GEF-8 PROJECT IDENTIFICATION FORM (PIF)

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General Project Information

Project Title	
Promoting the Safe and Effective Use of Treated Wastewater and Sludge to Improve Soil Quality, Address Land Degradation, and Mitigate Climate Change	
Region Türkiye	GEF Project ID 11826
Country(ies) Türkiye	Type of Project MSP
GEF Agency(ies): FAO	GEF Agency ID 745569
Executing Partner Ministry of Environment, Urbanization and Climate Change	Executing Partner Type Government
GEF Focal Area (s) Multi Focal Area	Submission Date 10/28/2024
Project Sector (CCM Only) Mixed & Others	
Taxonomy Climate Change Mitigation, Climate Change, Focal Areas, Climate Change Adaptation, Climate resilience, Ecosystem-based Adaptation, Agriculture, Forestry, and Other Land Use, Land Degradation, Sustainable Land Management, Improved Soil and Water Management Techniques, Ecosystem Approach, Restoration and Rehabilitation of Degraded Lands, Influencing models, Strengthen institutional capacity and decision-making, Beneficiaries, Stakeholders, Gender Mainstreaming, Gender Equality, Learning, Capacity, Knowledge and Research	
Type of Trust Fund GET	Project Duration (Months) 48
GEF Project Grant: (a) 1,045,892.00	GEF Project Non-Grant: (b) 0.00
Agency Fee(s) Grant: (c) 99,359.00	Agency Fee(s) Non-Grant (d) 0.00
Total GEF Financing: (a+b+c+d) 1,145,251.00	Total Co-financing 4,800,000.00
PPG Amount: (e) 50,000.00	PPG Agency Fee(s): (f) 4,749.00
PPG total amount: (e+f)	Total GEF Resources: (a+b+c+d+e+f)

54,749.00	1,200,000.00

Project Tags

CBIT: No NGI: No SGP: No Innovation: No

Project Summary

Provide a brief summary description of the project, including: (i) what is the problem and issues to be addressed? (ii) what are the project objectives, and if the project is intended to be transformative, how will this be achieved? iii), how will this be achieved (approach to deliver on objectives), and (iv) what are the GEBs and/or adaptation benefits, and other key expected results. The purpose of the summary is to provide a short, coherent summary for readers. The explanation and justification of the project should be in section B "project description".(max. 250 words, approximately 1/2 page)

1. As the impacts of climate change and land degradation intensify globally, their effects are profoundly felt across diverse regions, including Türkiye. These challenges amplify the scarcity of essential resources such as water, highlighting the imperative need to optimize and conserve every available resource. In Türkiye, faced with escalating water scarcity, enhancing water use efficiency and embracing the reuse of non-conventional water sources have become crucial strategies for sustainable development.

2. This project is strategically designed to address these pressing challenges by focusing on the innovative reuse of treated wastewater and the beneficial application of treated sludge. Aimed at combating land degradation and mitigating climate change, the project integrates nature-based solutions to revitalize degraded lands and enhance the resilience of ecosystems and communities against environmental change. Karapinar in Konya Province, characterized by its arid climate and agriculture-centric economy, has been selected as the pilot site. With its annual rainfall of just 300 mm and a history of groundwater over-extraction leading to environmental issues such as sinkholes, Karapinar exemplifies the urgent need for integrated resource management to support sustainable agricultural practices.

Justification under Climate Change Focal Area:
3. This project is primarily justified under the climate change focal area, particularly aligning with Pillar I: Promote innovation, technology development and transfer, and enabling policies for mitigation options with systemic impacts. It specifically addresses:
- Objective 1.1. Accelerate the efficient use of energy and materials: By utilizing treated wastewater and sludge, the project promotes the efficient use of resources, thus contributing to a circular economy approach. This efficient resource utilization not only conserves water but also reduces the energy and material costs associated with conventional water and fertilizer use in agriculture.
- Objective 1.4. Promote Nature-based Solutions with high mitigation potential: The development of green belts, irrigated and nourished by treated sludge, serves as a pivotal nature-based solution within Karapinar. These green belts are instrumental in moderating urban temperatures and sequestering carbon, thereby contributing significantly to mitigating the urban heat island effect. This approach not only enhances urban biodiversity but also improves the overall quality of urban life.

4. While the project primarily focuses on these climate change objectives, it also contributes to addressing land degradation focal area, under "Objective 3. Address desertification, land degradation, and drought (DLDD) issues, particularly in drylands", and the third approach to build resilience, through "the implementation of drought-smart land management (D-SLM), including croplands, rangelands, dryland forests, and mixed land-uses". The application of treated sludge improves soil quality and fertility, combating land degradation and enhancing agricultural productivity. Furthermore, the strategic creation of green belts not only serves as a mitigation strategy against climate change but also acts as a barrier against land degradation, promoting soil stability and reducing erosion.

Broader Impacts and Co-Benefits:
5. By aligning with Türkiye's Land Degradation Neutrality (LDN) strategy and national goals to enhance water use efficiency, the project underscores the importance of responsible resource management, supporting the sustainable transformation of agricultural production. It reduces environmental pollution through controlled use of fertilizers and improves food security and the socio-economic conditions of local communities. Moreover, by involving local communities in sustainable practices and considering women's involvement and empowerment, the project enhances socio-economic resilience and supports inclusive growth.

6. This integrated approach ensures that the project not only addresses immediate environmental challenges but also sets a sustainable model that can be replicated nationally, demonstrating how innovative and holistic management of natural resources can lead to sustainable agricultural and urban development.

7. To realize these objectives, the project will be implemented through 3 components:

- Component 1: Optimized Reuse of Wastewater and Sludge for Soil Revitalization, Carbon Sequestration and Climate Change Mitigation
- Component 2: Enhancing Urban Climate Resilience through Nature-Based Solutions
- Component 3: Public Awareness, Capacity Building, and Gender-Responsive Approaches to Safe Reuse of Wastewater and Nature-Based Solutions

Indicative Project Overview

Project Objective

Improve soil quality and resilience in the Konya region by safe use of wastewater and application of treated sludge from existing wastewater treatment facility, enhancing carbon sequestration capabilities, contributing to climate change mitigation and advancing Türkiye's Land Degradation Neutrality (LDN) targets.

Project Components

Component 1: Optimized Reuse of Wastewater and Sludge application for Soil Revitalization, Carbon Sequestration and Climate Change Mitigation

Component Type	Trust Fund
Technical Assistance	GET
GEF Project Financing ($)	Co-financing ($)
475,526.00	500,000.00

Outcome:

Outcome 1.1: Improved soil fertility and increased carbon sequestration through the effective reuse of treated wastewater and sludge

Indicators:
1. Soil Health and Carbon Sequestration Monitoring System

2. Scalable models for replication in similar ecosystems

Output:

Output 1.1.1. Completed feasibility study identifying cost-effective fit for purpose wastewater reuse and sludge application strategy

Activity:
Conduct a comprehensive feasibility study on the current wastewater treatment plant's performance, identifying opportunities for technological upgrades to enhance water quality, reduce antimicrobial resistance (AMR) spread, and consider the construction of a biogas digester for energy recovery.

Output 1.1.2. Development of a Soil Health and Carbon Sequestration Monitoring System for wastewater and sludge reuse

Activity:
Applying treated sludge over 70-100 hectares to demonstrate improved soil carbon content and fertility, showcasing how waste materials can be transformed into beneficial resources.

Output 1.1.3. Demonstrated scalable models of sludge and wastewater reuse that can be replicated in similar arid environments, contributing to broader sustainability goals.

Activity:
Establishing the baseline practices in reuse of treated wastewater for productive use and ecological applications

Component 2: Enhancing Urban Climate Resilience through Nature-Based Solutions (green belts) utilizing Treated Sludge and Wastewater

Component Type	Trust Fund
Investment	GET
GEF Project Financing ($)	Co-financing ($)
300,000.00	2,850,000.00

Outcome:

Outcome 2.1: Enhanced urban resilience and soil quality through the development of green belts utilizing treated sludge and wastewater, contributing to cooling effects, improved soil fertility, and the sustainable management of urban ecosystem

Indicators:
70 ha of green belts to demonstrate the benefits of treated sludge and NbSs
Yearly monitoring reports including soil health, carbon sequestration rates, and biodiversity

Output:

Output 2.1.1. Development of Urban Green Belts: Establishing and expanding green belts using climate-resilient plant species to provide shade and reduce ambient temperatures.

Activities:
- Select and prepare pilot sites.
- Apply treated sludge and plant appropriate vegetation (almond trees and forest species).
- Implement Nature Based Solutions (NBS) to improve soil structure and water retention.
- Monitor soil health, carbon sequestration rates, and biodiversity.

This is to stabilize soil, protect against erosion, enhance soil organic matter, fix nitrogen, and filter pollutants.

With the government co-financing there is possibility of increasing the greenbelt to 230 ha according to the capacity of the wwtp.

Design and Plant Green Belts: Select optimal urban areas for green belt development and plant drought-resistant and native species to maximize cooling and ecological benefits.

Establish Riparian Buffers and Agroforestry Systems: Implement natural features that improve urban water management and increase green space.

Monitor Environmental Impact: Continuously assess the impact of green belts on urban temperature and air quality.

These nature-based solutions are instrumental in moderating urban temperatures, thereby mitigating the urban heat island effect and improving air quality.

Component 3: Public Awareness, Capacity Building, and Gender-Responsive Approaches to Safe Reuse of Wastewater and Nature-Based Solutions

Component Type	Trust Fund
Technical Assistance	GET
GEF Project Financing ($)	Co-financing ($)
170,366.00	1,000,000.00

Outcome:

Outcome 3.1:
Enhanced public awareness and capacity for sustainable wastewater and sludge management, including NBS.

Indicators:
1. Knowledge Management Strategy
2. A public awareness campaign that reaches 5,000 farmers (60% women), achieving a 25% improvement in knowledge.
3. A public awareness campaign for students of Karapinar to visit the WWTP as a pilot site
4. Study tour for the WWTP operators and municipality key staff and pioneer farmers

Outcome 3.2: Increased ownership and participation of communities in sustainable development initiatives introduced by the project.

Indicator:
A policy brief based on the review of existing regulations and the results of the project

Output:

Output 3.1.1: Public awareness campaigns and capacity-building workshops.

Output 3.1.2: Gender-responsive strategies for wastewater reuse.

Output 3.1.3: Increased capacity of local stakeholders to implement and maintain sustainable practices effectively

Activities: Training on the benefits and implementation of NBS.

Study tours:

1.CEBAS, Spain (Murcia): Focus on sustainable agricultural practices and water management.

2.Jordan: Focus on water reuse and arid land agriculture.

Output 3.2.1: Community Involvement: enhancing urban quality of life and fostering environmental stewardship.

Before and during the establishment of green belts, the community meetings will be held to consult local people and provide information about the environmental and social benefits of greenbelts.

M&E

Component Type	Trust Fund
	GET
GEF Project Financing ($)	Co-financing ($)
50,000.00	250,000.00

Outcome:

Effective M&E System

Output:

An M&E mechanism to ensure timely achievement of project objectives, with a special focus on the pilot projects. In addition, FAO gender specialist will oversee overall implementation of the activities in line with the Gender Action Plan (GAP).

Component Balances

Project Components	GEF Project Financing ($)	Co-financing ($)
Component 1: Optimized Reuse of Wastewater and Sludge application for Soil Revitalization, Carbon Sequestration and Climate Change Mitigation	475,526.00	500,000.00
Component 2: Enhancing Urban Climate Resilience through Nature-Based Solutions (green belts) utilizing Treated Sludge and Wastewater	300,000.00	2,850,000.00

Component 3: Public Awareness, Capacity Building, and Gender-Responsive Approaches to Safe Reuse of Wastewater and Nature-Based Solutions	170,366.00	1,000,000.00
M&E	50,000.00	250,000.00
Subtotal	**995,892.00**	**4,600,000.00**
Project Management Cost	50,000.00	200,000.00
Total Project Cost ($)	**1,045,892.00**	**4,800,000.00**

Please provide justification

PROJECT OUTLINE

A. PROJECT RATIONALE

Briefly describe the current situation: the global environmental problems and/or climate vulnerabilities that the project will address, the key elements of the system, and underlying drivers of environmental change in the project context, such as population growth, economic development, climate change, sociocultural and political factors, including conflicts, or technological changes. Describe the objective of the project, and the justification for it. (Approximately 3-5 pages) see guidance here

A.1. Global/Regional context

8. Desertification and land degradation is a global issue affecting a population of more than a billion people living worldwide and lead to serious food safety issues in the countries affected. In this regard, the United Nations Convention on Desertification, Land Degradation and Drought was ratified in 1994 in Paris and was introduced in 1996. Türkiye became a signatory to the convention in 1998. In line with membership requirements, Türkiye has undertaken to implement the requirements of the UNCCD convention. This is being done through the implementations within the framework of the Turkish National Action Program to Combat Desertification, which commenced in 2005, and still continues. In line with changing conditions since then, the UNCCD Secretariat issued a “10-year strategy document” covering years 2008 - 2018, to facilitate member states in the implementation of national, regional, and international strategies and action plans. Member states are expected to harmonize their national and regional strategies within the context of this document. In 2013, Directorate General of Combating Desertification and Erosion (ÇEM) embarked on establishment of a national strategy to be harmonized with the UNCCD’s 10-Year strategy document. The national “Strategy to Combat Desertification in Türkiye” was finalized in the same year.

9. Following development of the strategy document, it was agreed to develop an Action Plan, implemented through a project to ensure a participatory approach. The National Strategy and Action Plan to Combat Desertification (2014-2018) was developed with funding provided by the Global Environment Facility (GEF). In 2019, the completion of the implementation period of the current action plan and the publication of the UNCCD's new strategy document (2018-2030), the National Strategy and Action Plan to Combat Desertification (2019-2030) has been developed by taking into account the National Land Degradation Balancing (LDN) targets.

10. Türkiye, being conscious of the fact that climate change is a multi-dimensional and complex challenge which poses serious environmental and socio economic consequences and threatens national security and its range of potential impacts represents one of humanity's most important threats facing future generations; recognizes the importance of international cooperation to reduce greenhouse gas emissions leading to climate change, and to combat climate change. Against this background, Türkiye became a party to the United Nations Framework Convention on Climate Change on 24 May 2004, and developed the "National Climate Change Strategy" in order to contribute to global efforts to reduce the impacts of climate change, taking into account its own special circumstances and capacity. One of the goals of the Strategy is to contribute to global greenhouse gas emission mitigation policies and measures, within its own capacity, by limiting the rate of growth of national greenhouse gas emissions, without disrupting the country's development.

11. Following the announcement of 2053 Net Zero Emission Target, Turkey's first Climate Council was held by the Ministry of Environment, Urbanization and Climate Change in 2022, in order to determine the building blocks of country's long-term road map towards climate change with all stakeholders. In addition, under the title 'Protection of the Environment' in the 12th Development Plan (2024-2028), the preparation and implementation of strategies and action plans to reduce greenhouse gas emissions in order to achieve the goals of the 'Paris Agreement'; as well as developing and announcing the steps to be taken within the scope of adaptation to and combating climate change were also included.

12. On the other hand, the priority reform area that is defined in the Medium Term Program 2024-2026 is as follows: 'In order to realize and maintain the green transformation and the 2053 net zero emission target, planning and implementation tools will be organized to reduce greenhouse gas emissions and adapt to climate change, and to combat climate change. In accordance with this, Climate Change Adaptation Strategy and Action Plan 2024-2030, which determines the vision and strategies and actions until 2030, has been prepared to ensure that people living in Turkey and public and private sector institutions are prepared and adapted to the effects of climate change, become more resilient economically, socially and ecologically and Turkey becomes more sustainable and greener. At the same time, Turkey's Climate Change Mitigation Strategy and Action Plan (2024-2030) was developed. Within the SAP, 49 strategies and 260 actions for 7 main reduction sectors and 2 cross-cutting theme areas were prepared. The basic sectoral strategies of the Action Plan includes "Protecting and increasing sink areas for combatting effectively against climate change and Dissemination of nature-friendly agricultural practices".

13. Following the EU's statement of ambition for being the first climate-neutral continent in 2050 through the European Green Deal (EGD) announced on 11 December 2019; it was decided that all the strategic objectives of the EGD will be integrated to existing and new policies and legislation in line with this long-term goal. As a response to the critical elements of the EGD, an action plan was prepared in Turkiye with the contributions of relevant national institutions to ensure aligning national policies with the European Green Deal, which was published in the Official Gazette dated 16 July 2021 with the Presidential Circular No. 2021/15. This Action Plan will help ensuring sustainable growth and green development of Turkiye in an inclusive way along with maintaining the country's competitiveness and improving country's integration into the transforming global value chains.

14. The European Commission has launched a new EU Soil Strategy, building on the European Green Deal and related EU policies. It will contribute to the objectives of the European Green Deal. As a signatory of the EGD, the strategy presents an opportunity for Turkiye to conserve its lands and soil. The EU soil strategy for 2030 sets out a framework and concrete measures to protect and restore soils, and ensure that they are used sustainably. It sets a vision and objectives to achieve healthy soils by 2050, with concrete actions by 2030. Healthy soils are essential for achieving climate neutrality, a clean and circular economy and halting desertification and land degradation. They are

also essential to reverse biodiversity loss, provide healthy food and safeguard human health. The EU soil strategy aims to ensure that, by 2050:

- all EU soil ecosystems are healthy and more resilient and can therefore continue to provide their crucial services.

- there is no net land take and soil pollution is reduced to levels that are no longer harmful to people's health or ecosystems.

- protecting soils, managing them sustainably and restoring degraded soils is a common standard.

A.2.National Context

A.2.1. Baseline:

15. Considering the possible effects of climate change and associated land degradation/desertification for the Mediterranean basin, where Türkiye is located and increasing population, intensive agricultural activities, water scarcity and industrialization put great pressure on both land and water resources. According to the Desertification Projection Model of Türkiye, 22.5% of the country is highly sensitive to desertification while 50.9% of it is sensitive to medium level desertification [1]. In addition, the use of valuable agricultural lands in urbanization and industrialization and the use of ground water for agricultural purposes, have led farmers to produce in less valuable or marginal agricultural lands and drought and excessive groundwater withdrawal caused collapses and sink holes in the soils.

16. Besides, the increase in the amount of wastewater generated in parallel with the rapid population growth, urbanisation and industrialization, and the increasing number of domestic wastewater treatment plants throughout the country, Turkiye has a great potential for wastewater re-use and recovery that can be used in agriculture. This will also help to increase the quality of degraded soil. Currently, the recovery rate of treated wastewater is 4.2%. However, as stated in the 2019-2023 Strategic Plan of the Ministry of Environment, Urbanization and Climate Change, it is aimed to reuse 5% of urban wastewater until 2023 and 15% by 2030 by applying appropriate treatment technologies. In addition, 22% of the treatment sludge formed in Türkiye has a potential for use in the soil. Land application, specifically in arid regions, offer a huge potential for recycling both sewage sludge and treated wastewater from domestic wastewater treatment plants [2].

17. It has been argued that the linear economy (take-make-use-dispose) shaped by the increasing population, developing industry, and today's production and consumption patterns, is no longer sustainable, and it is replaced by the logic that nothing in nature turns into garbage. A circular economy focused on efficiency has begun to take over. Today, the increasing need for water and energy, and the demand for substances such as nitrogen and phosphorus, especially in agricultural activities, have enabled wastewater treatment plants to be considered both as a source of water, energy and organic matter and plant nutrients, and these treatment plants have started to be operated with a circular economy perspective. The most important component in the operation of wastewater treatment plants within the framework of circular economy principles is treatment sludge. Due to the fact that sewage sludge is rich in organic matter, it is used to obtain energy from methane gas formed as a result of processing in anaerobic digesters, while stabilized sewage sludge, which is another product, is used as a soil improver. Sewage sludge is a valuable resource for reinforcing low nutrient soils. In addition to improving the physical and chemical properties of the soil, it also improves the microelement content, which has an important place in plant production. The increase in organic matter and available phosphorus content of the soil where sewage sludge is applied demonstrates the potential of sewage sludge to be used as a soil improver [3]. When sewage sludge is used in the reclamation of lightly, moderately, and severely eroded soils, both the physical and chemical

properties of the soils are increased by increased water holding capacity, organic carbon and some plant nutrients [4].

18. Several articles have investigated the use of sewage sludge as a soil amendment by determining its impact on soil properties and plant growth. One study focused on sandy loam soil and found that the addition of sewage sludge led to significant changes in soil parameters. Total organic carbon and nitrogen levels improved consistently up to an application rate of 50 tonnes per hectar. Initially, soil microbial properties increased but gradually decreased. While sewage sludge increased the availability of heavy metals, the values remained below contamination thresholds [5]. Another article explored the effects of sludge amendment on the reclamation of coal mining subsidence areas. A mining soil restoration system combining plants, substrates, and microbes, with sludge added to accelerate reclamation, was developed. Over a 10-year period, sludge amendment positively influenced plant growth, microbial activity, and soil stability. Soil organic carbon and glomalin-related soil protein significantly increased, demonstrating the system's effectiveness in early mining soil reclamation and enhancing soil structure and ecosystem function [6]. In the context of coastal mudflat soil, characterized by poor structure, high salinity, low fertility, and limited microbial flora, another article investigated the application of sewage sludge to improve soil properties and rise productivity. The experiment showed that despite increasing electrical conductivity, sewage sludge improved soil fertility. It effectively countered the negative effects of salinity, promoting rice yield, root growth, and activity in waterlogged conditions. This highlights the potential of organic carbon amendment in enhancing plant growth and mitigating salinity effects [7]. The efficacy of sewage sludge-derived biochar as a soil amendment was explored in a different study. Potting experiments were conducted, and the results indicated that a 2% biochar concentration significantly increased biomass yield and improved soil parameters such as aggregate stability and pH. However, there were no significant differences observed in microbial biomass and soil respiration. Further long-term field experiments are necessary to validate the persistent effectiveness of sludge biochar in crop production and soil health [8]. Lastly, an article discussed the use of sewage sludge as a soil amendment, emphasizing the importance of maintaining an equilibrium between agronomic and environmental considerations. With significant pollutant discharges from industrial and urban activities, wastewater treatment plants play a crucial role in preserving the environment. The resulting sludge is commonly used as fertilizer or soil amendment, offering advantages such as improving soil aggregation [9].

19. The use of synthetic nitrogen fertilizers in land improvement is not feasible due to the nitrogen's high solubility and very high volatilisation in arid lands. Thus, the nitrogen needed by plants is given all at once, which causes pollution of groundwaters and/or surface waters. However, most of the nitrogen and phosphorus present in the sewage sludge are mainly chelated to organic matter found in sludge and slowly released. Thus, it is possible to apply the sludge in a single time, which can provide the 1000 kg N/ha value required by the land to be reclaimed. In addition, if treated and aerated; sewage sludge that is used as a soil conditioner is preferred by earthworms as the first priority feed compared to other organic fertilizers, which shows that the degraded soil biology and ecosystem has the potential to improve in a shorter time than other costly applications with treatment sludge application [10]. Furthermore, the calcareous and smectite-rich soils [11] in the area will absorb any heavy metals that may be present, lowering the likelihood that these trace levels of heavy metals will reach the food chain even though the treated waters offer the health-requisite conditions.

20. In the context of sustainable agriculture and environmental stewardship, the safe and optimized use of treated wastewater offers a valuable opportunity. While wastewater can contribute to pollution and the spread of antimicrobial resistance (AMR), strategically managing its application can transform this challenge into a solution. By focusing on wastewater quality and implementing effective risk management strategies, we can significantly mitigate the spread of AMR, turning a potential threat into a resource for agricultural and environmental benefits.

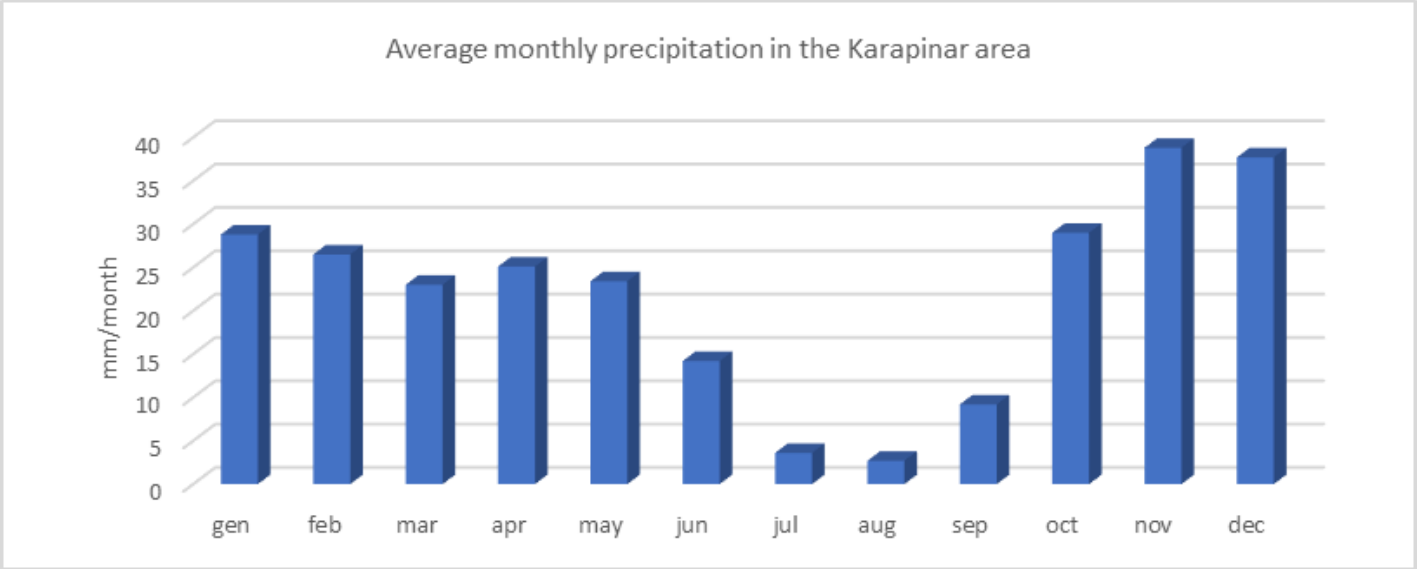
21. Properly treated sewage sludge, rich in essential nutrients like nitrogen, phosphorus, and micronutrients, can provide a sustainable alternative to synthetic fertilizers, supporting a circular economy that repurposes waste for societal and environmental gain. However, it is essential to address the presence of resistant bacteria and emerging pollutants in wastewater. Through rigorous treatment processes and monitoring programs, we can ensure that the use of treated wastewater and sludge in agriculture enhances productivity without exacerbating AMR or soil pollution.

22. Furthermore, enhancing soil quality goes beyond improving soil fertility. A fertile soil can also be a polluted one. Recognizing this, the project will assess the potential accumulation of heavy metals, pathogens, and organic contaminants in soil from sewage sludge and wastewater applications. Addressing the presence of 'new generation' or 'emerging' pollutants, such as pharmaceuticals, personal care products (PPCPs), endocrine-disrupting compounds (EDCs), PFAS, micro-plastics and others, is also a key focus. Our approach will mitigate the environmental and health impacts of these contaminants, ensuring that soil health is improved in a holistic and sustainable manner.

23. Overall, this project aims to not only enhance soil quality and resilience, but also to safeguard environmental health by transforming the way we view and use treated wastewater and sewage sludge in agriculture.

Project Site:

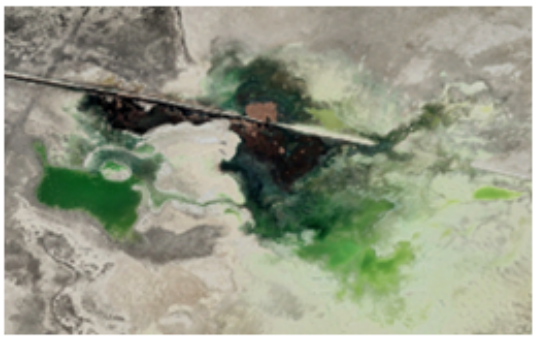
24. The Karapinar area in the province of Konya (Türkiye) is one of the driest areas in the Mediterranean with average rainfall of less than 300 mm/year. Only in the months of October to January does the monthly rainfall exceed 25 mm, while for the rest of the year, rainfall is far below evapotranspiration, making the soil completely dry in the absence of irrigation.



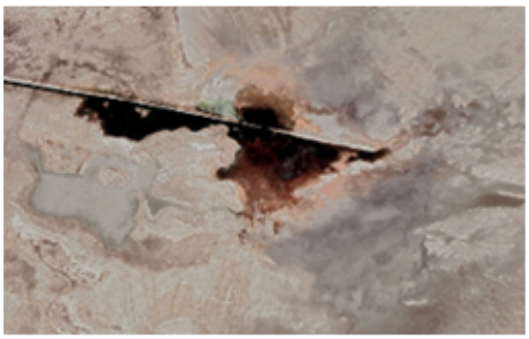
25. The low rainfall combined with the volcanic nature of the soils have resulted in a very severe arid condition with almost no vegetation cover in an area of over 200 km2. For this area, also due to the effects of climate change, we can currently speak of a state of complete desertification with a further loss of fertility and reduction of vegetation cover.

26. The area is home to the new wastewater treatment plant serving the city of Karapinar that went into operation in 2021. Currently, the treated wastewater from the plant is discharged to an artificial canal that also collects stormwater from the town.

27. Treated wastewater and, during rainfall storm water, are uncontrollably dispersed into a degraded area about four kilometers from the outskirts of Karapinar and three kilometers from the sewage treatment plant.



Drainage area in the rainy season



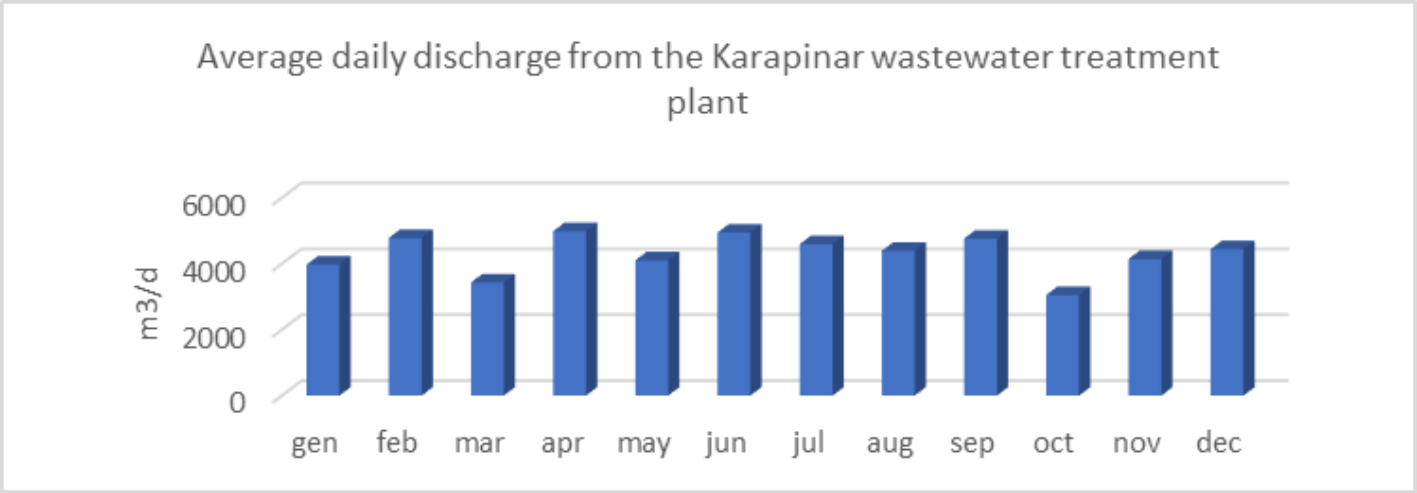
Drainage area in the dry season

28. Treated municipal wastewater currently represents a valuable water resource that is not rationally exploited. However, it should be noted that the water discharged at the current channel (discharge point) is not completely lost. It in fact infiltrates into the ground and feed the water table, which in the area has been severely lowered due to excessive withdrawal for irrigation purposes. The lowering of the water table has also led to the drying up of the small volcanic lake Make.

29. This project proposes to realise a rational use of the sewage treatment plant by-products, water and sludge, to improve soil fertility and support a small agro-forestry ecosystem that can be used by the local community and serve as green belt.

Availability of water and sewage sludge

30. Currently, none of the entire quantity of sewage water and sludge is used and is therefore available for this project. The following figure shows the quantities of water produced monthly.



31. It is noted that the average daily available quantity is 4300 m3/d on an annual basis, while in the dry season, from April to September, it rises to 4630 m3/d. The latter value can be taken as the design data to assess the size of the plant.

32. The purification capacity of the treatment plant is very good, producing water of excellent quality in terms of the content of macro-pollutants, as shown in the table below.

Parameter	Abbreviation	Inflow Concentration	Output Concentration
Biodegradable organic substance	BOD_5	420 mg/l	10 mg/l
Oxidisable organic substance	COD	944 mg/l	33 mg/l
Suspended Solids	SS	264 mg/l	5 mg/l
Ammonia nitrogen	NH_3-N	65 mg/l	5,33 mg/l
Nitritic Nitrogen [12]	NO_3-N	0,8 mg/l	2,85 mg/l
Total phosphorus	Ptot	10,9 mg/l	1,09 mg/l

33. Equally good is the quality of treated water in terms of heavy metal content as follows:

Heavy metals	Mercury (Hg) : <0,005 Zinc (Zn) : 0,169 Copper (Cu) : 0,040 Fluoride (F^-) : 0,420 İron (Fe) : 0,671 Cadmium (Cd) : < 0,010 Total Cyanide (CN-) : < 0,011 Lead (Pb) : < 0,125 Total Chromium : < 0,023 Total Phosphorus (P) : 0,812 Chromium (Cr+6) : < 0,039

34. The water quality is therefore suitable for use in agriculture and, even more so, for renaturation and planting applications for non-food species.

35. Organic residual sludge from sewage operations is also produced at the plant. Given the nature of the treated water, which is predominantly of urban origin, one can be sure that the sludge does not contain pollutants at levels exceeding those required by national directives. Based on the amount of water treated and its organic matter content (BOD5), the quantity of sludge produced can be estimated to be approximately 300-350 t/y as dry matter. This figure can be considered valid for the project.

Project sponsored activities:

36. The project idea consists of the realisation of several coordinated interventions that, also depending on the available resources, will achieve the following objectives:

1. Creation of a new agricultural area for the production of dried fruit plants (almond or hazelnut);
2. Establishment of a vegetation strip (riparian buffer zone) with low-water-consuming tree species to improve the natural environment and combat desertification;
3. Recovery of soil fertility and carbon sequestration capacity of soil through the addition of organic matter from treated sludge.

Hypothetical location of the 70 ha area (in green) and a further 230 ha area (in yellow) assuming reuse of the entire amount of water available at the Karapinar plant.

A.2.2. Associated baseline projects:

37. Türkiye has implemented projects funded by GEF to combat land degradation and climate change. The Country aims to develop tools and mechanisms with BD, CC and SLM benefits. In this regard, Sustainable Land Management and Climate Friendly Agriculture, GCP/TUR/055/GFF Project (GEF

ID 4583) has been implemented in a semi-dry region of country. The project aimed to improve sustainability of agriculture and forest land use management through the distribution and adoption of low-carbon technologies with win-win benefits for land degradation, climate change, and biodiversity conservation, and increase farm profitability and forest productivity as well as reduce rural poverty. The project results contributed to country's effort for combatting CC and LD and conserving BD through its interventions covering innovative approach for rehabilitation of degraded lands, introducing climate friendly agriculture practices and thus mitigating 4,256,675 tCO2e and 10,000 tCO2e methane gas.

38. Another project is Contributing to Land Degradation Neutrality (LDN) Target Setting by Demonstrating the LDN Approach in the Upper Sakarya Basin for Scaling up at National Level, GCP/TUR/065/GFF, (GEF ID 9586). The Project sets out to develop a model for LDN target setting, planning and implementation in the Sakarya basin for upscaling at national level in line with UN Sustainable Development Goals (SDGs) Target 15.3. It takes a phased approach and first strengthen the enabling environment for LDN and multi-sectoral land-use planning processes in Türkiye, followed by development of a Decision Support System (DSS) for LDN that will first be applied in the Sakarya basin in northwestern Türkiye. The final phase involves achieving land degradation neutrality on the ground in the Sakarya basin with associated global benefits related to improved land cover, enhanced soil carbon and enhanced land productivity. The LDN-DSS will be integrated into existing land-use planning and will be upscaled to set targets at the national level.

39. Another related project is “Support to the Promotion of Sustainable Soil Management in the Framework of the Global Soil Partnership. The Global Soil Partnership (GSP)” (FAO reference: GCP/GLO/650/RUS) is aimed to be a unified and authoritative global mechanism specifically focused on soils, in order to coordinate efforts at all levels - global, regional and national - and pool limited resources to guarantee the many contributions of soil resources to food security and key ecosystem services, including climate change adaptation and mitigation now and in the future. Securing healthy soils for a food secure world is the vision of GSP.

40. A follow-up project to the first one, which was funded by the Russian Federation, was called “GSP Global Promoting Sustainable Soil Management in the Framework of the Global Soil Partnership: Phase 2” (FAO Reference: GCP/GLO/853/RUS). This project was built on the results obtained from activities implemented under the project “Support to the promotion of sustainable soil management in the framework of the Global Soil Partnership” and aims to continue activities initiated under Phase I of the project, continue the implementation of activities as part of the core business of the Global Soil Partnership (GSP), as well as implement the emerging priority activities resulting from the increased visibility and action under the GSP. In this Phase II project, activities were implemented in the 13 countries of the Eurasian Soil Partnership: Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Republic of Moldova, Russian Federation, Tajikistan, Turkmenistan, Türkiye, Ukraine, and Uzbekistan as well as at the global level.

41. The third phase of the project, Support to the promotion of sustainable soil management in the framework of the Global Soil Partnership Phase III (FAO Reference: GCP/GLO/772/RUS), is ongoing. The project builds on the achievements of the two previous phases of the project, supporting the promotion of sustainable soil management in the framework of the Global Soil Partnership for the promotion of sustainable soil management (SSM) at national, regional and global levels. The project includes three outcomes focused on: 1) Promoting and implementing SSM in Eurasia through the implementation of the Eurasian Soil Partnership Implementation Plan; 2) Strengthening awareness and advocacy for SSM; and 3) Implementing SSM at national, regional and global levels.

42. Ministry of Environment, Urbanization and Climate Change also carried out the Domestic and Urban Sewage Sludge Management Project between 2010-2013 in order to ensure the management

of domestic and urban treatment sludge. The characterization of the treatment sludges belonging to 28 wastewater treatment plants selected within the scope of the project was determined and as a result of the project, it was decided to use the treatment sludge formed in the Ankara and İzmir wastewater treatment plants in the soil. Following this project, the Project of Sewage Sludge Management and Preparation of the Action Plan in Türkiye was carried out between 2016-2019, the data of the Domestic and Urban Sewage Sludge Management Project was updated, and the constraints in the Regulation on the Use of Domestic and Urban Sewage Sludge in Soil were identified at the scale of Türkiye. Potential treatment sludge usage areas were determined by taking it as an input to the model. However, the Plan has not been officially published and only deals with the management of sewage sludge. According to this Plan, Türkiye has the potential to use only 22% of the sludge to be applied to the soil. With this proposed project, this potential will be evaluated and also use of treated wastewater in desertified areas or the areas prone to desertification will be ensured. For this reason, the area of interest of the project is municipal and food industry treatment sludges and wastewater treatment plants that have the potential to use treatment sludge in the soil and the wastewater is treated according to irrigation water standards.

43. Besides, the activities to be implemented in Karapinar within the scope of the proposed project will strengthen and be a continuation of the sustainable land management practices, such as conservation agriculture, programmed irrigation, establishing farm type biogas systems for manure management and establishing windbreaks to avoid soil erosion, done under the GCP/TUR/055/GFF Project (GEF ID 4583), one of the implementation areas of which is Karapinar. Decision Support System (DSS) for LDN developed by the current FAO project on Contributing to Land Degradation Neutrality (LDN) Target Setting by Demonstrating the LDN Approach in the Upper Sakarya Basin for Scaling up at National Level, GCP/TUR/065/GFF, (GEF ID 9586), will be used in the selection of demonstration sites of the proposed project.

44. In conclusion, the proposed project will contribute to the country efforts that have been made through above initiatives in sustainable land management and soil management, combating desertification, land degradation and drought and it will promote the utilization of treated sludge, struvite and waste water as a tool to eliminate land degradation and combat climate change.

A.2.3. Legal Context

45. The first regulation regarding the use of treatment sludge in the soil in Türkiye is the Soil Pollution Control Regulation, which was issued in 2001. In 2005, it was published in the Official Gazette No. 25831 by ensuring full compliance with the 86/278 EEC directive. Due to the problems experienced in the implementation of the Soil Pollution Control Regulation in 2010, the said regulation became two independent regulations as the Regulation on Soil Pollution Control and Point Source Contaminated Fields and the Regulation on the Use of Domestic and Urban Treatment Sludge in Soil. While preparing the Regulation on the Use of Domestic and Urban Treatment Sludge in Soil, the Working Document on Sludge dated 27 April 2000 was also taken into consideration and the limit values for organic compounds and dioxins in the draft Working Document were added, and the proposed values for heavy metals were accepted. Microbial parameter was also included to regulation against diseases transmission.

46. The history of legal regulations regarding the use of treated wastewater in irrigation in Türkiye is based on the Technical Procedures Communiqué on the Water Pollution Control Regulation, which was published in the Official Gazette dated 7 January 1991 and numbered 20748. The practices regarding the reuse of treated wastewater are carried out within the framework of the Wastewater Treatment Plants Technical Procedures Communiqué, which was published in the Official Gazette dated 20 March 2010 and numbered 27527. Apart from the reuse of treated wastewater as irrigation water by revision of the Communiqué and Annex-7 of the Communiqué, environmental (creation of

wetlands, feeding of wetlands, feeding of surface and groundwater), industrial (process water, cooling water, boiler feed water) and other (general cleaning, fire water, dust control/field irrigation water, urinal and flushing water etc.) regulations were brought into effect after being published in the Official Gazette dated 25.10.2022 and numbered 31994.

47. In addition, one of the targets set for urban infrastructure in the 11th Development Plan of Türkiye, covering the years 2019-2023, is to increase the re-use rate of treated wastewater, and in this context, “basin-based planning for the re-use of treated wastewater, especially for agriculture, and water resources. “Reducing the pressure on people” was determined as a policy and measure.

A.2.4. The baseline in the absence of the project:

48. Preserving the quality of agricultural lands is crucial for environmental and socioeconomic security in economies based on agriculture, especially in extremely vulnerable arid areas. Making all resources available to save and increase water and organic carbon, which are the most crucial elements of soil quality for the sustainability of agriculture and resilience to climate change in dry environments, should be the main goal. In this proposed project, the strategic application of treated sludge and wastewater will enhance the soils' ability to hold both water and organic carbon, strengthening the ecosystem's resistance to the present consequences of climate change and land degradation.

49. With the implementation of the project, the use of treated sludge and wastewater, as a result of increased urbanization, will improve soil quality in degraded lands with low productivity due to climatic, geographic, and administrative (overgrazing, insufficient fertilizer use, etc.) limitations. In accordance with the research, the applied techniques will also aid in enhancing soil organic carbon, which is useful in combatting climate change and reducing land degradation. Therefore, without the project, the soils of the target area face threats from erosion, pollution, the loss of organic carbon, biodiversity, etc., which will lead to desertification as locals try to compensate for yield losses by using more fertilizer and irrigation systems that are more demanding on the environment. Without the project, it would be extremely difficult to accomplish the aims because of the locals' limited financial resources and lack of expertise in this novel field. These shortcomings could be fixed by the project.

A.2.5. Barriers & Project Interventions

50. Several barriers are preventing effective utilization of treated wastewater and sludge including lack of cost effective and innovative strategies and insufficient experience in holistic resource management in combatting climate change and reducing land degradation, a high dependence on agricultural production in the local and national economy that leads to overuse of land and ground water, and a lack of capacities and resources to tackle these issues.

51. Barrier 1: Participatory and integrated implementation approaches have not been institutionalized because there are no practical guidelines/comprehensive strategies and policy framework for how to do so. As a response, under Component 1: “Optimized Reuse of Wastewater and Sludge for Soil Revitalization, Carbon Sequestration and Climate Change Mitigation”; an in-depth socio-economic and feasibility study to identify optimal strategies for using treated wastewater and sludge in agriculture, focusing on potential crops, geographical considerations, and quality and health/risks criteria will be conducted. The Project will also explore how these practices alongside nature-based solutions like agroforestry; contribute to restoring soil organic carbon and achieving LDN, while also offering significant climate change mitigation benefits. Hence, scalable models of sludge and wastewater reuse that can be replicated in similar arid environments will be demonstrated. Besides, a monitoring system will be established to monitor the impact of the practices on soil health and carbon storage, emphasizing the reuse and valorization of waste. Legal framework informed by the

assessment findings, to support sustainable and integrated land and water management practices that contribute to both LDN and climate change mitigation will be developed and refined.

52. Barrier 2: Insufficient experience in the utilization of treated wastewater and treated sludge in combatting climate change/desertification and reducing land degradation; to overcome this barrier, under the project Component 2: "Enhancing Urban Climate Resilience through Nature-Based Solutions"; field activities and pilot projects will be implemented to demonstrate the practical utility and benefits of treated wastewater, sewage sludge, and biogas production in sustainable agriculture, with an emphasis on enhancing soil organic carbon in line with LDN objectives and climate change mitigation. The project will establish riparian buffer zone and implement NBS such as agroforestry, cover cropping, and contour farming to enhance ecosystem services. Hence, it will develop tools to combat land degradation/desertification and drought associated with climate change. In the selection of demonstrations, ecosystem-based land use will be considered.

53. Soil pH, electrical conductivity, organic matter, soil nitrogen, phosphorous, potassium, iron, zinc, copper content analyzed and water holding and carbon sequestration capacity will be determined. Carbon footprint will be created for each practice. Increase in soil organic carbon through pilot projects applying treated wastewater and sludge in agriculture, alongside nature-based solutions like agroforestry, riparian buffer zone, will be documented. The effect of stabilized sewage sludge and treated wastewater rich in nitrogen and phosphorus on agricultural production and therefore its role in climate change resilient production landscapes and sustainable food safety will be determined. How the sustainable reuse of wastewater and sludge, including the incorporation of nature-based solutions positively impacts agricultural productivity in arid regions will be demonstrated. According to the results obtained, the contribution of treated wastes to climate change resilient production landscapes through the improvement of soil carbon sequestration capacity and to the economy of the country at the national scale and to the small-scale farms and family businesses at the local scale will be revealed.

54. The project will also explore the potential of biogas systems under this component. A comprehensive report on the pilot project for biogas production from sludge will be developed.

55. Barrier 3: Lack of awareness in the utilization of treated wastewater, sewage sludge in agriculture for combatting climate change and land degradation. Within the context of Component 3 of the Project: "Public Awareness, Capacity Building, and Gender-Responsive Approaches to Safe Reuse of Wastewater and Nature-Based Solutions"; public awareness and stakeholder capacity on the use of stabilized sludge, and treated wastewater will be increased and cooperation among the related institutions/stakeholders will be strengthened. Understanding among the public and stakeholders will be enhanced by focusing on gender-responsive approaches, regarding the benefits and safety of using treated wastewater and sludge in agriculture, and highlighting the benefits of nature-based solutions for climate change mitigation and LDN.

56. The roles and responsibilities of the institutions will be determined within the scope of the existing authorities and responsibilities, and these roles and responsibilities will be reviewed in line with the legal strengthening recommendations.

57. Trainings will be given to farmers, relevant institutions and organizations regarding the use of treatment sludge and/or treated wastewater in combating desertification and climate change, public awareness will be created by preparing handbooks, brochures, public service announcements and short videos. Investigation visits will be made to selected good practices abroad and where the use of sludge and/or treated wastewater is effectively implemented. Awareness on the subject will be increased by participating in various organizations such as conferences, workshops, seminars, etc.

M&E and Knowledge Sharing Mechanisms:

58. Monitoring and evaluation of progress in achieving project results and objectives will be based on the objectives and indicators set in the Project Logical Framework.

59. All project activities and outputs will be recorded to be shared with the public in different media (eg website, TV documentary, social media, printed materials, posters, brochures, guides, etc.). Various national and international resources will be used in dissemination of activities. The project will benefit from existing operational platforms to disseminate the lessons learned and case studies showcasing successes and challenges in using treated sludge and wastewater.

60. A study tour will be arranged for technical staff of the government and municipality and farmers to visit best practices abroad.

A.2.6. Stakeholder Engagement:

61. The Ministry of Environment, Urbanization and Climate Change (MEUCC) will be the executive agency of the Project. General Directorate of Environmental Management (CYGM) will be the lead institute of the project. General Directorate of Combating Desertification and Erosion will be a project partner.

62. The local unit of MEUCC will execute the project in the pilot site in close cooperation with local municipalities, farmer associations, farmers, and the local unit of relevant project stakeholders. Directorate of Water and Soil Management of Ministry of Environment, Urbanisation, and Climate Change, Ministry of Agriculture and Forestry (MAF), General Directorate of Agricultural Research and Policies (TAGEM), General Directorate of Crop Production (BÜGEM), Konya Metropolitan Municipality and General Directorate of Konya Water and Sewerage Administration (KOSKİ) will be the main stakeholders of the project and will be the members of Project Steering Committee (PSC). Food and Agriculture Organization (FAO) will be the implementing agency of the project. Under the coordination of the Ministry of Environment, Urbanization and Climate Change, strong cooperation with other ministries, universities and non-governmental organizations needs to be developed. This cooperation will make a significant contribution to the removal of drivers of land degradation and climate change.

63. To ensure proper stakeholder engagement, the project's steering committee will include relevant institutions of the Ministry of Environment, Urbanization and Climate Change and Ministry of Agriculture and Forestry and relevant NGOs and private sector organizations. Development of the soil quality and carbon sequestration capacity of soil will be participatory through the involvement of all the stakeholders and relevant parties. Meetings, workshops, discussion platforms and circulation of materials for the wider contribution will be pursued.

64. A participatory stakeholder analysis will be undertaken and a Stakeholder Engagement Plan (SEP) will be developed during the PPG phase using FAO's methodology to identify key, primary and secondary stakeholders with respect to the project's overall objective across national and sub-national scales, and the SEP will ensure the effective participation of all relevant stakeholders in consultations and planning process of the project's implementation.

65. During the PPG phase, experts in social and environmental safeguards will be engaged to develop the details of the Stakeholder Engagement Plan (SEP), Grievance Redress Mechanism (GRM) and Environmental and Social Management Plan (ESMP); which are required documents of the FAO internal screening and clearance processes for the project documents before submission for GEF's approval. An environmental and social assessment will be conducted, and potential risks and impacts will be identified in Project location during the PPG stage. Proposed mitigation measures and strategies to mitigate the identified risks and impacts will be developed and detailed in the Plans. SEP, GRM, ESMP and budget allocated for safeguards implementation and monitoring will be included in the CEO Endorsement request submission.

Institutions/Organizations	Related Units

Ministry of Environment, Urbanization and Climate Change	General Directorate of Environmental Management (CYGM)
	General Directorate of Combating Desertification and Erosion (CEM)
	Directorate of Water and Soil Management
	General Directorate of Spatial Planning (MPGM)
	Environmental Impact Assessment, General Directorate of Authorization and Auditing (CED)
	Directorate General of National Property
Ministry of Agriculture and Forestry (MAF)	General Directorate of Agricultural Research and Policies (TAGEM)
	General Directorate of Crop Production (BÜGEM)
	General Directorate of Agricultural Reform (TRGM)
	General Directorate of Water Management (SYGM)
Universities	
TUBITAK	
FAO	
NGOs	Chamber of Agricultural Engineers (ZMO) Chamber of Environmental Engineers (CMO) Türkiye Union of Chambers of Agriculture Farmers Association Soil Science Society of Turkey
Municipalities	Konya Metropolitan Municipality - Water and Sewerage Administration of Konya (KOSKİ)

A.2.7. GEBs of the Project

66. The project will contribute to global environmental benefits primarily through improved land and soil health by incorporating nature-based solutions to address climate change mitigation goals. Utilization of treated wastewater and stabilized sewage sludge practices in 70-100 ha to demonstrate improved soil carbon content and fertility, showcasing how waste materials can be transformed into beneficial resources will reduce irrigation water demand and secure ecosystem services in the targeted province and surroundings, which will help to reduce the main threats to ecosystem functions and services in Türkiye by reducing land degradation due to soil erosion and deterioration in water retention and carbon sequestration capacity of soil due to climate change, poor agricultural practices, using inorganic fertilizer, and uncontrolled use of water resources. The development of green belts in 230 ha, irrigated and nourished by treated sludge, serves as a pivotal nature-based solution within Karapinar. These green belts are instrumental in moderating urban temperatures and sequestering

carbon, thereby contributing significantly to mitigating the urban heat island effect. This approach not only enhances urban biodiversity but also improves the overall quality of urban life.

67. While the project primarily focuses on these climate change objectives, and total 94,864 tCO2 e will be mitigated through establishment greenbelts/agroforestry systems by applying treated wastewater and sledge. It also contributes to addressing land degradation under the broader theme of environmental sustainability. The application of treated sludge improves soil quality and fertility, combating land degradation and enhancing agricultural productivity. Furthermore, the strategic creation of green belts not only serves as a mitigation strategy against climate change but also acts as a barrier against land degradation, promoting soil stability and reducing erosion.

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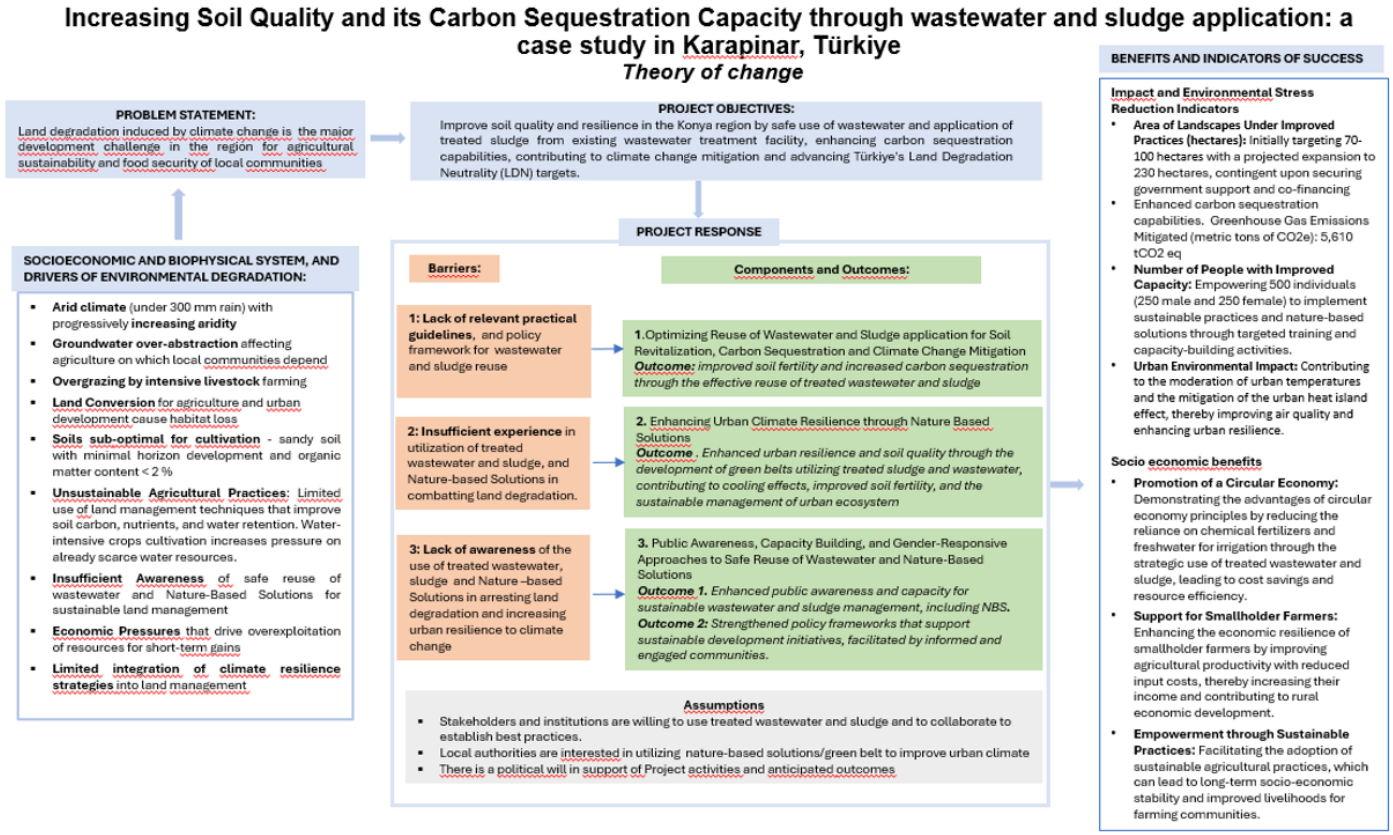
B. PROJECT DESCRIPTION

Project description

This section asks for a theory of change as part of a joined-up description of the project as a whole. The project description is expected to cover the key elements of good project design in an integrated way. It is also expected to meet the GEF's policy requirements on gender, stakeholders, private sector, and knowledge management and learning (see section D). This section should be a narrative that reads like a joined-up story and not independent elements that answer the guiding questions contained in the PIF guidance document. (Approximately 3-5 pages) see guidance here

68. Due to the arid climate and shortage of nutrients, particularly nitrogen, in the project region, biomass production in agricultural and grazing areas is low. The amount of organic matter in the soils is likewise low as a result of the removal of all biomass from the produced area by harvesting and grazing. The ability of soils to store water is significantly impacted by low levels of organic matter. To break this vicious cycle, the usage of treated sludge and wastewater rich in phosphorus and nitrogen is thought to have a high potential in the local environment. In addition to all these incentives, the project will offer an excellent case study for the circular economy by reducing the usage of chemical fertilizers and irrigation in agricultural areas through the use of recycled sludge and water.



69. Given that the project's core pillars are the circular economy, socioeconomic benefits and combating against climate change and land degradation, the project stands out by advancing carbon sequestration, which is the primary tool in the global fight against climate change through its mitigation. Because arid environment and soil fertility constraints in target locations have a detrimental impact on organic carbon and water retention, and thus yield, they contribute to shortcomings in the fight against climate change. The use of treated sludge and wastewater to increase soil organic carbon, water retention, and productivity threatened by land degradation

will help to develop the target group's capacity to adapt to climate change, who used to have few options against land degradation. Thus, applications should be made in wide areas to attain these goals to a noticeable degree. In this scenario, accessing the target participants and land application dimension is only conceivable with GEF funding support. It is quite impossible for the locals to implement the planned project on this scale and scope with their own funds.

70. Farmers and livestock producers, who are the project's primary beneficiaries, frequently complain about the project area's poor agricultural and pasture productivity due to the climate and soil constraints. The practice of using excessive chemical fertilization, irrigation, and grazing to maintain their revenue owing to diminishing yields results in mismanagement and depletion of natural resources. The fact that the project trials will be conducted directly on the lands of the farmers, with their own experiences, will strengthen the farmers' perception of ownership of the project. Organic matter and water management strategies have a positive impact on the yield of croplands and pasturelands, according to the FAO's prior experiences. Farmers would benefit financially from enhanced productivity in this project since the use of treated sludge and wastewater will rapidly improve biomass production in degraded pastures and agricultural areas. In addition, the project's environmental and financial advantages will be demonstrated through illustrating to the farmers the gains in soil quality and water content before and after application through soil analysis.

71. In the project region, it is uncommon to use land management techniques that are designed to improve soil organic carbon, nutrients, and water retention, which not only increase productivity but also assist in fighting against climate change mitigation and land degradation; also boosting soil biodiversity and ecosystem services. The communities are producing more sewage sludges and water as a result of the growing population. When these resources are processed in a way that does not harm human or environmental health; they are beneficial materials for circular economy approach. Demonstrating the use of these resources as organic carbon, plant nutrients, and water sources in the region's agricultural and pasture lands will show that low levels of organic carbon and water, which constrain agricultural and animal production in the area, can be improved through the use of local sources. Due to the deployment of the applications in the farmers' fields and in the pastures of the settlement areas, the farmers will be able to see the benefits firsthand by observing the procedure in action. The stakeholders will readily accept the application of treated sludge and wastewater since they can get them for a lot more affordable price than chemical fertilizers and irrigation, and also the justifications for these gains will be shown during the trainings during the project. Within the scope of the project, the lessons learned from the use of treated sludge and wastewater in degraded areas will be applied to other arid and semi-arid areas of the country, and the use of treated water will improve the soil quality, which is low in organic carbon, plant nutrient elements, and freshwater resources. As a result, the land's above-ground and underground biomass will help to establish robust soils in the fight against climate change mitigation.

72. The project will conduct assessments to identify the most effective strategies for utilizing treated wastewater and sludge in agriculture considering the potential of nature-based solutions for enhancing ecosystem resilience and carbon sequestration. Based on these assessments, the current National Action Plan will be reformulated that outlines the optimal use of treated wastewater and sludge in agriculture incorporating nature-based solutions to address both climate change and LDN mitigation goals.

73. Based on the findings of assessments made in the demonstration sites, the recommendations, scalable model/s and strategies will be developed to scale up the project results at national and regional levels. Moreover, policy frameworks that support sustainable development initiatives, facilitated by informed and engaged communities are strengthened and the capacity of relevant stakeholders to implement and maintain sustainable practices effectively will be increased.

B.1.Project Overview:

74. The GEF’s incremental funding and co-financing resources will be used to overcome the identified barriers to reduce vulnerability from climate change and land degradation in degraded arid lands that resulted from land

management practices that are not designed to improve soil organic carbon, nutrients, and water retention from the past to date.

75. The project's theory of change is underpinned by the desired intermediate state of enhancing the resilience of ecosystems and communities against environmental change through (a) developing innovative strategies and strengthening legal and policy framework for the utilization of treated sludge and wastewater that contribute to both climate change mitigation and LD goals (b) Increasing organic matter content, water storage and carbon sequestration capacity of soil by using stabilized organic matter-rich treated sludge and wastewater by applying nature-based solutions. (c) increasing public awareness and stakeholder capacity on the reuse of treated sludge and wastewater and NBSs in combating Climate Change and land degradation at national, regional and local levels with gender responsive approach.

76. In this regard the project seeks to deliver intended outcomes under three interlinked project components that will contribute to the desired intermediate state and ultimately the desired impacts of improved and healthy, resilient, and productive ecosystems towards improved livelihoods and well-being and expanded global environmental benefits. Technical assistance under Component 1 will realize the outcome of Enhanced soil fertility and increased carbon sequestration through the effective reuse of treated wastewater and sludge, demonstrating the principles of the circular economy by converting waste into valuable resources that contribute to climate change mitigation and soil health. Investment under Component 2 will realize the outcome, cooling of Karapınar city and enhanced urban livability through the development of green belts, technical assistance under Component 3 will realize the outcomes of Enhanced public awareness and capacity for sustainable wastewater and sludge management, including NBS and Strengthened policy frameworks that support sustainable development initiatives, facilitated by informed and engaged communities. These approaches will be tested in erosion vulnerable and the driest region Karapinar province of Konya Closed Basin, which is receiving the lowest precipitation located semi-arid region of Central Anatolia of Türkiye across three components detailed below.

77. Component 1: Optimized Reuse of Wastewater and Sludge for Soil Revitalization, Carbon Sequestration and Climate Change Mitigation:
Under Component 1, a comprehensive feasibility study will be conducted on the current wastewater treatment plant's performance, including opportunities for technological upgrades to enhance water quality, reduce antimicrobial resistance (AMR) spread, and consider the construction of a biogas digester for energy recovery. An application site will be selected around 70-100 ha and treated sludge will be applied to demonstrate improved soil carbon content and fertility and showcasing how waste materials can be transformed into beneficial resources. Hence scalable models of sludge and wastewater reuse that can be replicated in similar arid environments, contributing to broader sustainability goals will be developed to reinforce the circular economy by maximizing resource efficiency and reducing the environmental footprint. Moreover, a Soil Health and Carbon Sequestration Monitoring System will be established to monitor the impact of sludge application on soil health and carbon storage, emphasizing the reuse and valorization of waste. The project will involve regular testing of soil carbon, nitrogen, phosphorus, and water retention capacity, with data collection occurring before and after the application of amendments. This process will establish baselines and track progress, ensuring that the selected lands demonstrate significant improvements in soil health and sustainability outcomes. The collected soil samples will be analyzed in the soil laboratories of MEUCC and MAF. Furthermore, a comprehensive report on the pilot project for biogas production from sludge, detailing its feasibility, potential for sustainable energy resource development, and requirements for co-financing and government support will be developed.

78. Component 2: Enhancing Urban Climate Resilience through Nature-Based Solutions:
Within the scope of this component:
The field activities and pilot projects applying treated wastewater and sludge in agriculture, alongside nature-based solutions like establishing riparian buffer zone, agroforestry to stabilize soil, protect against erosion,

enhance soil organic matter, fix nitrogen, and filter pollutants and dust and establishing green belt to provide shade and reduce ambient temperatures.
The impact of riparian buffer zone, agroforestry and greenbelt on soil health, carbon sequestration rates, biodiversity and urban temperature and air quality will be continuously monitored and assessed.

79. Component 3: Public Awareness, Capacity Building, and Gender-Responsive Approaches to Safe Reuse of Wastewater and Nature-Based Solutions:
Public Awareness and Institutional Cooperation, within the context of Component 3 of the Project: Understanding among the public and stakeholders, focusing on regarding the benefits and safety of using treated wastewater and sludge in agriculture , gender-responsive approaches and highlighting the benefits of nature-based solutions for climate change mitigation and LDN will be enhanced.

80. The project will build capacity among stakeholders with the delivery of workshops, training, seminars related to utilization of treated waste water and sludge management to combat land degradation/desertification and climate change. A Communication Plan will be developed to craft clear messaging, to increase stakeholder awareness of the utilization of the products of treatment plants and NBSs in combatting climate change and land degradation issues that are being addressed by the project. The project will build its profile in alignment with global and regional agendas, notably the Sustainable Development Goals, the UN CC Mitigation, Land Degradation Neutrality and, EU Green Deal.

81. Trainings will be given to farmers, relevant institutions and organizations regarding the use of treatment sludge, treated wastewater and NBSs in combating climate change and land degradation, public awareness will be created by preparing handbooks, brochures, public service announcements and short videos. Investigation visits will be made to selected good practices abroad and where the use of sludge and/or treated wastewater through NBSs is effectively implemented. Public awarness campaign will be conducted for farmers and students in the project sites. Awareness on the subject will be increased by participating in various national and international organizations such as conferences, workshops, seminars, etc.

82. The results of the project such as savings of farmers in comparison to synthetic fertilizer use and saved water volume compared to conventional irrigation practices will be used in the training materials and sahered with stakeholders through the workshops, project videos, trainings etc.

83. The roles and responsibilities of the institutions will be determined within the scope of the existing authorities and responsibilities, and these roles and responsibilities will be reviewed in line with the legal strengthening recommendations.

B2: M&E and Knowledge Sharing Mechanisms:

84. Monitoring and evaluation of progress in achieving project results and objectives will be based on the objectives and indicators set in the Project Logical Framework.

85. A knowledge management strategy and plan will define how all the project outputs and learning from implementation will be captured and organized so that they are easily accessible by beneficiaries and users. The KM Plan will detail recommendations for sustainability and replication of results for follow-on and related initiatives. Awareness products will be developed in support of all components of the project (the number and diversity of the products will be defined during the PPG phase). All project activities and outputs will be recorded to be shared with the public in different media (eg website, TV documentary, social media, printed materials, posters, brochures, guides, etc.). Various national and international resources will be used in dissemination activities. The project will benefit from existing operational platforms to disseminate the lessons learned and good practices. Two Study tours study tour for the WWTP operators and municipality key staff and

pioneer farmers focusing on sustainable agricultural practices, water management, water reuse and arid land agriculture will be arranged to visit best practices according to availability of the budget.

Coordination and Cooperation with Ongoing Initiatives and Project.

Does the GEF Agency expect to play an execution role on this project?

If so, please describe that role here. Also, please add a short explanation to describe cooperation with ongoing initiatives and projects, including potential for co-location and/or sharing of expertise/staffing

Core Indicators

Indicator 4 Area of landscapes under improved practices (hectares; excluding protected areas)

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)
230	0	0	0

Indicator 4.1 Area of landscapes under improved management to benefit biodiversity (hectares, qualitative assessment, non-certified)

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)
230.00			

Indicator 4.2 Area of landscapes under third-party certification incorporating biodiversity considerations

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)

Type/Name of Third Party Certification

Indicator 4.3 Area of landscapes under sustainable land management in production systems

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)

Indicator 4.4 Area of High Conservation Value or other forest loss avoided

Disaggregation Type	Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)

Indicator 4.5 Terrestrial OECMs supported

Name of the OECMs	WDPA-ID	Total Ha (Expected at PIF)	Total Ha (Expected at CEO Endorsement)	Total Ha (Achieved at MTR)	Total Ha (Achieved at TE)

Documents (Document(s) that justifies the HCVF)

Title

Indicator 6 Greenhouse Gas Emissions Mitigated

Total Target Benefit	(At PIF)	(At CEO Endorsement)	(Achieved at MTR)	(Achieved at TE)
Expected metric tons of CO_2e (direct)	94864	0	0	0
Expected metric tons of CO_2e (indirect)	0	0	0	0

Indicator 6.1 Carbon Sequestered or Emissions Avoided in the AFOLU (Agriculture, Forestry and Other Land Use) sector

Total Target Benefit	(At PIF)	(At CEO Endorsement)	(Achieved at MTR)	(Achieved at TE)
Expected metric tons of CO_2e (direct)	94,864			
Expected metric tons of CO_2e (indirect)				
Anticipated start year of accounting				
Duration of accounting				

Indicator 6.2 Emissions Avoided Outside AFOLU (Agriculture, Forestry and Other Land Use) Sector

Total Target Benefit	(At PIF)	(At CEO Endorsement)	(Achieved at MTR)	(Achieved at TE)
Expected metric tons of CO_2e (direct)				
Expected metric tons of CO_2e (indirect)				
Anticipated start year of accounting				
Duration of accounting				

Indicator 6.3 Energy Saved (Use this sub-indicator in addition to the sub-indicator 6.2 if applicable)

Total Target Benefit	Energy (MJ) (At PIF)	Energy (MJ) (At CEO Endorsement)	Energy (MJ) (Achieved at MTR)	Energy (MJ) (Achieved at TE)
Target Energy Saved (MJ)				

Indicator 6.4 Increase in Installed Renewable Energy Capacity per Technology (Use this sub-indicator in addition to the sub-indicator 6.2 if applicable)

Technology	Capacity (MW) (Expected at PIF)	Capacity (MW) (Expected at CEO Endorsement)	Capacity (MW) (Achieved at MTR)	Capacity (MW) (Achieved at TE)

Indicator 9 Chemicals of global concern and their waste reduced

Metric Tons (Expected at PIF)	Metric Tons (Expected at CEO Endorsement)	Metric Tons (Achieved at MTR)	Metric Tons (Achieved at TE)
0.00	0.00	0.00	0.00

Indicator 9.1 Solid and liquid Persistent Organic Pollutants (POPs) removed or disposed (POPs type)

POPs type	Metric Tons (Expected at PIF)	Metric Tons (Expected at CEO Endorsement)	Metric Tons (Achieved at MTR)	Metric Tons (Achieved at TE)

Indicator 9.2 Quantity of mercury reduced (metric tons)

Metric Tons (Expected at PIF)	Metric Tons (Expected at CEO Endorsement)	Metric Tons (Achieved at MTR)	Metric Tons (Achieved at TE)

Indicator 9.3 Hydrochloroflurocarbons (HCFC) Reduced/Phased out (metric tons)

Metric Tons (Expected at PIF)	Metric Tons (Expected at CEO Endorsement)	Metric Tons (Achieved at MTR)	Metric Tons (Achieved at TE)

Indicator 9.4 Number of countries with legislation and policy implemented to control chemicals and waste (Use this sub-indicator in addition to one of the sub-indicators 9.1, 9.2 and 9.3 if applicable)

Number (Expected at PIF)	Number (Expected at CEO Endorsement)	Number (Achieved at MTR)	Number (Achieved at TE)

Indicator 9.5 Number of low-chemical/non-chemical systems implemented, particularly in food production, manufacturing and cities (Use this sub-indicator in addition to one of the sub-indicators 9.1, 9.2 and 9.3 if applicable)

Number (Expected at PIF)	Number (Expected at CEO Endorsement)	Number (Achieved at MTR)	Number (Achieved at TE)
1			

Indicator 9.6 POPs/Mercury containing materials and products directly avoided

Metric Tons (Expected at PIF)	Metric Tons (Expected at CEO Endorsement)	Metric Tons (Achieved at MTR)	Metric Tons (Achieved at TE)

Indicator 9.7 Highly Hazardous Pesticides eliminated

Metric Tons (Expected at PIF)	Metric Tons (Expected at CEO Endorsement)	Metric Tons (Achieved at MTR)	Metric Tons (Achieved at TE)

Indicator 9.8 Avoided residual plastic waste

Metric Tons (Expected at PIF)	Metric Tons (Expected at CEO Endorsement)	Metric Tons (Achieved at MTR)	Metric Tons (Achieved at TE)

Indicator 11 People benefiting from GEF-financed investments

	Number (Expected at PIF)	Number (Expected at CEO Endorsement)	Number (Achieved at MTR)	Number (Achieved at TE)
Female	250			
Male	250			
Total	**500**	**0**	0	**0**

Explain the methodological approach and underlying logic to justify target levels for Core and Sub-Indicators (max. 250 words, approximately 1/2 page)

The project is designed to enhance the organic matter content, water retention, and carbon sequestration capacity of degraded soil through the application of stabilized organic matter-rich sewage sludge, and/or treated wastewater. The full scope of the project targets 230 hectares, with an initial focus on treating 70 hectares during the project's duration, aiming to scale up to the entire 230 hectares with government support and co-financing. Accordingly, the estimation of GHG emissions with EX-ACT for a 70 ha agroforestry and 160 ha greenbelt establishment is a total of 94864 tCO2 e in total for 20 years period (starting from 2026, 4 years implementation and 16 years capitalization phase). The figure will be re-assessed during the PPG phase.

Core Indicator: Soil Organic Matter (SOM) Increase

The target of 230 hectares was determined through a comprehensive analysis of the capacity of the existing wastewater treatment plant (WWTP), the current level of wastewater treatment, and the quantity of stabilized sludge available. Additionally, the availability of suitable land and its current soil quality were taken into account. This detailed evaluation ensured that the selected area could be effectively treated with the available resources, maximizing the benefits in terms of SOM increase, which directly correlates with improved soil structure, fertility, and water retention. The initial 70 hectares will serve as a pilot phase, demonstrating the project's effectiveness and providing a foundation for scaling up to the full 230 hectares, based on the full capacity of the existing WWTP.

Sub-Indicators: Water Retention Capacity and Nutrient Content

Water retention capacity and nutrient content (nitrogen and phosphorus) in the soil will be key indicators to monitor the improvements. The target levels for these sub-indicators are based on benchmarks from similar interventions, considering the specific characteristics of the selected lands in the vicinity of the WWTP, including current soil degradation levels and expected improvements from the application of treated wastewater and organic amendments. The application of treated wastewater and sludge will also be reducing the need for application of chemical inputs; as the nutrient levels of the soil will be increased through organic inputs. This will create a system of usage of non-chemical materials that will contribute to the lowering the amount of chemical materials that are applied during the utilization and management of the ecosystems; contributing to the GEF Core Indicator 9.5 on "Low-chemical/non-chemical systems implemented particularly in food production, manufacturing and cities".

Monitoring and Evaluation:

The project will involve regular testing of soil carbon, nitrogen, phosphorus, and water retention capacity, with data collection occurring before and after the application of amendments. This process will establish baselines and track progress, ensuring that the selected lands demonstrate significant improvements in soil health and sustainability outcomes. This methodical approach guarantees that the project targets are not only realistic but also scientifically justified based on the capacity of the WWTP, land availability, and the specific needs of the degraded soils.

The number of direct beneficiaries was calculated considering the number of persons who will receive benefits and support from the activities of the project as follows:

Total of 500 persons at least 30% of women receiving training as a result of the capacity-building activities:

250 people (150 central, 100 local staff at least 30% women) receiving training on utilization of treated wastewater/sludge and r to combat land degradation/desertification and climate change.

200 farmers and 50 herd owners receiving support at least 30% women.

This number adds up to a total of 500 beneficiaries (150 female, 350 male). During PPG, this calculation will be further refined and confirmed.

Key Risks

	Rating	Explanation of risk and mitigation measures
CONTEXT		
Climate	Low	Although the project site is the driest province of the Basin, the utilization of treated wastewater in the demonstration sites will provide a tool to combat the effect of climate change.
Environmental and Social	Moderate	The use of treated wastewater in the agricultural systems might not be acceptable to the farmers, however, the project will build the capacity of the farmers in the utilization of treated water.
Political and Governance	Low	All relevant stakeholders will be effectively participating through the implementation process and the roles and responsibility of the stakeholders will be clearly identified during the PPG stage to ensure continued support and the project will develop coordination mechanism among the related institutions and improve the capacity of the government staff, which will provide an enabling environment for governance.
INNOVATION		
Institutional and Policy	Low	As the project will develop coordination mechanism among the related institutions and improve the capacity of the government staff, it will provide an enabling environment for developing strategies and policies during and after the project life time.
Technological	Low	The likelihood of malfunctions in existing technologies in wastewater treatment plant and, as a result, the decrease in wastewater quality is considered low. The wastewater is regularly monitored through laboratory analyses.
Financial and Business Model	Moderate	Due to economic fluctuation and inflation in Türkiye, there may be instability for demonstration inputs and equipment. Costly procurements will be planned in the earlier stages of the project.
EXECUTION		
Capacity	Low	The project executing partner is the focal point of UNCCD, UNFCCC and has experience in the Project field.
Fiduciary	Low	The financial management of the project and procurement will be monitored through GEF & FAO relevant procedures/policies by FAO.

Stakeholder	Low	All relevant stakeholders will be involved in the project design, preparation and implementation and their responsibilities will be identified under the project component 3.
Other	Low	As project partner, the ministry has experience in the project field and as implementing agency FAO has experience in the technical design of the GEF Projects.
Overall Risk Rating	Low	Treated wastewater is included as an alternative water resource in the drought strategies and action plans developed by institutions responsible for water management in Türkiye for arid and semi-arid areas. Municipalities that undertake the management of wastewater treatment facilities also support farmers' use of treated wastewater. Therefore, it is anticipated that the project's acceptability/ownership and impact will be high for both public stakeholders and farmers.

C. ALIGNMENT WITH GEF-8 PROGRAMMING STRATEGIES AND COUNTRY/REGIONAL PRIORITIES

Describe how the proposed interventions are aligned with GEF- 8 programming strategies and country and regional priorities, including how these country strategies and plans relate to the multilateral environmental agreements.

Confirm if any country policies that might contradict with intended outcomes of the project have been identified, and how the project will address this.

For projects aiming to generate biodiversity benefits (regardless of what the source of the resources is - i.e., BD, CC or LD), please identify which of the 23 targets of the Kunming-Montreal Global Biodiversity Framework the project contributes to and explain how. (max. 500 words, approximately 1 page)

86. The project is aligned with the Sustainable Development Goal 2 (SDG2); End hunger, achieve food security and improved nutrition and promote sustainable agriculture, SDG15: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss and SDG targets: 2.4: By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change,- extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality, 15.3: By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world.

87. It is also in alignment with FAO strategic objectives; BP1: Innovation for sustainable agriculture production (contributing to SDG.2.4); BE1: Climate change mitigating and adapted agri-food systems (contributing to SDG12.2 and SDG15.2.); BE3: Biodiversity and ecosystem services for food and agriculture (contributing to SDG15.1, SDG15.3).

88. The project is in alignment with the national priorities stated in Türkiye's National Strategy and Action Plan to Combat Desertification (2015-2023), Climate Change Strategy and Action Plan (2010-2023) and 11th Development Plan of Turkey (2019-2023).

89. From GEF-8's programmatic directions, the project is aligned with CC-1.4: Promote Nature-based Solutions with high mitigation potential: The project will contribute to country efforts in achieving global climate change mitigation targets by applying natural based solutions such as constructing green belts and implementing agroforestry through

reuse of treated wastewater and sledge supporting integrated resource management, While the project primarily focuses on these climate change objectives, it also contributes to addressing land degradation focal area, under "Objective 3. Address desertification, land degradation, and drought (DLDD) issues, particularly in drylands", and the third approach to build resilience, through "the implementation of drought-smart land management (D-SLM), including croplands, rangelands, dryland forests, and mixed land-uses. The project also aims to apply circular economy strategies such as recover, reduce, reuse resulting in the efficient use of resources utilizing treated wastewater and sludge. While water and energy savings are achieved through the effective use of resources, it is also cost effective in the use of fertilizer, which contributes to small farmers and country economy.

90. The project also ensures sustainable agriculture production that improves livelihoods of rural people and demonstrates how the sustainable reuse of wastewater and sludge, including the incorporation of nature-based solutions positively impacts agricultural productivity and food security in arid regions.

91. Furthermore, the project will serve GEBs related to improved soil nutrient and water retaining capacity of soil, thus, reduce soil erosion and increase resilience of degraded lands to climate change and degradation, and enhancing food security in a dryland area; increasing the area of landscapes under improved practices. It will increase sustainability and resilience of agro-ecosystem services and prosperity of farmers.

92. In summary, the project will achieve strengthened policy, regulatory and institutional environment that will foster adoption of new tool within degraded landscapes with benefit of enhanced climate resilience, in 230 hectares in Karapinar province of Konya under improved practices that will contribute to enhanced adaptation to climate change through decreased vulnerability to land degradation induced by extreme weather events and longer-term climate change stressors; and reduced 94,864 tCO2e greenhouse gas emissions mitigated through improved carbon sequestration capacity of soils within degraded landscapes (CO2 sequestration estimates will be reassessed during the PPG phase) and improved socio-economic returns from improved agriculture productivity and improved fertilizer management.

D. POLICY REQUIREMENTS

Gender Equality and Women's Empowerment:

We confirm that gender dimensions relevant to the project have been addressed as per GEF Policy and are clearly articulated in the Project Description (Section B).

Yes

Stakeholder Engagement

We confirm that key stakeholders were consulted during PIF development as required per GEF policy, their relevant roles to project outcomes and plan to develop a Stakeholder Engagement Plan before CEO endorsement has been clearly articulated in the Project Description (Section B).

Yes

Were the following stakeholders consulted during project identification phase:

Indigenous Peoples and Local Communities: Yes

Civil Society Organizations:

Private Sector:

Provide a brief summary and list of names and dates of consultations

93. In line with GEF Policy on Stakeholder Engagement and Implementation Guidelines guidance, meaningful and regular stakeholder engagement during project design and implementation is crucial to maximize country ownership and ensue enduring results at scale. Moreover, the project intends to strengthen polycentric, multi-stakeholder governance mechanisms. Existing and potential stakeholder individuals, groups and entities will be identified and consulted during the PPG process through meetings with key partners and various wide-ranging initiatives (see below).

94. A participatory stakeholder analysis will be undertaken and a Stakeholder Engagement Plan (SEP) will be developed during the PPG phase using FAO's methodology to identify key, primary and secondary stakeholders with respect to the project's overall objective across national and sub-national scales

95. In general, the project will work closely with a wide range of stakeholders including national and local government agencies, universities, research institutions, civil society organizations, private enterprises and local communities in the Project Area. In Türkiye Stakeholder engagement is also protected under the primary national legislations (see table below).

96. Primary National Legislation for the Stakeholder Engagement

Stakeholder Engagement	
Constitution of Republic of Türkiye	Constitution of Republic of Turkey is the fundamental document in respect to guaranteeing citizens' freedom of thought and opinion. According to Article 26 of the Constitution, "Everyone has the right to express and disseminate his/her thoughts and opinions individually or collectively, through speech, writing, painting or other means".
Law on the Right to Information No.4982 (Official Gazette dated 24.10.2003 and numbered 25269)	Law on the Right to Information defines the process concerning the right to information. It regulates this right in line with the principles of equality, impartiality and transparency, which are the prerequisites of democratic and transparent administration.
The Law on Use of the Right of Petition (Official Gazette dated 01.11.1984 and numbered 3071)	Citizens of the Turkish Republic are entitled to apply to the Turkish Grand National Assembly and the public authorities by written petition.
Regulation on Environmental Impact Assessment (Official Gazette dated 25.11.2014 and numbered 29186)	Projects falling under the scope of the Regulation on Environmental Impact, prepared in the context of Article 9 of the Environmental Law (1983), and are required to conduct a public information meeting.

List of names and dates of consultations

Institution	Consultation Date
General Directorate of Combating Desertification and Erosion (CEM)	20.02.2023
Directorate of Climate Change	23.02.2023
General Directorate of Agricultural Research and Policies (TAGEM)	22.02.2023
General Directorate of Crop Production (BÜGEM)	20.02.2023
Konya Metropolitan Municipality	14.02.2023
Water and Sewerage Administration of Konya (KOSKİ)	16.02.2023

General Directorate of Environmental Management, Water and Sewerage Administration of Konya Municipality (KOSKİ)	10.05.2024
General Directorate of Environmental Management	29.08.2024

(Please upload to the portal documents tab any stakeholder engagement plan or assessments that have been done during the PIF development phase.)

Private Sector

Will there be private sector engagement in the project?

No

And if so, has its role been described and justified in the section B project description?

Environmental and Social Safeguard (ESS) Risks

We confirm that we have provided indicative information regarding Environmental and Social risks associated with the proposed project or program and any measures to address such risks and impacts (this information should be presented in Annex D).

Yes

Overall Project/Program Risk Classification

PIF	CEO Endorsement/Approval	MTR	TE
Medium/Moderate			

E. OTHER REQUIREMENTS

Knowledge management

We confirm that an approach to Knowledge Management and Learning has been clearly described in the Project Description (Section B)

Yes

ANNEX A: FINANCING TABLES

GEF Financing Table

Indicative Trust Fund Resources Requested by Agency(ies), Country(ies), Focal Area and the Programming of Funds

GEF Agency	Trust Fund	Country/ Regional/ Global	Focal Area	Programming of Funds	Grant / Non-Grant	GEF Project Grant($)	Agency Fee($)	Total GEF Financing ($)

FAO	GET	Türkiye	Climate Change	CC STAR Allocation: CCM-1-4	Grant	742,964.00	70,581.00	813,545.00
FAO	GET	Türkiye	Land Degradation	LD STAR Allocation: LD-3	Grant	302,928.00	28,778.00	331,706.00
Total GEF Resources ($)						**1,045,892.00**	**99,359.00**	**1,145,251.00**

Project Preparation Grant (PPG)

Is Project Preparation Grant requested?

true

PPG Amount ($)

50000

PPG Agency Fee ($)

4749

GEF Agency	Trust Fund	Country/ Regional/ Global	Focal Area	Programming of Funds	Grant / Non-Grant	PPG($)	Agency Fee($)	Total PPG Funding($)
FAO	GET	Türkiye	Climate Change	CC STAR Allocation: CCM-1-4	Grant	35,518.00	3,374.00	38,892.00
FAO	GET	Türkiye	Land Degradation	LD STAR Allocation: LD-3	Grant	14,482.00	1,375.00	15,857.00
Total PPG Amount ($)						**50,000.00**	**4,749.00**	**54,749.00**

Please provide justification

Sources of Funds for Country Star Allocation

GEF Agency	Trust Fund	Country/ Regional/ Global	Focal Area	Sources of Funds	Total($)
FAO	GET	Türkiye	Climate Change	CC STAR Allocation	852,437.00
FAO	GET	Türkiye	Land Degradation	LD STAR Allocation	347,563.00
Total GEF Resources					**1,200,000.00**

Indicative Focal Area Elements

Programming Directions	Trust Fund	GEF Project Financing($)	Co-financing($)
CCM-1-4	GET	742,964.00	3350000
LD-3	GET	302,928.00	1450000
Total Project Cost		**1,045,892.00**	**4,800,000.00**

Indicative Co-financing

Sources of Co-financing	Name of Co-financier	Type of Co-financing	Investment Mobilized	Amount($)
Recipient Country Government	General Directorate of Environmental Management, Ministry of Environment Urbanization and Climate Change	In-kind	Recurrent expenditures	100000
Recipient Country Government	General Directorate of Environmental Management, Ministry of Environment Urbanization and Climate Change	Grant	Investment mobilized	1200000
Recipient Country Government	General Directorate of Combatting Desertification and Erosion, Ministry of Environment Urbanization and Climate Change	In-kind	Recurrent expenditures	100000
Recipient Country Government	General Directorate of Combatting Desertification and Erosion, Ministry of Environment Urbanization and Climate Change	Grant	Investment mobilized	500000
Recipient Country Government	General Directorate of Plant Production, Ministry of Agriculture and Forestry	In-kind	Recurrent expenditures	200000
Recipient Country Government	General Directorate of Plant Production, Ministry of Agriculture and Forestry	Grant	Investment mobilized	300000
Recipient Country Government	General Directorate of Konya Water and Sewerage Administration (KOSKİ), Konya Metropolitan Municipality	In-kind	Recurrent expenditures	200000
Recipient Country Government	General Directorate of Konya Water and Sewerage Administration (KOSKİ), Konya Metropolitan Municipality	Grant	Investment mobilized	1700000
GEF Agency	FAO	In-kind	Recurrent expenditures	200000

GEF Agency	FAO	Grant	Investment mobilized	300000
Total Co-financing				**4,800,000.00**

Describe how any "Investment Mobilized" was identified

As implementing agency, FAO will provide co-financing investments under the ongoing Climate Change Awareness Assessment and Capacity Building (SHARP+ Tool) Project, (UTF /TUR/071/TUR-F), Supporting Water Policy in Central Asian Agri-food Sector with Emphasis on Climate Change Impact (TCP/SEC/3901) and Improving Biodiversity and Sustainable Forestry (GCP /SEC/025/TUR). General Directorate of Environmental Management considers the activities under the “Reuse of Treated Urban Wastewater for Different Alternatives” Project as co-financing, General Directorate of Combatting Desertification and Erosion has investment under Cankiri Province Middle District Kirsakal Village Carbon Sink Area Project and Kirşehir Province Çiçekdağı District Barakli Village Carbon Sink Area Forestation Project as a source of co-financing. KOSKI has investments for wastewater treatment plants that exist in the region as a source of co-financing.

ANNEX B: ENDORSEMENTS

GEF Agency(ies) Certification

GEF Agency Type	Name	Date	Project Contact Person	Phone	Email
GEF Agency Coordinator	Jeffrey Griffin	10/25/2024	Senior Coordinator, GEF Coordination Unit	0039 06 57055680	Jeffrey.Griffin@fao.org
Project Coordinator	Kaan Evren Basaran	10/25/2024	GEF Support Specialist, Regional Office for Europe and Central Asia	0090 5078986081	Kaan.Basaran@fao.org

Record of Endorsement of GEF Operational Focal Point (s) on Behalf of the Government(s):

Name	Position	Ministry	Date (MM/DD/YYYY)
Ahmet Bagci	Deputy Minister	Ministry of Agriculture and Forestry	10/22/2024

ANNEX C: PROJECT LOCATION

Please provide geo-referenced information and map where the project interventions will take place

KARAPINAR, KONYA, TURKIYE: LATITUDE: 37.71335, LONGITUTE: 33.54556

ANNEX D: ENVIRONMENTAL AND SOCIAL SAFEGUARDS SCREEN AND RATING

(PIF level) Attach agency safeguard screen form including rating of risk types and overall risk rating.

Title
Turkiye_Wastewater_Climate Risk Screening
Turkiye_Wastewater_ESS Screening

ANNEX E: RIO MARKERS

Climate Change Mitigation	Climate Change Adaptation	Biodiversity	Land Degradation
Significant Objective 1	Significant Objective 1	No Contribution 0	Significant Objective 1

ANNEX F: TAXONOMY WORKSHEET

Level 1	Level 2	Level 3	Level 4
Focal Area/Theme	Climate Change	Climate Change Mitigation	Agriculture, Forestry, and Other Land Use
		Climate Change Adaptation	Climate Resilience
			Ecosystem-based Adaptation
	Land Degradation	Sustainable Land	Ecosystem Approach

		Management	Improved Soil and Water Management Techniques Restoration and Rehabilitation of Degraded Lands
Influencing Models	Strengthen institutional capacity/decision-making		
Stakeholders	Beneficiaries		
Capacity, Knowledge and Research	Learning		
Gender Equality	Gender mainstreaming		