



**ICID2015**

26<sup>th</sup>ERC & 66<sup>th</sup>IEC

# AGRICULTURAL GROUNDWATER MANAGEMENT IN TURKEY

**Aynur Fayrap**  
aynurf@dsi.gov.tr



**ICID2015**

26<sup>th</sup>ERC & 66<sup>th</sup>IEC

# Presentation outlines

---

- 1. Agricultural Groundwater Use in Turkey**
- 2. Groundwater Irrigation Cooperatives**
- 3. DSI(State) Groundwater Irrigations**
- 4. Public Institutions Irrigations**
- 5. Individual Farmer Irrigations**
- 6. Consideration**



# Agricultural Groundwater Use in Turkey

**ICID2015**

26<sup>th</sup>ERC & 66<sup>th</sup>IEC

**The available water per capita in Turkey is less than the World average. Approximately 73% of limited water resources of Turkey is allocated for agricultural purposes. Agricultural area which is irrigated with groundwater comprises of approximately 23 % of total irrigated agricultural area. In this context, agricultural groundwater management is very important and critical issue for the country.**



# Agricultural Groundwater Use in Turkey

**ICID2015**

26<sup>th</sup>ERC & 66<sup>th</sup>IEC

**The groundwater activities in Turkey have been executed by General Directorate of State Hydraulic Works (DSI) on behalf of the State according to the Law on Groundwater. According to the law, groundwater is under the decree and possession of the State. Any research, allocation, utilization, protection and registration of groundwater are subject to the law.**



# Agricultural Groundwater Use in Turkey

**ICID2015**

26<sup>th</sup>ERC & 66<sup>th</sup>IEC

**Within the framework of the Groundwater Law, whenever and wherever each person intends to construct a water structure in order to provide groundwater (such as drilling well, excavating galleries or tunnels, etc.), they should get license from DSI.**



# Agricultural Groundwater Use in Turkey

**ICID2015**

26<sup>th</sup>ERC & 66<sup>th</sup>IEC

**Groundwater Law puts in order on groundwater:**

- ✓ **conduct surveys of groundwater and drill;**
- ✓ **deep wells or have them drilled;**
- ✓ **transfer or lease deep wells;**
- ✓ **protect and record groundwater;**
- ✓ **grant licenses for survey, use and**
- ✓ **rehabilitation and modification of wells.**



# Agricultural Groundwater Use in Turkey

**ICID2015**

26<sup>th</sup>ERC & 66<sup>th</sup>IEC

**Groundwater irrigation management is performed in four types. These are;**

- ✓ **Groundwater Irrigation Cooperatives,**
- ✓ **DSI Groundwater Irrigations,**
- ✓ **Public Institutions Irrigations,**
- ✓ **Individual Farmer Irrigations.**



**ICID2015**

26<sup>th</sup>ERC & 66<sup>th</sup>IEC

# Groundwater Irrigation Cooperatives

---

**Groundwater activities concerning irrigation cooperatives are jointly carried out by General Directorate of State Hydraulic Works(DSI) and Agricultural Development Sectional Directorate of Province Special Administration(SPA).**



# Groundwater Irrigation Cooperatives

---

**There is an agreement between these two organizations. All activities are followed according to the agreement. This agreement consists of responsibility of two organizations. Farmers establish irrigation cooperatives, and want DSI or SPA to construct irrigation schemes.**



**ICID2015**

26<sup>th</sup>ERC & 66<sup>th</sup>IEC

# Groundwater Irrigation Cooperatives

**In the content of this activity, responsibilities of DSI are following;**

- ✓ Hydrogeological survey is carried out.**
- ✓ If groundwater quality and quantity is suitable, feasibility report is written,**
- ✓ if it is optimal, project is started.**
- ✓ Groundwater wells are drilled.**
- ✓ Electrification systems are built.**
- ✓ Pumps are provided and mounted.**



**ICID2015**

26<sup>th</sup>ERC & 66<sup>th</sup>IEC

# Groundwater Irrigation Cooperatives

---

**Shortly performing of hydrogeological survey, preparing of feasibility reports, drilling of wells, building of electrification systems and providing of pumps are under the responsibilities of DSI. Irrigation systems can be constructed by either of them- DSI or SPA.**



**ICID2015**

26<sup>th</sup>ERC & 66<sup>th</sup>IEC

# Groundwater Irrigation Cooperatives

**All schemes (wells, pumps, electrification systems, irrigation systems) are transferred to the cooperatives namely users. All investment cost constructed by DSI is refunded in 15 years by users without any interest. First three year is called as adaptation period. They do not pay during this period. It is paid in 12 years as equal shares without any interest.**



**ICID2015**

26<sup>th</sup>ERC & 66<sup>th</sup>IEC

# Groundwater Irrigation Cooperatives

---

**As of 2014, an area of 482 275 ha has been irrigated by means of 11 700 deep wells by Groundwater Irrigation Cooperatives. Presently, there are 1,400 irrigation cooperatives, intensely in Konya, Isparta, Eskişehir, Kayseri, Edirne, Samsun, and İzmir.**



**ICID2015**

26<sup>th</sup>ERC & 66<sup>th</sup>IEC

# DSI Groundwater Irrigation

---

**This type of groundwater irrigation is performed to supply groundwater into irrigation canal where surface water is insufficient. Operation and maintenance services were made by DSI.**



**ICID2015**

26<sup>th</sup>ERC & 66<sup>th</sup>IEC

# DSI Groundwater Irrigation

---

**As of 2014, 2051 deep wells are used in 100 470 ha of DSI groundwater irrigations. From year to year, the responsibility of operation, maintenance and management of these irrigation networks are being transferred to irrigation organizations.**



**ICID2015**

26<sup>th</sup>ERC & 66<sup>th</sup>IEC

# DSI Groundwater Irrigation

---

**As of 2014, 2051 deep wells are used in 100 470 ha of DSI groundwater irrigations. From year to year, the responsibility of operation, maintenance and management of these irrigation networks are being transferred to irrigation organizations.**





# Public Institutions Irrigations

**ICID2015**

26<sup>th</sup>ERC & 66<sup>th</sup>IEC

**In the need of Public Institutions, mostly Agricultural Enterprises, all equipment related to irrigation schemes are provided by DSI. DSI drills groundwater wells and provides irrigation schemes with equipments on the cost recovery base. Afterwards, they are transferred to public institutions. The operation of these projects is performed by related institutions.**



# Public Institutions Irrigations

---

**ICID2015**

26<sup>th</sup>ERC & 66<sup>th</sup>IEC

**As of 2014, in 32 projects with 2 161 drilled wells, 84 080 ha area have been irrigated by groundwater.**



# Individual Farmer Irrigations

**ICID2015**

26<sup>th</sup>ERC & 66<sup>th</sup>IEC

**As per related law, land owners or farmers can irrigate their own fields from individually operated groundwater wells. To operate them, farmers have to get a user's license from DSI if the well depth is more than 10 meters. This permission depth is decrease to 5 m in some extraordinary conditions of coastal areas to avoid from sea water intrusion.**



# Individual Farmer Irrigations

**ICID2015**

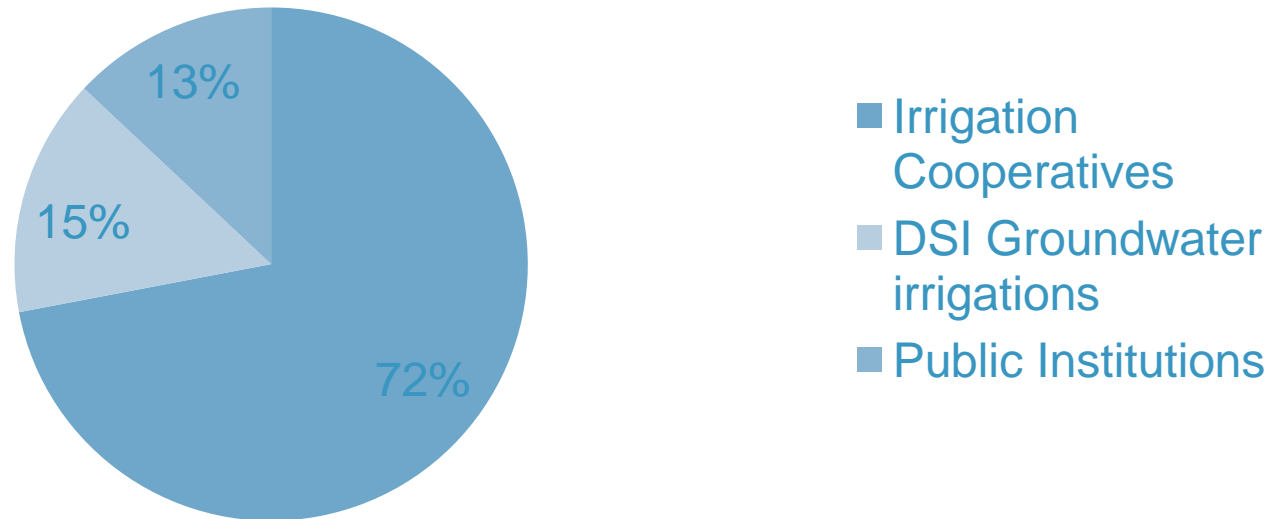
26<sup>th</sup>ERC & 66<sup>th</sup>IEC

**Each farmer who wants to consume groundwater for irrigation should get license from DSI according to the Law on Groundwater. 3.430 billion cubic meters was allocated for individual groundwater irrigations. 273 962 user's licenses have been granted for individual irrigations.**

# Consideration

---

**The ratio of groundwater irrigation areas which are irrigated from facilities built by DSI**





**ICID2015**

26<sup>th</sup>ERC & 66<sup>th</sup>IEC

# Consideration

---

**From year to year, operational rights of irrigation networks are being transferred to irrigation organizations. There are several organizations responsible for development, management and conservation of groundwater resources. DSI, as a water authority, is the main organization responsible for development, management and conservation of groundwater resources.**



**ICID2015**

26<sup>th</sup>ERC & 66<sup>th</sup>IEC

# Consideration

---

**Foundation of irrigation cooperatives and education of the farmers are performed by Ministry of Agriculture and Rural Affairs.**



# Consideration

---

**Groundwater has been over extracted therefore the government initiated some measures to control the use of groundwater. Some gauging systems have been necessary in order to measure the groundwater use. As per Law, it has been imperative that gauging systems are to be installed in boreholes. “DSI Groundwater Gauging System Regulation” come into effect.**





# Agricultural Groundwater Use in Turkey

---

**ICID2015**

26<sup>th</sup>ERC & 66<sup>th</sup>IEC

**Thank you for your attention**