

## **SOCIOECONOMIC STUDY FOR CAMEL FARMING SYSTEM IN EGYPT**

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### **Abstract**

*The current study was conducted in Matrouh, Egypt during 2014. The main objectives were to determine the socio-economic situation of camel's herders in the region, to know the other economic activities of the camel's herders and to investigate the constraints and problems facing camel's herders and their solutions. Multistage, purposive and simple random sampling techniques were used to select 200 respondents for the study. Well-structured questionnaires were administered to the respondents to obtain data. Tabular analyses as well as descriptive statistics were used to analyze the data. The results revealed that the age of more than half of camel's herders were between 27 - 50 years old, and most of the respondents (33%) were illiterate, 57.5% of them were only camel reared and 85.24% of them possessed their camel stock through inheritance. The results showed that, 88.6% of the respondents depend mainly on buying camels as source of income, and 39.05% pay 4000 LE yearly for zakaat or Islamic tax. The results also revealed that more than half of them depend only on family labor for herd management. The main constraints facing camel's herders in the study area were lack of labors, expansion of agriculture at the expense of the range lands, lack of general services for human and livestock.*

*Keywords: Camel herders, household, Socio-economics, Egypt, camel farming system, XL stat*

## INTRODUCTION

Camels are considered second only to the sheep and goats before widespread in some desert areas, especially Shalateen triangle - Abu Ramad - Halayib. In third place is also in the northwest coast and the Sinai Peninsula has been named the camel according to the names of their presence or kept by tribes and to implement programs for the development of the camels to be deployed to identify strains in Egypt. And characterization of the production characteristics and specifications of the formal. And camels belong to the family known as the owner of Fine foot flatfish (Khuff).

According to FAO statistics there are about 19 million camels in the world, of which 15 million are found in Africa and 4 million in Asia. Of this estimated world population, 17 million are believed to be one-humped dromedary camels (*Camelus dromedarius*) and 2 millions two-humped (*Camelus bactrianus*) (FAOstat, 2010). Approximately 11 million dromedaries, representing two thirds of the World's camel population, are in the arid areas of Africa, particularly in North East Africa, i.e. Somalia, Sudan, Ethiopia and Kenya. Camels are held by nomads in arid regions. The pastoral land is mainly covered with annual grass, acacias, euphorbias and dwarf bushes. The annual rain fall varies between 100 and 400 mm, the amount of rain varying from year to year and the rains being restricted to widely separated areas. This type of pasture permits only extensive types of animal production. Because of its high mobility, its modest fodder requirement and its water regulation perfectly adapted to the environment, the camel is better suited than any other domestic animal to use this type of pasture. According to the nomads, camels can survive in times of extreme need for up to 30 days without water. This depends, however, on the grazing and prevailing temperatures ((Younas and Iqbal, 2001).

### Research Objectives

- To determine the socio-economic situation of camel's herders in the region.
- To know the other economic activities of the camel's herders.
- To investigate the constraints and problems facing camel's herders and their solutions.

## METHODOLOGY

This study is a descriptive research study based on analytical research design. And several methods could be used, by segmentation, by automatic classification using a questionnaire. The method by automatic classification is based on statistical analysis of typological questionnaire using clustering method (Späth, 1980). The convenient identification keys being not known and

in absence of identified experts on camel farming systems, the method based on automatic classification was used in the present study.

### **Sampling and Data collection**

The data were collected by interviews based on questionnaires with close questions. The interviews were conducted during 2014. The farmers were chosen randomly from several regions. A number of 200 camel owners were interviewed. They belonged to different tribes coming from 3 regions: matrouh (n=30 farms), Sedy prane (n=100), Al negela (n=70). The questionnaire included nine page data form and was filled out for each camel farm. The interview took approximately 60 to 100 min per farmer.

The questionnaire included 51 questions and was divided into the following questions regarding information on camel owner identity and its activities (status, place of living, number of herds, age of owner, education,...) - questions regarding the descriptions on the herd (main activity, goals of camel breeding, household composition ...). - questions focused on time is dedicated by the family to the agricultural work ,the family members that contribute to off-farm income of the household in the last 12 months and household members are they permanent migrant / seasonal their jobs . And questions only regarding information on sub-agricultural products used by the camel, Herd composition and the mobility of the herd camels and herd of small ruminants in the past 12 months.

### **Statistical analysis**

The questionnaire included quantitative and qualitative data. In order to get homogenous data for multivariate analysis, The quantitative data were transformed into qualitative variable with modalities according to the distribution of the quantitative values. Building dummy variables describing similar topic, and use multivariate analysis of group of variables. The convenience of the cutting was estimated when the gain in between-cluster variance is not significant. The retained clustering is expressed by the total between-cluster variance explained by the model. The interpretation of the types was achieved by analyzing the contribution of the different variables to the class. Only variables with significant contribution (assessed by Chi square test) at  $P > 0.05$  were retained for the final interpretation. For all the statistical tools applied (ANOVA, AHC, chi square test), the software XLstat© and SPSS 22 were used (Addinsoft, 2015: <http://www.xlstat.com>).

## EMPIRICAL RESULTS AND DISCUSSION

The data presented in table (1) showed that the age of more than half of camel's herders were between 27 - 50 years old, while the age group between 50 to more than 60 years old was less than 16%.

Table 1. Age groups of the Respondents in Matrouh

Age group	N	%
20 – 30	50	25
30 – 40	47	23.5
40 -50	50	25
50 – 60	32	16
More than 60	21	10.5
Total	200	100 %

The information about the education levels and illiteracy were demonstrated in table (2) and showed that most of camels herders were illiterate people (33%) this is attributed to the lack of schools and to the continuous movement of those camel owners also may be due to the misconception of nomads towards the educational operation through some believes and social customs, While those who have their learning at Quran schools or Kouttab about 57.3% and then those who had completed primary and secondary school levels and superior were 3% , 2% and 4.5% , respectively. The results showed that the increasing of illiteracy trend will be reflected negatively in the development and general improvement of the camel herder's environments.

Table 2. Education level of Camel herders in Matrouh

Level	N	%
Illiterate	66	33
Khouttab	115	57.5
Primary	6	3
Secondary	4	2
Superior	9	4.5
Total	200	100 %

The data in table (3) show the findings of this study recorded that the other activities includes farming or traditional agriculture (68%), and who are rearing camels and work in trade in general goods businessman were (1%), from the data in table (3)the decrease of percentage of camel

owners who worked in other activities might be due to hard conditions and unsuitable environmental conditions and inadequacy and uneven distribution of rains beside camel rearing need more efforts and would decline the herders efficiency, in addition many of them haven't lands according to the land tenure system in the region.

Table 3. Other activities of Camel Herders in Matrouh

Type of work	N	%
Farmer	136	68
Businessman	2	1
Without driver	36	18
housewife	7	3.5
security	3	1.5
employee	2	2
retired	10	5
total	2	1
	200	100%

The data in table (4) show the findings of this study recorded that the goal of breeding, that most of goal of breeding were Extensive breeding (91.5%) while fattening and dairy (7%),(1.5%) in order.

Table 4. Goal of breeding in Matrouh

type	N	%
Extensive	183	91.5
dairy	3	1.5
fattening	14	7
total	7	100

The data in table (5) demonstrated that the history of breeding in the study area is varying in number of animal heads, the findings showed that (85.5%) of the history of breeding between 20 to 39 years in different age classes and sex followed by those who between 10 to 19 years (21%) then those who between 40 -49 years, on other hand the lowest percentage 5.5% of the respondent who between 50 - 60 years of experience.

Table 5. History of breeding in Matrouh

Years of experience	N	%
10 - 19	42	21
20 - 39	117	85.5
40 - 49	30	15
50 - 60	11	5.5
total	200	100

The data in table (6) demonstrated that the mode of ownership in each patch in the study area is varying in Private ownership or rented or put the hand, the finding showed that the mode of ownership in patch 1 the most area is put the hand (98.5 %) by total area of about 2211.7 ha, while in patch 2 about 477 ha, then patch 3, 4 and 5 by total area about 379.5, 142 , 93ha in order.

Table 6. Mode of ownership in each patch in Matrouh

patch	N	Total area(ha)
1	197	2211.7
2	164	477
3	128	379.5
4	43	142
5	15	93

The data in the study area showed the household member were they permanent migrant farmer, the amount of funding were 42000 during 24 month, the grain were produced about 6576 ton in the last 12 month and consumption were 565.5 ton. The data in table 7 showed sub agricultural products used by the camel were many type of crops the more used are barley, wheat, watermelon, fig and olive.

The data in table (7) indicated that 90% of camel herders bred other kind of domesticated animal beside camel rearing and this may be used as pattern of income diversity and adaptation for facing hard condition and natural disaster like drought and epidemic diseases, while 10% of respondent reared camels only. Data in table (7) found that the respondents owned more than 24242 heads of sheep. On the other hand goats are found beside camels about 4514 heads of goats. On the other hand cattle were other animals in the study area about 10495 heads of other animals. The findings in Table (7) revealed that sheep

breeding rank first when compared with other animals this mainly due to the high growth rate and significant contribution in the income and the livelihood of the herders.

The mobility of the herd camels and herd of small ruminants in the past 12 months during may 2012 to august 2012 we found the number of camels were near house 1280 heads in location 1 and 3639 head in second location, the most camels were grazed in rangelands public. From September 2012 to may 2013 the number of camels were near house 689 heads in first location and 4284 heads in second location. From data presented in table (7) the results found that over the past 3 years, number of camels and small ruminants have increased by average 23 head in year to camels and about 112 head small ruminants in year.

Table 7. List of variables retained in the final multivariate model with their different modalities and the number (n) of each modality in Matrouh

<b>Signification</b>	<b>Modalities</b>	<b>N</b>
sub agricultural products used by the camel		
Part1	Crop barley	123
	Product grain	29
	Product straw	94
	Total qua.	5955.9 ton
Part2	Crop barley	29
	Product straw	29
	Product core waste	22
	Total qua.	6909.5 ton
Part3	Crop barley	3
	Product core waste	24
	Product other	2
	Total qua.	269ton
Practicing camel breeding		
Origin of the first flock	Buy	9
	Heritage	190
Funding for the establishment	Granting	1
	Capital gains	21
	Other	1
Intimal herd size	Total herd	7898
	Average herd	39.49
Herd size now	Total herd	4946
	Average herd	24.7

Herd composition		
camels	Young f	311
	Young m	171
	Sub adult f	846
	Sub adult m	124
	Adult f	3351
	Adult m	115
sheep	young	6275
	adult	17967
goats	young	1417
	adult	3097
Other animal	donkey	241
	cattle	32
	poultry	6230
	turkey	81
	pigon	1568
	duck	75
	rabbits	468
The mobility of the herd camels and herd of small ruminants in the past 12 months		
May 2012 to august 2012	No. of camels near house	1280
Location1	special pasture	58
	pastures of Commons	83
Location2	No. of camels near house	3639
	special pasture	0
	pastures of Commons	60
sept 2012 to may 2013	No. of camels near house	689
location1	special pasture	24
	pastures of Commons	106
Location2	No. of camels near house	4284
	special pasture	0
	pastures of Commons	68
May 2012 to august 2012	No. of small ruminants near house	17440
Location1	special pasture	110
	pastures of Commons	9
Location2	No. of small ruminants near house	8303
	special pasture	0
	pastures of Commons	16

sept 2012 to may 2013 location1	No. of small ruminants near house	4866
	special pasture	49
	pastures of Commons	70
Location2	No. of small ruminants near house	20502
	special pasture	0
	pastures of Commons	15
Over the past 3 years, number of camels and small ruminants		
2011- 2012	Camels	4567
	Ruminants	22495
2010- 2011	Camels	4616
	Ruminants	21845
2009- 2010	Camels	4649
	Ruminants	21775
Camels lost		104
Causes	Diseases	28
	Robbery	2
	Other	2
No. female mate		1510
No. female didn't mate		2088
No. birth		1226
Replace the male	Breeding	154
	Buy	6
Age of male		1266
Selecting male	Shape	73
	Original	72
Strategy for reproduction	Borrowing	67
	Mixing	113
Products animals - camels fattening		
Sale	No. fattening	16
	Value	76000LE
Zakaah	No. fattening	3
	Value	11100LE
Camels n. mother + young		
Sale	No. fattening	1
	Value	9000LE
Buy	No. fattening	2
	Value	11000LE

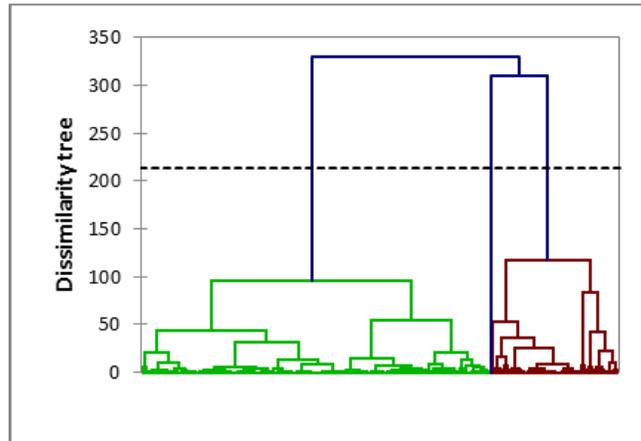
Camels young f		
sale	No. fattening	163
	Value	195000LE
Buy	No. fattening	1
	value	3000LE
zakaah	No. fattening	13
	value	21500LE
Camels young m		
sale	No. fattening	358
	value	409700LE
zakaah	No. fattening	1
	value	3000LE
Camels sub adult f		
sale	No. fattening	29
	value	108000LE
Buy	No. fattening	2
	value	10000LE
zakaah	No. fattening	19
	value	77800LE
Camels sub adult m		
sale	No. fattening	147
	value	139902LE
Camels adult f		
sale	No. fattening	28
	value	136000LE
zakaah	No. fattening	11
	value	101000
Camels adult m		
Sale	No. fattening	15
	value	25600LE
Sheep fattening		
Sale	No. fattening	3705
	value	2033550 LE

### Types of household composition

After classification of data describing the household composition, 3 types of household were identified explaining 67% of the total variance between-classes (Figure 1). According to

contribution of the 8 different variables to the clusters, the types of household could be summarized as follow: (1) young (n=196); (2) adult (n=145); (3) older (n=93).

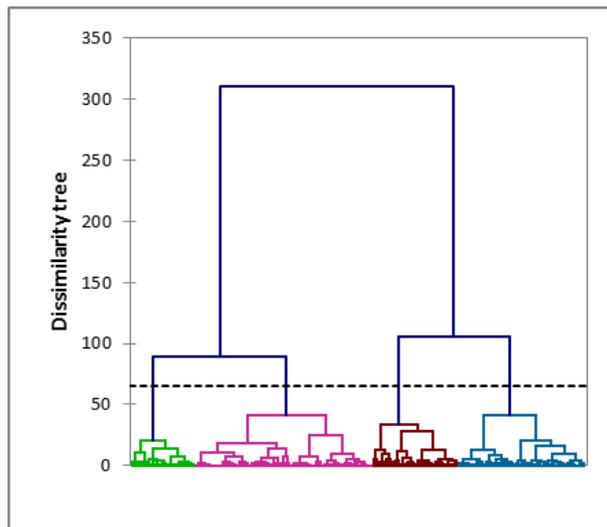
Figure 1. Dendrogram (dissimilarity tree) obtained after cluster analysis of the data table describing the household composition between cluster-variance



**Types of herd composition**

As for household, 4 types of herd were identified after classification of data describing the herds (Figure 2). The retained model into 4 clusters explained 57.97% of the between cluster variance. According to the significant 11 variables contributing to the classes, the types of herds could be described as follow class (1) n = 122; (2) n = 143; (3) n = 16; (4) n = 112.

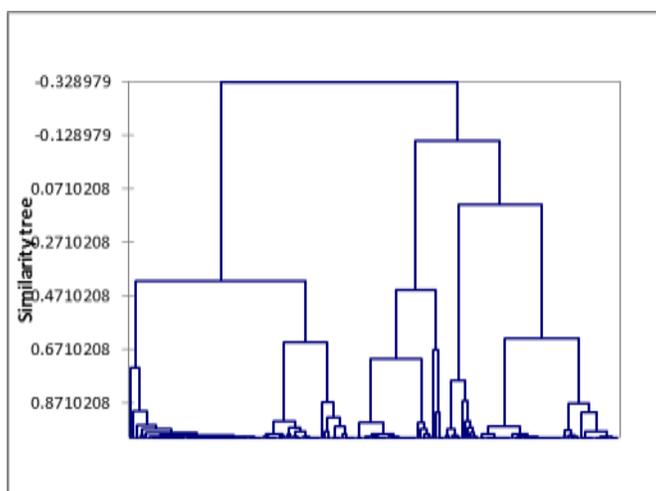
Figure 2. Dendrogram (dissimilarity tree) obtained after cluster analysis of the data table describing the camel herd



## Type of land uses

With similar method involving data describing the farmer's practices in 4 locations, 4 types of practices were identified explaining 79% of the total between-classes variance (Figure 3). The classes were interpreted according to the significant variables as follow: (1) surface ha, mode of owner ship, irrigation and land occupation (barley and olive)n = 201; (2) surface ha, mode of owner ship, irrigation and land occupation (barley and watermelon)n = 332; (3) surface ha, mode of owner ship, irrigation and land occupation (barley and wheat)n = 142; (4) surface ha, mode of owner ship, irrigation and land occupation (other crops)n = 93.

Figure 3. Dendrogram (dissimilarity tree) obtained after cluster analysis of the data table describing the land uses



## CONCLUSION

This study was addressing the Socio-economic Profile of Camel's Holders in matrouh, Egypt . It is concluded that 68% of the respondents were only farming or traditional agriculture. The results indicated that, 90% of them possessed other breeds besides camel rearing. Also the results revealed that, 71% of the respondents were sedentary. Also, 88.6% of the respondents depend mainly on buying camels as source of income. The results also revealed that the most of them depend only on family labor for herd management. The main constraints facing camel's herders in the study area were lack of labors, expansion of agriculture at the expense of the range lands, lack of general services for human and livestock.

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