Inception Report

Green Corridor Demonstration Project (GCDP)

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Contract No. CS-04 Green Roads Design Advisory

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1. Introduction

1.1. Background

This inception report presents our planned approach to the **Green Corridor Demonstration Project**, in particular the **Green Roads Design Advisory**, the steps to achieve each of the outputs, the intended time-line and sequencing of activities and the early analysis.

The **Green Corridor Demonstration Project** is a pioneering project designed to introduce, institutionalize, and mainstream Green Roads practices in Tajikistan. The project responds to the urgent need for more resilient, sustainable, and inclusive road infrastructure, recognizing that Tajikistan's road network—crucial for national and regional connectivity—is increasingly challenged by climate change, landscape change, aging infrastructure, and evolving development needs.

The **Green Roads Design Advisory** is structured around **four main tasks**:

(1) Identifying Green Roads opportunities in carefully selected focus district(s);
(2) Reviewing enabling government policies and design approval procedures;
(3) Preparing Green Road Design Guidelines in close collaboration with stakeholder Ministries; and
(4) Developing a project concept note for international climate financing, focused on the large-scale rollout of a roadside tree planting initiative.

Through a combination of district-level assessments, policy and capacity reviews, national guideline development, and a targeted climate finance strategy, the project aims to create practical models and institutional momentum for scaling up Green Roads solutions across the country.

1.2. Objectives of the inception phase

This inception report serves as the roadmap for the **Green Roads Design Advisory**, Its main objectives are to:

- Clarify and align project objectives among all partners and stakeholders.
- Present the detailed methodology and guiding principles for each of the four main project tasks.
- Define the work plan, timeline, and key milestones.
- Map stakeholders and outline the engagement strategy.
- Present the key tools and frameworks—especially the Green Roads Toolkit and the Maturity Assessment—that will guide implementation.
- Facilitate project coordination and communication to ensure transparency, accountability, and effective collaboration.

By fulfilling these objectives, the inception report ensures the **Green Roads Design Advisory** begins with clear direction, strong stakeholder buy-in, and a practical plan for achieving transformative results in Tajikistan's road sector.

2. Context and Background

2.1. National and regional context

Tajikistan's road network is fundamental to the country's connectivity, economic growth, and social development. The public (state) road network – under the control of the Ministry of Transport - comprises approximately 14,314 km, including 5,568 km of republican roads (the main corridors, with 17 international routes) and about 8,746 km of local roads connecting rural settlements to main roads.

Additionally, there are an estimated 13,000 km of 'departmental, or non-public' roads. They consist of of "industrial, technological and access roads to various sites and farmland. They do not depend on the Ministry of Transport, but on "several ministries and departments, committees and executive bodies of state power, of cities and regions" that are responsible for their construction and maintenance.

The road sector faces significant challenges. Many roads are in poor condition, having outlived their economic life, and a substantial portion of the population (over 2 million people) lives more than 2 km from an all-weather road. There is a backlog in basic access, and ongoing investments are required to upgrade and expand the network, including new international road connections within the Central Asian region. The Ministry of Transport is responsible for the public road network, but effective management in particular around regreening requires coordination with multiple ministries and agencies.

2.2. Climate and transport sector linkages

Tajikistan's unique diverse geography—characterized by high mountains, steep valleys, and complex hydrology on the one hand, and extensive plains on the other hand amplifies the challenges of road development and asset management. In particular in the mountainous areas, roads are vulnerable to natural hazards and climate impacts. Infrastructure problems, such as flooding, landslides, and glacial melt, are increasingly affecting roads and bridges, particularly at higher altitudes.

The country is highly vulnerable to climate-related risks, including more frequent and severe droughts, intense rainfall and flooding, snowmelt events, and heat waves. According to the Climate Risk Index (2000–2019), Tajikistan ranks 59 out of 174, and it is ranked 203 out of 208 on the national road vulnerability index, making it one of the most exposed countries in the world to road network disruption. At the same roads and roadside vegetation can have a stabilizing factor amidst these challenges: stabilizing erosion prone areas, harvesting water, retaining floods, promoting biodiversity and facilitation disaster responses.

Over the past 65 years, average annual temperatures have increased significantly[1], leading to glacial retreat and jeopardizing water storage and regulation. Another significant change in Tajikistan is the decline in forest cover. This has been a long-term trend, accelerated by the expansion of large-scale agriculture in the first part of the 20th century and the fuel crisis during the transition from the Soviet era.

These changes have affected the reliability of the road network, increase maintenance costs, and disrupt connectivity for communities and the economy. Furthermore, extreme weather events can cause landslides, floods, and erosion, directly damage road infrastructure and isolating vulnerable populations. Increased precipitation and melting glaciers may accelerate the deterioration of road infrastructure, while higher temperatures can cause asphalt to crack and fail, leading to temporary or permanent road closures. In August 2023, severe flooding and landslides damaged multiple roads and bridges, hindering access to

[1] Elco Koks, S. Travis Waller, Kasun Wijayaratna, Sadhana Nirandjan, and Shadi Shirazian, *A Climate Risk & Resilience Assessment of Tajikistan's Transportation System*, prepared for the Asian Development Bank, 18 November 2024.

communities and causing traffic disruptions around Dushanbe. The Bartang Valley, for example, is frequently cut off due to floods, avalanches, or rockslides, affecting the mobility of its residents.

The recent climate risk & resilience assessment of Tajikistan's transportation system developed by Kocks et al., 2024 for ADB[2], highlights that rainfall-triggered landslides, fluvial floods, and earthquakes are the most significant hazards facing the road network. The annual expected damage from river flooding alone is estimated at $30.2 million, with mountainous regions—such as Darvoz, Rushon, and Shughnon—identified as high-risk areas. Pluvial flooding, landslides, and earthquakes further increase the vulnerability of key corridors and can cause up to 20% disruption in travel demand, especially in critical areas like the Dangara-Guliston corridor. The figures below present risk maps showing the expected annual damage per kilometer of road affected by rain-induced floods (Figure 1), rainfall triggered landslides (Figure 2), pluvial flooding (Figure 3) and earthquake triggered landslides (Figure 4).

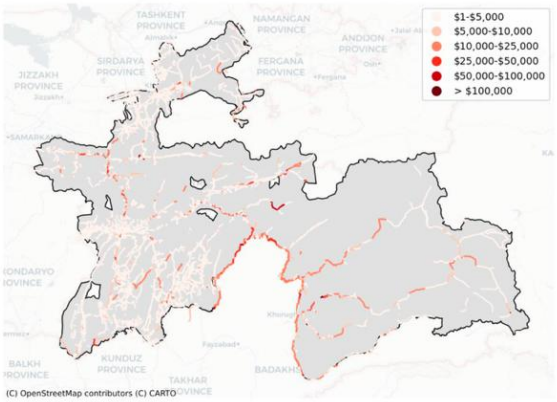

Figure 1: Expected annual damage for rain-induced floods per kilometer of damaged road segment [2].

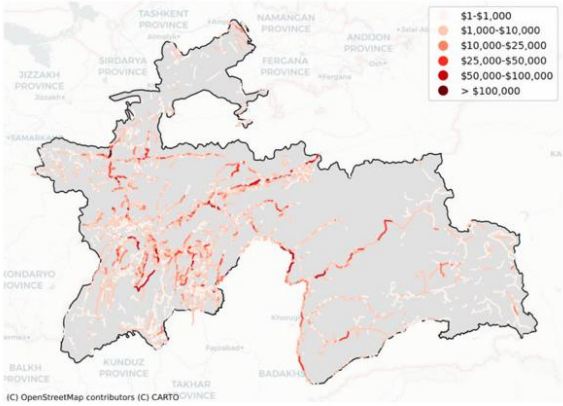

Figure 2: Expected annual damage for rainfall triggered landslides per kilometer of damaged road segment [2].

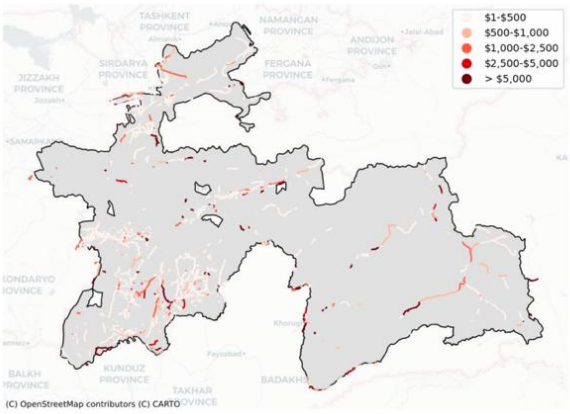

Figure 3: Expected annual damage for pluvial flooding per kilometer of damaged road segment [2].

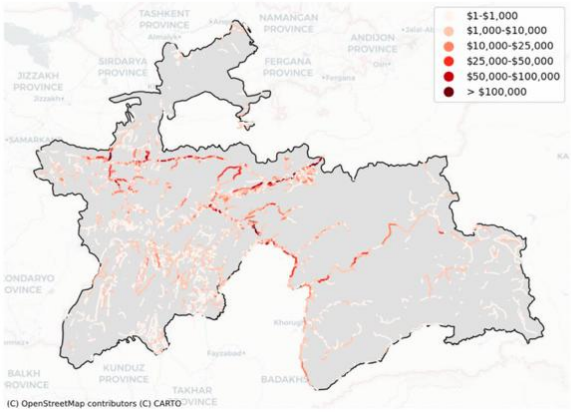

Figure 4: Expected annual damage for earthquake triggered landslides per kilometer of damaged road segment [2].

[2] Elco Koks, S. Travis Waller, Kasun Wijayaratna, Sadhana Nirandjan, and Shadi Shirazian, *A Climate Risk & Resilience Assessment of Tajikistan's Transportation System*, prepared for the Asian Development Bank, 18 November 2024.

At the same time, well-designed and climate-smart roads can play a positive role in adaptation, such as redirecting water flows, supporting disaster risk reduction, and maintaining access during emergencies. Integrating climate resilience into road planning and design is therefore essential for Tajikistan's sustainable development.

2.3. Overview of existing green infrastructure initiatives

Historically, the road sector in Tajikistan has focused on basic infrastructure delivery and maintenance, with limited integration of green road principles such as decarbonization, landscape management, or inclusive growth. Most existing drainage systems and infrastructure are for instance under-designed for new climatic challenges, do not serve beneficial use or are poorly maintained, resulting in regular overflows, flooding, and missed opportunities for land and water management. The absence of systematic green roads practices means that the sector has not yet fully leveraged the potential for roads to contribute to climate resilience, environmental protection, or social inclusion.

Most dimensions of Green Roads (Figure 5) are not systematically integrated into road development. These main dimensions are:

- Decarbonization
- Climate adaptation
- Land and water management
- Pollution control
- Quality of life
- Biodiversity
- Disaster risk reduction
- Safe sourcing and circularity
- Inclusive growth

Figure 5: Green Roads Dimensions according to the ADB Green Roads Toolkit.

Recent advances, however, mark a turning point. In September 2022, the Government of Tajikistan formally adopted Government Decree No. 482, establishing the Green Economy Strategy for 2023–2037. The strategy targets three key fields: economic (low carbon growth), social (green jobs, eco tourism, education), and environmental (renewables, resource efficiency). Core sectors include: renewable energy, industry and industrialization, agriculture, transport, waste, infrastructure, urban planning, and tourism. Emphasis on resilience, sustainable infrastructure, human capital, and inclusive green growth. Once goal is the nationwide reforestation campaign: 3 million+ trees already planted, with a 2040 goal of 2 billion. On March 18, 2025, the Ministry of Economic Development and Trade held the first meeting of the Interdepartmental Working Group on the development of the Action Plan of the Green Economy Development Strategy of the Republic of Tajikistan for 2023-2037 for 2026-2028 under the leadership of the First Deputy Minister of Economic Development and Trade Solehzoda A.

Total funding required is approximately 21.5 billion somoni (~US $2.1–2.2 billion) for 2023–2037, with contributions expected from the national budget, development partners, and private investors. An initiative has started to develop a green bond market for Tajikistan, with focus on private sector. In Tajikistan's latest

nationally determined contribution (NDC), it is estimated that its climate change activities would require total funding of roughly 7% of Tajikistan's GDP. The initiative is take in partnership, the Agency for Securities Market Development and Special Registration of Tajikistan, UN ESCAP, UN RCO and Luxembourg Green Exchange.

Despite these advances, most adaptation measures in the sector to date have focused on infrastructure improvement (e.g., protection from natural disasters, roadside greening, and animal crossings), with less emphasis on institutional mechanisms, new technologies, or climate finance. The sector still lacks systematic approaches to forecasting and modeling climate risks, and to integrating adaptation into all levels of road planning and management.

The climate risk assessment of Koks et all 2024 underlines the need for a layered adaptation strategy. Short-term, operational measures include regular clearing of blockages, debris removal, and maintenance of drainage systems to prevent flood-induced disruptions. Long-term, climate-proofing infrastructure involves building flood walls, elevating roads, resizing drainage systems, and using geosynthetics for slope stability and erosion protection. Enhancing network redundancy, such as adding alternative road connections or relocating vulnerable road sections, further supports resilience. The report emphasizes that adaptation pathways must be flexible and tailored to evolving climate and socioeconomic conditions, with no single solution sufficient for all scenarios.

2.4. Alignment with national policies and climate strategies

The Green Roads Demonstration Project is fully aligned with Tajikistan's national development strategies, green transition policies, and climate adaptation plans. It directly supports government objectives to promote sustainable, resilient, and inclusive infrastructure, in line with the National Development Strategy, green economy plans, and international commitments such as the Sustainable Development Goals (SDGs) and Nationally Determined Contributions (NDCs) under the Paris Agreement.

Tajikistan has developed a range of national policies, laws, and strategic programs that provide a foundation for advancing green road practices. These frameworks address key areas such as transport development, road safety, environmental protection, climate resilience, sustainable land management and inclusive growth. Recent policy advances also reflect growing national commitments to afforestation, climate adaptation, and the integration of environmental and social safeguards in infrastructure projects. The full inventory and analysis of relevant national and sectoral policies, laws, and programs, including climate change adaptation, green economy, disaster risk reduction, and transport sector regulation are provided in Annex E.

The government has identified four priority sectors[3]—energy, water, transport, and agriculture—as particularly sensitive to climate change and in need of adaptation. In the transport sector, national ambitions include increasing infrastructure resilience, aligning with international standards, expanding and upgrading road quality, constructing bypasses, using anti-corrosion materials, and creating protective forest plantations. Urban transport strategies focus on sustainable mobility and emissions reduction, while rural strategies emphasize equitable access and resilience for vulnerable communities. The transition to electric vehicles and sustainable fuels is also prioritized.

[3] Elco Koks, S. Travis Waller, Kasun Wijayaratna, Sadhana Nirandjan, and Shadi Shirazian, *A Climate Risk & Resilience Assessment of Tajikistan's Transportation System*, prepared for the Asian Development Bank, 18 November 2024.

Despite this progress, analysis of the current policy and legal framework reveals several gaps for mainstreaming green road practices. While national strategies provide a strong foundation, sectoral adaptation policies—especially for roads—are still developing. Most regulatory documents focus on infrastructure development and lack clear mechanisms for climate risk assessment, institutional coordination, and climate finance tracking. There is also a need for stronger capacity building, better coordination among ministries, and systematic integration of adaptation and green road principles into planning, budgeting, and implementation.

By mapping institutional mandates, preparing national Green Road Design Guidelines, and developing a climate finance concept note for afforestation along road corridors, the **Green Roads Design Advisory** will help mainstream green road principles and practices within Tajikistan's transport sector and broader sustainability and inclusive growth agenda. The approach is designed to foster cross-sectoral coordination among ministries responsible for transport, agriculture, environment, and natural resource management, ensuring that green road practices are embedded in national policy and planning frameworks for long-term impact.

3. Methodology and Approach

3.1. Overall approach and guiding principles

Our overall approach to the **Green Roads Design Advisory** aims to be participatory, evidence-based, and results-oriented. We are committed to co-creating all major outputs with the Ministry of Transport and relevant stakeholders, ensuring that the assignment is grounded in Tajikistan's realities and builds national ownership from the outset. The methodology is structured around four main tasks, each with a clear sequence of activities and deliverables, and is guided by the following principles:

- **Stakeholder Engagement**: We prioritize early and continuous engagement with national, regional, and district stakeholders, including the Ministry of Transport, other ministries, and local authorities. This ensures that the **Green Roads Design Advisory** benefits from a wide range of expertise, local knowledge, and institutional perspectives, and that outputs are owned and actionable.
- **Evidence-Based Decision Making**: All activities are underpinned by robust data collection, fieldwork, and participatory assessments. We use proven tools such as the ADB Green Roads Toolkit for opportunity mapping and the Maturity Assessment for evaluating the enabling environment, ensuring that recommendations are grounded in evidence and best practice.
- **Integration of International and Local Experience**: Our consortium brings together extensive international experience in green roads, policy development, and climate finance, as well as deep local expertise and knowledge of Tajikistan's road sector. We leverage this combination to adapt global solutions to local needs. In addition, we will draw on relevant ongoing initiatives, such as the vulnerability assessments for the Tajikistan road network being conducted by the Free University Amsterdam and supported by the Asian Development Bank.
- **Alignment with National Strategies**: The **Green Roads Design Advisory** is closely aligned with Tajikistan's national development strategies, climate commitments, and policy frameworks. All activities are designed to support government objectives for sustainable, resilient, and inclusive infrastructure.
- **Capacity Building and Institutionalization**: We aim not only to deliver high-quality outputs, but also to strengthen the capacity of national institutions and embed green road principles in day-to-day practice. This includes the co-development of guidelines, institutional recommendations, and a climate finance concept note.

3.2. Detailed methodology per task

Task 1: Identification of Green Road Opportunities in Focus District(s)

The objective of Task 1 is to systematically identify, document, and prioritize green road opportunities in selected focus district(s) through a participatory, evidence-based process, providing a foundation for piloting, guideline development, and scaling. Our proposal is to select at least two focus districts – to reflect the diversity in climate zones and landscapes in Tajikistan. The methodology for Task 1 is stepwise and participatory and described below:

1.1. Set up basic data base and decide on criteria for selection of focus district(s)

We will begin by mapping all districts across Tajikistan's key geographical and climatic zones, using a harmonized classification that captures the country's diversity. Preliminary work on setting up the database for district(s) selection as well as the selection process is presented in Annex C. For each district, we are completing the essential information on population, road network,

environmental risks, infrastructure, socio-economic factors, and governance capacity. By applying a multi-criteria approach—considering factors such as zone coverage, road density, population, climate risks, and project readiness—we will identify the most representative and suitable districts for deep-dive assessment. The final selection will be made in close consultation with the Ministry of Transport and stakeholders. While we recognize that some data may be limited, we will make every effort to gather the best available information to guide an objective and robust selection process. When some data are unavailable, we will try to find (qualitative) proxies, based on expert opinion for instance.

1.2. Selection of Focus District(s):

Once the database is completed, each candidate district will be systematically assessed and scored against the available agreed criteria, using a balanced mix of quantitative indicators (geography, current road network, ongoing/planned road investments) and qualitative factors (such as administrative engagement and alignment with national priorities). The scoring results will be shared and discussed together with the Ministry of Transport and other key stakeholders in a joint meeting, so that everyone can review the findings and agree on which district(s) to select. Depending on the diversity of contexts and project needs, one or more districts may be selected for the demonstration, providing a solid foundation for subsequent fieldwork and deep-dive analysis. There is a stong case in the selection of focus districts to align with the officially endorsed road-climate zones in Tajikistan:

Table 1: Road Climatic Zones. Source: Urban Planning Norms and Rules of the Republic of Tajikistan 32-02-2012. Automobile roads (replacing SNiP 2.05.02 85) / Committee on Architecture and Construction under the Government of the Republic of Tajikistan

Vertical road-Climate zones	Altitude above sea level, m	Brief description of the vertical road-climatic zone
I	Up to 500.0	Flat and flat-hilly
II	500.0 – 1,000.0	Flat and hilly
III	1,000.0 – 1,500.0	Hilly
IV	1,500.0 – 2,000.0	Foothill
V	2,000.0 – 2,500.0	Mountain
VI	2,500.0 – 3,000.0	High mountain
VII	more than 3,000.0	High-mountain-pass

1.3. Fact finding, field surveys, interview surveys and transects in the focus district(s)

After selecting the focus district(s), we will identify specific road stretches for in-depth analysis in close collaboration with local partners. For these selected segments, we will conduct comprehensive road transect drives—using webcams and field observations—to document current road conditions, landscape features, and existing green road practices. We will also carry out targeted interviews with a wide range of stakeholders from sectors such as roads, agriculture, water, forestry, and energy. These interactions will help us understand their roles, challenges, successes, capacities, priorities, and how they collaborate. All collected data—including photographs, video footage, community stories, and stakeholder inputs—will be systematically organized into a dedicated database. This rich dataset will not only inform our deep-dive analysis but also provide

valuable input for the development of the Green Road Design Guidelines and related project outputs.

1.4. Map the Green Roads opportunities in the focus district(s) using the ADB Green Roads Toolkit

We will use the ADB Green Roads Toolkit—a comprehensive, open-access resource developed to help practitioners identify, design, and implement sustainable road practices. The Toolkit contains more than 150 best practices for green road development, organized around nine key themes such as climate resilience, decarbonization, water management, biodiversity, and inclusive growth. Detailed information on the Green Roads Toolkit is provided in Annex A.

1.5. Assess district level institutional and financial settings in support of/ or blocking the Green Roads opportunities

Building on the opportunity mapping, we will conduct a thorough analysis of district-level enabling and constraining factors for green road adoption. This includes reviewing institutional arrangements, roles, and coordination between agencies, as well as examining financial resources, budgeting processes, and relevant policies and regulations. Through engagement with local authorities and key stakeholders, we will identify existing support systems, pinpoint bottlenecks, and clarify what institutional changes or capacity building are needed to ensure successful implementation of green road solutions in the selected district(s).

1.6. Validate findings on opportunities and institutional framework in focus district(s)

All findings and proposed interventions will be validated through a participatory workshop with the district core group. This collaborative process will ensure local ownership, refine the list of priority opportunities, and place special emphasis on roadside vegetation and tree planting potential, which will directly inform the concept note developed under Task 4.

Task 2: Review of Enabling Government Policy and Design Approval Procedures

The objective of Task 2 is to systematically evaluate and enhance the policy, institutional, and capacity framework required to mainstream green road practices in Tajikistan. We will make use of the Enabling Factors Maturity Assessment for Green Roads, developed for the Asian Development Bank in 2025. Through a comprehensive analysis of existing mandates, policy frameworks, and institutional arrangements, this task seeks to identify key opportunities, gaps, and barriers. The ultimate goal is to provide actionable recommendations that will enable the effective, coordinated, and sustainable adoption of green road solutions throughout the sector. Our methodology for Task 2 is structured around the following steps:

2.1. Actor and Mandate Analysis:

We will do a two-way actor analysis. We will map and analyze the roles, mandates, planning, budgeting, and implementation responsibilities of all relevant organizations at both national and district levels and identify their main bottlenecks. We will also do the actor analysis from the perspective of the key tasks in green roads – and identify who is responsible and what gaps exists in implementation, management, regulation and finance. We will complement the two actor analysis with case studies to better understand the practice on the ground.

2.2. Enabling Factors Maturity Assessment:

To systematically evaluate the readiness of Tajikistan's enabling environment for green roads, we will apply the Enabling Factors Maturity Assessment from the ADB Green Roads Toolkit. This assessment covers twelve critical enabling factors—including improved design standards,

sustainable procurement, policy development, environmental standards, regulatory frameworks, planning systems, capacity building and awareness, financial mechanisms, green road roadmaps, supply systems, application of new technologies, and collaborative partnerships—that together create the foundation for mainstreaming green road practices. A description of the Enabling Framework Maturity Assessment is given in Annex B.

2.3. Policy and Practice Review:

We will review and assess relevant national and sectoral policies, laws, and guidelines that affect green roads—including those related to transport, environment, land use, disaster risk reduction, and cross-sectoral frameworks (e.g., SDGs, NDCs). Identify strengths, gaps, and barriers to implementation. A preliminary list of relevant policies has already been identified and is presented in Annex E.

2.4. Stakeholder Engagement and Key Interviews:

We will conduct in-depth interviews and organize green roads sessions with ministries, local government, and other key stakeholders. The interview with help gather practical insights, validate findings, and identify gaps.

2.5. Institutional Change and Capacity Development:

Based on the above analysis, priority institutional and regulatory changes needed to mainstream green roads are proposed. The shortlist of top institutional changes and capacity needs through stakeholder consultation will be developed for more detailed planning. A targeted capacity building plan aligned with current systems will be developed. While there is no formal, predefined capacity-building program within the current **Green Roads Design Advisory** scope, we will actively seek opportunities to organize relevant sessions and strengthen local capacity wherever possible throughout the **Green Roads Design Advisory**.

Task 3: Development of National Green Road Design Guidelines

Task 3: Development of National Green Road Design Guidelines

The objective of Task 3 is to develop practical, evidence-based, and widely endorsed national guidelines that will facilitate the mainstreaming of green road practices throughout Tajikistan. The process is designed to ensure the guidelines are relevant, actionable, and fully integrated into existing regulatory and operational frameworks. A draft structure of the National Green Roads Guidelines is presented in Annex F.

The methodology for Task 3 is structured around the following key steps:

3.1. Approval Procedure Mapping:

We will begin by clarifying all necessary steps for the development, review, and official approval of the guidelines, working closely with the Ministry of Transport and other relevant authorities. Because this is a one-year project, we will initiate this process from the very beginning to ensure that all approval procedures and institutional protocols are clearly understood and integrated into the work plan, allowing for timely endorsement and development and initialization of the guidelines within the project timeframe.

3.2. Evidence Base and Data Collection:

Building on the findings from Task 1, we will record and synthesize data on current road conditions, vulnerabilities (such as deforestation and flood/landslide risks, see section 2), existing road management practices, and asset management records. The deep dives in the focus groups and the interviews add more value. This evidence base will ensure that the guidelines are grounded in local realities and tailored to Tajikistan's specific needs.

3.3. Drafting and Consultation:

The drafting of the guidelines will be a collaborative process involving the Ministry of Transport and key sectoral departments, including forestry, agriculture, and environment. To ensure the guidelines are relevant across Tajikistan's diverse regions, we will organize consultative workshops, field visits, and stakeholder meetings at both district and national level.

3.4. Policy and Practice Integration:

We will systematically review and cross-check the draft guidelines against existing policies, regulations, and best practices. This approach is designed to build on existing knowledge, proven practices, and the current capacities within Tajikistan's road and related sectors. By ensuring coherence and alignment, we will avoid duplication of effort, reinforce what already works, and clearly identify where policy updates or harmonization are needed to maximize impact and sustainability.

3.5. Validation and Finalization:

The draft guidelines will be presented in a formal forum for review by support experts and a broad group of stakeholders. We are proposing a drafting review group as part of the stakeholder consultation with a pendant in the focus districts. Feedback from these consultations will be incorporated into the final version. An implementation plan will also be developed, outlining the steps for operationalizing the guidelines, including required capacity building and institutional changes identified in Task 2.

Task 4: Development of a Project Concept Note for International Climate Financing (Roadside Tree Planting Initiative)

The objective of Task 4 is to prepare a robust and well-supported concept note to secure international climate finance for a large-scale roadside tree planting initiative in Tajikistan. By combining international climate finance expertise with practical, nature-based solutions and strong local engagement, this task aims to design a project that is both ambitious and grounded in the realities and priorities of Tajikistan. The following methodological steps will guide the preparation and submission of the concept note:

4.1. Fact finding and analysis on roadside tree planting

We will begin with in-depth surveys and consultations to assess the current status of roadside tree planting in Tajikistan. This will include a review of existing and promising initiatives, technical capacities, supply chains for tree seedlings, working arrangements, and commercial interests.

4.2. Engagement with Forestry Agency

We will work in close partnership with the Tajikistan Ministry of Forestry (or the Forestry Agency), Ministry of Transport, and district-level partners identified in Task 1. This engagement will ensure the concept note is grounded in local realities, leverages field-level insights, and enjoys strong

ownership from all relevant actors. The initiative will also build on the Department of Forestry's "Offsetting Greenhouse Gas Emissions By Landscaping Roads" project and align with ongoing collaborative discussions with ADB.

4.3. Explore climate funds to aim for and mapping of process with ADB Strategy Policy Department

It has been suggested during the kick-off meeting to liaise with the ADB to find out their preferred options for climate financing. In collaboration with ADB's Strategy Policy Department and national climate finance liaison offices, we will thereafter identify the most suitable international funding sources—such as the **Green Climate Fund**, **Adaptation Fund**, **Home Planet Fund**, **Forest Carbon Partnership Facility**, and others under the **Global Environment Facility**. We will also consider options such as **Green Bonds**, **Climate Bonds**, or **Biodiversity Funds**. Early in the assignment, we will map the application and approval processes for these funds, ensuring the concept note is tailored to donor requirements and timelines. Preliminary work on Identifying Climate Funding options is presented in Annex G.

4.4. Concept Note Development:

Drawing on the baseline assessment and stakeholder input, we will develop an initial draft concept note. This will detail the scope of work, targeted road segments (linked to Task 1 focus districts and roads in need of periodic maintenance), expected costs and benefits, and the multi-functional roles of roadside vegetation (including decarbonization, traffic safety, climate resilience, land and water management, pollution abatement, biodiversity, and inclusive growth). The concept note will also describe operational requirements, implementation arrangements (supply lines, maintenance, harvesting), protection and survival strategies, and capacity building needs. Species selection, planting design, and management systems will be informed by international best practice and adapted to Tajikistan's context.

4.5. Consultation, Finalization and Submission

The draft concept note will be reviewed through targeted consultations with key agencies, technical experts, and funding partners, including the support experts engaged for this assignment. Feedback will be incorporated to strengthen the proposal, ensuring it meets both local priorities and donor expectations. The finalized concept note will be submitted through the appropriate channels of the Government of Tajikistan and ADB, aiming for early submission to maximize the chances of timely feedback and approval from the targeted climate funds.

4. Timeline and Work Plan

4.1. Work plan and delivery schedule

The work plan provides a detailed overview of the main tasks, sub-tasks, deliverables, and their respective timelines. This structure ensures that all activities are logically sequenced, responsibilities are clear, and the **Green Roads Design Advisory** remains focused on key milestones and outputs.

The assignment is organized around four main tasks, each divided into sub-tasks with deliverables and deadlines. **Error! Reference source not found.** below summarizes the structure and timeline for each task and its associated outputs.

Table 2: Green Roads Design Advisory Project Overview.

#	Task Title	Sub-Tasks	Main Deliverable	Timeline
1	Identify the green roads opportunities in carefully selected focus district(s)	**1.1** Set up basic database and decide on criteria for selection; **1.2** Select focus district(s); **1.3** Fact finding, field surveys, interviews; **1.4** Map opportunities using ADB Toolkit; **1.5** Assess institutional and financial settings; **1.6** Validate findings	#1: District Opportunity Report	Months 1–4 (Report: End of Month 4)
2	Review enabling government policy and design approval procedures	**2.1** Actor analysis; **2.2** Maturity assessment; **2.3** Policy analysis sessions; **2.4** Key person interviews; **2.5** Institutional change directions; **2.6** Capacity development needs; **2.7** Agreement on changes and plan	#2 Enabling Framework Report #3 Capacity Building Plan Report	Months 2–9 (Reports: End of Month 7 & 9)
3	Help prepare Green Road Design Guidelines in close collaboration with stakeholder Ministries	**3.1** Understand approval procedures; **3.2** Develop basic database; **3.3** Formulate draft guidelines; **3.4** Review and discussions; **3.5** Finalize guidelines; **3.6** Implementation/ capacity buidling plan	#4 Green Road Design Guidelines	Months 2–8 (Guidelines: End of Month 8)
4	Develop a project concept note for international climate financing (roadside tree planting)	**4.1** Fact finding and analysis; **4.2** Engagement with Forestry Dept.; **4.3** Explore climate fund options; **4.4** Concept development; **4.5**. Consultation, finalization and submission	#5 International Climate Finance Project Concept Note	Months 2–11 (Concept Note: End of Month 11)

A more detailed Gantt chart is provided below (**Error! Reference source not found.**), which shows the timeline for each sub-task, the experts involved, and the connection to key activities and deliverables. This chart enables effective tracking of progress and coordination among team members. A risk table is also provided, looking at main risk and how they could affect progress, as well as measures to mitigates the risk or their impact.

Table 3: Green Roads Design Advisory Chart.

Task / Activity	Timeline in Months												Experts	Key Milestones/Events
	1	2	3	4	5	6	7	8	9	10	11	12		
Inception & Planning													All experts	Kick-off meeting and Inception report
Task 1: Identification of Green Road Opportunities														
1.1. Database & Criteria													K1, K2, NK2, NK3, NK4	Criteria and Database set up and complete
1.2. District Selection													K1, K2, NK3	Focus districts selected
1.3. Fieldwork (Surveys, Transects, Interviews)													K1, K2, NK2, NK3, NK4	Field visits/documentation
1.4. Opportunity Mapping (Toolkit)													K1, K2, NK1, NK4	Toolkit application results and opportunity mapping

1.5. Institutional & Financial Analysis													K1, K2, NK2	Analysis complete
1.6. Validation Workshop													K1, K2, NK2, NK3, NK4	Validation workshop to present and validate the District Opportunity Mapping
District Opportunity Report				*									All	Deliverable for Task 1
Task 2: Enabling Policy & Design Review														
2.1. Actor & Mandate Analysis													K1, K2, NK3	Stakeholder map
2.2. Maturity Assessment													K1, K2, NK3, NK2	Maturity Assessment results
2.3. Policy & Practice Review													K1, K2, NK3	Policy review summary
2.4. Interviews & Green Roads Sessions													K1, K2, NK3, NK2	Interview summaries
2.5. Synthesis & Recommendations													K1, K2, NK3	Draft Enabling Framework Report
2.6. Validation Workshop													K1, K2, NK3	Validation workshop to present and validate the Enabling Factor Report and the needs for capacity
Enabling Framework Report							*						K1, K2, NK3, NK2	Deliverable for Task 2
Capacity Building Plan									*				K1, NK3, NK2	Deliverable for Task 2
Task 3: National Green Road Design Guidelines														
3.1. Approval Procedure Mapping													K1, K2, NK3	Approval roadmap
3.2. Evidence Base & Data Collection													K1, K2, NK1, NK3, NK4	Data summary
3.3. Drafting & Consultation													K1, K2, NK1, NK2	Draft guidelines, workshops
3.4. Policy & Practice Integration													K1, K2, NK3	Integrated draft guidelines
3.5. Validation & Finalization													K1, K2, NK2, NK3,	Guideline validation and if possible, approval
Green Road Design Guidelines								*					K1, K2, NK1, NK2, NK3, NK4	Deliverable for Task 3
Task 4: Project Concept Note for Climate Finance														
4.1. Fact finding & baseline assessment													K2, NK1, NK4	Baseline
4.2. Engagement with Forestry Dept. and ADB													K2, K1, NK4,	Collaboration established
4.3. Climate finance mapping													K1, K2, NK1, NK2, NK4	Funding options and application procedures

4.4. Concept Note Development												K1, K2, NK1, NK2, NK4	Draft concept note
4.5. Consultation, Finalization & Submission												K1, K2, NK1, NK4	Final concept note, submission
International Climate Finance Project Concept									*			NK1, K1, K2	Deliverable for Task 4
Final Completion Report									*		X	K1, K2, NK1, NK2, NK3, NK4	Final report

The summary task of each team member is given below.

K1: Dr. Frank van Steenbergen – Team Leader / Green Roads Specialist (MetaMeta)

- Provides overall technical and strategic leadership for the project, ensuring quality and timely delivery of all outputs.
- Leads on methodology development, application of the ADB Green Roads Toolkit, and integration of international best practices.
- Oversees guideline development, policy analysis, and capacity building activities.
- Acts as the main liaison with the Ministry of Transport and international partners.
- Guides and participates in fieldwork, validation workshops, and stakeholder consultations.

K2: Tojiddin Rasulov – National Green Roads Design Engineer (Muhandisoni Rohnamo)

- Leads all technical and engineering aspects in the Tajik context, including field data collection, district selection, and road opportunity mapping.
- Coordinates and supervises fieldwork, surveys, and local stakeholder engagement.
- Ensures that all solutions are tailored to local conditions and regulatory requirements.
- Supports the drafting and review of national guidelines and contributes to institutional analysis and validation events.

International Non-Key Support Experts

NK1: Dr. Hero Heering – Green Development Expert (MetaMeta)

- Provides technical support on green development
- Leads the Green Climate Fund application as part of Task 4.
- Supports toolkit application, guideline drafting, and capacity building activities.

NK2: Anastasia Deligianni – Green Road Communications and Support (MetaMeta)

- Manages project communications, knowledge management and dissemination, and reporting.
- Coordinates stakeholder engagement activities, including workshops and learning events.
- Supports in deep dives, Green Roads Toolkit and Maturity Assessment application as well as Guideline development.

National Non-Key Support Experts

NK3: Isfandiyor Shukurzoda – Policy Expert (Muhandisoni Rohnamo LLC)

- Leads on policy and institutional analysis, including actor mapping and the maturity assessment.

- Coordinates with government agencies on policy review, regulatory alignment, and capacity building.
- Supports stakeholder interviews and policy-focused workshops.

NK4: Madibron Saidzoda – Forestry Expert (Muhandisoni Rohnamo LLC)

- Leads on technical aspects of forestry and afforestation, especially for the roadside tree planting concept note.
- Advises on biodiversity, land management, and environmental safeguards.

Supports field assessments, data collection, and engagement with the Forestry Department

Table 4: Risk table

Risk	**Implication**	**Mitigation measure**
Lack of coordination and cooperation of Ministries	Difficult to get Guidelines grounded, forced to narrow perspective	Initiate a coordination team from the beginning, creating stimulating environment and gentle commitment
Important data is missing	Difficult to select focus districts on basis of all angles, limitation in assessing larger roll out	Work with best available data set, supplement with expert insights
Limited interest from local stakeholders	Blockage to broad ownership	Work with group of the willing, creating stimulating environment and gentle commitment, ownership by key organizations, not try to be all-encompassing, engage Ministry of Planning for broad endorsement
Long procedure for concept approval for climate funding	May not complete before end of assignment	Start at earliest with procedure discussion, leave behind clear package

5. Stakeholder Engagement Plan and Communication

5.1. Stakeholder Engagement Plan

Stakeholder engagement is central to the success of the assignment and is embedded in all tasks and activities. The **Green Roads Design Advisory** will work in close collaboration with the Ministry of Transport (MoT), Ministry of Forestry (Forestry Agency), and other relevant national and district-level stakeholders. This collaborative approach ensures that the development of the National Green Roads Guidelines and the roadside tree planting concept note are grounded in local realities, build on existing policies and experiences, and reflect shared priorities.

A preliminary mapping of stakeholders and their mandates has been carried out (see Annex D), identifying both national and district-level actors. We will complete these with a two-way actor analysis and complement this with case-based discussions. In addition, we will dive into the parties responsible for road side vegetation and tree planting – and record the plans and main initiatives.

For the engagement of the stakeholders the following is proposed at the different levels:

- National Level:
    - A National Reference Group will be established, including representatives from MoT, Forestry Agency, other ministries, and ADB.
    - This group will review, discuss and validate **Green Roads Design Advisory** milestones, outputs, and especially the draft Green Roads Guidelines.
    - National workshops and formal consultations will be organized to validate findings and agree on key recommendations.

- District/Regional Level:
    - District-level reference groups will be formed, involving local authorities, technical staff, and community representatives for the focus groups
    - Participatory workshops and field visits will be held to present discuss and validate findings, and ensure guidelines are relevant to diverse local contexts.

- Joint Review and Validation:
    - Both reference groups will be involved in reviewing the draft guidelines providing feedback and jointly agreeing on final recommendations.

Methods of Engagement

- Interviews and Focus Groups: In-depth interviews and focus group discussions with key ministries, agencies, and local actors.
- Surveys and Questionnaires: To capture input from stakeholders (especially under Task 2)
- Workshops and Consultations: workshops at both national and district levels to ensure broad participation, local relevance and ownership.

Stakeholder feedback will be systematically documented and integrated at every stage from Task 1 to 4.

6. Communication and Coordination

Effective communication and coordination are fundamental to the successful delivery of the **Green Roads Design Advisory**. The assignment involves multiple partners, ministries, and stakeholders at both national and district levels, as well as the Asian Development Bank (ADB) as the loan provider. The following structured approach will ensure transparency, timely information sharing, and collaborative decision-making throughout the project lifecycle.

Internal Project Communication

- **Ministry of Transport (MoT, Client) and MetaMeta (MM, JV Lead Partner)**
  - MM will provide regular updates to MoT and will be submitting the **Green Roads Design Advisory** reports as per contract agreement.
  - MM will request coordination meetings for updates, discussion of challenges and alignment on the next steps.
  - Ad-hoc communication via email (Contact Point: Mr. Nurali Arabzoda, Executive Director, PIUUR).
  - The Team Leader (Frank van Steenbergen) and the Project Manager (Anastasia Deligianni) will act as main contact point to MoT.

- **MM (JV Lead Partner) and MR (JV Partner):**
  - Weekly internal meetings to review progress, share information, and coordinate tasks.
  - Use of a shared project management platform for document exchange and task tracking.
  - Clear delegation of roles and responsibilities.

- **Communication with ADB as Loan Provider**
  - Regular updates will be provided to ADB, particularly on critical project milestones such as the use of the ADB Green Roads Toolkit, the Enabling Factors Maturity Assessment, guideline development, and concept note preparation.
  - Alignment with ADB's requirements and expectations will be ensured through scheduled calls and direct liaison with the ADB Strategy Policy Department, especially regarding climate finance mapping and application processes.
  - Key deliverables, including the concept note for climate finance, will be shared for feedback and validation prior to submission through official government channels.

7. Annexes (Background Information and Preliminary Results)

7.1. Annex A: Summary of the ADB Green Roads Toolkit

The Asian Development Bank has issued the Green Roads Toolkit (2024), which will be used in identifying green roads priorities in the focus districts. The Green Roads Toolkit has been developed by MetaMeta and the International Road Federation. This toolkit is an essential collection of good practices intended to inform the development and management of sustainable and eco-friendly roads. It goes beyond the road sector and serves as a comprehensive compendium of green roads measures for guiding the planning, development, construction, and management of roads. The toolkit sets out interventions and good practices under nine dimensions including decarbonization, climate resilience, water and land management, pollution reduction, improving quality of life, conserving biodiversity, disaster preparedness, responsible sourcing of materials, and fostering inclusive growth (Figure 6).

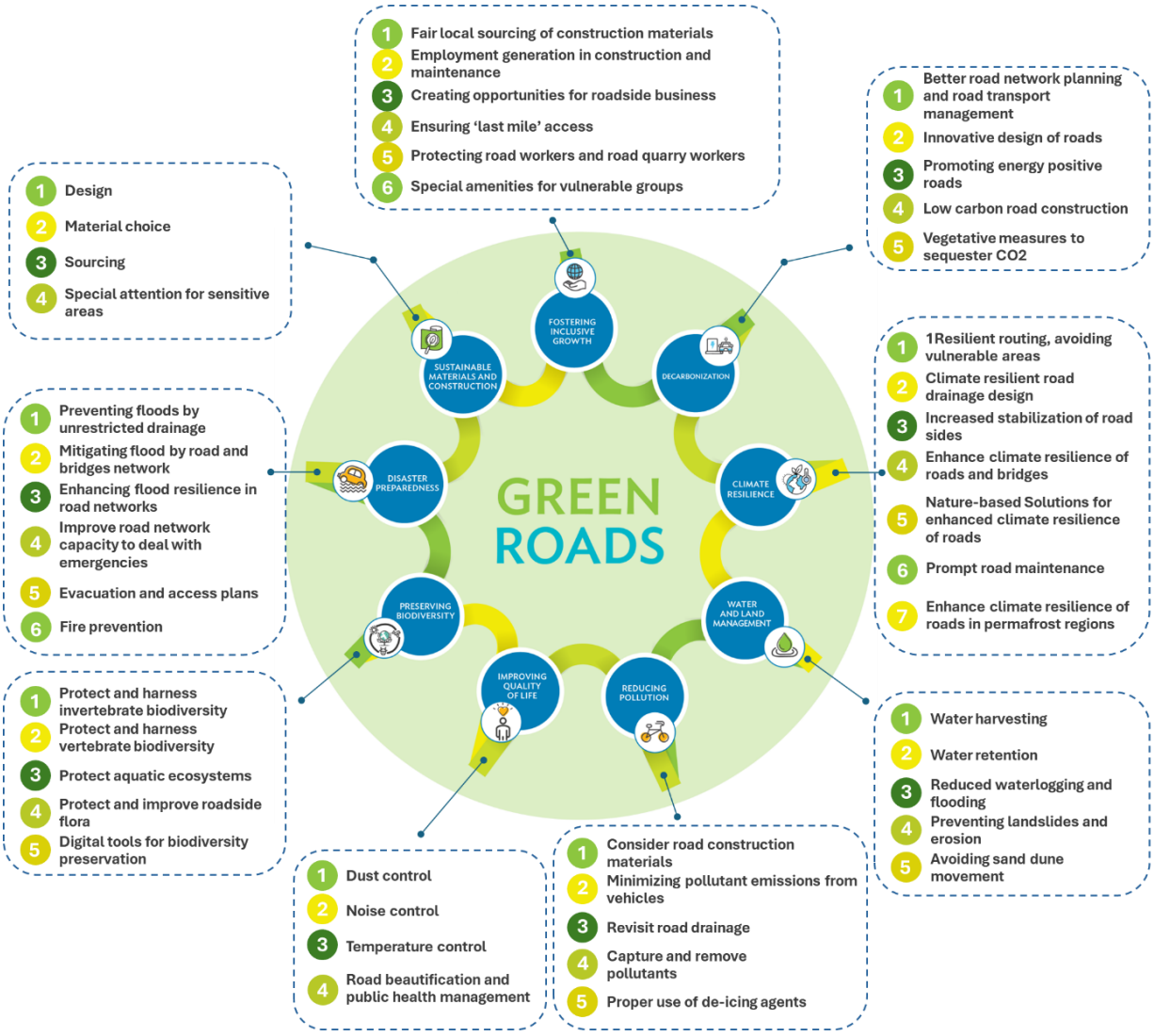

Figure 6: Green Roads Toolkit with the 9 Green Road Dimensions and the categories covered within these dimensions.

Detailed explanation about each of the 9 Green Road Dimensions is presented below:

Dimension 1: Decarbonization

The road sector is a major contributor to global CO2 emissions (18%). In Asia CO2 emissions from transport increase faster than anywhere else, at 3.9% annually, double the rate of the global increase (1.9% in 2018)[4]. The carbon emission comes largely from road transport, and to a lesser degree from the construction of roads. Given the sheer size of these emissions, transformations in the road sector are essential for countries to reach low-carbon targets set forth by the Paris Agreement among others.
To achieve decarbonization action is required in a number of interventions areas:

1. **Better road network planning and road transport management**: Improving traffic flows, reducing travel time and congestions will avoid unnecessary stationary emissions. Creating low-emission zones and facilitating the use of electric vehicles with charging stations will encourage the transitions to energy efficient transport. Energy use will be further reduced by timely asset management, avoiding slow-downs and detours.
2. **Innovative design of roads**: Friction-low asphalt may reduce fuel consumption with 1-3%. Energy use can also be reduced by energy-efficient or solar powered appliances, such as LED lightning or reflective signage.
3. **Promoting energy positive roads:** Exploring the scope for energy capture with roads. Several opportunities have been experimented. They can be game-changers but are still in proof-of-concept stage. Examples are heating water storage with black top roads and solar-paneled lanes and roads. In the meantime, the use of solar panels alongside roads has become common.
4. **Low carbon road construction**: Using recycled material in road construction and using low carbon material emission friendly 'green cement' and bio-based material reduces the carbon footprint in road construction. The effect can even be turned into a positive, when carbon-sequestering material, in particular olivine, is used in the construction of road and on road verges.
5. **Vegetative measures to sequester CO2**: Planting trees along roads will absorb carbon and proved multiple benefits to both environment and roadside communities.

Dimension 2: Creating Climate Resilience

Transport systems in Asia and the Pacific are vulnerable to climate-related hazards, such as floods, landslides, forest fires, heat waves, thaw – all specific-to-specific areas. This leads to direct damage to critical transport infrastructure, disruption to transport services, and wider social and economic impacts. Globally, main factors are surface, river and coastal flooding, cyclones and earthquakes.
On a global scale, the annual cost of direct damage to roads and railways due to natural hazards is estimated at around $15 billion. The Asia and the Pacific Region experiences a disproportionate share of these damages, accounting for 65% of the annual global damage to road and rail transport. Furthermore, the Asia-Pacific region is expected to bear 70% of the global annual damage to trade. ADB estimated an additional 7% (equivalent to $37 billion) would need to be added to the costs of transport infrastructure requirements in Asia and the Pacific region for adaptation and resilience of the transport infrastructure[5].

[4] Gota, S. and Huizenga, C. (2023) *The contours of a net zero emission transport sector in Asia*, *Asian Development Outlook Thematic Report*.
[5] Asian Development Bank (2017) *Meeting Asia's Infrastructure Needs*. Available at: https://dx.doi.org/10.22617/FLS168388-2 (Accessed: 27 February 2025).

In Climate Resilience theme the interventions include:

1. **Resilient routing, avoiding vulnerable areas**: Rethinking the layout of road networks to avoid the areas that are most vulnerable to flooding, landslides, forest fires or earthquakes
2. **Climate resilient road drainage design**: Adjusting Road drainage designs to handle increased water peak flows, and avoid at the same time that drainage disposal happens at the cost of downstream erosion and landscape degradation
3. **Increased stabilization of roadsides**: Stabilizing road embankments and managing vegetation to prevent erosion due to changed and more challenging weather patterns
4. **Enhance climate resilience of roads and bridges**: Strengthening bridges and related structures to withstand severe weather, adjusting dimensions and designs
5. **Nature-based Solutions for enhanced climate resilience of roads**: Using natural methods to mitigate climate impacts – such as bio-engineering and natural slope protection. Using road-side tree planting to minimize the effect of heatwaves.
6. **Prompt road maintenance**: Implementing timely and effective maintenance to prevent small damage from becoming major service problems will increase climate resilience
7. **Enhance climate resilience of roads in permafrost regions**: As a special case, counter the thawing of permafrost areas, by using geocells for soil stabilization and using thermosyphon cooling under paved roads.

Dimension 3: Water and Land Management

Water is responsible for 80% of the damage to unpaved roads and 30% to paved roads[6]. Water around roads is also a prime cause for delays in construction. There is a saying that the main three enemies to roads are 'water, water and water'.

There is another side to the narrative. Roads have a major impact on landscape hydrology.
Roads affect watersheds by concentrating and accelerating runoff. They increase hydrological connectivity. This often cause flooding, gullying, and erosion. Studies indicate that 12-40% of sediment in catchments originates from road surfaces[7]. This clogs streams and reservoirs and negatively affects soil fertility and water quality[8]. Roads may damage small mountain aquifers and disrupt subsurface flows. The construction of a road radically changes the drainage pattern, which may lead to extensive water logging.

All this can be turned around. If managed properly, roads can serve as valuable tools for water management and enhance resilience. By integrating road development with water management roads can be utilized to harvest, store, and channel water, to manage water levels, do no harm to local aquifers and - thereby contributing to beneficial water use. This Roads for Water[9] approach transforms roads from potential environmental liabilities into assets that contribute to improved land and water management. Moreover, by integrating water management and watershed conservation into road development water-related damage and disruption of roads is importantly reduced. Because roads are everywhere, the scale of positive impact on land and water management in the entire country can be high, with different best practices for different geographies.

Key intervention packages for beneficial water and land management in road development include:

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[6] Chinowsky, P. and Arndt, C. (2012) 'Climate change and roads: A dynamic stressor–response model', *Review of Development Economics*, 16(3), pp. 448–462.
[7] Van Steenbergen
[8] Faisal, M., You, Z. J., Idrees, M. B., Ali, S., and Buttar, N. A. (2024) 'Exploring urban runoff complexity: road-deposited sediment wash-off mechanisms and dynamics of constraints', *Journal of Hydroinformatics*, 26(6), pp. 1396-1408.
[9] www.roadsforwater.org

1. **Water harvesting:** Diverting runoff guided by road drainage to storage structures, recharge areas or applied on land directly for beneficial use.
2. **Water retention:** Using road bodies and bridges to retain water, in the shape of dams, gated culverts, non-vented causeway, increased sills to retain and store water and release when needed
3. **Reduced waterlogging and flooding.** Design roads and bridges with adequate cross-drainage and passage so as not to impede free runoff and cause impoundment and/or uncontrolled overflows; also avoid concentrating run-off and create erosive floods. In addition, road networks and drainage systems, especially in flat areas, may be designed to compartmentalize flood basin and hence slow down the run-off and avoid damaging flood peaks.
4. **Preventing landslides and erosion:** Using roads to stabilize erosion prone sections, avoid land saturation and use road catchment management to stabilize hill sides.
5. **Avoiding sand dune movement:** Aligning roads away from prevailing wind directions and incorporating windbreaks and soil stabilization planting to prevent sand dune movement.

Dimension 4: Reducing Pollution

The construction and operation of roads can significantly impact both human well-being and environmental health. Vehicle emissions and dust from roadworks contribute to deteriorated air quality. This serious concern is highlighted by the Asian Transport Outlook, which estimates that 76% of global deaths related to breathing particulate matter happen in Asia and the Pacific[10]. In fact, data by IQAir, which operates the world's largest free real-time air quality monitoring platform, show that 18 of the 20 most air-polluted cities globally are in Asia[11]. Smog, triggered by winter weather and air pollution, has led to temporary closure of schools in many parts of Asia in recent years.

Furthermore, roads can be a conduit for pollutants to enter soil and water systems; contaminants such as gasoline, oil from vehicles, heavy metals, rubber particles, trash, and microplastics are often carried by rainwater runoff from roads. Additionally, in colder climates, the use of deicing salts and sand on roads presents further environmental challenges, as these substances can leach into the soil and potentially contaminate groundwater and surface water. Perera et al. (2013) for instance found that about 40% of the chloride from road salt enters shallow aquifers[12].

Key areas for reducing pollution through road development include:

1. **Consider road construction materials**: Using materials with fewer fine particles and avoid additives that act as pollutants.

2. **Minimizing pollutant emissions from vehicles**: Setting minimum standards for vehicle emissions and fuel composition, enforcing anti-idling regulations, removing traffic bottlenecks and use non-abrasive road pavements.

3. **Revisit road drainage**: Avoiding untreated runoff near sensitive areas, using porous asphalt for better water quality, treating effluent through systems like detention ponds and sand filters, and implementing frequent drainage measures.

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[10] Anyala, M., Stapleton, R., Keller, G., and van Steenbergen, F. (2023) 'Six Steps Toward Greener Climate-Resilient Roads in Asia and the Pacific', *Asian Development Blog*, 12 December. Available at: https://blogs.adb.org/blog/six-steps-toward-greener-climate-resilient-roads-asia-and-pacific (Accessed: 27 February 2025)

[11] https://www.iqair.com/world-air-quality-ranking. These 18 cities most polluted cities were in order of pollution: Beijing, Hanoi, Mumbai, Dhaka, Shanghai, Kathmandu, Kolkata, Chengdu, Wuhan, Bishek, Tashkent, Chongging, Phnom Penh, Kaohsing, Delhi, Almaty, Lahore and Ulan Bator. This is as of 27 February 2025. The ranking is changing daily.

[12] Perera, N., Gharabaghi, B., & Howard, K. (2013). Groundwater chloride response in the Highland Creek watershed due to road salt application: A re-assessment after 20 years. *Journal of Hydrology*, *479*, 159-168.

4. **Capture and remove pollutants**: Planting grass buffer strips and vegetation to absorb and intercept pollutants and using accumulator plants for soil bioremediation.

5. **Proper use of de-icing agents**: Using de-icing and traction agents in environmentally considerate ways.

Dimension 5: Quality of Life

Roads can significantly shape the quality of life for roadside communities. There are four critical factors: road dust, traffic noise, temperature, and beauty or road appeal.
Road dust, composed of coarse (PM10) and fine (PM2.5) particles, includes harmful substances from vehicle emissions, brake and tire wear. , and contains toxins like heavy metals – besides the dust particles from the road itself. Effective dust control on unpaved roads is essential for reducing the incidence of respiratory diseases, particularly in densely populated areas. The presence of vegetation along roadsides can mitigate the adverse effects of road dust as well as reducing noise pollution, and heat island effects.

Next, traffic noise is an often-forgotten health factor, causing the loss of healthy live years, particularly in cities. Furthermore, the issue of high temperatures and heat waves has attracted much attention in recent years. Urban Heat Islands occur when cities experience significantly higher temperatures than the surrounding rural areas due to human activities and urban development. The daytime effect can easily reach 1-3°C, but the difference is very much marked at night: 5-7°C or even higher. There are also considerably more heat wave days in cities. A main cause is the absorption of **heat by buildings and pavements – next to changes in air circulation and reduced vegetation and water bodies.**

A final quality of life factor is beautification. Beautification is not a luxury. Greenery along roadsides improves the appearance of roads and is associated with reduced mortality and longer life expectancy for nearby residents[13]. The impact of beautification goes further. It is estimated that people globally spent 10% of their time outdoors, and most of this is on roads and streets. The perception of the outer world is hence to an important degree shaped by what roads and streets look like: organized, clean, inviting and open or grim, neglected and dirty. Roads are an important factor in environmental psychology.

Key intervention areas to promote quality of life are:

1. **Dust control**: Using road stabilization through towns or rural areas, applying binding agents and dust palliatives on unpaved roads, use well-planned vegetation to capture dust.

2. **Noise control**: Use silent pavement such as porous asphalt and rubberized asphalt, create distances, use sound barriers and apply anti-honking regulations

3. **Temperature control**: Utilizing cool (white) pavements, planning the effect of roads on open space and air circulation, regreening of roadsides, managing shadow effects.

4. **Road beautification and public health management**: designing scenic roads and roadside facilities, managing public health of roads and sales of street food vendors, avoiding waste-fringes areas around roads.

[13] ///

Dimension 6: Preserving Biodiversity

Road development can pose a significant threat to biodiversity, potentially leading to habitat fragmentation, impeding wildlife movement, disrupting plant and animal populations and material flows within landscapes[14]. On the other hand, if the road ecology is well managed, it can also provide a safe harbor for animal and plant species, particular in areas where widespread commercial farming or industries dominates. Roadside tree corridors, moreover, can be the connecting lines and passageways for biodiversity linking together different habitats.

In alignment with the global commitments under the Convention on Biological Diversity, it is imperative to maintain ecological connectivity and minimize habitat division during infrastructure development to help preserve biodiversity. To adhere to these international commitments, measures to prevent road kills are essential, especially for larger mammals. This is important not only for wildlife protection but also for road safety. Mitigation strategies include the creation of appropriate wildlife crossings, installation of fences or wild-life detection system with high-frequency noise emitters, and regulation of vehicle speeds in areas frequented by wildlife. All this can avoid tragic and costly vehicle-wildlife collusions.

Key intervention areas for Preserving Biodiversity are:

1. **Protect and Harness Invertebrate Biodiversity:** Managing habitats to support invertebrate populations, create specially designed crossings for amphibians, and creating water points away from roads to support species diversity.
2. **Protect and Harness Vertebrate Biodiversity:** Installing (electronic) fencing and wild-life sound emitters in sensitive areas and providing safe passages like wildlife overpasses and underpasses (including flat culverts), creating roadside oases and mini-wetlands fed by road water harvesting or nesting boxes under bridges to support vertebrate species.
3. **Protect Aquatic Ecosystems:** Designing culverts to facilitate fish passage and prevent alterations or sedimentation of streams that affect aquatic habitats.
4. **Protect and Improve Roadside Flora:** Fostering roadside flora through appropriate mowing practices and hydroseeding to maintain healthy plant communities.
5. **Digital Tools for Biodiversity Preservation:** Utilizing digital tools to identify and monitor animal-vehicle collision hotspots, enhancing efforts to prevent wildlife fatalities.

Dimension 7: Disaster Preparedness

Disasters, exacerbated by climate change, significantly threaten economic and social progress in Asia and the Pacific. From 2015 to 2022, a total of 814.8 million people in ADB's developing member countries were impacted by disasters. During the same period, total losses amounting to $418.5 billion were recorded in ADB's developing member countries[15].

Roads are a fundamental component of disaster preparedness and response. They serve as critical lifelines, providing safe passage during emergency and enabling the delivery of relief. During the 2022 mega-flood in Pakistan, which covered 30% of the country, roads served as evacuation routes to relief camps for more than 800,000 people. They also served to evacuate livestock, a critical economic asset for rural families. Over 70% of livestock was successfully moved in regions with functional road networks. In general,

[14] Goldfarb, Ben (2023), Crossings: How Road Ecology Is Shaping the Future of Our Planet. New York: W.W. Norton.

[15] Centre for Research on the Epidemiology of Disasters (CRED) (2008) *EM-DAT: The International Disaster Database*. Available at: http://www.emdat.be/Database/Trends/trends.html (Accessed: 27 February 2025)

affected people close to roads can salvage a much larger portion of their assets during disaster and businesses close to roads are much quicker to restart.

The strategic planning and construction of road infrastructure can significantly enhance disaster resilience, particularly in areas prone to floods. Moreover, proper drainage can mitigate water-related hazards. In coastal regions, roads can double as protective embankments, when carefully managed. Additionally, roads can aid in forest fire prevention by allowing access for firefighting equipment. However, this access must be balanced with the potential risk of exacerbating fires.

Key Intervention Areas for Improving Disaster Preparedness through Road Development are:

1. **Preventing floods and water logging by unrestricted drainage:** Floods in many areas are not so much result from heavy rainfall but are caused by obstructions to the natural drainage pattern. Road development with inadequate cross drainage or too narrow bridges is a major factor here, impeding run-off and causing water to accumulate and flood to rise. Where this happens the road drainage systems needs to be adjusted, and bridges need to be reengineered. Another area of attention is to ensure that the road drainage system does not overly concentrate run-off and thus generate floods during heavy rainfall. Also, roads should not divert streams at road-stream crossings.
2. **Mitigating floods by road and bridges network:** The road and bridges network also be used to mitigate flood risks. Particularly in flat flood-prone areas the road network can be designed so to create flood compartments, slowing down the accumulation of floods. A related strategy is to have overflow section in roads along flood plains to handle excess water during floods and to route this to recharge areas or wetlands
3. **Enhancing flood resilience in road networks:** Elevating roads and bridges to appropriate flood levels to prevent water damage and ensure functionality during high stress. In Bangladesh submersible roads have been developed in the hoar areas that are flooded annually. The roads are constructed to withstand the period of inundation and not obstruct the rising floods. It is explored that what extent these submersible roads can be used to retain some of the receding floods and hence secure soil moisture in the dry period.
4. **Improve Road Network Capacity to Deal with Emergencies:** Increasing road network capacity for emergency response and integrating early warning systems enhances disaster preparedness and effective response. Flood shelters may be added to enhance the lifeline capacity for people and livestock in search for safe shelters during flood emergencies
5. **Evacuation and Access Plans:** Developing clear emergency communication strategies with appropriate signage and messaging, managing emergency traffic efficiently, and planning detailed disaster preparedness procedures are critical for effective evacuation and access.
6. **Fire Prevention:** Using roads to provide access for fire and emergency equipment, incorporating fire breaks along their routes, and using fire-resistant materials to prevent and manage fires.

Dimension 8: Sustainable Materials Sourcing and Construction Practices

The construction and rehabilitation of roads require a substantial amount of construction materials, representing 30%-40% of all materials used in construction projects [16]. The rapid growth in demand for these materials, particularly in Asia and the Pacific, poses a challenge to the sustainability of natural resources and the management of waste and pollution. In the last decade, Asia's demand for construction

[16] Anyala, M., Stapleton, R., Keller, G., and van Steenbergen, F. (2023) 'Six Steps Toward Greener Climate-Resilient Roads in Asia and the Pacific', *Asian Development Blog*, 12 December. Available at: https://blogs.adb.org/blog/six-steps-toward-greener-climate-resilient-roads-asia-and-pacific (Accessed: 27 February 2025)

materials has surged by 64%, compared to a global increase of only 17%[17]. This disparity highlights the urgent need for implementing good practices toward sustainable material sourcing, promoting circularity and well-planned extraction.

To effectively implement sustainable sourcing and construction practices, interventions must be tailored to the specific context of each country or region. This could involve selecting lower carbon construction materials, reusing and recycling waste, and a shift toward construction methods that extend the lifecycle of the materials used. This approach not only preserves natural resources but also aligns with the global pursuit of net-zero emissions and sustainable development. The reuse of material is also major opportunity to dispose of non-biodegradable material.

Key Areas for Sustainable Materials Sourcing and Construction Practices:

1. **Design:** Implementing economical designs and specifying sustainable construction materials and techniques, such as cold mix asphalt and polymer-modified bitumen (PMB), helps reduce environmental impacts and resource consumption.
2. **Material Choice:** Opting for materials with efficient life-cycle use, ensuring the safe use of recycled and bio-based materials, and incorporating geo-textile fibres and marginal materials contribute to sustainability and reduce reliance on raw resources.
3. **Sourcing:** Reducing the environmental costs of material extraction by avoiding sensitive areas, bringing down haulage distances, and ensuring sustainable extraction practices are essential. A promising practice is the repurposing of extraction sites, such as borrow pits and quarries.
4. **Special attention for sensitive areas.** An example are small islands, which have extremely limited access to construction material. These need utmost care by way of environmental analyses and end-of-life strategies, as well as special techniques such as stabilizing coral rock and sands.

Dimension 9: Fostering Inclusive Growth

Green roads play a crucial role in fostering inclusive growth by creating employment, enhancing connectivity, and stimulating economic opportunities along transport corridors. Globally, road construction and maintenance account for USD 1-1.5 trillion annually, making the sector a major economic driver and one of the top employers in many countries. The road sector contributes 5-10% of national economies and generates large-scale employment. Road infrastructure projects can kickstart economic development, both through the money they bring in the economy and the economic opportunities they create. Key intervention areas for inclusive development include:

1. **Fair local sourcing of construction materials.** Supporting local economies by creating business opportunities around road construction, such as local fair sourcing of building materials
2. **Employment generation in construction and maintenance.** Providing rewarding local jobs in road development and maintenance, providing capacity building and other support, creating opportunities for young contractors, adjusting designs so that more local opportunities are created, for instance in stone bridges or in asphalt roads as against concrete roads.
3. **Creating opportunities for roadside business.** Creating special spaces for roadside business with good access and appeal, protecting and managing conditions for existing roadside vendors.
4. **Ensuring 'last mile' access.** Prioritizing access to isolated and small settlements, deploying special elements to overcome difficult terrain, such as trail bridges in mountainous terrain or improved motorbike trails.

[17] Anyala, M., Stapleton, R., Keller, G., and van Steenbergen, F. (2023) 'Six Steps Toward Greener Climate-Resilient Roads in Asia and the Pacific', *Asian Development Blog*, 12 December. Available at: https://blogs.adb.org/blog/six-steps-toward-greener-climate-resilient-roads-asia-and-pacific (Accessed: 27 February 2025)

5. **Protecting road workers and road quarry workers.** Programs to ensure safe and decent working conditions for these labour groups and special measures to provide basic social protection such minimum wage, pension and insurance and avoid child labour. Ensuring salary payment in safe accounts to avoid abuse. Special measures to avoid exploitation and hazards around labour camps, such as prostitution and substance abuse.
6. **Special amenities for vulnerable groups.** Special consideration for people with disability such as guideways for the blinds, special ramps or safe traffic lights.

Structure and Application of the Green Roads Toolkit

The ADB Green Roads Toolkit is a practical, user-friendly Excel-based tool designed to help project teams identify and implement green road practices tailored to their specific context. Using a systematic filtering process, the Toolkit allows teams to select relevant green road dimensions according to project objectives, then input key project characteristics such as geographic setting, road type and standard, project stage, and intended impact. Based on this information, the Toolkit filters its database to generate a customized list of recommended practices that fit the project's unique environmental, technical, and operational realities. This targeted approach ensures that recommendations are actionable and suited to local conditions, enabling teams to focus on feasible interventions with the greatest potential benefits. By providing clear, prioritized guidance, the Toolkit supports more effective planning, design, and implementation of sustainable road infrastructure across diverse settings.

Green Road Theme	Intervention Area	No.	Pracitce Name
1. Decarbonization	1.5 Vegetative measures to sequester carbon	1.5.1	Roadside tree planting for sequestering CO2
3. Water and Land Management	3.1. Water harvesting and run-off storage	3.1.3	Flow diversion from culverts and road drainage (relevant for arid, semi-arid areas)
3. Water and Land Management	3.1. Water harvesting and run-off storage	3.1.6	Using roads as reservoir embankments
3. Water and Land Management	3.3. Groundwater management	3.3.4	Use of water harvesting measures upstream and downstream of the road
4. Reducing Pollution	4.6. Capture and remove pollutants	4.6.1	Planting roadside grass buffer filter strips to absorb dispersed road runoff pollutants. Keep deicing agents and dust palliatives out of water sources and streams.
4. Reducing Pollution	4.6. Capture and remove pollutants	4.6.2	Planting roadside vegetation to intercept road dust and ambient pollutants taking into account distance from the road and aerodynamics
6. Preserving Biodiversity	6.1. Protect and harness invertebrea biodiversity	6.1.1	Habitat management

Figure 7: Screenshot of the Green Roads Toolkit

7.2. Annex B: Summary of the Maturity Assessment

While the Green Roads Toolkit offers a compendium of best practices and technical solutions, their uptake is highly dependent on the presence and maturity of enabling frameworks. These include policy direction, regulatory clarity, financial incentives, capacity building, and multi-sectoral collaboration. The Maturity Assessment Tool provides a structured approach for governments, project teams, and development partners to:

- Assess the current level of readiness and integration of key enabling factors for green roads;
- Identify areas where additional effort, investment, or reform is needed;
- Support the design of targeted action plans and policy roadmaps;
- Facilitate dialogue among stakeholders on priorities and sequencing of reforms.

The tool is designed for use at the national or subnational level and can be adapted for sector-wide assessments or focused on specific green road dimensions (e.g., decarbonization, climate resilience, inclusive growth). In the **Green Roads Advisory**, the Enabling Factors Maturity Assessment will be deployed for assessing current regulations under Work Package 2.

Below is an overview of enabling arrangement factors and current standards/regulations that will be assessed in order to identify priority improvements in the enabling framework.

- **Policy Development:**

The development of clear, forward-looking policies is the cornerstone of mainstreaming green roads. A strong policy framework articulates national or regional commitment to sustainable road development, sets out guiding principles, and connects the green roads agenda with broader climate, environmental, and social goals. Policy development is not only about drafting documents but also about building consensus among stakeholders, aligning mandates across government agencies, and providing the strategic direction needed to drive innovation and reform. Effective policies create the mandate for action, unlock resources, and provide a basis for accountability and long-term continuity.

- **Roadmaps for Green Roads:**

A roadmap translates policy vision into a practical, time-bound sequence of actions and milestones. It serves as a strategic plan that outlines how green road principles will be integrated into the sector over time, identifying priorities, responsible agencies, and clear targets. Roadmaps help coordinate efforts across multiple institutions, align investments, and manage change by breaking down the transition into manageable phases. They also provide a mechanism for tracking progress, learning from early experiences, and scaling up successful approaches, ensuring that the shift towards green roads is systematic and sustained rather than ad hoc.

- **Application of New Technologies:**

Adopting and adapting innovative technologies is essential for realizing the full potential of green roads. This includes the use of low-carbon materials, recycled aggregates, digital monitoring tools, and nature-based solutions, among others. The enabling environment must support research, piloting, and validation of these technologies, as well as their integration into mainstream practice. This often requires partnerships with research institutions, flexible procurement systems, and the willingness to experiment

and learn. Widespread application of new technologies can drive efficiency, reduce environmental impacts, and enhance the resilience and longevity of road infrastructure.

- **Improved Design Standards:**

Design standards are the technical backbone of road construction and maintenance. Updating these standards to incorporate green road principles ensures that sustainability, climate resilience, and social inclusion are systematically addressed in every project. Improved standards provide clear specifications for materials, construction methods, drainage, landscaping, and safety features, among others. They also facilitate quality control and consistency across the sector, making it easier for engineers, contractors, and regulators to deliver green road outcomes. Flexibility within standards is important to allow for innovation and adaptation to local contexts.

- **Environmental Standards:**

Environmental standards define the minimum acceptable levels of air, water, soil, and noise pollution, as well as requirements for biodiversity protection. These standards are critical for ensuring that road development does not compromise environmental quality or public health. They provide benchmarks for planning, design, construction, and operation, and are often enforced through monitoring and reporting systems. Strong environmental standards drive the adoption of cleaner technologies and practices, promote compliance, and help build public trust in infrastructure projects.

- **Regulatory Frameworks:**

A robust regulatory framework provides the legal and institutional structure needed to enforce green road practices. This includes laws, regulations, and guidelines that mandate environmental and social assessments, set requirements for stakeholder engagement, and specify responsibilities for compliance and enforcement. Effective regulations clarify the roles of different agencies, set out procedures for permitting and oversight, and establish penalties for non-compliance. They also create opportunities for public participation and recourse, making the system more transparent and accountable.

- **Improved Planning Systems:**

Planning systems determine how projects are identified, prioritized, and designed. Improved planning systems integrate environmental, social, and economic objectives from the outset, using tools such as strategic environmental assessments, multi-criteria analysis, and participatory planning processes. These systems encourage coordination across sectors and levels of government, ensuring that road investments support broader development goals such as disaster risk reduction, watershed management, and inclusive growth. Well-functioning planning systems also facilitate the early identification of risks and opportunities, leading to more resilient and sustainable infrastructure.

- **Capacity Building and Awareness:**

Building the knowledge, skills, and motivation of all stakeholders is essential for the successful implementation of green roads. Capacity building includes formal training for engineers, planners, and contractors; in-house learning for government staff; and awareness campaigns for communities and decision-makers. It also fosters a culture of innovation, collaboration, and continuous improvement. Raising awareness about the benefits of green roads—such as improved safety, resilience, and quality of life—can generate public support and political will, helping to drive the agenda forward.

- **Sustainable Procurement:**

Procurement processes shape the incentives and behaviors of contractors and suppliers. Sustainable procurement incorporates environmental and social criteria into tendering, evaluation, and contract management, encouraging the use of green materials, technologies, and practices. This can include merit-based selection, early contractor engagement, and performance-based contracts with bonuses for exceeding sustainability targets. By aligning market incentives with policy goals, sustainable procurement accelerates the adoption of innovative solutions and ensures that public investments deliver maximum value for society and the environment.

- **Financial Mechanisms:**

Access to appropriate, flexible, and sustained financing is a key enabler for green roads. Financial mechanisms include dedicated budget lines, climate funds, green bonds, public-private partnerships, and grants or subsidies for innovative practices. These mechanisms can be designed to prioritize green projects, support experimentation, and ensure that the costs and benefits of sustainability are fairly distributed. Effective financial systems also enable long-term planning and maintenance, reducing the risk of underinvestment or project abandonment.

- **Supply Systems: Available Resources and Materials:**

Reliable access to sustainable materials, equipment, and skilled labor is essential for implementing green road practices at scale. This includes developing supply chains for recycled materials, promoting local sourcing, and ensuring the availability of environmentally friendly products. Supply systems must be supported by standards, quality control, and market incentives to encourage investment and innovation. By strengthening supply systems, governments can reduce project costs, minimize environmental impacts, and create economic opportunities for local communities.

- **Collaborative Partnerships and Connection with Other Programs:**

Green roads require collaboration across sectors, institutions, and stakeholder groups. Collaborative partnerships bring together government agencies, private sector actors, civil society, and local communities to share knowledge, align objectives, and coordinate action. Connections with other programs—such as those focused on climate adaptation, disaster risk reduction, biodiversity, or social inclusion—amplify the impact of green road initiatives and leverage additional resources and expertise. Strong partnerships foster innovation, build trust, and ensure that green roads contribute to broader sustainable development goals.

Structure and Application of the Maturity Assessment

The Maturity Assessment Tool employs a structured, three-step methodology:

- **Step 1: Data Collection via Self-Assessment Questionnaire**
  The first step in the maturity assessment process is gathering information and perspectives from key stakeholders using a structured self-assessment questionnaire. This questionnaire invites participants—such as government officials, road agency staff, contractors, and civil society representatives—to evaluate the status of each enabling factor on a standardized scale, typically from 1 (not initiated) to 5 (mature and sustainable). Participants are encouraged to provide qualitative comments and examples to support their ratings, ensuring that the assessment reflects

both quantitative scores and contextual insights. This participatory approach fosters a shared understanding of the current situation and helps surface diverse viewpoints.

- **Step 2: Analysis and Categorization**
  In the second step, the maturity level of each enabling factor is assessed based on the responses from the questionnaire. This involves analysing the questionnaire responses to categorize the readiness of each factor and identify gaps or areas for improvement. The maturity levels categorize as Absent, In development, In place, and Mature and Sustainable, offering a clear framework to evaluate progress and integration of each enabling factor into national practices.

- **Step3: Analysis and Categorization of Results**
  The final step involves prioritizing enabling factors that require immediate enhancement. Utilizing the findings from the assessment and the Green Roads Excel toolkit, country teams can prioritize the enabling factors that need urgent attention. This step ensures that the assessment results translate into actionable priorities for addressing a particular Green Road theme in road development practices.

The maturity assessment is meant as a tool to initiate discussion on steps to support the introduction of green roads systematically, beyond the scope of a single project or pilot. In most cases several enabling factors are already in place. They may be or not be used or applied and can be triggered.

7.3. Annex C: Preliminary Database for District(s) Selection

Tajikistan's remarkable diversity in geography and climate necessitates a careful approach to selecting representative districts for deep dives and data collection. The goal is to ensure that the challenges, current practices, and opportunities identified through this project will be relevant and applicable to the entire country, ultimately informing the development of a robust National Green Roads Guideline.

Geographical and Climatic Zones in Tajikistan

For the purpose of this project, the classification of road climatic zones is based on the official "Urban Planning Norms and Rules of the Republic of Tajikistan 32-02-2012" (Table 1). These government standards distinguish vertical road-climatic zones according to altitude, landscape, and associated environmental features, reflecting differences in elevation, rainfall, terrain, and the specific road and water management challenges encountered across the country.

Based on this official classification, (Table 4) presents the different zones, highlighting their unique characteristics, typical challenges, and key opportunities for green road interventions.

Table 4: Characteristics, Challenges, and Opportunities for Green Roads by Road-Climatic Zone in Tajikistan.

Zone	Altitude (m)	Landscape Type	Climate/ Environmental Features	Road/Water /Environment Challenges	Recommended Strategies	Corresponding Districts/ Examples
I	Up to 500	Plain, flat, flat-hilly and irrigation schemes	Low rainfall (avg. 222 mm), hot summers, mild winters	Waterlogging, salinity, drainage issues	Improved drainage, closed drainage systems, regular maintenance	Vakhs, Vose, Konibod, Isfara, Dangara
II	500–1000	Flat and hilly	Moderate rainfall (509 mm), moderate temps	Modest erosion, scour, dust, limited water resources	Adequate drainage, scour control, roadside tree planting, modest water harvesting, floodwater spreading	Hissor, Kulob, Rudaki, Khuroson
III	1000–1500	Hilly	More rainfall (648 mm), cooler, increased erosion	Erosion from deforestation/grazing, uncontrolled drainage	Adequate drainage, downstream protection, water harvesting from road drainage, regreening, slope protection	Shamsiddin Shohin, Muminobod
IV	1500–2000	Foothill	Moderate precipitation (569 mm), cooler, slope instability	Slope instability, erosion, landslides, flooding	Slope stabilization (terracing, retaining walls), reforestation, bioengineering, careful drainage design	(Not explicit, but applies to foothill areas)
V	2000–2500	Mountain	High precipitation (343 mm), cold winters, high landslide/mudflow risk	Floods, landslides, rockfall, temporary lakes, limited land, changing climate	Hydrological road design, safe elevation/distance, tunnels/galleries, embankments, riverbank protection, Irish bridges	Darvoz, Ishkoshim, Roshqala, Vanj, Rushon, Shugnon
VI	2500–3000	High mountain	High precipitation (489 mm), very cold, high snow, permafrost risk	Snow/ice hazards, extreme cold, slope instability, water scarcity	Water/snow retention (protected springs, artificial glaciers), catchment improvement, managed grazing, bioengineering	(Mountain districts at higher altitudes)

VII	>3000	High-mountain-pass	Extreme cold (avg. -16°C coldest month), high precipitation, snow, permafrost	Extreme weather, permafrost, very high slope instability, glacier hazards	Protected/managed springs, artificial glaciers, robust engineering, snow and water retention, catchment improvement	(High mountain passes, e.g., Pamir region)

Database Parameters for District Selection

To ensure an objective and comprehensive selection, we will build a database for each district using the following parameters:

General

- Population
- Urban
- Rural
- Length of roads in different categories
- Road condition
- Area (km2)

Geography

- Elevation & Terrain Type
- Natural Hazard Risk Maps.
- Proximity to Glaciers or GLOF-Prone Lakes

Environment

- Erosion Risk / Land Degradation
    - Soil erosion or land degradation
- Climate Vulnerability Index
    - Includes risks from floods, landslides, glacial lake outbursts (GLOFs), and extreme weather.
- Forest Cover
- Biodiversity Hotspots (including presence of endangered species)
- Air and Water Quality

Infrastructure & Accessibility Parameters

- Road Density and Condition
    - Type of roads
    - Condition of roads.
- Accessibility to Services
    - Distance/time to schools, hospitals, markets — green roads can reduce travel emissions and improve social equity.
- Traffic Volume / Projected Growth.
- Main important assets (industries, hydropower, mines)

Socio-Economic Parameters

- Economic Development Index
- Rural-Urban Migration / Population Pressure
- Agricultural Productivity / Food Security
- Male and female employment (general)
- Male and female employment (roads and transport related)
- Access to services (if possible gender specific)

Governance & Project Readiness

- District Capacity for Implementation
- Road Budgets
- Existing or Planned Investments
- Other green infrastructure or climate adaptation programs.

Approach and Next Steps

By mapping all districts and zones, systematically collecting data across these parameters, and applying a multi-criteria approach that incorporates both quantitative and qualitative factors, we will identify the most representative and suitable districts for deep-dive assessment. Districts will be evaluated based on the geographical coverage of each major zone, population distribution, road network density and condition, and their strategic importance within the national and regional transport system. Additional criteria will include the prevalence of environmental and climate risks, the presence of existing or planned infrastructure and green investments, the readiness and capacity of local governance structures, and—importantly—the potential for roadside tree planting. This last factor may provide an excellent case study for the climate finance concept note to be developed under Task 4.

After compiling and analyzing this data, we will score and rank districts within each zone and finalize the selection in close consultation with the Ministry of Transport and stakeholders. While we recognize that some required information may not be readily available, we will make every effort to gather the best possible data to inform our selection. This targeted approach will ensure that the chosen districts provide a solid and relevant foundation for developing the National Green Roads Guideline for Tajikistan.

7.4. Annex D: Preliminary Stakeholder List

This preliminary stakeholder list (Table 5) provides an overview of the main national and regional stakeholders relevant to green roads, climate adaptation, and infrastructure development in Tajikistan. It summarizes core responsibilities, regulatory roles, and types of permits or authorizations they issue.

The list is preliminary and will be expanded. In the final actor analysis, we will focus on state and non-state roads.

Table 5: Preliminary Stakeholder List.

Stakeholders	Main responsibilities	Relevant Permits/Authorizations
Ministry of Transport	is the central governing body responsible for the development, policy, and regulation of the transport sector. Its key functions include overseeing land transport (including railways and roads), developing transport infrastructure, and ensuring the safe and efficient movement of people and goods. The Ministry also plays a role in international cooperation and the integration of Tajikistan's transport network with global corridors.	
Ministry of Forestry	is the central authority responsible for developing and implementing state policy, regulations, and management in the field of forestry, forest resources, hunting, and protected natural areas. It also oversees economic activities within its system and ensures state control.	
Committee for Environmental Protection under the Government of the Republic of Tajikistan	is the national environmental protection authority and is responsible for the development and implementation of state policy in the field of environmental protection, biological diversity, persistent organic pollutants (POPs), climate change, control over the rational use of natural resources, hydrometeorology and the prevention of causes of emergency situations that negatively affect the environment. It is the National Designated Authority for the Global Climate Fund	Licenses: - on handling hazardous waste, -for handling ODS, - to use plants and animals listed in the Red Book, - for environmental audit. Permission: – permission to emit harmful substances into the atmosphere; - permission to discharge waste water -permit for special water use; – permission to use objects of flora and fauna; – permission to use the forest; – conclusion of the state environmental assessment; – permission for import and export of waste for reuse; – permission to regulate the production, use, destruction and disposal of waste.
Ministry of Energy and Water Resources	is responsible for the implementation of state policy and regulation in the fuel and energy complex and water resources and the coordination of activities in these sectors at	License: On oil and gas production from abandoned wells Permission:

of the Republic of Tajikistan	the level of domestic and international policy. The tasks of the ministry include technical supervision of water and fuel and energy facilities under construction, the development of incentives and activities in the field of renewable energy sources, the implementation of measures to prevent and eliminate emergency situations in the fuel and energy complex and water resources sectors, as well as participation in determining the methodology for calculating tariffs for electricity and heat, natural gas, oil, oil products and water	– permission to connect users to energy networks; – technical report for obtaining a certificate of energy products; – technical report for obtaining permission and technical conditions for carrying out activities in the energy sector.
Ministry of Industry and New Technologies of the Republic of Tajikistan	carries out functions on the implementation of state policy and legal regulation in the spheres of industry, fuel complex and development of new technologies, including the defense industry, mechanical engineering, processing of metals, chemicals, mining ores, building materials, coal, food and processing industries. In addition to other tasks, the Ministry is entrusted with the following functions: technical supervision of industrial facilities under construction; development and approval of technical standards and requirements for industrial products, equipment and materials; prevention and elimination of emergency situations in the industrial complex; rational use of materials and energy in the production of industrial products; increasing the use of local raw materials in production; and handling of radioactive waste	License: - activities related to the extraction of precious metals and precious stones and production of fossil fossils
Ministry of Health and Social Protection of the Republic of Tajikistan State Sanitary and Epidemio-logical Surveillance Service	is the central executive body responsible for implementing state policy in the field of health protection and social protection of the population. Among other tasks, the Ministry approves sanitary norms, rules and hygienic standards. is responsible for supervision in the field of public health: ensuring sanitary and epidemiological safety of the population. The Service also carries out sanitary and epidemiological monitoring, participates in the elimination of epidemics, accidents and natural disasters, supervises the use of sources of ionizing and non-ionizing radiation and carries out accreditation of laboratories whose activities are related to sanitary and hygienic and microbiological research.	License: Permission: – sanitary and epidemiological conclusion; – coordination of methods for the destruction of unauthorized pesticides and pesticides with expired shelf life; – coordination of the repurposing of activities of environmentally harmful facilities; – coordination of projects for scrap and waste reception and storage facilities black and colored metals (reception points) And their equipment;

State Committee on Investments and State Property Management of the Republic of Tajikistan	is the central executive body implementing state policy in the investment sphere, measures to attract investment, management of state property and privatization processes, as well as programs to support entrepreneurship. In addition, it is the authorized state body for public-private partnerships The Committee provides assistance and coordinates external assistance and cooperation of other government bodies with donors.	
Service for State Supervision of Industrial Safety and Mining Supervision under the Government of the Republic of Tajikistan	supervises the activities of legal entities and individuals in the field of accident prevention and ensuring industrial and mining safety, and also carries out geological exploration of the subsoil. Its scope of activities also includes control over chemically hazardous and explosive objects. The service determines the procedure for conducting industrial safety examinations and establishes standards and rules for the use of subsoil.	License: -for activities related to the operation of hazardous facilities - for activities related to conducting industrial safety assessments. Permission: - certificate of registration of hazardous production facilities in the state register; – permission to carry out blasting operations; – permission to connect gas equipment to vehicles; – certificate for the operation of explosives warehouses; – certificate for the purchase of explosive materials; – assignment for the design of mining production facilities; – coordination of the project for the development of a mineral deposit.
Main Directorate of Geology under the Government of the Republic of Tajikistan	is responsible for coordinating work in the field of geological exploration of the subsoil and the rational use of mineral resources. The functions of this body also include exploration of reserves of underground water deposits and issuance of permits for the use of underground water.	License: geological study, including prospecting, evaluation and exploration of mineral deposits and other geological research Permission: – coordination of projects for geological, geophysical and other studies of the subsoil (regional geological survey and geophysical work, search and exploration of mineral deposits, including groundwater).
Ministry of Labor, Migration and Employment of the Republic of Tajikistan		– conclusion on compliance with labor protection requirements during construction, reconstruction of production facilities, machines and mechanisms.

7.5. Annex E: Overview of relevant current policies and guidelines

This annex is an initial overview of relevant laws, policies and programmes relating to this project. We intend to update and expand on this section during the implementation of this assignment.

Policies and guidelines related to roads and transport

The Ministry of Transport of Tajikistan (MOT) operates within a legal framework that includes the Constitution of Tajikistan, various transport laws, and international agreements ratified by the country. Key aspects of this framework include the regulation of road transport, railway transport, and air transport, with the MOT responsible for oversight and enforcement. The most important legal documents are:

- Law of the Republic of Tajikistan "On Transportation": This law forms the foundation for the transport sector, outlining the general principles and regulations for all modes of transport.
- Code of Road Transport of the Republic of Tajikistan: This code specifically addresses road transport, covering aspects like vehicle ownership, land use for transport, and measures to ensure safety and reliability of road transport infrastructure.

At the present time, the Government of the Republic of Tajikistan has also adopted several Resolutions and programs in the Ministry of Transport, including:

- Regulation on the Ministry of Transport of the Republic of Tatarstan dated 6.05. 2011 No. 250
- Rules for the use of motorways in the Republic of Tatarstan dated 05.09.2002 No. 360. These Rules establish the procedure for the use of motorways and road structures in order to ensure road safety, the preservation of roads and structures, as well as the natural environment. The Rules apply to all ministries and departments, organizations, regardless of the form of ownership and citizens, using and carrying out construction, repair, design and research work within the right-of-way and controlled zone of motorways. Without the consent of the road authorities of the Republic of Tajikistan, it is prohibited to perform road landscaping works (except for road authorities);
- State target program for the development of the transport complex of the Republic of Tajikistan until 2025 dated April 1, 2011 No. 165. This program is ensuring environmental safety of transport. An analysis of the situation in the republic as a whole has shown that transport makes a significant contribution to environmental pollution. Its impact is manifested in the pollution of atmospheric air, surface and ground waters and soils. Transport is one of the main sources of noise and thermal pollution of the urban environment. The total gross emission of pollutants by vehicles into the atmosphere is 43.5% of the total emissions in the country. Recently, in order to reduce emissions of harmful substances into the atmosphere with exhaust gases from vehicles, alternative types of motor fuel, primarily compressed natural gas, and various additives to gasoline fuel have been widely introduced
- The Government of Tajikistan pays special attention to the sphere of international cooperation in transport sector: 43 agreements with nine CIS countries and seven countries in Central Asia and Europe, also 27 agreements with 7 international organizations have been signed. The Republic of Tajikistan has joined officially 9 International Conventions and Agreements:
- International Convention for the Coordination of monitoring the transport of goods across borders
- International Convention on road traffic
- International Convention on road signs and signals
- International Convention for the delivery and storage of goods
- International Customs Convention on the Carriage of Goods by TIR Carnet

- European Agreement on the transport and delivery of dangerous goods by road
- An interstate agreement on perishable food and special vehicles for the delivery of such goods
- European Agreement concerning the activities of service vehicles on the international highways
- Agreement on implementation of safety for vehicles and spare parts which are used in them

Policies and guidelines related to forestry

Important laws and regulations and programmes for the Forestry sector are:

- Forest Code of the Republic of Tajikistan
- Regulation on the Forestry Agency under the Government of the Republic of Tatarstan dated 28.02.2014 No. 132
- Forestry Development Program for the Period 2022-2026
- State program for greening the Republic of Tajikistan for the period up to 2040 dated 06/29/2024 No. 374
- The procedure for documenting and formalizing works on afforestation and reforestation , establishing forest protection strips and landscaping of highways. Orders of the Director of the Forestry Agency dated 01.07. 2016. No. 74
- Resolution of the Government of the Republic of Tajikistan dated November 29, 2023 No. 544 On the National Program "Green Country" of the Republic of Tajikistan for 2023-2027"
  The main goal of the program is to reduce the negative impact of human activities on the environment. The project will be carried out in two phases: the first from 2023 to 2025, and the second from 2026 to 2027.
  During the first phase, various trees such as fruit trees, rosehip, sea buckthorn, pine, poplar, white acacia, paulownia, thuja, and saxaul will be planted. For each type of tree, 200 to 275 hectares will be allocated. Rosehip and sea buckthorn will serve not only as decorative plants but also have economic uses. The program reportedly also includes the cultivation of high-quality varieties of walnut, pistachio, plum, and almond using modern breeding methods. More than 181 thousand trees were planted in Tajikistan in the first quarter of 2025. Recently the National Program Green Country - has lost its power; the State Program for Greening the Republic of Tajikistan for the Period up to 2040 is currently being implemented instead, which plans to plant and grow 2 billion seedlings

Policies and guidelines related to Climate change

After signing the Kyoto Protocol of the UNFCCC in 2008, the Paris Agreement in 2016 and the submission of the first nationally determined contribution (NDC), Tajikistan adopted a number of strategic documents, programs and concepts that directly or indirectly define measures to reduce the impact and take adaptation measures to climate change. Some of the policies and strategies worth mentioning are the following:

- National Development Strategy of the Republic of Tajikistan for the period up to 2030 (NDS - 2030). Approved by the resolution of the Majlisi Oli of the Republic of Tatarstan of December 1, 2016, No. 636;
  Adopted in 2016, the NDS outlines four key development goals:
  1. Achieving energy security and efficient electricity use
  2. Ensuring food security
  3. Overcoming geographic isolation and transforming Tajikistan into a regional transit hub
  4. Industrializing the economy, aiming for industry to contribute 22% of GDP by 2030

It emphasizes productive employment, infrastructure development, and access to quality nutrition.

- National Strategy for Adaptation to Climate Change of the Republic of Tajikistan for the period up to 2030 (NSACC). The Resolution of the Government of the Republic of Tajikistan No. 482 was approved on October 2, 2019;
  This is Tajikistan's primary climate strategy aimed at increasing the country's resilience and energy efficiency to support sustainable economic growth and modernization. It integrates long-term climate forecasts into national planning and focuses on key sectors such as:
  - Energy
  - Water resources
  - Transport
  - Agriculture

  It also addresses cross-cutting areas like health, education, gender, youth, migration, environment, and emergency preparedness.
- National Strategy of the Republic of Tajikistan for Disaster Risk Reduction for 2019-2030. Approved by the Decree of the Government of the Republic of Tajikistan on December 29, 2018 No. 602;
- Strategy for the Development of the "Green" Economy in the Republic of Tajikistan for 2023-2037. Approved by the Decree of the Government of the Republic of Tajikistan dated September 30, 2022, No. 482;
- Medium-term development program of the Republic of Tajikistan for 2021-2025. Approved by the Resolution of the Republic of Tajikistan on April 30, 2021, No. 168;
  This program includes specific climate adaptation and environmental protection measures. It encourages gender-sensitive climate indicators and mainstreams adaptation into sectoral policies and plans. It aligns with Tajikistan's Nationally Determined Contribution (NDC).
- Updated Nationally Determined Contribution (NDC), 2021
  Tajikistan's NDC outlines its climate commitments for 2020–2030. It targets reductions in greenhouse gas (GHG) emissions through efforts in:
  - Energy (including transport and efficiency)
  - Industry
  - Agriculture, forestry, and land use (AFOLU)
  - Waste

  Mitigation targets:
  - Unconditional: Cap emissions at 60–70% of 1990 levels (21.32–24.87 $MtCO_2eq$ by 2030)
  - Conditional: Cap at 50–60% with international support (17.76–21.32 $MtCO_2eq$)

  Adaptation focus areas: energy, water, agriculture, forestry, transport, infrastructure, industry, and cross-cutting sectors like education, health, gender, migration, and environment.The NDC Implementation Plan (2022) outlines sector-specific projects and estimates that $1 billion annually is needed to meet the targets.
- National Adaptation Plans (NAPs)
  These have been developed with UNDP support, and aim to establish institutional frameworks and guide adaptation planning. Four key sectors have been prioritized, with responsible agencies identified:
  - Energy: Ministry of Energy and Water Resources
  - Water: Ministry of Energy and Water Resources, Land Reclamation and Irrigation Agency, Hydrometeorology Agency
  - Transport: Ministry of Transport
  - Agriculture: Ministry of Agriculture

- The concept of the transition of the Republic of Tajikistan to sustainable development. Approved by the Decree of the Government of the Republic of Tajikistan dated October 1, 2007, No. 500;
- The Law of the Republic of Tajikistan "On state forecasts, concepts, strategies and programs for the socio-economic development of the Republic of Tajikistan" adopted by the Majlisi Namoyandagon and Majlisi Oli of the Republic of Tajikistan of June 8, 2018, No. 1111;
- Law of the Republic of Tajikistan on regulatory legal acts (as amended by the Law of the Republic of Tajikistan of 19.07.2019 No. 1632, of 23.12.2021 No. 1820);
- Constitutional Law of the Republic of Tajikistan on the Government of the Republic of Tajikistan as amended on 18.07.2017 No. 1455 ;
- Law of the Republic of Tajikistan "On Nature Protection"
- The Law of the Republic of Tajikistan "On Specially Protected Natural Areas" Adopted by the Resolution of the Majlisi namoyandagon Majlisi Oli of the Republic of Tajikistan of November 30, 2011, No. 605

Table 6: Policies, law and guidelines related to Environmental, Health and Safety.

Law	Effective and amended	Responsible agency	Brief description
Environmental Protection Act	August 2, 2011, No.760	The Committee for Environmental Protection and its divisions in the districts	The law defines the legal state principles of environmental protection and is aimed at ensuring sustainable socio-economic development, guaranteeing human rights for a healthy and friendly environment, strengthening law and order, preventing the negative impact of business and other operations on the environment, rational use of natural resources and ensuring environmental safety. Chapter 6 requires an environmental impact assessment, and Chapter 7 specifies requirements for the location, design, construction, reconstruction and commissioning of enterprises, buildings and other facilities.
Environmental Impact Assessment Act	18.07.2017 No.1448	The Committee for Environmental Protection and its divisions in the districts	The law establishes the legal and organizational framework for environmental impact assessment, relations with the state environmental expertise and procedures for registering and classifying the impact of assessment objects on the environment.
Land Code of the Republic of Tajikistan	Entered into force in 1996, amended in 2016	The Committee on Land Management and Geodesy of the Republic of Tajikistan and its subdivisions by districts	Land legislation regulates relations of land use and protection, relations of land ownership associated with the receipt (acquisition) of rights to land use.
Law on specially protected natural areas	Entered into force on 26.12.2011, with amendments in 2014	State institution for specially protected natural forestry areas under the Government of the Republic of Tajikistan and its	The law defines the legal, organizational and economic principles of specially protected natural areas, establishes the purposes, operations and zoning

Law	Effective and amended	Responsible agency	Brief description
		subdivisions in the districts	
Plant Protection Act	Entered into force on 16.04.2012 No. 817	The Committee for Environmental Protection and its divisions in the districts Ministry of Agriculture Forestry Agency under the Government of the Republic of Tajikistan Academy of Sciences	The law defines the legal, organizational and economic principles for the protection of plants and agricultural products from pests, diseases and weeds.
Law on the Protection and Use of Plants	Entered into force on 17.05.2004, with amendments in 2008	The Committee for Environmental Protection and its divisions in the districts Ministry of Agriculture Forestry Agency under the Government of the Republic of Tajikistan Academy of Sciences	The law establishes the state policy of the Republic of Tajikistan on the protection and effective use of plants, defines the legal, economic and social principles of local activities and the targeted conservation and reproduction of plants.
Forest Code of the Republic of Tajikistan	Entered into force on 2.08.2011	Forestry Agency under the Government of the Republic of Tajikistan The Committee for Environmental Protection and its divisions in the districts Ministry of Agriculture	Regulates relations for the protection, ownership, sustainable use and reproduction of forests in Tajikistan. Defines prohibited activities in protected forest zones and their regimes and conditions for the implementation of permitted activities in use zones and their regimes.
Law "On the Preservation and Use of Historical and Cultural Heritage"	Entered into force on 03.03.2006	Ministry of Culture of the Republic of Tajikistan Academy of Sciences of the Republic of Tajikistan Committee for Environmental Protection under the Government of the Republic of Tajikistan Forestry Agency under the Government of the Republic of Tajikistan	The law regulates the legal framework for the preservation and use of historical and cultural heritage sites on the territory of the Republic of Tajikistan and is the national property of the Tajik people.
Law on Subsoil Use	Entered into force on 20.07.1994, with amendments in 2013	Main Department of Geology under the Government of the Republic of Tajikistan Committee for Environmental Protection under the Government of the Republic of Tajikistan	Regulates relations concerning the use and protection of the earth's resources in the interests of present and future generations.
Soil Conservation Act	Entered into force on 16.10.2009	Committee for Environmental Protection under the Government	The law defines the basic principles of state policy, the legal framework of state bodies, individuals and legal entities for the effective

Law	Effective and amended	Responsible agency	Brief description
		of the Republic of Tajikistan Committee on Land Management and Geodesy of the Republic of Tajikistan Ministry of Agriculture	and safe use of soils, maintaining the quality, fertility and protection of soils from negative impacts and regulates the variety of relations related to soil protection.
Water Code	Entered into force on 20.10.2000 with amendments made in 2012	Committee for Environmental Protection under the Government of the Republic of Tajikistan - Ministry of Energy and Water Resources of the Republic of Tajikistan Ministry of Agriculture Head Office of Geology under the Government of the Republic of Tajikistan, Ministry of Health of the Republic of Tajikistan	The objectives of the Water Code of the Republic of Tajikistan are to protect the state water fund and lands of the state water fund, to improve the social condition and environment of the population, to combat water pollution, depletion, prevention and control of adverse effects, to increase and protect water bodies, to strengthen the rule of law and protect the rights of individuals and legal entities in the field of water resources management.
Law on the Protection of Atmospheric Air	Came into force in 1995 and was amended in 2012 Accepted on 28.12.2012	Committee for Environmental Protection under the Government of the Republic of Tajikistan Ministry of Health of the Republic of Tajikistan Hydrometeorological Agency	The law regulates relations between individuals and legal entities, not related to the form of ownership, with the aim of preserving and restoring atmospheric air and ensuring environmental safety.
Health Code of the Republic of Tajikistan	Accepted on 30.05.2017	Ministry of Health of the Republic of Tajikistan	The Code regulates public health relations and is aimed at implementing constitutional rights and protecting the health of citizens. Chapter 17 of the Code ensures sanitary and epidemiological safety
Law on production and consumption waste	Adopted on 10.05.2002, with the latest amendments in 2011	Committee for Environmental Protection under the Government of the Republic of Tajikistan Ministry of Health and Social Protection of the Population of the Republic of Tajikistan State Unitary Enterprise for Municipal Housing and Communal Services of the Republic of Tajikistan	The law regulates relations arising in the process of waste generation, collection, storage, utilization, transportation, decontamination and disposal of waste, as well as state supervision, regulation and control of waste utilization, and to prevent the negative impact of industrial and consumer waste on the environment and human health when handling them, their involvement in economic and industrial turnover as an additional source of reserves.
On the protection of the population	Adopted on 15.07.2007	The Committee for Emergency Situations	The law defines the organizational and legal framework for the protection of the

Law	Effective and amended	Responsible agency	Brief description
and territories from natural and man-made emergencies		and Civil Defense under the Government of the Republic of Tajikistan and its structural divisions	population of the Republic of Tajikistan and stateless persons on the territory of the Republic of Tajikistan, as well as lands, subsoil, water resources, airspace, animals and plants and other natural resources of Tajikistan, industrial and social facilities and the environment from natural and man-made emergencies. Regulates public relations on the prevention, occurrence and development of emergency situations, reduction of losses and damages, elimination of emergency situations and timely notification of the population in hazardous areas about natural and man-made emergencies.
Wildlife Act	Adopted on 05.01.2008	Committee for Environmental Protection under the Government of the Republic of Tajikistan Ministry of Agriculture Academy of Sciences of the Republic of Tajikistan Forestry Agency under the Government of the Republic of Tajikistan	The law regulates public relations in the field of protection, restoration and rational use of wildlife, establishes legal, economic and social frameworks at the local level and is aimed at protecting and restoring wildlife resources.
Labor Protection Law	Adopted on 19.05.2009	Ministry of Labor, Migration and Employment of the Republic of Tajikistan, Ministry of Health of the Republic of Tajikistan	The law establishes the legal framework for labor protection relations between employers and employees and is aimed at creating conditions that meet the requirements of the life of employees and maintaining health during the work process.
Labor Code of the Republic of Tajikistan	Adopted on 23.07.2016	Ministry of Labor, Migration and Employment of the Republic of Tajikistan Ministry of Health of the Republic of Tajikistan	The Code regulates labor and other relations directly aimed at them, the protection of the rights and freedoms of the parties to labor relations, and the provision of minimum guarantees of labor rights and freedoms.
Fire Safety Law	Adopted on 20.04.2008 with amendments made in 2010	Main Directorate of the State Fire Agency of the Ministry of Internal Affairs of the Republic of Tajikistan	The law defines the general legal, economic, social and organizational principles of fire prevention in the Republic of Tajikistan, regulates relations between state bodies, local government bodies, organizations, other legal entities that are not related to the organizational and legal form, as well as between public associations, officials and citizens of the Republic of Tajikistan, foreign citizens and stateless persons.

Table 7: National standards - GOSTs.

No.	National standards - GOSTs
1.	31431—2011, Nature Protection, Atmospheric Air. Maximum Allowable Emissions (MAE), November 29, 2011.
2.	31434—2011, Nature protection, atmospheric air. Determination of efficiency parameters of air cleaning systems from dust. November 29, 2011.
3.	IEC 61241-0—2011, Electrical equipment for use in areas containing combustible dust — Part 0: General requirements. 29 November 2011.
4.	GOST 17.0.0.01-76 (STSEV 1364-78) (in addition to 1987) System of standards for environmental protection and improvement of natural resource use. General provisions.
5.	General Provisions GOST 17.0.0.04-80 (1998) Environmental Protection. Ecological Passport (Certificate) of an Industrial Facility. General Provisions.
6.	GOST RISO 14001-98. Environmental management systems. Requirements and guidelines.
7.	GOST 17.0.0.02-79 (1980). Environmental protection. Provision of metrological control of air, surface water and soil pollution.
8.	GOST 17.1.1.01-77 (STSEV 3544-82). Use and protection of water. General conditions and definitions.
9.	GOST 17.2.1.01-76. Classification of emissions (content).
10.	GOST 12.1.014-84 (1996) SSBT . Air in the area of completed works. Methodology for measuring the concentration of pollutants using indicator tubes.
11.	GOST 12.1.005-88 (1991) SSBT . General sanitary and hygienic requirements for air in the area of completed works.
12.	GOST 17.2.2.05-97. Standards and methods for measuring emissions containing diesel fuel from tractors and self-propelled agricultural machinery.
13.	GOST 21393-75 Diesel vehicles. Analysis of transparency of exhaust gases. Standards and methods of measurements.
14.	GOST 17.2.2.03-77. Carbon monoxide concentration in exhaust gases of vehicles with gasoline engines. Methodology of standards and measurements.
15.	GOST 17.2.2.03-87. Standards and methods for measuring carbon monoxide in exhaust gases of vehicles with gasoline engines.
16.	GOST 17.4.2.01-81. Designations of sanitary parameters of the state.
17.	GOST 17.4.1.02-83. Classification of chemical substances for pollution control purposes.
18.	GOST 12.1.003-83 (1991) SSBT . Noise. General safety requirements.
19.	GOST 12.1.023-80 (1996) SSBT . Noise. Threshold noise level methods for stationary
20.	GOST 12.1.029-80 (1996) SSBT . Means and methods of noise protection. Classification.

21.	GOST 12.1.036-81 (1996) SSBT . Noise. Permissible noise levels in residential and public buildings.
22.	GOST 12.1.007-76 (1999) SSBT . Harmful substances. Classification and general safety requirements.
23.	GOST 12.4.119-82 SSBT . Personal respiratory protective equipment. Methods for assessing protective functions for aerosols.
24.	GOST 12.4.125-83 (1985) SSBT . Collective protection against mechanical factors. Classification.
Sanitary norms and rules (SanPiN)	
25.	SanPiN 2.1.4.559-96 Drinking water. Requirements for the hygiene of water quality from centralized drinking water supply systems. Quality control.
26.	SN 2.2.4 / 2.1.8.562-96 Noise in workplaces, residential and public buildings, as well as in residential areas.

7.6. Annex F: Draft structure of the National Green Roads Guidelines

A draft structure of the National Green Roads Guidelines is presented below:

1. Preface
2. Overall direction – current situation
3. Strengthening decarbonization
    1. Priorities and target
    2. Recommended Measures
    3. Programming
    4. Supporting and enabling framework
4. Climate adaptation
    1. Priorities and target
    2. Recommended Measures
    3. Programming
    4. Supporting and enabling framework
5. Land and water management
    1. Priorities and target
    2. Recommended Measures
    3. Programming
    4. Supporting and enabling framework
6. Pollution control
    1. Priorities and target
    2. Recommended Measures
    3. Programming
    4. Supporting and enabling framework
7. Quality of life
    1. Priorities and target
    2. Recommended Measures
    3. Programming
    4. Supporting and enabling framework
8. Biodiversity
    1. Priorities and target
    2. Recommended Measures
    3. Programming
    4. Supporting and enabling framework
9. Disaster risk reduction
    1. Priorities and target
    2. Recommended Measures
    3. Programming
    4. Supporting and enabling framework
10. Safe sourcing
    1. Priorities and target
    2. Recommended Measures
    3. Programming
    4. Supporting and enabling framework
11. Inclusive growth
    1. Priorities and target

2. Recommended Measures
3. Programming
4. Supporting and enabling framework

12. Follow up

7.7. Annex G: Tajikistan Roadside Forestry and Green Funding

Forestry in Tajikistan

In this section a preliminary assessment is made of the road side forestry sector and the scope for Green Funding. This assessment is to be consolidated in the implementation of the assignment.

The natural environment of Tajikistan's mountainous regions is highly vulnerable to human impact. Even the slightest disruption to the mountain ecosystem can result in disastrous consequences. The most at-risk areas are the mountain-desert landscapes, where the majority of the country's forests are located. Approximately 95% of the country's territory faces an elevated risk of environmental destabilization, primarily due to illegal logging, the intensive development of steep slopes—including forested areas—and overgrazing. Additional environmental risks stem from the vast high-mountain deserts of the Eastern Pamirs and the coastal forests, where wind erosion has intensified in recent years due to deforestation and the destruction of shrublands.

Forestry is a crucial part of Tajikistan's natural resource base and plays an essential role in combating desertification and preserving biodiversity, especially in the context of global climate change. Tajikistan is one of the least forested countries in Central Asia, with only 3% of its land area covered by forests. This equates to just over 0.05 hectares of forest per capita.

V.I. Zapryagaeva identified ten distinct forest regions in Tajikistan: Southern, Kafirnigan-Vakhsh, Gissar, Central, Dangara, West Pamir, Zeravshan, Turkestan, Syr Darya, and Kuramin. Each region is characterized by unique features such as its relief, climate, soil, hydrology, vegetation, and—most notably—the types of forests found there. Forest distribution in Tajikistan is uneven, with the largest forested areas located in the Northern and Central parts of the country. As an ecological system, forests serve a variety of functions and are an irreplaceable resource for environmental conservation.

In Tajikistan, forests primarily fulfill water protection, anti-erosion, coastal protection, sanitary, hygienic, and health-related roles. Based on these functions, forests are categorized as follows:

- Water Protection: Forest strips along rivers, lakes, reservoirs, and other water bodies, including restricted zones that protect the spawning grounds of valuable fish species.
- Protective: Anti-erosion forests, including those on mountain slopes, as well as protective strips along railways and highways. These forests, especially the most valuable areas, play a critical role in environmental protection.
- Sanitary-Hygienic and Health: Urban forests, green spaces around cities and towns, recreational forests, and forests designated for sanitary protection in resort areas.
- Forests in Protected Natural Areas: Forests within reserves, sanctuaries, national parks, and those with scientific, historical, or cultural significance.
- Nut-Growing and Fruit Plantation Forests: Forests dedicated to the cultivation of nuts and fruits.

The country's dendroflora includes 268 species of trees and shrubs. The richest species diversity is found in the xerophilous (drought-resistant) hardwood forests, which host 89 species. Small-leaved forests follow with 57 species, and broad-leaved forests (referred to as "black forests") contain 45 species. Across all forest types, shrubs outnumber trees.

Tajikistan's total forested area spans 1.9 million hectares. Although the Republic of Tajikistan is a sparsely forested country, the role and importance of forest resources are becoming increasingly significant due to global climate change and ongoing social transformations.

To date, over 50,000 landslide-prone areas have been identified across the country, with approximately 1,200 posing a direct threat to populated areas, roads, and infrastructure. The loss of humus—the most valuable component of agricultural soil that determines fertility—is accelerating. Annual soil erosion is estimated at 87 million tons, with humus losses reaching 11–13 million tons per year. Deforestation has intensified erosion in mountainous regions, leading to an increase in mudflows, landslides, and other natural hazards, which in turn cause emergency situations and natural disasters.

While the Government of the Republic of Tajikistan has made significant efforts to restore and promote the sustainable development of forestry, the lack of material and technical resources, along with insufficient funding, continues to exacerbate environmental challenges and increase the severity of associated risks. Forests play a critical role in maintaining ecosystem stability by providing water conservation, climate regulation, and soil protection. The sharp rise in natural disasters such as mudflows and landslides in recent years is closely linked to the degradation of forest resources and a reduction in forested areas. Additional challenges facing the forestry sector include harsh climatic and soil conditions, the remoteness of forest sites, and the complexity of creating forest plantations, which require mechanized support. However, the poor road infrastructure, scattered forest plots, lack of mechanization, and a weak material and technical base hinder the quality and efficiency of forestry work.

Moreover, agricultural authorities have not implemented measures to increase forest cover, improve the productivity of forest plantations, or enhance pasture quality throughout the entire period of managing state forest fund lands. Unregulated livestock grazing, which has continued for nearly 30 years, has led to widespread erosion across these lands.

Institutional Structure

The institutional structure of the forestry sector in Tajikistan comprises several key organizations. The Forestry Agency under the Government of the Republic of Tajikistan is the primary body responsible for managing the state forest fund and implementing national forestry policy. It oversees forest protection, reforestation efforts, and regulates the use of forest resources. The Committee for Environmental Protection also plays a significant role, particularly in managing specially protected natural areas such as nature reserves and national parks.

At the regional level, forests are managed through a network of leskhozes (state forestry enterprises), which are tasked with the local administration, restoration, and protection of forest resources. These institutions carry out reforestation projects, combat illegal logging, and monitor pasture use—ensuring a balance between local community needs and forest conservation.

Additionally, scientific research institutes and educational institutions contribute significantly by conducting studies focused on adapting forests to climate change and by developing innovative methods of sustainable forest management.

Policy and Legal Framework

Annex E provides the overall legal framework in which this project operates. The context relating to forestry is summarized below:

The legislative framework governing Tajikistan's forestry sector is primarily based on the ***Forest Code of the Republic of Tajikistan***, adopted in 2011, and the ***Law on Environmental Protection***, along with a range of

forest management programs. The Forest Code outlines regulations for the use of forest resources, management and control of forest lands, and their protection against degradation.

One of the key strategic documents supporting the sustainable development of the forestry sector is the ***Forestry Sector Development Program for 2022–2026***. This program emphasizes the restoration of forest plantations, enhancement of their biological productivity, and the adoption of modern technologies in forest management.

Tajikistan's forestry policies also include broader initiatives aimed at restoring and protecting forest ecosystems. Notably, the ***National Climate Change Adaptation Strategy***, approved in 2019, includes measures to strengthen forest resilience to climate change, improve water resource management in forested areas, and safeguard biodiversity and ecosystem services. These efforts contribute to increasing the country's adaptive capacity, particularly in protecting forests from wildfires, pests, and other environmental threats.

Green Economy Development Strategy in Tajikistan (2023–2037)

The *Green Economy Development Strategy of Tajikistan for 2023–2037* is a comprehensive, multi-phase plan designed to integrate environmentally sustainable principles across various sectors of the national economy. The strategy is structured into five distinct stages, each with specific goals and implementation measures.

Stages I and II (2023–2025 and 2026–2028) focus on raising awareness of the green economy, promoting environmental education, and fostering eco-conscious thinking. These phases also involve incorporating green economy principles into regulatory frameworks and decision-making processes. Substantial government funding, along with financial support from international development partners, is required during these initial phases.

Stages III and IV (2029–2031 and 2032–2034) emphasize the integration of green economy principles into key economic sectors, including industry, agriculture, transportation, infrastructure, construction, housing and utilities, and tourism. These phases also prioritize the development of institutional capacity and the reduction of greenhouse gas emissions.

Stage V (2035–2037) aims to consolidate the green economy model by ensuring the sustainable use and preservation of natural capital. This final phase also focuses on stimulating investment growth aligned with green economy principles, including the establishment of a growing green investment market.

Roadside Plantation

Green spaces such as the "Right of Way" along roadsides play a vital ecological role in protecting the environment from pollutants generated by road transport—including emissions from trucks, buses, and cars. These green belts act as natural barriers, helping to regulate the spread and concentration of pollutants in the surrounding area. Roadside plantations are generally classified as public green spaces, though they can also be viewed as service plantings due to their functional role. A key aspect of roadside landscaping is its integration with the surrounding natural environment, ensuring both aesthetic appeal and environmental benefit. In addition to enhancing visual appeal and improving sanitary-hygienic conditions, roadside landscaping must also support efficient land use and promote high traffic safety.

Importantly, these green belts serve a protective function—particularly when they are wide enough and composed of gas-resistant tree and shrub species. Effective decorative landscaping should not only involve the planting of new vegetation but also the preservation of existing roadside flora. This helps reinforce the visual and ecological connection between roads and their surrounding environment.

In conclusion, green spaces play a crucial role in human well-being. They absorb dust and toxic gases, contributing to cleaner air and a healthier environment. Beyond their ecological and functional value, the

diversity and beauty of plants bring comfort and enjoyment, positively impacting mental and emotional health.

The road greening initiative in Tajikistan is fully supported by the Government of the Republic of Tajikistan, reflecting its commitment to promoting environmental sustainability and improving the ecological landscape along the nation's roadways.

The **Forestry Agency under the Government of the Republic of Tajikistan** serves as the main implementing partner of the project, under which a **Project Coordination Committee (PCC)** has been established to oversee its activities.

To ensure a reliable supply of planting material, the Forestry Agency manages five large nursery enterprises covering a total of 748 hectares of irrigated land, as well as 42 smaller nurseries occupying 40 hectares. Collectively, these nurseries have the capacity to produce up to 32 million tree and shrub seedlings over a two-year period.

More than 260 species of trees and shrubs are cultivated in these facilities, offering significant biodiversity and flexibility in selecting suitable species for roadside planting across various climatic and geographic zones.

In the final document we will expand on the practical and technical aspects of Roadside plantation. We will address topics such as species selection, planting techniques, nursery and seedling requirements, pest and disease control, costs and benefits – economic analysis and Capacity building and buy-in from government and local communities for a large project funded though green financing instruments.

Financing Opportunities

Green finance is a rapidly expanding segment of the financial market and plays a critical role in transitioning the global economy toward environmentally sustainable development. Achieving this transformation requires substantial financial investment—estimated at an average of 2% of global GDP annually from 2010 to 2050. These investments are essential for modernizing industries, deploying clean technologies, and developing green infrastructure.

In developed countries, green financial instruments—such as green bonds, loans, deposits, mortgages, and insurance—are increasingly common. These tools help mobilize private capital for green investments and enhance the management of climate-related risks. As of 2020, over 80% of global green investments were concentrated in developed nations, with emerging markets and international institutions holding smaller shares.

Key instruments of green finance include:

1. **Green Bonds** – The most established green financing tool, with global issuance growing from $1 billion in 2007 to $1 trillion by 2020. These bonds ensure transparency in the allocation of funds and adherence to environmental standards.
2. **Green Loans** – Issued in accordance with international green lending standards, green loans serve as the foundation for green lending practices in financial markets worldwide.
3. **Green Investment Funds** – Specialized funds that invest exclusively in companies committed to socially responsible and sustainable development practices.

4. **Green Climate Fund and related climate and biodiversity funds -** GCF country program is acceptable for Tajikistan and several projects are already funded. There are no other additional ongoing green funding initiatives so far except for the "Adaptation Fund".