

**INTEGRATED RURAL DEVELOPMENT
IN RIVER BASIN MANAGEMENT :
THE SEYHAN RIVER BASIN EXAMPLE**

Sevgi DONMA

**Head engineer of the 6th Regional
Directorate of State Hydraulic Works**

Adana/TURKEY

TURKEY



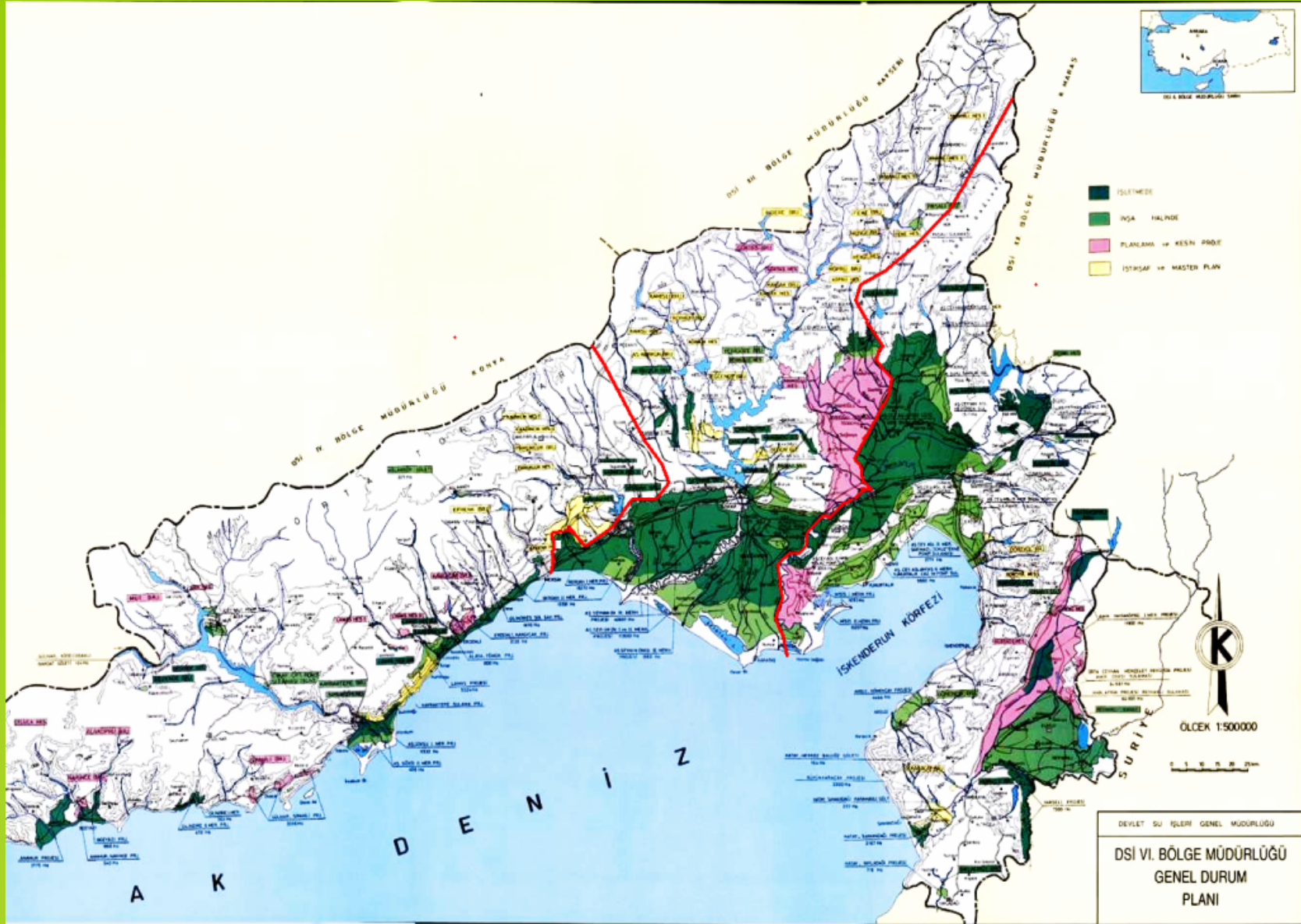
Area: 77,95 million ha
Population: 65 million

INTRODUCTION

- Turkey is located in the semi-arid Mediterranean zone of the world. Climate and precipitation figures exhibit great variance throughout the country. The average annual precipitation ranges from 250 mm to over 3000mm.
- Therefore, the planning and development of water resources has always been important in the country.
- The General Directorate of State Hydraulic Works (DSI), which employs an integrated water resource management, is the primary executive state water agency for Turkey

- DSI intends to implement integrated river basin management systems in all 26 main river basins of Turkey.
- It is expected the integration of the reservoirs in the river basin management system combined with the extension and improvement of the on-line monitoring networks, would form a base for a better decision making system.
- As part of the activities carried out to diversify and increase agricultural production in Turkish agriculture, huge irrigation projects were included in the planning responding in an integrated way to requirements of rural development and sustainable water management.
- This study shows two farmer participation projects which are ongoing for the irrigated and non-irrigated areas in the Seyhan Basin.

THE STUDY AREA

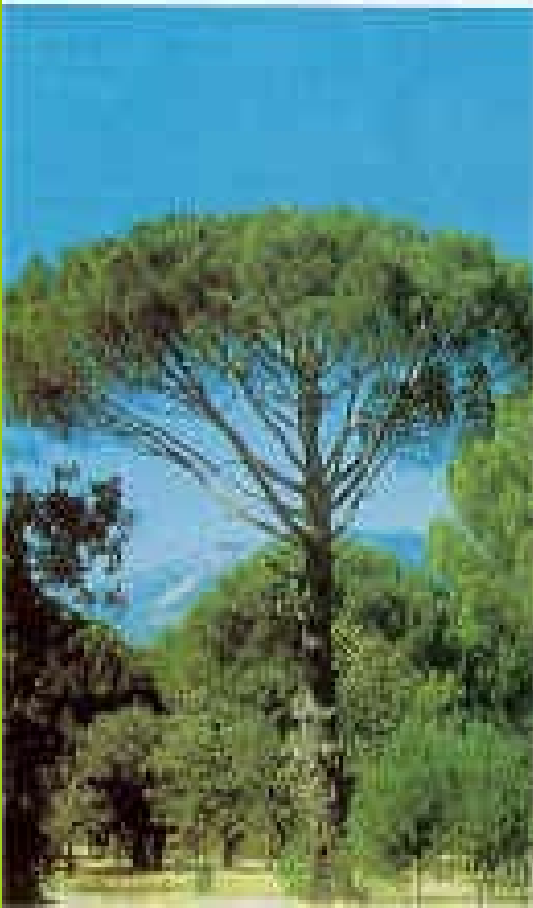


- The Seyhan basin covers an area lying between the Mediterranean Sea and Taurus Mountains rising to an elevation of 3500m.
- The waters of this area are conveyed to the sea by the Seyhan River and its main tributaries, the Zamanti and Goksu. The river's watershed comprises about 19,300 square kilometers with an average annual accumulated discharge between 5.5 to 6.0 billion cubic meters.
- The South part of the Seyhan Basin is typically Mediterranean, characterized by very hot and droughty summers and mild rainy winters.
- The annual average rainfall is 650mm, most of the precipitation occurs between December and May. The climate in the upstream is different and mildly continental.

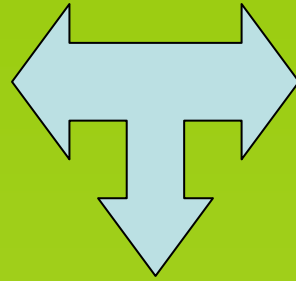
- There are 31 projects prepared by the DSI in the Seyhan River Basin for irrigation, power generation, domestic water supply and flood protection. Three of them are in operation, five of them are under construction and the others are in the planning stage.
- One of the projects which have been under operation since 1992 is the Catalan Dam project, supplying domestic water to the city of Adana.
- According to the law, farmers who have land within one km of reservoir can not use pesticides or fertilizers while cultivating their land. Therefore, farmers' incomes have decreased due to prohibitions in pesticides and fertilizers.
- A recently developed project on agro-forestry for the upstream is carried out by the Forestry Department and the University of Cukurova which seeks the management of three different sectors.

- The purposes of this project are to increase the farmers income via implementing alternative agro forestry such as *pinus pinea* (stone pine), *Rosmarinus officinalis* (Rosemary), *Laurus nobilis* (Daphne), *Ceratonic siligva* (carob), *Olea europea* (Olives), *Capari Spinoza* (Caper)
- To prevent the pollution of the reservoir and to produce ecological products suitable to EU standards
- To protect from pollution of the environment without using fertilizers and pesticides
- To protect the dam site from erosion damage To improve the conditions of the forests and increase the biomass.

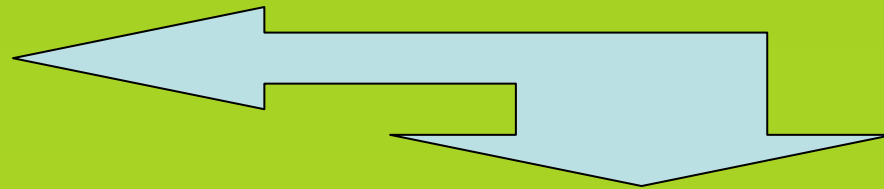
Pinus Pinea



Stone Pine



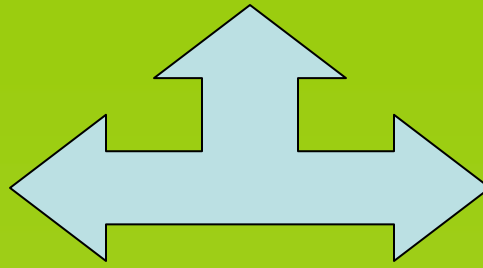
Laurus Nobilis (Daphne)



Rosmarinus Officinalis (Rosemary)



Ceratonic Siligva
(Carob)



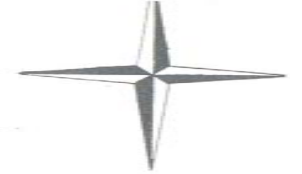
Capari Spinoza
(Caper)



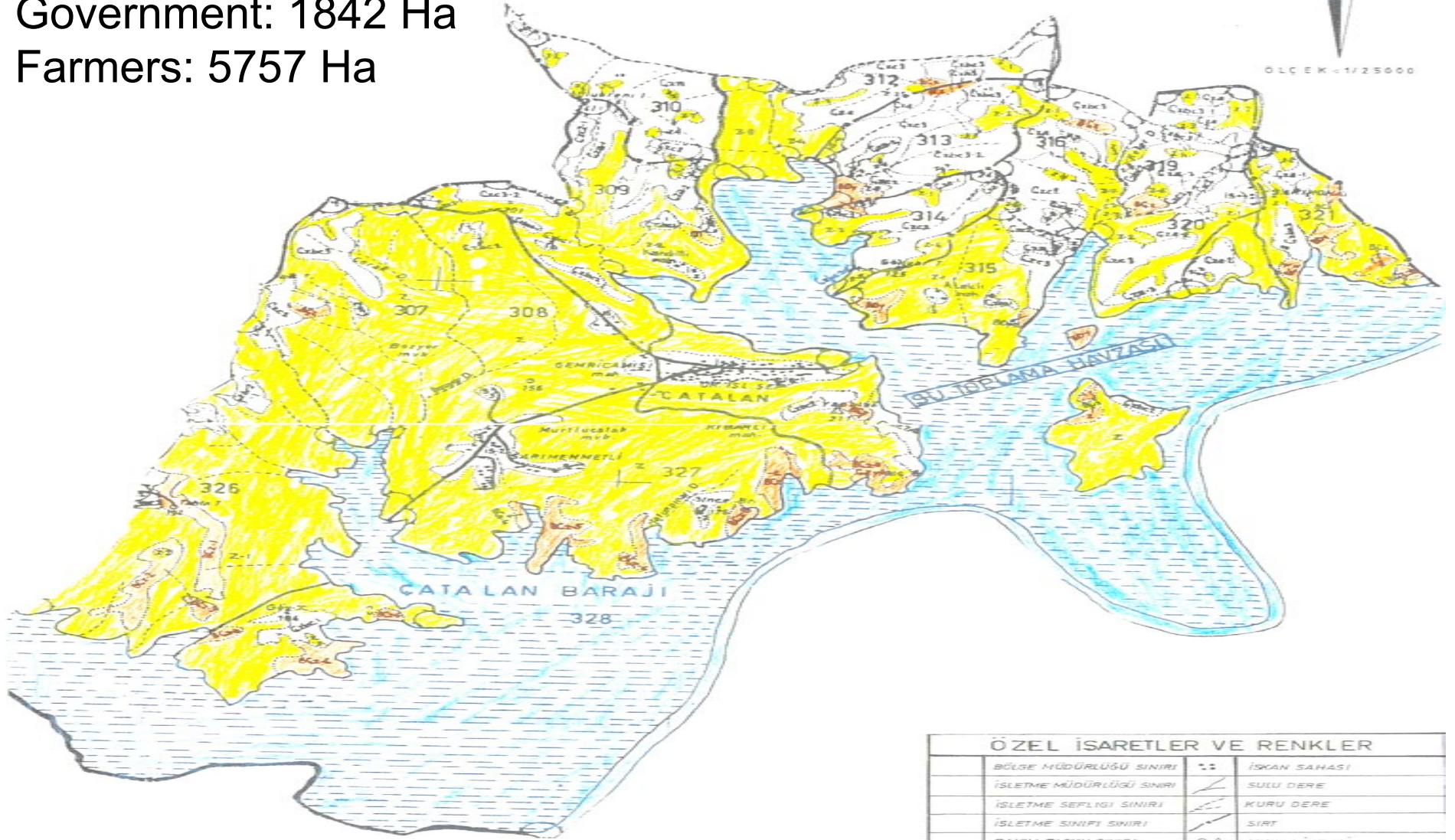
- The total area of this project is 7599 ha. 5757 ha of this land belongs to the farmers and the other 1842 ha land is Government property, which was covered by forests in the past, but has somehow been degraded.
- This project has been going on for 6 months,
- During which there were some meetings with the farmers and village administrators under the supervision of the vice Governor of Adana and project leader.
- All the seedlings are to be provided to the farmers by the Governor of the city of Adana
- The degraded forestry land which belongs to the Government will be distributed to the farmers depending on the village socio-economic conditions.

Total: 7599 Ha
Government: 1842 Ha
Farmers: 5757 Ha

AKARCA-2



ÖLÇEK=1/25000



ÖZEL İSARETLER VE RENKLER			
—	BÖLGE MÜDÜRLÜĞÜ SINIRI	—	İSKAN SAHAĞI
—	İŞLETME MÜDÜRLÜĞÜ SINIRI	—	SULU DERE
—	İŞLETME SEFLİĞİ SINIRI	—	KURU DERE
—	İŞLETME SINIFI SINIRI	—	SIRT
—	BAKIM BLOKU SINIRI	—	TEPE NİRENGİ
—	BAKIM BLOKU NUMARASI	—	BÖLME KLAVUZU
—	ASFALT YOL	—	MESCERE TİPİ SINIRI
—	TOPRAK YOL	—	PINAR-ÇESME
—	STABİLİZE YOL	—	KÖPRÜ
—	ZİRAAT ALANI	—	BARAJ GÖLÜ
—	KUM ALANI	—	BOZUK ORMAN ALANI

- Comparasion of the farmers income before and after project.

- BEFORE:

Income of cultivating cereals

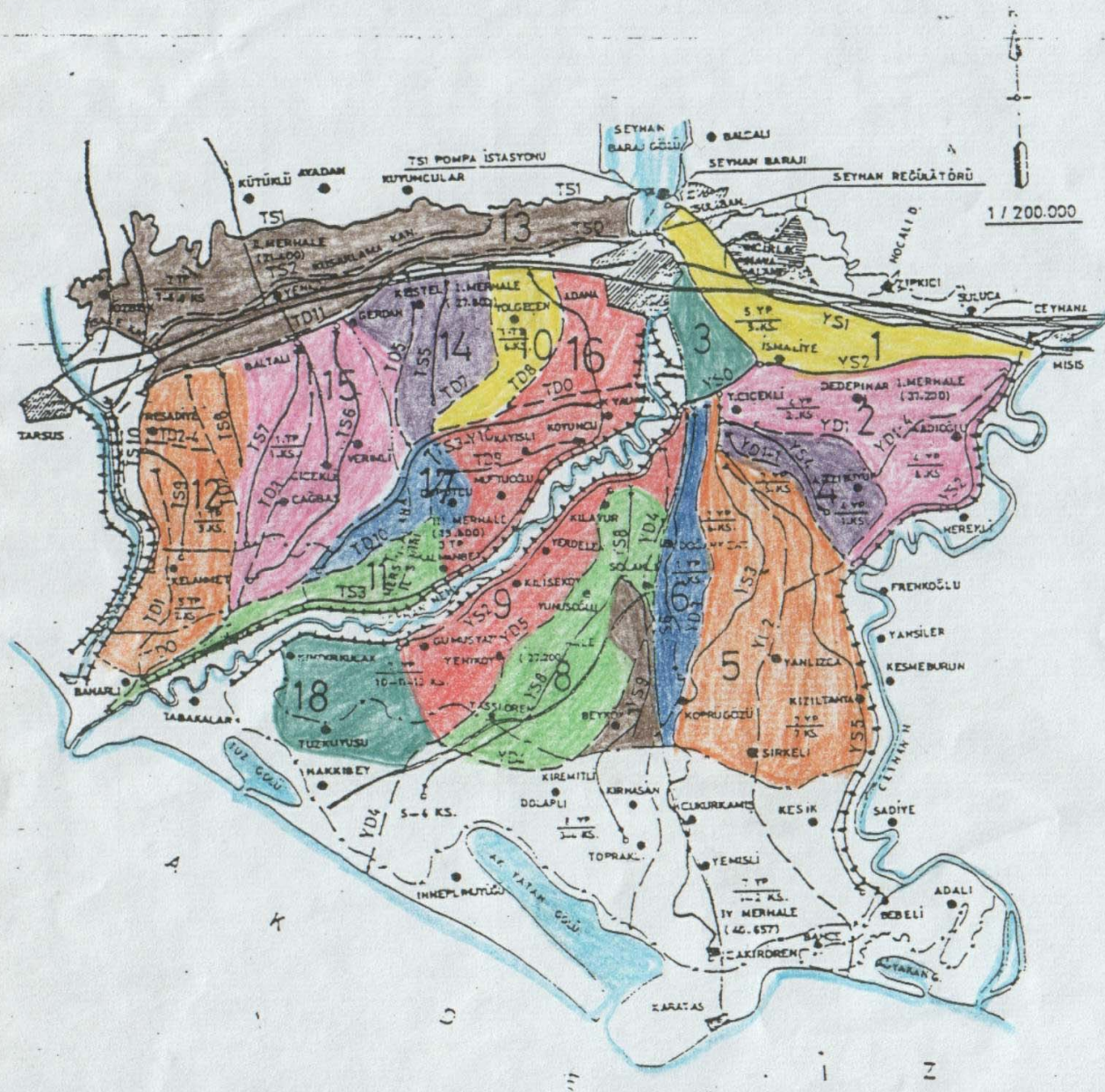
$$5757 \text{ Ha} \times 1000 \text{ €} = 5\,757\,000 \text{ €}$$

- AFTER:

$$7599 \text{ Ha} \times 2500 \text{ €} = 18\,997\,500 \text{ € (Min.)}$$

$$7599 \text{ Ha} \times 7300 \text{ €} = 55\,472\,700 \text{ € (Max.)}$$

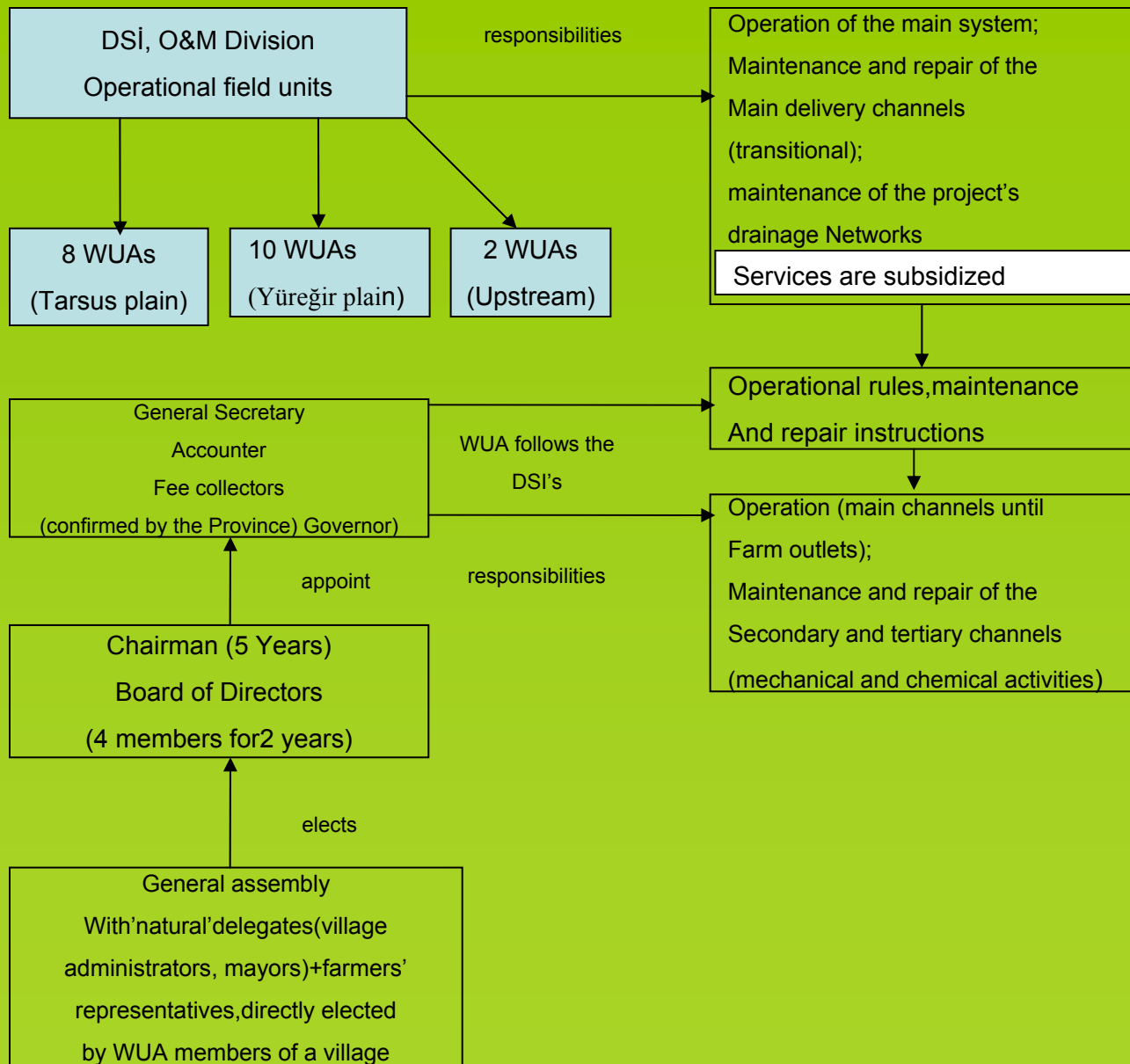
- The other project which was developed for the plain is the Lower Seyhan Plain Irrigation Project (LSPIP), which started in 1960.
- During that period the irrigation system was managed jointly with Water Users Group (WUG), with DSI being responsible until 1994
- As a result of their institutional setting, WUG had not been successful in enforcing the water allocation rules, and they could not prevent excess water withdrawals by the farmers.
- After 1994, large-scale irrigation systems such as the Lower Seyhan Irrigation Project started to be transferred to WUAs.
- Water rights were not transferred, and the hydraulic infrastructures remained the property of SHW who, therefore, exercised control over the WUAs O&M activities.



The Irrigation Unions Established in the Lower Seyhan Plain

The Left Bank	
The Name of the Union	Area (Ha)
1- Kuzey Yüreğir Irrigation Union	4860
2- Akarsu " "	8943
3- Cumhuriyet " "	2655
4- Çotlu " "	2425
5- Güney " "	16890
6- Gökova " "	4289
7- Yenigök " "	1864
8- Kadıköy " "	9808
9- Gazi " "	6394
18- Ata " "	6000
The Right Bank	
10- Yesilova Irrigation Union	3740
11- Seyhan " "	3610
12- Onköy " "	11983
13- Toroslar " "	13700
14- Altınova " "	6150
15- Pamukova " "	12037
16- Çukurova " "	6840
17- Yukarı Seyhan " "	4895

- At present the operating responsibility in virtually all larger schemes is shared between the DSI and WUAs.
- The DSI operates all dams and conveyance canals which serve several different WUAs.
- The DSI takes the lead in planning with WUAs's the irrigation calendar for the year and measures/ controls flows at major diversion points also operating any drainage pumping works of the schemes.



• **Administrative structure of water management in the LSP**

PRESENT PROBLEMS OF COORDINATION AND SUGGESTIONS

- Currently the associations and cooperatives work independently with lack of mutual actions between governmental and private bodies as well as end-users.
- Relevant regional organizations must improve communication among themselves, and research should focus more on actual and future problems.
- The projects explained above will give opportunity to farmers for active participation and will be part of sustainable land and water management.
- There is a recently submitted law to the parliament to empower WUA's establish their federations and confederations.
- This also will give them the opportunity to establish their R&D and use their large scale machinery cooperatively.

- Meetings, seminars and workshops should be organized annually for discussing problems and the solutions with the active participation of the academic institutions, irrigation associations, governmental establishments and farmers.
- Crop patterns will be accordingly determined with the cooperation of the farmers unions and associations which have the responsibility for negotiating between the government and the farmers as well as the WUAs'.
- Accordingly a R&D action program should be established for the development of environmental friendly, efficient and low cost irrigation methods via the integration of these various bodies and policy makers, encouraging them to accept the outcomes of these mutual endeavors for extending future sustainable land management policies throughout the country.

- This task should be performed by governmental bodies, NGOs and participatory projects. Further, farmers' associations should contribute to the development of the relations among the investors, producers and land tenants of the LSB together with national and international functioning marketing establishments for the trade of citrus, cereals, cotton, maize, vegetables, fruits, olives, figs, grapes and groundnuts.
- WUAs should be made aware, via related institutions studying sustainable land management so as to seek alternatives related to rainfed indigenous together with the irrigated crops (cotton, indigenous since the 19th century) in the downstream.