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DEVELOPMENT OF AN INCOME GENERATING AGRICULTURAL MANAGEMENT VIA IRRIGATION SYSTEM IMPROVEMENT IN LOWER SEYHAN PLAIN

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INTRODUCTİON

Huge irrigation projects play important role in activities carried out to diversify and increase agricultural production in Turkish agriculture. These projects also offer enormous possibilities for increasing economic efficiency and incomes in rural areas and undeveloped regions. The Lower Seyhan Irrigation Project, which is considered as one of the most progressive irrigation projects of Turkey, is a multipurpose project implemented for irrigation, drainage, flood control and hydroelectric energy production. It is well known that this irrigation project realized in The Lower Seyhan Plain has resulted in important achievements in increased yields, employment and economic welfare as well as reduction of social problems. However, despite of all these positive accomplishments, there also exist some problems such as excessive water use, high water tables, salinity and insufficient water measurements.

This study seeks the determination of the level of implementation of the LSP project and its contribution to income product generation.

THE STUDY AREA

The study area is the, Lower Seyhan Irrigation area is bordered in the north by the Taurus Mountains, in the east by the river Ceyhan, in the west by the river Berdan, and in the south by the Mediterranean Sea. The plain is divided by the River Seyhan into the Yuregir and Tarsus Plain. The region is one of the most fertile areas of Turkey.

The major soils of the plain are Cambisols, Luvisols, Vertisols, Calcisols and Arenosols with profile depths varying from 40 to 200cm (Dinç *at al.*1990).

The River Seyhan, with its tributaries, supplies the project mentioned here with irrigation water with a watershed comprising about 19,300 square kilometers. The rivers annual discharge is 6, 3 billion cubic meters, the quality class of the Seyhan river water is C_2 S_1, this means that there is a very low sodium hazard and a medium salinity hazard via irrigation.

AGRICULTURE IN THE LOWER SEYHAN PLAIN BEFORE THE IRRIGATION PROJECT

Until the middle of the 19th century the Yuregir and Tarsus Plains were of little agricultural importance. From the 110 000 ha which were agriculturally utilizable in the Yuregir Plain, 6 250 ha were used to grow rice, and areas near to towns and villages. The Yuregir Plain was mainly wooded with oak, which spread from the Southern district town of Karatas to Adana city. While marshlands and steppes dominated the Tarsus Plain.

In 1858 a new land legislation was introduced which brought radical changes to the development of settlements and agricultural use. Up to this point in time, there was only the traditional right to own house plots. The farm land became land with a possessor title for which tax had to be paid, but which could also be sold, bequeathed or mortgaged.

The purchase of land by each other, led to the formation of the so-called ´Ciftliks´ which are prominent features in a number of villages. Ciftlik is the name given to a large private or state-owned farming enterprise in which land accumulation has resulted from prudent management of existing

land, labor, and capital, rather than by inheritance. The Ciftliks concentrated on the cultivation of cotton, sesame and rice, which generally command a higher return on the commercial market, and they invested in the agricultural as well as in the urban sector.

Up to 1940, short staple cotton was grown in rotation with wheat; in some areas rice plantation dominated.

A great chance was brought about by the introduction of a new cotton variety in 1943, the medium staple ´ Akala´ which increased yields of cotton from 500 to 1000 kg /ha. Wheat growing disappeared completely, and in some areas crop rotation was abandoned. The output increased due to the expansion of the area cropped, and, at that time, the gross income per hectare of cotton was estimated three times higher than that of cereals.

In 1961, prior to the irrigation project, 75% of the arable land had planted with cotton in dry farming, and, in some parts of the project area, cotton and other crops were irrigated by withdrawing water from the natural infrastructure and from the rivers .However the project planner, the World Bank estimated that the cotton cultivated areas would decline to 35% and the areas under fruit, vegetable and oilseed production would increase, and fodder crops and legumes would be new crops needed in the rotation for intensifying livestock production and for improving soil fertility. It was further expected that about 45% of the area would be used for producing winter crops (, i.e. legumes, winter vegetables, melons and cabbage).

These expectations of the World Bank and local government planners were not met because of farmers' decisions. From 1964 to 1981 cotton remained the dominant crop in irrigated agriculture (94 and 77% respectively), and the crop rotation system (cotton-wheat) was widespread. In the 1980s, cotton was still being planted at project area, and only since 1987 has the area devoted to cotton declined to the estimated level of approximately 35%.Since the mid-1980s the significant increases expenditures of cotton (increasing prices for pesticides and farmers had difficulties to find labor for harvesting after the GAP* project started, where , most of the labor came from) created a low net income, together with the second crop promotion policies for soybean and maize, caused the farmers to give up cotton plantation; maize and soybean become profitable. In 2003 Maize was the first crop (56%) and citrus the second (16%).

THE PLANNING AND IMPLEMENTATION PROCESS OF THE PROJECT

The planning of water resource development on the River Seyhan started in 1939. In the 1940s, a diversion dam, flood control barriers, and two main conveyance channels were constructed from which 18,500 ha could be irrigated. In 1956, the Seyhan Dam was completed and the hydroelectric power plant started its operation with an installed capacity of 54 megawatts, an average annual power generation of 350 Gwh.

The Seyhan Dam and its reservoir also serve for flood control for 24,500 ha of agricultural land and the city of Adana, and the area surrounding the reservoir is used for recreation. The available volume of surface water from the river Seyhan, damned in the Seyhan reservoir, is sufficient to irrigate the project area of 175 000 ha, and water quality is most suitable for irrigation purposes.

The LSP area comprises 175 000 ha which were to be installed with irrigation and drainage facilities and with on farm development work. The LSP was planned to developed in three stages at first but after some time due to high investment costs incurred, the area of stage a 3 was reduced, and the most problematic part of the plain was designated for the stage 4 project

Table 1.Implementation schedule for the subproject and their size

Stage I	65 000 ha	1963-1968
Stage II	48 600 ha	1969-1974
Stage III	19 831 ha	1976-1985
Stage IV	40 657 ha	

*Large scale irrigation project seeking to irrigate 1, 7 million ha. in Southeastern Turkey

In 1987 with the completion of the stage 3 project, irrigation and drainage facilities had been constructed on approximately 133 000 ha, or about 70% of the total project area. Surface drains were installed on 120 000 ha, Subsurface drains on 62 00 ha, and land leveling had been completed on 95 400 ha., the stage II and the stage III projects were completed with delays of 10 years and 18 years respectively. The service area was not significantly extended until the 1990s.

With the completion of the stage I project at the end of the 1960s, the General Directorate of State Hydraulic Works (SHW) initiated the establishment of Irrigation Cooperatives and Irrigation Associations, which were in operation until 1981.The Irrigation Cooperatives were weak in settling matters of conflict, the farmers did not pay O&M costs and irregularities appeared with the administration of the collected water charges. After 1981 another type of village based water user organization, named as the Water User Group (WUG) was established.

The WUG have shown some disadvantages within the publicly run projects. The main disadvantage was that there is a lack of direct farmer involment, and that the irrigators had no institutionalized control over the WUG's operation and maintenance activities. As a result of their institutional setting, they 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. Because SHW failed to provide enough service, farmers themselves were willing to take responsibility of water management.

Water rights were not transferred, and the hydraulic infrastructures remained the property of the DSI who, therefore, exercised control over the WUAs O&M activities. The O&M responsibility for the irrigation networks are turned over by the contracts negotiated between the WUAs, on behalf of their members, and the Regional Directorate of the SHW. WUA's responsibility starts from the main canal. The DSI handed over water supply planning, scheduling, monitoring and conflict settlement.

The WUAs are fully responsible for O&M works and they issue the actual water requirement for the planning of the water supply, and the timing schedule, and are responsible for its enforcement, and for the maintenance of their delivery networks.

PRESENT PROBLEMS OF COORDINATION BETWEEN ESTABLİSHMENTS AND SUGGESTIONS

Currently the associations and cooperatives work independently. There is a special law waiting for approval by the parliament. If this law is approved, Associations will be reorganized based on crops. The expectation of this law, Each Association will receive some money from their crop's marketing and will have a chance to put that money to improve the quality and quantity of crop. Relevant regional organizations must improve communication among themselves and Researchers should focus more on actually occurring and future problems. The most important issues are lack of land consolidation and extension service.

The uncoordinated efforts of the two stage agencies (DSI and GDRS) caused the levels of the project and the on-farm drainage systems to be unadjusted, which had to be corrected entailing high costs. The heavy delays in the installation of the on farm drainage network were directly related to the investment strategy for on farm works. The investment strategy which is in force at present, completely subsidizes the installation of the on-farm drainage system. However, the publicity financed technical systems at the farm levels remained inadequate unless the farmers installed additional subsurface drains in between the state financed and constructed drains. These additionally required investments that were also omitted by the farmers. Irrespective of the investment strategy, cooperation between the constructions units, i.e. the public agency, and/or the private company, and the farmers was poor. Therefore the engineering works could not be organized in a rational way, causing delays and the overrun of the estimated project costs.

At the farm level where water is used as an input factor in agricultural production, water savings have not been considered. Policies encouraged irrigation and certain crops by setting low water charges per crop and area, which is not effective. The O&M charges have been area-crop-based

which has provided no incentive for water savings. For the farmers, the dominant decision-making factor has been the profitability of the crops; decisions on water have been secondary.

Under the present transfer program the Water User Associations have no control over the publicly subsidized services, in particular the maintenance of the entire project drainage networks, DSI still carries out the maintenance works of drainage networks but it is not sufficient enough because of shortage budget.

A new investment strategy is required with active farmer participation, covering the whole process from the project identification to the maintenance of the on-farm drainage development works. Some part of the investment costs could be subsidized by the government, and some parts to be paid by beneficiaries, including realistic interest rates. The farmers should commit themselves to sharing a substantial part of the on farm development costs in real terms before any government support is given. The basic assumption of this investment approach is that farmers who participate in actual decision-making, and who share in the costs, will also have a positive attitude and feel responsible for the maintenance of the on-farm drainage infrastructure.

REFERENCES

Dinç,U., Sarı,M., Kapur,S., Sayın,M., Derici,M.R.Çavuşgil, V.S,Gök, M.,Aydın, M.,Ekinci, H., Ağca, N., (1990). Soils of the Çukurova Region. University of Çukurova Pub.Pub.No.26.Adana, Turkey.

Scheumann, Waltina.(1997) Managing Salinization: Institutional Analysis of Public Irrigation Systems. Berlin: Springer.

Ozekici, B., (2003). Proceedings of the International Workshop for the Research Project on the Impact of Climate Change on Agricultural Production System in Arid Areas (ICCAP). Kyodai Kaikan, Kyoto, Japan. January 22-23. 2003.