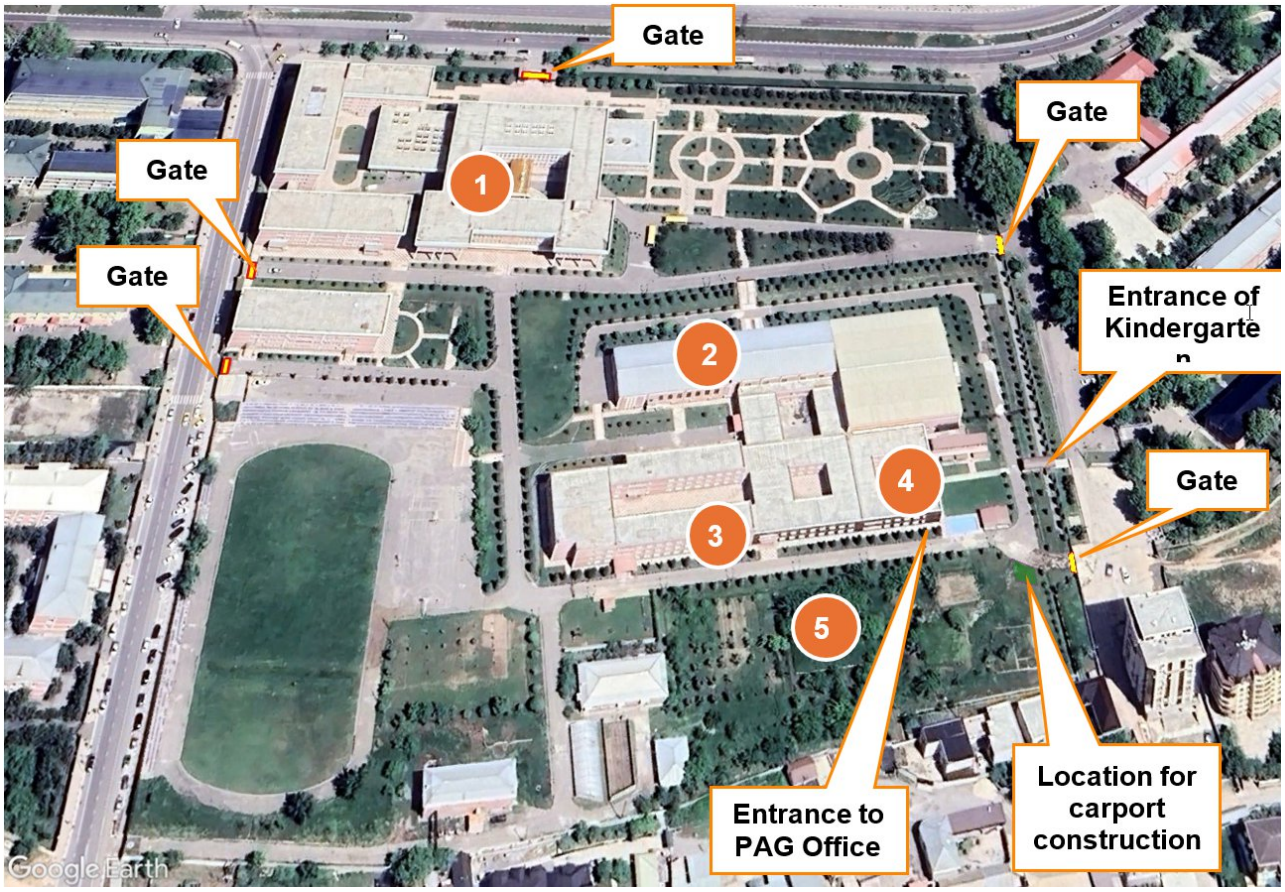
127. Transportation of equipment and construction materials will be done using the main road of Karamov street. The contractor shall install warning signs at appropriate points (at least at the distance 20 m before construction site) during conduction of rehabilitation works and observe requirements to ensure traffic and pedestrian safety. The Contractor shall be responsible for developing a comprehensive Traffic Management Plan (TMP) and ensuring its effective implementation throughout the duration of the project. The TMP must address all necessary measures to minimize disruptions, ensure public safety, and maintain smooth traffic flow in accordance with applicable regulations and project requirements.

128. Construction waste from the site is being disposed of at the waste storage facility in Dushanbe, as designated by the city municipality. The contractor has already concluded an agreement with the relevant district body and obtained the necessary permits.

129. The IPL campus is within a fenced property and have Five (5) gate accesses. The PAG office will use the service gate in eastern part of the campus The Main Gate has stationed guard personnel controlling the entry and exit of academic personnel and students.

130. The Campus consist of a number of buildings and halls for academic and learning purposes, administration and other operations. The front of the specific plot is an open green-grass space for outdoor activities. A small size of it will be affected along with some line of ornamental pine trees

which were to be fully inventoried. Walkways for general mobility are also provided along with some driveways and trails.



LEGEND

q	Main Building of the lyceum
w	Sports hall
e	Kindergatren
r	PAG office
t	Open green-grass space for outdoor activities

Figure 2: Location of site

3.3.1. The International Presidential Lyceum

131. The International Presidential School in Dushanbe was inaugurated in September 2012, marking a significant milestone in the region's educational landscape. Spanning an expansive area of approximately 10 hectares, the school is designed to provide a comprehensive and modern learning environment for its students.

132. Equipped with state-of-the-art educational facilities, the school boasts a wide range of amenities aimed at fostering both academic and extracurricular development. Among these facilities are a well-equipped stadium for various sports activities, a spacious canteen serving nutritious meals,

an extensive library stocked with a diverse collection of books and resources, a swimming pool for aquatic activities, and a fully equipped gymnasium to promote physical fitness. Additionally, the school offers comfortable dormitories, ensuring that students who require overnight accommodations have a safe and conducive living environment.

133. The International Presidential School is committed to delivering high-quality education, with all instruction conducted exclusively in English. This immersive language approach not only enhances students' proficiency in English but also prepares them for global opportunities in an increasingly interconnected world.

134. Currently, the school serves a vibrant community of approximately 640 students, who come from diverse backgrounds. This multicultural environment enriches the educational experience, promoting understanding and collaboration among students from different cultures and perspectives. The school’s mission is to cultivate well-rounded individuals who are equipped with the knowledge, skills, and values necessary to thrive in a rapidly changing world.

IV. DESCRIPTION OF THE BASELINE ENVIRONMENT

135. Mountains occupy around 93% of Tajikistan. The main elements of Tajik geography are the following: the Kuramin Mountain Range and the Mogoltau Mountains, Fergana De- pression, Hissar-Alai Mountains (the South Tian Shan), the depressed area in southwestern Tajikistan (Tajik depression), and Pamir. Altitudes range from 300-7,495 meters above sea level (masl). The modern relief of Tajikistan is the result of activities of alpine tectonic movements of the earth surface and the denudation process. The majority plain territories of the country are the broad areas of river valleys or the vast depressions between the mountains. Most of the country's population is concentrated in these particular areas along with the main fields of industrial production and agricultural potential of the county. Dushanbe is located in the central west of Tajikistan in Hissar Valley where the Varzob and Kofarnihon rivers meet. The total land area of the city is 124.6 sq. km.

136. The subproject area is located in the western part of Dushanbe, the capital city of Tajikistan, at an elevation of approximately 859 meters above sea level. Geologically, the area falls within the Tajik Depression, a region characterized by its unique geological history and sedimentary composition. The dominant sediments in this area date back to the late Mesozoic and early Cenozoic eras. These sediments are predominantly soft and largely unconsolidated, which can increase the vulnerability of slopes in the area to landslides or other forms of instability.

137. In addition to these older formations, modern alluvial sediments are prominent in the floodplains of nearby rivers. These alluvial deposits primarily consist of pebbles, sands, and sandy loams, with sediment thickness varying between 10 and 25 meters. Furthermore, alluvial-proluvial sediments from the Upper Quaternary period are found on the floodplain terraces of the Dushanbinka and Kofarnihon Rivers. These deposits cover a significant portion of the Sino region of Dushanbe and are composed of materials such as pebbles, boulders, sandy loams, and loess loams. The thickness of these sediments typically ranges from 1 to 4 meters but can occasionally reach depths of up to 10–25 meters.

138. In the eastern part of the Sino region, buried and submerged valley deposits are present. These formations are made up of boulders and pebbles mixed with sand and gravel, often cemented together. In some cases, they also include loam with crushed stone and gravel. The total thickness of these deposits can be substantial, reaching up to 150 meters in certain areas.

139. Beyond the city limits, indigenous or bedrock deposits are primarily composed of Neogene-age rocks. These formations consist of rocky and semi-rocky materials interspersed with clay-rich layers of varying compositions and origins. Common rock types in these deposits include sandstones, conglomerates, siltstones, and clays. Such deposits are particularly evident in the valleys of the Kofarnihon and Dushanbinka Rivers outside the urban area

140. It should be noted that with a very complex geological structure, wide development of silty, mainly subsiding loam in the region, there are various and intensive man-made impacts on the geological environment (filtration from canals, leaks from water-carrying networks, undercutting and slope loading, change in surface runoff, uncontrolled irrigation of land) led to significant changes, caused the formation of technogenic waters horizons of, and then subsidence, suffusion, landslides both in the city, and surrounding area, which is increasingly being developed. Many of these changes continue to develop in an unfavorable direction and, if protective measures are not taken, this can lead to even more negative changes in the geological environment.

141. Soils in the area of Dushanbe are light-brown and carbonate, which are typical of plains formed on loess deposits, are characterized by low organic matter content and fine texture, and are suitable for agriculture.

4.1. Seismicity

142. Tajikistan is a country of intense tectonic movements and high seismicity. Earthquakes are dependent on many factors: geotechnical conditions, nature of the soil, presence of groundwater, landforms, etc. Major seismic zones in Tajikistan are with 7, 8, and 9-degree seismic intensity on the MSK-64 scale.[27] In each of these zones, earthquakes at the mentioned levels are possible. Most southern districts are in seismic Zones 7 or 8. Northern districts are in Zone 8, except for Mastchoh District, which is in Zone 7. Dushanbe, the districts of Republican Subordination, and Gorno-Badakhshan Autonomous Region are in Zone

143. 9. As is the case throughout Tajikistan, Dushanbe City is situated on a seismically active belt (Figure. 10).

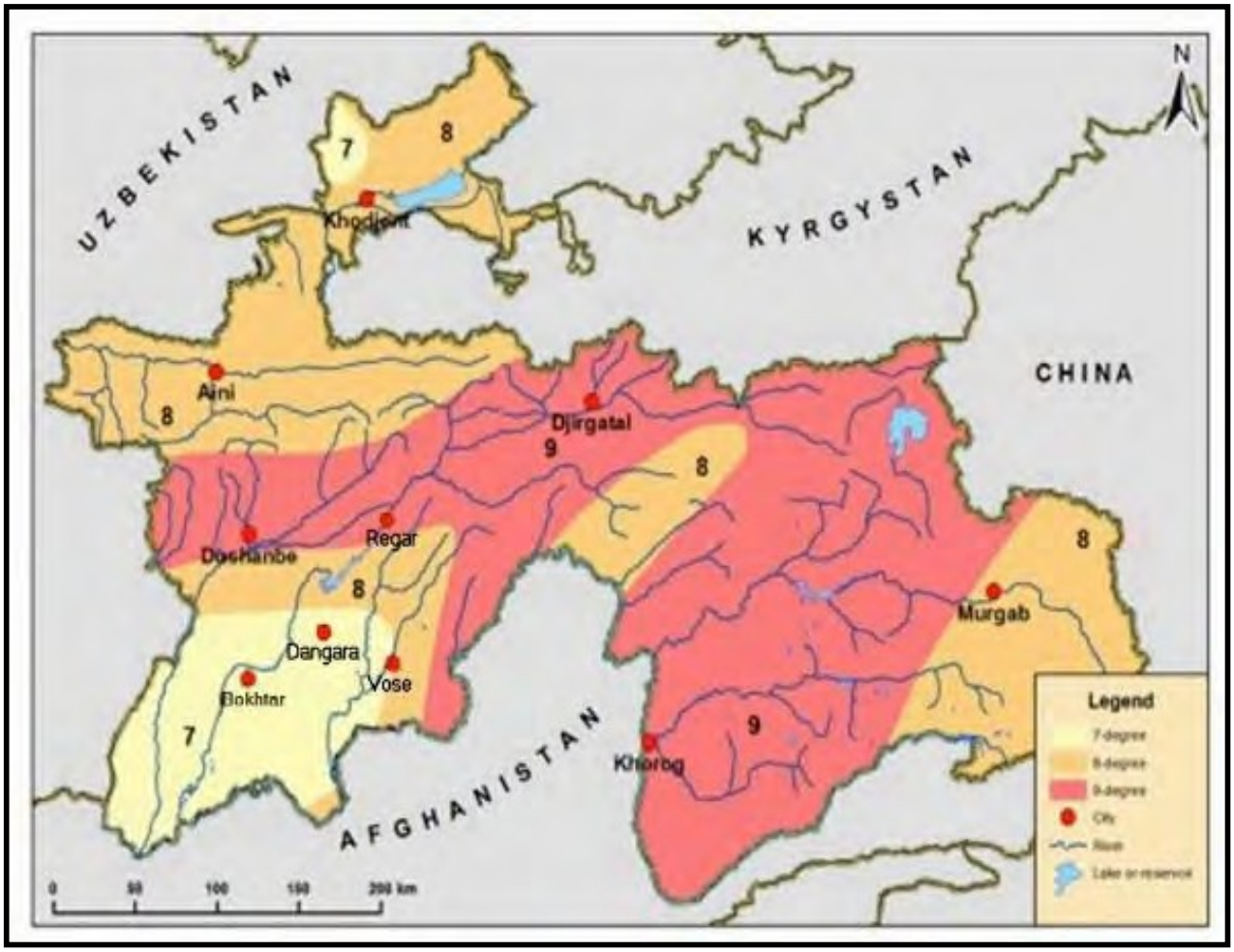


Figure 3: Seismic Map of Tajikistan

[27] This normative map of seismic zoning was compiled in 1978 by A.M. Babayev, T.A. Kinyapina, K.M. Mirzoev, R.S. Mikhailova and G.V. Koshlakov under the guidance of S.Kh. Negmatullaev

4.2. Soil

144. As a typical alpine country, Tajikistan has vertical variability of soil cover. Three major vertical belts of soil distribution can be found in the country: (i) grey soils of valleys and idle fields; (ii) brown soils of middle belts of mountains; and (iii) soils of highlands.

145. There is a distinguished gradient from the more humid northern part of the study area to the very dry southern part. The soils of the study area are highly productive, with much of the area used for agriculture. In the dry southern part of the subproject area, agricultural use is, however, only possible when soils are irrigated. Soil erosion is a major environmental concern throughout the country due to seismic activity, steep slopes, the fragility of soils, and human activities such as inappropriate livestock management, the removal of protective vegetative cover, and poor water management practices. Soils in the area of Dushanbe City are light brown and carbonate, which are typical of plains formed on loess deposits, are characterized by low organic matter content and fine texture, and suitable for agriculture (Figure below).

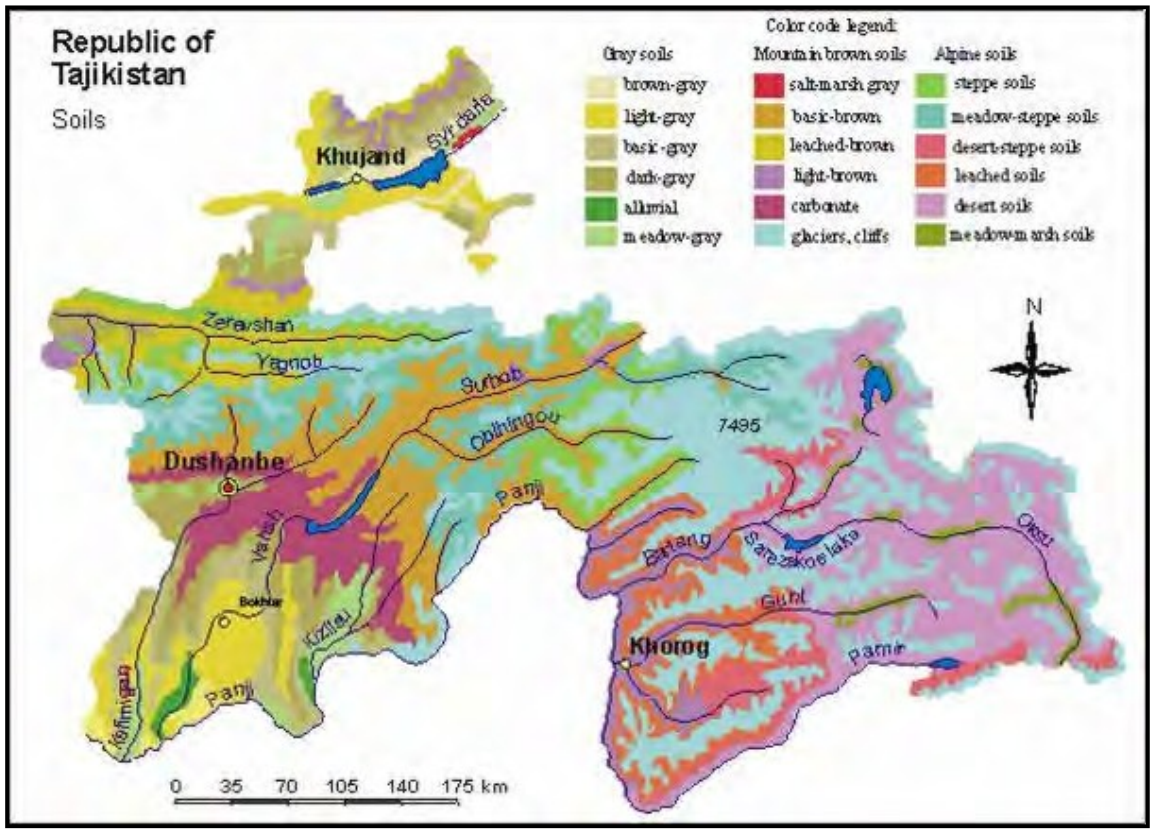


Figure 4: Soil Map of Tajikistan

4.3. Air Quality

146. The problem of air quality is one of the basic ecological issues of industrial and urban- ized areas in Tajikistan. The main stationary sources of air pollution in Tajikistan are mining, metallurgy, chemical industries, buildings, mechanical processing, light industries, heat and power generation, and agriculture. However, in general, no industrial stationary sources of atmospheric air pollution are located within the subproject cities.

147. In 2005, the share of motor transport emissions was 170,300 tons (t) or 83 % of the total amount of pollutants released into the atmosphere. Motor transport is the main source of substances

accumulating in the atmospheric surface layer. Products of fuel combustion are released to the atmosphere and generate smog. Old vehicles with increased toxic gas emissions comprise 30-40% of the total number of vehicles for road transportation. The ex- haust emissions include about 200 chemical components and dangerous substances such as carbon monoxide, nitrogen oxide, hydrocarbons, lead, etc.

148. Typically, a vehicle with an internal combustion engine using 1,000 liters (l) of fuel emits about 200 kilograms (kg) of carbon monoxide, 20 kg of nitrous oxides, 1 kg of ash and solid particles, and 200-400 g of lead components. In urban conditions, emissions from road transport potentially rise because of frequent changes in operation mode and traffic jams. Illegal burning of leafage, street litter, and household wastes contributes to the pollution of urban atmospheric air. It is dangerous as leaves absorb harmful elements and heavy metals, such as lead, while household wastes contain rubber, plastic, and other organic substances that emit 40 harmful and toxic components when burning. The emission of harmful sub- stances into the atmosphere potentially affects many natural and societal objects not de- pending on the pollution source and distance. As a result of air pollution, cultural values, vulnerable ecosystems, agricultural lands, and population might be damaged.

149. The main stationary sources of air pollution in Dushanbe City are the Dushanbe cement plant, Dushanbe heat (thermal) power plant, Dushanbe refrigerator plant, and the Dushanbe reinforcing steel factory. There are no regular instrumental air quality data avail- able for Dushanbe City. The other sources of emissions are: (i) vehicle engine emissions; and (ii) dust, including that generated from the movement of vehicles. The main emissions from the combustion of fuel in vehicle engines include nitrogen oxides (NOx), carbon monoxide (CO), volatile organic compounds (VOCs), carbon dioxide (CO2), and particulate matter (PM). At present rates, these emissions levels are relatively low when compared to those in the region.

4.4. Climate

150. Tajikistan has three major climate zones: continental, subtropical, and semi-arid, with some desert areas. The climate changes drastically according to elevation, however. The location of the country in the middle of Eurasia, its remoteness from oceans and seas, and proximity to deserts predefine its climate, which can be characterized as continental, with considerable seasonal and daily fluctuations in temperature and humidity. The climate in the central and southwest regions of Tajikistan is characterized by rather hot summers and mild winters. The cold period lasts for 90-120 days, and the warm period, 235-275 days. Of the annual precipitation, 75-85% occurs from December to May. The country‘s very complicated relief structure, with huge variations in elevation, creates unique local climates with great temperature differences (Figs. 12-14).

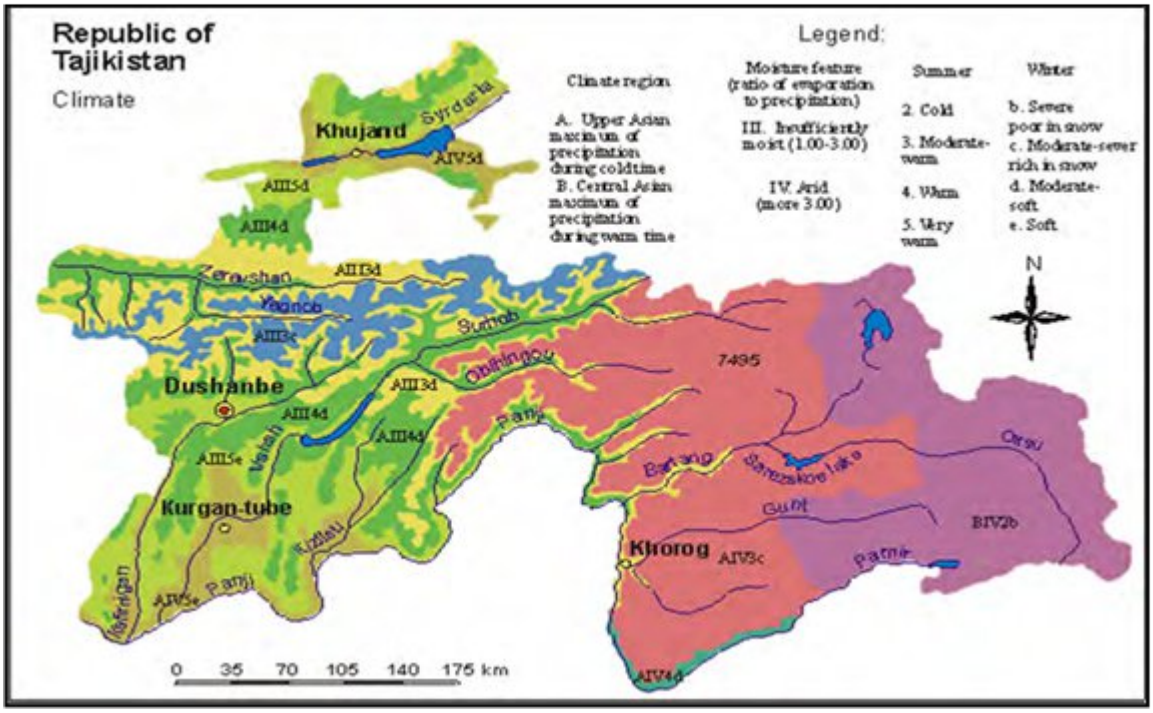


Figure 5: Climatological Map of Tajikistan

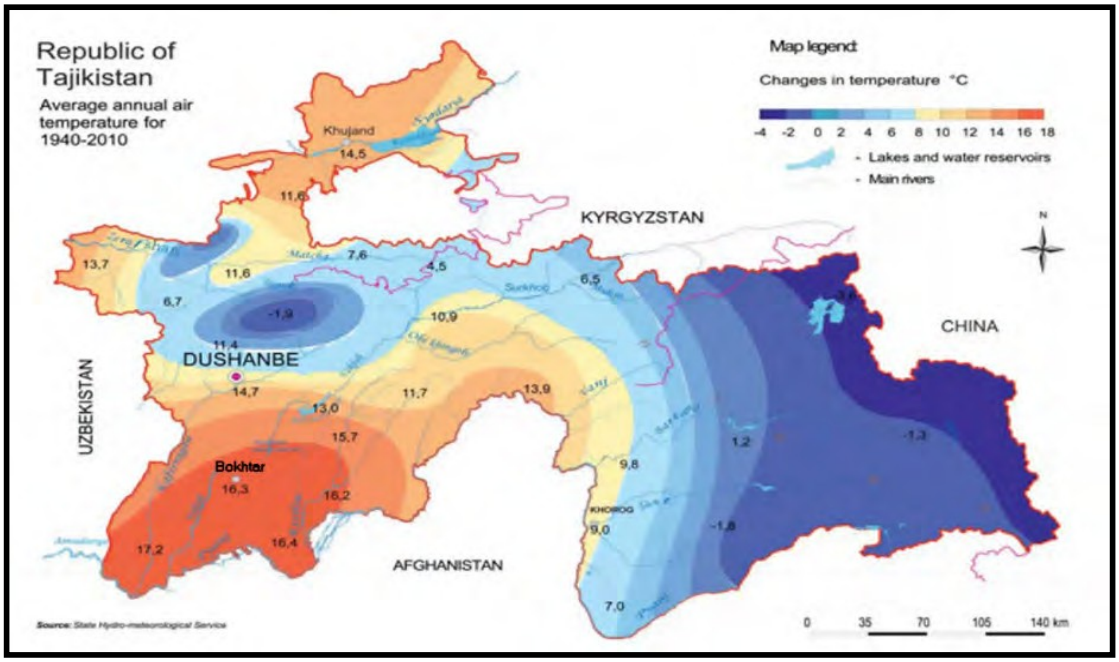


Figure 6: Average Annual Temperature Map of Tajikistan

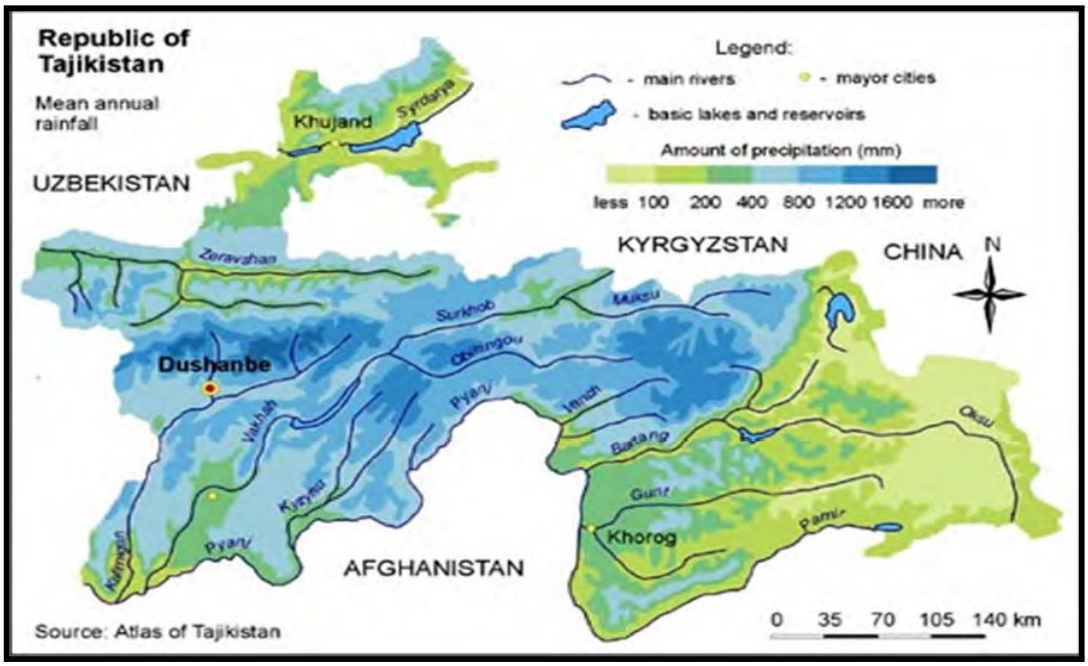


Figure 7: Mean Annual Precipitation in Tajikistan

151. The subproject area of Dushanbe City is of Climate Type A-III 5e characterized by insufficient moisture and very warm. The average annual temperature in the subproject area is 14.5oC, with an average maximum temperature of 7.90oC in January and 35.80oC in July. The average minimum temperature in is -2.4oC in January and 17.9oC in July. A normal average annual rainfall is 568 millimeters.[28]

4.5. Climate Change

152. Climate change has already had concrete consequences in Tajikistan and neighboring areas. The region's climate has become noticeably warmer. Average annual temperature has risen by 0.10-0.3oC every 10 years (higher than the global trend of 0.06oC). In Tajikistan, the greatest increase has been for the winter period (based on analyzed data from the period, 1940-2005) (State Agency for Hydrometeorology of Tajikistan, 2009). The variability of precipitation, both among years and seasons, has increased. Intense rainfall events (15-20 mm or more per 24 hours) have become more frequent and irregular. This is particularly true for the mountain areas. A decline in precipitation is expected during the summer season. Individual precipitation events are projected to become more intense.

153. Tajikistan ranks first among the countries in Europe and Central Asia with an index of climate change vulnerability of 25, compared to 22 for Kyrgyzstan, 21 for Armenia, and 19 for Uzbekistan. This figure is exacerbated by the low capacity of Tajikistan for climate adaptation. Climate warming and the increase in mean annual air temperature in Tajikistan began in the 1980s. Since the magnitude of global warming in the 1980s was 1.2oC, recent warming is due to anthropogenic causes. Since the late 1970s, the deforestation of vast areas has created favorable conditions for the development of semi-arid areas.

[28] The Third National Communication of the Republic of Tajikistan under the UN Framework Convention on Climate Change, www.meteo.tj

154. An analysis of the situation in recent years has shown that in the north, on the western Pamir, several factors have combined to produce desertification. These are the lack of rain- fall, wind erosion, salinization, and soil dehumidification. In the central part of the country and in the Western Pamir, there are ongoing processes of physical weathering, water erosion, uncontrolled deforestation, and degradation of trees and shrubs.

155. By the year 2030, it is expected that average temperature in most areas of Tajikistan will increase by 0.2-0.4oC from that in the period, 1961-1990. This trend coincides with the trends prevailing in the country during the last 15-20 years. The predicted future rainfall will show large shifts in the terms of their change, intensity, and geographical distribution. Winter seasons are expected to be wetter and drier, which can lead to flooding and more prolonged droughts. CO2 emissions in Tajikistan in 2010 amounted to 0.4 thousand tons per capita, accounting for 0.03% of global CO2 emissions.

156. Between 1940 and 2012 the highest increase of temperature was observed in Dangara town and Dushanbe city, (0.5-0.8 0C).

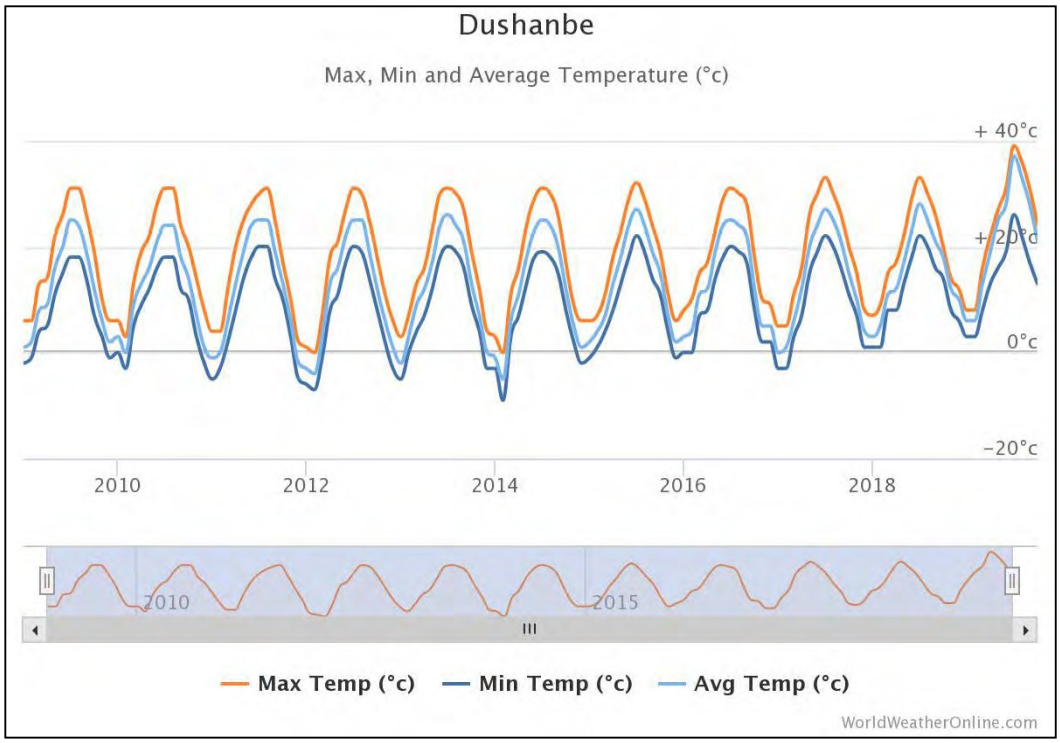


Figure 8: Effects of Climate Change to Temperature in Dushanbe City

4.5. Hydrology

157. The rivers of Tajikistan are important sources of fresh water for the Aral Sea. The glaciers and permanent snow feed the rivers of the Aral Sea basin with over 13 cu km of water a year. The major rivers are: (i) Syr Darya with a total length of 2,400 km, which flows for 195 km across the Fergana Valley in the north; (ii) Zaravshan, which runs through central Tajikistan; and (iii) Kafirnigan, Vakhsh, and Panj rivers, all of which together drain more than 75% of Tajikistan's territory. Groundwater reserves are extensive in the Gissar valley. Aqui- fers are located at depths of 5-40m, generally deeper around the subproject area (Figs. 19- 20).

158. Dushanbe is situated at the confluence of two rivers, Varzob and Kofarnihon. Situated in the largest agricultural oasis of the country, Dushanbe occupies the area along both banks of the Varzob River (called the Dushanbinka within the city), taking its waters from the snow- fields and glaciers of the Hissar range, which are a part of the giant Pamir-Alai mountain system. In the Upper Varzob river-basin there are around 120 glaciers of various sizes, which create a favorable microclimate in the mountainous valley near Dushanbe. The Var- zob River generously provides drinking water, irrigation for adjacent gardens and fields, and electricity for city residents.

159. **The subproject area is located within the Kafirnigan River Basin**. The Kafirnigan river has a length of 387 km. Its left source, the Sorbo river, originates in the glaciers and snowfields of the Karategin range, and its right source, the Sardai-miena river, is in the Hissar range. Below Shahrituz settlement, in the South of Tajikistan, Kofarnihon flows into the Amu Darya. The food of the rivers Sorbo and Sardai-miena is mixed – glacial and snow. The greatest flow in them falls on May-July. Riverbeds having a width of 40-60 m, with the same width of the water flow, are heavily cluttered with boulder and pebble deposits.

160. **River water quality.** The water quality of the Kafernigan River is measured on a monthly basis by the Committee for Environmental Protection. The results show that there are high levels of manganese in both the Kafarnigan and Varzob rivers. Manganese deposits can be found in Tajikistan, but it is not known if the elevated levels of manganese are linked to mining activities upstream, or if they are naturally occurring. The level of dissolved salts in the water of the Kafirnigan river decreases from the upstream to the downstream. So, if in the upper reaches of the mineralization of water ranges from 0.2 to 0.4 g/ dm3, in the lower reaches (lower Panj) - from 0.3 to 0.8 g/dm3. Its maximum values are observed in the period September-April.

4.5.1. Ground waters

161. By chemical composition, the ground waters of the Kofarnihon river valley are hydro-carbonate-sulphate calcium-magnesium with mineralization of 0.2-0.7 g/l. The total hard- ness is 6-8.85 mg-Eq, carbonate - 5-7.3 mg-Eq. In relation to concrete structures, ground- water is predominantly non-aggressive. Groundwater alluvial deposits have a mixed type of feeding. Sources of groundwater recharge are infiltrated waters from river beds, irrigation canals and precipitation infiltration. Inflow from the mountain framing is negligible. The Dushanbinka and Luchob rivers, after leaving the mountain frame, constantly only feed the aquifer.

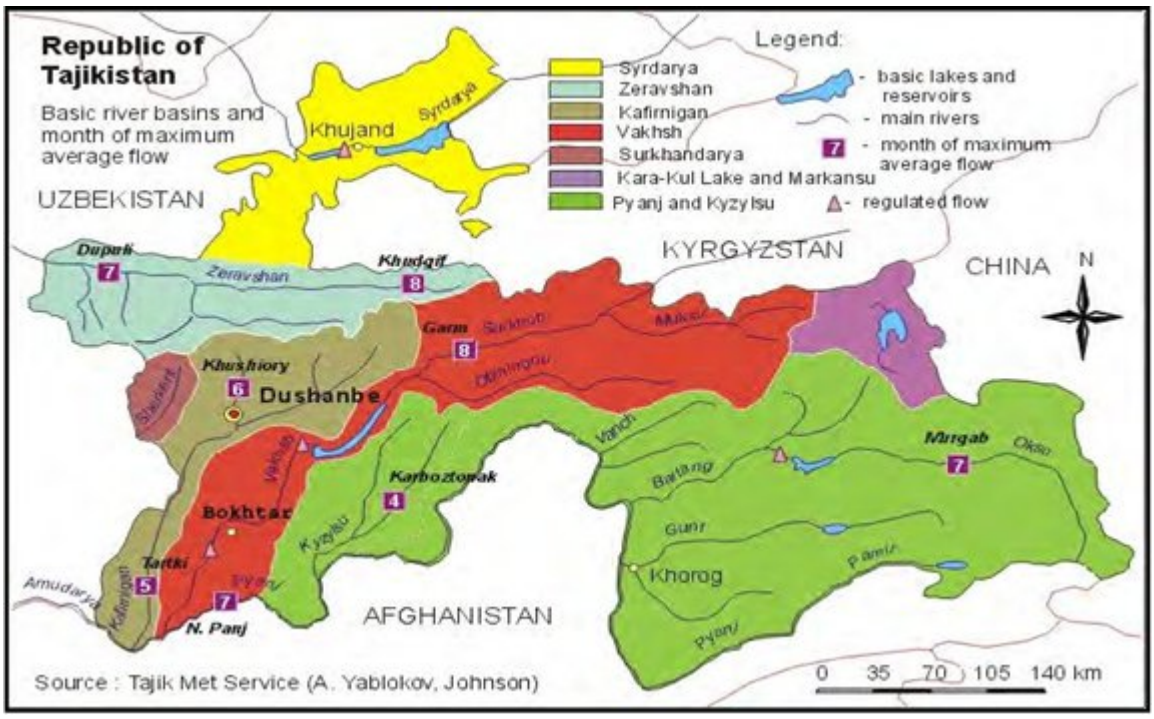


Figure 9: River Basins in Tajikistan

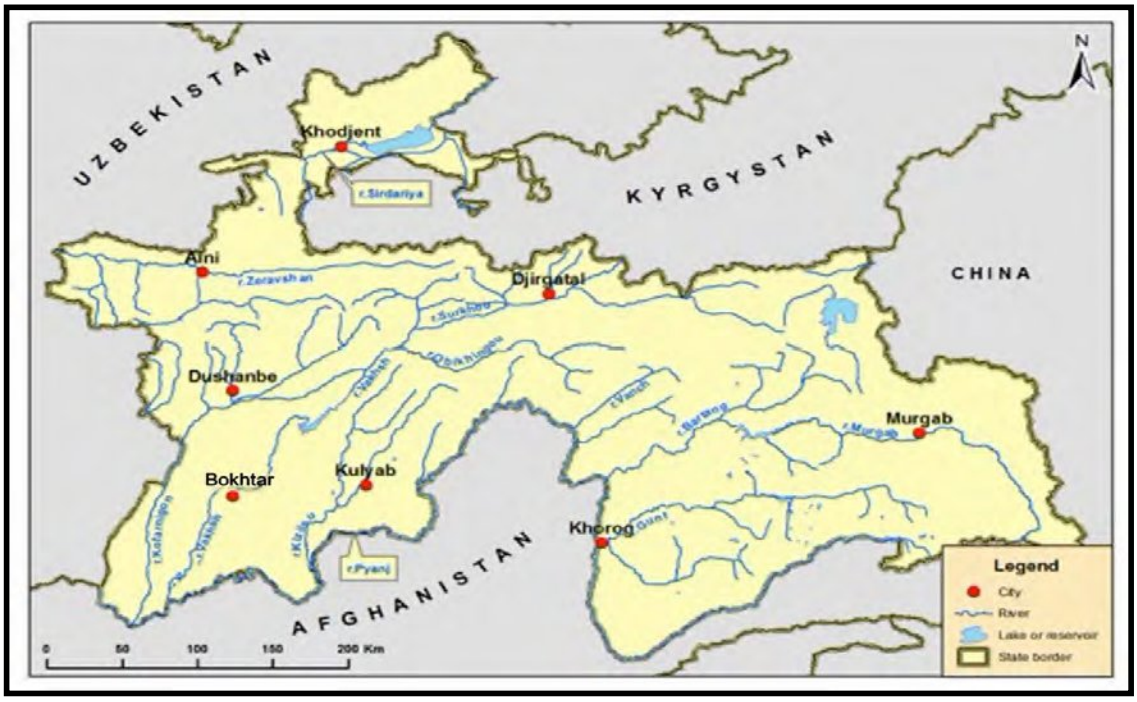


Figure 10: River Network in Tajikistan

4.6. Floral Communities

162. The Hissar Valley is characterized by rich vegetative cover. The Dushanbe City sub- project area lies within the belt of herbaceous plants, mostly bluegrasses and sedges, the habitat of Caucasian skeleton, pistachio, almond, and hawthorn. Over the past 50-60 years, these habitats have been severely degraded and heavily modified by humans.

163. The vegetation of the Vakhsh Valley can be attributed to the desert and steppe (300- 800 masl) belt and the low-mountain (800-1,300 masl) belt, as well as the river valley belt. The Vakhsh River with its tributaries from three floodplain terraces. The surrounding hills and mountains are of relatively low elevation, ranging from 1,000-1,500 masl, on average. The highest peak is Mundy-Tau at 2,227 masl. The natural vegetation consists mainly of short meadow grass and sedges as well as other herbaceous vegetation. Some are planted to almonds and pistachios. Natural vegetation has been severely destroyed or altered by the influence of anthropogenic factors. Vakhsh Valley is the most important region of Tajiki- stan for agricultural cultivation, with cotton as the predominant crop.

164. Based on the literature review, the most common species of the former natural vege- tation within the study areas are the following: bluegrass (*Poa bulbosa*), sedge (*Carex pachystilis*), *astragalus* (*Astrogalus*), wormwood (*Artemisia scotina*), *calligonum* (*Calligonum griseum*), circassian (*Salsola richteri*), medusa head (*Thaeniatherum asperum*), maple (*Acer lactum*), walnut (*Inglana regia*), wild almonds (*Amygdalus bucharica*), apple (*Pirus malus*), cherry (*Prunus divaricata*), plum (*Mahaleb*), and willow (*Salix*). Poplar and juniper (*Juniperus polycarpos*) are also found on the slopes.

165. Dushanbe is very green city with many trees including fruit trees, sycamores, maples, chestnuts as well as mulberry- trees, oaks, and walnuts besides vines and flower gardens.

166. Within the urban areas of the Project zone, there are also areas (gardens, kitchen- garden) that are located at personal sites. These are mainly on the end lines of Janubi, Gulbutta and Mashal the entire private sector. In these gardens, number of fruits and vegetables are grown by residents and used for their own consumption.

167. No protected areas or parks occur in the vicinity of the subproject area that maybe affected by subproject works. The nearest protected area is the Almasy species management area, which is located at the distance about 75 km north-east from the subproject area, and the Shirkent Historical Nature Park – at the distance about 65 km north-west from the sub- project area.

168. The literature review and the survey conducted by the PAG team showed that there are no important, rare, endangered, or protected species of flora found within or in the vicinity of the subproject area. The Figure below on the forest distribution in Tajikistan shows that no forest area is traversed by the subproject.

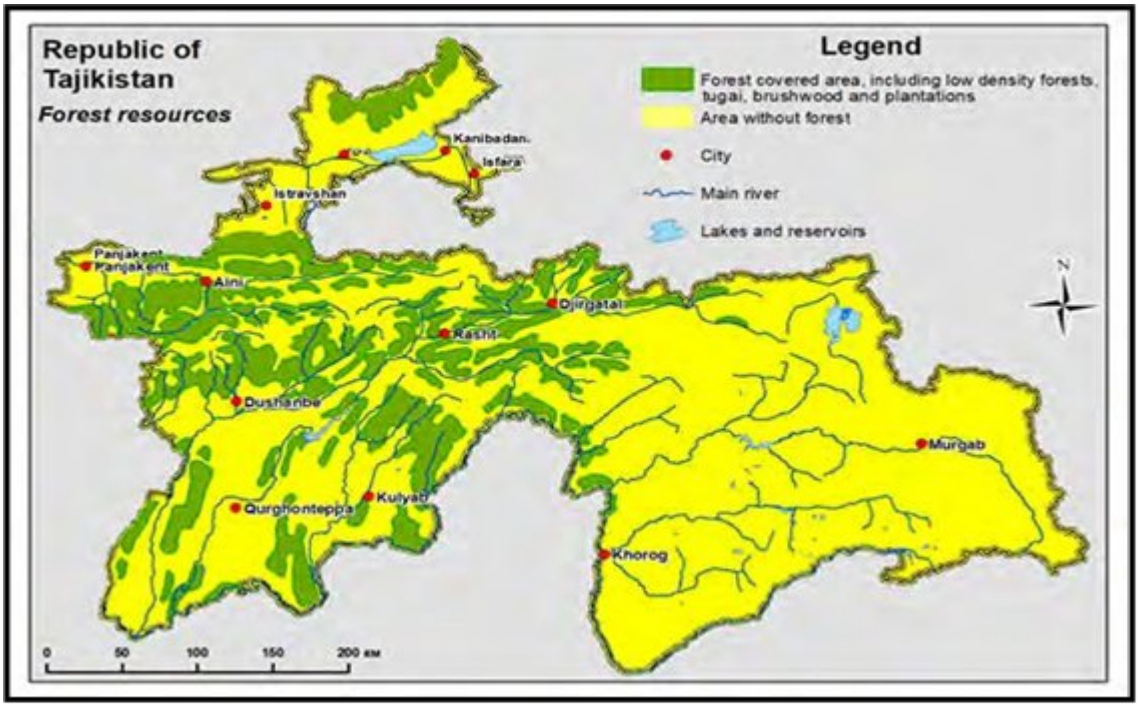


Figure 11: Map of Forest Reservations in Tajikistan

4.7. Fauna

169. The fauna of Tajikistan is characterized by the great genetic diversity. Mountain fauna is richer than that in the plains and contains a substantial number of European-Siberian and East Asian elements. The fauna of the hot, lowland deserts contains plenty of Indo-Himalaya, Ethiopian, and Mediterranean species. In terms of zoogeographic zoning, the entire subpro- ject falls under the Tajik zoogeographical site characterized by an abundance of represent- atives of all classes of vertebrates. This area is home to two species of amphibians, 40 species of reptiles, 186 species of birds, and 45 species of mammals.

170. The subproject area is urban and as such little terrestrial fauna can be found within the subproject area and no Tajik Red-book or International Union for Conservation of Nature (IUCN) red-list species have been identified.

171. In the Kofarnihon and Dushanbinka River the following fish species have been rec- orded:

- The Amu Darya Trout (Salmo Trutta Oxianus)
- Samarkand Khramulya (Varicorhinus capoeta heratensis)
- Ordinary Marinka (Schizotorax intermedius)
- Turkestan catfish (Glyptosternon reticulatum)
- Striped Bystranka (Alburnoides taeniatus)
- Tajik char (Nemashilius pardalis)

172. Subproject Area. There are no fisheries in the Kofarnihon and Dushanbinka river and its tributaries and they have no fishery significance. There are no critical habitats for these species within or in the vicinity of the subproject area. There are no important, rare, endangered, or protected

species or habitats found within the subproject area, based on the March 2020 AIEE (see footnote 1 on page 1). The Figure below shows the distribution of rare mammals in Tajikistan.

Figure 12: Map Showing the Distribution of Rare Mammals in Tajikistan

4.7. Demography

173. In 2023, Tajikistan's population is estimated at 10.29 million people, with a large population of young people up to the early 30s, as shown in the age pyramid in the Figure below. The population growth rate is 2.1% per year. The average density is 72.8 people per sq. km, but the population is concentrated heavily in the western, southwestern, and northwest- ern regions. The level of poverty is quite high in the rural areas. In 2015, the poverty head- count ratio living on $2.15 per day was 1.4%, as determined by the World Bank's atlas method.[29]

[29] World Bank. 2013. *World Development Indicators, 2013.* Washington, D.C., USA. http://data.worldbank.org.

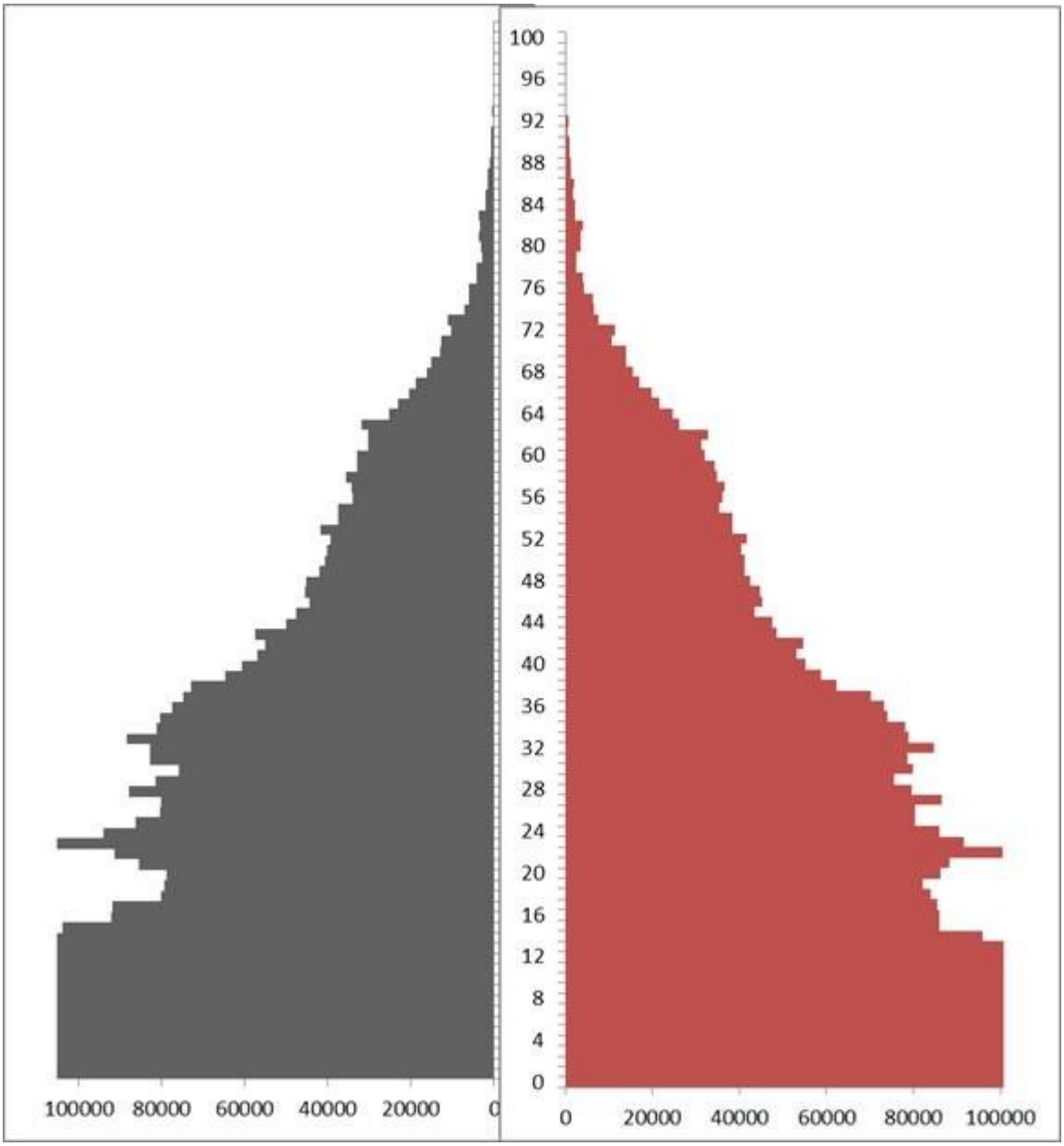


Figure 13: Age Pyramid of Tajikistan

174. Dushanbe is the capital city of Tajikistan with the population number of 846 thousand people officially residing on its territory; while the actual population (including migrants) is estiamted to be around one million people.

175. The population density is 6,581 people/km². More than 10% of the country's population lives in Dushanbe. Population of Dushanbe is relatively young with the growth rate of 1.8% and labor force accounting for 62%. In addition to its current population, a rapidly growing construction sector in Dushanbe makes it attractive to returning skilled migrants.

176. The City's territory of 127 thousand square kilometers is administratively divided into four districts: Shohmansur, Firdavsi, Ismoili Somoni and Sino, with the latter covering the largest territory and population.

Table 10: Demographic data on Dushanbe City of Tajikistan

No.	District of Dushanbe	Territory (km^2)	Population	Density of population (people/km^2)
1	Shohmansur	27.9	162,707	5,831.8
2	Firdavsi	29.1	209,043	7,183.6
3	I.Somoni	37,94	148,675[2]	3,918.1
4	Sino	39.08	326,000	8,341.9
	Total for Dushanbe:	126.6	846,425[3]	

177. The growth rate was 2.19% per year. The average density was 51.3 people per square kilometer, but the population was concentrated heavily in the western, southwestern, and northwestern regions. The level of poverty is quite high in the rural areas: in 2009, the poverty headcount ratio living on $1.25 per day was 6.6% as determined by the World Bank's atlas method; for the same year, the UNDP Human Development report reported 22%. Poverty is multidimensional as it touches the three sectors of education, health, and living standards, implying that there is severe deprivation in these three dimensions.

178. With regard to gender, females with secondary education are at least at 93.2 % com- pared to males at 85.8%, at the national level for those 25 years and older. The population of Dushanbe city made up of ethnic Tajiks, Uzbeks, Russians and others (2.4%).

179. Men proportion in population of Dushanbe is higher than that women (52.2% to 47.8%), and compared with the national average (50.6% to 49.4%), this may be due to the fact that men they work in the capital and leave families in rural areas, where living conditions are often more favorable for families, as there is a farm, a garden and livestock. In Dushanbe, young people under the age of 30 make up 63% in the republic: 64%. The number of working age (15-64 years) in Dushanbe is 69% (by country: 62%), while the labor force is less than 50% of this age group. The working-age population currently stands at about 2.5 million people. In 2021, only 58,908 citizens received official unemployment status. The official un- employment rate in Tajikistan is 2.9% at the end of 2021 and, therefore, very low. This is mainly due to the fact that the majority of the unemployed are not registered (about 1 million). The working population is outside the country for work. On this basis, the actual unemployment rate may be much higher.

180. The City Master Plan (up to 2040) envisaged further expansion of the city mainly to the south to add 18,000 ha by 2025 and 25,000 ha by 2040; expansion will include territories of Hissar, Rudaki and Varzob districts adjacent to the City. Infrastructure development plans supporting ambitious Master Plan are yet to be developed.

4.8. Economy

181. The Tajik economy is developing rather slow compared to its neighboring Central Asian countries. The economy is dominated by minerals extraction, metals processing, agriculture, and strongly relies on remittances from citizens working abroad, which accounts for almost 50% of the GDP. In recent years the service sector developed at the expense of the industrial sector, whereas the agricultural sector has asserted its position.

182. The poor business climate still prevents attracting foreign investment in Tajikistan and Dushanbe respectively. Despite the moderate development of Dushanbe's service sector there is still a lack of attractive job opportunities. Thus, the qualified work force often prefers working abroad, slowing down the economic development even more. Unless the business cli- mate improves, de-

urbanization may not be completely disregarded in the mid- and long- term perspective and future investment planning.

183. Infrastructure. The subproject area is located in Firdavsi District of Dushanbe and has a developed infrastructure. There are 21 secondary schools, 23 kindergartens, 1 center for children and adolescents, a maternity hospital, 5 city polyclinics, the Republican Hospital Istiqlol, Diagnostic Center, more than five private clinics and hospitals. In the western and southern part of the district there is an industrial zone in which manufacturing enterprises are located, as well as transport and service enterprises and institutions. Dushanbe-Bokhtar road passes through the Subproject area. Population serves a large network of trade and service centers, there is a bath and saunas, small markets.

4.8.1. Health Facilities

184. Indicators such as infant and maternal mortality rates are among the highest in the former Soviet republics. In the post-Soviet era, life expectancy decreased as a result of poor nutrition, polluted water supplies, and increased incidence of cholera, malaria, tuberculosis, and typhoid. The leading causes of death are cardiovascular diseases, respiratory disorders, and infectious and parasitic diseases. The health care system has deteriorated badly and receives insufficient funding and sanitation, and water supply systems are in decline, resulting in a high risk of epidemics.

185. Health facilities in the selected regions include the following indicators: number of doc- tors, nursing staff, and units of hospital, which are important to obtain information on the health conditions of the population. The Table below provides data on health facilities in the Dushanbe City Job and Migration Service Center subproject area.

Table 11: Health Facilities and Personnel, Dushanbe City

Location	Health Personnel	Health Facilities
Dushanbe City	Doctors: 6,580 Nursing staff: 7,654	Hospitals: 44

4.8.2. Education

186. School attendance is mandatory between the ages of 7 and 17, but many children fail to attend because of economic needs and, in some regions, security concerns. Tajikistan's education system suffers from poor infrastructure and an acute shortage of teachers at all levels. This will become more acute because of the relatively high birth rate. The official literacy rate is 98%, but the poor quality of education since 1991 has reduced skills in the younger generations. The Table below provides data on education facilities in the subproject districts and cities.

Table 12: Education Facilities and Personnel, Dushanbe City

Location	Education Personnel	Education Facilities
Dushanbe City	Teachers: 8,300 Students: 109,900 Schoolchildren: 185,400	Universities: 23 Schools: 140

4.9. Historical and Archeological Areas of Significance

187. Historic and cultural resources include monuments, structures, works of art, sites of outstanding universal value from historical, aesthetic, scientific ethnological and/or anthropological points of view, including graveyards and burial sites. The responsibility for the preservation,

maintenance, and assessment of historical and cultural monuments in Tajiki- stan rests with the Ministry of Culture.

188. The proposed site for the PAG office does not contain any known historical or archaeological areas of significance. However, it is important to note that the surrounding subproject regions boast a rich and diverse cultural heritage. Archaeological investigations have uncovered evidence of ancient settlements in this area, with some artifacts and structures dating back over 2,000 years. This historical context underscores the importance of conducting thorough assessments and adhering to established protocols. In accordance with the guidelines outlined in the ADB Safeguard Policy Statement (SPS), specific procedures will be implemented to address any chance finds or discoveries of items that may possess archaeological or historical significance during the course of construction or development activities. This proactive approach ensures that any significant findings are properly documented, preserved, and managed in a manner that respects the cultural heritage of the region.

4.10. Existing Environmental Conditions in Dushanbe Site

4.10.1. Dushanbe City's General Environment

189. Dushanbe is located in the central west Tajikistan, at an altitude of 800 masl, in the Hissar Valley, where the Varzob and Kofarnihon rivers meet. The total land area of the city is 124.6 sq. km.

190. Soils in the area of Dushanbe City are light brown and carbonate, which are typical of plains formed on loess deposits, are characterized by low organic matter content and fine texture, and suitable for agriculture.

191. The climate is continental, where winters are quite cold with an average temperature of 3°C in January, and summers are hot and sunny in July and August, with high temperatures around 35°C and peaking up to 40°C. In winter, the temperature often drops below 0°C at night, but remains quite mild during the day. Cold waves may occur here as well, although not as intense as in the rest of the country because the city area is protected by mountains in the north. It virtually never rains in Dushanbe. It receives about 600 mm of rain or snow per year, mostly between November and May, with a maximum of about 110 mm per month in March and April and in summer, from July to September (Table 22).

Table 13: Average Temperature and Precipitation in Dushanbe

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average temperature (°C)	2.7	4.4	9.2	15.4	19.6	24.5	26.9	25.5	20.8	15	9.2	4.9
Min. temperature (°C)	-1.6	-0.2	4.3	9.6	13.1	16.9	18.8	17	12.1	7.6	3.5	0.7
Max. temperature (°C)	7.1	9	14.2	21.2	26.1	32.3	35.1	34	29.5	22.5	15	9.2
Precipitation (mm)	73	83	129	101	81	6	2	0	3	37	43	66

Source: Climate-data.org, past 30 years average (2018).

192. The main stationary sources of air pollution in Tajikistan are mining, metallurgy, chemical industries, buildings, mechanical processing, light industries, heat and power generation, and agriculture.

193. In Dushanbe, an internet article30 pointed out the sources of main emission of chemical pollutants into the atmosphere of Dushanbe at the beginning of 2019 are the (thermal power plant)

[30] Central Asian Bureau for Analytical Reporting. (19 June 2020). *How to Improve Air Quality in the Capital of Tajikistan?* cabar.asia/en/how-to-improve-air-quality-in-the-capital-of-tajikistan

TPP-2, Dushanbe cement plant, other industrial enterprises of the city, boiler houses, as well as small workshops that process and burn various types of waste. It added that many metropolitan enterprises use coal as raw materials for energy production. It cited as an ex- ample that there are twenty-four (24) enterprises in the city that generate heat by burning coal fuel, with the largest being the Dushanbe TPP-2, which is managed by the state energy company Open Joint-Stock Holding Company “Barki Tojik”. Furthermore, coal is used by 434 manufacturing enterprises.

194. Dushanbe is situated at the confluence of two rivers, Varzob and Kofarnihon. Situated in the largest agricultural oasis of the country, Dushanbe occupies the area along both banks of the Varzob River (called the Dushanbinka within the city), taking its waters from the snowfields and glaciers of the Hissar range, which is a part of the giant Pamir- Alai mountain system. In the Upper Varzob river basin, there are around 120 glaciers of various sizes, which create a favorable microclimate in the mountainous valley near Dushanbe. The Varzob River generously provides drinking water, irrigation for adjacent gar- dens and fields, and electricity for city residents.

195. There are no protected, conservation, or biodiversity areas within or close to Dushanbe City. There are also no sites that are considered as historically or archaeologically significant within or in the vicinity of the subproject area.

196. The poor business climate still prevents attracting foreign investment in Tajikistan and Dushanbe respectively. Despite the moderate development of Dushanbe's service sector there is still a lack of attractive job opportunities. Thus, the qualified work force often prefers working abroad, slowing down the economic development even more. Unless the business climate improves, de-urbanization may not be completely disregarded in the mid- and long- term perspective and future investment planning.

4.10.2. The Sino District (Rayon)

197. Sino District is one of the four (4) city district of Dushanbe. The other three (3) districts are Firdavsi, Ismail Somoni and Shomansur. Sino is situated on the north-west of Dushanbe. The Varzob River, runs through its eastern territory, making some of the district land on the east bank of the river. The major highways running from north to south are Somoni Street, Karamov Street and the Sherozi road along Varzob River. There are two (2) major bridges that crosses the Varzob River, the Soltani Kabir Bridge along Abay Street and Jomi Bridge along Jomi Avenue.

198. The district land use is mainly mixed residential, commercial and institutional. A good number of educational institutions are found within Sino.

Figure 14: Districts in Dushanbe City

V. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

5.1. Preamble

199. This section provides information on the impact assessment methodology and process adopted for the assessment of project impacts and the determination of their significance.

200. The development of mitigation measures for identified significant effects are set out, and any residual significant effects are reported.

201. The assessment findings are based on all mitigation measures presented in this document being fully implemented as part of the project implementation. All mitigation established in the report are considered to be committed mitigation once the report has been approved by ADB. The commitments made within the AIEE become a binding part of the contract and grant agreement.

202. The mitigation measures provided in this AIEE shall be considered as high level in many cases and will need to be refined by the contractor during the development of Site-Specific and Topic Specific Environmental Management Plans.

5.2. Impact Assessment Methodology

203. The following sections provides an overview of proposed process of impact assessment to be used for the current projects. This section provides the conceptual model to be used for determining effects. A standardized approach is based on standard terminology for the determination of impacts and determination of effects, their significance and mitigation or offsetting of said impacts.

204. The proposed approach for impact identification and assessment of effects relating to air land and water is based on the Source – Pathway – Receptor – Consequence Model (SPRC). Such an approach is commonly used in contamination studies but is highly applicable for many of the elements considered in an impact assessment process. The model is shown diagrammatically below in Figure 9.

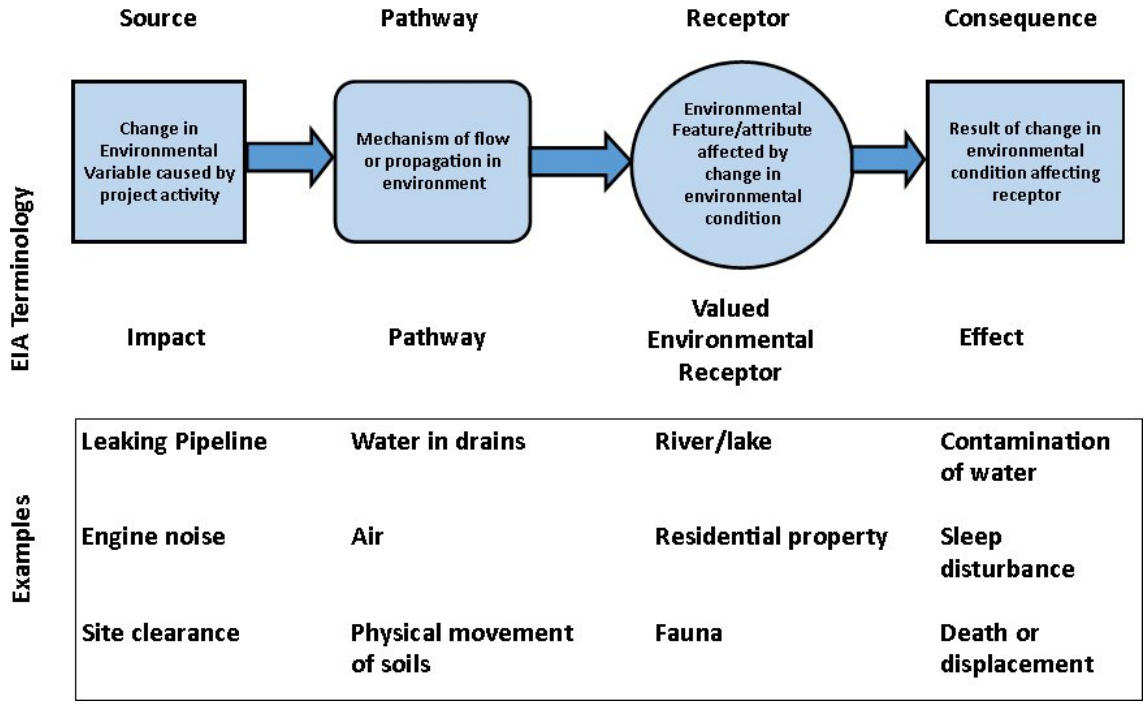


Figure 15: Source Pathway Receptor Model as used in EIA

205. The model shows that to have an effect on a receptor all elements of the chain need to be present. Therefore, an effect can only occur if there is a source (of change), a receptor upon which that change acts and a pathway between the source and receptor.

206. The SPRC conceptual model is less effective on intangible elements of the environment. These include potential exceedances of legislative standards and topics such where human perceptions and constructs are considered, for example landscape and visual impacts where individual perceptions of beauty, scenic value are important.

207. The SPRC model brings out some important aspects of terminology for the impact assessment process. The first is that the terms impact and effect are not synonymous and cannot be used interchangeably. As can be seen, the IMPACT is the change in environmental variable. The size of change can be determined objectively in cases where change can be measured or predicted, for example increases in emissions to air.

208. This IMPACT acting on the RECEPTOR creates a consequence or EFFECT on that receptor.

209. In order to determine the level or importance of the effects two key aspects need to be determined. These are:

- Characterization of the magnitude and nature of the impact; and
- Identification of valued Environmental Receptors and their level of importance and/or sensitivity to change.

210. The following sections provide guidance in determining Valued Environmental Receptors (VERs) and ascribing value/sensitivity.

5.3. Identifying Receptors

211. Based on the SPRC model it is necessary to identify receptors which will be subject to the change in environmental variable.

212. The Valued Environmental Receptors (VERs) and its sensitivity to change may not be the same for each discipline. Thus, each discipline needs to determine its own set of VERs and ascribe values to each of them.

213. Valued Environmental Receptors can be defined as:

- Elements of the environment that are of value to the functioning of natural or human systems (i.e., areas or elements of ecological, landscape or heritage value, soil and sediment, air and water bodies); and
- Human receptors, such as people (i.e., users of dwellings, places of recreation, places of employment and community facilities), and human systems (e.g., employment market).

214. In addition, receptors will include legislative and policy standards and values. For example, air quality limits, noise standards and planning policy requirements.

215. The VERs are described in terms of their spatial importance and/or the sensitivity of that

216. receptor to change due to potential impacts.

217. The environmental value (or sensitivity) of the receptors identified will be defined using the criteria in Table 14.

Table 14: Value and Sensitivity of Receptors used in the impact assessment

Value / Sensitivity	Description of Value
International/ Extremely Sensitive	High importance and rarity, international scale and limited potential for substitution (e.g., hospital receptor) Extremely sensitive to change
National/ Highly sensitive	High importance and rarity, national scale, and limited potential for substitution (e.g., residential receptor) – very sensitive to change
Regional/ Moderately sensitive	High or medium importance and rarity, regional scale, limited potential for substitution (e.g., commercial or recreational receptor) and moderately sensitive to change
Local/ Low sensitivity	Low importance and rarity, local scale and insensitive to change

218. Establishing the VERs for the project is a fundamental building block of the impact assessment process. Only VERs should be referred to in the determination of significance of effect. The identification and evaluation of VERs is the first step in the assessment process.

5.4. Characterizing Impacts

219. Size of Impact - As noted above the impact is the change of state of the environment which is caused by a project activity. In general, this change can be measured or estimated in some manner.

For example, a change in sound level of 2 dBA, or an increase in ground concentration of an air pollutant of 20 mg/m3. For some topics the measure may be an area of land to be affected or number of trees to be lost etc. Wherever possible the size of the impact should have a physical measurement.

220. Other aspects of an impact - While the size of the change in environmental parameter is an important aspect of an impact, there are other aspects which will determine the severity of the impact when it acts on the receptor.

221. For this impact assessment the following aspects are taken into consideration, in addition to the Size of Impact as set out above:

- Extent of impact;
- Duration of Impact;
- Frequency of Impact;
- Probability of Impact Occurring; and
- Reversibility of Impact.

222. The assessment process used in this impact assessment process will use a bespoke scoring system to enable a systematic and transparent process to be undertaken to determine the impact magnitudes identified.

223. The following sections provide the scoring system to be adopted and its rationale.

224. Extent of Impact or Area of Influence - This relates to the physical extent over which the impact will happen. A larger extent would tend to lead to increased risk of significant effects occurring than a highly localized area of influence. The classification of this variable and the ascribed scores is shown in Table 15.

Table 15: Classification of Extent of Impact and Assigned Scores

Classification	Description	Example/s	Score
Very Local	The area of influence is highly limited, likely to take place only at the point of impact and not influencing receptors outside of this immediate area.	Minor increases in noise levels during construction not extending from the work site	1
Local	The area of influence is contained within the project site or immediate surrounding area.	Loss of local and common habitat within the site during clearance works	2
Regional	The area of influence extends to a regional scale, affecting areas outside the project site and into the wider environment	Changes in property or land prices within a region due to the development. Air emissions which affect	3
National	The area of influence extends to national scale	Creation of special wastes which cannot be handled within the nations existing capacity/capability	5
International	The area of influence will be cross boundary	Production of Greenhouse Gases which affect global climate	7

225. Duration of Impact Effect - An impact's magnitude will be increased as its duration increases. It is important to note that the impact duration is not synonymous with the duration of the event causing the impact. The duration is defined as how long the impact will last. For example, a loss of containment event resulting in a chemical spill may last only 5 minutes but the impacts of the chemical entering the environment will last much longer depending upon the type of chemical, location and nature of spill and any remediation efforts.

226. The classification of this variable and the ascribed scores is shown in Table 16.

Table 16: Classification of Duration of Impact and Assigned Scores

Classification	Description	Example/s	Score
Transient	Less than 1 day	Delivery of single large item of equipment affecting local road network	1
Very Short Term	1 – 30 days	Temporary closure of road or other access	2
Short term	1 – 12 months	Dust emissions from site clearance	3
Medium	1 – 5 years	Construction traffic effects on large project	5
Long Term	Greater than 5 years	Changes to air quality due to emissions from process	7
Permanent	Permanent	Clearance of natural vegetation which cannot be recreated	10

227. Frequency - An event, such as blasting during site preparation works, may be short term in nature but if the event is repeated many times during the course of the project, then the magnitude of the impact would be considered to be increased. The classification of this variable and the ascribed scores is shown in Table 17.

Table 17: Classification of Frequency of Impact and Assigned Scores

Classification	Description	Example/s	Score
One off	The event causing the impact occurs only once in the lifetime of the project	Clearance of soils and habitats at the start of the project	1/5*
Rare	A rare event in the lifetime of the project	Increased noise or air emissions due to emergency situations	2
Infrequent	An event which is expected to occur but not commonly as part of the normal project conditions	Increased emissions from a plant during regular maintenance and	3
Frequent	An event is will occur regularly throughout a phase of the project or the lifetime of the project	Daily noise from blown down of steam drums. Delivery of raw materials and export of products from a facility on daily basis	5

Continuous	An event which by the nature of the project is continuous	Noise emissions from operational plant	7

*For one off events, a score of 1 is ascribed if the event does not lead to a permanent non-reversible impact, if the impact is permanent; a score of 5 is used.

228. Probability - Impact assessment for some issues is based on risk assessment. Not all predicted impacts will occur but should be considered in the assessment process. In order to account for this, a three-point probability scale and scores has been used as follows:

- Certain 5
- High 3
- Low 2

229. **Reversibility** - If an impact can be readily reversed, then its overall magnitude would be considered less if it cannot be rectified. For example, the loss of natural habitats can never be fully reversed but the visual impact of a wind turbine will be reversed at the end of life when the turbine is dismantled and removed.

230. For this impact assessment process, a simple Yes or No scale is used with associated scores of 1 and 5 respectively.

231. **Size of Impact** - For the established size of impact the following values have been ascribed:

- Low 3
- Medium 5
- High 8

232. For any impacts which do not exceed the threshold of significance then by definition, the impact severity must be negligible.

233. **Overall Impact Magnitude Scoring Model** - The scoring model for the described variables results in scores across a range of 7 – 40. The impact assessment uses a four-point terminology to describe impact magnitude. This is presented in Table 18. The model ascribes the outcomes of the scoring of the variables as follows.

- 7 – 15 Negligible
- 16 – 23 Minor
- 24 – 31 Moderate
- 32 – 40 Major

Table 18: Criteria for Magnitude of Impacts used in the impact assessment

Magnitude	Description of Adverse Consequence	Description of Beneficial Consequence

Major	Loss of resource and/or quality and integrity, severe damage to key characteristics, features or elements	Large scale or major improvement of resource quality; extensive restoration or enhancement; major improvement of attribute quality
Moderate	Significant impact on the resource, but not adversely affecting the integrity, partial loss of/damage to	Benefit to, or addition of, key characteristics, features or elements; improvement of attribute quality
Minor	Some measurable change in attributes quality or vulnerability, minor loss of, or alteration to, one (maybe more) key characteristic, feature or element	Minor benefit to, or addition of, one (maybe more) key characteristic, feature or element; some beneficial impact on attribute or a reduced risk of negative impact occurring
Negligible	No loss, or very minor loss or detrimental alteration to one or more characteristic, feature or element	Very minor benefit to or positive addition of one or more characteristics, features or elements

234. **Assessment of Significance** - A significant effect may be broadly defined as one which should be brought to the attention of those involved in the decision-making process. The determination of significance of an effect uses a two-dimensional matrix based on the above parameters of Impact magnitude and Value/sensitivity of the receptor.

235. The proposed assessment will use a matrix for determining the significance of an effect as presented in Table 19. Significance is therefore a function of the value or sensitivity of the receptor being considered defined in Table 14 and the consequence of impacts defined in Table 19.

Table 19: Matrix for Determining the Significance of Environmental Impacts

	International/ Extreme	National/ High	Regional/ Moderate	Local/Low
Major	HIGH	HIGH	MEDIUM	LOW
Moderate	HIGH	MEDIUM	MEDIUM	LOW
Minor	MEDIUM	MEDIUM	LOW	NS
Negligible	NS	NS	NS	NS

236. The impact assessment has utilised the following semantic definitions of the significance terms High, Moderate and Low. They are based on the terminology used in international principles and guidance and on the geographical context of the effect:

- High – An environmental effect that has importance at international or national level and is irreversible or unprecedented;

- Medium – An environmental effect that has importance at a regional scale and/or one that can be readily reversed with intervention and is limited to the site boundary and immediate surrounding area;
- Low - An environmental effect that is only important in a local context, which is readily mitigated, and it occurs only within the boundary of the project; and
- NS – An environmental effect that is considered non-significant.

237. Significant adverse effects occur where valuable or sensitive receptors, or numerous receptors, are subject to impacts of considerable magnitude and duration. Some effects will be temporary, others are permanent in nature and these will be stated in the assessment.

5.5. Mitigation

238. Figure 10 shows the Hierarchy of Mitigation. This is based on the principle of avoidance of impacts through design, followed by minimizing impacts through mitigation, and finally offsetting impacts that cannot be mitigated fully.

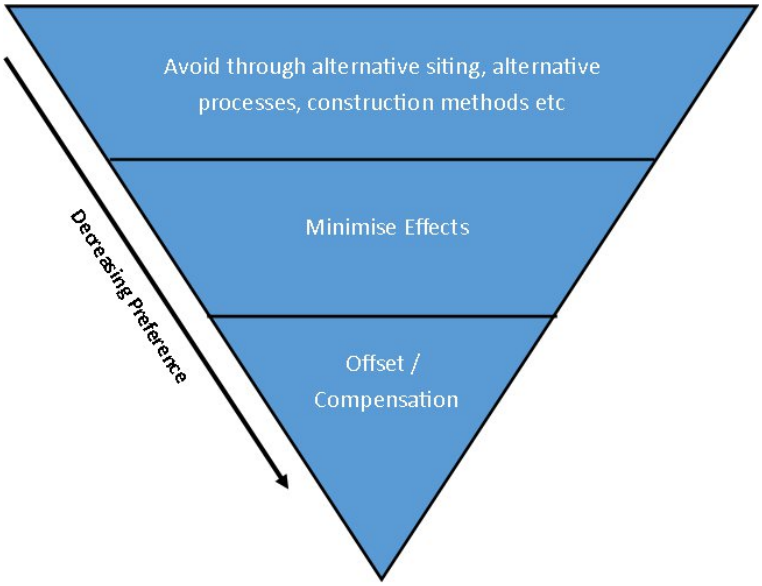


Figure 16: Hierarchy of Mitigation

239. The above hierarchy has been incorporated into the Updated AIEE process for the current project. The mitigation set out in this document is committed and will form part of the contract documentation.

240. The results of the assessment are presented in the following sections.

241. A total of fourteen Valued Environmental Receptors (VER) were identified during the assessment process. A full listing of these and their ascribed value or sensitivity to change is presented in Table 21. Potential effects were not identified on all of these VER's, but they are presented for completeness.

Table 20: Valued Environmental Receptors

VER No.	VER Description	Value/Sensitivity
1	Agricultural land	Local/Low
2	Trees within territory of schools	Local/Low
3	National Air Quality Standards	National/High
4	Potential unknown below ground artefacts	National/High
5	Worker Health and Safety	National/High
6	National and International Legslative Noise standards	National/High
7	Local demographics	Local/Low
8	Local incomes	Regional/Moderate
9	Access to facilities	Local/Low
10	Soils	Regional/Moderate
11	Water courses - water quality	Regional/Moderate
12	Ground Water	Regional/Moderate
13	General environment	Regional/Moderate
14	Local population health	National/High

242. Table 22 and Table 23 provide a breakdown of the impact assessment outcomes. The tables are presented by environmental aspect for construction and operations. Each table provides an Impact ID number, a description of the anticipated impact, the results of the impact magnitude evaluation, the VER that the impact will act upon and its value/sensitivity and the predicted significance of effect without mitigation. Then the approved mitigation measures are listed and finally the predicted Significance after application of the mitigation is provided.

243. Note - The following abbreviations are used in the Tables.

NS = Non-Significant, Sub table headings (Im = Impact, C = Class, S = Score)
S = Severity, E = Extent, D = Duration, F = Frequency, P = Probability, Rev = reversibility
Lo= Low/Local, Med = Medium, Hi = High, VL = Very Local, Fre = Frequent, Cer = Certain, Y = Yes, N = No
St = Short Term, Inf = Infrequent, Ra = Rare, ST30 = Short term less than 30 days, Per = Permanent

Table 21: Sensitive receptors assessment

VER	Value Sensitivity	Comments
Residential and residents	National/High	Housing areas under construction
Institutional – school and users	National/High	Learning process
Commercial buildings	Local/Low	Light commercial activities
Local Road Network and Users	Local/Low	

Table 22: Potential impact assessment and mitigation measures

Impact ID	Impact Description	Impact Severity	VER Description	VER Value/ Sensitivity	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
PRE-CONSTRUCTION							
1	Impact on land acquisition and community assets such as from loss of community assets and damage to properties	**Im C S** S Med 5 E Lo 2 D St30 2 F Ra 2 P Hi 3 Rev Y 1 Negligible **15**	Residents	Local/low	NS	Construction on State- owned land, existing buildings in place. Access roads will be designed to the minimum necessary width within the right of way (ROW) when feasible.	**NS**
CONSTRUCTION							
2	Temporary disruption of existing roads, pathways, and access	**Im C S** S Med 5 E VL 1 D Med 5 F Ra 2 P Lo 2 Rev N 5 Minor **20**	And feeder roads	Local/Low	NS	Particular attention will be given to ensuring safety along roads and paths such as the main road and the feeder road. The contractor must develop a detailed site-specific environmental management plan, including a traffic management plan (TMP), and ensure its proper implementation. Contractor will be required to immediately rehabilitate excavated areas and any damaged road and path sections.	**NS**

Impact ID	Impact Description	Impact Severity	VER Description	VER Value/ Sensitivity	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
4	Air pollution from dust (PM10 and less) and air emissions from earthworks and movement of vehicles posing nuisance and health risk to nearby communities.	**Im C S** S Med 5 E Lo 2 D ST 3 F Fre 5 P Hi 3 Rev Y 1 Minor **19**	Surrounding residential, commercial and institutional areas	National/High	Medium	Contractor will be required to cover materials with tarpaulin or other suitable materials while in transit to avoid spillage of materials. Earthen roads, particularly roads near residences and through the town core area, will be moistened during dry and dusty conditions. Speed limits will be imposed on construction vehicles. Construction equipment and vehicles will be regularly maintained to control air emissions during vehicle operation.	**NS**
5	Noise and Vibration from operation of construction equipment causing excessive noise, resulting in nuisance to the school and communities.	**Im C S** S Med 5 E Lo 2 D ST 3 F Fre 5 P Cer 5 Rev Y 1 Minor **21**	Workers and nearby residential, commercial and institutional areas	National/High	Medium	Construction activities, particularly operation of noise generating equipment, will be limited to the daytime. Noise suppression devices will be installed in noise generating equipment. Drivers will be required to minimize blowing of horns and to comply with speed limits.	**NS**
6	Potential for conflict to develop with some residents in local communities should they be marginalized by the introduction of outside workers who enjoy an enhanced economic status in comparison to the local residents.	**Im C S** S Lo 3 E Lo 2 D ST 3 F Inf 3 P Lo 2 Rev N 5 Minor **18**	Within the project site and nearby community residents	Regional/ Moder ate	Low	Workers from the local communities will be preferentially offered employment as unskilled labor. Workers will also be required to undergo regular check-up to minimize the risk of contracting and spreading of HIV and STI's. Workers will be housed on-site to avoid social conflicts. Workers to be provided with cultural awareness training if they are from outside region.	**NS**
7	Provision of inadequate living conditions within project site. Loss of worker productivity may result from the absence of appropriate living conditions within the project site.	**Im C S** S Lo 3 E Lo 2 D Med 5 F Fre 5 P Hi 2 Rev Y 1 Minor **18**	Construction workers	National/High	Medium	Workers will be provided with adequate living sanitation and recreational facilities. Contractor will provide potable water, sanitation and washing facilities, kitchen and adequate cooking facilities, nutritionally adequate food rations to either meet requirements of the relevant labor regulations of RT or an acceptable international standard whichever is the higher.	**NS**

Impact ID	Impact Description	Impact Severity	VER Description	VER Value/ Sensitivity	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
9	Contamination of the soil and nearby water courses may result from the utilization of hazardous materials. Improper handling, storage or utilization of hazardous materials poses asignificant health risk to the workers and residents of nearby settlement areas;	**Im C S** S Med 5 E Reg 3 D Med 5 F Ra 2 P Lo 2 Rev N 5 Minor **22**	Workers and nearby residential areas, aquatic and terrestrial ecosystems	Regional/Moderate	Medium	Ensure that safe storage of fuel, other hazardous substances consistent with national and local regulations to prevent soil and water contamination. Fuel storage tanks to be on impervious surface with bund to catch spills, bund shall have holding capacity of 110% of tank capacity. Fuel tanks etc shall not be located within 50 m of a water course. Ensure all storage containers are in good condition with proper labeling; Used oil and other residual toxic and hazardous materials shall be disposed of in an authorized facility off-site; Ensure availability of spill clean-up materials (e.g., absorbent pads, etc.) specifically designed for petroleum products and other hazardous substances where such materials are being stored; Spillage, if any, will be immediately cleared with utmost caution to leave no traces, Spillage waste will be disposed at approved disposal sites.	**NS**
10	Generation of construction waste such as excavated soil	**Im C S** S Med 5 E Lo 2 D Med 5 F Fre 5 P Hi 3 Rev Y 1 Minor **21**	Project site land	Low	NS	Surplus excavated material/cut soil from construction will be used as backfill material for low-lying portions per site development plan	**NS**
11	Generation of construction wastes such as solid wastes, inert construction wastes, during construction will result in the pollution of land and receiving water bodies.	**Im C S** S Med 5 E Lo 2 D Med 5 F Fre 5 P Hi 3 Rev Y 1 Minor **21**	Land and any nearby receiving body of water (drainage channels) Exceedance of local capacity to treat or dispose of such waste	Low	NS	Contractor to develop and implement Waste Management Plan Surplus excavated material/cut soil from construction will be used as backfill material for low-lying portions per site development plan	**NS**
12	Impacts on community health and safety such as from accidents risks to surrounding communities from vehicles transiting the main highway	**Im C S**	Local residents	National/High	Medium	Contractor to develop a Traffic Management	**NS**

Impact ID	Impact Description	Impact Severity	VER Description	VER Value/ Sensitivity	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
		S Med 5 E Lo 2 D Med 5 F Fre 5 P Hi 3 Rev Y 1 Minor **21**				Plan. Signage and appropriate speed limits Requiring suppliers that delivery vehicles transporting construction materials are maintained in a safe operating condition, loads are to be secured and all loads with fugitive materials (e.g. excavated soil and sand) are to be covered with tarpaulins. All drivers and machinery operators act responsibly	
13	Occupational health and safety hazards from operating and using heavy machinery, refueling hazards, traffic accident hazards	**Im C S** S Hi 8 E Lo 2 D Med 5 F Inf 3 P Lo 2 Rev N 5 Moderate **25**	Construction workers, contractors, suppliers	National/High	Medium	The contractor will be required to implement the construction health and safety plan in accordance with the World Bank *EHS Guidelines* (http://www.ifc.org/ehsguidelines) as a minimum standard. Contractor will appoint an EHS officer to ensure implementation of the plan. Workers will be provided with a safe working environment including conduct of safety induction, safety equipment appropriate for the task in which they are employed, medical and first aid facilities provided together with a person qualified in first aid.	**NS**
OPERATION							
14	Impact on community health and safety from access and intrusion of unauthorized personnel.	**Im C S** S Lo 3 E Lo 2 D Med 5 F Fre 5 P Hi 3 Rev Y 1 Minor **19**	Local people	National/High	Medium	Watchmen/security personnel will be hired to secure the facilities on a 24-hour basis. This will minimize the safety risks to the community.	**NS**

NS = Non-Significant, Sub table headings (Im = Impact, C = Class, S = Score)
S = Severity, E = Extent, D = Duration, F = Frequency, P = Probability, Rev = reversibility
Lo= Low/Local, Med = Medium, Hi = High, VL = Very Local, Fre = Frequent, Cer = Certain, Y = Yes, N = No
St = Short Term, Inf = Infrequent, Ra = Rare, ST30 = Short term less than 30 days, Per = Permanent

VI. ENVIRONMENTAL MANAGEMENT AND MONITORING PLAN

244. Considering the project's limited scope and its location within a densely populated urban area, it is expected that there will be minimal adverse effects on the ecological environment. The anticipated impacts are largely temporary and primarily associated with construction activities, which may include noise, dust, and the generation of construction waste. However, these impacts can be effectively managed through the implementation of suitable mitigation strategies.

245. During the construction phase, it is likely that noise levels will rise temporarily due to the operation of machinery and equipment on-site. To mitigate this issue, strategies such as scheduling high-noise activities during off-peak hours, utilizing sound barriers, and providing ear protection for workers can be employed. Additionally, consistent monitoring of noise levels will help ensure adherence to local regulations and standards, thereby minimizing disturbances to the surrounding community.

246. Dust production is another prevalent concern during construction, particularly in urban environments characterized by heavy traffic and pedestrian activity. To combat this issue, various dust control measures can be implemented, including regularly watering exposed surfaces, covering trucks that transport materials, and using specialized dust control agents. These actions will help reduce airborne dust particles and maintain better air quality in the vicinity.

247. Effective management of construction waste is essential for reducing the project's environmental footprint. By ensuring proper segregation, recycling, and disposal of construction debris, the amount of waste directed to landfills can be significantly decreased, promoting more sustainable practices. Developing a comprehensive waste management plan that emphasizes recycling materials such as concrete, wood, and metal not only lessens environmental impact but also leads to cost savings and resource conservation.

248. In urban areas where extensive impermeable surfaces are present, inadequate drainage systems can result in flooding. This flooding poses risks to infrastructure, homes, businesses, and public health. To alleviate these concerns, the installation of a drainage pipeline is recommended to effectively manage stormwater runoff.

249. Beyond these specific measures, it is crucial to incorporate overarching environmental management practices into the project plan to ensure all facets of the construction process adhere to environmentally responsible standards. This could involve implementing erosion control techniques, safeguarding water bodies from potential contamination, and preserving existing vegetation whenever feasible.

250. By proactively identifying potential environmental challenges and adopting appropriate mitigation strategies, the project can advance in a manner that minimizes its overall ecological impact. Through meticulous planning, ongoing monitoring, and strict compliance with relevant regulations, construction activities can be executed efficiently while prioritizing environmental sustainability.

251. Potential impacts of the proposed Construction activities and relevant mitigation measures are presented in the Table 23 below.

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Table 23: Environmental management plan

Impact ID	Impact Description	Mitigation Measures	Monitoring	Budget for implementation mitigation measures	Responsible Office	Significance after Mitigation
PRE-CONSTRUCTION						
1	Impact on land acquisition and community assets such as from loss of community assets and damage to properties	Construction on State- owned land, existing buildings in place. Access roads will be designed to the minimum necessary width within the right of way (ROW) when feasible.	PAG/ Design and Supervision Consultant (DSC) - any access road that will be reinstated should be designed properly and to be ensured by both PAG and DSC	**PAG operations cost**	**PAG**	**NS**
2	Impact on planted ornamental trees	1. Cutting of trees will be undertaken as per the approved design and only upon approval by the school The cutting of trees will be avoided as much as possible and damage to native vegetation minimized.	PAG/DSC to ensure that any cut trees shall be replaced with the approval of schools	N/A	PAG	**NS**
3	Preparation of Site-Specific Environmental Management Plan	1. The appointed contractor, within one month of awarding of the contract, will prepare the requisite Site-Specific Environmental Management Plan (SSEMP) based, among others, on the IEE, construction methodology he will utilize, schedule of works, and site conditions in his awarded area.	PAG/DSC will review and approve the SSEMP of the Contractor	Included in contractor's contract	Contractor	**NS**
CONSTRUCTION						
3	Impact on historical and archaeological sites such as damage to relics and artefacts during the conduct of the works	The contractor will ensure that the workforce is briefed that in the event of accidental finds of relics, they should immediately cease any works in the area and promptly report the find to their supervisor.	Periodic monitoring and reporting by the DSC and PAG. Complaints received from the school or community will be reported to the PAG and documented in safeguard monitoring reports.	Included in civil works cost	Contractor/ PAG	**NS**
4	Temporary disruption of existing roads, pathways, and access	Particular attention will be given to ensuring safety along roads and paths such as the main road and the feeder road.	Periodic monitoring and reporting by the DSC and PAG.	Included in civil works cost	Contractor/ PAG	**NS**

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Impact ID	Impact Description	Mitigation Measures	Monitoring	Budget for implementation mitigation measures	Responsible Office	Significance after Mitigation
		Contractor will be required to immediately rehabilitate excavated areas and any damaged road and path sections.	Complaints received from the school or community will be reported to PAG and documented in the safeguard monitoring reports.			
5	Air pollution from dust (PM10 and less) and air emissions from earthworks and movement of vehicles posing nuisance and health risk to nearby communities.	Contractor will be required to cover materials with tarpaulin or other suitable materials while in transit to avoid spillage of materials. Earthen roads, particularly roads near residences and through the town core area, will be moistened during dry and dusty conditions. Speed limits will be imposed on construction vehicles. Construction equipment and vehicles will be regularly maintained to control air emissions during vehicle operation.	Periodic monitoring and reporting by the DSC and PAG. Complaints received from the school or community will be reported to PAG and documented in the safeguard monitoring reports.	Included in civil works cost	Contractor/ PAG	**NS**
6	Noise and Vibration from operation of construction equipment causing excessive noise, resulting in nuisance to the communities.	Construction activities, particularly operation of noise generating equipment, will be limited to the daytime. Noise suppression devices will be installed in noise generating equipment. Drivers will be required to minimize blowing of horns and to comply with speed limits.	Periodic monitoring and reporting by the DSC and PAG. Complaints received from the school or community will be reported to PAG and documented in the safeguard monitoring reports.	Included in civil works cost	Contractor/ PAG	**NS**
10	Contamination of the soil and nearby water courses may result from the utilization of hazardous materials. Improper handling, storage or utilization of hazardous materials poses a significant health risk to the workers and residents of nearby settlement areas;	Ensure that safe storage of fuel, other hazardous substances consistent with national and local regulations to prevent soil and water contamination. Fuel storage tanks to be on impervious surface with bund to catch spills, bund shall have holding capacity of 110% of tank capacity. Fuel tanks etc shall not be located within 50 m of a water course. Ensure all storage containers are in good condition with proper labeling; Used oil and other residual toxic and	Periodic monitoring and reporting by the DSC and PAG. Complaints received from the school or community will be reported to PAG and documented in the safeguard monitoring reports.	Included in civil works cost	Contractor/ PAG	**NS**

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Impact ID	Impact Description	Mitigation Measures	Monitoring	Budget for implementation mitigation measures	Responsible Office	Significance after Mitigation
		hazardous materials shall be disposed of in an authorized facility off-site; Ensure availability of spill clean-up materials (e.g., absorbent pads, etc.) specifically designed for petroleum products and other hazardous substances where such materials are being stored; Spillage, if any, will be immediately cleared with utmost caution to leave no traces, Spillage waste will be disposed at approved disposal sites.				
11	Generation of construction waste such as excavated soil	Surplus excavated material/cut soil from construction will be used as backfill material for low-lying portions per site development plan	Periodic monitoring and reporting by the DSC and PAG. Complaints received from the school or community will be reported to PAG and documented in the safeguard monitoring reports.	Included in civil works cost	Contractor/ PAG	**NS**
12	Generation of construction wastes such as solid wastes, inert construction wastes, during construction will result in the pollution of land and receiving water bodies.	Contractor to develop and implement Waste Management Plan Surplus excavated material/cut soil from construction will be used as backfill material for low-lying portions per site development plan	Periodic monitoring and reporting by the DSC and PAG. Complaints received from the school or community will be reported to PAG and documented in the safeguard monitoring reports.	Included in civil works cost	Contractor/ PAG	**NS**
13	Impacts on community health and safety such as from accidents risks to surrounding communities from vehicles transiting the main highway	Contractor to develop a Traffic Management Plan. Signage and appropriate speed limits Requiring suppliers that delivery vehicles transporting construction materials are maintained in a safe operating condition, loads are to be secured and all loads with fugitive materials (e.g. excavated soil and sand) are to be covered with tarpaulins.	Periodic monitoring and reporting by the DSC and PAG. Complaints received from the school or community will be reported to PAG and documented in the safeguard monitoring	Included in civil works cost	Contractor/ PAG	**NS**

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Impact ID	Impact Description	Mitigation Measures	Monitoring	Budget for implementation mitigation measures	Responsible Office	Significance after Mitigation
		All drivers and machinery operators act responsibly	reports.			
14	Occupational health and safety hazards from operating and using heavy machinery, refueling hazards, traffic accident hazards	The contractor will be required to implement the construction health and safety plan in accordance with the World Bank *EHS Guidelines* (http://www.ifc. org/ehsguidelines) as a minimum standard. Contractor will appoint an EHS officer to ensure implementation of the plan. Workers will be provided with a safe working environment including conduct of safety induction, safety equipment appropriate for the task in which they are employed, medical and first aid facilities provided together with a person qualified in first aid.	Periodic monitoring and reporting by the DSC and PAG. Complaints received from the school or community will be reported to PAG and documented in the safeguard monitoring reports.	Included in civil works cost	Contractor/ PAG	**NS**
15	Occupational health and safety hazards working at height	Use of Personal Protective Equipment (PPE) • Equip workers with appropriate PPE, such as harnesses, helmets, and non-slip footwear. • Ensure that all PPE is regularly inspected and maintained. Fall Protection Systems • Implement guardrails, safety nets, and personal fall arrest systems (PFAS) where applicable. • Use scaffolding that meets safety standards and is properly erected and maintained. Safe Work Practices • Establish and enforce safe work procedures for tasks performed at height. • Limit the number of workers who need to work at height at any given time.	Periodic monitoring and reporting by the DSC and PAG. Complaints received from the school or community will be reported to PAG and documented in the safeguard monitoring reports.	Included in civil works cost	Contractor/ PAG	
OPERATION						
16	Impact on community health and safety from access and intrusion of unauthorized personnel.	Watchmen/security personnel will be hired to secure the facilities on a 24-hour basis. This will minimize the safety risks to the community.	Periodic monitoring and reporting by PAG	**PAG operations cost**	**PAG**	**NS**

RESTRICTED. This information is accessible to selected ADB Management, staff, and/or business groups. It may not be shared with other parties without appropriate permission.

6.1. Site-Specific Environmental Management Plan (SSEMP)

252. The appointed Contractor, within one month of awarding of the Contract, will prepare the requisite SSEMP based, among others, on the AIEE, construction methodology he will utilize, schedule of works, and site conditions in his awarded area. The SSEMP will include subplans listed below.

- Worker Health and Safety plan
- Air Quality and Dust suppression Plan
- Noise and Vibration Management Plan
- Spill management plan
- Emergency Preparedness and Response Plan
- Solid waste and wastewater management plan
- Water Quality Management Plan
- Soil Management Plan
- Site Restoration and Landscape Plan
- Traffic management plan
- Worker camp management plan
- “chance find” procedures
- Occupational and community health and safety plan
- Epidemic Emergency response plan

253. The SSEMP would also include the detailed operational plan for the implementation with the requisite targets/indicators over a specific timeline that would be monitored for milestone highlights.

254. The SSEMP should not be a reproduction of the EMP but site-specific, reflecting the contractor’s construction methodology and schedule and demonstrating how these activities meet the requirements of the EMP.

255. The SSEMP should provide:

- Clear description of the subproject influence area especially broader affected areas subject to induced or secondary impacts (e.g., nearby village communities and water courses).
- Clear identification of sensitive receptors along the subproject site on a plan of appropriate scale (sensitive receptors include nearby villages, dwellings, water supply sources, etc.).
- Risk assessment undertaken to determine how vulnerable the sensitive receptors are to subproject impacts (air, noise water quality, erosion, sedimentation, traffic safety, etc.). This would include seasonal related impacts (snow, heavy rain, dry, etc.).
- Site-specific mitigation measures at specified locations based on the results of a risk assessment. This should include a narrative description of the site-specific mitigation methodology. The specific mitigation measures should be shown on site plans/designs showing what and where specific mitigation measures/structures will be applied on the site.

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- Environmental audit inspection procedures which describe how and when site audits are undertaken to check implementation and effectiveness of mitigation measures (including audit checklists based on SSEMP, to be used for regular weekly inspections) and how corrective action is initiated and resolved (internal communication mechanisms to ensure compliance with the SSEMP). For example, inspection reports are discussed and provided to management, reported in progress meetings for action, etc.

256. PAG and DSC will have the right to suspend works or payments if the Contractor is in violation of any of his obligations under the EMP and SSEMPs.

6.2. Environmental Monitoring

257. Table 29 presents the environmental monitoring plan and performance indicators during the construction and operational phases of the subproject based on the EMP.

258. Pre-construction phase. EMP monitoring during the pre-construction phase of the subproject will be undertaken by the DSC.

259. Construction phase. Throughout the construction period, the contractor will submit monthly environmental compliance progress reports to the DSC with copy furnished to the PAG. Contractor's monthly environmental compliance progress reports need to include a summary of the status of environmental mitigation implementation including site inspection activities, issues identified, and associated corrective actions undertaken for resolution during the reporting month (not simply the results and trends of parametric monitoring). The contractor will be able to highlight the summary of the progress of construction activities undertaken within the reporting period to implement the measures outlined in the EMP and record any community complaint received and how the complaint was resolved.

260. The PAG will consolidate the results of the monthly environmental compliance progress reports through a quarterly progress report (QPR) that will be submitted to MoE. The QPR will summarize the significant findings and measures undertaken to address any adverse environmental impacts during construction and also present any unforeseen environmental impacts and suggested remedial actions for the next monitoring period. Copies of the QPR prepared by the PAG will be given to the District Governor. PAG will consolidate information from the QPRs and compile and submit semi-annual integrated safeguards monitoring reports to ADB.

261. Once the reports are received by the PAG, these will be reviewed relative to subproject compliance with the indicators defined in the EMP. The PAG will submit QPRs to MOE and ADB. The PAG will also prepare the QPRs in English for submission to ADB.

6.3. Reporting

262. Safeguards' compliance will be performed by PAG with the DSC's support. PAG will submit SAEMRs to ADB for review and disclosure, within 30 days after completion of each monitoring period. Within three months after completion of all civil works, a report on the STEM's environmental compliance performance (including lessons learned that may help PAG in their environmental monitoring of future projects) will also be prepared.

263. PAG, with the support of DSC, will translate the summary of these documents into Russian language, and post them on PAG's website with the full reports (in English), within two weeks after ADB's clearance of each document. The DSC will support PAG in preparing such reports. In case

DSC's liability period ends before ADB's PCR issuance, PAG itself will prepare the SAEMRs. In addition to the above-mentioned reports, in case of any accident related to occupational and community health and safety causing fatality or near- fatal event, NTDC will to (i) report to ADB within 24 hours of any fatal or near-fatal event, (ii) prepare and submit to ADB an incident notification form within 48 hours, and (iii) prepare and submit to ADB an incident root cause investigation and corrective action form within 72 hours.

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Table 24: Environmental Monitoring Plan (EMoP)

Parameters	Location	Environmental Performance Indicator	Frequency	Means of Monitoring
PRE-CONSTRUCTION PHASE / Detailed Engineering Phase				
Additional Consultation to be undertaken during the Detailed Design Phase	Subproject site	Attendance sheets, Minutes of Meeting, DSC regular Reports	Once prior to construction	Submission of report by the DSC
Obtain baseline measurements for air quality (total suspended particulate matter, SOx, NOx and CO) and noise levels	Subproject site	Report and baseline measurement results of parameters	Once prior to construction	Submission of report by the contractor
CONSTRUCTION PHASE				
Obtain periodic measurements for air quality (total suspended particulate matter, SOx, NOx and CO) and noise levels	Subproject site	Report and periodic measurement results of parameters	Every quarter during construction	Submission of report by the contractor
Adherence to provisions in the EMP to mitigate construction impacts	Subproject site	Compliance with EMP	Daily	Compliance monitoring by contractor and PAG/DSC
Direct effects on the academe and communities from impacts such as damage to properties/ features, dust generation, noise, and safety	Subproject site	Views and opinions of communities and complaints received via GRM	Weekly	Through community feedback and GRM
Monitoring of EMP during construction/ excavation, including compliance with traffic management requirements	All roads/acce sses	Compliance with EMP	Daily	Compliance monitoring by contractor and PAG/DSC
OPERATIONAL PHASE				
Observance of avoidance and minimization of solid waste, hazardous waste, wastewater, noise	Subproject site	Compliance with EMP	Daily	Compliance monitoring DPED/MoE
Maintenance of safety and security	Subproject site	Compliance with EMP	Daily	Compliance monitoring DPED/MoE

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6.4. Environmental Management and Monitoring Costs

264. The cost of the environmental safeguard activities during subproject construction (i.e., environmental management) will be included in the civil works cost. The budget for the implementation of the EMP for Renovation PAG office and additional works is estimated at $18,750, as shown in Table 30, and was calculated based on prevailing prices and will be incorporated in the Bill of Quantities (BOQ) for the subprojects.

Table 25: Estimated Costs for Contractor's EMP Implementation

ITEM	UNIT	QTY	UNIT COST ($)	TOTAL ($)
Preparation of SSEMP	Lumpsum	1	1,000	1,000
Provision of requisite PPE and related health and safety requirements	Lumpsum	1	2,000	2,000
Re-vegetation and landscaping	Lumpsum	1	1,000	1,000
Clearing of Work Sites	Lumpsum	1	5,000	5,000
Minor Earthworks (Removal and Storage of Topsoil)	Lumpsum	1	500	500
Protection of Ecological Resources (Land, Water and Biological)	Lumpsum	1	100	100
Regular Dust Suppression Activities	Lumpsum	1	700	700
Environmental safeguards officer (ESO)	Month	3	750	2,250
Health and safety officer (HSO)	Month	3	750	2,250
Medical staff	Month	3	750	2,250
Restoration of Work and Storage Sites	Lumpsum	1	1,500	1,500
Regular Environmental Monitoring	-	-	200	200
GRAND TOTAL				**18,750**

SSEMP = site-specific environmental management plan, PPE = personal protective equipment

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VII. GRIEVANCE REDRESS MECHANISM

7.1. ADB Requirements

265. ADB Safeguard Policy Statement (SPS, 2009) requires the establishment of "a responsive, readily accessible and culturally appropriate grievances redress mechanism capable of receiving and facilitating the resolution of affected persons' (AP) concerns and grievances about the physical, social and economic impacts of the projects".

266. The GRM aims to: (i) reduce conflict, risk of undue delay and complication in project implementation; (ii) improve quality of project activities and outputs; (iii) ensure that the rights of affected parties are respected; (iv) identify and respond to unintended impacts of projects on individuals; and, (v) maximize participation, support and benefit to local communities.

267. The fundamental objectives of the Grievance Redress Mechanism are:

268. To reach mutually agreed solutions satisfactory to both, the Project and the APs, and to resolve any project-related grievance locally, in consultation with the aggrieved party;

269. To facilitate the smooth implementation of the Environmental Management Plan and prevent delay in project implementation;

270. To democratize the development process at the local level, while maintaining transparency as well as to establish accountability to the affected people.

7.2. Project GRM

271. The objective of the GRM is to resolve complaints as quickly as possible at the local level through a process of conciliation, and if that is not possible, to provide clear and transparent procedures for appeal. All affected persons will be made fully aware of their rights, and the detailed grievance redress procedures will be publicized through an effective public information campaign. An aggrieved affected person or affected household will be free from any fees in connection with the lodging and resolution of complaints, as the costs will be borne by the MOES and appointed contractors.

272. The Ministry of Education does not have any specific Environment or Social Safeguards Policy. ADB procedures require the Ministry of Education to establish a GRM for environmental safeguards, which will have a suitable grievance redress procedure for project affected persons. The GRM will address the project affected persons concerns and complaints promptly, using an understandable and transparent process that is gender responsive, culturally appropriate, and readily accessible to the APs at no cost.

273. For the purposes of the Ministry of Education and ADB, the GRM will be identical for the environment and social aspects of the project. The project will establish a National Grievance Redress Committee (NGRC) at the Ministry of Education level in line with ADB SPS (2009) requirements. Local Grievance Redress Committees (LGRCs) will be established in each district and will report to the NGRC. The LGRC members of each district shall visit the sites regularly to meet the local residents and workers at construction site. Local communities and individuals can contact the LGRC in case of any appeal, request, or claim. No claims have been registered so far as there have not been any civil works.

7.2.1. Type of Grievances

274. Complainants are entitled to lodge complaints regarding any aspect of the project. Any affected person will be able to submit a grievance if he/she believes that a practice has a detrimental impact on the community, the environment, or on his/her quality of life. Eligible grievances or complaints include:

- Negative impacts on a person or a community (e.g., financial loss such as from loss of water, roadside trees; health and safety issues; nuisances, etc.);
- Dangers to health and safety or pollution of the environment;
- Hazards due to construction activities (e.g., noise, dust, disruption of access, etc.);
- Impacts on social infrastructure;
- Failure to comply with standards or legal obligations;
- Improper conduct or unethical behavior of contractor leading to nuisance of APs;
- Misuse of funds and other irregularities;
- Grievances due to land acquisition, resettlement, compensation, relocation, and unaddressed losses; and
- Complaints related to gender issues.

275. During the public consultation sessions conducted during the IEE, the dweller groups and individuals were made aware of the proposed project. Thus, the project-affected communities residing beside the selected schools have already gained a reasonable knowledge about the potential grievances, which may arise in the future. The public was also informed that there will be no involuntary acquisition of land or involuntary restrictions on land use, which result in physical displacement and economic displacement.

7.2.2. Time Frame

276. A community awareness program must be conducted one month prior to construction by the PAG regarding the scope of the project, procedure of construction activities, utility of resources, identified impacts and mitigation measures. This awareness program will help the community to resolve problems and clarify their distrust related to the proposed project at initial stage. The community will be informed about the GRM, which is already established as per the Ministry of Education and GOT procedure, for making complaints, including the place and the responsible person to contact in a practical way in this regard. Almost all the stakeholders related to the GRM will also be aware of the established grievance process, the requirement of the grievance mechanism, goals, benefits, relevant laws and regulations, etc.

7.2.3. Establishment of NGRC

277. The NGRC will register and follow up on any issues and/or complaints directly raised by any individual or community member in a group or via LGRC. The NGRC consists of representatives of the Ministry of Education, the PAG project coordinator and social and environmental safeguards staff, the local Hukumat representative, and appropriate local NGOs to allow voices of the affected communities to be heard and to ensure a participatory decision- making process. The NGRC decisions will be made by majority of members and will be publicized among the local communities and directly to the complainant(s). If the complainants are not satisfied with the National GRC decisions, they can always file their cases with ADB or in court. The PAG will maintain a complaint register, which will include a record of all complaints for regular monitoring of grievances and results of services performed by the GRCs for periodic review by ADB.

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7.2.4. Establishment of LGRCs

278. An LGRC will be established in each subproject district at the Hukumat level. The LGRCs will register and follow up on issues and/or complaints raised by any individual or community member in a group at the local level. They will be established by the Head of Hukumat administration and will include the professionals needed to solve specific cases. The committee shall have the following composition:

- Deputy Head of *Hukumat*, Chairman;
- Head of *Jamoat* (focal point to accept and register grievances);
- District Land Management and Geodesy Department representative;
- District Architecture Department representative;
- District Environment and Forestry representative;
- Head of Housing and Communal Services Enterprise;
- A professional civil engineer;
- Community leaders and NGO leaders;
- Principals of selected schools; and
- Other specialized organizations and professionals, as required.

279. One of the abovementioned professionals will be nominated to serve as the LGRC Secretary to: register complaints in the database, convene LGRC meetings, process relevant paperwork, keep records, and share summary of complaints with NGRC on a monthly basis.

280. Grievance mechanism during the implementation phase. Complaints and grievances received during the construction work will be addressed through the following steps and actions:

- **Step 1:** Complaints will be lodged at the district level, where the responsible and *Hukumat* officers, as well as representatives of the PAP, will attempt to resolve the issue. Each complaint will be registered, signed by the PAP and a representative of the LGRC. The period for resolution of complaints is fixed at 14 calendar days.
- **Step 2:** If a grievance is not resolved during a 14-day period, the PAP (or her/his representative, if chosen) may lodge the complaint with the NGRC at the Ministry of Education. The NGRC has an obligation to attempt to resolve the issue within 14 calendar days.
- **Step 3:** PAPs have the right to appeal to the court of law at any time if they wish to do so.

76. The procedure and timeframe for the grievance redress process is shown in Figure 11.

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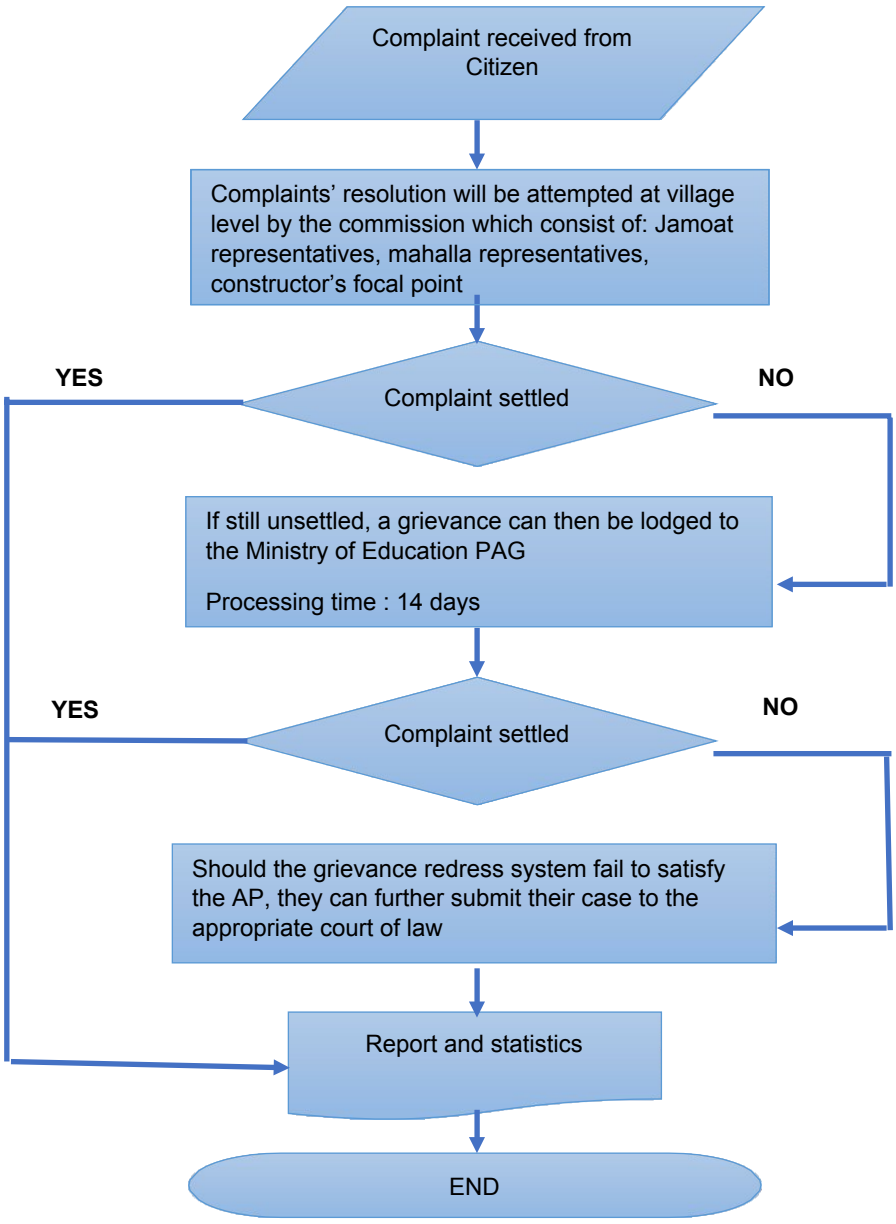

Figure 17: Flow Chart of the Grievance Redress Mechanism

281. GRM proceedings may need one or more meetings for each complaint and may require field investigations by specific technical or valuation experts. Grievance cases shared by more than one complainant may be heard together as a single case.

282. For appeals lodged directly with the Ministry of Education, the NGRC at PAG will review the case together with the respective concerned technical expert. PAG shall implement the GRM and shall undertake GRM initiatives that include procedures of taking/recording complaints, handling of on-the-spot resolution of minor problems, taking care of complainants and provisions of responses to distressed stakeholders, etc., while paying particular attention to the impacts on vulnerable groups.

283. LGRCs at Hukumat level will attempt to find a resolution to the complaint together with the aggrieved person. The LGRC decisions will be made by majority of members and will be publicized

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among the local communities and directly to the complainant(s). If the complainants are not satisfied with the NGRC decision, they can always file their cases in court.

284. If PAPs want to register a complaint with ADB, the Focal Person will provide the complainants the following contact information:

> *ADB National Environment and Social Safeguards Focal Point*
> *Resident Mission of the Asian Development Bank in the Republic of Tajikistan 2/1, Huvaydulloev Street, Dushanbe, Tajikistan*
> *Tel: +992 44 6031000*

285. The National Environmental Safeguards Specialist (NES) of the Ministry of Education / PAG will maintain the complaint register. This will include a record of all complaints for regular monitoring of grievances and results of services performed by the GRCs for periodic review by ADB.

286. The GRM will be in place in the first year of project operation and will utilize the abovementioned GRM procedure for grievance redress. The GRM will be linked to the Citizen Service Center of the Office of the Mayor of District/Hukumat for a centralized system of receiving, referring, solving, and responding to public grievances.

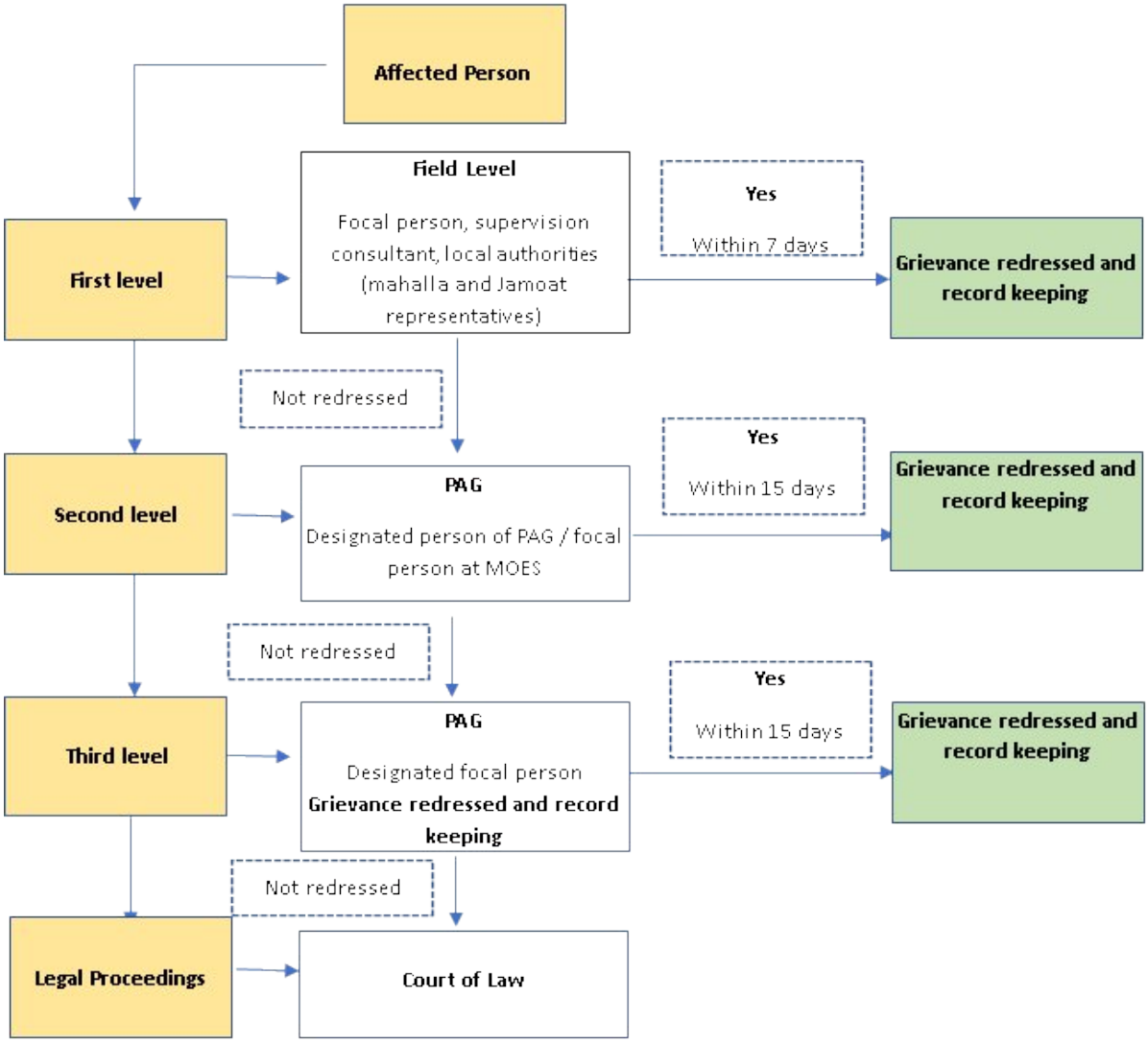

Figure 18: GRM levels and redress times

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VIII. INFORMATION DISCLOSURE, CONSULTATION AND PARTICIPATION

287. Discussion and consultation activities surrounding the establishment of the Project Advisory Group (PAG) office within the International Presidential School's Kindergarten building have been ongoing since the initial stages of project identification. It was determined early on that the location would not trigger any Land Acquisition and Resettlement (LAR) impacts, which is a significant consideration in ensuring that the project aligns with social and environmental safeguards.

288. To further engage stakeholders and provide updates on project developments, a crucial consultation meeting took place on December 26, 2024, at the International Presidential School - Kindergarten building. This meeting brought together key stakeholders, including teachers from the International Presidential School and Kindergarten, as well as representatives from the PAG. The invitation for this meeting was disseminated well in advance, ensuring that all relevant parties were informed and could participate effectively.

289. The primary objective of this consultation meeting was to actively involve stakeholders in discussions regarding the planned project interventions, specifically the establishment of the PAG office at the newly designated site within the International Presidential School - Kindergarten building. Engaging stakeholders at this stage is vital for fostering transparency, building trust, and ensuring that community concerns are addressed proactively.

290. The meeting was attended by a diverse team from the STEM (Science, Technology, Engineering, and Mathematics) initiative, which included the National Social Safeguard Consultant, the Environmental Consultant, and representatives from both the International Presidential School and the Kindergarten. Each participant played a critical role in facilitating discussions and providing insights into their respective areas of expertise.

291. During the meeting, the National Social Safeguard Consultant delivered a comprehensive presentation on social safeguard requirements and procedures. This presentation was particularly important as it outlined the frameworks and guidelines that govern social safeguards within the context of the project. The consultant emphasized the significance of adhering to these requirements to mitigate any potential negative impacts on the community and to promote inclusivity throughout the project's lifecycle.

292. Furthermore, the presentation included an overview of best practices for stakeholder engagement, highlighting strategies for maintaining open lines of communication between project implementers and community members. The importance of continuous dialogue was underscored, as it allows for ongoing feedback and adjustments to be made based on stakeholder input.

293. In addition to discussing social safeguards, the meeting also provided an opportunity for stakeholders to voice their concerns and ask questions about the project. This interactive component is essential for fostering a collaborative environment where all voices are heard. Stakeholders expressed their appreciation for being included in the decision-making process and acknowledged the importance of having a dedicated office space for the PAG within the school premises.

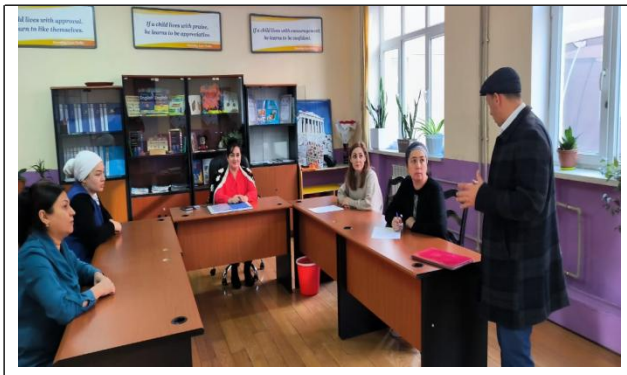

Photo 5 Consultation Meeting with the Stakeholders in the International presidential School –Kindergarten building.

8.1. Information Disclosure and Future Consultations

294. After approval of the AIEE, this document will be made available at public locations in Russian language, and will be disclosed to a wider audience via the ADB and MOES website.

295. Should additional information about the project be required at any time, the public may contact the MOES/PAG. Alternatively, people can seek information from the contractor that will be selected for the project's civil works.

296. During construction stage, consultations will be held at the IPL site to provide updated information and clarifications to the public and other interested stakeholders on as need basis. This will also be used to update the AIEE document prior to construction, if and how required by the project.

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IX. CONCLUSIONS AND RECOMMENDATIONS

9.1. Conclusions

297. The proposed project to establish the Project Administration Group (PAG) office within the International Presidential School's Kindergarten building is not expected to have significant adverse environmental impacts. The project site is located within an existing educational institution, and the proposed construction activities are limited in scope, primarily involving minor renovations and upgrades to the existing building.

- The key environmental and social impacts anticipated during the construction phase include:
- Temporary disruption of existing roads, pathways, and access within the school premises;
- Air pollution from dust and emissions generated by construction activities;
- Noise and vibration from the operation of construction equipment;
- Potential for conflict with local communities due to the presence of outside workers;
- Occupational health and safety risks for construction workers;
- Improper handling, storage, or utilization of hazardous materials leading to soil and water contamination;
- Generation of construction waste.

298. These impacts are assessed to be of minor to moderate significance, and can be effectively mitigated through the implementation of appropriate measures outlined in the Environmental Management Plan (EMP). The EMP includes specific mitigation strategies, monitoring requirements, and institutional responsibilities to ensure the effective management of environmental and social risks throughout the project's lifecycle.

299. The project is not expected to have any significant adverse impacts on the surrounding environment, as it is located within an existing educational institution and does not involve any land acquisition or resettlement. Furthermore, the project will not affect any protected areas, critical habitats, or areas of cultural or historical significance.

300. Overall, the proposed project to establish the PAG office within the International Presidential School's Kindergarten building is considered to be environmentally and socially feasible, provided that the mitigation measures outlined in the EMP are properly implemented and monitored.

9.2. Recommendations

301. Based on the findings of the Initial Environmental Examination (AIEE), the following recommendations are made:

(i) The Contractor shall prepare a comprehensive Site-Specific Environmental Management Plan (SSEMP) prior to the commencement of construction activities, based on the EMP provided in this AIEE. The SSEMP shall include detailed, site-specific mitigation measures, monitoring requirements, and institutional responsibilities to address the potential environmental and social impacts identified.

(ii) The PAG shall ensure that the Contractor strictly adheres to the provisions of the SSEMP and the EMP throughout the construction phase. Regular monitoring and inspections shall be

carried out to verify the Contractor's compliance with the environmental and social safeguard requirements.

(iii) 3. The PAG shall establish a Grievance Redress Mechanism (GRM) to address any complaints or concerns raised by the local community or other stakeholders during the project implementation. The GRM shall be accessible, transparent, and responsive to the needs of the affected parties.

(iv) 4. The PAG shall ensure that all construction workers are provided with appropriate personal protective equipment (PPE) and are trained on occupational health and safety practices to minimize the risks of accidents and injuries.

(v) 5. The PAG shall coordinate with the International Presidential School administration and the local community to ensure effective communication and address any concerns or issues that may arise during the construction phase.

(vi) 6. The PAG shall monitor the implementation of the EMP and prepare regular environmental monitoring reports to be submitted to the Ministry of Education and Science and the Asian Development Bank.

(vii) 7. The PAG shall ensure that the project's environmental and social performance is evaluated upon completion of the construction phase, and any lessons learned are incorporated into the design and implementation of future projects.

(viii) By implementing these recommendations, the PAG can ensure that the project is carried out in an environmentally and socially responsible manner, minimizing potential impacts and promoting sustainable development.

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