



The Opinions and Expectations of the Farmers on Socio-Economic Impacts of Yortanlı Dam in Bergama District of Izmir Province

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ARTICLE INFO

Article history:

Received date: 19.03.2020

Accepted date: 04.05.2020

Edited by:

Zuhal KARAKAYACI ; *Selçuk University, Turkey*

Reviewed by:

Altuğ ÖZDEN; *Adnan Menderes University, Turkey*

Murat MERCAN; *Ege University, Turkey*

Keywords:

Agricultural irrigation

Land use

Rural development

Yortanlı dam

ABSTRACT

The aim of this study is to determine opinions and expectations of the farmers on socio-economic impacts of Yortanlı dam in Bergama district. For this purpose, nine settlements of Bergama district that will benefit from dam irrigation were included. In this research, data were collected from 87 farmers with proportional sampling and by the survey. In the analysis of the data, firstly the socio-economic characteristics of the farmers were examined. Then, the opinions and expectations of the farmers about the socio-economic impacts of the dam in various aspects were determined. Five-point Likert scale was used in this stage. According to the results of the research, 72.41% of the farmers stated that the dam had positive impacts on agricultural production. 34.48% of the farmers think that the dam increases agricultural income. 85.06% of the farmers believe that agricultural lands are used more effectively after the dam. On the other hand, 65.52% of the farmers think that the dam will not reduce the migration from the region. However, 51.72% of the farmers stated that the dam will affect the young farmers positively. As a result, with the development of irrigation opportunities with the dam, income level and employment opportunities in the region may increase. Therefore, the young population in the region should be encouraged to agricultural production and private sector investments should be encouraged for processing agricultural products.

1. Introduction

Today, irrigated agriculture makes important contributions to maintaining food security and plays a critical role in world food production (Le Visage et al, 2018). There are 1.52 billion hectares of cultivated land in the world and 20.1% of this land is irrigated. 41.3% of the irrigated lands are located in China and India. Turkey has 1.7% of irrigated land in the world (FAO, 2018).

Too many dams have been built for agricultural irrigation in different countries of the world. Dams provide socio-economic and environmental benefits in rural areas. In countries with water problems, dams are needed for efficient use of water in terms of resource sustainability and economic development (Engindeniz et al., 2014). On the other hand, the positive and negative effects of dams can emerge over time. Therefore, scientific research in this direction should be done after each dam and the results should be evaluated. Generally, the effects of dams on agricultural production and income level, population and employment are emphasized. While the effects of irrigation dams on agricultural production and income levels are evaluated as

direct effects, the effect on employment is considered as an indirect effect.

So far about the effects of dams in Turkey have been numerous studies. In some of these studies, the dams' environmental impacts (Gümüş et al., 2006; Yıldırım, 2006; Tahmişçioğlu et al., 2007; Satılmış, 2009; Akkaya et al., 2009; Üslü, 2011; Sönmez, 2012; Özdemir, 2015; Yıldırım et al., 2015; Doğan et al., 2016), the dams' impacts on climate (Emiroğlu et al., 1996; Yeşilnacar and Gülşen, 1999; Bulut et al., 2006; Şengün, 2007; Bacanlı et al., 2015; Kum, 2016), the dams' impacts on fishes (Özkurt, 2000; Kırnkaya and Ekmekçi, 2007; Berkün et al., 2008), the dams' impacts on cultural assets (Sarıyıldız et al., 2008), and the dams' social and economic impacts have been analyzed (Sarıyıldız et al., 2005; Ulaş, 2008; Engindeniz et al., 2010; Tumer and Aksoy, 2011; Engindeniz et al., 2014; Baskaya and Turk, 2015; Kurt, 2015; Kocuyigit and Emiroglu, 2016; Özbey, 2017; Akgün, 2018). However, the dams' impacts in different regions should also be evaluated in terms of farmers.

Yortanlı Dam, the construction of which was completed in 2011 and opened to operation since 2013, is located 18 km the northeast of Bergama district center and on the Yortanlı Stream. The dam is expected to provide agricultural irrigation in an area of 6,990 hec-

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Table 2
Socio-economic characteristics of farmers

| | |
|--|-------|
| Age of farmers | 52.10 |
| Education periods of farmers (years) | 8.18 |
| Agricultural experience of farmers (year) | 14.31 |
| Household size (person) | 3.96 |
| Labor force potential of family (unit of male labor force) | 2.85 |
| Land size (decare) | 72.15 |
| Rate of equity capital (%) | 62.08 |
| Rate of being a cooperative member (%) | 98.85 |

The household size of the farms is 3.96 person and 50.72% of them are male. The average family labor force potential in farms is 2.85 as a male labor unit (EIB) and 855 as a male labor day (EIG).

The average land size in the farms is 72.15 decare. The average number of parcels is 3.56 and the average parcel size is 20.27 decare. 49.70% of the lands in the farms are operated lands by the owner, 34.61% of the lands are rented land and 15.69% of the lands are operated lands by the partner. Cotton, wheat, corn and tomato are generally produced in the farms.

As an average of farms, 86.30% of total assets are land assets. When the distribution of the assets according to the items is examined; a large share of land assets (78.04%), followed by tool-machine assets (10.56%) and land reclamation (6.49%) respectively. However, equity capital constitutes 62.08% of passive assets. 86 of 87 farmers included in the research are partners to at least one agricultural cooperative.

The farmers in the study were asked how their agricultural production was affected after the dam was completed. 72.41% of the farmers stated that the dam had positive affects (Table 3).

Table 3
The farmers' answers to the question "how did the completion of the dam affect your agricultural production?"

| Answers | Number of farmers | % |
|---------------------|-------------------|--------|
| Positively affected | 63 | 72.41 |
| Negatively affected | 0 | 0 |
| No affected | 8 | 9.20 |
| No idea | 16 | 18.39 |
| Total | 87 | 100.00 |

Table 5
The farmers' answers to the question "what level do you participate in the local effects after the dam is completed?"

| Effects of dam | Strongly disagree (1) | | Disagree (2) | | Undecided (3) | | Agree (4) | | Strongly agree (5) | | Mean |
|---------------------------------------|-----------------------|------|--------------|-------|---------------|-------|-----------|-------|--------------------|------|------|
| | N | % | N | % | N | % | N | % | N | % | |
| Irrigation opportunities increased | 0 | 0 | 0 | 0 | 1 | 1.15 | 82 | 94.25 | 4 | 4.60 | 4.03 |
| Fly increased | 0 | 0 | 6 | 6.90 | 12 | 13.79 | 64 | 73.56 | 5 | 5.75 | 3.78 |
| Environmental pollution has occurred | 0 | 0 | 9 | 10.34 | 9 | 10.34 | 63 | 72.42 | 6 | 6.90 | 3.76 |
| Land became fragmented | 0 | 0 | 10 | 11.49 | 8 | 9.20 | 64 | 73.56 | 5 | 5.75 | 3.74 |
| Air quality deteriorated | 0 | 0 | 21 | 24.14 | 8 | 9.20 | 51 | 58.62 | 7 | 8.04 | 3.50 |
| Land prices and rents increased | 1 | 1.15 | 17 | 19.54 | 13 | 14.94 | 50 | 57.47 | 6 | 6.90 | 3.49 |
| Marketing opportunities improved | 0 | 0 | 33 | 37.93 | 20 | 22.99 | 31 | 35.63 | 3 | 3.45 | 3.05 |
| Employment opportunities increased | 0 | 0 | 47 | 54.02 | 14 | 16.09 | 24 | 27.59 | 2 | 2.30 | 2.78 |
| The roads are extended | 0 | 0 | 43 | 49.42 | 24 | 27.59 | 19 | 21.84 | 1 | 1.15 | 2.75 |
| Transportation opportunities improved | 0 | 0 | 61 | 70.11 | 8 | 9.20 | 17 | 19.54 | 1 | 1.15 | 2.52 |
| Local population increased | 1 | 1.15 | 64 | 73.56 | 6 | 6.90 | 15 | 17.24 | 1 | 1.15 | 2.44 |

Dams can positively affect agricultural lands and usage patterns, as well as increase the irrigation opportunities and increase production. These expectations were also revealed in the studies conducted before the Yortanlı Dam was put into operation (Sarıyıldız et al., 2005; Engindeniz et al., 2010).

It is expected that cotton production will continue in the region after the dam, whereas other products will be preferred by partially giving up wheat production. It is thought that the most important of the products that can be an alternative to wheat may be corn, and also tomato and cotton farming can be preferred.

When the farmers were asked how the agricultural income levels changed after the dam was completed; 34.48% of farmers stated that their agricultural income increased and 33.33% did not change (Table 4).

Table 4
The farmers' answers to the question "how did your agricultural income level change after the dam was completed?"

| Answers | Number of farmers | % |
|---------------------------|-------------------|--------|
| My income increased | 30 | 34.48 |
| My income decreased | 1 | 1.15 |
| My income has not changed | 29 | 33.33 |
| No idea | 27 | 31.04 |
| Total | 87 | 100.00 |

When the farmers' opinions and expectations on the effects in the region after the dam is completed are examined; it was determined that they agree with the expressions 'irrigation opportunities increased' (4.03), 'fly increased' (3.78), 'environmental pollution has occurred' (3.76), 'land became fragmented' (3.74), 'air quality deteriorated' (3.50), 'land prices and rents increased' (3.49), 'marketing opportunities improved' (3.05). On the other hand, they do not agree with the expressions 'employment opportunities increased' (2.78), 'roads are extended' (2.75), 'transportation opportunities improved' (2.52), 'local population increased' (2.44) (Table 5).

When the opinions of the farmers about the frequency of land sales in the region after the dam was completed, 49.42% stated that they had no idea, 25.29% increased of sales frequency and 25.29% it has not change (Table 6).

Table 6

The farmers' answers to the question "has the number of land sold after the dam completed?"

| Answers | Number of farmers | % |
|---------------------------|-------------------|--------|
| Sales frequency increased | 22 | 25.29 |
| Sales frequency decreased | 0 | 0 |
| It has not changed | 22 | 25.29 |
| No idea | 43 | 49.42 |
| Total | 87 | 100.00 |

41.38% of the farmers within the scope of the research stated that after the dam was completed, they had no idea about the change of land prices, 29.88% of the land prices did not change and 28.74% of the prices increased (Table 7).

When the farmers were asked whether the lands sold after the dam was completed were used for agricultural purposes, they all answered yes.

Table 7

The farmers' answers to the question "has the land purchase-sale prices changed after the dam was completed?"

| Answers | Number of farmers | % |
|--------------------|-------------------|--------|
| Prices increased | 25 | 28.74 |
| Prices not changed | 26 | 29.88 |
| No idea | 36 | 41.38 |
| Total | 87 | 100.00 |

85.06% of the farmers evaluated the dam in their region positively in terms of effective use of agricultural lands (Table 8).

When farmers were asked whether the dam would reduce migration in the region, 65.52% gave no reduce answer (Table 9).

In previous studies conducted in different regions, it has been revealed that dams cannot reduce migration (Tümer and Aksoy, 2011; Koçyiğit and Emiroğlu, 2016).

Table 8

The farmers' answers to the question "how do you evaluate the dam in your region area in terms of effective use of agricultural lands?"

| Answers | Number of farmers | % |
|----------|-------------------|--------|
| Positive | 74 | 85.06 |
| Negative | 0 | 0 |
| No idea | 13 | 14.94 |
| Total | 87 | 100.00 |

Table 9

The farmers' answers to the question "does the dam in your region reduce migration?"

| Answers | Number of farmers | % |
|------------|-------------------|--------|
| Reduce | 8 | 9.19 |
| Not reduce | 57 | 65.52 |
| No idea | 22 | 25.29 |
| Total | 87 | 100.00 |

When asked how the dam would affect younger farmers, it stated that it could affect 51.72% positively (Table 10).

Table 10

The farmers' answers to the question "how does a dam in your region affect the young farmers?"

| Answers | Number of farmers | % |
|-----------|-------------------|--------|
| Positive | 45 | 51.72 |
| Negative | 0 | 0 |
| No effect | 31 | 35.63 |
| No idea | 11 | 12.65 |
| Total | 87 | 100.00 |

According to the research results, the farmers believe that the dam is beneficial for the effective use of the local lands. They express that their agricultural production is positively affected by the increase of irrigation opportunities. However, they also emphasize that the dam may have some environmental and physical adverse effects.

With the development of irrigation opportunities with the dam, it is expected that the income level and employment opportunities in the region may increase, therefore, the population may continue to live in the region and consequently migration will decrease. Apart from this, it is estimated that there may be a population flow by immigration to the region from other regions. However, although some of the farmers within the scope of the research think that immigration will not decrease, they believe that the dam can positively affect young people. It is necessary to encourage the young population in the region to agricultural production and to encourage private sector investments in the processing of agricultural products.

After the dam is completed, it is expected that the corn will have the most important share in the product pattern in the region and that the tomato will follow. However, while determining the product pattern, farmers should also conduct market researches and make the most of the supports provided.

As a conclusion, dams provide socio-economic and environmental benefits in rural areas. However, the positive and negative effects of dams can emerge over time. Therefore, scientific research in this direction should be conducted after each dam and the results should be evaluated.

4. Acknowledgements

We would like to thank the Ege University Scientific Research Projects Commission which provided financial support for the project No 16-ZRF-020 and the local farmers who patiently responded to the survey questions.

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