ISSN 0972-3021

African-Asian

JOURNAL OF RURAL DEVELOPMENT

Vol. LIV, No. 1, January-June 2021

AFRICAN-ASIAN RURAL DEVELOPMENT ORGANIZATION
ORGANISATION AFRICAINE-ASIATIQUE POUR LE DEVELOPPEMENT RURAL

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African-Asian Journal of Rural Development, Volume 54, No. 1, 2021, pp.53-102

AN ANALYTICAL STUDY OF THE ROLE OF FINANCE AND INVESTMENT IN LIVESTOCK SECTOR IN EGYPT

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The livestock sector in Egypt needs to enhance its financial capabilities to raise production capacities in the wake of low investment in this direction. However, it requires a thorough review of the distribution of investments and loans directed towards livestock sector to ensure whether it is consistent with the geographical concentration of the livestock activities. The present research study, therefore, is aimed at assessing the impact of investment and financing for the growth of the livestock sector in Egypt. The results reveal that as per the geographic distribution, out of the total short-term livestock loans, 22.7% and 14% were concentrated in Sharkia and Dakahlia governorates respectively during 2014-2018. Hence, developing an appropriate policy to stimulate growth and raise efficiency of the livestock sector is desirable. The policy must be complemented by re-allocation of loans and investments in the potential regions that lack the material capacity to increase production.

1 Introduction

Livestock sector is considered as one of the most important sectors within the agricultural economy because of its great development potential that can be relied upon in developing the agricultural economy in particular and the national economy in general. Egypt is trying to work on developing livestock sector with the aim of providing food needs from various livestock, whether meat or milk, in order to reduce the sector's imports which estimated 2.5 billion USD , contributing 7.14% of the total agricultural income estimated 35 billion USD for development and different issues. It also represents about 34% of agricultural imports estimated at 7.4 billion USD in 2019 (Control, 2020). To achieve that, Egypt is working to provide veterinary care and

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organize national campaigns to immunize animals against diseases, in addition to establish and renew slaughterhouses, and engaged recently in reviving the veal project and the dairy collection centers project in the various governorates. But this effort will not be gained by providing the necessary agricultural investment for the advancement of livestock production sector, as the success of agricultural development policies depends to a large extent on the extent and efficiency of the distribution of investments between the different agricultural activities within the same sector.

2 Statement of the Problem

Livestock in Egypt is one of the most prominent features of the agricultural sector in terms of number and diversity, in addition to being an important source of food and agricultural income, both national and individual. However, recent years have witnessed a retreat in the growth of livestock and a steady growth of deactivated capacities, the high mortality rates despite the importance of developing livestock sector to reduce the value of food imports of live, slaughtered meat and its products to develop the export capacity of dairy products. However, in light of the deterioration of the infrastructure of this sector, which is represented in the sector's reliance mainly on importing all production requirements, fodder and vaccines, and the primitive of many massacres and milking sections, and their number decreasing even in the governorates with high production capacity. The sector's need for high financial capabilities to raise production capacities in light of the weak investments directed to livestock sector, estimated 650 million L.E, representing about 1.3% of total agricultural investment compared to other activities within the agricultural sector in 2018.

A careful reading of the agricultural lending data for livestock activity also revealed the increase in the volume of lending to livestock projects 8.1 billion L.E, representing about 57% of the total investment loans directed to the agricultural sector in 2018. However, the failure to rationalize the distribution of these loans to the governorates with high production, and the lax control and follow-up on the loans directed to livestock projects, in addition to the failure to direct technical, advisory and material support to the governorates with large production capacities, which led to the emergence of large percentages of deactivated capacities in those governorates.

2.1 The Research Questions:

i) What are the indicators of the current status of livestock activities?

ii) Is the distribution of both investment loans and investments directed to livestock activities consistent with the geographical concentration of the volume of livestock activities and the deactivated capacity in these activities?

iii) Is there a relationship between the volume of loans and investment directed to these activities and the size of livestock?

3 Purpose of Research

The main objective of this research is to study the impact of financing and investment on the growth of the livestock sector in Egypt, by identifying:

i) Analyzing the current situation of the livestock sector in Egypt through:

- Identifying the actual and deactivated capacities in Egypt, whether in Feed cattle farms and dairy farms

ii) Knowing the role of financing and investment in developing livestock activities, through the following:

- Study the relative importance of livestock loans granted by the Agricultural Bank of Egypt
- Geographical distribution of investment loans and agricultural investment in livestock directed to livestock activities.
- Therefore, the other purpose is to test for the direction of causality between the two basic variables, namely Livestock loans and economic growth in livestock sector and Livestock investment and economic growth in livestock sector.

4 Data Sources and Methodology

The research relied on secondary data published by the Central Agency for Public Mobilization and Statistic, Agricultural Bank of Egypt, Economic Affairs Sector, Ministry of Agriculture and Land Reclamation (MALR) , in addition to a number of research papers, theses, studies and scientific books relevant to the research subject. This research will rely on the analytical method in terms of both descriptive and quantitative analysis methods have been applied in an attempt to investigate the relation between both of livestock loans,investment and growth livestock income in Egypt using Granger Causality approach.

Although regression analysis deals with the dependence of one variable on others, it does not necessarily imply causation. In other words, the existence of a relationship between variables does not prove causality or the direction of influence. But in regressions involving time series data, the situation may be somewhat different because, time does not run backward. That is, if event A happens before event B, then it is possible that A is causing B. However, it is not possible that B is causing A (Gujarati, 2004). In other words, events in the past can cause events to happen today. Future events cannot(Koop, 2000). This is roughly the idea behind the so-called Granger causality test (Granger, 1969). At one extreme are people who believe that "everything causes everything," and at the other extreme are people who deny the existence of causation whatsoever. The econometrician Edward Leamer prefers the term precedence over causality. Francis Diebold prefers the term predictive causality.

In this research , the following hypotheses will be tested in conducting the Granger Causality Test:

i) Ho: livestock Loans and Livestock Investment does not Granger cause economic growth in livestock sector

ii) Ho: Economic growth in livestock sector does not Granger cause the growth of livestock Loans and Livestock Investment

iii) Ho: There is no feedback (bi-directional) effect between economic growth in livestock sector and livestock Loans and Livestock Investment

The variables are livestock Loans (LL) , Livestock Investment (LI) and growth livestock Income (GLI) respectively. Two types of causations are expected: unidirectional when H1in (1) and (2) are accepted; and bi-directional when H1 in (3) is accepted. A priori from the analysis of livestock loans ,livestock investment, all H0s should be accepted.

To evaluate whether each of the above two conditions holds the above null hypotheses are tested through following models:

First :

i) Test the null hypothesis "LL ^{TN} does not cause GDP by running both unrestricted and restricted regressions:

$$GLI = \sum_{t=1}^{m} \alpha_i \, GLI_{t-i} + \sum_{t-1}^{m} \beta i \, LL^{NT} t - i + \varepsilon_{t} \ldots\ldots\ldots (1)$$

$$GLI = \sum_{t=1}^{m} \alpha_i \, GLI_{t-i} + \varepsilon_{t} \ldots\ldots\ldots (2)$$

ii) Test the null hypothesis "LI TN does not cause GDP" by running both unrestricted and restricted regressions:

$$GLI = \sum_{t=1}^{m} \alpha_i \, GLI_{t-i} + \sum_{t-1}^{m} \beta i \, LI^{NT} t - i + \varepsilon_{t} \ldots\ldots\ldots (3)$$

$$GLI = \sum_{t=1}^{m} \alpha_i \, GLI_{t-i} + \varepsilon_{t} \ldots\ldots\ldots (4)$$

Second :

Test the null hypothesis "GLI does not cause LI TN i.e.

$$LL^{TN} = \sum_{t=1}^{m} \alpha_i \, LL^{TN}{}_{t-i} + \sum_{t-1}^{m} \beta i \, GLI^{NT} t - i + \varepsilon_t \ldots . (5)$$

$$LL^{TN} = \sum_{t=1}^{m} \alpha_i \, LL^{TN}{}_{t-i} + \varepsilon_t \ldots . (6)$$

Test the null hypothesis "GLI does not cause LL ^{TN}" i.e.

$$LI^{TN} = \sum_{t=1}^{m} \alpha_i \, LI^{TN}{}_{t-i} + \sum_{t-1}^{m} \beta i \, GLI^{NT} t - i + \varepsilon_t \ldots . (7)$$

$$LI^{TN} = \sum_{t=1}^{m} \alpha_i \, LI^{TN}{}_{t-i} + \varepsilon_t \ldots . (8)$$

In all the models F tests are conducted to determine whether ß$_1$, ß$_2$, ..,ßm are significantly different from zero. It is to be noted that: to conclude "LL ^{TN} , LI TN causes GLI", we must reject the null hypothesis "LL^{TN} , Li ^{TN} does not cause GLI" and also accept the null hypothesis "GLI does not cause LLTN , LI^{TN}". This is the ideal situation, but it must also be noted that real life data do not always yield this result. What is achieved normally is by directional causation (i.e. LL^{TN} ,LI^{TN} causes GLI and GLI causes LL^{TN} , LI^{TN}) or an inter-dependent situation in which no causation between LL^{TN} , LI^{TN} and GLI.

5 Results and Discussion

Agricultural output contributes 11.5% of the national product, which was estimated 4335 billion L.E in 2018(Development, Different issues). Hence, working to increase the value of agricultural output by increasing the growth of its components is necessary, and by studying the components of the Egyptian agricultural production, it was found that livestock was 112.2 billion L.E in 2014, which increased until it reached 188 billion L.E in 2018, with an annual average 145 almost one billion L.E over period (2014-2018).

By studying the relative importance of the value of livestock, it was found that despite the increase in the value of livestock, the percentage of its contribution to agricultural income did not change significantly, as the average percentage of livestock contributed 37% over period (2014-2018). Results in Table 1 reveal that the relative importance of the value of livestock requirements[1] is increasing from 49% in 2014 to 69% in 2018, with an average about 58% during the studied period.

This may be due to the dependence on imports to provide production requirements, the expansion of livestock activities to fill the gap, as well as the non-submission of production requirements to pricing and leaving them

to market forces, in light of the decrease in support directed to local production requirements. This indicates the absorption of the value of production requirements for any increase in the value of livestock, which will negatively affect the growth of livestock sector in Egypt.

The value of livestock meat comes at the forefront of livestock, with a value 72 billion L.E, representing 38% of the value of livestock in 2018, and the value of milk and its products amounted to 39 billion L.E, representing 21% of the value of livestock during the same year. Municipal manure from cows and buffaloes is 7.1% of the value of livestock in 2018 (Economic Affairs Sector Different issues)

5.1 The Current Situation of Livestock in Egypt

5.1.1 Evolution of Number of Livestock According to their Types

Table 2 reveals that the development of number of livestock according to the different types, as it showed a decrease in the number of livestock of all kinds from 18.6 million heads in 2014 to 16.3 million heads in 2018, with an average estimated at 17.8 million heads over period (2014-2018) .Although the buffalo is the main consumption pattern among consumers, it was noticed that the number of buffaloes decreased from 3.9 million head in 2014 to 3.4 million head in 2018, with an average 3.6 million head over period (2014-2018). Where the buffalo comes in fourth place in terms of the number in Egypt. There are also varieties of sheep in Egypt, the most famous of which are the Barqi, Osimi, and Rahmani, in addition to other breeds, the most important of which are the Falahi and the Upper (Galal, 2002). By studying the relative importance it was found that sheep come first with 30%, followed by cows 26%, while the relative importance of number of goats was estimated at 22.6%. Among the most famous of the Egyptian goat breeds is the Barqi, which is spread widely in the northwestern coast (Galal, 2002). While the number of camels accounted for less than 1% of the total number of heads. With regard to cows, the estimates showed that it decreased from 4.8 million heads in 2014 to 4.4 million heads in 2018, with average 4.7 million heads over period (2014-2018). And spread in Egypt, multiple strains of cows can be classified into three main subspecies, which are the Baladi strain, the foreign strain, and the mixed strain. The data indicate a decline in the relative importance of municipal cows to 48.7% in 2018 in favor of the increase in the number of mixed, whose relative importance increased to 47% in 2018[2]

5.1.2 Geographical Distribution of Livestock in the Governorates of Egypt

Table 3 reveals that relative importance of geographical distribution of livestock in Egypt. Where it was found that relative importance of the geographical distribution of buffaloes at the various governorates in Egypt, Beheira comes first with 10.7%, followed by Menoufia 9.6%, then Sohag 7.5%, as these governorates constitute in addition to Gharbia, Sharkia and Minya 50.7% of the total average number of buffaloes in Egypt, which is estimated 3.6 million head over period (2014-2018). Beheira also came first in number of cows, with 11.6%, followed by Sharkia 8.2%, Menoufia 6.63%.

According to the relative importance of the geographical distribution of sheep, it was found that the governorate of Sohag comes first with 455 thousand heads, representing 8.5% of total average of sheep in Egypt, which is 5.3 million heads, followed by Beheira, Minya, Sharkia, Matrouh and Qena, with a percentage 7.9%, 7.7%, 7.6%, 7.5%, and 6.9%, respectively. According to the geographical distribution of the governorates producing goat, it was found that Sohag comes first with 10.5%, followed by Minya 9.1%, then Sharkia and Qena 8.7% for each of them. Finally, camels data show that the Red Sea Governorate comes first with 31%, then Matrouh and Sohag,12.3% and 8.7%, respectively, of total average estimated at 141.7 thousand heads over period (2014-2018).

Results in Table 3 reveals that it becomes evident that despite the spread of livestock of various kinds at all governorates of Egypt, there is a concentration in livestock in a small number of governorates, and this is clearly evident in each of Beheira, Sharkia, and Minya, where they were included. The five most important governorates nationwide in producing (buffaloes, cows, sheep, and goats). While Sohag (among the most important governorates producing buffaloes, sheep, goats and camels and Menoufiawere distinguished in producing buffaloes and cows. Qena governorate in producing sheep, goats and camels. This requires identifying the actual and deactivated capacities in those governorates and the extent of providing support to those governorates to develop their production capacities.

5.1.3. The Productive Capacities of the Livestock for Feed Cattle Farms in Egypt

According to Table 2 (Appendix), it is evident that the number of livestock farms increased to 9.4 thousand farms in 2018, with average 8.6 thousand farms over period (2014-2018), and total capacity increased from 587

thousand in 2014 to 716 thousand head in 2018 (Fig.1). In spite of the increase in the number of farms and the total capacity in them, by studying the relative importance of the deactivation capacities in those farms, it is evident that the relative importance of the deactivated capacity has increased 43.7% in 2014 to 44.7% in 2018. This indicates that these farms do not work at full capacity, but rather suffer from low economic production efficiency due to the disruption of 45% of the production capacity in these farms, which is a lack of exploitation of economic resources and requires research into the reasons behind the increase in the disrupted capacities of livestock farms in Egypt over period. (2014-2018)

5.1.4. Geographical Distribution of Number of Feed Cattle Farms in Egypt

By studying Table 2 (Appendix), it becomes clear that 62% of livestock feed cattle farms in Egypt, which estimated 8649 farms over period (2014-2018), are concentrated in Nubaria, Fayoum, Beheira, Sharkia, Sohag, and Luxor respectively. It is also noted that the number of farms decreased in both Beheira and Fayoum during the studied period, while it increased in Sharkia to 851 farm in 2018, and increased in Sohag 683 farm in 2018, in addition to doubling the number of farms in Luxor to 676 farm in 2018, with an annual average estimated at 552 feed cattle farms over period (2014-2018). According to the relative importance of the number of feed cattle farms distributed in Egypt, it was found that this percentage decreased 62.3% in 2014 to 59.8% in 2018.

5.1.4.1. Geographical Distribution of the Full Production Capacity of Feed Cattle in Egypt

According to Table 2 (Appendix), it is clear that 62% of the total capacity of the feed cattle farms during 2014-2018 is concentrated in the governorates of Beheira, Sharkia, Fayoum, Sohag, Gharbia, and Nubaria, where the total capacity increased by a thousand heads in each of Beheira, Sharkia, Sohag, Nubaria, and Gharbia by 53, 103, 39, 130 and 26 thousand heads each, respectively in 2018.

5.1.4.2. Geographical Distribution of the Actual Capacity of Feed Cattle in Egypt

By studying the relative importance of actual capacity in feed cattle farms over period (2014-2018), it was found that Nubaria came first with 25.5%, Fayoum by 13% despite the decline in the number of heads from 49 thousand

head in 2014 to 47 thousand heads in 2018 . With average actual capacity of feed cattle farms was 359,000 heads .

5.1.4.3. Geographical Distribution of Deactivated Capacity of Feed Cattle in Egypt

By studying Table 2 (Appendix) the following is revealed:

- Despite the increase in the number of farms from 8.04 thousand farms in 2014 to 9.4 thousand farms in 2018, there is an increase in deactivated capacity in Egypt from 256 thousand heads in 2014 to 320 thousand heads in 2018, and this has emerged clearly, in the first governorates in Egypt in terms of the number of farms, such as Sharkia, in which the number of farms is increasing in parallel with the increase in deactivated capacity.

- Despite the actual capacity of livestock feed cattle farms in the first five governorates in Egypt, Beheira, Sharkia, Fayoum, Sohag, and Nubaria, which represent 63.1% of total actual capacity in Egypt, however, these same governorates have deactivated capacity about 53.3%. That is, the actual capacity of those farms in these governorates is estimated 9.8%, which indicates the inefficiency of the production of those farms in question.

5.1.5. The Current Situation of Meat Production and Consumption

Meat production in Egypt includes the production from both buffaloes and cows (whether large or small) in addition to goats, sheep and camels. Table 4 and Fig. 2 show the time trend of meat production, consumption and the gap, as it showed a decrease in meat production from 769 thousand tons in 2014 to 639 thousand tons in 2018, with average 746 thousand tons over period (2014-2018).

Despite decrease in production, the consumption increased to 1263 thousand tons in 2018, which led to an increase in the size of meat gap from 454 thousand tons in 2014 to 624 thousand tons in 2018, then the rate of sufficiency decreased to 51%in 2018. This shows the extent of dependence on import, whether in the form of live heads or frozen or chilled meat to fill this deficit in production, which represents a burden on the agricultural trade balance.

5.1.6. Egyptian Imports of Livestock

From the study of the foreign trade report of the general organization for export and import control, it was found that frozen meat imports ranked in fourth among the imports of the main food commodities, with 1.2 billion USD in 2018, and that frozen beef ranks eighth among twenty most important food import commodities, with 1.6 billion USD in 2018 (Control, 2020).

Imports of cattle are the most important imports of live heads in addition to imports of frozen and chilled meat, Table 5 shows it is evident that the amount of imports of meat increased from 348 thousand tons with 1.54 billion USD in 2014 to 602 thousand tons with an estimated value1.6 billion USD, and annual average 532 thousand tons of meat. It was observed that the volume of imports of meat quantities increased despite the increase in imports of live heads, and this may be attributed to the use and imports of live heads in breeding after the government allowed the import of young live heads and raising them to weights that allow slaughter in 2018.From the previous, the researcher thinks that Egypt's reliance on importing live heads for breeding them for a period of time ranging between 3-6 months costs Egypt more financial burdens due to the dependence of nutrition on imported feed, which requires consideration again for importing live heads and the true cost of them and not the apparent cost in the form of value. Import, which represents support for the foreign product at the expense of the Egyptian Producers.

5.2 The Current Situation of Dairy Production in Egypt

Dairy production in Egypt depends on a diverse Livestock in terms of type or strain, which is often characterized by a lack of specialization in the production of dairy. Buffalo and cows are the main source of dairy production in addition to the milk of goats, sheep and camels, which are found in desert and tribal areas. In spite of the herds produced in numbers, it is too much, but it is characterized by low productivity from milk due to limited resources such as feed, veterinary care, and the economic pattern in which production takes place. Dairy production in Egypt can be divided into two main systems:

a) The traditional production system which is one of the individual-owned farms in which cows and buffaloes are raised together, and dairy production is not a main goal of this system, but it also includes animal breeding such as meat production. The herd where less than five large heads results in lower productivity of dairy and meat (Ibrahim Soliman, 1993).

b) The specialized production system where the dairy production is the main objective of the farm and therefore the herd used in the production of milk by the producers of this system falls under two main types of production:

- A pattern based local animals, which represents an advanced stage of specialization in production for the traditional system. This system is located near cities in order to supply the place with raw drinking milk.

- A pattern based on imported breeds specializing in dairy production such as Friesian cows. As a result of policies to encourage and develop animal production and dairy production, its projects were associated with integrated systems for the production of clean milk using advanced equipment, tools and machines, in addition to the presence of specialists in production, veterinary and animal care, and project management. Due to the appropriate quality of the milk of these farms, modern factories rely on it as a main source of raw milk(Metwally, 2006).

5.2.1. The Relative Importance of Number of Milking Heads in Egypt

Dairy production farms are divided according to number of heads into small, medium and large farms. Table 6, shows the relative importance of the number of milking heads according to the size of the farm. It was found that large farms represent about 73% of the total number of milk heads, followed by medium farms at a rate of about 14.6%.

5.2.2. Geographical Distribution of Milk Heads According to the Size of the Farm

Table 6 shows that the relative importance of the geographical distribution of the number of milk heads in Egypt according to farm size , Nubaria comes first in total general with 17.2%, 26.3% and 31% for each of the small, medium and large farms respectively over period (2014- 2018).

It was clear from a study of the relative importance of the geographical distribution of the milking heads of medium-sized farms, Luxor comes second after Nubaria, with 14%, followed by Fayoum 8.6%. The total number of milk heads in large farms in Egypt increased from 162.6 thousand head in 2014 to 192 thousand head in 2018, with an annual average 180 thousand head. Alexandria, Beheira, Sharkia, Qalyubia and Fayoum, in addition to the Nubaria, constitute about 67% of the total number of milk heads in large farms over period (2014-2018).

5.2.3 Production Capacities of Dairy Farms in Egypt

According to Figure 3, therer is an increase in the number of dairy farms from 5.5 thousand farm in 2014 to 6.2 thousand farms in 2018. It is evident that total production capacities are concentrated in governorates of Alexandria, Beheira, Sharkia, Fayoum, Damietta, in addition to Nubaria, at a rate of 58% over period (2014-2018). But it was noticed that there is an increase in the full and actual capacities except Fayoum which witnessed a decline in capacities over studied period[3]. By studying the geographical distribution of deactivated capacities in a thousand heads, it was found that the deactivated capacities increased in Alexandria, Sharkia, and Nubaria by 8.2%, 13.3% and 6.2%, respectively. It also showed that the size of deactivated production capacities increased from 161,000 heads in 2014 to 206,000 heads in 2018, with average 183,000 heads over period (2014-2018).

By comparing the full-actual and deactivated capacities in Egypt, it was found that the average size of the actual capacities represents 57% of the total average capacities, then the deactivated capacities of 74.5% over period (2014-2018), which indicates on the existence of unexploited productive capacities and requires research into the reasons behind it.

5.2.4. The Relative Importance of Producing and Consuming Milk in Egypt

Table 7, indicates that the self-sufficiency rate has increased to 93% in 2018 which indicates that in light of growth of deactivated capacities in dairy farms, there is a possibility to develop milk production and achieve self-sufficiency and provide an opportunity to develop exports of milk and its products manufactured. Despite the preference of the Egyptian producer of buffalo as a milk-producing animal due to its endurance to environmental conditions and its ability to resist diseases and its high production of milk compared to municipal cows in addition to the advantages of buffalo milk, such as the high clearance ratio of it from cow's milk, in addition to the distinctive white color, which is the desired coloramong the Egyptian consumer, however, estimates indicate the diversification of milk production sources in Egypt, as 52% of the milk production in Egypt comes from cows, followed by buffaloes 46% during the studied period, despite the decline in buffalo milk from 2.9 million tons in 2014 to 2.2 million tons in 2018, with average 2.4 million tons during the studied period[4]

This is in addition to some studies by Soliman 1991, Soliman & Bahagat, et al 2017, Soliman and Mashour 1997, it indicates that raising buffaloes without

cows in light of the restrictions of the existing crop composition for the purpose of dairy production will produce the same volume of production with fewer milking heads, which leads to saving 1.5 million acres of Alfalfa that can be used in the cultivation of wheat, and 800 thousand acres of Alfalfa. Tharish can be used with vegetable crops, in addition to the possibility of filling the deficit in the production of fodder by using concentrated feed mixture that does not depend on raw materials such as mineral salts, molasses, butter and wheat bran.

Then the researcher thinks that developing milk production from buffalo herds should receive more attention from the state, especially with decrease in productivity of Egyptian buffalo from milk compared to buffaloes in other countries such as India and Pakistan. The average productivity of the milk head in Egypt was estimated 1375 kg, while it was estimated in India 2054 kg in 2018 (Nations, 2020), especially in light of the assertion of many studies that the cost of producing a kilogram of buffalo milk is 4% less fat for small farms than any other production system in Egypt, and that the traditional farm system widespread in Egypt produces buffalo milk at the lowest cost compared to production systems, whether cows or buffaloes. Even after liberalizing the prices of inputs and outputs, some studies have confirmed that the cost of producing a kilo of buffalo milk in small farms represents one-third of the cost of producing a kilo of cow's milk in the USA, and that the highest costly production system for milk production is the commercial production pattern of cow's milk (Bashier E. Bahagat, 2017).

5.3. The Role of Finance in Developing Livestock Sector

Economic development theories indicate that finance is the main instrument for achieving development. Schumpeter and several economists such as McKinon& Shaw affirmed in their studies on the great role of the financing policy in stimulating economic activity, and that the shortage or deficiency in the financing process results in many negative effects on the production process and the efficient use of the available resources. Rather, it represents a hindrance to economic activity(Yehia, 2016). Therefore, agricultural financing is considered one of the most important factor to encourage investment, promote agricultural production and raise the level of the rural communities that it serves. Hence, financing has become one of the main factors as agricultural projects require effective financing and support by the government or by the lending authorities to provide production and breeding requirements, and the establishment of slaughterhouses, parlors, etc. from agricultural activities.

5.3.1 The Current Situation of Livestock Loans

The Egyptian Agricultural Bank is the primary source for lending to agricultural producers, and many farmers resort to obtaining investment loans to establish livestock projects, whether dairy production, livestock breeding, or activities related, such as milking, slaughterhouses and manufacturing activities. Currently, the government launched an initiative to collect milk to organize the collection process and raise its efficiency, in addition to reviving the veal project by providing productive loans to small breeders on easy terms in the interest rate and payment. The investment loans directed to agricultural activities vary according to their age, ranging from short, medium and long-term loans. However, livestock activities are related to short and medium loans only due to the short production cycle compared to activities that need long loans such as land reclamation projects.

Short-term loans are defined as loans with a duration of no more than 14 months and include plant loans and short-term investment loans. These loans are provided for basic activities such as production of agricultural crops or economic activities related to agriculture, such as loans for operating livestock and poultry production, and the entitlement of this type of loan is usually linked to the date of crop maturity and marketing or to obtain income from the project.

As for medium-term loans, they are investment loans whose duration ranges from 14 months to 5 years and provided by the bank with the aim of implementing some projects that serve small and large farmers. Such loans for establishment and renewal of orchards and nurseries, as well as loans are for livestock from the purchase of animals and milk machines, loans for establishing poultry projects, loans for fish production like establishing fish farms, and agricultural mechanization loans.(Yehia, 2009)

Table 8 and Fig.4 show the relative importance of livestock production during 2007-2018, as that period was divided into three periods to determine the size of loans directed to livestock sector during a politically and economically stable period, which is the period before 2011 and then during instability (2011- 2014), then, after the stability of the economic, political and security conditions (2015-2018). Where it turns out that despite the decline in the volume of livestock production loans during the period 2007-2010, there is an increase in the relative importance of livestock production loans.

This indicates the decline in volume of investment loans directed to the agricultural sector in general, and that the amount of decrease in the volume

of livestock loans was by a lesser percentage than the change in the share of the rest of the activities from those loans, and the breeders' appetite for livestock loans compared to other agricultural activities, and they are economically feasible for the breeder. The period from 2011-2014 witnessed a remarkable decline in the relative importance of livestock production loans from 67% in 2011 to 44% in 2014. However, the relative importance of loans granted livestock sector has witnessed a remarkable increase in relative importance over third period, as it increased from 43% in 2015 to 57% in 2018, with average 50.3%. This indicates the impact of political and economic stability on the credit and loan policy of the Agricultural Bank of Egypt, which was reflected in the increase in the volume of investment loans directed to the agricultural sector in general, which amounted to 14.2 billion L.E in 2018.

5.3.2. Geographical Distribution of Livestock Loans

By studying the geographical distribution of livestock loans as per Table 9, that short-term loans are concentrated in Sharkia, 22.7%, followed by Dakahlia 14% , the two governorates, in addition to Gharbia, and BeniSuef, Minya, Assiut, and Menoufia, account 75% of total short-term loans directed to livestock sector over period (2014-2018) (Fig.5). According to the geographical distribution of the volume of loans directed to the livestock sector and comparing it to the number of live heads, the number of feed cattle farms and the production capacities in these governorates, in addition to the dairy production farms and their production capacities, found that :

Short-term investment loans are concentrated in Sharkia, Dakahlia, Assiut, and Minya, and from studying the production situation in these governorates, the following was observed:

Dakahlia, according to the aforementioned research, was not among the first governorate in Egypt in terms of numbers of livestock, or the concentration of the number of feed cattle farms, or dairy cattle farms nevertheless, it comes as second in terms of livestock loans, with 14% over period (2014-2018), although Dakahlia is not being among the most important governorates that include deactivated capacities in livestock production or dairy, directing more loans to that governorate may be due to the fact that these loans are directed for purposes other than livestock activity, as the effect of these productive loans has not been reflected in increasing the productive capacities of Dakahlia.

Sharkia comes first in terms of total short-term lending, 23% in 2014-2018, Sharkia is one of the governorates in which livestock is concentrated in terms

of number of heads of cows, buffaloes, sheep and goats, but it is one of the first governorates in terms of volume of deactivated capacities in feed cattle farms, where the percentage of deactivated capacity increased from 50% in 2014 to 54% in 2018, with an average of 17.3% over period (2014-2018), meaning that it comes first in terms of the volume of deactivated capacity in Egypt, which indicates the inefficiency in using the loans directed to the county's livestock production activities, and the failure to pursue projects, which led to an increase in deactivated capacities.

From the study of geographic distribution of short-term loans, it was found that the producing governorates in which livestock are concentrated, such as Qena and Sohag, did not have the appropriate size of lending for their productive activity and were not among the governorates of relative importance in terms of distributing short-term loans or producing dairy where the relative importance of the size of short-term investment loans directed to livestock activity was 2% and 2.1% for each, respectively. It indicates the inequality in the distribution of loans between the governorates and confirms that the governorates with high lending ratios did not use the loans for the purpose they were given , and Menoufia is the only governorate that is consistent with its productive activity, as it came within the first governorates in terms of the number of cows and buffaloes, and the volume of lending directed to livestock production activity.

By studying the medium-term investment loans, it was found that they are consistent with the volume of productive activity in the governorates, as Sohag and Menoufia are considered among the first governorates in terms of the number of heads and production capacity, however, Sohag Governorate, which comes first in terms of the acquisition of medium-term loans, 14.4% over period (2014-2018), has an increasing idle capacity in feed cattle farms, which amounted to 17.2% in 2018. In addition, it is not among the most important dairy-producing governorates, despite this volume of lending directed to it. This requires research behind the reasons for the increase in the size of deactivated production capacities in that province (Fig.6).

Beheira comes second in terms of the size of medium-term loans, as total of loans directed to it doubled from 133 million L.E in 2014 to 279 million L.E in 2018, with 9.4% as a relative importance of the average size of loans during 2014-2018. It also comes first in terms of concentration of number of livestock from buffaloes and cows, and in the third place in terms of the number of feed cattle farms. However, it is noticeable that the size of the deactivated capacity in the feed cattle farms in Beheira has increased to

23%, in addition, it is among the first governorates in Egypt in terms of the concentration of medium and large-sized dairy farms. Despite this, it ranks fifth in Egypt in terms of the size of idle capacities in dairy farms with 7.1% as a relative importance of the average size of lending during 2014- 2018. It also notes the decrease in the number of automatic milking sections in Beheira until they completely disappeared from Beheira during the last three years, which indicates the inefficiency of utilizing loans or exploiting them in a way that serves animal production activities in Beheira and increases production capacities.

Qena comes in third place in the volume of medium-term loans directed to livestock (9.1%). This may be attributed to the concentration of sheep, goat and camel production farms in Qena which requires an increase in total lending to the governorate, which leads to a reduction in sheep imports, which amounted to 70 thousand heads with value 19 million USD in 2018.

According to geographic distribution of number of live heads in Egypt, Gharbia ranked sixth in terms of number of buffalo heads, but there was no concentration of number of feed cattle farms in Gharbia during 2014-2018 , as for dairy production, Gharbia ranks fifth in terms of concentration of medium-sized farms, and the fourth in terms of large farms (7.1%) and it ranks fifth in terms of the volume of medium-term loans directed to the livestock sector in the Gharbia.

5.3.3. Estimating the Relationship between Livestock Loans and Livestock Income by Using Granger's Causality Approach

5.3.3.1 Model Specification

This model was used to study the impact of agricultural financing on the economic activity of the agricultural sector by measuring the relationship between livestock loans and growth livestock income by applying Granger's causality model to investigate the direction of relationship between the parameters . Depending on that the economic thought that supports the existence of a positive impact of this financing on the economic growth of the agricultural sector, in order to reduce the number of variables used in this research to facilitate the analysis process . The variable real livestock income (GLI) was chosen as a variable expressing livestock economic activity and a measure of its growth and development, and real livestock loans (LL) as a variable affecting livestock activity. These two hypotheses are tested below using the Grangers causality models. Where the model variables act as internal variables and there are no external variables (Granger, 1969).

5.3.3.2 Results of Model Analysis

Statistical tests were performed to determine Stationary or non stationary in time series, the unit root test , Cointegration test then Granger causality test and the results are as follows :

*i) The Unit Root Test :*The statistical properties of regression analysis are missing when non-static series are used. It gives spurious regression of the estimated relationships (Phillips, 1987). The unit root test is the most popular test for measuring the stability of time series , where the presence of the unit root in the time series data indicates its instability, thus, the time series which has a unit root is known with random walk time series.This test checks the stability of the model's variables over time, and the level of Cointegration of the series is determined by using Augmented Dickey (ADF)(Gujarati, 2004) which requires selection the lag length (p) which gives the lowest value according to Information Akaike Criterion (AIC) & Schwarz Criterion (SC) (Yehia, 2016). The null hypothesis test is then performed by comparing the calculated (t) value for estimated parameter (δ) with tabular values to test ADF which modified by Mackinnon (Mackinnon, 1990), at a specific level of significance.

Table 10 shows that the results of unit root test by using ADF, the time series of model variables are : real growth livestock income (GLI) , real livestock loans (LL) , where the series become stationary at second difference with intercept , where the calculated values are greater than the tabular values of all variables at all levels of significance according to AIC & SC as it was values of DW and F. Test which are significant statistically acceptable at (0.05) significant level , which mean that the time series of the variables have become stable and move through time . That is , it's an integrated second order (2) and there is a long term period of time known as regression of co-integration .That is, there is no correlation between errors after taking the second difference, which indicates the accuracy of the estimated results and that they are not misleading.

ii) Selection the Lag Length : One of the important things in the accuracy of the model is the choice of the time lag , Granger causality test is one of the most sensitive models for lag length, the optimal number of lag length is chosen according to values of AIC & SC , where the number of lag length corresponding to the lowest calculated value for both tests is chosen . In case that the results of the two tests differ about the optimal value, they are compared according to the following:

AIC was used for small samples whereas SCws used for large samples.By applying the results of the two tests, it was found that they had achieved their lowest value during the third lag length period, the results of most of the tests also agreed with them, this number of lag length gave good and statistically significant results (Table 11).

iii) Cointegration Test Results : Cointegration analysis is the ideal solution to eliminate spurious regression by focusing on the behavior of the residuals in the model, the cointegration test measures the equilibrium relationship between variables in the long run. If the time series variables are not stable at their levels, this means that it is a first-class integral, then the cointegration test suggested by Johansen can be performed (Dickey & Fuller, 1981). There are several methods to test cointegration : Engle – Granger (Harvie & Pahlavani, 2006) , Johansen- Juselius test. By applying Johansen test to Trace Test and Maximum Eigen Value Test for real livestock income (GLI) and real livestock loans (LL). Results reveal that both of the Computed trace test value and Max Eigen Test greater than tabular value at 1% level of significance. Thus we reject the null hypothesis and accept alternative hypothesis , which says that there is at least one vector for cointegration between the two variables , which indicates the existence of a stable linear combination between real livestock income (GLI) and real livestock loans (LL), This result also confirms the existence of a long-term equilibrium relationship between the two variables in the model (Table 12).

iv) Granger's Causality Results: According to Granger Causality results in Table 13 , there is no positive impact relationship between both of real livestock income (GLI) , real Livestock loans (LL) as this test depends mainly on (F) test value , and computed F estimated (1.4) at the level of significance 5%. Thus we reject the alternative hypothesis and accept the null hypothesis. Also the results showed that the inverse relationship didn't materialize. Where the calculated F value is less than the tabular and hence not significant . According to the results change in real livestock income (GLI) doesn't explain change in real livestock Loans (LL) . This indicates a decline in the growth rate of real livestock income and livestock loans may not be directed to the purpose for which they were granted, and therefore their effect has not been shown on the growth of livestock income.

5.4. Investment in Livestock

5.4.1. Relative Importance of Investment in Livestock Sector

Agricultural investment is the main tool to raise efficiency of agricultural sector, given that the agricultural sector is linked to many activities that require

a huge investment volume that Egypt may not be able to undertake. Hence, successful agricultural development policies depend on the volume of planned investments and the efficiency of distributing these investments and using them in various fields. Many agricultural economic studies indicate lack a study of the impact of the economic relationship between investment and various agricultural activities and the extent to which the agricultural sector benefits from that economic relationship. And what this requires in terms of adjusting policies and procedures to maximize that benefit, in a way that helps increase the growth rates of the sector and improve its conditions and contribute to achieving economic growth for the Egyptian economy in general, and then the investment directed to the agricultural sector is divided into general investment[5] by the government. It is a private investment made by individuals of different material capabilities and productive activities within the sector.

Data in Table 14, reveals that the relative importance of the volume of agricultural investment over period (2007-2010) increased in spite of the increase in the volume of national investment to 232 billion L.E in 2010, which constitutes a major obstacle to achieving development in the agricultural sector in general and the activity of livestock in particular. By studying the relative importance of the value of animal investment to agricultural investment during the same period, it was revealed that the volume of investment in livestock sector increased by 12.3% in 2010. This indicates that the increase in the total livestock investment was not due to a real increase in total investment, but rather to the decline in the value of total agricultural investment, which is not commensurate with the volume of activity in this sector and undermines its growth. From the table it appears that investment in animal production activities is divided into two types: public investment, which the state undertakes in the form of providing infrastructure, technical and guidance support, vaccines, and private investment by individuals or private entities. Estimates indicate an increase in the relative importance of the volume of private investment in animal production during the studied period to 97%, compared to 3% for public investment in animal production in 2010 (Fig.7), which indicates the dependence of the animal production activity mainly on private investment. In addition to the decrease in the volume of government spending, a stimulus to attract more private investment for this important productive activity, this may be one of the reasons for increase in the size of deactivated capacity in livestock sector, and the reluctance of breeders and small farmers from livestock production projects. Despite the increasing relative importance of agricultural investment over period (2011-2014), this period witnessed a severe decline in total investment directed to livestock, as it represented 4% of agricultural investment in 2014.This was

clearly reflected in decline in the volume of public and private investment in the livestock sector during the same period. By studying total investment directed to livestock activity during 2015-2018, total investment increased from 520 million L.E in 2015 to 650 million L.E in 2018, with average 590 million L.E, despite the increasing total investment in the activity of livestock. But there is a decline in the relative importance of the volume of investment in this activity despite its insignificance, as the relative importance decreased from 4% in 2015 to 1.3% in 2018.

This indicates an increase in total investment directed to the agricultural sector in general, with a decline in share of livestock activity from those investments, which was clearly evident in the relative importance of the activity. This is not commensurate with the importance of this productive activity and its role in achieving food security and reducing the value of imports of live animals and frozen and chilled meat. This requires taking a package of stimulating measures to attract more investments, directing them according to a clear investment map, and supporting them in a way that ensures achieving the desired return. It was also evident that livestock activity completely depends on private investment, which was evident in the increase in the volume of private investment by 99 per cent in 2018.

5.4.2. Geographic Distribution of Livestock Investments

Table 15 shows that there are 6 governorates that account by 75% of total investments in 2014, that percentage decreased to 43% in 2018 on an average. Sohag comes first in terms of acquisition of livestock investments, with average 2.7 million L.E, by 16.3% of total public investment, followed by Gharbia , Menoufia by 11.2% and 10.3% each, respectively.

From the geographic distribution of private investment in livestock activities during the studied period, it was found that Beheira comes first, with an annual average 120.6 million L.E, by 1.8%, followed by Giza 0.9%. Despite the increase in total private investment directed to these governorates, to 366 million L.E in 2018. However, it became clear from studying the relative importance of total private investment in livestock activities decreased to 3.2% in 2018, which indicates that despite increase in livestock investment the share of these governorates has decrease despite being productive governorates. Table 16 shows the concentration of investments in dairy production in only three governorates, with a minimal value, namely Minya, Menoufia and Dakahlia, respectively, where Minya came first by 0.21% of total investments directed to agricultural activities during the studied period. Noting that no data are available on private investment in dairy production

activity in Egypt over various studied period. Fig.8 shows investment in livestock and deactivated capacities.

From a study of the distribution of investments on livestock activities in the various governorates, it was found that:

- Although the Sharkia possesses large productive capacities in parallel with the increase in deactivated capacities by 54% in 2018, but it comes in fourth place by 9% in terms of total public investments implemented during the studied period . This is in light of the decline in total private investments in livestock activities. This indicates the inefficiency in the distribution of investments to the governorates and the deficiency of monitoring and evaluation, as more investments would attract private investment rather than its exit, and this did not happen in Sharkia.

- Sohag comes first in terms of total investment in livestock activities, especially as it is one of the governorates in which livestock of all kinds are concentrated and it is considered one of the first governorates in Egypt in terms of the number of heads.

- It is noticeable that Qena Governorate lacks investment in the field of livestock, despite the concentration of goats, sheep and camels with them.

- Gharbia is considered one of the first governorates in the concentration of dairy farms, and therefore it has a large volume of investment in livestock activities. Likewise, Menoufia, which is characterized by livestock in addition to milk and this was evident in the concentration of public and private investments in those two governorates, which indicates the efficiency of distribution and its consistency with production areas in Egypt

Although Luxor owns about 6.4% of feed cattle farms in Egypt during the studied period, and 11% of the small-sized farms, and 14% of the medium-sized farms for the production of milk, it ranks fifth in terms of attracting public investment by 8.9 % over period (2012-2018), which requires directing more investments towards this governorate in order to maximize the economic return of the livestock inherent in it.

5.4.3 Foreign investment in Livestock Sector

According to distribution of foreign investments directed to the agricultural sector, it was found that they serve four main sectors: land reclamation and livestock, poultry and fish production, agricultural industrial integration projects, automatic slaughterhouses, and other agricultural activities.

Table 17 shows that the distribution of foreign investments to these sectors and the fluctuation of investments up and down, and even the disappearance in some years as a result of the withdrawal of those foreign investments from the Egyptian economy, in particular investments directed to land reclamation sector and agricultural industrial integration projects. The highest sector acquisition of investments was the land reclamation sector, by 49%, it is followed by livestock, poultry and fish production sector by 21% , automatic massacres, 13% as an average for 2014-2018.

From the foregoing it is evident that the livestock sector in Egypt requires more planning and setting appropriate policies to stimulate growth of the sector and raise its efficiency and subsequent complementary productive activities through redistribution of productive loans and investments directed to regions that have high production capacities but lack the material capacity to develop and increase production.

5.4.4 *Estimating the Relationship between Livestock Investment and Livestock Income Using Granger's Causality Approach*

5.4.4.1.Model Specification

According to Granger Causality, we will try to study the relationship between livestock investment and livestock income. The variable real livestock income (GLI) was chosen as a variable expressing livestock economic growth, and real livestock investment (LI) as a variable affecting livestock activity. These two hypotheses are tested below using the Grangers causality models. Where the model variables act as internal variables and there are no external variables(Granger, 1969).

5.4.4.2.Results of Model Analysis

i) The Unit Root Test : Table 18 show that the results of the unit root test by using ADF, the time series of model variables are : real livestock income (GLI) , real livestock investment (LI) , where the series become stationary at second difference with intercept , where the calculated values are greater than the tabular values of all variables at all levels of significance according to AIC & SC as it was values of DW and F. Test are significant statistically acceptable at (0.05) significant level , which mean that the time series of the variables have become stable and move through time. That is, it's an integrated second order (2) and there is a long term period of time known as regression of cointegration .That is, there is no correlation between

errors after taking the second difference, which indicates the accuracy of the estimated results and that they are not misleading.

*ii) Selection the Lag Length :*Table 19 shows that by applying the results of both tests AIC, and SC had achieved their lowest value during the first lag length period, the results of most of the tests also agreed with them , this number of lag length gave good and statistically significant results.

iii) Cointegration Test Results : Results reveal that both of computed trace test value and Max Eigen Test greater than tabular value at 1% level of significance. Thus we reject the null hypothesis and accept alternative hypothesis , which says that there is at least two vector for cointegration between the two variables , which indicates the existence of a stable linear combination between real livestock income (GLI) and real livestock investment (LI). This result also confirms the existence of a long-term equilibrium relationship between the two variables in the model (Table 20).

iv) Granger's Causality Results : According to Granger Causality results in Table 21 , there is positive impact relationship between both of real livestock income (GLI) , real Livestock investment (LI), computed F estimated (11.3),(15.6) at the level of significance 5%. Thus we reject the null hypothesis and accept the alternative hypothesis.

And there is inverse relationship between GLI and LI where the calculated F value is greater than the tabular and significance statistically . According to the results, change in real livestock income (GLI) can explain the change in real livestock Investment (LI) , and change inLI can be explain change in GLI . This indicates increase in the growth rate of real livestock income and livestock Investment. Reveal to Granger Causality results it is important to confirms the importance of directing more investment to livestock sector and its development, which leads to an increase in agricultural income

6 Recommendations

Based on the previous results, the research recommends the following:

i) It is necessary to develop appropriate policies to stimulate the growth of livestock sector and raise its efficiency and the subsequent complementary secondary productive activities by re-allocating production loans and investments directed to regions that have high production capacities but lack the material capacity to develop and increase production.

ii) Re-evaluate the credit system for livestock activity in terms of providing more credit facilities to encourage breeders to borrow, in addition to evaluating and following up the loans provided to breeders and the economic return of the projects to which the loans have been disbursed to determine the feasibility of these projects.

iii) Directing more attention to investing in the field of goats and sheep, especially as they are animals that feed on agricultural production waste and then have a large production capacity at the lowest cost compared to other types of feed cattle, which contributes to raising the self-sufficiency rate of red meat.

iv) Establishing a number of desert shelters that provide water for breeders in desert areas by digging wells and planting some economic trees such as olives, palms and pastoral weeds, which helps stimulate and continue production in those areas.

v) By looking to the agricultural census data for the year 2010, it becomes clear that 60% of livestock in Egypt is owned by individuals without land or owning less than three acres, which requires directing more economic empowerment to these breeders through a special credit line compatible with their living conditions and their ability to access for credit in order to encourage them to maintain and expand their productive activity.

vi) Increase the volume of public investment in livestock sector to attract more private investment to this important sector, provide more investment incentives to attract investment into this sector, and draw a real investment map for production.

vii) Reassessing livestock projects and its various activities in Egypt to identify the deficiencies that led to the increase in deactivated capacities, especially in governorates with a comparative advantage in the concentration of livestock, feed cattle farms and milk production.

viii) Raising capacities of small and medium farms by importing high-productivity wheels (ten and below) with the aim of breeding, in order to increase the productive capacities of farms and encourage breeders to do so, especially in the presence of a financing initiative that serves this purpose, which was put forward by the Central Bank

ix) Reassessing the role of official institutions and agencies entities that serve livestock sector to find out what these institutions can provide in terms

of support, guidance and awareness for breeders in order to achieve real growth in livestock sector, especially in the field of providing vaccines and serums, disseminating genetic vaccination, providing free artificial insemination service for breeders, providing high-productivity strains and introducing breeders to them, especially in light of the high mortality rates of feed cattle.

x) The high price of fodder is a major impediment to the growth of livestock sector, especially with the dependence of livestock on imported feeds and feeds through:

- Expanding the cultivation of the yellow corn crop specifically to face this problem by supporting the crop farmers and contracting with them to supply the crop to the country for a fair price in a way that serves the livestock system and its development
- Providing feeders at subsidized prices for breeders, such as bran and barley

Endnotes

1. Animal Production requirements include green, dry, concentrated and processed fodder, margarine and hatching eggs.

2. Calculated and estimated from Table 1, Annex.

3. Table 3 (Appendix).

4. Table 4 (Appendix).

5. Total public investments implemented in the agricultural sector include animal production, dairy production, agricultural mechanization, poultry, apiaries, agricultural manufacturing and non-traditional agriculture

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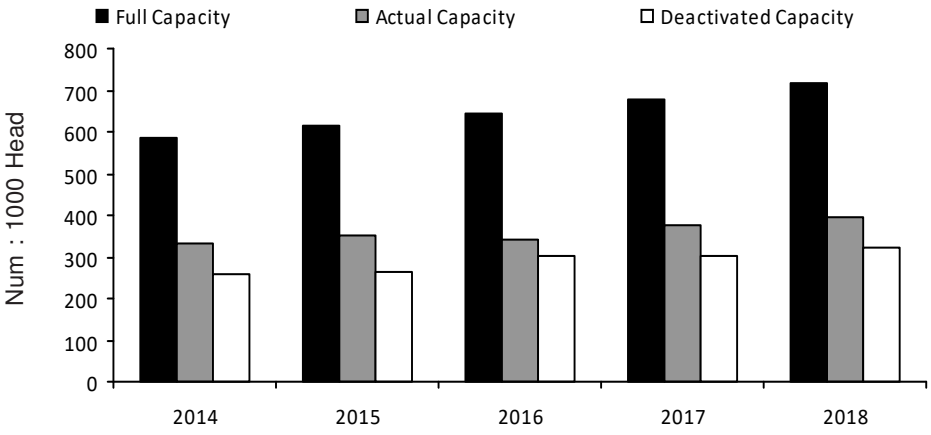

Fig. 1 : The Productive Capacities of Livestock Farms in Egypt

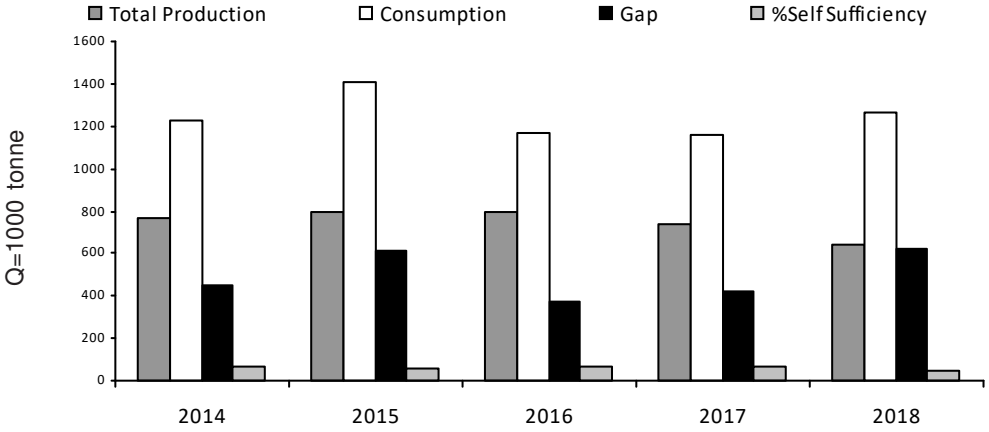

Fig. 2 : Indicators of Production, Consumption, Gap and Self Sufficiency of Red Meat in Egypt

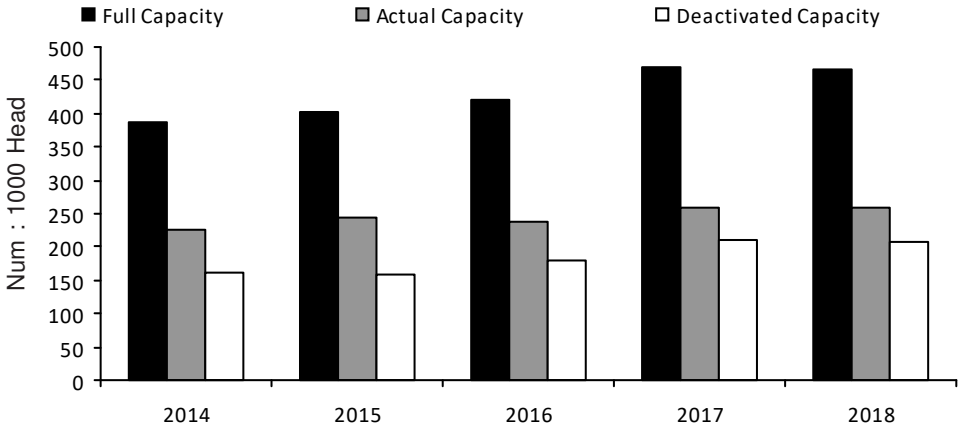

Fig. 3 : The Production Capacities of Diary Farms on Egypt, Table (3) appendix

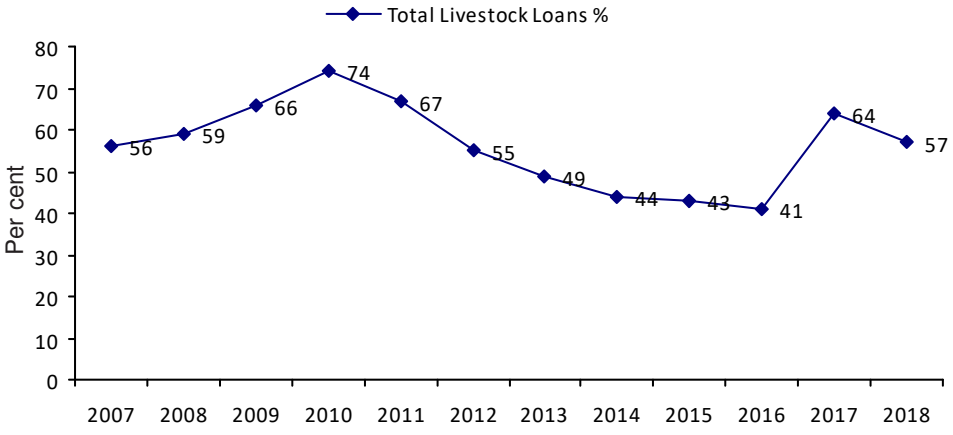

Fig. 4 : Relative Importance of Value of Livestock Loans, Computed and Collected from Table 8

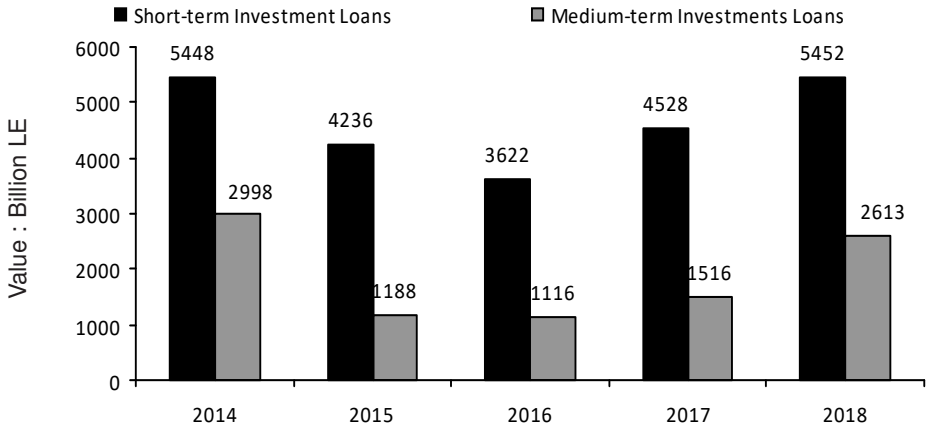

Fig. 5 : Livestock Loans According to their Time Over Period, Computed from Table (9)

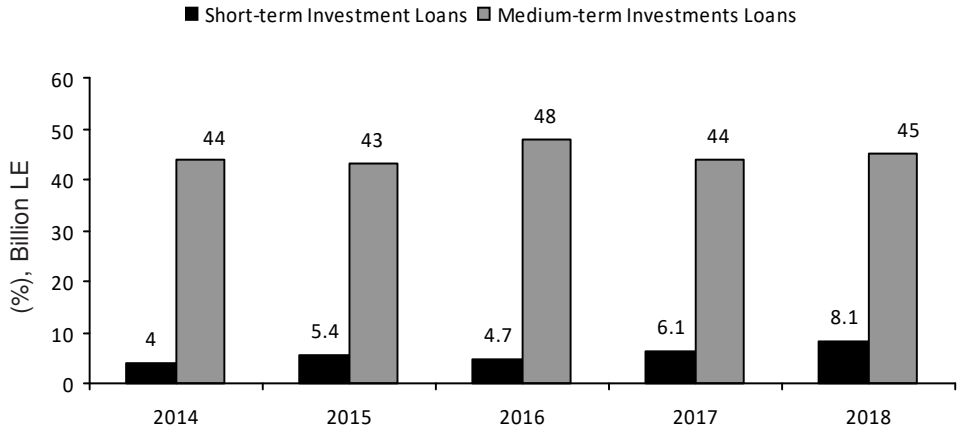

Fig. 6 : Livestock Loans and Deactivated Capacities for Feed Cattle Farms

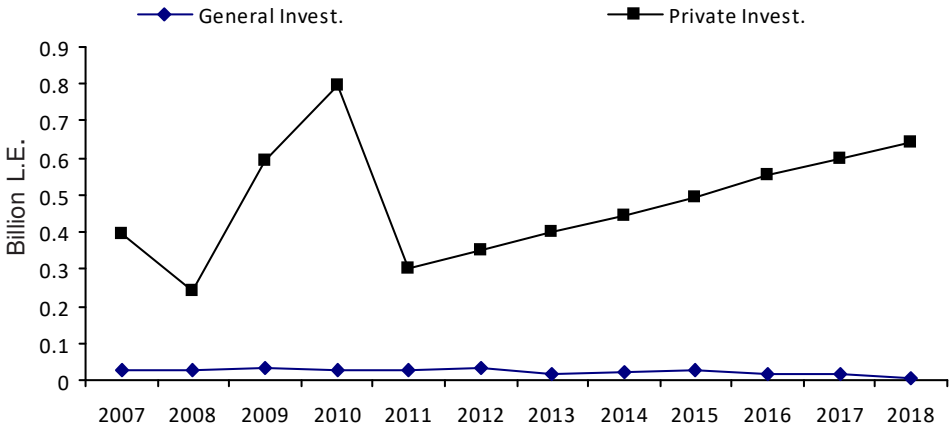

Fig. 7 : General and Private Investment in Livestock Sector, Computed from Table (14)

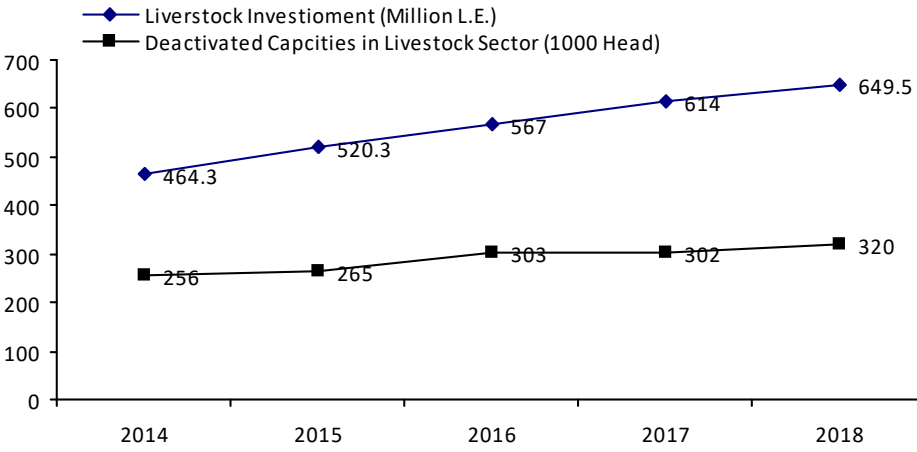

Fig. 8 : Computed from Tables (16) in Reserch and Table (2) in Appendix

Table 1 : Relative Importance of Value of Livestock Agricultural Income Over Period (2014-2018)

Billion L.E

Year	Agricultural Income	Livestock Income	% Livestock Income	Cost of livestock inputs	%Cost of livestock inputs to livestock income	net income
2014	305.4	112.2	36.7	55.1	49	57.1
2015	318.3	119.4	37.5	68	57	51.4
2016	357	134.1	37.6	75.6	56	58.5
2017	469.2	170.1	36.3	101	59	69.1
2018	500.4	187.8	37.5	130	69	57.8
Average	390.1	144.7	37	86	58	59

Source : Agricultural Income Bulletin, The Economic Affairs Sector (EAS) of the Ministry of Agriculture and Land Reclamation (MALR), different issues.

Table 2 : Total Number of Livestock According to Type Over Period (2014-2018)

1000 head

Year	Buffalo	Cow	Sheep	Goat	Camel	Total
2014	3949.3	4762	5503	4186	158.3	18558.6
2015	3701.6	4883	5463	4046	152.5	18246.5
2016	3437	5012	5556	4260	156.5	18421.5
2017	3432.6	4387.3	5305	3973.7	155.7	17254.3
2018	3445.2	4379	4830	3571.5	85.3	16311
Average	3593	4685	5331	4007	142	17758
%	20	26	30	22.6	0.8	

Source : Livestock Bulletin, Economic Affairs Sector (EAS) , (MALR), different issues

Table 3 : Relative Importance of Geographical Distribution of Livestock on Governorates in Egypt (According to the Different Types Over Period (2014-2018))

1000 Head

	Buffalo						Total	General Total
Gov.Year	Beheira	Sharkia	Sohag	Menoufia	Minya	Gharbia		
2014	419	391	292	338	199.4	263	1902.4	3950
2015	384	298	273	369.7	292	227.3	1844	3701.6
2016	359.5	251.2	255.4	346	273.1	213	1698.2	3437
2017	383.5	388.3	266.5	290.3	276.1	225	1829.7	3432.6
2018	384	298	266.5	386	293	216	1843.5	3445.2
Average	386	325.3	270.7	346	266.7	228.9	1823.6	3593.3
%	10.7	9.1	7.5	9.6	7.4	6.4	50.7	

	Cow						Total	General Total
Gov.Year	Beheira	Sharkia	Menoufia	Fayoum	Minya	BeniSuef		
2014	576	473	286	275	270	233	2113	4762.5
2015	537.4	349.8	317	292	238.1	425.5	2159.8	4883.2
2016	579	361	314	291.4	332	426	2303.4	5012
2017	499	430.2	271	283.2	351.2	228.4	2063	4387.3
2018	537.4	313.4	365.7	386.6	348.1	227.4	2178.6	4379
Average	545.76	385.5	310.7	305.64	307.9	308.1	2163.6	4684.8
%	11.6	8.2	6.63	6.5	6.6	6.6	46.2	

	Sheep						Total	General Total
Gov.Year	Beheira	Sharkia	Minya	Sohag	Qena	Matrouh		
2014	414	469.2	410	537.7	428.4	445.1	2704.4	5502.6
2015	442	359.3	441.4	482.7	364.6	390	2480	5463
2016	450.1	365.8	449.3	491.4	371	397	2524.6	5556.3
2017	364.5	464.5	308	371.3	247	432.6	2187.9	5305
2018	442.2	354	447	394	424.6	342.5	2404.3	4830
Average	422.6	402.6	411.1	455.4	367.1	401.4	2460.2	5331.4
%	7.9	7.6	7.7	8.5	6.9	7.5	46.1	

	Goat						Total	General Total
Gov.Year	Beheira	Sharkia	Minya	Assiut	Sohag	Qena		
2014	272.1	440.5	315.4	387.4	424.6	315.7	2155.7	4186
2015	290	309	400	366.1	463.5	343	2171.6	4046
2016	297	315.5	408.5	374	474	350.5	2219.5	4260
2017	361.7	362	304	222	350.7	355	1955.4	3974
2018	290	320	395	195	393.7	386.8	1980.5	3571.5
Average	302.16	349.4	364.6	308.9	421.3	350.2	2096.5	4007.5
%	7.5	8.7	9.1	7.7	10.5	8.7	52.3	
	Camel						Total	General Total
Gov.Year	Red Sea	Matrouh	Assiut	Sohag	Qena	Giza		
2014	49.2	18.6	7.15	15.9	6.6	7.4	104.85	158.3
2015	58	18	7.7	15.3	6.3	7.1	112.4	152.52
2016	57.1	17.6	7.6	15.1	6.2	7	110.6	156.5
2017	53.7	17.5	3.1	5.1	8.7	8.3	96.4	156
2018	2.34	15.6	5.1	10.6	5.7	9.8	49.14	85.3
Average	44.1	17.5	6.1	12.4	6.7	7.92	94.7	141.7
%	31.1	12.3	4.3	8.7	4.7	5.6	67	

Source : Livestock Bulletin, Economic Affairs Sector (EAS) , (MALR), different issues .

Table 4 : Self-Sufficiency of Red Meat in Egypt over Period (2014-2018)

1000 Tonnes

Year	Total Production	Consumption	Gap	%Self Sufficiency
2014	769	1223	454	62.88
2015	793	1408	615	56.32
2016	791	1167	376	67.78
2017	737	1155	418	63.81
2018	639	1263	624	50.59
Average	745.8	1243.2	497	59.96

Source : Food Balance Sheet, (EAS), (MALR), different issues .

Table 5 : Import of Live Heads and Red Meat over period (2014-2018)

1000 Tonnes

Year	Total Imports Live Heads		Total Imports from Red Meat	
	Q	Value	Q	Value
	1000 Head	Billion USD	1000 Ton	Billion USD
2014	241.7	0.131	348.4	1.536
2015	298.1	0.175	781	1.856
2016	264	0.179	426.6	1.501
2017	197.7	0.152	503.4	1.404
2018	240.6	0.208	602	1.595
Average	248.4	0.17	532	1.58

Source : Food Balance Sheet, (EAS), (MALR), different issues. Ministry of Trade & Industry, Egypt, 2020.

Table 6 : The Geographical Distributionof Dairy Cattle According to Farm Size over period (2014-2018)

1000 Head

Gov. / Year	Farms of 10 to less than 25 Head						Total	General Total	%
	Alexandria	Damietta	Giza	Luxor	Nubaria	Suez			
2014	3.91	2.4	3.3	3.3	4.6	0.44	18	27	66.6
2015	4.64	5.2	2.8	3.3	5.1	2.3	23.4	32.4	72.2
2016	4.5	5.2	2.2	2.5	5.1	2.4	22	31.1	70.5
2017	2.2	1.7	2.3	3.5	5.3	2.3	17.2	28	61.9
2018	3.6	1.2	2	3.5	5.4	2.3	18	30.2	59.7
Average	3.76	31.4	2.52	3.2	5.1	2	19.7	29.7	
%	12.7	10.6	8.5	10.8	17.2	6.6	66.3		

Gov. / Year	Farms of 25 to less than 50 Head						Total	General Total	%
	Alexandria	Beheira	Gharbia	Fayoum	Nubaria	Luxor			
2014	2.3	1.9	2.4	3.6	9.1	4.8	24.1	35.4	68.3
2015	3	1.9	2.4	3.3	9.3	5.2	25	36	69.5
2016	2.8	1.9	2.5	3	9.3	4.4	24	34.6	69
2017	2.5	1.82	2.4	2.9	9.7	5.4	24.6	36.3	67.9
2018	2.3	2.3	2.7	2.5	9.6	4.7	24.1	36.5	66.1
Average	2.5	2	2.5	3.1	9.4	5	24.3	36	
%	7.1	5.4	6.9	8.6	26.3	13.7	68.2		

Gov. / Year	Farms of 50 Head and more						Total	General Total	%
	Alexandria	Beheira	Sharkia	Qalyubia	Fayoum	Nubaria			
2014	7.5	11.2	16.8	10	14.1	43.2	103	162.6	63.2
2015	8.9	12	15.1	10.2	13	57	116	176	66
2016	8.5	11.2	14.7	10.2	13.1	57.5	115	173.2	66.5
2017	19.6	11	23.3	9.7	13.7	58.4	135.7	195.7	69.4
2018	12.6	11.8	25.6	11.1	15	58.7	134.6	192.3	70
Average	11.4	11.4	19.1	10.3	13.8	55	121	180	
%	6.3	6.3	10.6	5.7	7.6	30.6	67		

Source: Livestock Bulletin, Economic Affairs Sector (EAS), (MALR), different issues.

Table 7 : Production, Consumption and Foreign Trade of Dairy in Egypt over period (2014-2018)

(1000 Ton) (Billion USD)

Year	Production		Imports		Exports		Consu-mption	Gap	Self sufficiency
	Q	V	Q	V	Q	V			
2014	5601	3.82	1324	0.226	485	0.183	6519	-918	86
2015	4836	3	1684	1.1	462	0.342	6599	-1763	73
2016	5089	2.5	1747	0.945	279	0.267	6618	-1529	77
2017	5173	2.2	1010	0.657	541	0.275	5904	-731	88
2018	5395	2	1220	0.861	500	0.268	5822	-427	93
Average	5219	2.7	1397	0.758	453	0.27	6292	-1074	83

Source : Computed based on data collected from Food Balance Sheet, (EAS), (MALR), different issues.

• Foreign Trade Report (1/1/2019 to 31/12/2019) compared to previous years , GOEIC, Ministry of Trade & Industry, Egypt, 2020

Table 8 : Relative importance of Livestock Loans in Egypt over periods (2007-2010, 2011-2014 and 2015-2018)

Billion L.E

Year	Total Investment Loans	Total Livestock Loans	Per cent
		(2007-2010)	
2007	10.8	6	56
2008	11	6.5	59
2009	6.5	4.3	66
2010	6.1	4.5	74
Average	8.6	5.3	63
		(2011-2014)	
2011	8.7	5.8	67
2012	8.15	4.5	55
2013	7.2	3.5	49
2014	9	4	44
Average	8.3	4.5	53
		(2015-2018)	
2015	12.6	5.4	43
2016	11.4	4.7	41
2017	9.6	6.1	64
2018	14.2	8.1	57
Average	12	6.08	50.3

Source : Statistical Davison, Agricultural Bank of Egypt, Unpublished Data.

Table 9 : Geographical Distribution of Livestock Loans According to Their Time over period (2014 -2018)

Billion L.E

Year	Short-Term Investment Loans							Total	Total General	%
	Dakahlia	Sharkia	Gharbia	Beni Suef	Minya	Assiut	Menoufia			
2014	563.6	910.7	247.2	250	374	0.667	135	2481	5448	45.5
2015	596.5	858	276	334.4	449	723	213.7	3450.6	4236	81.5
2016	590.3	1089	291	447.3	379.4	0.61	226	3023.6	3622	83.5
2017	619	1112	316	352	434	818.5	269.4	3921	4528	86.6
2018	877	1309.2	23.3	400	585.6	1006	310	4511	5452	82.7
Aver-age	649.28	1055.78	230.7	356.74	444.4	509.76	230.82	3477	4657	
%	13.9	22.7	5	7.7	9.5	10.9	5	75		
	Medium-Term Investment Loans							Total	Total General	%
	Dakahlia	Sharkia	Gharbia	Beni Suef	Minya	Assiut	Menoufia			
2014	86.6	111	52.6	133.4	123	49.5	102.1	658	2998	22
2015	89.4	129.6	63	178	130.2	76	215	881	1188	74.2
2016	138	172.2	51	146.2	109	105	164.4	886	1116	79.4
2017	168.2	217	166	148	135	134	112.6	1081	1516	71.3
2018	220	17.3	274	279	860.4	180.2	263	2094	2613	80.1
Aer-age	140.44	129.42	121.32	176.92	271.52	108.94	171.42	1120	1886	
%	7.45	6.86	6.43	9.38	14.4	5.78	9.09	59		

Source: Statistical Davison, Agricultural Bank of Egypt, Unpublished Data,

Table 10 : The Unit Root Test Results

Variable	Level	Test Critical Values			F-statistic	DW
	ADF	1%	5%	10%		
GLI	-5.4	-4.4	-3.3	-2.8	19.8	2.4
LL	-8.3	-4.4	-3.2	-2.8	36.6	2.5

Source : E-views 9.0 statistical package is used, Computed based on data collected from Table (8)

Table 11 : Selection the Lag Length Test Results

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-188.2391	NA	1.15e+14	38.04782	38.10834	37.98144
1	-177.6330	14.84851*	3.18e+13	36.72661	36.90816	36.52745
2	-172.6227	5.010342	3.04e+13	36.52454	36.82713	36.19261
3	-163.4429	5.507894	1.73e+13*	35.48858*	35.91220*	35.02387*

Note : * indicates lag order selected by the criterion
LR : sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error, AIC : Akaike information criterion
SC: Schwarz information criterion , HQ : Hannan-Quinn information criterion

Source: E-views 9.0 statistical package is used ,Computed based on data collected from table (8)

Table 12 : Cointegration Test Results

Trace Test

Hypothesized No. of CE(s)	Eigen Value	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.963816	38.5	25.9	0.0008
At most 1	0.41188	5.31	12.52	0.5527

Note : * denotes rejection of the hypothesis at the %5 (1%) level

Trace test indicates 1 cointegrating (s) at both %5 and 1% level

Maximum Eigen Value Test

Hypothesized No. of CE(s)	Eigen Value	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.9638	33.19	19.4	0.0003
At most 1	0.4118	5.31	12.5	0.5527

Note : * denotes rejection of the hypothesis at the %5 (1%) level
Max-Eigen Value test indicates 1 cointegrating (s) at both %5 and 1% level

Source : E-views 9.0 statistical package is used, Computed based on data collected from Table (8)

Table 13 : Granger Causality Test Results

Null Hypothesis	F-Statistic	Probability
GLI Non Cause LL	4.1	0.15
LL Non Cause GLI	7.1	0.12

Source : E-views 9.0 statistical package is used, Computed based on data collected from table (8)

Table 14 : Relative Importance of Investment in Livestock Sector in Egypt over periods (2007-2010), (2011-2014), (2015-2018)

Billion L.E

Year	National Invest	Agric. Invest.	%	Investment in Livestock			% Livestock Invest to Agri. Invest	% General Invest to Total Invest Livestock	% Private Invest to Total Invest Livestock	% General Invest to Private Invest
				General	Private	Total				
					(2007-2010)					
2007	155.3	7.8	5	0.025	0.393	0.418	5.4	6	94	6.4
2008	199.5	8.1	4.1	0.03	0.241	0.271	3.3	11	89	12.4
2009	197.1	7	3.6	0.034	0.591	0.625	8.9	5.4	94.6	5.8
2010	231.8	6.7	2.9	0.027	0.796	0.823	12.3	3.3	96.7	3.4
Aver-age	196	7.4	4	0.029	0.51	0.53	6.7	6	93.5	6.3
					(2011-2014)					
2011	229.1	7	3.1	0.028	0.303	0.331	4.7	8.5	91.5	9.2
2012	246.1	5.4	2.2	0.032	0.35	0.382	7.1	8.4	91.6	9.1
2013	241.6	8.4	3.5	0.019	0.403	0.422	5	4.5	95.5	4.7
2014	265.1	11.63	4.4	0.022	0.442	0.464	4	5	95	5
Aver-age	245.5	8.1	3.2	0.025	0.375	0.4	5.1	6.3	93.4	6.7
					(2015-2018)					
2015	333.7	13.41	4	0.025	0.495	0.52	3.9	4.8	95.2	5.1
2016	392	16.28	4.2	0.015	0.552	0.567	3.5	2.6	97.4	2.7
2017	514.3	17.34	3.4	0.015	0.598	0.613	3.5	2.5	97.5	2.6
2018	721	48.39	6.7	0.006	0.644	0.65	1.3	0.9	99.1	0.9
Aver-age	490.3	23.9	4.4	0.015	0.572	0.59	2.83	2.33	97.27	2.4

Sources : i) Statistical Database, Ministry of Planning and Economic Development, Internet.
ii) Statistical Year Book, Central Agency for Public Mobilization and Statistics(CAPMAS), different Issues.
iii) General Authority for Investment and Free Zones, Unpublished Data.

Table 15 : The Geographical Distribution of Investments in Livestock Sector over period (2014 -2018)

Billion L.E

General Investments

Year	Governorates						Total	Total General	%
	Sharkia	Gharbia	Menoufia	Minya	Sohag	Luxor			
2014	3.344	2.058	2.61	2.107	3.956	2.67	16.745	22.3	75
2015	2.515	2.307	1.992	3.36	2.807	2.744	15.725	25	63
2016	1.064	0.45	1.489	0.292	3.902	0.278	7.475	15	50
2017	0.256	3.47	2.38	0.432	2.788	0.49	9.816	15.3	64
2018	0.479	1.064	0.172	0.603	0.151	0.1	2.569	6.03	43
Average	1.53	1.87	1.73	1.36	2.72	1.26	10.47	16.73	59
%	9.2	11.2	10.3	8.1	16.3	7.5	63		

Private Investments

Year	Governorates						Total	Total General	%
	Beheira	Giza	Menoufia	Kafrshikh	Gharbia	Qalubia			
2014	75.8	161.3	18.2	39.3	0.1	46	340.8	3098	11
2015	101.2	41.6	27.3	51	44.5	44.5	310.2	3556	8.7
2016	152.9	38.7	23.5	57.1	44.9	41.8	358.9	5628	6.4
2017	142.4	35.6	26.7	73	48.1	60.5	386.4	10659	3.6
2018	130.4	39.3	44.7	60.8	35.7	55.4	366.3	11498	3.2
Average	120.6	63.3	28.1	56.2	34.7	49.6	352.5	6888	6.6
%	1.8	0.9	0.4	0.8	0.5	0.7	5		

Source : Statistical Year Book, (CAPMAS), different Issues

Table 16 : The Geographical Distribution of General Investments in Dairy Production Over Period (2014 -2018)

1000 L.E

Year	Governorates			Total Agricultural Investment
	Minya	Dakahlia	Menoufia	
2014	18	0	0	22738
2015	42	3	3	25253
2016	14	0	0	15124
2017	61	0	19	15914
2018	47	0	39	6935
Average	36.4	0.6	12.2	17193
%	0.21	0	0.07	

Source : Statistical Year Book, (CAPMAS), different Issues

Table 17 : Distribution of Foreign Investment to activities in Agricultural Sector over period (2014 -2018)

Million USD

Year	Foreign Invest.	Foreign Agric. Invest.	%	Land Reclamation		Livestock, Poultry and Fish Production		Agricultural Industrial Integration		Automatic Slaughter houses		Other	
				Value	%	Value	%	Value	%	Value	%	Value	%
2014	3057	36.5	1.2	15.8	43	2.5	7	17	47.4	0.02	0	0.8	2.3
2015	2634	48	1.8	35.5	74	1.8	3.7	-3	0	10.7	22	0	0
2016	2451	5.5	0.2	-28.9	0	3.2	58.2	0	0	2.31	42	0	0
2017	1313	11.5	0.9	9.2	80	1.6	13.6	0	0	0.1	1	0.6	5.5
2018	1438	38.7	2.7	17.7	46	8.6	22	9	24.4	0.01	0	2.9	7.4
Average	2179	28	1	9.9	49	3.5	21	4.8	14.4	2.6	13	0.9	3

Source : General Authority for Investment and Free Zones, Unpublished Data.

Note : • (-) It indicates that the value is less than 50,000 pounds, and the Investment Authority did not mention the equivalent of that value in dollars

• Negative values indicate an investment exit from economic activity

Table 18 : The Unit Root Test Results

Variable	Level ADF	Test Critical Values			F-statistic	DW
		1%	5%	10%		
GLI	-5.4	-4.4	-3.3	-2.8	19.8	2.4
LI	-9.04	-4.6	-3.3	-2.8	160.3	0.75

Source : E-views 9.0 statistical package is used , Computed based on data collected from table (8)

Table 19 : Selection the Lag Length Test Results

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-188.2019	NA	3.58e+12	34.58216	34.65451	34.53656
1	-176.1433	17.53975 *	8.51e+11 *	33.11697 *	33.33400 *	32.98016 *
2	-172.8668	3.574418	1.09e+12	33.24850	33.61023	33.02049

Noe : * indicates lag order selected by the criterion
LR : sequential modified LR test statistic (each test at 5% level)
FPE : Final prediction error , AIC: Akaike information criterion
SC : Schwarz information criterion , HQ: Hannan-Quinn information criterion

Source : E-views 9.0 statistical package is used, Computed based on data collected from Table (8)

Table 20 : Cointegration Test Results

Trace Test

Hypothesized No. of CE(s)	Eigen Value	Trace Statistic	0.05 Critical Value	Prob.**
None*	0.783	28.02	18.4	0.0017
At most 1	0.639	11.2	3.84	0.0008

Note : * denotes rejection of the hypothesis at the %5
Trace test indicates 2 cointegrating (s) at %5

Maximum Eigen Value Test

Hypothesized No. of CE(s)	Eigen Value	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.783	16.8	17.1	0.0057
At most 1	0.639	11.2	3.8	0.0008

Note : * denotes rejection of the hypothesis at the %5 level
Max-Eigen value test indicates no cointegration at the 0.05 level

Source : E-views 9.0 statistical package is used, Computed based on data collected from Table (8)

Table 21 : Granger Causality Test Results

Null Hypothesis	F-Statistic	Probability
GLI Cause LI	11.3	0.008
LI Cause GLI	15.6	0.002

Source : E-views 9.0 statistical package is used , Computed based on data collected from Table (8)

APPENDIX

Table 1 (Appendix) : Relative Importance of Cows in Egypt According to Strain over period (2014-2018)

Num. Head

Year	Strain						Total
	Baladi	%	Mixed	%	Foreign	%	
2014	2623	55.0	1994	41.9	145.6	3.1	4762.5
2015	2493	51.0	2192	44.9	198.5	4.1	4883.0
2016	2366	47.0	2386	47.6	260.0	5.2	5012.0
2017	2193	50.0	1995	45.5	199.0	4.5	4387.0
2018	2132	48.7	2063	47.0	184.0	4.2	4379.0
Average	2361	50.0	2126	45.0	197.4	4.1	4685.0

Source : Livestock Bulletin, Economic Affairs Sector (EAS), (MALR), different issues.

Table 2 (Appendix): The Geographical Distribution of the Production Capacities of Feed Cattle Farms in Egypt Over Period (2014-2018)

The Geographical Distribution of Number of working Feed Cattle Farms

Num. : 1000 Head

Year	Governorates						Total	Total General	%
	Beheira	Sharkia	Fayoum	Sohag	Luxor	Nubaria			
2014	900	633	940	609	314	1614	5010	8041	62.31
2015	891	611	937	629	640	1642	5350	8448	63.33
2016	887	626	912	629	488	1642	5184	8297	62.48
2017	897	823	992	663	641	1633	5649	9043	62.47
2018	896	851	897	683	676	1632	5635	9416	59.84
Average	894.2	708.8	935.6	642.6	551.8	1632.6	5365.6	8649	
%	10.3	8.2	10.8	7.4	6.4	18.9	62		

The Geographical Distribution of Full Capacities for Feed Cattle Farms

Year	Governorates						Total	Total General	%
	Beheira	Giza	Menoufia	Kafrshikh	Gharbia	Qalubia			
2014	49.8	82.61	85.5	38.5	15	80	351.41	587	59.87
2015	49.1	75.2	84.4	39	21	111	379.7	616.4	61.6
2016	49	78	84	39	26.3	136.3	412.6	644	64.07
2017	53	95	84.6	38.4	26.4	123	420.4	678.3	61.98
2018	53	103	84.3	39.2	26	130	435.5	716	60.82
Average	50.8	86.8	84.6	38.8	22.9	116.1	399.9	648.3	
%	7.8	13.4	13	6	3.5	17.9	61.7		

The Geographical Distribution of Actual Capacities for Feed Cattle Farms

Year	Governorates						Total	Total General	%
	Beheira	Giza	Menoufia	Kafrshikh	Gharbia	Qalubia			
2014	31.7	32.1	49	22	12.4	79.8	227	330.7	68.64
2015	31.41	30	48.4	21	12.7	90	233.51	352	66.34
2016	28	29.7	45.4	19.3	13	95	230.4	341	67.57
2017	29	42	45	22	17	97	252	377	66.84
2018	30	49.5	47	22	17.2	97.1	262.8	396	66.36
Average	30	36.7	47	21.3	14.5	91.8	241.1	359.3	
%	8.4	10.2	13.1	5.9	4	25.5	67.1		

(contd...)

The Geographical Distribution of Deactivated Capacities for Feed Cattle Farms

Year	Governorates						Total	Total General	%
	Beheira	Giza	Menoufia	Kafrshikh	Gharbia	Qalubia			
2014	18.1	50.5	36.5	16.5	8	20	149.6	256.3	58.37
2015	17.7	45.2	36	18	12.8	21	150.7	264.4	57
2016	21	48.3	38.6	19.7	17.6	41.3	186.5	303	61.55
2017	24	53	39.6	16.4	17.5	26	176.5	301.3	58.58
2018	23	53.5	37.3	17.2	23	32.9	186.9	320	58.41
Average	20.8	50.1	37.6	17.6	15.8	28.2	170	289	
%	7.2	17.3	13	6.1	5.5	9.8	58.8		

Source : Livestock Bulletin, Economic Affairs Sector (EAS), (MALR), different issues .

Table 3 (Appendix) : The Geographical Distribution of The Production Capacities of Dairy Catte Farms in Egypt Over Period (2014-2018)

The Geographical Distribution ofNumber of working Dairy Cattle Farms

Num. : 1000 Head

Year	Governorates						Total	Total General	%
	Alexandria	Gharbia	Sharkia	Giza	Fayoum	Nubaria			
2014	565	377	386	501	642	676	3147	5522	57
2015	565	415	370	387	638	679	3054	5944	51.4
2016	565	428	357	390	623	684	3047	5995	50.8
2017	492	427	442	390	627	711	3089	5875	52.6
2018	685	451	468	371	627	712	3314	6173	53.7
Average	574.4	419.6	404.6	407.8	631.4	692.4	3130	5901.8	
%	9.7	7.1	6.9	6.9	10.7	11.7	53		

The Geographical Distribution of Full Capacities for Dairy Cattle Farms

Year	Governorates						Total	Total General	%
	Alexandria	Gharbia	Sharkia	Giza	Fayoum	Nubaria			
2014	22.4	26.2	21.5	41.8	37.7	66.7	216.3	385.7	56.1
2015	22.6	26.3	26.3	38.2	35.6	76	225	402.1	56
2016	22.6	26.8	26.3	38	35	91	240	419.5	57.1
2017	54.7	27	26.3	56	35	90.6	290	468.5	61.8
2018	41	27	21.5	58.6	35	93	276	465	59.4
Average	32.7	26.7	24.4	46.5	35.7	83.5	249	428	
%	7.6	6.2	5.7	10.9	8.3	19.5	58.2		

The Geographical Distribution of Actual Capacities for Feed Cattle Farms

Year	Governorates						Total	Total General	%
	Alexandria	Gharbia	Sharkia	Giza	Fayoum	Nubaria			
2014	13.7	13.4	19	19	57	13.1	135	225	60.1
2015	16.3	14	17.6	17.5	71.5	17.1	154	244	63.1
2016	15.8	13.4	17	17.3	72	17	153	239	63.8
2017	24	13	27	18	73.4	13.5	169	260	65
2018	18.5	14	30	19	74	10	166	259	63.9
Average	17.7	13.6	22.1	18.2	69.6	14.1	155	245	
%	7.2	5.5	9	7.4	28.4	5.8	63.3		

(Contd...)

The Geographical Distribution of Actual Capacities for Feed Cattle Farm

Year	Governorates						Total	Total General	%
	Alexandria	Gharbia	Sharkia	Giza	Fayoum	Nubaria			
2014	9	13	22.5	18.6	10	11.6	85	161	52.6
2015	6.3	12.2	20.1	18.1	4.3	12	73	158	46.2
2016	7	13.5	21	18	19	11.5	90	181	49.7
2017	30	14	29	17	17	11	118	209	56.5
2018	22.5	12.5	29	16	19	11	110	206	53.4
Average	15	13	24	18	14	11	95	183	
%	8.2	7.1	13.3	9.6	7.6	6.2	52		

Source : Livestock Bulletin, Economic Affairs Sector (EAS) , (MALR), different issues .

Table 4 (Appendix) : Relative importance of The Quantities produced of Dairy According to Type over period (2014-2018)

1000 Ton, Billion USD

Year	Cow		Buffalo		Goat		Total	
	Q	V	Q	V	Q	V	Q	V
2014	2553	1.46	2923	2.298	125.4	0.065	5601	3.83
2015	2729	1.45	2394	1.738	122	0.058	5245	3.25
2016	2630	1.12	2334	1.324	124.5	0.047	5089	2.49
2017	2962	0.98	2351	0.988	82.8	0.019	5395	1.98
2018	2882	1.12	2212	1.035	79.7	0.022	5174	2.18
Average	2751	1.23	2443	1.477	107	0.042	5301	2.75
%	52	45	46	54	2	1		

Source : Livestock Bulletin, Economic Affairs Sector (EAS), (MALR), different issues.