IRRIGATION DEVELOPMENT & MANAGEMENT ACTIVITIES IN TÜRKİYE

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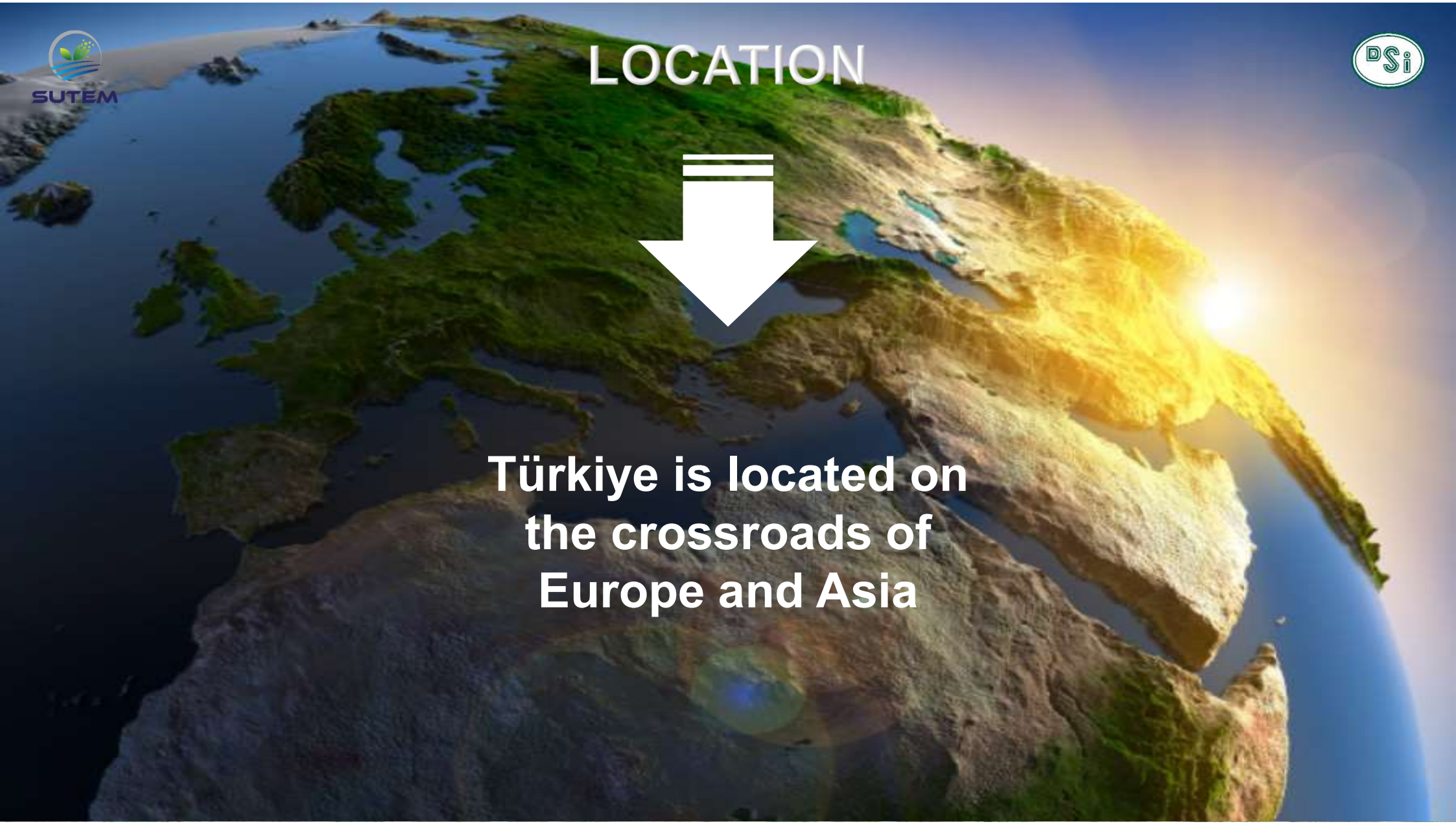
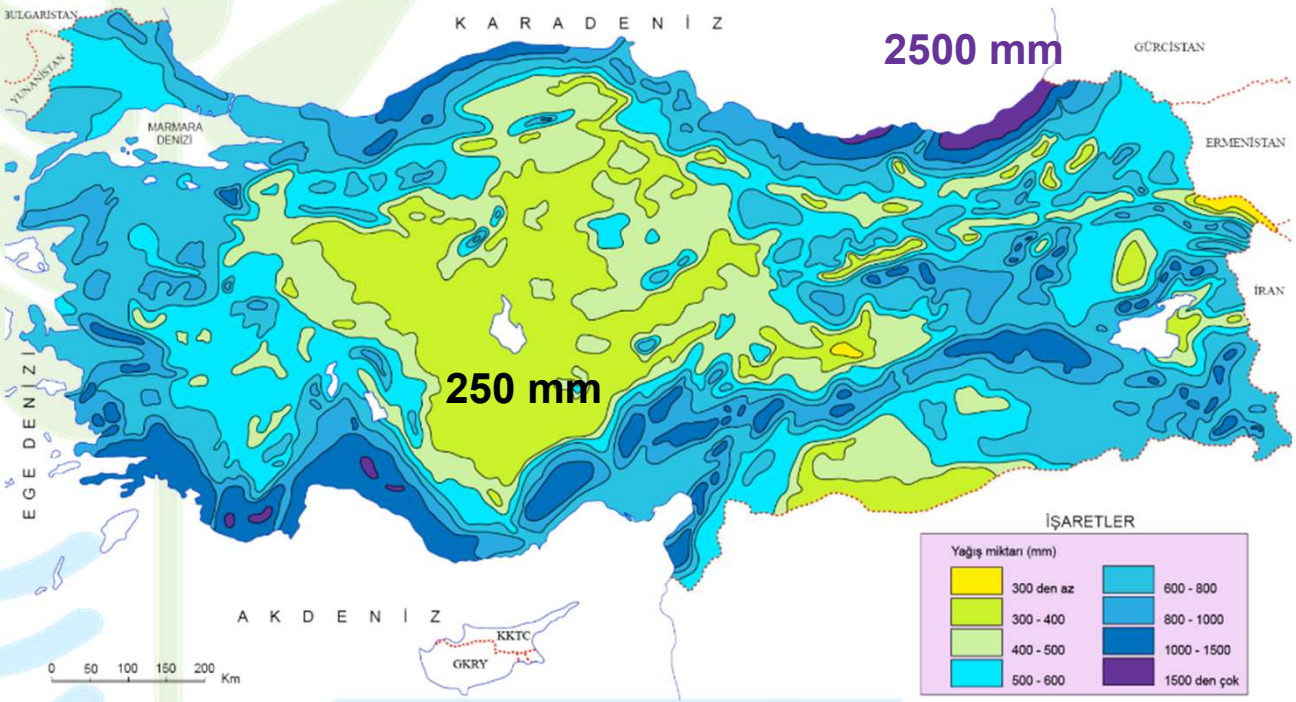
GENERAL STATISTICAL VALUES


LOCATION
Türkiye is located on
the crossroads of
Europe and Asia

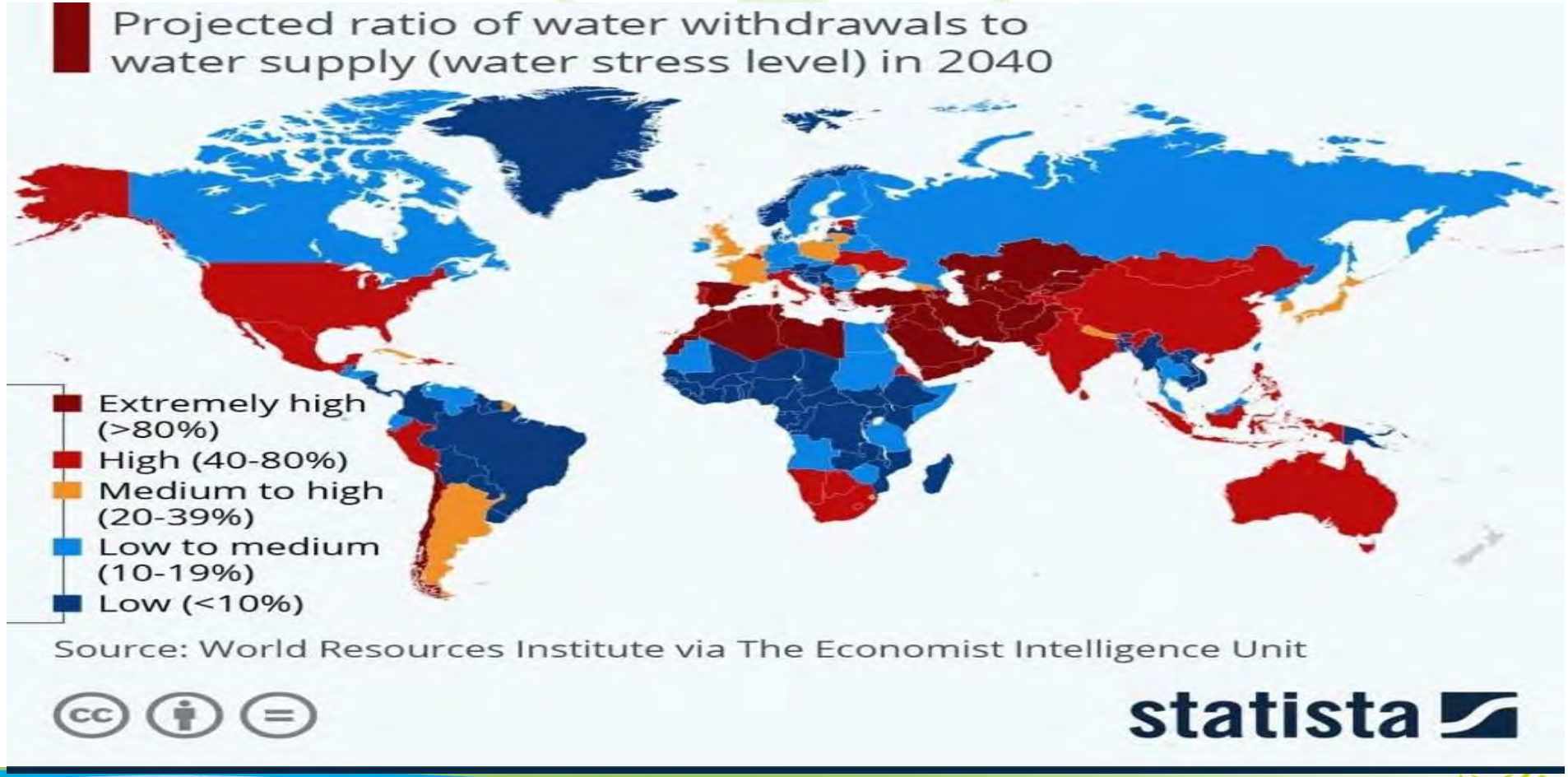
WATER POTENTIAL

- Our country is under water stress in terms of the amount of water per capita.
- Turkey is located in a semi-arid region; precipitation has uneven distribution varying between **250-2500 mm**.



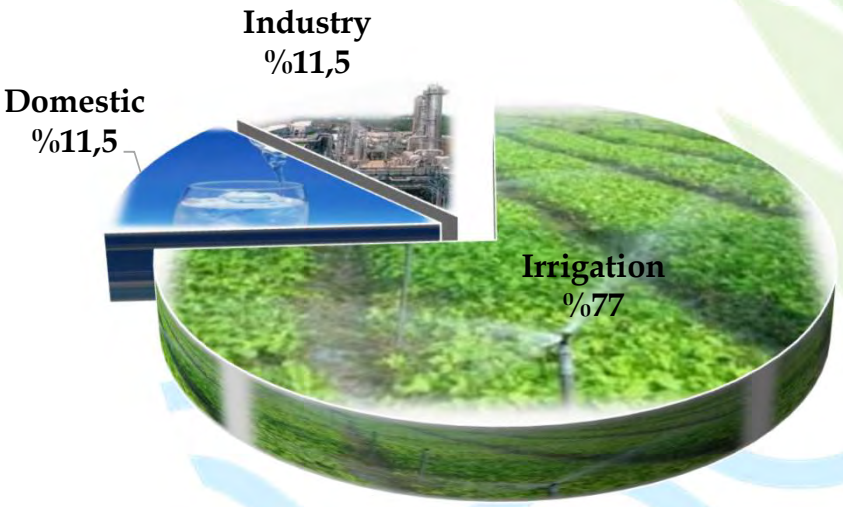
- Irrigation required area to achieve optimum yield level is **93%**.

WATER STRESS



WATER CONSUMPTION

Actual Water Consumption



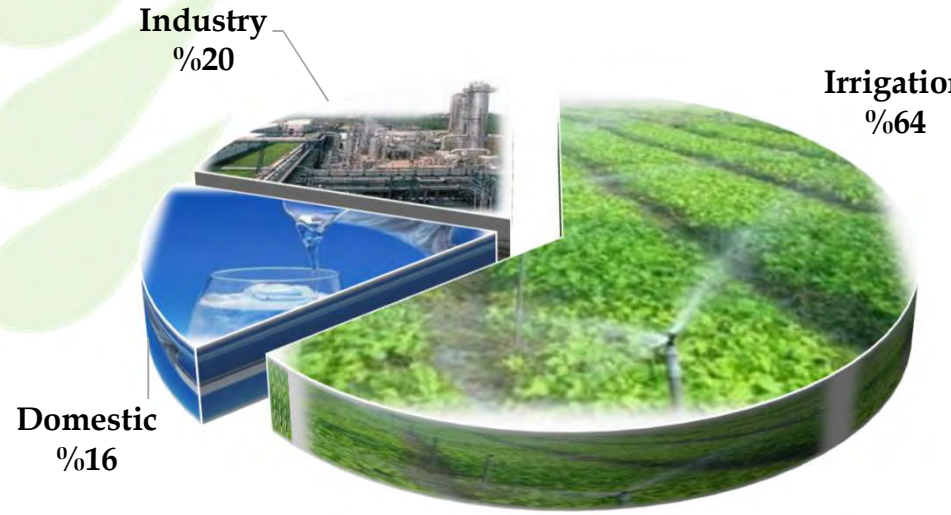
Water Cons. for Irrigation : 46 billion m³

Water Cons. as Domestic Water : 7 billion m³

Water Cons. for Industry : 7 billion m³

Total Consumed Water : 60 billion m³

Water Consumption Projection



Water Cons. for Irrigation : 72 billion m³

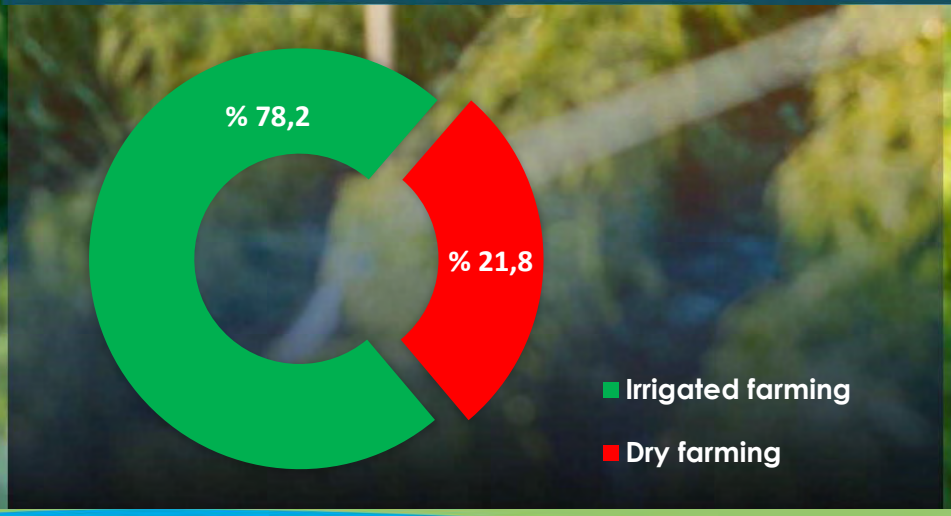
Water Cons. as Domestic Water : 18 billion m³

Water Cons. for Industry : 22 billion m³

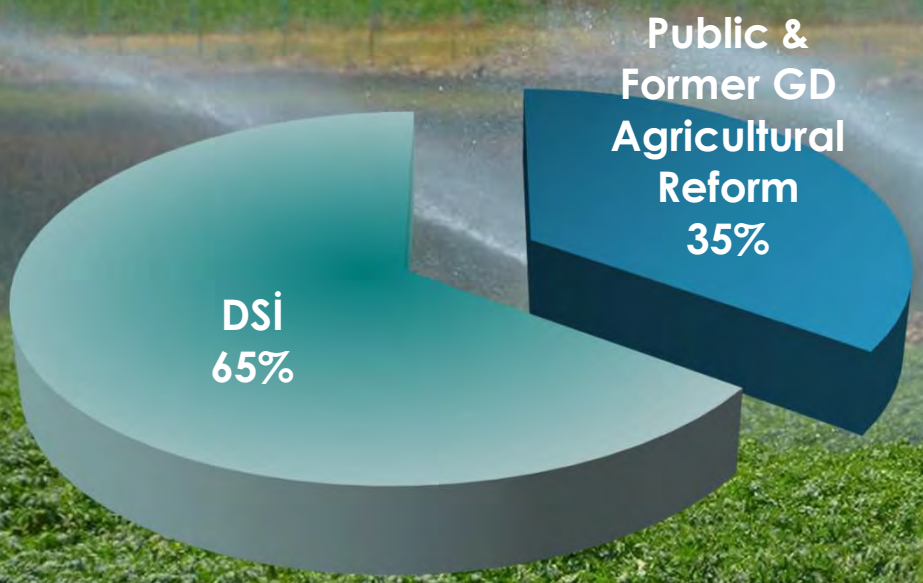
Total Consumed Water : 112 billion m³

AGRICULTURAL LAND

Surface area	78	million ha
Farmland	24	million ha
Economically irrigable land	8,5	million ha



ORGANISATIONAL DISTRIBUTION OF IRRIGATIONS



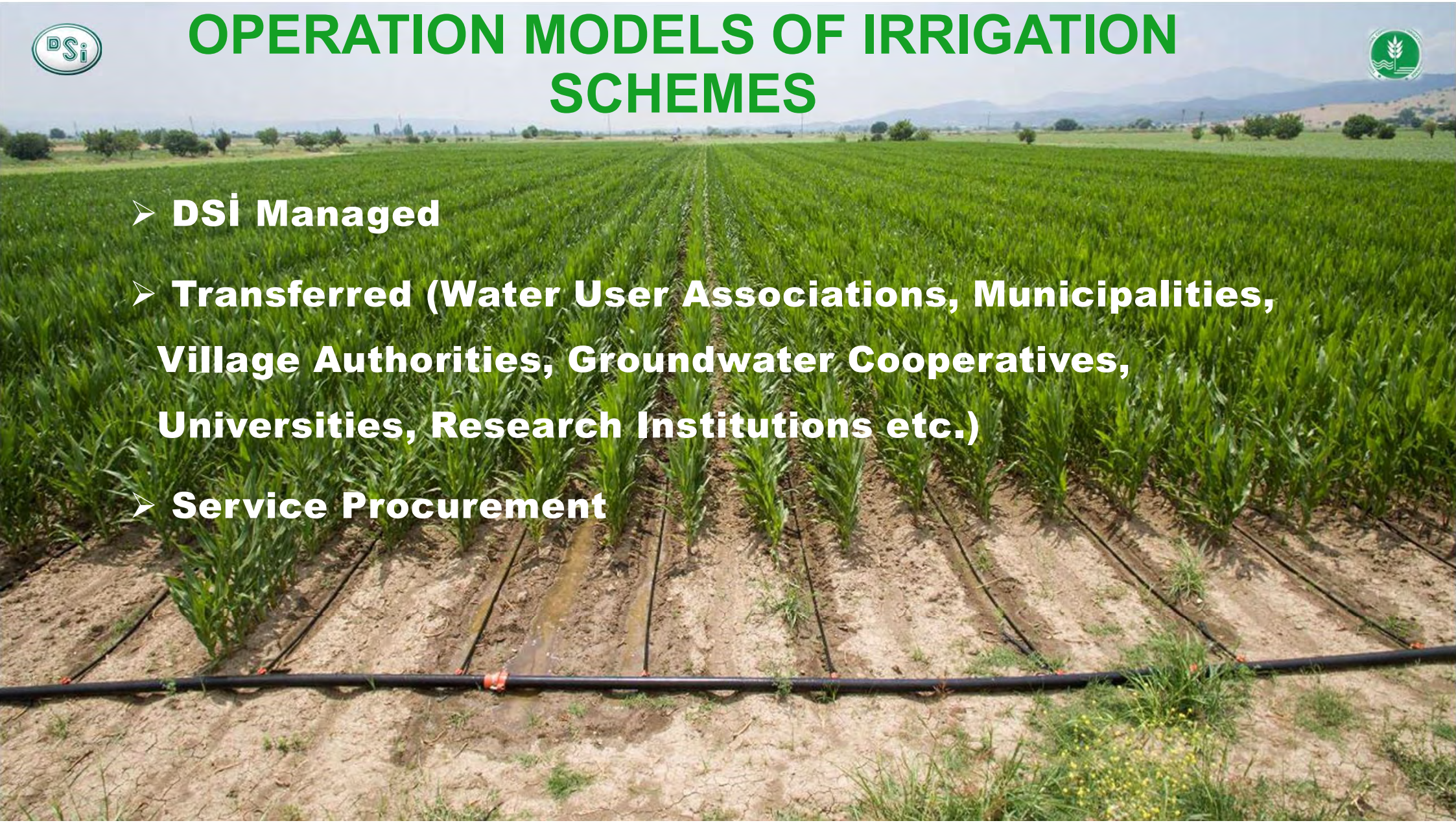
Economically irrigable land by 2020

4,36 million hectare DSİ

2,29 million hectare Public and Former GD of Agricultural Reform

6,65 million hectare

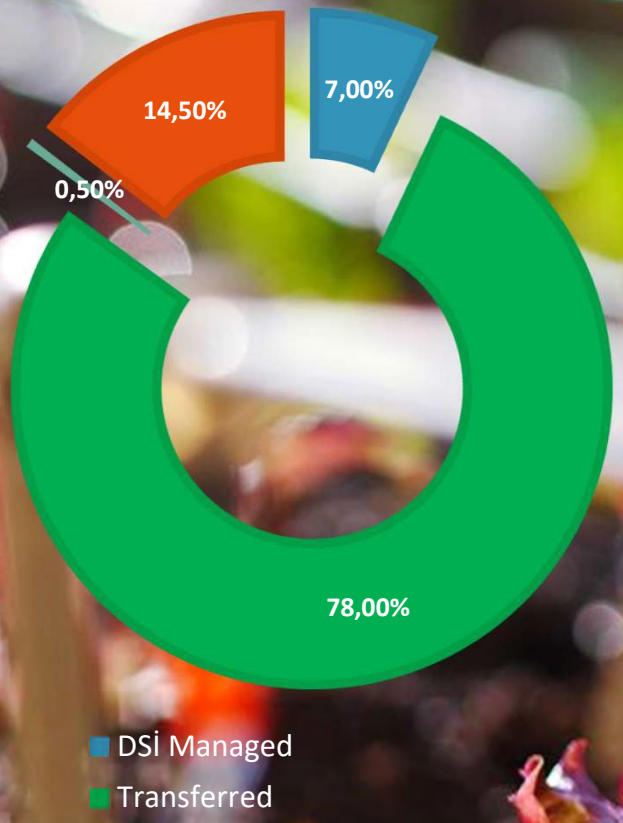
OPERATION MODELS OF IRRIGATION SCHEMES



- DSİ Managed
- Transferred (Water User Associations, Municipalities, Village Authorities, Groundwater Cooperatives, Universities, Research Institutions etc.)
- Service Procurement

IRRIGATION SCHEMES BY THE END OF 2020

Irrigation Schemes	Numbers	Area (ha)	(%)
DSİ Managed	304	232 546	7
Transferred	1 204	2 714 027	78
Built for the cost	29	17 013	0,5
Groundwater Cooperatives	1 446	499 239	14,5
TOTAL	2 983	3 462 825	100



DEVELOPMENT OF IRRIGATION SYSTEMS IN TÜRKİYE

DEVELOPMENT OF IRRIGATION SYSTEMS

- **ANCIENT PERIOD**

- **OTTOMAN EMP. PERIOD**
  - **Konya Irrigation Project (1903 – 1913) - First irrigation project by the government**

- **BEGINNING PERIOD OF THE REPUBLIC**
  - **Tokat Kazova Irrigation Scheme (1945)**
  - **İzmir Menemen Irrigation Scheme (1949)**

DEVELOPMENT OF IRRIGATION SYSTEMS

- 1950 - 1965 open canal irrigation systems
  - Huge infrastructural investments on irrigation and drainage started after the establishment of the General Directorate of State Hydraulic Works (1954).

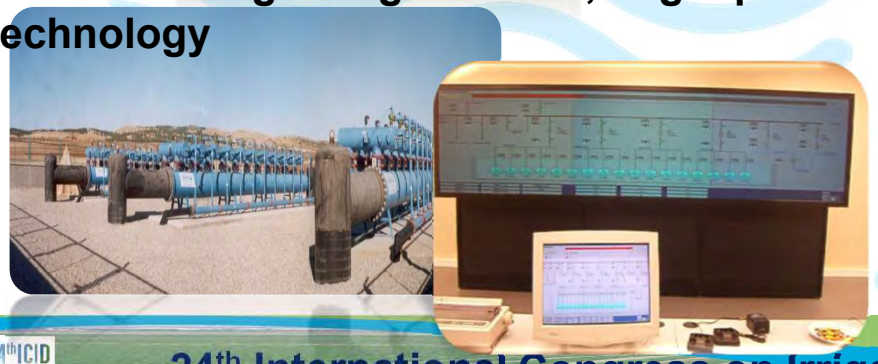
- 1970 - 1980 canalette systems

DEVELOPMENT OF IRRIGATION SYSTEMS

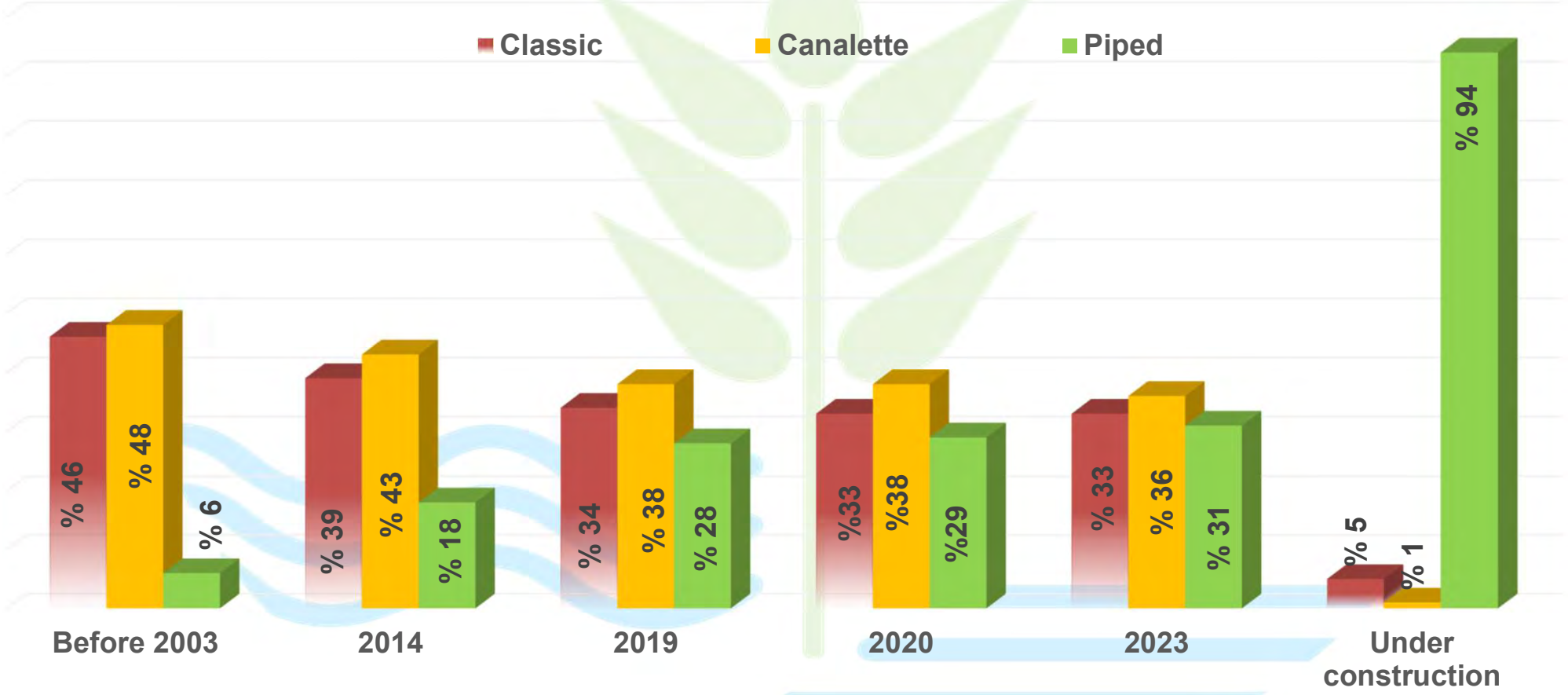
- 1980 - 1990 low&med pressurized piped irrigation systems applied commonly

- After 1990s high pressurized pipe irrigation systems applied commonly

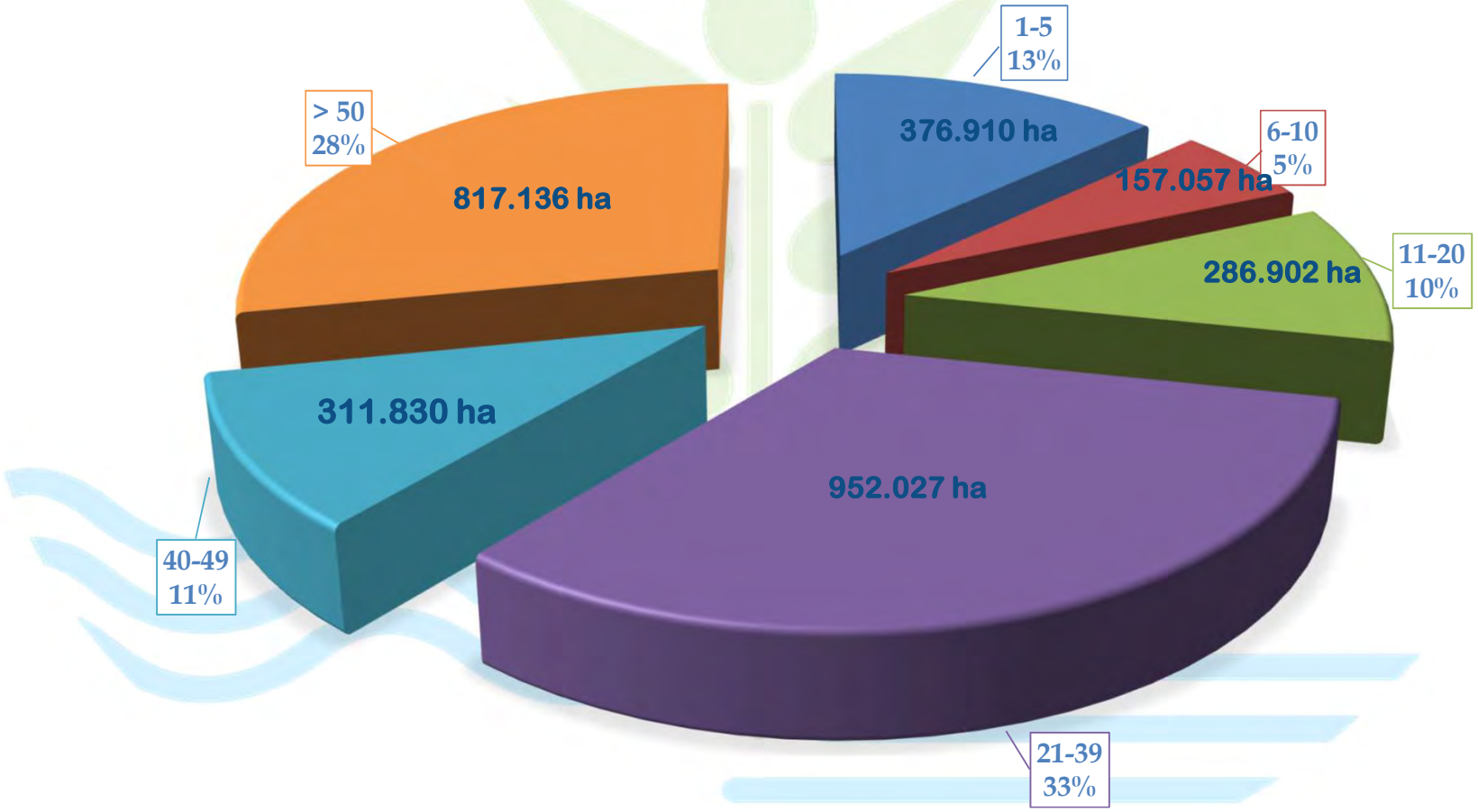
- From the beginning of 2000, high pressurized pipe irrigation systems furnished with high technology



DEVELOPMENT OF IRRIGATION SYSTEMS

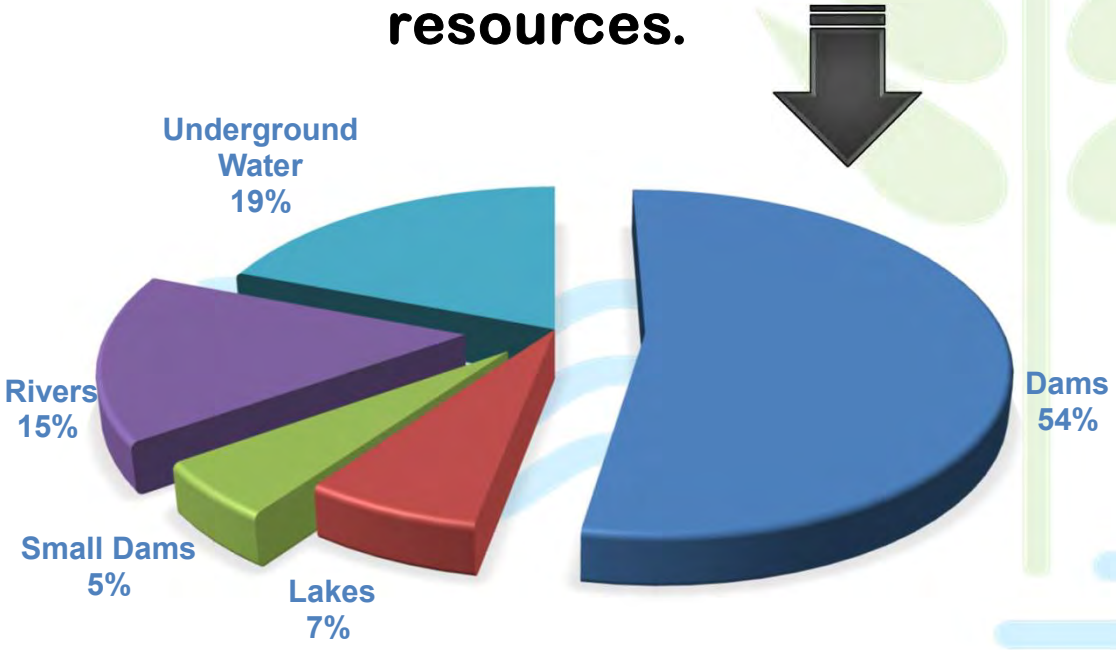


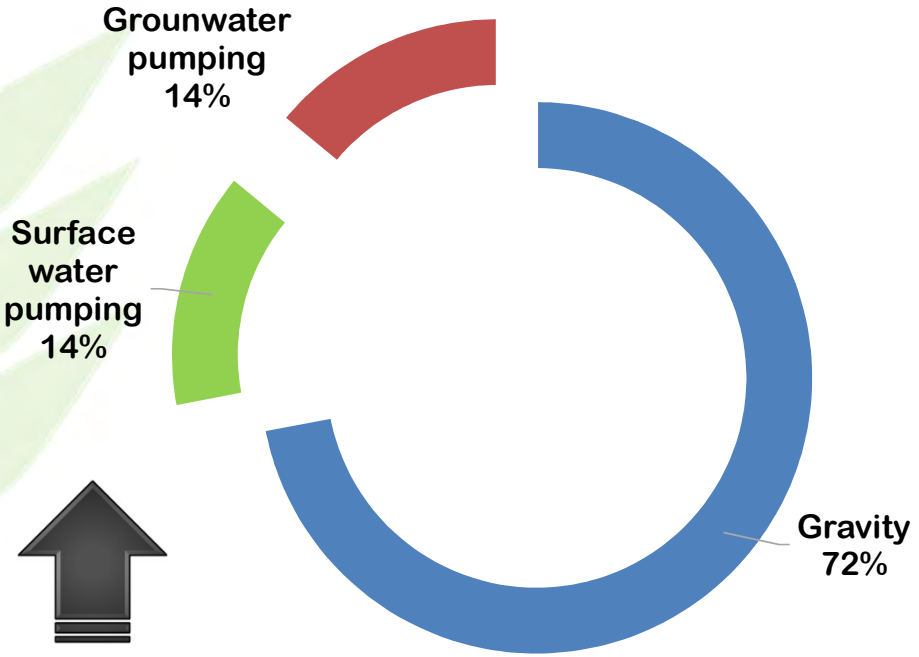
SERVICE PERIOD OF THE IRRIGATION SCHEMES UNDER THE OPERATION



WATER SOURCE OF IRRIGATION SCHEMES

84% of the irrigation areas are irrigated by surface water resources and **16%** by underground water resources.

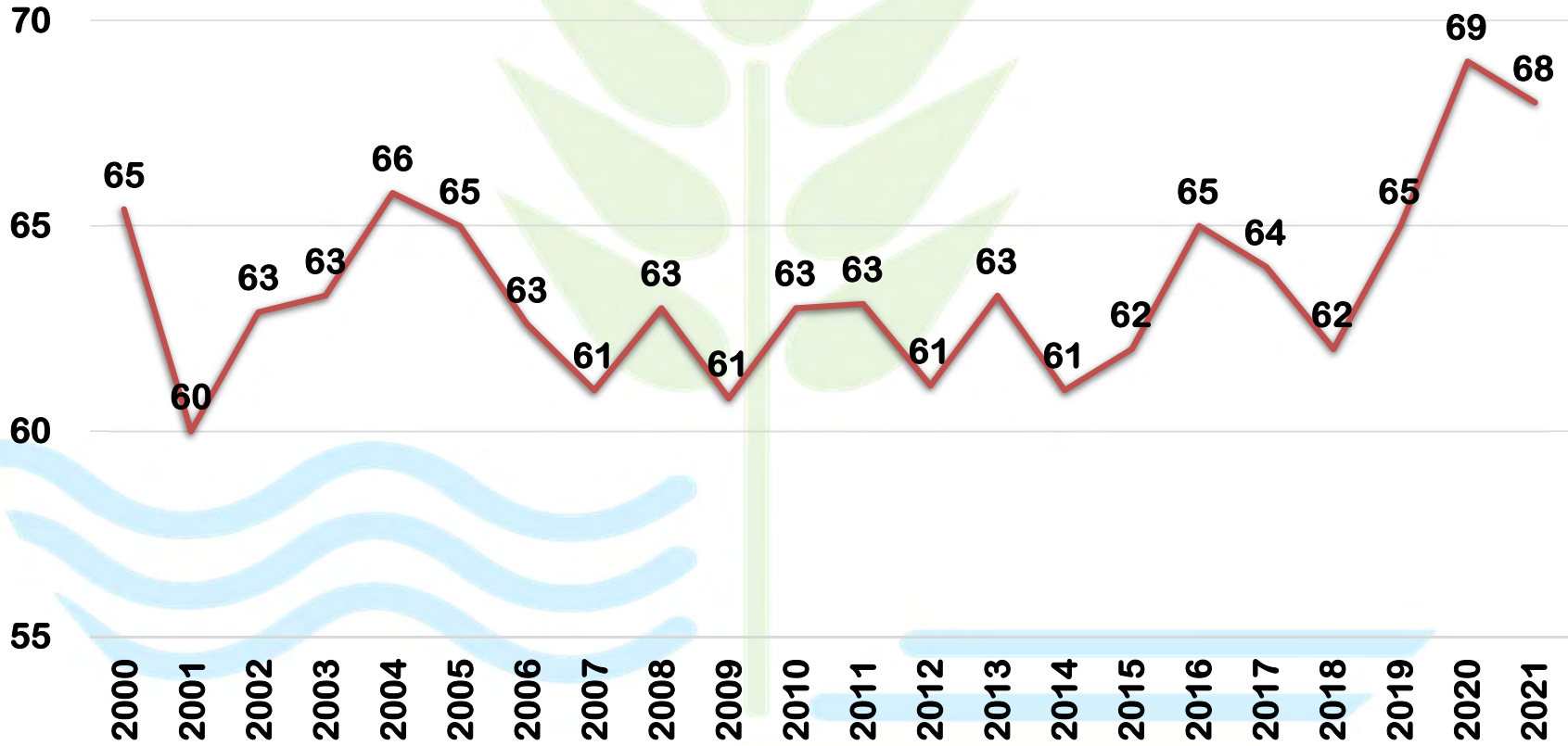




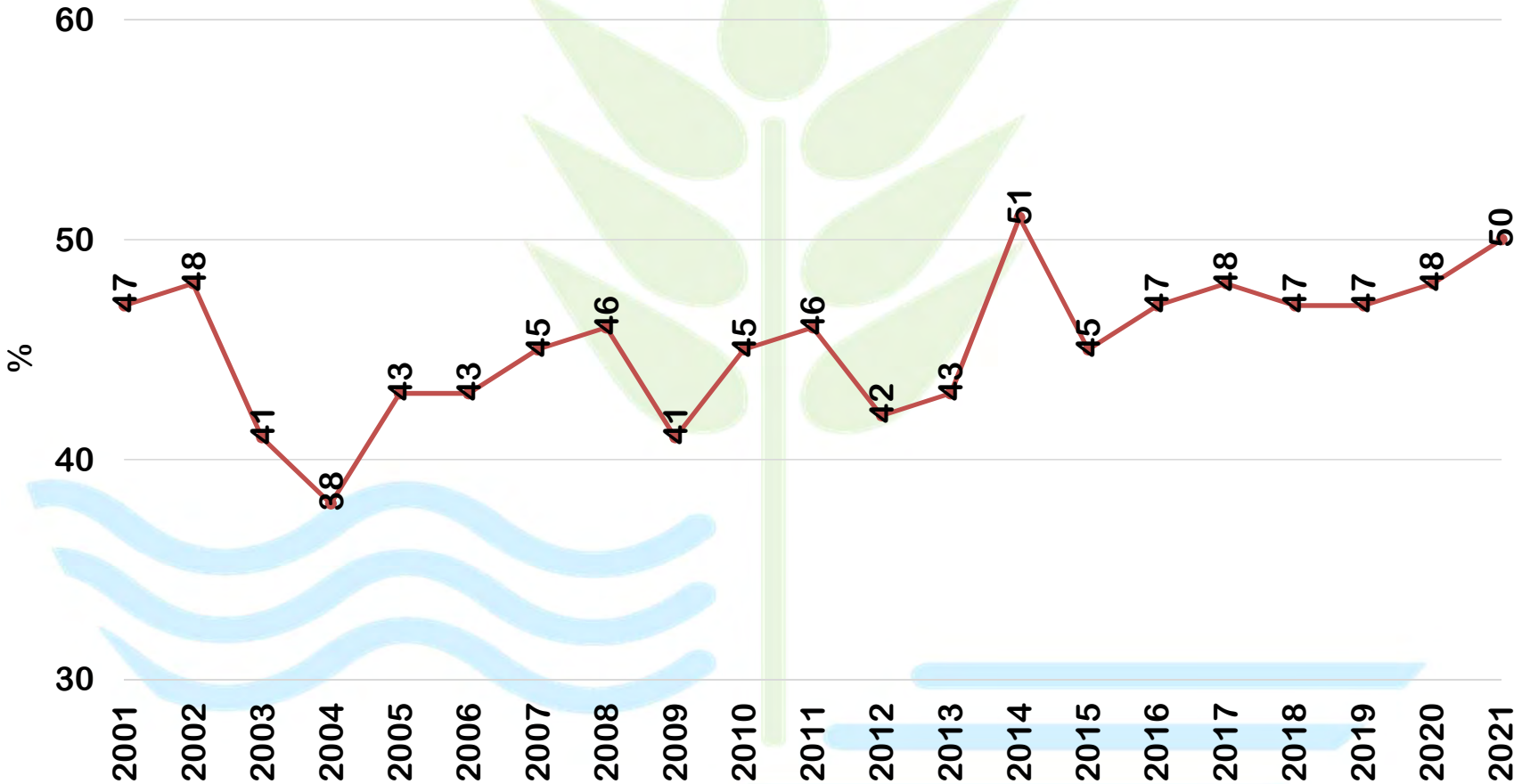
72% of the irrigation areas are irrigated by gravity and **28%** by pumping.


IRRIGATON
PERFORMANCE
INDICATORS

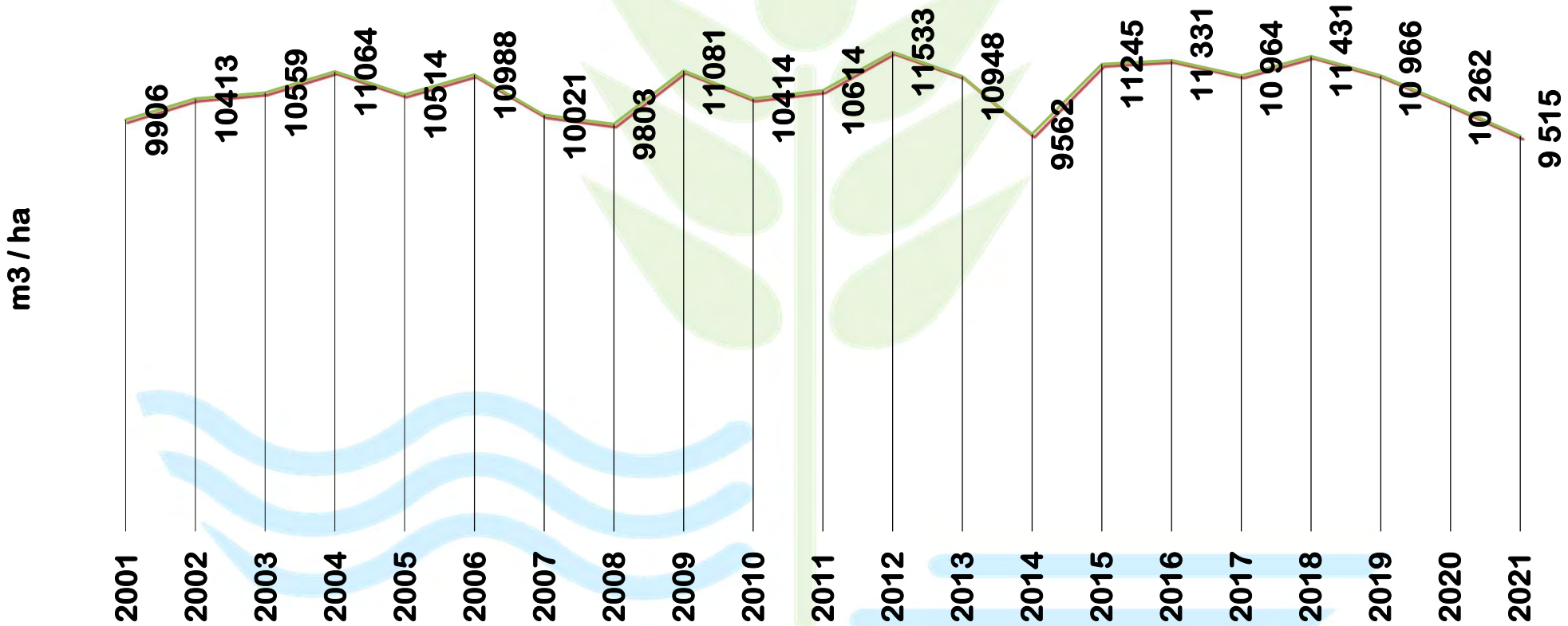
CHANGE IN IRRIGATION RATIO



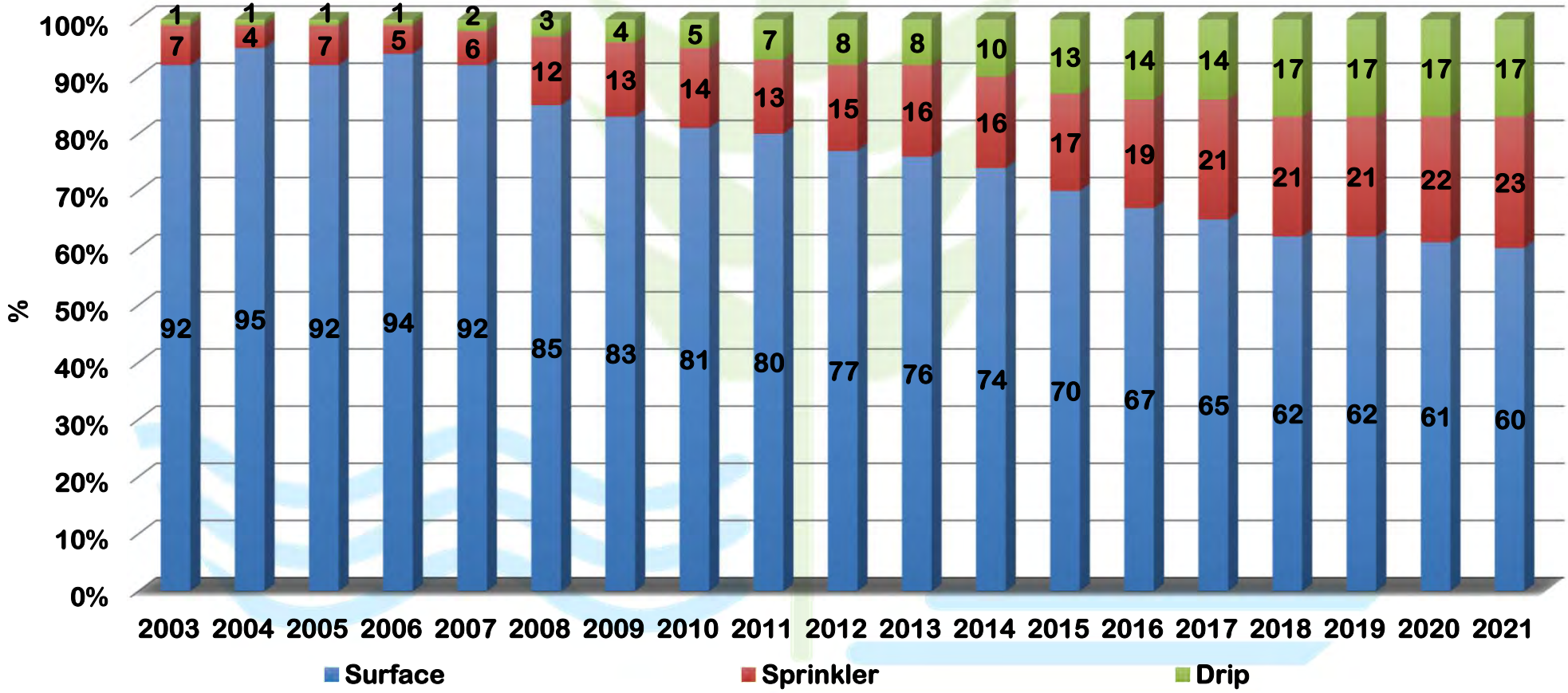
CHANGE IN IRRIGATION EFFICIENCY



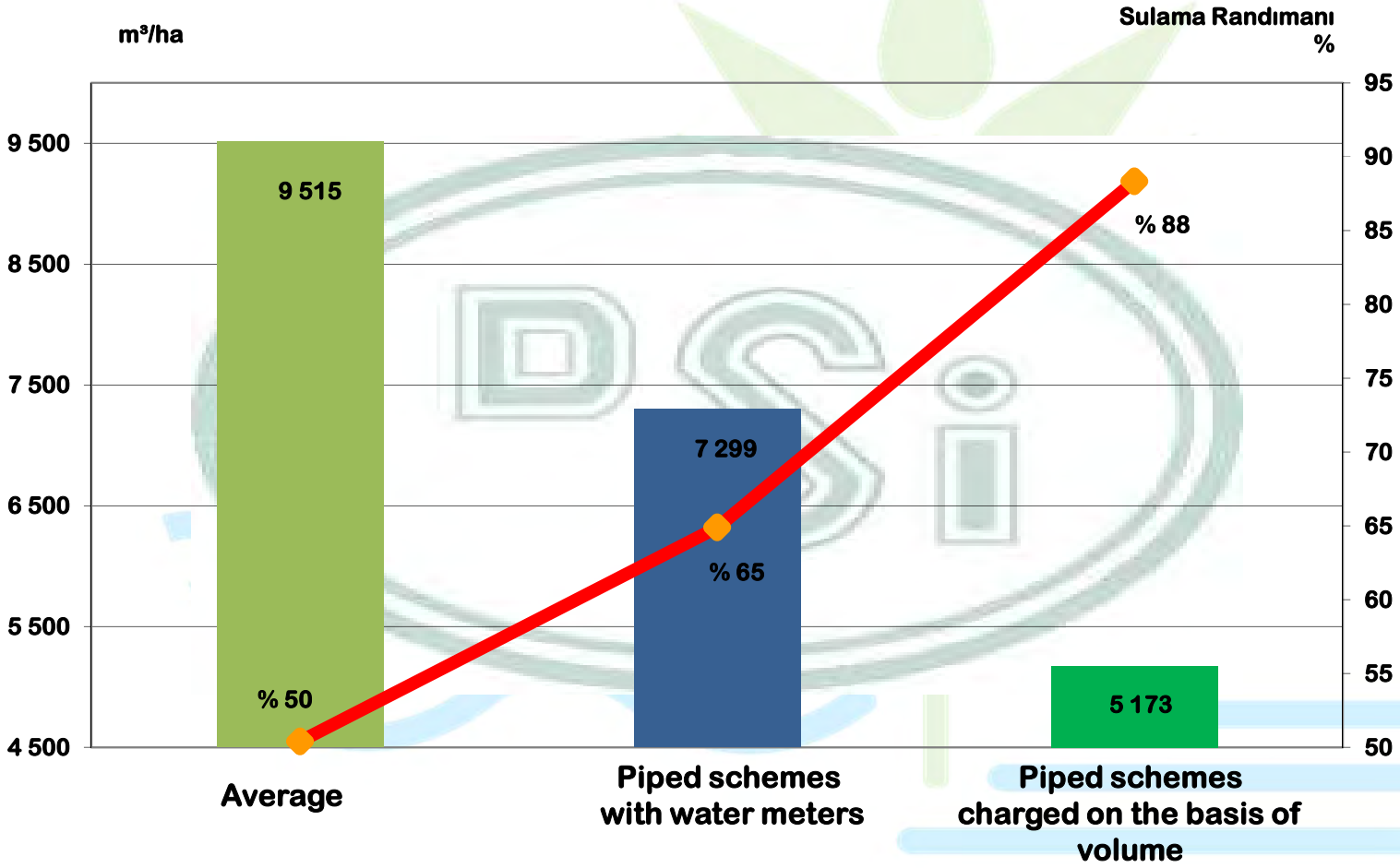
CHANGE IN WATER USAGE



IRRIGATION METHODS



IRRIGATION EFFICIENCY - 2021

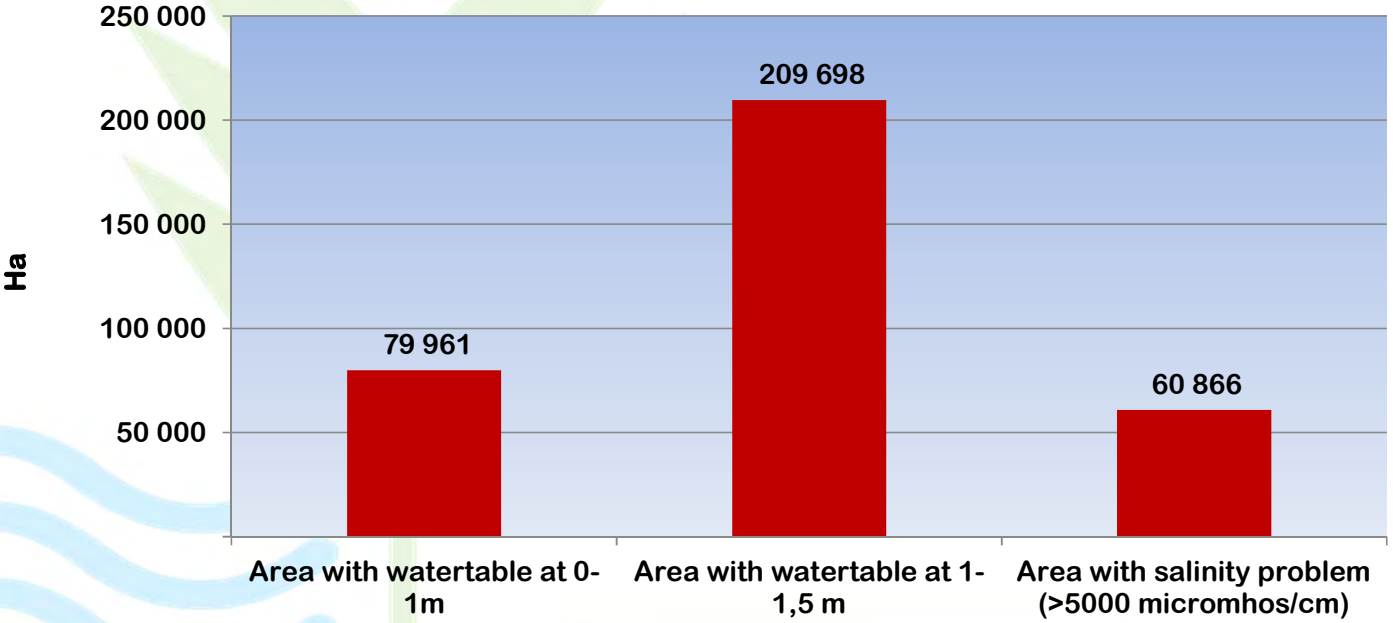


Water savings compared to the average;

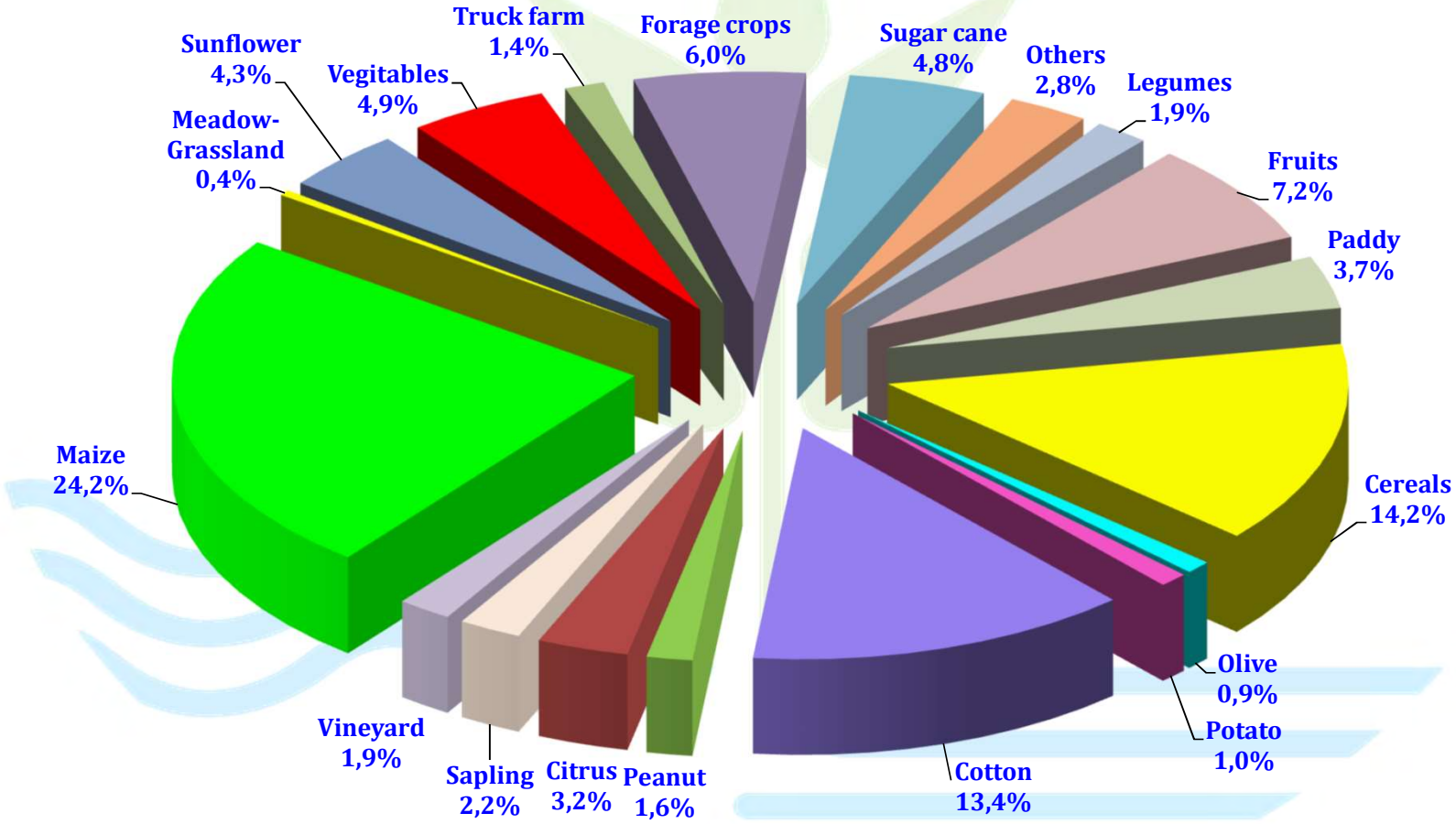
24% in piped irrigation facilities with meters

46% in irrigation facilities charged on the basis of volume

WATERTABLE MONITORING IN IRRIGATION SCHEMES



CROP PATTERN IN IRRIGATION SCHEMES



SUSTAINABILITY OF IRRIGATION SCHEMES

MAINTENANCE ACTIVITIES

- ✓ **Water user organizations are responsible to meet the maintenance needs of irrigation schemes according to the Transfer Agreement acted with DSİ and the Law.**

MAINTENANCE ACTIVITIES

Type of Maintenance	Long Terms Average
Irrigation canal cleaning (m^3)	4 400 000
Drainage canal cleaning(m^3)	3 350 000
Maintenance of concrete (m^3)	80 000
Maintenance of O&M service roads (km)	15 000
Paint of metal equipment (m^2)	40 000

MAINTENANCE PROJECTS

- ✓ **In order to meet growing needs of structures and to increase the duration of use Maintenance Projects are implemented.**
- ✓ **Based on the principle of the execution of together with the WUOs.**

PRINCIPLES OF THE MAINTENANCE PROJECTS

- There are two type of implementation.
  - I. In the first one, the work carried out by DSI in all aspect and the cost is recovered in 3-7 equal instalments.
  - II. In the second one, required material for the implementation of the work provided by DSI, labour done by WUOs. The cost of supplied material is recovered in 3-7 equal instalments

- Their upper limit of is 800 000 USD.

MAINTENANCE PROJECTS

Renovation of pumping station of İznik Boyalıca Irrigation Scheme in cooperation with Boyalıca Water User Association

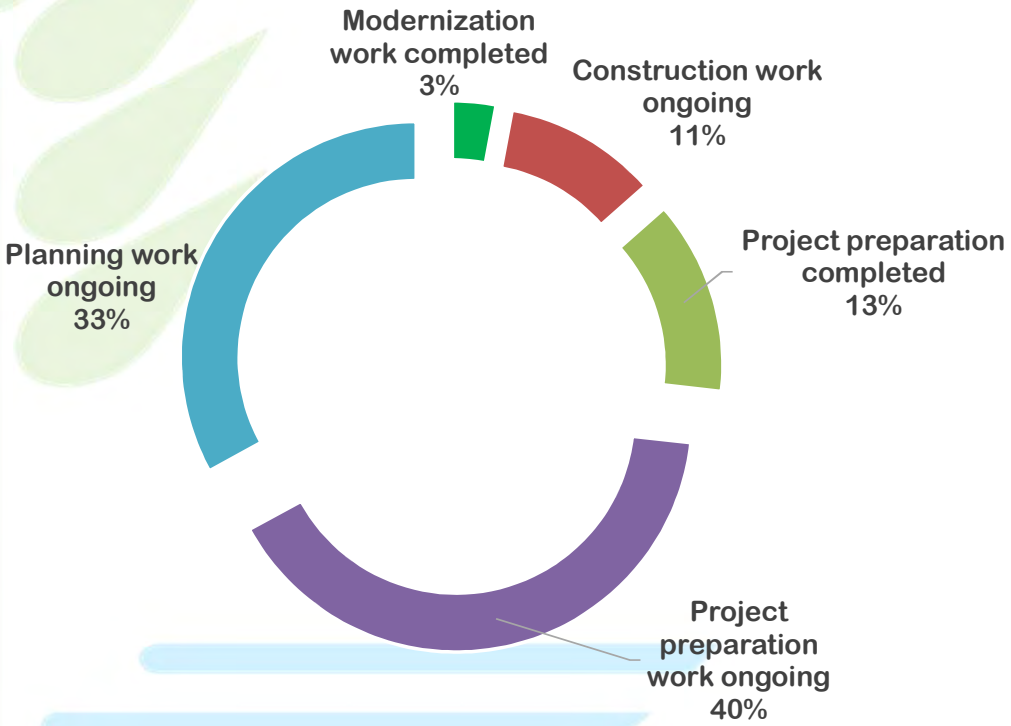
Renovation of concrete canal of Altınyazı Karasaz Irrigation Scheme in cooperation with Karasaz Irrigation Cooperative

MODERNIZATION PROJECT

Some irrigation schemes have been damaged over time due to natural conditions, human interventions and misuse and cannot be sustained by maintenance budget.

CURRENT STATUS OF THE MODERNIZATION PROJECT

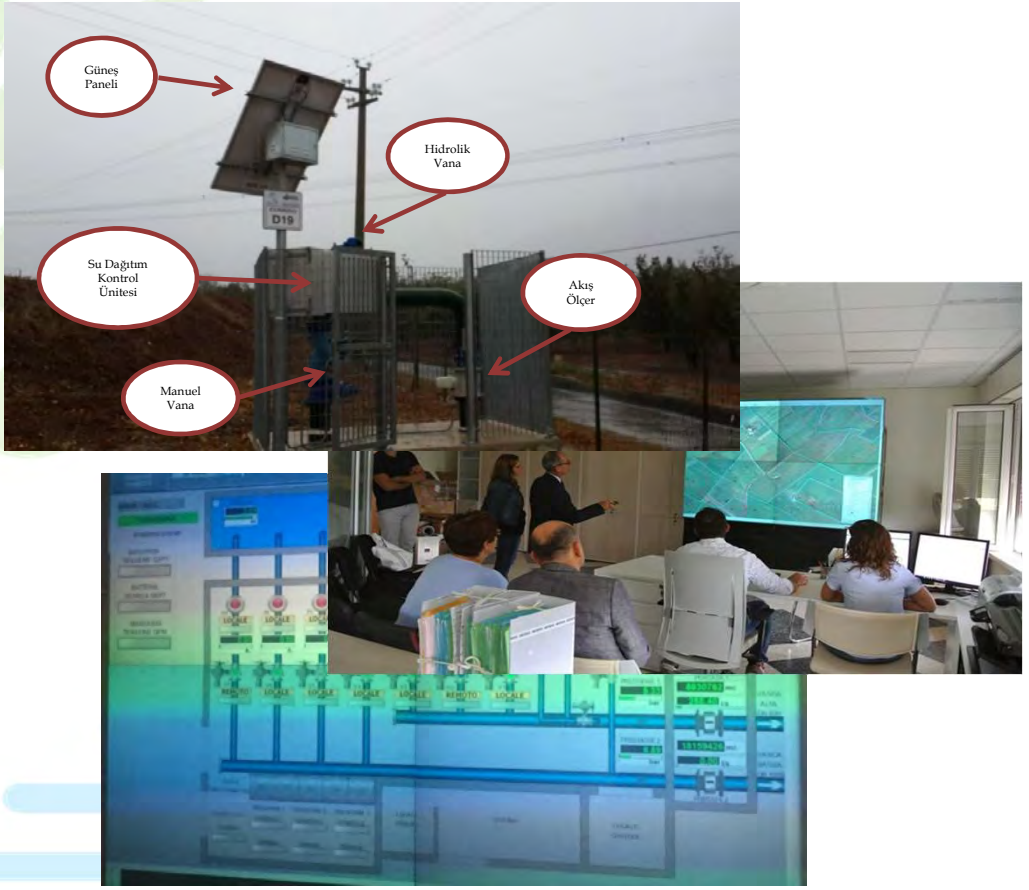
Status	Number of Project	Area (ha)
Modernization work completed	41	37 061
Construction work ongoing	21	130 978
Project preparation completed	55	165 988
Project preparation work ongoing	64	501 199
Planning work ongoing	81	410 861
TOTAL	262	1 246 087



MODERNIZATION PROJECT

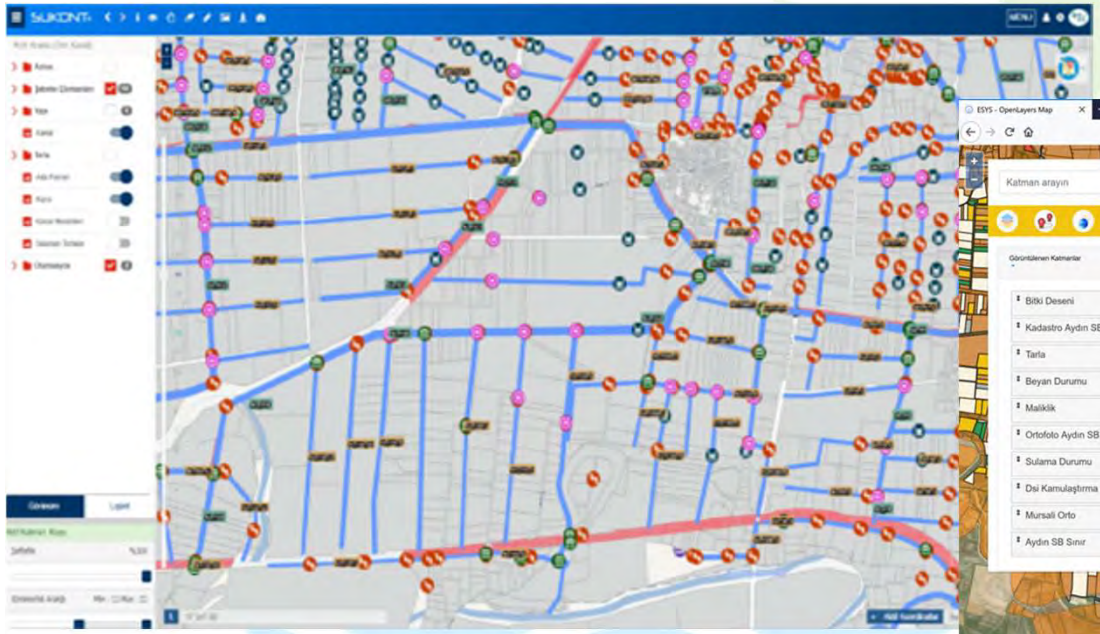
- Developments in automation and decision support systems are taken into account in new irrigation projects.

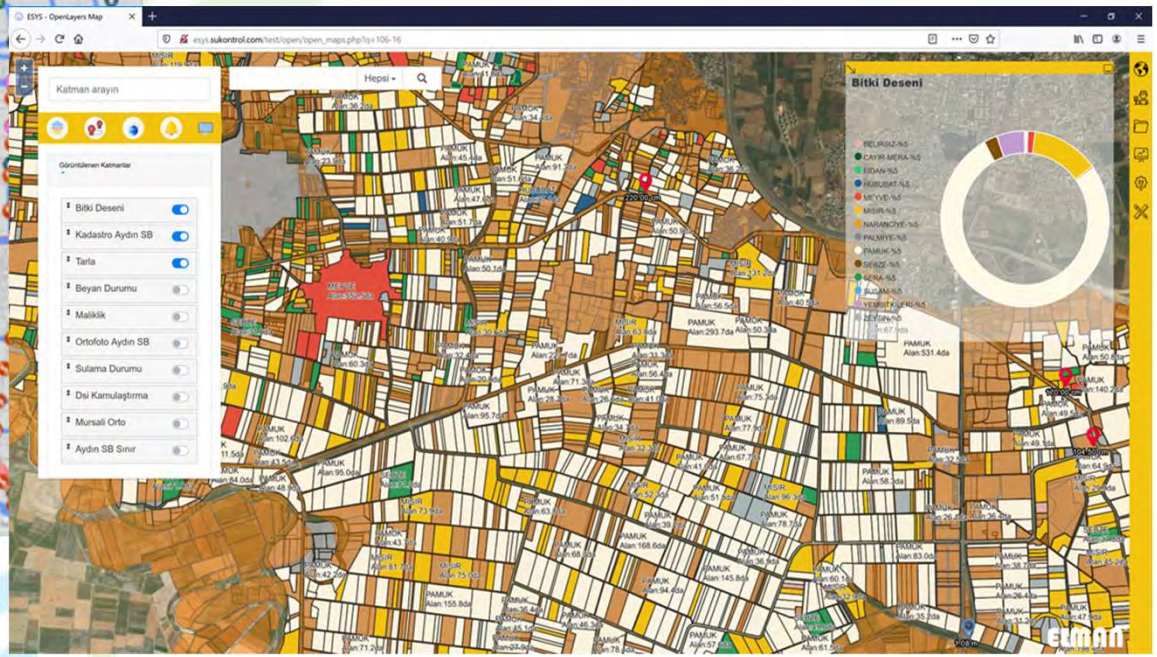
- These applications, especially in piped irrigation systems, can prevent intervention and water can be supplied to the network to the extent of real needs.



MODERNIZATION PROJECT

SEYİTLER IRRIGATION AUTOMATION SYSTEM CENTRAL MANAGEMENT SCREENS





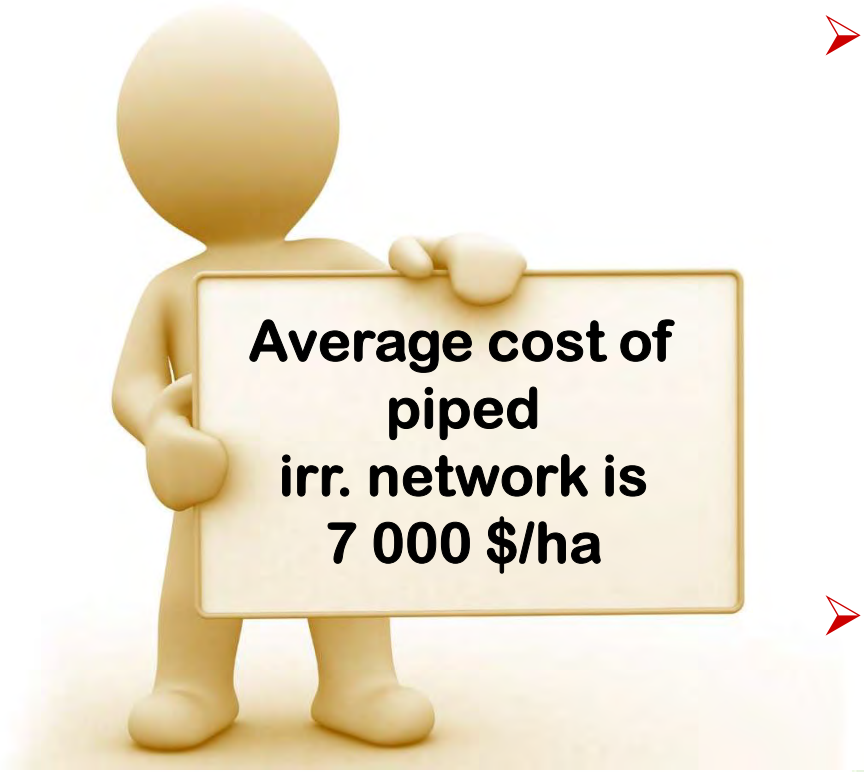
✓ It is an agricultural management system in which meters and valves for irrigation purposes specific to each parcel are centrally controlled with the SCADA system.

MODERNIZATION PROJECT

With the mobile application, regional directorate and water user organization managers can also manage the system remotely.

Such as starting-ending irrigation, declaration proceedings, accessing water observation station data and setting alarms, plot/farmer irrigation date, amount, authorization changes, plant pattern operations can be done without limitation of place or device 24 hours a day, 7 days a week, by providing many different data access or intervention possibilities.

ECONOMIC PORTRAIT OF THE MODERNIZATION PROJECTS



- Although some experts do not adopt the modernization of irrigation networks before new areas being taken to operation, an increase of 1% in the irrigation ratio means that 65 million USD increase in value of production.
- In addition, an increase of 1% in irrigation efficiency, 500 million m^3 of water is saved.

MONITORING & EVALUATION OF IRRIGATION SCHEMES

IRRIGATION FACILITIES SPATIAL INFORMATION SYSTEM

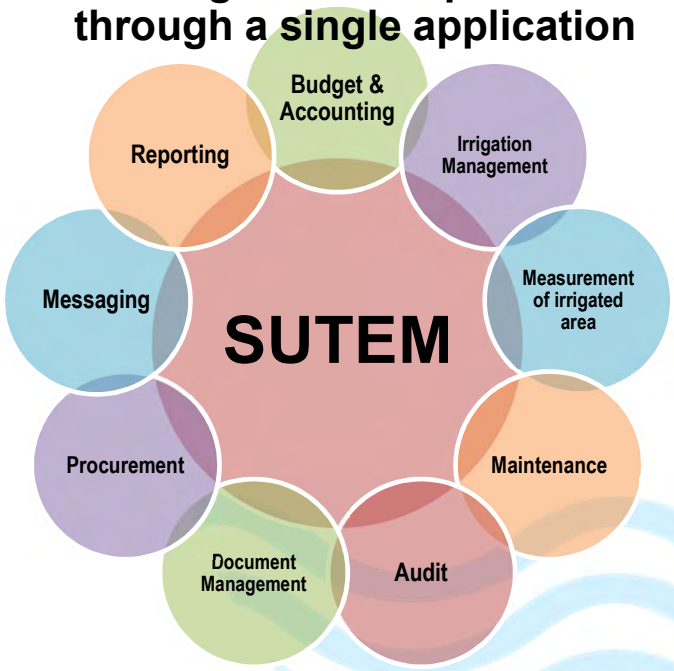
A digital platform to monitor, evaluate and report the O&M activities of irrigation facilities serves gross 4,6 Mha operated by DSİ and transferred to WUOs.

SUTEM is a kind of management information system that provides the basis for the decision support system.

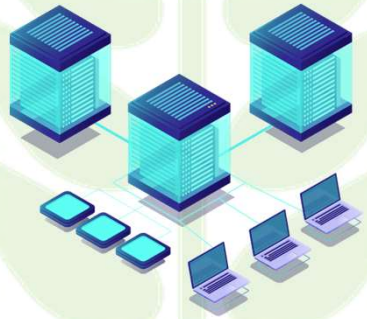
http://sutem.dsi.gov.tr

TARGETS

- Meeting the requirements through a single application

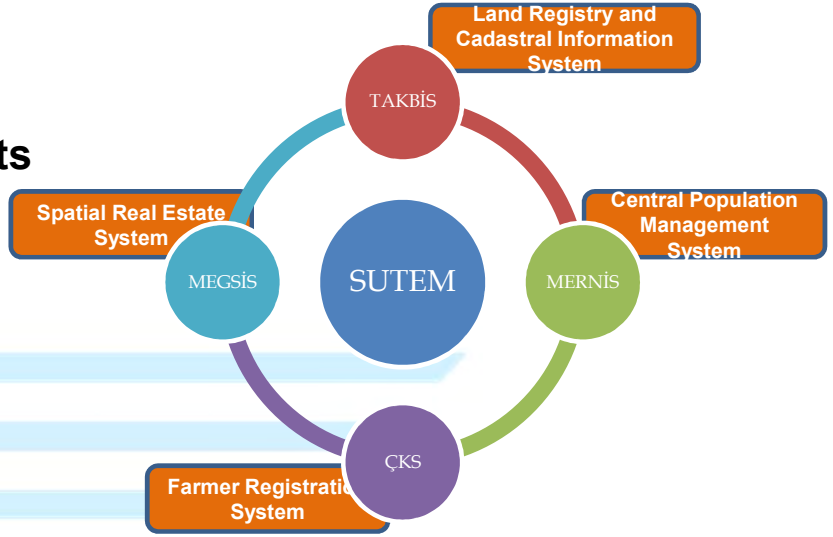


- Centralized data security



- Saving time and labor

- Effective use of external services



- Standardization in reports

- Ease of control and inspection

DESIGN AND INTEGRATION

Log and Identification Module	Inventory Module	Budget and Accounting Module	Accrual-Collection Module
Irrigation Management Module	Field Operations Module	Maintenance Module	Water User Module
Document Management Module	Communication Module	Audit Module	Purchasing Module
Investment and Expropriation Module	Crop Census Module	Monitoring and Evaluation Module	Report Module

CONCLUSION

- It is important to build structures, but the sustainability of them can be provided by good O&M activities. Therefore, more attention should be given to the operation and maintenance.

«The destiny of the next generation is determined by previous one.»

K'ung Fu-tzu


Thank you
for your attention ...
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