

# AGRICULTURE AND WATER POLICIES: MAIN CHARACTERISTICS AND EVOLUTION FROM 2009 TO 2019<sup>1</sup>

## TURKEY

This country profile reviews recent changes in agriculture and water policies. The content of the profile is based on a survey conducted in 2019 by the OECD Secretariat<sup>2</sup> and additional official sources.

### A. Agriculture and Water Characteristics

- Turkey's agriculture mainly produces cereals, dairy, livestock, vegetables, fruit and non-food crops. The share of livestock in the total agricultural production went from 31% in 2000 to 47% in 2018 (OECD, 2020c). The livestock density grew by 38% over the period 2005-2016, much faster than the OECD average increase of 8% (OECD, 2019a).
- Agriculture uses most of the abstracted freshwater: in 2018, agriculture accounted for 74% of national water abstractions (compared to 75% in 2000). The share of irrigated areas also augmented, from 8% to 10% (OECD, 2020c).
- It is estimated that 20 to 50% of surface water in Turkey is polluted by nitrogen (OECD, 2019a). The nitrogen balance remained stable between 2000 and 2018 (around 28 kg/ha), and the phosphorus balance remained around 8 kg/ha during the same period (OECD, 2020a).

**Table 1. Main challenges related to water in agriculture**

Water use +++	Water pollution ++	Water-related risks ++/+++
Agricultural water abstractions represent 74% of total water abstractions. Illegal groundwater abstractions for agricultural use are a growing problem in basins with water restrictions	Key pollutants from the agricultural sector are nitrogen, phosphorus and pesticides	Droughts are expected to become more frequent and affect yields. There has been an increasing trend in the frequency and intensity of flood events

Note: +: Minor issue; ++: Problematic issue; +++: Major issue. Source: OECD (2019a, 2019b, 2020c).

<sup>1</sup> This document, as well as any data included herein, are without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.

<sup>2</sup> For more details, Gruère, G., M. Shigemitsu and S. Crawford (2020), "Agriculture and water policy changes: Stocktaking and alignment with OECD and G20 recommendations", *OECD Food, Agriculture and Fisheries Papers*, No. 144, OECD Publishing, Paris, <http://dx.doi.org/10.1787/f35e64af-en>.

## B. Key Agriculture and Water Policies & Main Evolution from 2009 to 2019<sup>3</sup>

### B.1. Cross-Cutting Agriculture and Water Policies & Governance

**Table 2. Key agriculture and water policies and policy changes**

<p><b>Key Policies</b></p>	<p>The 11th National Development Plan (2019-2023) ambitions to increase improvements on the water use efficiency, accelerate institutional arrangements, and expand investment in irrigation infrastructure. National Water Plan (2019-2023) mainly aims to ensure efficient, rational, and sustainable use of existing water resources before finding new water resources and offering them to the user.</p> <p>The General Directorate of Water Management is responsible for overall water resource policies related to protection, improvement and usage of water resources in Turkey. The General Directorate of State Hydraulic Works (DSI) assigns all operation and maintenance responsibility of irrigation networks to Water User Organisations (WUO).</p>
<p><b>Main Evolution from 2009 to 2019</b></p>	<p>General, Water Quantity</p> <ul style="list-style-type: none"> <li>▶ Turkey's 8th (2001-2005) and 9th (2007-2013) National Development Plans included a number of objectives related to water management. Based on the 10th National Development Plan (2014-2018), "Action Plan for Effective Use of Water in Agriculture" aimed to establish centralised monitoring facilities for water storage and irrigation networks.</li> <li>▶ Since 2016, the General Directorate of Water Management has started implementing the "Sectoral Water Allocation Plans" in order to adjust water use by taking into account economic, social and environmental benefits.</li> <li>▶ River Basin Management Plans are in preparation to protect and minimise the negative impacts of pressures on water bodies both by determining pressures and by defining measures.</li> </ul> <p>Water Quality</p> <ul style="list-style-type: none"> <li>▶ Before 2009, a number of regulations were adopted in line with the EU legal framework, relating to discharges of dangerous substances into water, quality of surface water intended for the abstraction of drinking water and protection of water against nitrate pollution from agriculture.</li> <li>▶ In 2015, nitrate vulnerable catchment areas, the catchments of the water bodies polluted by agricultural and other land use activities, were designated. Approximately 50% of Turkey's territory were identified as nitrate vulnerable catchment areas. In addition, nitrate vulnerable zones will be determined within nitrate vulnerable catchment areas by for 2022. These areas were listed in By-Law on Determination of Sensitive Water Bodies and Areas Effecting these Water Bodies and Improvement of Water Quality.</li> <li>▶ In 2016, 133 pesticides were listed as specific pollutants in "By-law on Surface Water Quality" together with their corresponding environmental quality standards. 45 priority substances including pesticides and corresponding environmental quality standards were later added to the By-law in accordance with EU Water Framework Directive. According to the provisions of the By-law, those environmental quality standards must be satisfied in all surface water bodies.</li> </ul> <p>Risks</p> <ul style="list-style-type: none"> <li>▶ The General Directorate of Water Management also established "Drought Management Plans", the risk management framework, in order to prepare and minimize the negative effects of drought risks. In the Drought Management Plans, drought analysis, climatic and hydrological studies, sectoral vulnerability analysis and drought maps and studies such as recovery and intervention before, during and after droughts are used.</li> </ul>
<p><b>Consistency between Agriculture and Water Policies</b></p>	<p>Various consultative meetings were held with stakeholders on agricultural irrigation and some decisions were implemented based on the meetings, such as the determination of production plan that takes into account of the water potential in water-restricted basins.</p> <p>Studies for reusing treated wastewater for irrigation are being conducted.</p>

<sup>3</sup> Agriculture and water policies are defined here as all policies that affect the interaction between agriculture production and water.

## B.2. Policies to Manage Agricultural Water Use (Quantity)

**Table 3. Key instruments for the management of water use**

<p><b>Quantified national future targets for the use of water resources in the agriculture sector</b></p> <p>Yes:</p> <ul style="list-style-type: none"> <li>▶ <u>The 11th Development Plan (2019-2023) sets the goal of increasing the irrigated area by 2 million hectares by 2023</u></li> <li>▶ <u>The National Water Plan aims to boost irrigational efficiency to 55% by 2024<sup>4</sup></u></li> </ul>	<p><b>Metering, monitoring and reporting</b></p> <ul style="list-style-type: none"> <li>▶ Metering: Partially for Water abstraction)</li> <li>▶ Monitoring: No</li> <li>▶ Reporting: No</li> </ul>
<p><b>Quantity targets accounting for climate change</b></p> <p>Yes: Taking into account the present and future water needs of its growing population both its own and immigrants', urbanisation, infrastructural developments and climate change impacts. <u>Sectoral Water Allocation Plans and Drought Management Plans consider both historical water shortages and effects of climate change on water resources</u></p>	<p><b>Scarcity pricing</b></p> <p>No</p>
<p><b>Water entitlements</b></p> <ul style="list-style-type: none"> <li>▶ DSI allocates the water to be used in irrigation considering the amount of water in the storage facility and other allocations. DSI determines use licences and quantity of irrigation water for both surface water and groundwater</li> <li>▶ Water is allocated to water supply companies (publicly or privately owned such as farmers' cooperatives) and Water User Associations but not to individual farmers</li> </ul>	<p><b>Enforcement measures</b></p> <p>Yes</p>
<p><b>Proportion of cost recovery for surface water</b></p> <ul style="list-style-type: none"> <li>▶ 100% for Operation &amp; Maintenance (expenses incurred to the facilities are recovered from the farmers)</li> <li>▶ Unspecified % for Capital Costs</li> <li>▶ <u>The repayments of the irrigation facility investment costs were abolished with the 2018 legal regulation</u></li> </ul>	<p><b>Other policy instruments used to encourage water use efficiency</b></p> <ul style="list-style-type: none"> <li>▶ <u>A regulation was issued to provide registration and control of groundwater use in 2013</u></li> <li>▶ <u>"Regulation on the Control of Water Use and Reduction of Water Losses in the Irrigation Systems" was published in 2017 to control water use and mitigation of water losses in the irrigation systems</u></li> <li>▶ <u>"Technical Assistance on Economic Analysis within River Basin Management Plans and Water Efficiency Aspects in 3 Pilot River Basins in Turkey" has been carried out since 2017 and will be completed in mid-2021. Water use efficiency in the agricultural sector is one of the main components. The current situation for three river basins was assessed, a feasibility study was conducted for a pilot area, and action plans have been developed for three river basins after lessons taken from the previous studies on the agricultural water use efficiency.</u></li> <li>▶ Land use planning studies advise to cultivate low water demanding crops</li> <li>▶ A water efficiency guide document is being prepared.</li> </ul>

Note: Underline indicates changes since 2009

<sup>4</sup> According to the 2018 evaluation the irrigational efficiency was 51%

### B.3. Policies to Control Agricultural Water Quality

**Table 4. Key instruments to improve water quality**

<p><b>National water quality data collection tools</b></p> <ul style="list-style-type: none"> <li>▶ The agricultural pollution monitoring network was established in 2009. <u>Data was collected from 4760 stations in 2019. Monitoring is recorded in the web-based Nitrate Information System and evaluated in the studies for the determination of nitrate sensitive regions.</u></li> <li>▶ <u>Pesticides are also monitored in surface water bodies (2758 stations according to National Water Quality Monitoring Program) in scope of both chemical and ecological monitoring studies from DSI. Nitrates and phosphorus compounds are monitored in surface water bodies in scope of ecological monitoring. Results will be collected in both DSI Water Data Base and National Water Information System.</u></li> <li>▶ <u>TADPORTAL database is under construction to collect irrigation water analysis reports</u></li> </ul>	<p><b>Main policy instruments</b></p> <ul style="list-style-type: none"> <li>▶ <u>Regulatory: River Basin Management Plans which are prepared for protecting water bodies and improving water quality, have entered into force after approval by Water Management Coordination Committee<sup>5</sup></u></li> <li>▶ <u>Regulatory: By-law on Surface Water Quality has set environmental quality standards for 133 pesticides among the specific pollutants list and 45 priority substances in 2016.</u></li> <li>▶ <u>Regulatory: Within the framework of the Regulation on the Protection of Waters Against Nitrate Pollution from Agricultural Sources, studies are carried out to detect and prevent pollution of agricultural sources of water resources</u></li> <li>▶ <u>Regulatory: The 2017 Directive on the Code of Good Agricultural Practices for the Prevention of Nitrate Pollution Caused by Agricultural Activities in Waters includes measures to be taken by farmers to protect water from pollution caused by agricultural activities</u></li> <li>▶ <u>Information: Since 2009, afforestation and erosion control studies have been carried out in the dam basins to improve water quality</u></li> </ul>
<p><b>Spatial tools (e.g. topological, geometric, or geographic data analysis) to target policies in specific areas</b></p> <p>Yes: Nitrate vulnerable zones are determined and action plans to be implemented in these regions are determined</p>	<p><b>Enforcement measures</b></p> <p>-</p>

Note: Underline indicates changes since 2009

<sup>5</sup> RBMPs of the 8 basins have been prepared, 3 of them will be prepared by mid-2021 and RBMPs for the remaining basins will be prepared by 2024.

## B.4. Policies to Manage Climate-Induced Water Risks

**Table 5. Water risks and responses**

	Droughts	Floods
<b>Reported Trends</b>	No abnormal changes have been observed in the frequency of drought in the past decades. However, drought intensity was increased.	There has been an increasing trend in the frequency and intensity of flood events.
<b>Key Policies</b>	<ul style="list-style-type: none"> <li>• Support for irrigation infrastructure to address water scarcity problems.</li> <li>• In places facing water shortages, meetings on “drought and necessary measures” are held with the participation of local administrations, municipalities, irrigation organizations, farmers’ organizations and leading farmers under the coordination of DSI Regional Directorates. Measures are implemented in line with the decisions taken at these meetings.</li> </ul>	<ul style="list-style-type: none"> <li>• The Turkish Emergency Flood and Earthquake Recovery Project provides a national flood forecasting and warning system.</li> <li>• Meteorological Service provides 5-7 day forecasts for agriculture to warn possible flood events.</li> </ul>
<b>Main Changes from 2009 to 2019</b>	<ul style="list-style-type: none"> <li>• The Agricultural Drought Strategy and Action Plan (currently 2017-2023) is revised every five years with stakeholder involvement along the planning process.</li> <li>• Development of public insurance programmes, research and development on drought resistant/resilient varieties and breeds, implementation of water dripping farming</li> <li>• In order to ensure an effective irrigation management, centrally monitored measurement facilities were installed in storage facilities and irrigation networks with an area of 500 ha and above. In addition to measuring water at all points during its storage, transmission and distribution, it is also aimed to measure the discharged water. Additional efforts are underway to meet the required meters for pricing based on volume.</li> <li>• Due to the use of water that is more than the irrigation water requirement of the plant, it has become an important need to apply the gradually increasing water usage service fee tariff. The water usage service fee will decrease when less water is used and increase when more water is used, and the use of water as much as the plant needs will be encouraged.</li> </ul>	Flood Management Plan has been prepared to reduce and avoid the flooding problem on the catchment, which impacts water availability and quality and hence yields and production. Flood Management Plans are being prepared within the scope of preliminary assessment of flood risk, flood hazard maps, flood risk maps, and determine the measures before, during and after the flood.
<b>Factoring of Climate Change in Policies</b>	3/5: Studies for climate change adaptation and natural disaster risk reduction, particularly floods and drought related disasters are conducted. A comprehensive project, Climate change impacts on surface and groundwater resources (2013-2016) has been realized on effects of climate change on water resources. Through the project, the necessary actions for the adaptation in the entire country have been figured out.	

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