



# Project Information Document (PID)

Appraisal Stage | Date Prepared/Updated: 14-Jan-2022 | Report No: PIDA32733

**BASIC INFORMATION****A. Basic Project Data**

Country Turkey	Project ID P175011	Project Name Climate Smart and Competitive Agricultural Growth in Turkey	Parent Project ID (if any)
Region EUROPE AND CENTRAL ASIA	Estimated Appraisal Date 13-Jan-2022	Estimated Board Date 24-Feb-2022	Practice Area (Lead) Agriculture and Food
Financing Instrument Investment Project Financing	Borrower(s) Republic of Turkey	Implementing Agency Ministry of Agriculture and Forestry	

## Proposed Development Objective(s)

Strengthen capacity for sustainable and competitive agricultural growth and promote the use of climate-smart agriculture in targeted regions in Turkey.

## Components

Component 1: Institutional Capacity Strengthening for Climate Smart Agri-food Policy, Planning, and Investments  
Component 2: Enhancing Animal Health Capacity for Effective Disease Surveillance, Diagnostics and Control  
Component 3: Investments for Enhanced Productivity, Resource-Efficiency, and Climate Resilience  
Component 4: Project Management, Monitoring, and Evaluation.

**PROJECT FINANCING DATA (US\$, Millions)****SUMMARY**

Total Project Cost	339.59
Total Financing	339.59
of which IBRD/IDA	339.59
Financing Gap	0.00

**DETAILS****World Bank Group Financing**

International Bank for Reconstruction and Development (IBRD)	339.59
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## Environmental and Social Risk Classification

Substantial

### Decision

The review did authorize the team to appraise and negotiate

Other Decision (as needed)

## B. Introduction and Context

### Country Context

- Turkey is a large, upper-middle-income country with a strong record of inclusive growth, but recent shocks threaten the economic and social gains made since the early 2000s.** The COVID-19 crisis precipitated an economic shock and although the policy response to the pandemic cushioned the economic effects on businesses and households, it renewed Turkey's exposure to macroeconomic risks. As the COVID-19 pandemic took hold in early 2020,<sup>1</sup> real growth dropped sharply to -5%. The government responded swiftly to COVID-19 with a large economic stimulus program which generated a significant increase in economic activity in late 2020 that more than offset the decline recorded earlier in the year. Real economic activity over the full year 2020 was 1.8% higher than in 2019, Turkey exhibited the fastest growth of all G20 countries aside from China. However, the policy frameworks that ensured a strong economic rebound during the pandemic also heightened macroeconomic risks, including rising price inflation, currency depreciation, a large current account deficit, and a depletion of external reserves.
- The strong economic rebound and positive projections in coming years is overshadowed by widening economic and social disparities that are exacerbated by the COVID-19 outbreak.** Economic growth is projected to continue at 3.2% in 2022 as investment and consumption return to more stable growth. These encouraging prospects are shadowed by the widening economic and social disparities triggered by the 2018 economic crisis and COVID-19 outbreak, slashing nearly 3.4 million jobs from the Turkish economy, mostly jobs held by unskilled, informal, young, and female workers. The pandemic alone accounts for three-quarters of the job losses since 2018 (2.6 million jobs or 9.2% of employment).
- Turkey's economic growth prospects must also be considered in light of the country's vulnerability to climate change risks and the longer-term challenge to increase productivity sustainably.** Productivity growth has contributed less to overall growth in recent years. As a result, potential output—what the economy can produce when factor inputs are fully utilized—has flattened. Unless Turkey can produce more and better output with its available inputs, the return on those inputs, including labor, will stagnate. The effects of climate change, including rising annual mean temperatures and changes in precipitation patterns, have expanded Turkey's exposure to natural disasters. The country now experiences more frequent extreme weather-related events such as floods, heatwaves, and droughts. These events may also contribute to introduction and spread of new animal diseases and zoonoses.<sup>2</sup> Furthermore, with its diminishing surface water supply, Turkey is already considered a water-stressed country. In less than a decade—by 2030—it is likely to be a water-scarce country.

<sup>1</sup> By mid-September 2021, about 60,000 Turkish people had died from COVID-19, and about 6.7 million had been infected.

<sup>2</sup> i.e. diseases transmitted from animals to humans.



4. **The country has an opportunity to move rapidly onto a more resilient, sustainable, and inclusive growth path as its economy recovers from COVID-19.** The pandemic has generated a profound awareness of the links between climate change, fragile ecosystems, economic growth, and human health. It has also highlighted potential for food security issues due to interruption to agri-food sector value chains, supply chains, trade resulting in increasing food prices. As pressures intensify to support post-pandemic economic growth, recovery, and jobs, Turkey has an opportunity to build back better, relying on strategies that can reduce its vulnerability to climate disasters, and avoid depletion of its natural resources that weaken economic growth prospects. By incentivizing a green recovery and initiating a green transformation, Turkey can retain a competitive advantage as global markets—including the EU, Turkey’s main trading partner—move to decarbonize. The agri-food sector will have a pivotal role in a green recovery strategy fostering a climate-smart, competitive, and resilient growth.

#### Sectoral and Institutional Context

5. **Turkey has taken advantage of its natural capital to build a large agriculture and food sector that contributes importantly to the economy.** Turkey ranks among the top 10 global agri-food producers, and is a major global producer of wheat, cotton, hazelnuts, and other high value crops. Turkey exports around 1,800 agricultural products to more than 190 countries.<sup>3</sup> The agri-food sector contributed 6.6% of GDP in 2020,<sup>4</sup> and employs about 18% of Turkey’s labor force.<sup>5</sup> Through its participation in a customs union with EU countries<sup>6</sup> and free-trade agreements with 27 countries, Turkey has become the lead exporter of a substantial set of agri-food products (largely fruits, vegetables, and nuts) to a wide range of destinations worldwide.

6. **Low agricultural productivity can partially explain the persistent inflation and volatility of food prices in Turkey.** High food price inflation and volatility have serious welfare implications, especially for poor households, in which food accounts for 29% of spending. Unprocessed foods, particularly fresh vegetables and fruits, drive food price inflation (although more recently beef has become a major driver), which has been exacerbated recently due to COVID-19 pandemic. Food price inflation has increased, and prices have become more volatile over time. A recent analysis of food price inflation in Turkey by the World Bank<sup>7</sup> highlights the strong link between land productivity and food price inflation; food price inflation was lower in provinces where growth in land productivity was higher. The analysis also concludes that low levels of market integration are one of the drivers of food price inflation in Turkey, as reflected by the intertemporal volatility and spatial dispersion of prices.

7. **Agriculture’s vulnerability to climate change can exacerbate food price pressures and overall food security concerns in Turkey.** Decades of data from the Turkish State Meteorological Service (TSMS) confirm the increase in extreme weather events, mostly windstorms and heavy rain; such events are projected to occur more often as the climate changes.<sup>8</sup> Climate change is also projected to reduce the availability of surface water, increase the frequency and severity of floods, and prolong dry seasons and droughts. The Global Food Security Index (GFSI) ranks Turkey 47th among 113 countries with respect to the overall food security environment.<sup>9</sup>

<sup>3</sup> Switzerland Global Enterprise. 2018. <https://www.s-ge.com/en/article/global-opportunities/20211-c5-food-turkey-market-overview>

<sup>4</sup> This share of GDP far exceeds the average of countries in the Organization for Economic Co-operation and Development (OECD) (2.6%) and is close to the average for Upper Middle-Income countries (6.25% in 2019). OECD (2021), “OECD Economic Surveys: Turkey 2021.” OECD Publishing, Paris. Available at <https://doi.org/10.1787/2cd09ab1-en>

<sup>5</sup> Within its income group, Turkey has perhaps the largest share of agricultural workers in total employment.

<sup>6</sup> The EU and Turkey have formed a customs union since 1995, although current arrangements cover only a limited range of industrial products and exclude agriculture, public procurement, and e-commerce and services.

<sup>7</sup> World Bank (2021), Drivers of Food Price Inflation in Turkey (unpublished report).

<sup>8</sup> Demircan et al. (2017). Climate Change Projections for Turkey: Three Models and Two Scenarios. Turkish Journal of Water Science and Management 1(1):22-43.

<sup>9</sup> The index is a function of affordability, availability, quality and safety, and natural resources and resilience. Among these categories, Turkey does particularly poorly on affordability and natural resources and resilience.



GFSI's major risks for Turkey are exposure to droughts and severity of storms. In terms of the availability of water for agriculture, Turkey ranks at the bottom of its peer countries (and 77<sup>th</sup> in the overall GSFI ranking) due to its high level of drought stress and variability in renewable water supply. Strategies for enhancing the climate resilience of the agriculture sector need to improve both access and efficient water use, along with moving toward low-water demand crop patterns in regions facing high water scarcity and promoting water and soil conservation practices in crop production.

**8. Climate change has a major impact on soils/land, accelerating desertification, erosion, causing fertility losses, etc., and vice versa, changes in land use and soils can either accelerate or slow down climate change, as soils are important carbon sinks.** Climate change is one of the main drivers of land degradation through soil erosion, reducing fertility, nutrient depletion, and changing the structure of the soil. Turkey is mostly arid and semi-arid and with rising temperatures and extreme weather events like storms, droughts, and floods the risk of land degradation through topsoil erosion is serious.

**9. Turkey has made good and continued progress on the fight against animal diseases; however, climate change and other pressures are exacerbating risks of outbreaks.** Extreme weather events and exposure to increased temperatures can adversely affect animal health through heat stress, metabolic disorder, and immune suppression, resulting in an increased propensity for disease and death.<sup>10</sup> Enhancing animal disease surveillance through effective notification and laboratory diagnosis and control capacity are a priority in Turkey, particularly given the expected impacts of climate change on increasing the spread, severity, and distribution of pathogens and infectious animal diseases. Effective prevention and control of animal diseases and zoonoses is a key pillar of a climate resilient and safer agri-food system. One Health Initiative,<sup>11</sup> is particularly relevant in developing strategies and policies for multi-sectoral involvement in prevention and control of animal and vector-borne diseases and zoonoses and would be beneficial for Turkey to adopt.<sup>12</sup>

**10. In conjunction with climate change, the expansion and intensification of agriculture are also creating significant environmental pressures.**<sup>13</sup> The agri-food sector is a large user of land, water, and energy, as well as a large emitter of greenhouse gases (GHGs). Turkey's total GHG emissions from agriculture were estimated at 68 million tons of carbon dioxide equivalent (tCO<sub>2</sub>e) in 2019 representing 13.4% of total country GHG emissions.<sup>14</sup> Annual GHG emissions in the Turkish agricultural sector have increased by 47.7% since 1990. The largest source of emissions comes from digestion and manure in livestock, mainly from cattle.<sup>15</sup> Fertilizer and pesticide use is growing fast.<sup>16</sup> Their overuse combined with land mismanagement is creating agricultural pollution problems and market access challenges due to food safety rejections/notifications by major markets such as the EU, particularly linked to inappropriate pesticide use/residues.<sup>17</sup> Supply chain inefficiencies translate into high levels of food

<sup>10</sup> Ali, M. Z., Carlile, G., & Giasuddin, M. (2020). Impact of global climate change on livestock health: Bangladesh perspective. *Open veterinary journal*, 10(2), 178–188. Available at: <https://doi.org/10.4314/ovj.v10i2.7>

<sup>11</sup> As promoted by the World Organization for Animal Health (OIE), UN Food and Agriculture Organization (FAO) and the World Health Organization (WHO)FAO/OIE/WHO (2017). The Tripartite's Commitment – Providing multi-sectoral collaborative leadership in addressing health challenges. Available at: [https://www.who.int/zoonoses/tripartite\\_oct2017.pdf](https://www.who.int/zoonoses/tripartite_oct2017.pdf)

<sup>12</sup> Inci, A., Yildirim, A., Duzly, O., Doganay, M., Aksoy, S. (2016). Tick-Borne Diseases in Turkey: A Review Based on One Health Perspective. *PLOS Neglected tropical Diseases*.

<sup>13</sup> The Environmental Performance Index (EPI) ranks Turkey the lowest among countries with similar GDP per capita.

<sup>14</sup> Greenhouse Gas Emission Statistics 1990–2019. <https://data.tuik.gov.tr/Bulten/Index?p=37196&dil=2>.

<sup>15</sup> Turkish Greenhouse Gas Inventory 1990–2018. Inventory Report for submission under the United Nations Framework Convention on Climate Change." Available at: <https://unfccc.int/documents/223580>.

<sup>16</sup> OECD (2019), "OECD Environmental Performance Reviews: Turkey 2019." OECD Publishing, Paris. Available at: <https://doi.org/10.1787/9789264309753-en>.

<sup>17</sup> Turkey has increased importantly the number of food safety notifications issued by the EU, from 200 in 2014 to 362 in 2020, with the relevance of pesticides as a source of notifications increasing importantly in the last few years. In 2021, Turkey has already received 360 notifications, of which 286



waste and loss.

**11. Against this background of increasing climate and environmental risk—which threatens to destabilize gains in agricultural productivity, rural incomes and employment, and the resilience of the natural resource base—Turkey has a unique opportunity to pursue a transformation of its agri-food system through repurposing policies and support for the agriculture sector.** On the policy front, Turkey has made important progress on prioritizing agriculture climate action as part of the national climate change plans and strategies and aligning national development plans and sectoral programs, around such climate change objectives, and the country's parliament has recently ratified the Paris Agreement<sup>18</sup>, signaling the country's commitment to the global fight against climate change. There are opportunities to repurpose public investment support towards further advancing actions highlighted in such policies and global commitments.

**12. The sustainable transformation of Turkey's agri-food system will require a strong emphasis on skill development, knowledge dissemination/sharing, and public-private sector alliances.** Climate-smart (particularly digital) technologies can attract rural youth to farming and strengthen the economic recovery from the pandemic by spurring job creation. For that strategy to succeed, however, it is essential to reach farmers—especially young and women farmers—through investments to disseminate knowledge and build skills. Pilots, demonstration plots, public awareness campaigns, and skill development can enable farmers to learn about and use the latest available digital innovations, solutions, and opportunities. Supportive national policy, public-sector investment, and private-sector engagement in innovation and monetization are also needed. Government investments can help to reduce the risks of a technology and digital divide by providing better access to information, services, and innovative technologies to populations that traditionally have little access, and by building strong alliances with the private sector to increase outreach and enhance inclusiveness.

**13. Spurring Turkey's agri-food sustainable transformation could preserve and enhance trade opportunities, while enhancing sectoral competitiveness.** The EU, Turkey's biggest agri-food trade partner, is promoting climate action through its recently launched Green Deal, which highlights the EU's commitment to tackling climate and environmental challenges and achieving carbon neutrality by 2050. Within the framework of the Green Deal, the EU has adopted a Farm-to-Fork strategy, a Biodiversity strategy, a proposal for a Climate Law, as well as a new action plan for the Circular Economy, all of which address issues relevant to agri-food systems. Agriculture and rural areas are central to the European Green Deal. In August 2021, the Government of Turkey (GoT) released the "Green Deal Action Plan"<sup>19</sup> aimed at contributing to Turkey's transition to a sustainable and resource efficient economy and to respond to the comprehensive changes envisaged by the EU Green Deal. The Plan identifies 81 actions and 32 targets around nine pillars. These actions represent a timely opportunity for Turkey to further modernize the agri-food system, enhance its competitiveness, and strengthen public-private partnerships and multi-stakeholder alliances as vehicles to pilot approaches and promote innovations. Moving toward a sustainable transformation might increase costs in the short term, in the long term, climate-smart policies and practices will ensure the commercial viability of Turkey's agri-food sector.

**14. In sum, during the post-COVID phase of its economic recovery, Turkey has an unprecedented opportunity**

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concerns F&V, mainly due to pesticides residues of products banned in the EU (e.g. methyl chlorpyrifos and chlorpyrifos) or because the residues exceeded the Maximum Residue Levels (MRLs). These figures reflect an increased oversight by the EU on fruit and vegetable imports, as a result of the implementation of EU Commission Regulation (EU) 2020/625 of May 6, 2020, which entered into force on May 26, 2020, imposing temporary increases in official controls and emergency measures that regulate the entry of certain products of the certain from certain third countries, including from Turkey.

<sup>18</sup> The Paris agreement aims to limit the global average temperature rise to "well below" 2 degrees °C above pre-industrial levels and "make efforts" to limit it to 1.5 degrees °C.

<sup>19</sup> *Yeşil Mutabakat Eylem Planı 2021*—The Green Deal Action Plan, as per the English translation highlights priority action areas but does not define specific targets to be achieved e.g., in terms of reduction of pesticides or fertilizer use.



**to advance its agri-food agenda for climate-smart, resilient, and green growth that delivers more jobs and income.** In the post-COVID recovery face, the project activities will contribute to enhancing productive, green and resilient growth in the agri-food sector, while creating jobs and other livelihood opportunities. The project will help to place the sector onto a climate-smart growth path and prepare the country to take advantage of policy developments in key export markets. It will achieve these aims by aligning green support packages to build the sector's resilience, sustainability, and resource-use efficiency, with an emphasis on inclusion and human capital development and by enhancing the GoT's capacity for planning and effective service delivery in the sector. More specifically, the project will support higher levels of market integration, climate-resilient production, and improved productivity through innovation and technology adoption; reinforce human capital development through skills training; and provide technical support to meet new demands and opportunities created by the modernization of agri-food systems. Through modernization and improvements to animal health laboratories, there will be opportunities for the animal health sector to engage in on-going COVID response or any future significant pandemic as promoted by the One Health approach.

### C. Proposed Development Objective(s)

Development Objective(s) (From PAD)

15. The Project Development Objective (PDO) is to strengthen capacity for sustainable and competitive agricultural growth and promote the use of climate-smart agriculture in targeted regions in Turkey.

#### Key Results

16. The key results expected by the project and respective PDO indicators are:
- Land area with integral information to develop sustainable agricultural land planning/management (Hectare (Ha))
  - Public and private users of the information supported by the project that apply it to support decision making (%)
  - Farmers adopting Climate Smart Agricultural (CSA) technologies (Number)
  - Animal disease diagnostic/surveillance & control capacity expanded (Percentage)

### D. Project Description

17. The proposed project will support the GoT in transitioning toward a more sustainable, competitive, and climate-smart growth oriented agri-food sector focused on the soil, land, and animal health agenda. The project interventions focused around two key objectives (i) enhance capacity for sustainable and competitive agricultural growth; and (ii) promote innovations, technology dissemination and research around CSA. The project framework is structured along three intervention levels: (i) *broad capacity-enabling factors*, generating broad sectoral impacts and setting the ground for improved decision making, and in time more effective policy, programming and improved delivery of key public services (component 1 and 2); (ii) *the ecosystem for innovation and service provision* to support the further scaling-up of CSA technologies and practices and ensure sustainability (Component 3); and (iii) *direct on-farm investments and services* around CSA to validate and pilot approaches and generate and disseminate knowledge and support adoption (Component 3). The project design builds on key areas where the government has already developed important experience and capacity including MoAF's recent experience in the mapping of Turkey's land and soil resources and adds value by incorporating global knowledge approaches to soil surveys and the establishment of dynamic models for monitoring soil threats making use of digital technologies. The experience developed on supporting investments in resilient infrastructure (hard investments in greenhouse infrastructure) are complemented with soft investments to





improve system management and resource efficiencies, as well as with piloting approaches to expand sustainable greenhouse infrastructure linked to geothermal resources. Complementing and enhancing ongoing efforts by MoAF experience promoting traditional CSA approaches such as organic agriculture by linking innovation and research agenda, with a focus on CSA technologies.

**18. Component 1: Institutional Capacity Strengthening for Climate Smart Agri-food Policy, Planning, and Investments (US\$151.5 million IBRD).** Activities will support the strengthening of capacity, with a particular focus on narrowing information gaps in relation to Turkey's soil and land natural capital, to enhance its sustainable planning and management. Component activities will also enhance the digital blueprint of the Ministry of Agriculture and Forestry (MoAF) for data collection and information management to contribute to effective policy monitoring and programming. Component funds will mainly support specialized consulting services; acquisition of software/hardware/equipment required and training. Activities under this component will be implemented through two subcomponents.

**19. Subcomponent 1.1: Narrowing information gaps to enhance soil health and land-use planning/management (US\$143.5 million IBRD).** Soil and land use are major contributors to GHG emissions mainly through land use changes and nutrient management. Yet, they also play an important role in climate change mitigation by acting as a carbon sink, through adoption of CSA and the protection and rehabilitation of marginal and degraded lands and forests. Healthy soils are also essential for ensuing resilient production. This subcomponent will support the generation of key information and the narrowing of capacity gaps in relation to Turkey's soils/land natural capital, to contribute to its sustainable planning and management, generating climate co-benefits.<sup>20</sup> Subcomponent 1.1 will finance mainly specialized technical services, investments in equipment and computer infrastructure and training.

**20.** Capacity building activities will be implemented across the set of proposed activities and will be targeted to generators and users of the soil and land information, including MoAF staff. A set of awareness campaigns and dissemination and training efforts will be undertaken, targeting particularly local provincial governments and provincial Soil Conservation Boards, with specific tools developed by the project to support such activities. To facilitate data use by different stakeholders, the subcomponent will support upgrading, developing and/or validating user-friendly applications (e.g. via mobile phone) on soil and land information generated by the project.

**21. Subcomponent 1.2: MoAF digital blueprint for sectoral information collection and management (US\$8 million IBRD).** Activities under this subcomponent will enhance MoAF's capacity for data collection and sectoral information management to support smart climate sectoral policy and planning. The subcomponent will support the development, testing and implementation of improved data collection methods and modelling approaches for monitoring crop production and yields, provide production forecasts and overall contribute to agriculture planning (also considering climate change aspects) for food price monitoring, food security assessments, and other applications. The subcomponent will support stakeholder consultations; analysis of data collection and modeling approaches implemented by other countries for crop/yield and production forecasting (including application of disrupting technologies); the design and piloting of modelling approaches for Turkey, and the preparation and implementation of a roadmap for the institutionalization of those modelling approaches. The subcomponent will also support upgrades and integration of current institutional information systems to

<sup>20</sup> Soil and land are major contributors to GHG emissions mainly through land change uses and nutrient management. Yet, they also play an important role in climate change mitigation by acting as a carbon sink, through adoption of CSA and the protection and rehabilitation of marginal and degraded lands and forests. Healthy soils are also essential for ensuing resilient production.





enhance monitoring of agriculture support programs. The subcomponent will finance mainly specialized consulting services, investments in equipment and computer infrastructure, and training.

**22. Component 2: Enhancing Animal Health Capacity for Effective Disease Surveillance, Diagnostics and Control** (US\$80.9 million IBRD). Activities will support effective animal disease surveillance and diagnostic system and strengthen proper implementation of regulatory policies and controls of veterinary medicines and vaccines before reaching the market. Component activities will also identify challenges and gaps in the existing surveillance and disease control program, strategic objectives, and program targets. The component will support two main activities: strengthening the capacity of animal health institutes (Subcomponent 2.1) and support the establishing of the National Veterinary Medicine Product Control Center (Subcomponent 2.2). The component will follow the best practice (i.e. World Organization for Animal Health, EU) and will finance feasibility assessments, laboratory facilities and operative works, laboratory equipment, technical training (including biosafety, CSA topics as relevant), and information systems.

**23. Subcomponent 2.1: Strengthening the capacity of animal health institutes** (US\$ 31 million IBRD). It will support improvements in capacity for animal disease surveillance and diagnostics of infectious and vector-borne diseases in Turkey, through strengthening MoAF's network of animal health institutes. It will specifically support upgrades in biosafety laboratory infrastructure, information systems (including opportunities for digitalization) and capacity building. The network of laboratories targeted under this subcomponent include seven institutes affiliated with the MoAF located in the provinces of Adana, Elazığ, Erzurum, Konya, Samsun, İzmir, Istanbul and Ankara. These laboratories provide key services on animal disease diagnostics, analysis, research, and training, and serve as national reference services for specific animal diseases.

**24. Subcomponent 2.2: Strengthening and improving veterinary medicine product control to control animal infectious and vector-borne diseases and zoonoses** (US\$ 49.9 million IBRD). This subcomponent will support the establishment of a centralized Veterinary Medicine Control Center to improve the capacity of Turkey to control and regulate veterinary medicines and vaccines to ensure that effective and high-quality products reach the market. It will do so, by supporting. The project will invest in construction works, equipment, and technical services within required biosecurity levels of: i) test, analyses and administrative facilities; ii) a national vaccine strain collection bank and ii) experimental laboratory units. Activities will also support capacity building and training (also covering CSA topics as appropriate), and some operational costs. The supported construction and Biosafety installations will enable laboratories to meet international accreditation standards and follow national and international good practice. A detailed feasibility assessment and business planning will be undertaken the first year of project implementation, analyzing issues of location, technical design, costs and sustainability and technical visits abroad.

**25. Component 3: Investments for Enhanced Productivity, Resource-Efficiency, and Climate Resilience** (US\$95.7 million IBRD, US\$41.5 million Beneficiaries). This component will support the dissemination, validation and adoption of CSA technologies and practices, as well as RD&I efforts. The adoption of CSA technologies and practices will contribute to improved agriculture performance via productivity gains, cost reductions, more efficient resource-use (fertilizers, pesticides, energy, water), harvest loss reduction, and improved climate resilience, while generating also important climate mitigation benefits and reducing pollution. Investments under this component are also expected to generate key agricultural data to support decision making by farmers and enterprises and to inform policy design. The subcomponent will encourage the uptake and effective use of innovative/disruptive CSA technologies/practices by closing knowledge and skill gaps and by providing financial



support and technical assistance to producers and enterprises. Activities supported under Component 3 will be implemented through four subcomponents.

26. **Subcomponent 3.1: Strengthening climate resilience, productivity, and resource-use efficiency in vegetable production** (US\$28 million IBRD, US\$16 million Beneficiaries). This subcomponent will support ongoing public and private sector efforts to enhance protected agriculture vegetable production in Turkey, via upgrades on traditional greenhouse infrastructure, improved production management and the piloting of innovative clustering approaches for geothermal greenhouse production.

27. **Subcomponent 3.2: Promoting the adoption of CSA technologies/practices across relevant crops** (US\$30 million IBRD, US\$20.5 million Beneficiaries). It will expand the use of emerging innovative/disruptive CSA and energy-efficient technologies on small and medium farms to enhance the productivity and profitability of farm operations, increase input-efficiencies and reduce carbon footprint and other negative environmental impacts. This subcomponent will primarily focus on awareness creation, dissemination and providing co-funding opportunities for digitally enabled technologies and solutions (smart and precision agriculture) and energy efficient technologies.

28. **Subcomponent 3.3: Enhancing the productivity and greening profile of cattle production in Turkey** (US\$23 million IBRD, US\$ 5.0 million Beneficiaries). Nearly 70% of cattle milk production in Turkey comes from farms with fewer than 50 cows; of those farms, 71% (about 264,500) have fewer than 10 cows and contend with significant management and profitability problems, leading to disease outbreaks and low productivity and negative externalities on climate and water pollution. Investments will complement the activities under Component 2 and ongoing efforts by MoAF to improve livestock productivity (i.e. around pasture reclamation and management, good husbandry practices etc.), focusing on two innovative technology-based solutions: Precision Livestock Farming (PLF)<sup>21</sup> program and innovative integrated collective manure management.

29. **Subcomponent 3.4: Research and innovations to support CSA** (US\$14.7 million IBRD). It will support the implementation of a RD&I agenda around CSA. Activities focus on the development, validation and/or dissemination of in-house (by TAGEM) CSA agricultural technologies on natural pesticides, fertilizers management, energy-savings technologies. It will also support climate-assessments for selected value chains.

30. **Component 4: Project Management, Monitoring, and Evaluation** (US\$11 million IBRD). Activities under this component will support all project management functions. It will include support for a Project Coordination Unit (PCU) at the General Directorate of EU and Foreign Relations (ABDGM), and Project Implementation Units (PIUs) under TRGM, BUGEM, TAGEM, HAYGEM, GDIT and GDFC, for (i) strengthening capacity for day-to-day project management of technical, fiduciary, Monitoring and Evaluation (M&E), Environmental and Social (E&S) issues; (ii) E&S risk management, including preparation of site-specific E&S instruments required; (iii) grievance redress, citizen engagement, and communications; and (iv) M&E of project activities, including impact assessments, beneficiary satisfaction surveys, and development of an integrated system for project management and monitoring of project outputs and outcomes.

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<sup>21</sup> PLF uses digital technology (cameras, microphones, sensors, IT networks, and so on) for 24/7 automated livestock monitoring. The main reason for introducing this technology in a wide range of settings throughout the world is that it can increase livestock productivity while reducing environmental impacts; the world cannot realistically meet the growing demand for animal products by increasing livestock numbers, as in the past.



## Legal Operational Policies

	Triggered?
Projects on International Waterways OP 7.50	No
Projects in Disputed Areas OP 7.60	No

## Summary of Assessment of Environmental and Social Risks and Impacts

31. **The overall environmental risk rating is rated as Substantial.** Generally, the project will generate multiple positive environmental outcomes and impacts by increasing new livelihood opportunities as higher productivity and resource-use efficiencies, making its contribution to reducing vulnerability to climate shocks and increasing climate resilience, reducing GHG emissions and pollution due to more effective agricultural input use. While most of the proposed project activities and associated civil works are well known and will be of small scale, associated environmental risks and impacts will be moderate in scale, in some cases (construction of a biogas installation or of a Veterinary Medicine Control Center; construction of large greenhouses or building of infrastructure for getting access to geothermal energy) these can be substantial. The project substantial risk is also due to limited experience of the client with Bank-financed projects and ESF and its environmental and social standards (ESSs) requirements. Furthermore, the project implementing entities are yet to be created and the E&S staff is to be hired, therefore, capacity building will be necessary to manage the potential environmental and social risks and impacts. Specific measures in this regard for the PCU, PIs and other involved parties are specified in the ESMF document.

32. **The overall social risk is rated as Substantial.** As the majority of the project activities to be financed are comprised of technical assistance along with capacity building and information dissemination activities, purchasing and piloting contemporary IT equipment together with investment activities under Subcomponent 2.1., 2.2., 3.1.a. and 3.1.b— (upgrades to the institutes' infrastructure to increase the biosafety label (BSL) of laboratory units, establishment of a centralized Veterinary Medicine Control Center, construction work linked to upgrading greenhouse infrastructure, building infrastructure for getting access to geothermal energy and subsequently to build new greenhouses, construction works to set up the manure-energy-biofertilizer facility) are not clearly defined in terms of their scale, location and technical design. MoAF has limited experience with the ESF standards, including preparing and implementing SEP, Resettlement Framework (RF) and Labor Management Procedures (LMP). The PIU will be provided with training and support during preparation including TORs for the of ESF instruments, including hiring of subject matter experts. The Environmental and Social specialists in the PCU will be responsible for continuous monitoring of construction works to assure compliance with the ESMF, RF and the LMP, as well as to oversee the implementation of the SEP.

## E. Implementation

### Institutional and Implementation Arrangements

33. **Responsibility for overall project implementation, including management and coordination will lie with the Ministry of Agriculture and Forestry (MoAF), through the Implementing Units.** The Project Implementation Units are the General Directorate of Agricultural Reform (TRGM) (Subcomponents 1.1., 3.2 and 3.3b), the General



Directorate of Information Technologies (GDIT) (Subcomponent 1.2), the General Directorate of Plant Production (BUGEM) (Subcomponent 3.1), the General Directorate of Livestock (HAYGEM) (Subcomponent 3.3a), the General Directorate of Food and Control (GDFC) (Component 2), the General Directorate of Agricultural Research and Policies (TAGEM) (Subcomponent 3.4) and the General Directorate of EU and Foreign Relations (ABDGM) (Component 4). Within MoAF, overall responsibility for implementation will lie with the Vice Ministry hosting the Directorates that will lead the implementation of the components/subcomponents with the largest budget allocation, namely: TRGM, BUGEM, GDFC and HAYGEM.

34. **A Project Coordinating Unit (PCU) responsible for overall project coordination will be established.** The PCU will be responsible for overseeing overall implementation and management of the project, ensuring proper application of all project-related requirements, and preparing all project documents to be submitted to the Bank. The PCU will be located at the General Directorate of EU and Foreign Relations (ABDGM). The PCU will host a dedicated multidisciplinary team of project management, technical, financial management, procurement, environmental, and social specialists with qualifications satisfactory to the World Bank. PCU's functions will be overseen by the leading Vice-Minister.

35. **A Project Steering Committee (PSC) will be established to ensure effective coordination at a higher level and provide strategic advice.** The PSC will have participation of senior leadership of the General Directorate leading implementation of the subcomponents, including Deputy General Directors from the relevant DGs (TRGM, BUGEM, HAYGEM, GDIT, GDFC, TAGEM and ABDGM), as well as representatives of the Strategy and Budget Office of the Presidency (SBO) and the Ministry of Treasury and Finance (MoTF). The PSC will be chaired by the line Vice Minister of the MoAF (to which TRGM, BUGEM, GDFC and HAYGEM report to), with the PCU acting as the Secretariat. The key functions of the PSC will be to review the annual workplans and budgets (AWPB), monitor implementation progress, ensure effective institutional coordination, and provide guidance as needed for ensuring the delivery of project outputs and achievement of project outcomes.

36. **Project implementation Units (PIUs)** will be established at the leading Directorates responsible for specific subcomponents: TRGM, BUGEM, GDFC, GDIT, HAYGEM and TRGM and will be responsible of overseeing project activities under their respective sub-components and ensure effective engagement with MOAF's units and relevant stakeholders at the Regional/Provincial level.

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