IMECE WORKSHOPS

WATER

October 2022
İzmir

TÜRKİYE İŞ BANKASI

Sustain Finance

EFSE
DEVELOPMENT FACILITY

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INTRODUCTION

In our country, where 74% of freshwater resources are used for agricultural irrigation, the first of the Imece Workshops organized by İşbank was held with the theme of "Water" for all stakeholders to meet on common ground, take more significant steps together and provide essential outputs to the agricultural sector. Organized in collaboration with the EFSE Development Facility and the Frankfurt School of Finance Management, the workshop discussed methods and solutions to prevent improper water use in agriculture.

The Water Workshop, held in Izmir on 20 October 2022, brought together more than 60 stakeholders, including representatives from relevant public and non-governmental organizations, agricultural cooperatives and unions, producers, academics, agricultural entrepreneurs and leading farmers.

Workshop addressed the following topics;

- How to manage water with new technologies to combat drought,
- How to prevent water waste in agriculture for sustainable agriculture,
- How fresh water resources in our country can be used more efficiently in agricultural areas,
- Agricultural irrigation methods to secure the future of water resources and make better use of water,
- Joint solutions that are protective for both nature and producers

FINDINGS

The drought effect of the climate crisis has serious consequences for Turkey. It is predicted that precipitation in Turkey will decrease by approximately 10-15% in the 2040s. With the decrease in precipitation regime and increase in temperature, the demand for water in agricultural production is increasing day by day. In addition, the impact will be critical in determining whether dryland crops can be grown or not.

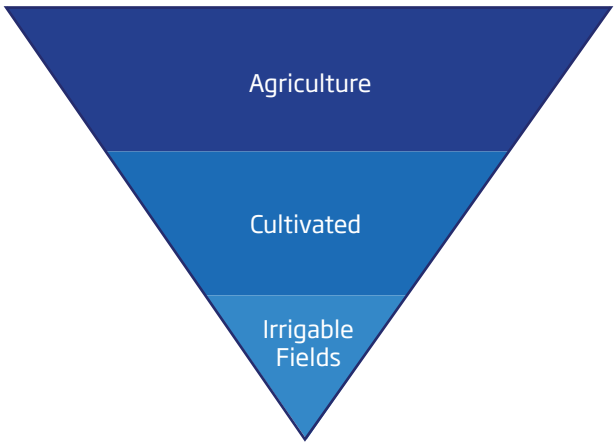
"The need for fresh water in Turkey is increasing day by day."

The need for fresh water is increasing for the following main reasons:
- Increasing water consumption in agricultural production,
- Changing consumption habits and increasing demand for food and fresh water due to a growing population,
- Rapid growth of the urban population while the agricultural population declines,
- The continued flow of migrants into our country; and
- Water use is expected to triple in the next 25 years compared to today.

"The volume of lakes and rivers, which are most critical for agricultural irrigation in Turkey, is shrinking."

Turkey 2020 precipitation data is determined as follows:
- Total Annual Rainfall: 450 billion m3
- Total Annual Available Water: 112 billion m3
- Annual Usable Water Amount per Person: 1.346 m3

Source: DSI, 2020



In Turkey;

- *Total Agricultural Area: 37.76 million ha*
- *Total Cultivated/Planted Area: 23.76 million ha*
- *Maximum Irrigation Rate in Cultivated Areas: 35%*
- *Maximum Irrigable Area: 8.5 million ha*
- *Irrigated Area: 6.96 million ha*
- *Irrigation Rate in Cultivated Areas: 29%*
  - *DSİ: 4.67 million ha (66%)*
  - *Irrigation Unions: 2.29 million ha (34%)*

Source: TurkStat, World Bank 2020

"Investment needs are high for managing water use and scaling up the development of modern irrigation systems."

In this context;

- The total amount of "In-Field Modern Irrigation Support" provided by the Ministry of Agriculture for 2022 is 300 million TL. With these supports, approximately 12.000 ha of land can be provided with modern irrigation.(1)
- The cost of converting existing surface irrigated areas to modern water-controlled systems is estimated at USD 15.6 billion.(2)
- In Turkey, the cost of converting the open canallette water distribution system into a closed pressurized water distribution system is estimated to be USD 28 billion.(3)
- For the 1.5 million ha planned to be opened for irrigation -USD 15 billion investment is needed.(4)
- 600 million USD is needed annually to replace existing in-field modern irrigation systems. (5)
- For the control of our agricultural water resources -USD 75 billion resources are needed in 30 years.
- Only USD 1 billion per year is allocated by the public sector to develop agricultural water re sources.

SOURCES:

(1) Support Data Ministry of Agriculture and Forestry; 12,000 ha is the figure obtained when this amount of support is divided by modern irrigation costs in the field and 50% of the support is covered.
(2) Anonymous.
(3) Anonymous.
(4) Anonymous.
(5) Frankfurt School of Finance Calculations.
(6) The results obtained from the sum of all these data.
(7) Optained from State Water Works (DSİ) budget. DSİ 2021 budget is USD 1.5 billion. Since this budget includes land consolidation works, the values to be allocated for water are taken as approximate.

Canallette: Small canal

WORKSHOP OPENING SPEECHES

İZLEM ERDEM
İşbank A.Ş.
Assistant General Manager

"All stakeholders must act together for effective and sustainable solutions"

Water, a vital issue, is of great importance for people not only today but also for the future and the sustainability of life. For this reason, the topic of the first Imece Workshops was determined as "WATER".

The scars of drought are now visible everywhere in the world. Fresh water resources are disappearing over time due to climate change and improper water use. Unfortunately, we are sadly seeing this process across the country with sinkholes opened due to drying underground resources, disappearing stream beds and lakes.

With the documentary "Water for Agriculture", filmed with information from 10 different provinces, we aimed to draw attention to the coming drought and raise awareness to take precautions.

By 2050, water consumption is projected to increase by 50% and agricultural production by 60%. Such issues are always talked about, but it is up to all of us to take them beyond talk and turn them into concrete actions. We believe that this will be solved through collective consciousness. We believe that it is more than a preference but a necessity to move forward through collaborations, stakeholder contacts, listening to and seeing different perspectives as much as possible. We consider it essential for all stakeholders to act together for effective and sustainable solutions.

As not just a bank, but a strong link in the agricultural value chain, we aim to increase our knowledge and insight in this area and thus our ability to be a solution partner.

As İşbank, we effectively bring together agriculture, technology and finance through products and services that support the agricultural ecosystem, as well as investments in next-generation technologies and digital agricultural practices.

"For us, agriculture means protecting our present and future and preserving our national values."

We interact with all stakeholders through the ImeceMobil application, the Digital Agriculture Solution implemented with Vodafone Business, the Workup Agri Program to encourage innovation and entrepreneurship in agriculture, and the irrigation systems loan campaign in cooperation with BASUSAD (Association of Pressurized Irrigation Industrialists). We are also one of the stakeholders of Izmir Agriculture Technology Center.

We aim to contribute to building the future with the results of the workshop.

We will continue to carry out activities and events that will reduce the water use of producers in the field of agriculture and raise awareness on this issue.

İBRAHİM OĞUZ
Frankfurt School of Finance & Management
Agricultural Field Research Group Manager

There is no problem in the water cycle of the ecosystem except human use. It is now well known that the climate crisis will affect agricultural production the most. Turkey is among the countries that will be most affected by drought.

In order to be able to invest more in modern irrigation systems in the future, old systems must be converted.

"Cost of converting open cnallette water distribution system to closed pressurized water distribution system is USD 28 billion"

60% of irrigated areas have surface irrigation systems. The cost of converting surface irrigated areas to water-controlled systems is 15.66 billion USD. When we look at these resources needed, it is not possible to solve the water problem only with public resources and the power of producers.

OĞUZ BARDAK
EFSE Development Facility
Investment Manager

"Contribute to the sustainability of small businesses in agriculture"

The European Fund for Southeast Europe (EFSE) aims to foster sustainable economic development in Southeast Europe and the Eastern Neighbourhood Region by investing in micro, small and medium enterprises. In addition, the EFSE Development Facility provides technical assistance, training, and other non-financial support to institutions to multiply the fund's impact. The EFSE Fund has €1 billion impact assets under management, with active investments in 16 countries.

The fund has been active in Turkey since 2010 and has a current investment of over €120 million in the country – with a significant share of agricultural subloans in its portfolio. Sustaninability remains in the core of EFSE values and investment strategy. To this end Turkey and in the 15 other countries where EFSE is active, the Fund aims to facilitate access to finance in the field of agriculture by prioritizing rural areas, supporting micro and small enterprises – especially farmers.

REPORT METHODOLOGY

- Grouped under the main headings of Environmental, Social and Governance.
- Participant views have been adhered to with impartiality.
- The main topics discussed at the workshop were listed as “Problems” and “Proposed Solutions” and the main issues were framed.

In 2040, Turkey will be the 27th of 33 countries with the highest water stress in the world.

ENVIRONMENTAL FACTORS

DROUGHT

PROBLEMS	PROPOSED SOLUTIONS
• Drought is observed across Turkey, and we are at risk of desertification. The Aegean Region faces the threat of summer and winter drought. In the Konya basin, sinkholes have started to form due to excessive groundwater use and drought. • Along with population growth, there is a decrease in water per capita. While the amount of water per capita was around 2,000 m3 in the 2000s, today, it is around 1,346 m3. • In scientific studies, below 1,700 m3 is considered the limit of water stress. Below 1,000 m3, water stress becomes chronic. On a basin basis, the amount of water per capita in Turkey's western regions is below 1,000 m3. • Access to water is becoming increasingly complex: In the Konya Plain, water can be obtained from depths of 250 - 400 meters, whereas in the past, water could be obtained from depths of 70 - 80 meters. Even if the wells in Konya are closed today, it is estimated that it will take at least 50 years for the water to return to its previous level. Since the wells at a depth of 20 m have dried up in Manisa, it is now	• To reduce water use and increase efficiency, modern irrigation systems should be preferred, and the performance of irrigation systems should be measured: √Drip irrigation systems should be expanded. Public support mechanisms can be combined with criteria to ensure efficient and proper water use. √Water flow rates should be taken under control. In addition, the transition to pressurized irrigation systems should be ensured. √Funding should be provided to convert open channels into closed systems very quickly. √Automation and remote digital irrigation systems should be expanded. √In-field irrigation systems should be established by the crop pattern. √Strict monitoring of illegal wells and prevention of new unlawful wells. • To save water, first of all, a data link should be established between the atmosphere, soil, water, and plants, and the data should be processed in a scientific framework and communicated to farmers. • Awareness of water harvesting should be raised and made widespread.

DISRUPTION OF BIODIVERSITY

PROBLEMS	PROPOSED SOLUTIONS
• Ponds are drying up as access to water becomes more difficult and water becomes scarce. Accordingly, changing agricultural cropping patterns and the natural ecosystem is changing. • 15% of Turkey's land is not cultivated at all. On the other hand, 65% of agricultural areas cannot be irrigated at all due to drought. There is concern that the rate of uncultivated land will increase further with climate change. • Chemicals used in agriculture cause water pollution. • Using inappropriate irrigation systems can cause waste water pipes to turn into waste, pollute the environment or remain in the soil, preventing cultivation.	• Agricultural practices and policies in line with climate, soil and water data should be expanded: Regional crop choices should be determined and farmers should be guided to plant the right crops. • In water use, water bill payment plans should be created according to criteria such as the amount of consumption / pollution rate, and appropriate meters and water clocks should be made widespread. • Agricultural production should be dynamically planned according to changing climatic conditions and needs. • Organic matter/fertilizers are needed to retain water in the soil. All plant material remaining after harvesting should be kept on the soil surface. Producers should be informed about techniques to increase the water holding capacity of the soil (e.g. use of organic matter, composting, cultivation of the soil at 10-12 cm, etc.). • Animal manure, humic acid, leonadide, green fertilization should be supported, and stubble sowing should be made widespread.

DATA INCOMPLETENESS

PROBLEMS	PROPOSED SOLUTIONS PROPOSALS
• It is assessed that there is no accurate, transparent, up-to-date and traceable data source on soil and water, or that existing sources are insufficient.	• Soil and water data should be recorded throughout Turkey: Water quantities should be calculated on a regional/basin basis every year and data-based planning should be carried out. Data sources should be generated through soil surveys and the data collected should be shared with different institutions and organizations. • With the Internet of Things, data should be brought into the sector and commercialization should be ensured. • Using the shared economy model, production based on digital data should be started. • All soil and water related institutions should be able to share standardized data in a common system. • Information transfer channels should be established. Information held by universities and the Ministry of Agriculture should be made available and accessible to users on a regular basis.

[2] Stubble Sowing: It is the dropping of the seed into the soil by cutting the stubble and residues left over from the previous crop before cultivating the soil. It means direct October.

[3] Shared Economy: A system of exchange based on a specialized marketer offering an infrequently needed item or service to other users who need it when it is not being used by the owner, and the marketer receiving a share of the usage fee paid by the user.

PROBLEMS WITH EXISTING INFRASTRUCTURE

PROBLEMS	PROPOSED SOLUTIONS
• Underground resources can be used illegally. The number of unlicensed wells is estimated to be 4-5 times higher than the number of licensed wells. • Due to the unplanned construction of ponds, more water is needed. In addition, when it is transported in old and concreted open channels, the loss/leakage rate of water can increase even more until it reaches the land. • In Turkey, 74% of the irrigation areas put into operation have been developed by DSİ. Only 32% of these have been converted to piped systems. • Pressurized irrigation systems are currently used in 40% of irrigated areas (17% drip irrigation, 23% sprinkler). • Water use efficiency in agriculture is around 54%; the amount of water used per unit area is 9,500 m3/ha; in closed irrigation systems with meters, it drops to 7,259 m3/ha. In water unions using volume-based pricing, this figure drops to 4,812 m3/ha. • The water coming into the field from open canals is not clean and requires a high-quality and properly designed filtration system. This increases the cost of in-field modern irrigation systems and makes filter maintenance critical. All these factors push producers away from modern irrigation systems. • Since the plots are small and fragmented, large irrigation systems cannot be implemented.	• Use of groundwater should be prevented through detection and monitoring. • Plans should be made to increase the amount of clean water available. • Water use efficiency in agriculture should be increased. A shift from productivity per unit area to productivity per unit water should be made. • Joint irrigation systems should be planned with neighboring parcels. • Underground water storage should be brought above ground.

SOCIAL FACTORS

SOCIOLOGICAL STRUCTURE / CULTURAL HABITS

PROBLEMS	PROPOSED SOLUTIONS
• Social awareness of water use is thought to be low. • Farmers continue to use traditional methods for irrigation widely. • Their language, expectations, and habits are poorly understood when communicating with farmers. This makes it challenging to transform farmers' ingrained behaviors. • In Turkey, the average age of farmers is high, skilled labor is hard to find, and the use of technology is low, making it difficult to transform the proper use of water in agriculture.	• Programs should be created to raise awareness on water use throughout the society. Water consumption awareness should be internalized through trainings starting from primary education level. Stakeholders should use "ambassadors" to guide public awareness in this area. • Training programs should be created in line with the regional needs of farmers, and farmers should be encouraged to participate voluntarily. • Identity analysis should be made in communication with farmers and the right communication language should be chosen. • "New generation farming" should be encouraged and incentivized, including younger generations. In addition, programs should be developed to increase the use of technology in agriculture. Qualified labor force should be increased. • Social and cultural areas, education and health services should be planned to encourage farmers to live in the village and prevent young people from migrating from the village to the city.

LACK OF INFORMATION / MISINFORMATION

PROBLEMS	PROPOSED SOLUTIONS PROPOSALS
• Water wastage is increasing as farmers are not sufficiently informed about irrigation techniques. • The working principles of the drip irrigation system are not known: Due to misuse of drip irrigation systems, the yield obtained is around 25%. Since drip irrigation requires constant monitoring/control, farmers are reluctant to use this system. In addition, since drip irrigation has high operating costs and the system cannot be installed efficiently, farmers are not willing leave their traditional irrigation systems.	• Nationwide training programs should be established to inform farmers about proper irrigation techniques. • Companies supplying irrigation systems should be able to guide farmers on the use of the right technology. Financial institutions should also guide the selection of the right irrigation technique as a prerequisite for financing; loans and grants should be monitored to ensure that they are used for the right purpose, and loan costs should be reduced, especially for drip irrigation. • A digital agriculture academy should be established. • For the effective use of water in modern irrigation, the "irrigation water calculation module based on climate, soil and crop" developed by the Ministry of Agriculture should be digitized and made effective, and should be provided free of charge to farmers. • Consultancy offices where agriculture engineers that graduated from 3 different departments should be established. Agricultural engineers must be present in information projects (irrigators, soil experts, etc.). On the other hand, since agricultural engineers who lack practical knowledge are not sufficiently taken into consideration by farmers, the practical knowledge of these engineers should be increased.

	• For the training of farmers, a tripartite structure can be established between universities/ research institutions, technical staff and farmers. For example; University/research institutions train technical staff, technical staff can transfer practical knowledge to farmers. • Two pilot areas, one with water abundance and the other with water scarcity, can be identified, and leading farmers in these areas can be worked with. Optimum agricultural practices can be developed in such a way that irrigators prescribe irrigation, fertilizers prescribe fertilizers and pesticides prescribe pesticides. Positive results can encourage other farmers. Good practices and the process can be transferred to farmers through an event (e.g. farmer meetings, field days). Not only positive experiences but also failures/problems can be shared with farmers for providing them a more comprehensive information.

GOVERNANCE FACTORS

LACK OF POLICY

PROBLEMS	PROPOSED SOLUTIONS
• Agriculture, wastewater and irrigation policies applied are not fully responsive to today's needs. Existing legislation is expected to allow for the pace of change. In this context, there is a need to update the legislation in line with the needs.	• Wastewater and irrigation policies should be established. A "Water Law" should be enacted with a bottom-up perspective. Wastewater should be recycled and reused in agricultural irrigation. • Regulations in the laws should be made with the opinions of producers, cooperatives, and unions. • A "National Water Council" should be established.

AUDIT

PROBLEMS	PROPOSED SOLUTIONS
• It is thought that wastewater disposal needs to be adequately regulated. • It is believed that the use of illegal wells cannot be prevented and that water consumption in wells needs to be sufficiently monitored. • There is no Turkish Standards Institute (TSE) certificate for drip irrigation pipe standards. • The risks and opportunities under the EU Green deal need to be sufficiently known.	• Wastewater monitoring must be done carefully and adequately. • Monitoring - detection - control systems should be established for unauthorized and unrecorded water use. • A meter use should be made compulsory. • A road map should be drawn as part of the EU Green deal. • Within the scope of the green consensus, banks should establish stricter control and audit mechanisms on issues such as water footprint, carbon footprint, etc., when granting loans. Farmers should be required to document the water used in irrigation techniques such as wild and drip irrigation.

SYSTEMIC PROBLEMS

PROBLEMS	PROPOSED SOLUTIONS
• Irrigation cooperatives can only exercise their powers to a limited extent. The most significant factor in this is that irrigation unions, the smallest of which has 1,500 members, are afraid of member reactions to change. • Irrigation unions may face technical and financial problems in water distribution. • Although large plains are under protection according to legal regulations, Soil Conservation Boards may not work efficiently in these areas. • Farmers cannot analyze/evaluate sufficiently the costs of irrigation systems because of the following reasons: • Input costs are high, • The purchase prices of their products are announced late, • The profits from their crops do not cover the costs. • Another obstacle to the widespread adoption of irrigation systems is the cost of installation and operation.	• Local/regional solutions should be produced. Establish an R&D center for irrigation. • Irrigation unions should establish an internal monitoring and evaluation system: Unions should convene with their technical staff at least once a year and meet with sector representatives to exchange information. • Farmers should organize: Local organizations should focus on reducing costs and increasing profits. • Bank and cooperative collaborations should be established. Examples/pilot applications where universities, private sector, and public sector come together; data from pilot applications should be brought to the industry and commercialized. • Taking costs from the user is very important for the correct use of water, the expansion and sustainability of irrigation systems. Renewable energy should be used to reduce operating costs.

ACCESS TO FINANCE

PROBLEMS	PROPOSED SOLUTIONS
• Small-scale farmers may need help accessing grants to meet the requirements. • "0" interest rate loans provided by private banks with prepayment (prepayment of interest in advance) may prevent sufficient scale irrigation system investments since they collect prepayment from the farmer and thus take money from the farmer in advance. In other words, using loans that do not have the proper maturity and financial conditions can negatively affect irrigation system investments.	• Grant conditions should be reviewed and reorganized: Grants should also be given to unions-cooperatives. In addition, grant systems need to be controllable. • Cost-reducing policies and incentives should be developed. √Public incentives for Pressurized Irrigation Systems should be increased. Areas opened for pressurized irrigation should be licensed. The public should cover the installation cost of licensed areas and the operating cost should be covered by the user; the amount of water needed by the plant should be subsidized. √Incentives should be given for the recycling of wastewater and its use in agricultural irrigation. • New financing models should be created: √A unique pension system for farmers should be established to encourage farming and prevent labor problems. √Young farmers should be supported and subject to a private individual pension system. √Developing a financing model for farmers that covers electricity bills and incentivizes the use of renewable energy. √The maturities of loans to farmers should be extended. √Financing models should be developed to convert open canals into closed systems.

	√Loan interest rates for drip irrigation should be reduced and an incentive system should be developed with public piping. √Exemptions should be created for water uses below a certain m3. √Agricultural companies, farmers who use drip irrigation and optimum use of fertilizers should be able to obtain these inputs at more affordable prices. √Irrigation unions should be more active in pricing (e.g. some unions offer a 50% discount on irrigation prices for those using drip irrigation). √For meters to become widespread, a protocol should be prepared directly with irrigation unions through the State Hydraulic Works (DSI). √Not only Ziraat Bank but also other private banks should be able to provide loans with public subsidies.

HIGHLIGHTS

Environmental Factors	Social Factors	Governance Factors
• Drought • Biodiversity Conservation • Lack of Data • Problems with Existing Infrastructure	• Sociological Structure / Cultural Habits • Use of Digital Technologies • Lack of Information / Misinformation	• Lack of Policy • Audit • Systemic Problems • Access to Finance

Within the workshop scope, the issues raised by the participating stakeholders were listed under the headings of "Environmental, Social and Governance", including potential non-financial "problems and solutions" and traditional financial analysis.

The following issues mentioned in the report have gained importance and need to be examined in more depth:

- Raising awareness,
- Raising knowledge of farmers on irrigation,
- Increasing technical knowledge of farmers,
- Mainstreaming technology for sustainable agriculture; and
- All stakeholders taking the necessary responsibility in cooperation in the agricultural ecosystem,

issues have gained importance and need to be examined in more depth.

As İşbank, we aim to increase our knowledge and insight in this field, and thus our ability to be a solution partner, not only as a bank but also as a vital link in the agricultural value chain.

ABOUT SUSTAINFINANCE

This report was compiled by the Sustainfinance team Ayşe Kaşıkçı, İlkay Demirdağ, and Kübra Koldemir adhering to the insights shared by the participants at the "Water Workshop" organized by İşbank in collaboration with the EFSE Development Facility and Frankfurt School of Finance Management. (Contact: Sustainfinance.org, kubra@sustainfinance.org)

SustainFinance is a non-profit organization with the vision of integrating more sustainability into the investment community's decision-making. At the same time, SustainFinance hosts a platform where multiple stakeholders can interact, express, and share their views and opinions.

**Throughout the report, groupings have been made under the main headings of "Environmental, Social and Governance" and the participants' views have been objectively adhered to.*

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