The Determination Of The Economic Results And Income Distribution Of The Wheat Farms In Central Anatolia Turkey

Cennet OĞUZ
Selcuk University, Faculty of Agriculture
Department of Agricultural Economics
coguz@selcuk.edu.tr

Kemal ESENGÜN
Karamanoğlu Mehmetbey University
Faculty of Economy and Business Administration
kesengun@kmu.edu.tr

Abstract: The purpose of this study is to determine the economic results and income distribution of wheat producers in Middle Anatolia Region. The data used in this study was collected from farms selected by random sampling among 20 villages of wheat producers in Konya and Ankara province. The data belongs to the 2006-2007 production years. The average size of all farms was 250.30 decare. The owned land covered the 63.55 % of the total area. The average number of fields per farm 8.03 and the average size of each field is 31.17 decare. Arable area occupied 94.25 % of total land. About 76.46 % of gross production was obtained from plant production and 23.54 % animal production. Income distribution of the farms was detailed by agricultural income, total family income and per capita family income. It was determined that per capita agricultural average income was 1 808.7 TL, and the average agricultural family income was 2 211.1 TL. Gini ratio of the agricultural income was found 0.358 .

Key Words: Central Anatolia, wheat farms, gross production value, income distribution

Introduction

As world population increases rapidly, countries run new progress to improve the level of their feed, shelter and life quality; based on the results of which activities, remarkable changes and improvements are seen. Expectations about better feed, shelter and live have influenced both the world's people and those of our country. In this case, our agricultural production has to be increased greatly in order to feed our growing population and animal existence better, and also provide necessary supplements to our economy and provide the required raw material to our industry. The success of these situations depends upon using our scarce natural resources more consciously and effectively and the effective transformation of our agricultural potential into production.

It is a well known reality that grain production has an important role on countries' economy as well as in Turkey. The grains have the most important portion among the agricultural production and wheat greatest. In 2010's will be the sovereignty of agricultural producing. Moreover, wheat and other grains will have the highest priority. According to the world's well known articles which are written by strategic experts, the strength, importance and functions of the wheat become more important. The population of the world and Turkey has increased continuously but grain stocks have decreased gradually. As a result of that, agriculture production became more important. Turkish economy depends upon mainly agriculture and 31% of population works for agriculture sector. Agriculture sector has 7,4 % of the Turkish gross domestic production (GDP) and 2,3 % of export (Anonymous,2007). The crop yield has to be increased, because of human and animal's feed. Wheat production is very important economically and strategically. Wheat is the most important income source of agricultural farms especially in Ankara, Konya, Eskişehir, Kayseri, Sivas, Niğde, Yozgat, Kırşehir, Karaman, and Aksaray are the cities of Central Anatolia. Central Anatolia region is 162 540 km² (Bayraklı and others, 1991) and of all this agricultural area is 9 million hectare. The total more than 4 million hectare is in Konya, Ankara and Sivas. Only, Ankara and Konya have 4 521 487 hectare. This is equal to 51% of Central Anatolia Land. Even though 89% of this area is rainfed and 11% of is irrigated. The 90% of grain has been obtained from rainfed areas. In general, wheat, and barley are produced in dry whereas the sugar beet is produced in irrigated area. Grain has 50% of total product in Konya, and 46% in Ankara (Anonymous, 2004). Both Ankara and Konya's income has 3.4% of total Turkey's plant production value. Also Central Anatolia region has 13% of Turkey's agricultural farming and 21.2% agricultural land. It should be given attention that Turkey population

will be more than 100 million in 2010's years so Central Anatolia will become much more important. The aim of this study is to investigate grain farms present situation, their problems, and give some suggestions.

Materials and Method

The survey method was used and all questions were asked to the farmers. The research area in this study covered Ankara and Konya. The grain farmers who have 50% and more were involved to this research. The 30 farms (Akşehir, Altınekin (Oğuzeli), Beyşehir, Çumra (İçeri Çumra), Kadınhanı (Kızılkuyu, Başkuyu), Karatay (Obruk, Yarma, Ovakavağı, İsmil), Sarayönü (Ertuğrul), Seydişehir (Akçalar, Gevrekli, Karabudak) were selected from Konya, and two farms from Ankara (Polatlı and Evren). The research data was obtained by surveying using stratified random sampling that was well known in economy fields (Yamane, 1967, Arıkan 1985). The other statistical findings and results also were utilized. The research farms distributions were as; 12 farms for 1-15 ha land, 17 farms for 15.1-20 ha land, and 7 farms for greater they 30.1 ha. The formula used for this purpose is written by;

$$n= N^2\Sigma (Nh. Sh^2) / N^2D^2 + \Sigma NhSh^2 \qquad D^2=d^2/Z^2$$

n: number of farms, Nh: farms number (h) for every stratified, Sh^2: Variance of samples for every stratified, d: The acceptable error to take the average of population, Z: standard normal distribution value obtained from Z table in which was 1.645 according to confidence limit 90%. To measure the inequality distribution of farms, Lorenz Curve and Gini ratio were used.

Lorenz Curve defines the relationship between the certain income share and population obtained this share. The share of farms can be expressed by percentage and is plotted to the vertical axes. The percentage of population is plotted horizontal axes. Thus, the curve is obtained (Ross, 1969). The 45º line passed away from the origins is named as "Certain Equal Line". The Certain Equal Line shows the 100% equal income distribution. If the income distribution goes away from the equal level, Lorenz Curve also goes away from the certain equal line and goes down. The Lorenz curve interests with certain equal line in 100% equality (Dauring, 1991).

Gini ratio may be calculated as; $G = 1- \Sigma^{n}_{i=1} (N_i - N_{i-1}) (A_i + A_{i-1})$

Where; G = Gini ratio, N_i = Cumulative farm number ratios in total farms (for each series), A_i = The ratio of farms or incomes to total farms or total incomes for i. farm, and n = series number .

Results and Discussions

Land Use by Crops

Every farm had 25.03 ha of land; 63.55% of land owner, 8.95% of rental land, 27.50% of share farmer. The owner, rental, share cropped lands were found to be 63.55%, 8.99% and 27.50% respectively. The production areas of wheat, barley and sugar beet and others such as fallow were determined to be 54.59 % (13.663 ha), 39.66% (9.927 ha), 4.11%(1.030 ha) and 1.64% (4.100 ha) respectively (table 1).

Table 1. The Patterns of Land Uses

Farm Sizes (ha)	Wheat	Barley	Sugar Beet	Fallow	Other	Total
0.1-15	8,250	2,983	1,175	0,217	-	12,625
15.1-30	17,218	4,182	1,300	0,236	0,146	23,082
30.1-+	17,357	30,857	0,357	0,286	0,500	49,357
Average farms	13,663	9,927	1,030	0,240	0,170	25,030
Rate (%)	54,59	39,66	4,11	0,96	0,68	100,00

The parcel number was found to be 8.03 and average parcel size 3.117 ha. According to results of Farm Counting 1991, average farm size was 5.68 ha in Turkey. The farm size was smaller comparison to Turkey's average. The total production wheat area was determined to be 1176656 kg/ha and was equal to 12.6% of Turkey Land. The production was 2 447 070 tons that was 13.12% of Turkey's total production. Total land has been increased because of great automation in agriculture after 1970. The Farms number have increased and reached up to 2.5 millions in 1951, 3.7 millions in 1980 and, 4.1 millions in 1991, 4.5 millions in 1999 in Turkey. But in recent years, this number again decrease 3,1 millions. As a result of this, arable land has reduced to 5.68 ha per farms. In Turkey, most producers have had own land whereas the 59% of producers in EU have used their own land (Eurostat, 2004).

Employment Potential

The employment potential for farmer family is given in table 2. According to results, employment varied between 4.47-3.76 MPU (man power unit) and depended upon the farm size. The average MPU was determined as 4.16. The annual working day was found to be 280 day, depending upon climatic conditions. According to actual production patterns for present technological level, the employment hour was determined adding present employment power to family members worked hours from farms. This was compared individually and farm size and average farm size and unemployment men power were computed.

Table 2. Working Patterns in Agricultural Farms

Farm Sizes (ha)	Family Potential		Power in Family				Foreigner power	Total Power
	Man Power Unit	Man Power Day	In farm	Out of agricultural	Out of farms	Total		
0.1-15	4.47	1251.6	116.0	32.0	80.0	228.0	71.0	299.0
15.1-30	4.07	1139.6	193.0	21.0	108.0	322.0	140.0	462.0
30.1-+	3.76	1052.9	265.0	19.0	320.0	604.0	185.0	789.0
Average farms	4.16	1164.8	179.0	24.9	146.3	350.2	122.9	473.1

The average family employment potential was found to be 1164.8 MPD (man power day) but, only 350.2 of this was used. Although there was an unemployment power in farms, 122.9 MPD was met from foreign workers (Table 2). In the research area the average family number were 5,90. In the central Anatolia region, working was very intensive during the harvesting and planting period. To use inactive capacity, it was important to enhance animals products, and change the production design. Erkuş reported that in Konya proper production sources uses resulted in reducing 15% of inactive workers and fell to 35.31%, so that income increased to be 28.64% (Erkuş, 1991). Oğuz (1992) reported that average worker was 780 MPD in agricultural farms for Konya. The 375 of it was obtained from women workers who were used animals sector.

Economic Results

The Value of Gross Production in Farms

In production concept, the gross production value can be defined as increase of value that covers the end of economic activities produced new products value and exchanging (Woermann, 1958). In research, gross production value was determined by multiplying of unit price of product value and market price obtained from activity results plus productive increments of plant and animals capital. Table 3 shows gross production value at the end of production activities.

Table 3. Gross Production Values according to crop production (TL and %)

Farm sizes (ha)	Wheat	Barley	Sugar beet	Other product	Total crop production value
0.1-15	1 206,00	278,00	712,00	-	2 196,00
15.1-30	2 744,00	475,00	928,00	54,00	4 201,00
30.1 - +	2 907,00	3 433,0	200,00	150,00	6 690,00
Average Farms	2 166,80	1 086,40	671,7	54,8,	3 979,70
Gr.Pro.Val Per hectare	86,57	43,40	26,84	2,19	159,00
Rate (%)	54.45	27.30	16.88	1.37	100.00

The total plant value was 3979, 70TL (Turkish Liras) and the 54.45% of this covered from wheat, 27.30% from barley, 16.88% from sugar beet and 1.37% from other products (melon, spinach, lettuce etc). The average gross production value per farm was 159 TL per hectare. In the Central Anatolia Region, wheat generally has been produced in dry conditions. As a result of this, average productivity has reduced up to 46.7% per ha. The producer income has gone down notably. If plant and animal production values were adding, gross total product value was calculated. The animal product value is given in table 4.

In agriculture farms, total average animal production value was 1225,4 TL. That number covered 61.5% of milk, 3.53% of wool, fertilizer etc., 19.04% of fixed asset increase, 14.97% of live animal sales and

0.95% of other productions such as eggs. In general, Central Anatolia Region is very appropriate for livestock in terms of natural resources and ecological conditions. However, animal husbandry has not developed enough because of plant production has been encouraged and supported relatively more than animal production. According to the results, animal husbandry was calculated to be 23.5% for research area and 25% for Turkey. The animal husbandry was more than 55% in EU for agriculture sector (Anonymous, 2004).

Table 4. Animal Production Values (TL and %)

Farm sizes (ha)	Milk	Wool	Other	Equipment Increment	Life Animal sale	Total Animal product. Value
0.1-15	928,00	44,5	10,0	210,0	125,0	1 317,5
15.1-30	452,00	45,0	9,5	182,0	-	688,5
30.1-+	929,00	38,0	18,0	354,0	572,0	1 911,0
Average Farms	753,70	43,2	11,7	233,3	183,5	1 225,4
Rate (%)	61,51	3,53	0,95	19,04	14,97	100.00

In this research, since agricultural farm was small and separated, poor production was occurred. Therefore, producers organization and publications service have been in a difficulty. The producers were weak against unstable market conditions. They couldn't access to Extension services. Also producers haven't been informed about fluctuation conditions. The soil was effective factor for production and there was no balance between work power, capital and production factors. This was a characteristic of all agricultural farms Central Anatolia.

Gross Profit, Farm and Family Income

Gross profit can be defined as omitting private variable costs from gross production values (Brandes and others, 1971). It was a main success criteria to use scarce production factors and to express competition power of production activities. The farmers needed to this profit for family expenditure, investment and tax payments. In research, agriculture income was calculated omitting interest and rent payment from agricultural income and adding family income which was equivalent to family works (Erkuş et all, 1995). The total family income was found by collection of income and out of income (Table 5).

Table 5. Gross Production Value, Gross Profit and Agricultural Family Incomes (TL and $)
1$=1,56TL

Farm Sizes (ha)		Gross production value	Total Variable Cost	Gross Profit	Agricultural Income	Out of Agricultural Income	Agricultural Family Income
0.1-15		3 513,50	1 353,90	2 159,60	1 517,10	357,00	1 874,10
15.1-30		4 889,50	1 876,00	3 013,50	1 879,00	255,00	2 134,00
30.1 - +		8 601,00	3 257,00	5 344,00	2 198,00	712,00	2 910,00
Aver. Farms	TL	5 205,10	1 989,40	3 215,70	1 808,70	402,40	2 211,10
	$	3336,60	1275,26	2061,35	1159,42	257,95	1417,37

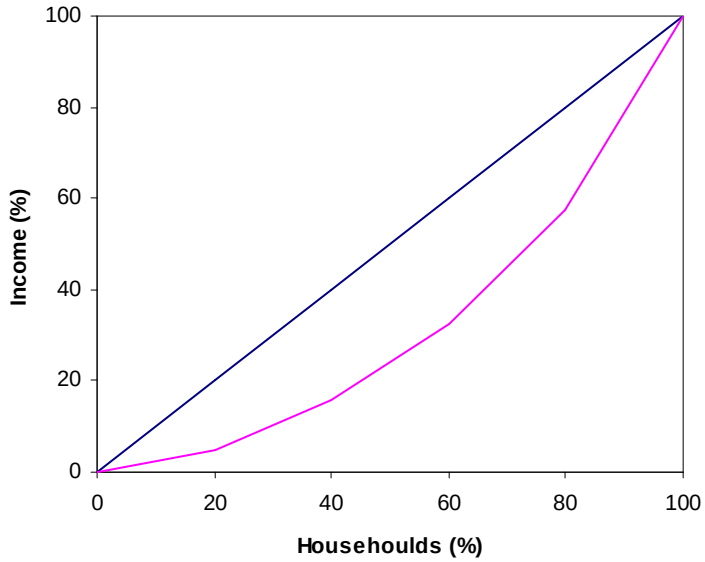
The farm had an average 5205,10 TL or $3336,60 the value of gross production. Total variable cost and gross profit were 1989,40 TL ($1275,26) and 3215,70 TL ($20 61,35) respectively. In agricultural income and out of income were 1808,70 or $1159,42 and 402,40 TL or $257,95. As a result of this, farmer obtained an average 2211,11 TL ($1417,37) per year. The 81.8% of family income was obtained from agriculture and, 18.2% of out of agriculture. This income was very low when it is compared with Turkey's average of $10000 income. In this area a lot of farmers have been living under the standard of poverty.

Income Distribution Of Agricultural Farms

Table 6. Income Distributions, Family Income and Gini Ratios

Household Ratios	Total Family Income		Cumulative Family Income	
	Value (TL)	Ratio(%)	Value (TL)	Ratios(%)
First %20	5 370,50	4,89	5 370,50	4,89
Second %20	11 839,50	10,79	17 210,00	15,68
Third %20	18 232,20	16,60	35 442,20	32,28
Fourth %20	27 832,50	25,35	63 274,70	57,63
Fifth %20	46 516,50	42,37	109 791,2	100,00
Total	109 791,20	100,00		
Gini ratios	0,358			

Figure 1. Lorenz Curve



The research showed that 80% of the agricultural farms had 57.63% share of the total family income and rests (20%) was 42.37%. According to the Gini ratio value of 0.358, agricultural farms were situated in research area. The total family income was not distributed uniformly. Since certain equal line that explains exactly 100% equal distribution. As the income distribution goes away from the equal level, Lorenz Curve also will far away from the certain equal line. In conclusion, it is seen that income distribution was not balanced well.

Conclusions

According to the research, farms had 63.55% of own land, and every farm size was 25.03 ha. The farm size was relatively greater than Turkey's average. According to the general farm counting in 1991, agricultural farms which covered nineth region (Afyon, Kayseri, Konya, Nevşehir, Niğde, Aksaray) varied between 10.01 and 9.9 ha land (Anonymous, 1994). Even though land was very small, it was still larger than Turkey's average. Every plot was found to be 3.12 ha and fallow area became narrow. It can be accepted as good amendments. The farm capital was not sufficient (26.07%). The money was determined to be 1.73% of this capital due to the lower saving rate (Demirci, 1981). Thus, producers were supported by Government. The employment and land productivity especially should be increased by using business economy. Price, market and insufficient knowledge and information were the most important producer problems and currently more than 3,1 million agriculture farms, which produced products without having information and communication between them. Turkey population will be greater than 100 million in 2014's, so cereals should be produced more in order to meet increased population needs. Agriculture products mainly depend upon the natural conditions. Therefore, there was not stable balance between demand and supply, and price and cost fluctuations. On the other hand, the problems in agricultural farms have been grown up. Their problems were derived from the small-scale activity,

organization, and insufficient integration between agriculture farms and industry. The finance problems may be more serious in the coming future.

The product quality becomes more important because of internal market demand and customer, baker and miller. Although, Turkey has a great potential about product kinds, export, it may not have stable and effective world market because of poor market research. The external cereals demands have increased gradually. Even though, world population is more than 6 billion, world cereals stock speed was less than world population growth. The FAO gave pay attention this subject and called world countries to improve their product (Kün et all. 1991). Turkey's production quality should be international standard and product costs must be minimized because of Turkey competition. The Turkey should grow macaroni wheat for international standard and external market. Therefore, producers must be encouraged to produce more qualified wheat. The Turkey is the eighth wheat producer in the world and wheat export has decreased recently. Although China is the first wheat producer in the world, wheat is still imported because of high population. The Brazil, Japan, Egypt and Italy are also other wheat importer countries whereas the Canada, USA, Argentine, and France are important wheat exporter in the world. Even though India and Russia are the biggest wheat producer, their export is limited. By producing of about 19 million tons wheat a year, wheat product will be more stable in Turkey. To be successful in this area, producers should be more organized.

The public and private institutions were informed more for grain products' quality and quantity and producers should be supported related to this subject. Support price should be explained previous year and, this rate must be equal to inflation rate. Therefore, farmers may be organized to change price in favor for them.

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