

**MINISTRY OF ENVIRONMENT OF THE REPUBLIC OF ARMENIA
ENVIRONMENTAL PROJECTS IMPLEMENTATION UNIT**

K0.RESILAND. RESILIENT LANDSCAPES OF ARMENIA (P179988)

**ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN
FOR REFORESTATION
(LORI)
[DRAFT]**

June 2026

TABLE OF CONTENTS

EXECUTIVE SUMMARY	ii
1. INTRODUCTION	1
2. BACKGROUND INFORMATION	2
2.1. Description of the Forestry Enterprises of Lori, Stepanavan, and Tashir	2
2.2. Socio-Economic Context	3
2.3. Biophysical environment	
3. Description of Forest Restoration	12
4. LEGAL AND REGULATORY FRAMEWORK	12
4.1 National regulatory framework – laws of the Republic of Armenia	12
4.2 National regulatory framework – Government Decisions	18
4.3 National regulatory framework – Ministerial Orders	
4.4 Forest management plans	
4.5 Strategic Sectoral Documents	
4.6 International Best Manufacturing Practice	
4.8 Environmental and Social Standards of the World Bank	21
5. PROJECT STAKEHOLDERS AND CONSULTATION	23
5.1 Stakeholder Identification and Consultation	23
5.2 Summary of Consultations Conducted During the Preparatory Phase of Forest Restoration	26
5.3 Grievance Redress Mechanism	28
6. ENVIRONMENTAL AND SOCIAL RISKS, POTENTIAL IMPACTS, AND THEIR MITIGATION	30
7. ROLES AND RESPONSIBILITIES FOR IMPLEMENTING ESMP	31

LIST OF ACRONYMS AND ABBREVIATIONS

Abbreviation	Description
CJC	Closed Joint-Stock Company
CPI	Corporate Performance Indicator
EIA	Environmental Impact Assessment
EPIU SA	Environmental Projects Implementation Unit State Agency
ESCP	Environmental and Social Commitments Plan
ESHS	Environmental, Social, Health and Safety
ESMP	Environmental and Social Management Plan
ECF	Environmental and Social Framework
ESS	Environmental and Social Standard
ES	Environmental and Social)
GBVH	Gender-Based Violence and Harassment
GHG	Greenhouse Gases
IBP	International Best Practice
GRC	Grievance Redress Committee
GRM	Grievance Redress Mechanism
IFC	International Finance Corporation
IPF	Investment Project Financing
LMP	Labor Management Procedures
MoE	Ministry of Environment
MoH	Ministry of Health
MoTAI	Ministry of Territorial Administration and Infrastructure
MSDS	Material Safety Data Sheet
NGO	Non-Governmental Organization
OHS	Occupational Health and Safety
PO	Project Objective
PGM	Project Grievance Mechanism
PPE	Personal Protective Equipment
PSC	Project Steering Committee
RA	Republic of Armenia
SEP	Stakeholder Engagement Plan
SNCO	State Non-Commercial Organization
MPL	Maximum Permissible Level
TMP	Traffic Management Plan
WB	World Bank
WHO	World Health Organization
GBF	Global Biodiversity Framework
NBSAP	National Biodiversity Strategy and Action Plan

EXECUTIVE SUMMARY

The objectives of the RESILAND: Armenia Resilient Landscape Project (the Project) are to: (i) increase the area under sustainable landscape management in Selected Locations and (ii) promote sustainable economic activities to communities in Targeted Landscapes in Armenia. The Project is co-financed by the Global Environment Facility (GEF) and the Swedish International Development Cooperation Agency (Sida). The International Bank for Reconstruction and Development administers the GEF grant. The Project is implemented by the Environmental Project Implementation Unit State Agency (EPIU SA) of the Ministry of Environment of Armenia.

The Project follows an integrated landscapes approach to restore forests and wetlands and focuses on four key areas of intervention: (i) reduction of forest fragmentation and increase in density of tree cover by restoring the forest land degraded due to mining and by forest enrichment planting; (ii) improving management of neglected and abandoned wetlands, (iii) increasing community economic benefits, and (iv) strengthen the institutional foundation for the sustainable management of landscapes, creating green jobs, and increasing community benefits. Project activities are grouped into four interrelated components as follows:

Component 1: Institutional Capacity and Policy Development

Component 2: Landscape Restoration

Component 3: Promoting Communities' Benefits

Component 4: Project Management, Monitoring & Evaluation, and Communication

Within Component 2, forest landscapes will be restored, fragmentation reduced, and forest biodiversity conditions improved. Restoration is planned in Lori region within the forestry enterprises of Vanadzor (82.25 ha), Stepanavan (21.49 ha), and Tashir (65.88 ha) under “HayAntar” State Non-Commercial Organization (SNCO).

Forest restoration activities in Lori region shall be implemented in compliance with the requirements of the Republic of Armenia's environmental legislation and the World Bank Environmental and Social Standards (ESS). These norms encompass biodiversity conservation, sustainable use of land resources, community engagement, and management of social impacts.

Implementation in alignment with national legislation and the World Bank's Environmental and Social Framework (ESF) ensures ecological integrity, social responsibility, and fulfillment of Armenia's international commitments in environmental protection.

To ensure compliance with the Environmental and Social Standards of the World Bank (ESSs) relevant for the Project during forest restoration, this Environmental and Social Management Plan (ESMP) has been prepared, covering all restoration activities. Works must be carried out in consideration of the forest management plans of the respective forestry enterprises.

During the preparation of the ESMP for forest restoration activities, several potential adverse impacts have been identified:

- Soil, air, and water pollution resulting from the use of machinery and materials during restoration works.
- Noise and vibration generated by the operation of equipment and transport, which may affect both workers and nearby communities.
- Improper waste management, which can disrupt the balance of the natural environment.
- Potential physical and visual impacts on cultural heritage monuments, posing risks to their preservation.
- Disturbance of ecosystems, potentially leading to imbalance and the decline of certain species.

The identified risks can be effectively avoided or minimized through the application of the prescribed mitigation measures.

- Waste management will be ensured through segregation of waste streams, organized on-site storage, and timely removal to designated facilities.
- Regular soil studies will be conducted to detect the presence of contaminants.
- Air quality monitoring will be maintained, applying measures to reduce dust and emissions.
- Water quality protection will be ensured to prevent contamination of surface and groundwater.
- Prevention of operational and accidental leaks from construction machinery and transport vehicles will be enforced, with emergency response provided in accordance with the response plan.
- Cultural heritage protection will be supported by establishing baseline indicators and continuous monitoring of impacts on historical monuments.
- Biodiversity conservation will include identification and prevention of disturbances to sensitive plant species, animal species, and migration corridors.

1. INTRODUCTION

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Within Component 2, forest landscapes are planned to be restored, fragmentation reduced, and forest biodiversity conditions improved. Restoration is foreseen in Lori region, specifically in the forestry enterprises of Vanadzor (82.25 ha), Stepanavan (21.49 ha), and Tashir (65.88 ha) under HayAntar SNCO.

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2. BACKGROUND INFORMATION

2.1 Description of the Forestry Enterprises of Lori, Stepanavan, and Tashir

Vanadzor Forestry Enterprise

The Vanadzor branch of “Hayantar” SNCO is located in the north of the Republic of Armenia, in Lori region. The forestry office is situated in Vanadzor city, 120 km away from Yerevan. The longest stretch of the forestry territory from northwest to southeast is 70 km.

Northern boundaries: lands of the administrative territories of Lusaghbyur, Saralanj, Mets Parni, Shirakamut, Gogaran, Gyulagarak, Hobardzi, Vardablur, and Dzoragyugh communities.

Eastern boundaries: lands of Dsegh, Margahovit, and Fioletovo communities, as well as the lands of the “Dilijan” National Park in Tavush region.

Southern boundaries: lands of the administrative territories of Khndzoyan, Hartagyugh, Tsaghkaber, Lernavan, Jrashen, Saramej, Lernantsk, Spitak, Ghursali, Lernapat, Halavar, Darpas, Shahumyan, Lermontovo, Antarrashen, Margahovit, and Fioletovo communities, as well as the lands of Aragatsotn Forestry in Aragatsotn region.

Western boundaries: lands of Jajur community in Shirak region and the lands of Gyumri Forestry. The forestry enterprise includes 7 forest districts: Vanadzor, Khndzorut, Margahovit, Spitak, Vahagni, Yeghagnut, and Pambak.
Total area: 32,202.0 ha.

Stepanavan Forestry Enterprise

The Stepanavan branch of “Hayantar” SNCO is located in the former administrative district of Stepanavan in Lori region. The forestry office is situated in Stepanavan city, 140 km from Yerevan and 30 km from the regional center Vanadzor.

Northern boundary: Tashir Forestry.

Southern and southeastern boundaries: Vanadzor Forestry.

Eastern boundary: Lalvar Forestry.

The territory stretches 27 km north to south and 32 km east to west.

The branch includes 2 forest districts:

Stepanavan – 6,009 ha

Gyulagarak – 2,864 ha

Total area: 8,873.0 ha.

Tashir Forestry Enterprise

The Tashir branch of “Hayantar” SNCO is located in the former administrative district of Kalinino in Lori region. The forestry office is situated in Tashir city, 165 km from Yerevan.

Northern boundary: Republic of Georgia.

Southern boundary: Stepanavan Forestry.

Eastern boundary: Jiliza Forestry.

Western boundary: Shirak region.

The territory stretches 25 km north to south and 39 km east to west. The branch includes 3 forest districts:

Metsavan – 3,195 ha

Tashir – 2,252 ha

Lalvar – 2,754 ha

Total area: 7,143 ha.

2.2 Socio-Economic Context

The areas targeted for forest restoration are located in Lori region, but historically they have followed different paths of development. The territory of the Tashir Forestry Enterprise lies within the borders of the historical Kingdom of Tashir-Dzoraget. The settlements in this area were founded either by Armenian migrants or by Molokans. Even today, Molokans reside here. Animal husbandry was established and developed also thanks to Swiss cattle breeders.

Vanadzor and Spitak, together with their adjacent settlements, suffered significant damage during the 1988 earthquake. Both due to the earthquake and the overall situation in the Republic during the 1990s, severe socio-economic problems emerged here, which negatively affected the development of the region. Natural ecosystems, especially forests, were heavily impacted during this period, as they became the main source of

firewood and income for many families.

According to preliminary mapping, target communities for the proposed investment are Stepanavan, Tashir, Gyulagarak, Vanadzor, Pambak, and Spitak. However, the results of ecosystem restoration may have both ecological and socio-economic impacts on other neighboring communities or individual settlements as well.

A brief description of the target communities is presented below.

Vanadzor is the regional center of Lori, located in the northern part of Armenia. It occupies an area of 2,599.33 ha, situated in the valley between the Pambak and Bazum mountain ranges.

Distance from Yerevan: 125 km by automobile road, 224 km by railway.

Elevation: 1,376 m above sea level.

Rivers: The Pambak, Tandzut, and Vanadzor rivers flow through the city.

Population: Approximately 131,656 people.

Vanadzor serves as a territorial administrative center and a transport hub. The Yerevan–Tbilisi railway passes through the city, as well as major interstate highways.

Lernapat Settlement (Pambak Community)

The designated area of the Halavar forest district adjoins the administrative territory of Lernapat settlement in Pambak community. The settlement is located on the left side of the Vanadzor–Spitak highway at the 8th km mark, 2 km away. It is close both to the regional center and to the national highway of republican significance. The Lernajur River flows through the center of the community.

Permanent population: about 2,000 people

Forest area: 435.70 ha

Livelihoods: Animal husbandry is developed

Large cattle: 702 head

Small cattle (sheep and goats): 110 head

Pigs: 170 head

Infrastructure: The settlement is gasified

Machinery available: 3 dump trucks:

Arjhovit (Ghursali) Settlement (Spitak Community)

The Arjhovit (Ghursali) settlement lies in immediate proximity to the forest ecosystems designated for restoration within the territories of Spitak and Yeghagnut forest districts. The main access road to the restoration sites passes directly through the village, reinforcing its functional connection to the project area.

The settlement is predominantly inhabited by Armenians displaced after 1988 from Baku, Gandzak, Khanlar, and Shamkhor districts. It is located in the upper valley of the Pambak River, 17 km from Vanadzor and 7 km from Spitak. It borders the administrative territories of Nor Khachakap, Lernapat, Karadzor rural settlements, and Spitak urban settlement.

The Yerevan–Vanadzor–Tbilisi highway, the Vanadzor–Yerevan and Vanadzor–Gyumri motor roads, as well as the railway line, pass through this area.

The permanent population is 557 inhabitants.

The forest territories cover 676.26 ha. Population: 557 inhabitants

Gyulagarak settlement has been inhabited since the 5th century. The present-day settlement was formed in the 1750s. The distance from Vanadzor is 28 km. The Gargar tributary of the Dzoraget River flows through the village. It is located at an elevation of 1,400 m above sea level.

Forest lands: 571.24 ha.

Large cattle: 991 head.

Small cattle: 286 head.

Although 68 units of agricultural machinery are available, the village still requires additional equipment. The main issues include the construction of roads to remote pastures and the establishment of an irrigation water network. The Hobardzi settlement of Gyulagarak community is located 30 km from the regional center, at an elevation of 1,350 m above sea level.

Forest lands: 167.12 ha.

It borders Gyulagarak and Vardablur.

Permanent population: 511 people.

Pig breeding, animal husbandry, and crop cultivation are well developed.

Large cattle: 434 head.

Small cattle: 157 head.

The village is mostly provided with agricultural machinery, totaling 50 units, including tractors, combines, and others. The main issues include the renovation of the cultural center and administrative building, as well as the construction of roads and a drainage system. Tashir enlarged community is mainly located at elevations of 1,475–1,615 m above sea level. The relief of Tashir is predominantly flat, occupying most of the Lori plain and the adjoining slopes of surrounding mountain ranges. This has determined specific directions of economic activity, particularly the development of large cattle breeding. The Margara–Vanadzor–Tashir–Georgia interstate highway passes through Tashir. Within the Tashir Forestry Enterprise, afforestation and forest restoration works are planned in the territory of the Metsavan forest district, which adjoins the administrative lands of Meghvahovit and Katnarat settlements.

Meghvahovit settlement of Tashir community was founded in 1896 and was resettled in 1989 by Armenians forcibly displaced from Azerbaijan, as well as migrants from nearby villages and Javakhk. It is located in the valley of the Lori River, 11 km from the community center and 53 km from the regional center.

Permanent population: 121 inhabitants

Households: 19 domestic households and 21 rural households

Economic activities: animal husbandry, agriculture, and fruit growing

Forest area: 98.62 ha

Key issues: gasification (ongoing works in 2025), road renovation, and introduction of new street lighting systems.

In the Katnarat settlement, the former Lori pedigree breeding farm was once located. It was established in the 1920s on the basis of the Swiss “Graf-Gotlik estate.” According to various authors’ descriptions, the Swiss Graf-Gotlik, together with his associates Zegentaureur and Busch, founded their farms here, where they kept horses and cattle. The farms employed local residents, most of whom came with their families and settled in the area. Families of migrants also settled here, including children who had survived the Turkish massacres and were raised in the “American orphanage” of Stepanavan.

After Sovietization, Graf-Gotlik left the settlement. On the basis of his farms, the Lori sovkhos was formed, which later became the pedigree breeding farm. In the 1980s, the enterprise was renamed Katnarat. This branch of agriculture has traditionally been preserved.

Current large cattle: 1,352 head
Current small cattle: 235 head
Permanent population: 888 inhabitants
Households: 295
Forest lands: 423.35 ha
Agricultural machinery: 10 units and 45 tractors

2.3 Environmental Description

Climate

The territory of Armenia is distinguished by a great diversity of bioclimatic conditions. According to the Agroclimatic Reference of Armenia, 11 agroclimatic zones are identified within the Republic. The territory of the Vanadzor Forestry Enterprise belongs to the 6th and 7th agroclimatic zones. The 6th zone (moderately warm) covers elevations of 600–900 m above sea level, while the 7th zone (moderately cold) includes areas above 900 m.

The territories of Stepanavan as well as Tashir are classified within the 7th agroclimatic zone, characterized as moderately cold.

Lori Plateau is characterized by a relatively mild climate. Summers are cool, winters are not very cold, and the amount of precipitation is sufficient for the growth of steppe vegetation. The average temperature of the coldest month is -5.1°C in Tashir, while the warmest month averages 16.8°C in Stepanavan. The absolute minimum air temperature reaches -34°C in Stepanavan and -36°C in Tashir. Summer begins somewhat later (in the second half of June) and lasts 60–80 days. Conditions are more favorable in Gyulagarak, where the average January temperature is -3.3°C . Winter is also relatively short here, lasting only 83 days (compared to 94 days in Stepanavan and 102 days in Tashir).

Annual precipitation in the Lori Plateau amounts to 680–720 mm. Most precipitation falls during the warm months, with the maximum in May–June. During these months, precipitation reaches 240 mm in Stepanavan, 235 mm in Tashir, and 244 mm in Gyulagarak, whereas in December and January each receives 40–50 mm.

Snowfall begins in the second half of November, forming a stable snow cover in January (Tashir) and February (Stepanavan). Due to sufficient precipitation, relatively low evaporation during the cloudiest summer months, and the presence of impermeable surface layers in certain areas, wetland vegetation occupies significant

territories.

Precipitation in the Lori Plateau is generally sufficient for cereal cultivation without irrigation. However, in the second half of summer, a type of drought known as “dust storm” (poqshemek) sometimes occurs, which negatively affects crop yields.

Seismic Hazards

Lori region is located within the seismically active zone of the Greater Caucasus / Armenian Highland. The area has previously been subjected to strong earthquakes (e.g., the 1988 Spitak earthquake) and is considered a zone of medium to high seismic risk. The hazards include ground shaking, fissures, as well as secondary phenomena caused by earthquakes such as landslides, rockfalls, and slope instability.

According to the Construction Norms of the Republic of Armenia (RA CN 20.04 “Norms for Earthquake-Resistant Construction and Design”), Armenia is divided into three seismic zones:

Zone 1 – 300 cm/sec²

Zone 2 – 400 cm/sec²

Zone 3 – 500 cm/sec²

The Lori region, where the project area is located, is classified as Zone 3 (the most hazardous seismic zone). In the project territory, the maximum ground accelerations reach approximately 0.5g.

Relief

The main landforms of Lori region have been shaped by endogenous forces—folding, faulting, and volcanic activity—which increased differences in elevation. However, these forms created by internal forces have been modified by exogenous processes, which eroded, fragmented, and lowered the mountains while filling depressions. As a result of the interaction of these two forces, the modern surface of Lori has been formed.

One of the key features of the region’s surface is the large variation in absolute elevations, amounting to about 2,700 m. The maximum elevation is 3,196 m at Mount Achkasar in the Javakhk range, while the minimum is 505 m in the area of Karkop village in the Tumanyan district. The average elevation of the region is 1,600–1,800 m above sea level. Lori lies within the Northern fold-fault mountain ranges and intermountain depressions of Armenia, as well as volcanic uplands and plateaus.

In the Lori Forestry Enterprise, forests are distributed between 800–2,500 m above sea level:

Up to 1,200 m – 55.2%

Above 1,800 m – 40.1%

The relief here is characterized by strong dissection and variation in slope orientation. North-facing slopes predominate, but regardless of orientation, slopes with 26–30° inclination are dominant.

In the Tashir Forestry Enterprise, the relief is also dissected, with varying slope orientations. South-facing slopes predominate, but steep slopes above 25° inclination are common. Forests are distributed between 1,100–2,200 m above sea level.

In the Stepanavan Forestry Enterprise, the relief is strongly dissected, with slope orientation variability. North-facing slopes predominate, but slopes with 25–30° inclination are dominant regardless of orientation. Forests

are distributed between 1,000–2,200 m above sea level:

- Up to 1,200 m – 2.3% (193.5 ha)
- 1,200–1,800 m – 76.5% (5,292.1 ha)
- Above 1,800 m – 21.2% (1,469.0 ha)

Soils

In the forest restoration areas, the main soil types are forest gray soils and forest brown soils.

Forest gray soils are formed within elevations of 1300–2100 m. They are characterized by a gray-brown shade, weakly differentiated genetic horizons, and a nut-shaped structure. The humus content in the upper horizons is 7–12%, sharply decreasing in the lower layers. The soil solution reaction is neutral or slightly acidic, and the absorption capacity is high. These soils are divided into two subtypes: weakly unsaturated gray and strongly unsaturated gray. Typical gray forest soils are mainly formed within 1300–1800 m, with humus content in the upper layer around 12%, which decreases significantly in the lower horizons. Gray forest soils formed at 1700–2100 m differ from the forest brown type by lower humus content and shallower soil depth.

Forest brown soils are mainly distributed at elevations of 700–1700 m. They differ from gray forest soils by the saturation of the absorbing complex. Parent rocks include porphyrites, dolomites, limestones, and sandstones. Within this type, washed, typical, and carbonate subtypes are found. The distinctive feature of washed soils is the absence of carbonates, with a nut-shaped structure. The typical subtype occupies an intermediate position between washed and carbonate soils: carbonates are present in both upper and lower horizons. In carbonate subtypes, carbonates are present in all horizons.

Humus content in these soils is:

- At 0–15 cm depth: 9.9–14.1%
- At 15–30 cm depth: 3.4–4.5%

Forest brown soils are characterized by heavy mechanical composition, high organic matter content in the upper horizon, and favorable structure, creating good conditions for plant growth and development. In the upper horizon, moisture content is 35–37%, the proportion of water-resistant aggregates is medium to high. They are poorly supplied with nitrogen and phosphorus but well supplied with potassium.

Water Resources

The rivers of Lori region are mainly mountainous, with unstable flow and significant seasonal fluctuations. Floods occur in spring and early summer (April–June), while minimum levels are observed in the second half of summer and in winter. The rivers are fed by rainwater, snowmelt, and groundwater; glacial feeding is absent.

The hydrographic network of the area belongs to the Debed River basin, which covers 4,080 km², of which 3,790 km² lie within Armenia. The river's length is 178 km, with an annual flow of 995 million m³, and an average mineralization of 22 mg/L. The Pambak River is considered the main tributary of the Debed.

Stepanavan Forestry Enterprise

The largest river in the area is the Dzoraget, a tributary of the Debed. Other tributaries include Tashir, Hovnadzor, Urut, and Chkhagh. The Dzoraget originates in the Javakhk mountain range and, flowing through the volcanic plateau of Lori, forms a canyon about 80–100 m deep. There are no lakes or swamps within the forestry territory.

Tashir Forestry Enterprise

This area contains numerous small and medium-sized streams, as well as ponds and wetlands. The largest river is the Tashir, which originates in the western part of the Virahayots Mountains and joins Dzoraget 4 km south of Getavan village. The Lori canal also initiates at the Tashir River.

Noise and Vibration

In forest restoration areas, the main sources of noise are divided into natural and anthropogenic groups. Natural sources include the sounds of wildlife and the wind. Anthropogenic sources include noise from transportation, construction activities, agricultural operations, and similar human activities. The potential sources of vibration are heavy machinery as well as transport vehicles.

Vegetation

The forests of Lori region cover the steep slopes of mountain ranges at elevations of 600–2100 m. Around 60 tree species and more than 90 shrub species are found here. The dominant tree species include Oriental beech, oak (mountain and Georgian), hornbeam, ash, and lime. Wild fruit trees are also present, such as pear, apple, walnut, cornelian cherry, and others.

The territory of the Vanadzor Forestry Enterprise is notable for its pronounced vertical zonation, diverse relief, and corresponding rich plant biodiversity. Within this area, there are 679 species of vascular plants belonging to 99 families and 342 genera. Among these, 23 species are listed in the Red Book of Armenia, including:

- Gagea lutea (Yellow star-of-Bethlehem)
- Allium tauricum (Crimean onion)
- Iris sibirica (Siberian iris)
- Rhododendron caucasicum (Caucasian rhododendron)



Fig. 1. *Iris sibirica* L. (Siberian iris)

From the forestry territory, 56 species of insects of environmental significance are known, of which 14 are listed in the Red Book of Armenia.

In the Debed River and its tributaries flowing through the forestry area, 10 fish species are found, including trout, Eastern bleak, murtsin, and others.

The forestry territory has recorded 4 species of amphibians (frogs, tree frogs, toads, snakes) and 19 species of reptiles. Frogs are not listed in the Red Book, while among reptiles, 5 lizard species and 1 snake species are registered.

The following endangered species require protection:

Dahl's rock lizard
Rostombekov's lizard
White-bellied lizard



Fig. 2. Armenian steppe viper

Vanadzor Forestry Enterprise

The mammals inhabiting the Vanadzor forestry territory are typical of Armenia's broadleaf dry forests. A total of 52 mammal species have been identified. Among predators, the fox and jackal are present; among ungulates, the roe deer; and among mustelids, the weasel, marten, and badger.

The main forest-forming tree species are Oriental beech, Oriental oak, and Caucasian hornbeam. Accompanying species include lime, maple, birch, ash, and others. Shrubs such as honeysuckle, dog rose, and hazel are also found. Above 1,400 m, up to the upper forest boundary, the southern mountain slopes are mainly occupied by oak groves. The fauna is represented by species characteristic of the Caucasian broadleaf forests. Accompanying species include lime, maple, birch, ash, and others. Shrubs such as honeysuckle, dog rose, and hazel are also found. Above 1,400 m, up to the upper forest boundary, the southern mountain slopes are mainly occupied by oak groves. The fauna is represented by species characteristic of the Caucasian broadleaf forests.

Stepanavan Forestry Enterprise

In the Stepanavan forestry territory, 389 species of vascular plants belonging to 62 families and 142 genera have been recorded. Of these, 6 species are listed in the Red Book of Armenia.

Rare plant species registered in the Red Book and found in Stepanavan include:

- Rhododendron caucasicum (Caucasian rhododendron) (Fig. 3)
- Fritillaria collina (Hill fritillary)
- Chamaenerion dodonaei (Dodonaei willowherb)
- Epipogium aphyllum (Ghost orchid)
- Primula amoena (Splendid primrose)
- Primula cordifolia (Heart-leaved primrose)



Fig. 3. Caucasian rhododendron (*Rhododendron caucasicum*)

Stepanavan Forestry Enterprise – Invertebrates and Fish

Within the Stepanavan forestry territory, 11 species of invertebrates are registered in the Red Book of Armenia, including:

- Marsh grasshopper
- Comb-bearded beetle
- Large oak longhorn beetle
- Dusky blue butterfly, among others.

The Dzoraget River and its right tributary, the Gargar River, along with their smaller tributaries, host 11 fish species. Among them:

Trout (Fig. 4) – a rare species whose population continues to decline

Eastern bleak – a local species without fishing significance

- Caucasian chub
- Silver crucian carp
- Kura barbel
- Kura whitefish
- Kura gudgeon, and others, most of which have no commercial fishing importance.



Fig. 4. Brown trout (*Salmo trutta fario* L.)

In the forestry territory, about 150 bird species are found. Around 75% of them nest in these areas, while the rest are observed only during migration or wintering.

The avian fauna of the forestry includes 14 species listed in the Red Book of Armenia, among them:

- Black stork (*Ciconia nigra* Linnaeus)(Fig. 5)
- Bearded vulture (*Gypaetus barbatus* Linnaeus)
- Egyptian vulture (*Neophron percnopterus* Linnaeus)
- Griffon vulture (*Gyps fulvus*)
- Lesser spotted eagle (*Aquila pomarina* C.L.)
- Steppe eagle (*Aquila nipalensis*) and other rare species.



Fig. 5. Black stork (*Ciconia nigra* Linnaeus)

Tashir Forestry Enterprise – Vegetation

In the Tashir forestry territory, 252 species of vascular plants belonging to 33 families and 74 genera have been recorded.

A significant portion of the forestry area is occupied by artificial plantations in the form of protective forest belts, which include both native and introduced tree species.

Among the plants growing in this area, 5 species are listed in the Red Book of Armenia, including:

- *Iris sibirica* (Siberian iris)
- *Fritillaria collina* (Hill fritillary)
- *Chamaenerion dodonaei* (Dodonaei willowherb)
- *Primula amoena* (Splendid primrose) (Fig. 6)



Fig. 6. Splendid primrose (*Primula amoena*)

Invertebrates and Fish – Tashir Forestry Enterprise

From the Tashir forestry territory, 4 species of invertebrates collected are registered in the Red Book of Armenia, including:

Dusky blue butterfly
Arion blue butterfly
Silkworm moth
Bumblebee

Additionally, in the immediate vicinity of the forestry, the narrow snail has been found, whose survival is directly linked to the preservation of the hydrological regime.

The Dzoraget River and its left tributary, the Tashir River, as well as the Vardajur, Metsavan, Moghraget, Urut, and Ghanzil tributaries, host 11 fish species. These include:

- Kartut (*Barbus* species)
- Hasham (*Capoeta* species) – listed in the Red Book (Fig. 7)
- Brown trout
- Eastern bleak
- Silver crucian carp
- Transcaucasian whitefish
- Rainbow trout, and others.



Fig. 7. Hasham (*Capoeta* species)

In the Tashir forestry territory, 5 species of amphibians and 19 species of reptiles have been recorded. Among reptiles, the Red Book of Armenia lists:

- 1 turtle species
- 2 lizard species
- 1 snake species

Most of their habitats are distributed along road areas.

The forestry territory also hosts 15 bird species registered in the Red Book. These include:

- Black stork (*Ciconia nigra*)
- Golden eagle (*Aquila chrysaetos*)
- Steppe eagle (*Aquila nipalensis*)
- Common crane (*Grus grus*)
- Lesser spotted eagle (*Aquila pomarina*)

The destruction of bird nesting habitats is mainly caused by logging activities.



Fig. 8. Steppe eagle (*Aquila nipalensis*)

In the Tashir forestry territory, the mammals are typical of broadleaf forests. Among predators, the fox and jackal are found; among mustelids, the marten and badger; and among ungulates, the roe deer inhabits the forestry areas.

Specially Protected Natural Areas

Within the Vanadzor forestry management territory, are the Margahovit and Caucasian Rhododendron Reserves.

Margahovit Reserve: Formed in the Aghstev River basin, covering the area from Margahovit village to the northern slopes of the Pambak mountain range at elevations of 1,700–2,200 m above sea level, over an area of 3,368 ha. It was established to conserve moisture-loving forests and their characteristic fauna (chamois, brown bear, Caucasian black grouse, etc.). The reserve's flora comprises 267 vascular plant species, nine of which are listed in the Red Book of Armenia, for example: high-mountain maple, multi-fruit juniper, *Iris reticulata*, *Damasonium alisma*, *Orchis mascula*, *Orchis simia*, etc.

Within the Stepanavan forestry management territory, is the Gyulagarak Reserve.

Gyulagarak Sanctuary is a specially protected nature area in the Lori Province of Armenia. It is located on the southern slope of the Lejan mountain range near Gyulagarak village. The sanctuary sits on the left bank of the Dzoraget River in the valley of the Karhankjur stream at altitudes of 1300 to 1850 meters above sea level. Established in 1958, it covers an area of 2586 hectares. It was created to protect relict pine forests. Out of the

sanctuary's total territory, 1768 hectares (spread across 747 sections) are located within the Gyulagarak forestry enterprise, while 1202 hectares are within the Stepanavan forestry enterprise.

Caucasian Rhododendron State Sanctuary is a specially protected nature area in the Lori Province of Armenia. It is located near the settlements of Fioletovo, Margahovit, Lermontovo, and Shahumyan. The sanctuary was created to protect relict bushes of Caucasian rhododendron. It was established on January 29, 1959, by Decision No. 20 of the Council of Ministers of the Armenian SSR and covers an area of 1000 hectares.

The sanctuary is situated on the northern slopes of the Pambak and Tsaghkunyats mountain ranges, on the right bank of the Aghstev River, south of Margahovit village. The rhododendron can be seen in the area stretching from Margahovit toward Mount Ampasar (3053 m) of the Pambak range, adjacent to the dirt road leading to the mountain pass of the same name and Meghradzor village.

The rhododendron is one of the rarest and most beautiful species of Armenian flora. Its evergreen, 20–25 cm tall bushes have an ornamental appearance thanks to their tough, leathery, shiny leaves and clusters of white or cream-colored flowers growing in raceme-like inflorescences. The main cause for the reduction of the rhododendron's habitat is the change in ecological conditions, especially climate change, specifically the decrease in humidity. It grows at altitudes of 1900 to 2200 meters above sea level.

The relict rhododendron sanctuary is under the departmental jurisdiction of the Ministry of Agriculture of the Republic of Armenia and is managed by the "Hayantar" (ArmForest) SNCO.

Historical-Cultural Areas and Cultural Heritage

The Tashir-Dzoraget region—including the communities of Vanadzor, Tashir, and Gyulagarak—is rich in both large and small archaeological monuments (such as "Tagavoranist," "Mashtotsi Blur," and "Kosi Choter"), as well as burial mounds from the Bronze Age and Early Iron Age (3rd millennium BC). Pottery and metallurgy once flourished here.

As for Vanadzor, not much information has survived from the Middle Ages. The only remaining trace of that period is Papani village, located in the Vanadzor gorge.

Along with the rest of the Gugark province, the settlement in the area of modern-day Vanadzor was part of Greater Armenia in the 2nd century BC, and part of the Kiurikian Kingdom in the 10th century AD. It is assumed that the name Gharakilisa (meaning "Black Church") is of Tatar origin, given in the early 13th century after the church built of black stone on Vanadzor's northern hill.

The settlement of Lernapat in the Pambak community is also an ancient site. Traces of Bronze Age settlements have been preserved in its territory, and remnants of a 13th-century cemetery survive in the Urut fields of the village.

In and around the village of Meghvahovit, several historic sites have been preserved, including a medieval fortress, abandoned village sites (gyughateghiner), a chapel, burial mounds (2nd–1st millennium BC), a cave, a bridge, watermills, and cemeteries.

3. DESCRIPTION OF REFORESTATION

Reforestation activities in the Lori Province are planned within the Vanadzor (approx. 82.25 ha), Stepanavan (approx. 21.49 ha), and Tashir (approx. 65.88 ha) forestry branches of the "Hayantar" (ArmForest) SNCO. The expected outcomes of these restoration efforts include reducing forest fragmentation, improving conditions

for biodiversity conservation, and increasing the resilience of forest ecosystems against climate stresses.

Although all areas subject to reforestation are under the management of the "Hayantar" SNCO, it is critical to clarify and finalize this matter before commencing any work.

Reforestation activities include site identification within the aforementioned forestry branches, fencing, environmental and social assessments, development of a reforestation plan based on the scheme provided in the technical assignment, and subsequent maintenance care.

The planned composition of tree species for the Lori forestry branches is as follows:

Vanadzor: 30% Pine, 20% Oak, 15% Apple, 15% Pear, 10% Ash, 10% Maple

Tashir: 50% Pine, 20% Birch, 10% Ash, 10% Maple, 10% Apple

Stepanavan: 40% Pine, 20% Ash, 20% Maple, 10% Apple, 10% Oak

Reforestation activities include fencing the designated areas, soil preparation based on the slope of the terrain (which involves digging trenches and pits), as well as supporting natural regeneration. No concrete work is planned during the construction of the fence; the fence will consist of 4 horizontal and 2 diagonal barbed wires, along with a gate.

For planting 1 to 2-year-old seedlings, pits are prepared with a depth of 0.3 x 0.3 or 0.4 x 0.4 meters. Seedlings up to 2 years old with either open or closed root systems will be used as planting material. Exclusively certified seedlings will be used for reforestation, and they are scheduled to be planted in autumn. The planting density is set at 3,000 seedlings per hectare.

In the spring, a seedling preservation assessment is planned, followed by a viability assessment in the autumn, based on which replanting (beating up) will be carried out. After conducting the viability assessment, non-viable seedlings must be replaced with new ones to maintain the required tree density (3,000 seedlings/ha). During the first year, seedling care is scheduled to be performed twice between April and August, depending on weather conditions and the degree of weed infestation. It is critical to remove weeds and loosen the soil around the seedling base at the right time. The necessity of mowing should be evaluated based on weather conditions and the growth stage of the grass cover. In the second year of care, weed removal is also scheduled to be performed twice.

4. LEGAL AND REGULATORY FRAMEWORK

4.1 Legislation of the Republic of Armenia

Forest Code of the Republic of Armenia (2005)

This Code defines the core rules for managing the forests and forest lands of the Republic of Armenia, including their conservation, protection, restoration, afforestation, and sustainable use. It also regulates relations regarding forest inventory, monitoring, and supervision.

Forestry relations in Armenia are regulated by the Constitution, the Civil, Land, and Forest Codes, as well as other legal acts. If international treaties stipulate rules other than those provided by domestic legislation, the rules of the international treaties apply.

By establishing frameworks for forest conservation, protection, restoration, and afforestation, this law directly supports reforestation initiatives aimed at restoring degraded lands and ecosystem balances.

Reforestation activities must be carried out in compliance with forest management rules. This includes site preparation, species selection that accounts for biodiversity, and the subsequent monitoring of the overall forest condition.

Land Code of the Republic of Armenia (2001)

The Code defines the legal foundations for improving the state regulation of land relations, developing various organizational and legal forms of land management, increasing land fertility and land-use efficiency, protecting and improving an environment favorable to human life and health, and protecting land rights, based on the vital environmental, economic, and social significance of land.

According to the Code, the possession, use, and disposal of land must not cause damage to the natural environment, the country's defense capabilities, or security, nor should it violate the rights and legally protected interests of citizens and other entities.

Within its classification of the land fund by targeted significance, the Code specifically distinguishes lands of specially protected areas. It also establishes land protection measures, as well as the land rights of state bodies, local authorities, and citizens. Furthermore, the Land Code defines the principles, objectives, and regulations for land protection through corresponding decisions of the Government of the Republic of Armenia (see subsection 3.2.2).

The law establishes the legal foundations for regulating land relations and protecting land rights, which is critical for ensuring that reforestation activities do not cause harm to the surrounding environment.

Any land plot designated for reforestation must comply with land-use norms, and an environmental assessment must be conducted to evaluate the potential impact on the soil, water, and adjacent ecosystems.

Water Code of the Republic of Armenia (2002)

The primary objective of the Water Code is to create the legal foundations for protecting the country's water resources and satisfying the water needs of citizens and economic sectors through the efficient management of water resources and their conservation for future generations. The Water Code regulates the following aspects: the responsibilities of state/local authorities and public participation; the development of the National Water Policy and the National Water Program; the water resources registry and monitoring system; public access to relevant information; water use and permitting systems; the use of transboundary water resources; and water quality standards, water resource protection, and state supervision. In Armenia, surface water quality is monitored based on the principles of the EU Water Framework Directive, which were adopted by RA Government Decision No. 75-N dated January 27, 2011 (amended by Decision No. 1056-N dated June 29, 2023).

The protection of water resources is of decisive importance in the reforestation process because forests play a massive role in retaining soil moisture and, consequently, replenishing groundwater reserves.

When implementing reforestation activities, addressing the protection of water bodies is critically important.

RA Law "on Flora" (1999)

This law ensures the prevention of negative human impact on the diversity of plant species (flora), their natural communities (vegetation), habitats, and ecosystem balance. It provides scientifically justified frameworks for conserving the quantitative and qualitative diversity of the plant world, its gene pool, and cenofond, as well as its habitats. Furthermore, it regulates relations regarding the continuous use and

reproduction of the plant world, protects the rights of resource users, and enforces their obligations in the field of flora conservation and utilization.

Draft Law on Amendments to the Law of the Republic of Armenia “On Plant Life” ¹:

This law regulates the protection of plant species and ecosystems, which is important during the implementation process of reforestation projects.

The selection of local plants for reforestation must comply with the provisions of this law regarding the conservation of the plant world and biodiversity.

RA Law "on Fauna" (2000)

This law defines the state policy for the conservation, protection, reproduction, and use of wild animal species within the territory of the Republic of Armenia. It provides for the conservation of the gene pool and species diversity, ensures natural reproduction, and prevents the disruption of animal habitats. Furthermore, it protects the integrity of animal species, their populations, and communities, safeguards animal migration routes, regulates relations regarding the use of fauna objects, and protects the rights and enforces the obligations of resource users in the fields of fauna protection and utilization.

The protection of wild animal habitats and the preservation of biodiversity are of decisive importance in the reforestation process, which aims to restore ecological balance.

During the implementation process of reforestation projects, the potential impact on animal species must be evaluated, ensuring that habitat restoration aligns with wildlife conservation goals.

The protection of wild animal habitats and the preservation of biodiversity are of decisive importance for reforestation, which aims to restore ecological balance.

During the implementation process of reforestation projects, the potential impact on animal species must be evaluated, ensuring that habitat restoration is consistent with wildlife conservation goals.

RA Law "on Specially Protected Nature Areas" (2006)

This law regulates the legal foundations of state policy for the natural development, restoration, protection, reproduction, and use of specially protected nature areas in the Republic of Armenia. These areas encompass ecosystems, natural complexes, and individual objects of environmental, economic, social, scientific, educational, historical-cultural, aesthetic, healthcare, and recreational value.

Specially protected nature areas often overlap with reforestation zones, making compliance with this law vitally important for maintaining ecosystem balance.

RA Law "on Environmental Impact Assessment and Expertise" (2014, revised in 2023)

This law regulates the procedures for implementing proposed activities by governing public relations in the fields of environmental impact assessment (EIA), transboundary impacts, and state environmental expertise. According to the law, an expertise process is conducted on the proposed activity, after which an official

¹The draft legal act was published for public consultation on the Unified Platform for Draft Legal Acts from 24 December 2024 to 17 January 2025 (<https://www.e-draft.am/projects/8129>); however, it is still under revision.

conclusion (verdict) is issued.

Environmental impact assessments are necessary to identify the potential impacts of reforestation measures on the environment and local communities.

However, if forest management plans are already in place, the need for an EIA expertise process does not arise.

RA Law "on Control over Land Use and Protection" (2008)

This law defines the objectives, forms, and monitoring bodies for supervising the efficient use and protection of land, as well as compliance with land legislation. It establishes the rights and obligations of both inspecting and inspected parties, along with the specific procedures for conducting inspections. The provisions of this law apply to the use and protection of all land plots within the land fund of the Republic of Armenia, regardless of their targeted significance, ownership, and/or land-use rights.

This law ensures the enforcement of land protection norms, which is essential for evaluating the sustainability of reforestation methods.

RA Law "on the Protection and Use of Immovable Historical and Cultural Monuments and Historical Environment" (1998)

This law regulates relations associated with the discovery, documentation, study, state inventory, protection, use, reinforcement, repair, restoration, relocation, and alteration of immovable historical and cultural monuments, as well as the protection and use of their historical environments.

According to the law, the jurisdiction of local self-government bodies (LSGs) in the field of monument protection and use includes suspending construction, agricultural, and other works upon the discovery of monuments and immediately reporting it to the authorized body in the manner prescribed by legislation. LSGs also ensure compliance with the established special regime requirements in the protection zones of monuments located within the community territory (Article 11).

Reforestation projects implemented near historical or cultural objects must account for potential impacts on those monuments. Any reforestation activity carried out near protected monuments must comply with the requirements of this law to prevent damage and ensure the preservation of cultural heritage. Appropriate measures must be taken if monuments are discovered during the course of the work.

RA Law "on Eco-Patrol Service"

This law regulates state control, supervision, and related service relations regarding the protection of state forests, forest lands, and specially protected nature areas. The law defines the activities of the state authorized body (Eco-Patrol Service) within the framework of ensuring the protection of forests and surrounding nature, preventing violations that disrupt it, implementing fire safety control, and combating illegal logging and grazing.

This law regulates state control and supervision over the protection of forests, forest lands, and specially protected nature areas, which is of decisive importance for maintaining legal norms within the framework of reforestation projects.

Labour Code of the Republic of Armenia (2004, revised 2024)

The Labour Code establishes the legal basis for employment relations, working conditions, occupational health and safety (OHS), and the protection of workers' rights. These provisions are complemented by secondary legislation, including Government decrees and regulatory acts on labor protection, technical safety, and sanitary norms.

All working relations must be formalized through written contracts in accordance with Article 84 of the Labour Code. This requirement applies universally, including to temporary and seasonal labor typically engaged in reforestation and land restoration works. The contract must define essential terms such as job description, remuneration, and working conditions. Article 14(1) further establishes the principle of non-discrimination, prohibiting any restriction of labor rights unrelated to professional qualifications. In practice, this requires contractors to ensure transparent hiring procedures, equal access to employment opportunities, and full documentation of labor arrangements. The prohibition of informal employment is particularly relevant in rural project areas of Lori region, where seasonal labor practices may otherwise bypass formal regulation.

The regulation of working time and rest periods is defined by Article 139(1), which limits the standard workweek to 40 hours. Overtime provisions under Article 145 impose strict conditions, allowing such work only in exceptional circumstances, subject to employee consent and increased compensation. Mandatory rest periods, including a minimum uninterrupted weekly rest of 24 hours (Article 151) and annual paid leave (Article 159), are designed to prevent fatigue-related risks. These provisions are directly relevant to the physically demanding reforestation activities in Lori, where workers operate at elevations of 800–2,200 m above sea level and in terrain with steep slopes of 25–30°, where extended working hours and exposure to environmental stressors significantly increase the likelihood of accidents.

Wage regulation under Articles 178 and 184 ensures that remuneration is paid in full, on time, and in accordance with contractual terms, with premium rates applicable to overtime and work on non-working days. From an ESMP perspective, this reduces the risk of labor disputes and contributes to stable workforce management, which is essential for maintaining safety compliance on-site.

OHS obligations are primarily established under Article 242, which assigns full responsibility to the employer for ensuring safe working conditions. This includes the requirement to organize work processes in a manner that minimizes risks to life and health and ensures compliance with state safety standards. Article 243(1) further requires systematic identification of workplace hazards and assessment of occupational risks. In the context of forest restoration in Lori, this encompasses site-specific hazards such as operation of heavy machinery on steep and unstable terrain, risks associated with falling trees and branches, exposure to extreme weather conditions including high seismic risk (Zone 3), manual soil preparation works at altitude, and potential contact with hazardous plants and reptiles (including Armenian steppe viper recorded in the project area).

Training and competency requirements are addressed in Article 244, which mandates that all workers receive appropriate instruction in safe working methods, including induction and periodic refresher briefings. This provision establishes a legal precondition for workforce deployment, as untrained personnel cannot be admitted to hazardous work environments. The provision of personal protective equipment (PPE) is regulated

by Article 245, requiring employers to supply, at no cost to workers, certified protective gear appropriate to identified risks. For forest restoration works in mountainous terrain, this includes protective footwear, hard hats, high-visibility clothing, gloves, and eye protection for soil preparation activities.

Article 246 establishes obligations related to occupational health services, including the provision of sanitary and hygienic working conditions, first aid arrangements, and, where necessary, medical examinations. These requirements are particularly relevant in the remote forest areas of Vanadzor, Stepanavan, and Tashir forestry enterprises, where access to healthcare services may be limited and rapid response capacity is critical. The management of occupational accidents is regulated under Article 247, which requires all incidents to be investigated, documented, and analyzed.

The Labour Code also provides specific protections for vulnerable groups. Articles 17 and 257 prohibit child labor in hazardous conditions and restrict the involvement of minors and pregnant women in high-risk activities. These provisions are directly applicable to reforestation and environmental restoration works, where physical risks are significant. Oversight and enforcement are carried out by the Health and Labor Inspection Body of the Republic of Armenia, which is authorized to conduct inspections, require corrective actions, and impose sanctions. Article 34 of the Labour Code establishes employer liability for violations, including breaches of occupational safety requirements.

All above regulations are applicable to the organization of worksites and deployment of workers during reforestation activities in the Vanadzor, Stepanavan, and Tashir forestry enterprises. This includes contracting of workers, ensuring their rights and safety, provision of PPE, and training, as well as the obligation of the employer to develop and apply OHS management plans, keep regular employment and safety records, train workers on PPE use, and regularly report on labor and safety performance.

Law of the Republic of Armenia on Equal Rights and Equal Opportunities for Women and Men (2013)

This Law ensures gender equality and non-discrimination. It establishes the legal foundations for guaranteeing equal rights and equal opportunities for women and men. More specifically, the Law provides for: (i) equal access to employment (Article 7), requiring proactive outreach to women in local communities, including dissemination of job opportunities through accessible channels; (ii) prevention of indirect discrimination (Article 6(2)), obligating that job requirements (e.g., physical strength) are justified and not unnecessarily restrictive; (iii) elimination of structural barriers (Article 8) implying consideration of flexible work arrangements or task differentiation where feasible; (iv) prevention of harassment (Article 9) through adoption of clear codes of conduct and confidential grievance mechanisms at worksites.

While the Law establishes gender equality, its Article 10 allows differentiated deployment of male and female workforce in high-risk activities (such as operation of heavy machinery on steep terrain), strictly on the basis of OHS requirements and without resulting in unjustified exclusion.

The socio-economic context of Lori region-where significant out-migration of working-age men occurred following the 1988 earthquake and the economic difficulties of the 1990s, resulting in a high proportion of

female-headed households in communities such as Stepanavan, Gyulagarak, Vanadzor, and Pambak-indicates that, without targeted measures, women may have limited access to employment opportunities generated by the Project, particularly in technically or physically demanding reforestation works.

Therefore, application of the Law on Equal Rights and Opportunities to the Project-supported activities shall imply: (i) ensuring gender-balanced access to project employment opportunities; (ii) applying equal pay for work of equal value; (iii) maintaining non-discriminatory working conditions; (iv) promoting safe and respectful workplaces free from gender-based harassment; (v) implementing accessible grievance mechanisms for all workers; and (vi) monitoring participation of women and men in Project activities as part of general E&S compliance reporting.

4. 2 Government Decisions

1. RA Government Decision No. 72-N dated January 29, 2010: "On Approving the Red Book of Plants of the Republic of Armenia."
2. RA Government Decision No. 71-N dated January 29, 2010: "On Approving the Red Book of Animals of the Republic of Armenia."
3. RA Government Decision No. 967-N dated August 14, 2008: "On Approving the List of Natural Monuments of the Republic of Armenia."
4. RA Government Decision No. 1404-N dated November 2, 2017: "On Defining Requirements for Determining Topsoil Removal Norms and the Preservation and Use of Removed Topsoil, and Declaring RA Government Decision No. 1026-N dated July 20, 2006, Void."
5. RA Government Decision No. 572-N dated May 10, 2019: "On Defining the Procedure for Soil-Ground Excavation."
6. RA Government Decision No. 1396-N dated September 8, 2011: "On Approving the Procedure for Topsoil Use, Declaring RA Government Decision No. 1622-N dated September 19, 2002, Void, and Amending Decision No. 286-N dated April 12, 2001."
7. RA Government Decision No. 1746-N dated December 24, 2003: "On Approving the Cadastral Valuation Procedure, Spatial Valuation (Location) Zoning Coefficients, and Boundaries of Lands of Settlements of the Republic of Armenia."
8. RA Government Decision No. 92-N dated January 25, 2005: "On Approving the Procedure for Assessing the Impact on Land Resources Resulting from Economic Activity."
9. RA Government Decision No. 1110-N dated August 14, 2003: "Procedure for Assessing the Impact on Water Resources Resulting from Economic Activity."
10. RA Government Decision No. 75-N dated January 27, 2011: "On Defining Water Quality Assurance Norms for Each Water Basin Management Area Based on Terrain Features" (amended by Decision No. 1056-N dated June 29, 2023).
11. Order of the RA Minister of Environment No. 74-N dated March 11, 2024: "On Defining the Procedure for the Implementation of Reforestation and Afforestation."
12. RA Government Decision No. 764-N dated May 27, 2015: "On Approving the Procedure for Assessment and Compensation of Potential Economic Damage to the Environment."
13. RA Government Decision No. 781-N dated August 14, 2014: "On Approving the Procedure for the Protection of Objects of Flora of the Republic of Armenia and Their Use for the Purpose of

Reproduction under Natural Conditions."

14. RA Government Decision No. 1325-N dated November 19, 2014: "On Defining the Procedure for Implementing Public Notification and Discussions."
15. Decision of the Tashir Community Council No. 644-A dated November 23, 2021: "On Organizing Public Open Hearings and (or) Discussions."
16. Decisions of the Councils of All Target Communities (Stepanavan, Spitak, etc.): "On Organizing Public Open Hearings and Discussions."
17. Development Plans of Target Communities.

4.3 Ministerial Orders

1. Order of the RA Minister of Environment No. 438-N dated October 29, 2024: "On Approving the Guidelines for Strategic Environmental Assessment and Environmental Impact Assessment".
2. Order of the RA Minister of Health No. 876-N dated December 25, 2002: "On Approving Sanitary Norms and Rules No. 2-III-A 2-1: 'Drinking Water: Hygienic Requirements for Water Quality in Centralized Water Supply Systems; Quality Control.'"
3. Order of the RA Minister of Urban Development No. 79-N dated March 17, 2014: "On Approving Building Norms RACN 22-04-2014 'Protection Against Noise' and Amending Order of the RA Minister of Urban Development No. 82 dated October 1, 2001."
4. Order of the RA Minister of Urban Development No. 38-N dated June 5, 2003: "On Approving Building Norms RACN I-2.03-03 'State Urban Development Cadastre of the Republic of Armenia.'"
5. Joint Order of the RA Minister of Environment No. 419-N dated December 1, 2022, and the RA Minister of Territorial Administration and Infrastructure No. 23-N dated December 5, 2022: "On Approving the List of Settlements Located in the Immediate Vicinity of Forests Whose Residents are Entitled to Obtain Free Fallen Firewood for Non-Industrial Purposes."

4.4 Forest Management Plans

Forest management project (forest management plan) is a technical document developed as a result of forest management planning and approved for the purpose of practicing forestry operations.

During forest management planning, corresponding projects are drafted for the purpose of managing the forestry operation. These documents provide a comprehensive assessment of the forest management and forest use practices of the preceding period, and they define the measures to be implemented during the upcoming 10 years of forestry operations.

The instruction for developing forest management projects is approved by the state authorized management body.

Once approved by the state authorized management body, forest management projects are considered mandatory technical documents for current and long-term planning of forestry operations.

Approved management plans for the 2021–2030 period are in place for the Vanadzor, Stepanavan, and Tashir

forestry branches. The management plan of each forestry branch contains detailed information regarding the baseline characteristics and forest growth conditions of the given area, forest lands, and the socio-economic profile of adjacent communities. It also details biodiversity conservation, High Conservation Value Forests (HCVFs), core principles of forest management, assessment of ecosystem services, reforestation measures, forest protection, and overall forestry branch management.

4. 5 Strategic Sectoral Documents

Considering that as of November 2025, the draft Government Decision "on Approving the National Strategy and Action Plan for Biological Diversity of the Republic of Armenia for 2025–2030" is under discussion, it is highly recommended to take the draft of this document into account. It is also crucial to pay attention to Armenia's national biodiversity conservation targets, which have been officially submitted to the Secretariat of the Convention on Biological Diversity (CBD). Reforestation activities should be designed and implemented in a way that directly contributes to achieving these corresponding targets.

4. 6 International Conventions and Agreements

According to the Constitution of the Republic of Armenia (2015), in the event of a conflict between the norms of international treaties ratified by the Republic of Armenia and those of domestic laws, the norms of the international treaties shall apply. The following international agreements are of primary relevance to ecosystem restoration:

- UN Convention on Biological Diversity (Rio de Janeiro, 1992);
- Convention on the Conservation of Migratory Species of Wild Animals (Bonn, 1979).

Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA) (The Hague, 1995);

- Convention on the Conservation of European Wildlife and Natural Habitats (Bern, 1979);
- Convention on Wetlands of International Importance, especially as Waterfowl Habitat (Ramsar, 1971);
- UN Convention to Combat Desertification (Paris, 1994);
- UN Framework Convention on Climate Change (Rio de Janeiro, 1992);
- UN ECE Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (Aarhus, 1998).

4. 7 International Best Practice

4.7.1 Sector Best Practice

Nature-based Solutions (NbS) are currently considered the most preferred modern approach to ecosystem restoration. They represent an overarching framework of ecosystem-based approaches that effectively and adaptively address societal challenges. By protecting, managing, and restoring natural or modified ecosystems, NbS provide dual benefits for both human well-being and biodiversity conservation. Consequently, the NbS approach considers not only the ecological advantages of ecosystem restoration but also its socio-economic benefits. Additional concepts integrated under the umbrella of NbS include natural

solutions (for example, the role of protected areas or forest ecosystems in mitigating climate change), Ecosystem-based Adaptation (EbA), and Ecosystem-based Disaster Risk Reduction (Eco-DRR).

In this context, the United Nations resolution aimed at advancing NbS serves as a core guideline. Specifically, Resolution 5/5 on "Nature-based Solutions for Supporting Sustainable Development," was adopted by the United Nations Environment Assembly on March 2, 2022. It provides the first multilaterally agreed definition of Nature-based Solutions as: "actions to protect, conserve, restore, sustainably use and manage natural or modified terrestrial, freshwater, coastal and marine ecosystems, which address social, economic and environmental challenges effectively and adaptively, while simultaneously providing human well-being, ecosystem services and resilience and biodiversity benefits."

The NbS concept was first proposed twenty years ago by the International Union for Conservation of Nature (IUCN). The IUCN defined NbS as actions to protect, sustainably use, manage, and restore natural or modified ecosystems, which simultaneously address societal challenges by providing human well-being and biodiversity benefits. In 2020, the IUCN developed a strict standard for designing, implementing, and assessing interventions, including ecosystem restoration. Based on this Global Standard, specific principles and criteria were also established. In 2025, the organization published the second edition of the NbS Global Standard. This revised standard incorporates lessons learned since the 2020s and the growing demand for science-based actions. It provides practitioners and decision-makers with tools to develop effective, equitable, and long-term solutions based on both science and practical field experience.

Thus, it is recommended to consider the feasibility of incorporating NbS during the design and implementation of corresponding ecosystem restoration interventions, and to be guided by the IUCN NbS Standard. Care should be taken to ensure, as much as possible, the fulfillment of the 8 NbS criteria and their corresponding indicators.

In terms of restoring forest ecosystems and establishing the foundations for their effective protection, it is critically important to account for the equitable distribution of provisioning ecosystem services and the benefits derived from non-timber forest by-products.

4. 8 World Bank Environmental and Social Standards

The environmental and social requirements for the World Bank financed/administered operations are defined in the World Bank's ESF, which consists of the Vision for Sustainable Development, the Environmental and Social Policy for Investment Project Financing, and ten ESSs that set out the applicable environmental and social requirements for borrowers. E&S risks and impacts of the Project are classified as **moderate**. ESS) 1, 2, 3, 4, 5, 6, 8, and 10 are relevant for the Project. Summary of requirements of each relevant ESS is provided in Table1 below.

Table 1. Environmental and Social Standards and Management Tools

ESS 1: Assessment and Management of Environmental and Social Risks and Impacts	Defines the Borrower’s responsibilities for assessing, managing, and monitoring E&S risks and impacts associated with each stage of a project supported by the Bank through Investment Project Financing, in order to achieve environmental and social outcomes consistent with the ESSs.
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Management Tools	ESMP
ESS 2: Labor and working conditions	Recognizes the importance of employment creation and income generation for poverty reduction and inclusive economic growth. Borrowers can promote sound worker-management relationships and enhance the development benefits of a project by treating workers in the project fairly and providing safe and healthy working conditions.
Management Tools	Management Tool: Labor Management Procedures (LMP), ESMP
ESS 3: Resource Efficiency and Pollution Prevention and Management	Recognizes that economic activity and urbanization often generate pollution to air, water, and land, and consume finite resources that may threaten people, ecosystem services, and the environment at the local, regional, and global levels. This ESS sets out requirements aimed at resource efficiency and pollution prevention and management throughout the project life cycle.
Management Tools	ESMP
ESS 4: Community Health and Safety	Addresses the health, safety, and security risks and impacts on project-affected communities, and sets out the Borrower's responsibility to avoid or minimize such risks, with particular attention to vulnerable groups.
Management Tools	ESMP
ESS 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources	ESS6 recognizes that biodiversity conservation and the sustainable management of living natural resources are fundamental to sustainable development. It emphasizes the importance of maintaining the core ecological functions of habitats, including forests. ESS6 further addresses the sustainable management of primary production and harvesting of natural resources, and highlights the significance of the livelihoods of project-affected parties, including Indigenous Peoples, whose access to or use of these resources may be affected by the project.
Management Tools	ESMP
ESS 8: Cultural Heritage	ESS8 recognizes that cultural heritage provides continuity between past, present, and future in both tangible and intangible forms. It sets out measures for protecting cultural heritage during project implementation. The identification of intangible cultural heritage typically involves consultations with tradition bearers and practitioners of cultural customs, and can be documented through recordings and related materials. ESS8 also establishes procedures such as the Chance Find Procedure, which ensures attention to the discovery of previously unknown cultural heritage during project activities, and defines management actions for such finds (e.g., notifying authorities, fencing off the site).
Management Tools	ESMP
ESS 10: Stakeholder Engagement and Information Disclosure.	ESS10 recognizes the importance of open and transparent engagement between the Borrower and project stakeholders as a core element of international best practice. Effective stakeholder engagement strengthens the environmental and social sustainability of projects, enhances acceptance, and contributes

significantly to successful project design and implementation.	
Managemnet Tools	SEP, ESMP

Engagement of stakeholders throughout forest restoration activities will be organized and held following the SEP developed by EPIU for RESILAND: Armenia Resilient Landscapes Project.

5. PROJECT STAKEHOLDERS AND CONSULTATIONS

5.1 Stakeholder identification and consultations

A SEP prepared for RESILAND: Armenia Resilient Landscapes Project includes information derived through stakeholder identification, mapping, and analysis, and outlines appropriate engagement mechanisms, roles and responsibilities of parties involved in stakeholder engagement, and resources allocated for the implementation of engagement activities.

For the forest restoration activities in Lori, identified stakeholders include project-affected and beneficiary communities located in the vicinity of the reforestation areas, public and private institutions, civil society organizations, and academic and research entities. In addition to institutional stakeholders, the Project recognizes several key stakeholder groups that may be directly or indirectly affected by restoration activities. These include: residents of nearby communities (particularly Stepanavan, Tashir, Gyulagarak, Vanadzor, Pambak, Spitak, Meghvahovit, and Katnarat), including farmers, livestock owners, and vulnerable households; local NGOs and community-based organizations active in environmental, agricultural, and social sectors; tourism-related entities given the historical-cultural significance of the project area; and academic and research institutions engaged in biodiversity and forestry studies.

The interests and level of influence of stakeholders identified to date are presented in Table 2. Additional stakeholders may emerge during the implementation of restoration works. The EPIU SA will monitor any changes in stakeholder composition and, where necessary, update engagement approaches accordingly.

Table 2. Stakeholder Mapping for Lori Forest Restoration

STAKEHOLDER	INTEREST	INFLUENCE
Ministry of Environment of the Republic of Armenia	Ensuring alignment with environmental policies, biodiversity conservation, and sustainable forest management; oversight of compliance with ESS framework.	High – strategic oversight, policy guidance, and regulatory control.
EPIU SA (Environmental Projects Implementation Unit State Agency)	Project implementation, E&S compliance, monitoring, and donor reporting. Responsible for stakeholder engagement and GRM oversight.	Very high – direct project management authority.
“Hayantar” SNCO (Vanadzor, Stepanavan, Tashir branches)	Forest management, land tenure over restoration areas, technical expertise in	High – as land manager and technical partner;

STAKEHOLDER	INTEREST	INFLUENCE
	forestry operations, and compliance with forest management plans for 2021–2030.	approval of activities within forestry territories.
Eco-Patrol Service	State control and supervision over forest protection; combating illegal logging and grazing; fire safety control within project areas.	Moderate – through enforcement and field-level monitoring functions.
Lori Regional Administration (Marzpetaran)	Regional development, protection of community interests; coordination of local government bodies and oversight of socio-economic impacts.	Moderate – through coordination at regional level.
Municipal administrations of Stepanavan, Tashir, Vanadzor, Spitak, and Pambak communities	Protection of community socio-economic interests, land-use coordination, public notification obligations, and cultural heritage protection. Access road and infrastructure coordination.	High – at local level, including decision-making and community liaison.
Residents of project-adjacent settlements (Meghvahovit, Katnarat, Gyulagarak, Hobardzi, Lernapat, Arjhovit)	Access to forest resources (firewood, non-timber products), livestock grazing near forest borders, employment in restoration works, protection from construction noise and traffic impacts. Women, elderly, and displaced households (from 1988 earthquake, from Azerbaijan) are particularly vulnerable.	Medium – socially critical; can raise concerns through GRM and community consultations.
Contractor (reforestation works)	Compliance with ESMP and C-ESMP; OHS management; worker welfare; timely and quality delivery of reforestation outputs; community engagement at worksite level.	High – direct implementer of works; primary E&S risk bearer at worksite level.
Scientific Research Center for Historical and Cultural Heritage SNCO	Protection of archaeological and cultural heritage monuments identified in the project area (Bronze Age burial mounds, medieval fortresses, historical sites near Meghvahovit, Lernapat, Vanadzor, and Tashir).	Moderate – through expert assessments and chance find procedure oversight.
NGOs and civil society organizations (environmental and community-focused)	Advocacy for biodiversity conservation, community rights, and transparent project implementation. Can support community awareness and monitoring.	Moderate – through advocacy, public communication, and independent monitoring.
Universities and research institutions (forestry, ecology, biology)	Scientific monitoring of ecosystem restoration, biodiversity baseline studies, provision of technical expertise on species selection and habitat management, contribution to post-restoration monitoring.	Medium – through expert opinions, scientific data, and monitoring support.
World Bank	Compliance with ESF and ESSs; project	Very high – as financing

STAKEHOLDER	INTEREST	INFLUENCE
	outcomes; fiduciary oversight; reporting on environmental and social performance.	institution; sets ESS requirements and approves ESMP.

The SEP provides for ongoing engagement with stakeholders throughout the Project lifecycle. Accordingly, engagement with stakeholders related to forest restoration in Lori will continue during the restoration phase and the maintenance period. During Project implementation, the EPIU SA will lead stakeholder awareness-raising and engagement activities. This will include conducting community meetings, discussions, and consultations with stakeholders, using communication tools and approaches in line with the national legislative framework, aligned with ESS10, and consistent with international good practice. Monitoring and evaluation of stakeholder engagement activities will be undertaken by the Project Monitoring Specialist and the Project Implementation and Monitoring Department of the EPIU SA.

5.2 Summary of consultations conducted during the reforestation preparatory phase

As part of conceptualizing and designing forest restoration activities in Lori, consultations were held with relevant government institutions, local authorities, neighboring communities, and technical stakeholders. The consultations aimed to disclose information on proposed restoration activities, identify stakeholder concerns, collect feedback on potential environmental and social risks and impacts, and integrate stakeholder input into project design and mitigation planning.

Consultations with governmental agencies

Consultations were conducted with representatives of the MoE of the Republic of Armenia, including the Department of Forests Policy, Department of Specially Protected Areas and Biodiversity Policy, and the Eco-Patrol Service, as well as the management of “Hayantar” SNCO and the heads of the Vanadzor, Stepanavan, and Tashir forestry branches. Discussions focused on the technical scope of reforestation works, compliance with approved forest management plans for 2021–2030, species selection, seasonal scheduling of activities to minimize ecological disturbance, and monitoring of restored forest conditions. Government stakeholders emphasized the importance of using certified native seedlings and of scheduling planting activities to coincide with optimal climatic conditions.

Consultations with local self-government and project-affected communities

Consultations were conducted with representatives of the municipal administrations of Stepanavan, Tashir, Spitak, and Pambak communities, and with residents of the settlements of Meghvahovit, Katnarat, Gyulagarak, Hobardzi, Lernapat, and Arjhovit (Ghursali), which are located in the immediate vicinity of the planned restoration sites. Community consultations focused on informing participants about the objectives and scope of reforestation works and gathering views on anticipated benefits and concerns. Residents raised concerns related to: temporary restrictions in access to forest areas during construction works; potential impacts on livestock grazing near the restoration perimeter fences; dust and noise from machinery; and employment opportunities for local residents during the restoration and maintenance phases. Questions

were also raised about the long-term impact of restoration on the availability of firewood and other non-timber forest products. These concerns were discussed, and information was provided regarding proposed mitigation measures, including GRM arrangements. Community representatives emphasized the importance of continued information sharing and involvement during implementation.

Key issues raised across consultations

Recurring issues raised across stakeholder groups included: (i) adequacy of proposed species composition and alignment with existing forest management plans; (ii) potential impacts of fencing on livestock movement and traditional grazing practices; (iii) employment of local residents, particularly from economically disadvantaged settlements and female-headed households; (iv) protection of cultural heritage monuments within and adjacent to restoration areas; (v) institutional roles and coordination responsibilities between EPIU SA, Hayantar SNCO, and local administrations; and (vi) continued stakeholder engagement, information disclosure, and access to grievance mechanisms throughout the implementation period.

5.3 Grievance Redress Mechanism

The Grievance Redress Mechanism (GRM) is designed to receive and address concerns, complaints, and grievances from stakeholders. It also covers issues related to the environmental and social impacts of the Project. It provides stakeholders with the opportunity to express their opinions or concerns regarding project implementation, ensures that information is communicated to higher levels of project oversight and management in a neutral manner and, if necessary, anonymously.

A Project-level GRM established by EPIU SA will include central and site-level arrangements to ensure that communities and other affected stakeholders have accessible channels to raise concerns related to reforestation activities in the Lori region. These arrangements will function as the first point of contact for issues related to construction impacts, access restrictions, transport and traffic, noise, dust, worker behavior, and safety risks. Given the dispersed nature of restoration works across three forestry enterprises (Vanadzor, Stepanavan, and Tashir), site-level GRM arrangements will be established within or near each active worksite, with designated grievance focal points.

Prior to the commencement of works, contact information for grievance focal points at the site level will be made available to nearby communities, including Meghvahovit, Katnarat, Gyulagarak, Hobardzi, Lernapat, and Arjhovit. This information will include relevant contact details and available communication channels for submitting grievances and will be displayed at the worksite and in accessible locations within the communities. Grievances may be submitted through multiple channels, including in person, by phone, in writing, electronically, or anonymously. All grievances will be recorded and tracked, including information on the nature of the complaint, actions taken, and status of resolution.

Acknowledgment of receipt and timely follow-up will be ensured: complaints will be acknowledged within 24 hours of receipt, and a response or resolution will be provided within 5–7 working days depending on complexity. Efforts will be made to resolve grievances at the site level. However, where resolution is not

possible or where issues are of a more serious or sensitive nature, including those related to sexual exploitation, abuse, and harassment (SEA/SH) or GBV, the matter will be referred to the EPIU SA for further review and action. Stakeholders will also have the option to directly contact the EPIU SA if they are not satisfied with the response at the site level. The EPIU SA will maintain overall oversight of the GRM, including monitoring the effectiveness of grievance handling and ensuring that responses are timely, fair, and transparent.

In addition, any company hired by EPIU SA to provide works under the Project will be required to establish and operate a grievance mechanism for their employees, in line with ESS2 and the Project's Labor Management Procedures. The contractor's grievance mechanism will be accessible to all categories of workers and will allow for confidential submission of complaints, including anonymous submissions. Appropriate procedures will be applied to ensure timely review and resolution of grievances, as well as protection against retaliation. Records of worker grievances will be maintained, and information about the mechanism will be communicated to all workers during induction and through ongoing awareness measures. Special arrangements will be in place to ensure that complaints related to SEA/SH are handled in a confidential and survivor-centered manner, including referral to appropriate support services where necessary.

Given the involvement of multiple communities spread across a large geographic area in Lori, the GRM will be adapted to the local context. This includes multilingual accessibility (Armenian and Russian where needed for Molokan communities in the Tashir area), accommodation of residents with limited mobility or literacy, and outreach to female-headed households who may face additional barriers in accessing formal grievance channels. Community meetings convened as part of the GRM process will be conducted at accessible locations within communities and at times that allow participation by both men and women.

6. ENVIRONMENTAL AND SOCIAL RISKS, POTENTIAL IMPACTS, AND THEIR PREVENTION

Reforestation carried out across the three forestry branches of Lori Province will reduce forest fragmentation, improve conditions for biodiversity conservation, increase the efficiency of ecosystem services, and strengthen resilience within the context of climate change.

At the same time, certain environmental and social risks are present during the reforestation process. It is extremely important to identify, prevent, mitigate, and effectively manage these risks.

MITIGATION PLAN

No	ACTIVITY	POTENTIAL ADVERSIVE IMPACT	MITIGATION MEASURE	TARGET OUTCOME OF MITIGATION	RESPONSIBLE AGENCY
Restoration phase					
Impacts on air					
1	Earthworks (excavations, trench and pit preparation, planting, loosening)	Dust generation (PM10, PM2.5)	<ul style="list-style-type: none"> - Limit the coverage of large areas and carry out earthworks gradually. - Schedule dust-producing activities to avoid dry/windy weather conditions. - Water unpaved roads at least twice per day to prevent dust formation. 	Visible presence of dust at the worksite.	Contractor
2	Organic residue burning	Emission of smoke, carbon monoxide, and suspended particulates.	<ul style="list-style-type: none"> - Prohibit open burning within project area and nearby forest patches unless authorized by regulator for safety; require written permit for any burning. - Prioritize on-site composting, chipping, mulching, or removal for off-site processing. 	No uncontrolled smoke or open burning incidents.	Contractor
3	Operation of transport vehicles and equipment	Emissions of smoke and exhaust from vehicle engines.	<ul style="list-style-type: none"> - Limit vehicle speed to ≤20 km/h on site; lower limits (e.g., ≤10 km/h) near sensitive receptors. - Establish wheel/vehicle washing at site exits; contain and treat wash water. - Prohibit vehicle/machinery idling when not in use; perform daily pre-start inspections. - Prefer low-emission equipment (meet local emission standards or equivalent). 	Reduced exhaust and track-out dust; compliant equipment operation.	Contractor
Impacts on water					
1	Earthworks	Erosion and soil particle runoff.	<ul style="list-style-type: none"> - Limit contiguous exposed area to ≤1 ha (site-specific); phase works and re-vegetate or cover completed areas within 7 days. - Apply erosion control mats, mulching, or hydroseeding on slopes and seedbeds immediately after finishing. - Establish buffer zones (e.g., 30–50 m) from watercourses; no stockpiles or vehicle movement within buffer. 	Minimized soil erosion and sediment runoff; exposed soils stabilized/revegetated within 7 days; no visible sedimentation in nearby watercourses.	Contractor

2	Operation of transport vehicles and equipment	- Fuel/oil storage & refuelling	<ul style="list-style-type: none"> - Provide bunded fuel storage with capacity $\geq 110\%$ of largest tank volume; secondary containment and impervious pad. - Designated refuelling areas with drip trays, spill kits, trained staff, and spill response plan. - Daily visual checks and weekly inventory reconciliation to detect leaks early. 	No uncontrolled fuel/oil releases to soil or water; any spills contained and cleaned up immediately; no detectable hydrocarbon contamination of waterways.	Contractor
3	Temporary worker shelters and sanitation facilities	- Wastewater and leakage of worker-generated waste	<ul style="list-style-type: none"> - Use chemical or septic toilets on impermeable bases and desludge by licensed contractor at specified intervals (e.g., when 75% full). - Contain greywater in settling tanks or tankered off-site; prevent soakaways near watercourses. - Provide handwashing stations with containment for wastewater. 	Absence of wastewater leakage.	Contractor
4	Waste burning	- Emission of ash particles due to burning.	<ul style="list-style-type: none"> - Prohibit open burning; segregate wastes, provide covered bins, and arrange regular removal to licensed facility. - Manage combustion residues as controlled waste; prevent disposal near waterways. 	Absence of ash particles in water bodies.	Contractor
Impact on soil					
1	Earthworks (pit and trench preparation for planting)	- Soil erosion; sediment runoff.	<ul style="list-style-type: none"> - Phase works; limit contiguous exposed area to ≤ 1 ha (site-specific); re-vegetate/stabilize completed areas within 7 days. - Schedule works when wind $< 6-8$ m/s and moist/non-dry conditions; avoid high-dust days. - Water unpaved roads/exposed areas min. twice daily in dry conditions; increase to every 2–4 hours when windy/high-traffic. - Install sediment controls: silt fences, check dams, diversion berms, settling ponds downhill of works; buffer 30–50 m from watercourses. - Provide PPE (N95/FFP2) when dust visible; signage and worker training. 	Topsoil preserved, erosion prevented	Contractor
2	Organic residue management (forest residues)	- Smoke, CO, particulates; nutrient and organic runoff if unmanaged.	<ul style="list-style-type: none"> - Prohibit open burning; burning only with regulator permit (safety). Prefer chipping, mulching, composting, off-site processing. - Designate compost/chip areas away from receptors with runoff containment. - Train crews on no-burn policy; enforce disciplinary actions for violations. 	No uncontrolled smoke; residues reused/processed without air or water impacts.	Contractor

3	Operation of Transport Vehicles	Exhaust emissions, dust, soil compaction, fuel/oil leaks.	<ul style="list-style-type: none"> - Limit site speed ≤20 km/h (≤10–15 km/h near receptors); restrict heavy vehicles to designated routes; use lighter equipment where feasible. - Designated bunded refuelling/maintenance areas (impervious pads, 110% containment); spill kits and trained staff on-site. - Prohibit idling; daily pre-start inspections; scheduled maintenance per manufacturer (log). - Use stabilized access tracks, track mats, and minimize passes; decompact (ripping/subsoiling) affected areas to 30–50 cm where needed. - Wheel wash at exits; contain/treat wash water. 	Low exhaust/dust emissions; zero uncontrolled hydrocarbon releases; limited compaction and restored affected areas.	Contractor
4	Movement of Heavy Transport Vehicles	Soil compaction reduces water permeability, leading to surface runoff and erosion development	<ul style="list-style-type: none"> - Limit movement of heavy machinery to specific sensitive routes. - Use lighter machinery where possible. - Restore areas affected by machinery movement. 	Reduced compaction	Contractor
5	Temporary worker shelters and sanitation facilities	Wastewater/leakage; soil and water contamination.	<ul style="list-style-type: none"> - Use closed chemical toilets or septic systems on impermeable base; desludge by licensed contractor when 75% full. - Locate camps ≥50 m from water bodies and sensitive soils. contain greywater in tanks and remove to licensed facility. - Provide handwashing with contained wastewater collection; no open burning of waste. 	No sewage or wastewater leakage to ground or surface water; safe collection and off-site disposal.	Contractor
Impacts of Waste Handling					
1	Fuel, Lubricant Storage and Equipment Maintenance	Hazardous waste (contaminated rags, used oil, filters)	<ul style="list-style-type: none"> - Store in designated, closed containers on impervious surfaces with protective bunds. - Collect and transport hazardous waste to appropriate facilities. - Ensure availability of emergency response kits. - Prohibit disposal of waste directly onto soil. 	Prevention of uncontrolled emissions	Contractor
Impacts of noise and vibration					

1	Operation of Transport Vehicles and Machinery (pit and trench preparation)	High noise levels; disturbance to local population; impacts on wildlife; local vibrations.	<ul style="list-style-type: none"> - Schedule noisy works daytime only (07:00–17:00); avoid nights and weekends near settlements. - Avoid major noisy/vibratory works during sensitive wildlife periods (breeding/nesting seasons). - Use modern, well-maintained, low-noise machinery; prefer electric/hybrid equipment where feasible and use mufflers/silencers. - Limit duration of noisy activities at any one location; implement work rotation and use manual methods for short tasks where practicable. - Use vibration-minimizing practices (low-impact pads, reduced compaction passes); avoid heavy vibration equipment near structures/wildlife-sensitive areas. - Establish setback distances from sensitive receptors and use temporary acoustic screens/barriers where required. - Provide community notifications at least 72 hours before high-noise activities and post schedules at communal points. - Maintain grievance mechanism with acknowledgement within 24 hrs and resolution/response within 48 hrs. Target outcome: Noise and vibration impacts kept within allowable limits; minimal disturbance to communities and wildlife. 	Noise levels maintained within permissible standards	Contractor
Impacts on Biodiversity					
1	Soil preparation for planting	Habitat fragmentation and loss	<ul style="list-style-type: none"> - conduct a pre-construction biodiversity survey (flora, fauna, habitat mapping); map and mark exclusion zones (habitat patches, nesting sites, corridors); phase works to avoid large contiguous clearing; carry out works outside identified breeding/seasonal use periods. 	Prevention of biodiversity loss	Contractor
2	Planting of Seedlings	Introduction of invasive species	<ul style="list-style-type: none"> - use only certified, locally sourced native seed/seedlings; quarantine/inspect planting stock; maintain a list of prohibited invasive species; control. 	Establishment of native forest cultures with <1% invasive cover.	Contractor
3	Movement of Transport Vehicles	Habitat fragmentation, disturbance to wildlife, spread of invasive species seeds	<ul style="list-style-type: none"> - avoid new road construction where possible; use existing routes; define and signposted vehicle corridors; limit speeds (e.g., ≤20 km/h); vehicle hygiene: clean tyres and undercarriage before entry and when moving between sites. 	Minimized fragmentation; no confirmed spread of invasive propagules from vehicles.	Contractor

4	Works Adjacent to Water Bodies	Deterioration of water quality; disruption of aquatic ecosystem balance	- maintain buffer strips (e.g., ≥30–50 m) from water bodies unless works are authorised with strict controls; install sediment and erosion controls (silt fences, settling basins); prohibit stockpiles, refuelling, and concrete washout within buffers.	Protection of riparian zones; no deterioration in aquatic indicators.	Contractor
5	Forest Restoration Works	Disturbance to wildlife (noise, light, human presence)	- Conduct timing windows to avoid sensitive periods; limit noisy activities and human presence near known dens/nests; prohibit artificial lighting at night; use low-impact access and minimize group sizes.	Minimal disturbance; no measurable declines in key indicator species abundance/behaviour.	Contractor
MAINTENANCE PHASE					
1	Assessment of Seedling Viability and Replanting	Low viability (≤75%)	- After viability assessment, conduct replanting in the autumn (or next suitable planting season) to achieve ≥95% site establishment within one year; Contractor to document replanting actions (areas, species, quantities, GPS points) and report survival rates in spring and autumn monitoring.	Improved seedling survival	Contractor
2	Weed Removal and Soil Loosening Around Seedlings	Reduction in seedling growth	- From April to August, perform weed removal and soil loosening around seedlings three times	Weed infestation reduced to <30%	Contractor
3	Fence Integrity Inspection (Quarterly)	Breach of fence integrity	- Define inspection checklist (posts, wire tension, gates, signage), remedial response times (repair within 7 days for minor breaches; 24 hrs for security breaches).	Maintained fence integrity	Contractor
4	Waste Management	Waste accumulation	- Specify segregation categories (general, recyclable, hazardous) and storage (covered, labeled). - Removal frequency (e.g., weekly) and licensed disposal contractor details; no burning policy enforced.	Clean site	Contractor

MONITORING PLAN

No	ACTIVITY IS TO BE MONITORED	PARAMETER TO BE MEASURED	TARGET INDICATOR TO BE ACHIEVED	MEASURING/ REPORTING TIME / FREQUENCY	AGENCY RESPONSIBLE FOR CHECKS / MONITORING
Restoration Phase					
Air quality monitoring					
1	Earthworks (excavation, trenching, planting, stockpiles)	PM10, PM2.5; visible dust (qualitative)	PM10 1-hr $\leq 150 \mu\text{g}/\text{m}^3$; PM2.5 24-hr $\leq 25 \mu\text{g}/\text{m}^3$ (or local standard); no visible dust beyond site boundary	Conduct baseline monitoring 24 hours prior to commencement of works; During active works, perform weekly 24-hour sampling;	Contractor
2	Operation of transport vehicles & equipment (on-site traffic, refuelling areas)	PM10, PM2.5; visible exhaust; dust track-out	Perimeter PM within thresholds; no visible heavy exhaust; track-out $\leq 5 \text{ m}$ beyond site exit	Continuous or targeted monitoring during peak traffic; daily vehicle inspection logs; weekly perimeter walkdowns and photo record; weekly summary	Contractor
3	Organic residue management / residue handling	Visible smoke; PM2.5; CO (if burning suspected/permitted)	Zero uncontrolled smoke; PM2.5 within trigger limits; CO within local limits	Daily visual checks of residue areas; spot PM/CO measurements if smoke observed; incident report within 24 hrs of any smoke/burning	Contractor
4	Complaints and incident monitoring (air quality)	Number/type of complaints, acknowledgment time, resolution time, corrective actions	Acknowledge within 24 hrs; investigate/respond within 72 hrs; corrective actions logged	Complaints register maintained daily; monthly incident summary and corrective action report	Contractor
Water quality management					
1	Baseline monitoring (pre-works)	Turbidity (NTU), TSS (mg/L), pH,	Establish background concentrations and variability (7–14 days)	Continuous turbidity probe or daily spot sampling for 7–14 days; laboratory analysis for TSS	X

2	Earthworks / soil disturbance / stockpiles	Turbidity (NTU), TSS (mg/L), visual sedimentation downstream, pH	Turbidity ≤ background +30 NTU; TSS ≤50–100 mg/L (or local limit); no visible sediment plumes or deposition in water bodies	Continuous turbidity monitoring at discharge/downstream points preferred; if not available, daily spot turbidity/TSS sampling during active works and after rain events; daily visual inspections; weekly summary report	Contractor
3	Refuelling, fuel/oil storage, maintenance areas	Hydrocarbons/TPH, visible oil sheens, pH (if displacement),	No visible sheens in water; TPH below detection/local limit; zero uncontrolled spills to water	Daily visual checks of storage/refuel areas; weekly inspection of secondary containment; immediate sampling and incident report if spill/phone report; lab TPH sampling after any suspected contamination	Contractor
4	Waste management and residue handling	Leachate turbidity/TSS, nutrients, visual runoff control effectiveness	No contaminated runoff to watercourses; leachate contained and treated/removed off-site	Weekly inspection of residue/compost sites; spot sampling after heavy rain events; incident reporting within 24 hrs if runoff occurs	Contractor
5	Complaints and incident response (water quality)	Number of complaints, response time, corrective actions, sampling results	Acknowledge within 24 hrs; investigate and respond within 72 hrs; remediate and verify before resuming works if contamination occurred	Complaints register updated daily; incident report within 72 hrs; monthly incident summary	Contractor
Soil quality monitoring					
1	Compaction monitoring (planting rows, vehicle tracks, restoration areas)	Bulk density (g/cm ³) and/or penetrometer resistance (MPa); infiltration rate (where relevant)	Bulk density and penetrometer readings within ≤20% of background / pre-works values; infiltration not reduced below site-specific threshold	Baseline (pre-works), immediately post-works (within 2 weeks), and post-remediation verification after decompaction. Spot checks monthly in high-traffic zones during works.	Contractor

2	Erosion and sediment deposition monitoring (soil loss indicators)	Visual signs of erosion (rills, gullies), sediment depth in traps, sediment accumulation in downstream traps, soil loss estimates (where applicable)	No significant erosion; sediment traps functioning; no deposition in sensitive areas or watercourses	Daily visual inspections during/after rain events while works ongoing; weekly checks in dry periods; record after each storm event (24–48 hrs)	Contractor
3	Contamination monitoring (fuel/oil spills and suspected hot-spots)	TPH (mg/kg), VOC screening (field), heavy metals where relevant; visual/odour check	TPH below local clean-soils thresholds or background; no uncontrolled contamination remaining after remediation	Immediate sampling after any spill; follow-up sampling after remediation (completion verification) and quarterly sampling of known hotspots until cleared.	Contractor
Noise monitoring					
1	Operation of transport vehicles & machinery (pit/trench preparation, planting process)	LAeq (1-hr), Lmax at representative receptor points and on-site reference locations	Daytime LAeq ≤55 dB at nearest residence (or local limit); no increase >5 dB above baseline; Lmax within local limits	Continuous monitoring during high-activity periods preferred; if not, spot 1-hr measurements at start/mid/end of peak workdays; weekly summary report	Contractor
2	Works near sensitive wildlife or habitat areas	LAeq (daytime), observation of wildlife disturbance (qualitative)	Noise kept below wildlife-sensitive thresholds per ecology advice; no observed nest abandonment/disturbance attributable to works	Spot measurements during works near sensitive zones; daily visual checks for wildlife disturbance during active periods; incident report if disturbance observed	Contractor
Biodiversity monitoring					
1	Baseline biodiversity survey (pre-works)	Species lists (flora/fauna), habitat mapping, presence of sensitive/priority species, nesting/den sites, baseline abundance indices	Complete baseline inventory and habitat map to inform avoidance zones and monitoring design	One campaign pre-works (7–14 days); baseline report before mobilization	Contractor

2	Planting success / vegetation establishment	Seedling survival rate (%), growth rate, species composition, % cover native species, planted vs natural regeneration ratio	≥95% establishment within 1 year (or site target); species composition aligned with planting plan; native cover increasing annually	Fixed monitoring plots; assessments in spring and autumn (year 1–3), annual thereafter to year 5; photographic records and GPS points	Contractor
3	Invasive species presence and spread	Presence/cover (%) of known invasive species in monitoring plots and buffer zones	Invasive species cover <1% in planted areas; early detection and eradication within defined response time	Monthly checks first year, quarterly years 2–3, annually thereafter; immediate response log if detected	Contractor
4	Vehicle movement and biosecurity (seed/propagule transfer)	Records of tyre/undercarriage cleaning, new tracks detected, invasive propagule findings near routes	100% compliance with vehicle hygiene on entry; no new invasive establishment linked to vehicle movement	Daily checks at entry; monthly route inspections; immediate remediation if new tracks/invasives found	Contractor
5	Pest presence study	% infected seedlings (incidence), presence/identification of pest/pathogen	infection incidence ≤10%; no recurring infection clusters after remedial actions.	Visual/field inspections every 15 days (or weekly if flagged); laboratory confirmation for suspect cases within 7 days; monthly summary reports.	Contractor
6	Weed infestation degree assessment after restoration	% weed cover (by sample plots/transects) and area (m2) infested.	≤15% weed cover across planted area.	Inspect and record % cover every 15 days; photographic records and GPS-referenced sample plots. Monthly summary report.	Contractor
Maintainance Phase					
1	Vegetation establishment and restoration success	Survival rate of planted seedlings (%); vegetation cover (%)	≥85% seedling survival; increasing vegetation cover	Spring and autumn monitoring; annual summary	Contractor
2	Natural regeneration and forest recovery	Density of natural regeneration; regeneration distribution	Positive regeneration trend and adequate stand development	Seasonal inspections; annual report	Contractor
3	Invasive species and weed control	Presence and cover (%) of invasive species	Invasive species maintained below project threshold	Quarterly; additional checks if detected	Contractor

4	Pest and disease monitoring	Incidence (%) of infected seedlings/trees; signs of pest outbreak	No uncontrolled spread; corrective measures implemented	Monthly during growing season	Contractor
5	Soil stabilization and erosion control	Visual erosion indicators; sediment accumulation; slope condition	No active erosion; restored soils remain stable	Quarterly and after heavy rainfall	Contractor
6	Waste and site maintenance	Presence of waste, residual materials	No residual waste or illegal disposal	Quarterly inspection	Contractor
7	Access route rehabilitation	Condition of restored access tracks and disturbed areas	Temporary infrastructure removed; restored areas stabilized	Semi-annual inspection	Contractor
8	Biodiversity recovery	Presence of indicator flora/fauna species; habitat condition	No decline attributable to restoration activities	Seasonal monitoring	Contractor
9	Community complaints and incidents	Number of complaints; corrective actions implemented	Complaints addressed under established GRM timelines	Continuous logging; quarterly reporting	Contractor
10	Adaptive management and corrective actions	Monitoring findings and implementation status	Monitoring measures updated where needed	Annual review	Contractor

7. ROLES AND RESPONSIBILITIES FOR IMPLEMENTING ESMP

Responsibilities of EPIU SA:

- Review and approve C-ESMP including Waste Management Plan, OHS Management Plan, Community Liaison and Safety Plan.
- Review and accept contractor's written inputs.
- Approve payments supported by deliverables and invoices.
- Undertake monitoring of contractor's E&S performance through at least one monthly field visit as well as unannounced spot-check visits.
- Exercise quality control over contractor's reports on instrumental monitoring of established environmental parameters. In case of E&S incidents/accidents, after prompt communication to the World Bank, work closely with contractor for the development of Root Cause Analysis and Corrective Action Plan (CAP). Monitor implementation of CAP and report to the World Bank.

Responsibilities of Contractor:

- Prepare and implement C-ESMP and all subplans; execute baseline and recurrent monitoring; maintain daily logs; implement mitigation; respond to incidents; prepare CAPs; submit weekly and monthly reports.
- Provide on-site GRM intake of communities' and contractor's personnel complaints; escalate to EPIU SA as required.
- Engage with communities, inform on upcoming works, handle GRM referrals and public notices.
- Implement site OHS Plan, manage daily safety, incident reporting and first aid arrangements.

Deliverables and timelines (mandatory):

- C-ESMP — Contractor → EPIU SA — ≥14 calendar days before mobilization; EPIU SA review: 7 working days.
- Baseline Data Report — Contractor → EPIU SA — ≥14 days before mobilization.
- Waste Management Plan, OHS Plan, Community Liaison and Safety Plan — Contractor → EPIU SA — ≥14 days before mobilization.
- Weekly safety logs during active works — Contractor → EPIU SA — weekly.
- Monthly monitoring report (data, photos, CAP status) — Contractor → EPIU SA — monthly.
- Immediate notification (fatality, major spill, heritage find) — Contractor → EPIU SA within 24 hours; full incident report within 72 hours.

Notification and escalation:

- Routine path: Contractor → Supervising Engineer/EPIU SA → EPIU SA.
- Immediate escalation to EPIU SA for emergencies, trigger exceedances or serious complaints.
- EPIU SA authority: issue CAPs, suspend works, require independent verification, and escalate to donor for unresolved serious issues.
- Inspections, audits and compliance:
 - EPIU SA inspections: monthly minimum + spot checks for critical activities.
 - Independent audit: annual or triggered by serious/repeated incidents.
 - Enforcement options: corrective action requirements, penalties, suspension or contract termination for serious non-compliance.

Corrective Action Plan:

- Trigger → Contractor prepares CAP within 5 working days (root cause, actions, responsible, deadlines) → EPIU SA reviews/approves within 7 working days → Contractor implements → EPIU SA/independent specialist verifies → closure recorded.

Training and capacity building

- Contractor provides induction (LMP, OHS, GBV/SEA, environmental procedures) and regular toolbox talks; attendance registers kept. EPIU SA organizes capacity building for inspectors and local representatives if required.

8. ESTIMATED BUDGET OF ESMP IMPLEMENTATION

The ESMP budget covers environmental and social management measures required in addition to the core reforestation works. These include environmental and biodiversity monitoring, OHS arrangements, stakeholder engagement, grievance redress, labor management, and EPIU supervision. Costs directly related to the primary reforestation activities (site preparation, seedling procurement, planting, fencing, and maintenance care) are accounted for separately within the main reforestation contract.

The estimated ESMP budget is based on the scope of works across the three forestry enterprises of Lori region: Vanadzor (82.25 ha), Stepanavan (21.49 ha), and Tashir (65.88 ha), totaling 169.62 ha, with a planting density of 3,000 seedlings per hectare (approximately 508,860 seedlings across all sites). Budget items attributable to the Contractor are to be included in the Contractor's ESMP (C-ESMP) and all associated sub-plans, and will form part of the contract price. Items attributable to EPIU are financed from the Project operational budget.

9. ENVIRONMENTAL AND SOCIAL RECOMMENDATIONS FOR POST-PROJECT MANAGEMENT OF RESTORED FOREST

Table 3. Estimated Budget of ESMP Implementation

No.	Budget Item	Basis / Scope	Responsible Party	Estimated Cost (USD)
A. Environmental and Biodiversity Monitoring				
A.1	Pre-works baseline surveys (biodiversity: flora, fauna, habitat mapping; soil quality; water quality; noise baseline)	One campaign per site (3 forestry enterprises) ≥14 days before mobilization; laboratory analysis for soil/water samples	Contractor	
A.2	Recurrent environmental monitoring during restoration phase (air: PM10/PM2.5; water: turbidity/TSS/TPH; soil: compaction, erosion, contamination; noise: LAeq)	Weekly sampling during active works; monthly summary reports; laboratory analysis for triggered events; across 3 sites simultaneously	Contractor	
A.3	Seedling survival and biodiversity monitoring (spring + autumn assessments; invasive species checks; weed infestation surveys; pest incidence)	2 assessments/year × 3 years × 169.62 ha (3,000 seedlings/ha = ~508,860 seedlings); fixed monitoring plots with GPS; photographic records	Contractor	
B. Occupational Health, Safety, and Labor Management				
B.1	OHS induction, periodic training, and toolbox talks for all workers (LMP, OHS plan, GBV/SEA procedures, environmental measures)	Mandatory induction before mobilization; regular toolbox talks during works; attendance registers maintained; per Article 244 RA Labour Code and ESS2	Contractor	
B.2	Personal Protective Equipment (PPE) for all workers: hard hats, protective footwear, high-visibility clothing, gloves, eye and respiratory protection (FFP2/N95)	Supplied at no cost to workers; per Article 245 RA Labour Code; adapted to mountain terrain (seismic Zone 3, slopes 25–30°, elevations 800–2,200 m) and risk of contact with protected reptile species	Contractor	
B.3	First aid kits, emergency response equipment, and sanitation facilities (chemical toilets) at each of the 3 active worksites	Per Article 246 RA Labour Code; desludging by licensed contractor; handwashing stations with contained wastewater; maintained throughout the restoration season	Contractor	
B.4	Spill response and waste management equipment: spill kits, secondary containment bunds, labelled waste containers, licensed hazardous waste disposal	Per site; licensed contractor for hazardous waste removal; weekly inspections; emergency spill response within 24 hrs notification to EPIU	Contractor	
C. Stakeholder Engagement and Grievance Redress				
C.1	ESMP disclosure, translation into Armenian, and publication; community	EPIU website publication; GRM contact details posted at 3 worksites and in 6+	EPIU	

No.	Budget Item	Basis / Scope	Responsible Party		Estimated Cost (USD)
	notification materials and information boards at worksites	adjacent communities (Meghvahovit, Katnarat, Gyulagarak, Hobardzi, Lernapat, Arjhovit)			
C.2	Stakeholder consultation meetings during implementation (community meetings, focus groups, consultations with Hayantar SNCO and local administrations)	At least one consultation per site prior to works; follow-up meetings during implementation; documentation and minutes; per ESS10 and RA Government Decision No. 1325-N	EPIU / Contractor		
C.3	Operation and maintenance of the Grievance Redress Mechanism (GRM): registers, site focal points, complaint tracking, response documentation, SEA/SH referral pathway	Continuous throughout implementation; 3 site-level focal points; acknowledgment within 24 hrs; resolution within 5–7 working days; accessible for Armenian- and Russian-speaking communities in Tashir area	Contractor / EPIU		
D. EPIU Supervision, Audits, and Reporting					
D.1	EPIU monthly field supervision visits to all 3 worksites; review of contractor E&S reports; unannounced spot checks	Minimum 1 visit/month per site during active works; travel to Vanadzor, Stepanavan, Tashir forestry areas; verification of mitigation measure implementation and monitoring records	EPIU		
D.2	Independent E&S audit (annual or triggered by serious/repeated incidents); review of Corrective Action Plans (CAPs)	Annual audit covering all 3 sites; CAP preparation within 5 working days of trigger; EPIU review within 7 working days; closure verified by EPIU or independent specialist	EPIU (independent specialist)		
D.3	Gender-disaggregated social monitoring and reporting: employment records by sex, GRM complaints by gender, community engagement participation data	Integrated into monthly E&S reports; per RA Law on Equal Rights and Equal Opportunities (2013) and ESS2; particular attention to female-headed households in project-adjacent communities	EPIU / Contractor		Included in D.1
E. Contingency (10%)					
E.1	Contingency for unforeseen E&S costs: additional monitoring triggered by incidents, emergency remediation, additional community consultations, corrective actions	10% of total estimated ESMP budget; allocated across contract and project operational budget proportionally	EPIU / Contractor		
TOTAL ESTIMATED ESMP BUDGET		All items above, all three forestry enterprises, restoration and maintenance phases			

Note: The figures above represent indicative estimates based on the scope of reforestation works (169.62 ha across three forestry enterprises, ~508,860 seedlings) and the monitoring, OHS, and engagement obligations set out in this ESMP. Exchange rate reference: 1 USD ≈ 390 AMD (indicative).