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# An analytical study of the most important variables affecting agricultural investment in Egypt

Dr. Sherien Zaghloul Zaki

Senior Researcher, Agricultural Economics Research Institute, Agricultural Research Center, Egypt.
Email: dr.sherien2011@gmail.com

**Abstract:** The research aims to study the most important variables affecting agricultural investment, and measure indicators of agricultural investment efficiency and the geographical distribution of the most important agricultural investment projects. The results of the research indicate an increase in agricultural investments, agricultural domestic product, agricultural income, the value of exports and imports, crop area, the interest rate on agricultural investment loans, the value of agricultural loans, and the rate of Inflation and the value of worker productivity, and the efficiency of agricultural investment is demonstrated by measuring its indicators represented in the investment rate, return on investment, settlement coefficient, employment coefficient, and investment multiplier. The results showed that the most influential variables on agricultural investment are the value of agricultural domestic product and the value of agricultural loans. It was also found that the most agricultural investment projects were businesses related to agriculture, livestock, youth loans, the social fund, and loans guaranteed by deposits, with percentages amounting to about 46.7%, 39.3%, 5.99%, and 4.87%, respectively, of the total value of loans. The five governorates that used these loans the most were Behera, then Dakahlia, followed by Gharbia, Sharqia, and Menoufia, with a total percentage of 54.9% of the total value of loans. The research recommended increasing agricultural investments, paying attention to long-term investments and directing them to major projects, land reclamation, and increasing investment in the governorates of Ismailia, Sinai, and the Canal cities due to the low percentage of investments there.
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**Keywords:** National Investment, Agricultural Investment, Efficiency Indicators, Agricultural Domestic Product, Agricultural Investment Loans.

## Introduction:

The agricultural sector is one of the most important economic sectors in Egypt, as it plays a vital role in achieving food security, creating job opportunities, and contributing to the gross domestic product, as the percentage of agricultural domestic product in 2022 reached about 12% of the gross domestic product, but one of the basic components On which the agricultural sector is based are agricultural investments, the value of which amounted to about 37.819 billion pounds in 2022, which represents about 3.2% of the total national investments, which amounted to about 1192.6 billion pounds for the same year. Which is considered one of the most important means of implementing agricultural development and allocating funds in agricultural projects and activities with the aim of obtaining a financial return, and contributing to achieving food security by increasing productivity and providing food at reasonable prices, creating job opportunities, and economic growth by increasing production and exports, and environmental sustainability by Using environmentally friendly agricultural practices. Agricultural investment is the process of adding money to national capital. Agricultural investment diversifies into plant, animal, fish and poultry production by raising livestock, growing crops, producing food products, and investing in food industries and marketing by manufacturing agricultural products such as dairy and cheese. Juices, packaging and marketing of food products, and investment in agricultural technology, which includes investment in modern technologies, such as drip irrigation and hydroponics, to increase productivity and improve the efficiency of resource use. Despite the great importance of investment in the agricultural sector and in achieving economic development, the insufficient investment in this sector and its accompanying effects. Negative impact on the agricultural sector represented by a deficiency in absorbing agricultural labor in the fields of multiple agricultural projects, which is the main factor in providing the food needs of the people and reducing unemployment and thus reducing poverty, the negative impact on agricultural exports and low rates of agricultural development and thus the inability of the agricultural sector to increase the rates of self-sufficiency in agriculture.

One of the most important agricultural investment tools is agricultural investment loans that provide capital for investment in the agricultural

sector, as the total agricultural investment loans in 2021 amounted to about 19.8 billion pounds, compared to 16.7 billion pounds in 2020. The value of short-term loans in 2021 was about 7.6 billion pounds, while it was the value of medium-term loans is about 11.3 billion pounds, while long-term loans amounted to about 0.853 billion pounds for the same year 2021, according to data from the annual bulletin of cooperative activity in the agricultural sector issued by the Central Agency for Public Mobilization and Statistics.

**Research problem**:

The problem of the research lies in the low share of investments directed to the agricultural sector in relation to total national investments, as the percentage of agricultural investments out of total national investments in 2022 amounted to about 3.2%, which negatively affects the performance of the agricultural sector and reduces its ability to optimally exploit resources, which hinders the achievement of economic development and threatens food security and increases Unemployment, which negatively affects the ability of the agricultural sector to achieve its goals.

**Research goal:**

The research aims to study the most important variables affecting agricultural investment in Egypt during the period (2000-2022), by analyzing the structure of national and agricultural investments and identifying the efficiency of agricultural investments by studying the following sub-points:

1. The development of variables related to the issue of agricultural investment during the period (2000-2022).
2. Measuring indicators of the efficiency of agricultural investments, represented by the investment rate, return on investment, investment multiplier, employment coefficient, and localization coefficient.
3. The impact of the most important economic variables on agricultural investment.
4. Geographical distribution of the volume of agricultural investment loans in Egypt.

**Research method and data sources:**

In achieving its objectives, the research relies on the method of descriptive and quantitative statistical analysis, using the general trend and the relative importance of the most important variables related to the subject of the research, relying on the simple and multiple regression method, and measuring indicators of the efficiency of agricultural investments during the study period.

The research also relied on obtaining its data from the Central Agency for Public Mobilization and Statistics, the website of the Ministry of Planning and Monitoring, and agricultural statistics bulletins issued by the Economic Affairs Sector of the Ministry of Agriculture and Land Reclamation, in addition to research, studies, and scientific references related to the subject of the research.

**Concepts related to the research topic:**

**National investment:** is allocating a portion of the state's financial resources and adding them to the national capital to finance projects and programs aimed at developing various economic sectors in the state, in order to achieve specific goals represented in economic growth, social development, infrastructure, and food security.

**Agricultural investment:** It is part of the national economy and an essential component of the gross domestic product. It works to allocate funds in agricultural projects and activities with the aim of achieving a material or moral return. This includes growing crops, raising livestock, producing food products, manufacturing them, and marketing them, with the aim of achieving food security and creating opportunities. Employment, economic growth and environmental sustainability.

**National Domestic Product**: It is the sum of the market value of all final goods and services produced by the citizen of the state during a specific period of time, whether within the borders of the state or outside it. It is considered a tool for measuring the performance of the economy, determining the standard of living, and comparing the performance of the economy of different countries by comparing their national gross domestic product.

**Agricultural domestic product**: It is a portion of the gross domestic product that represents the value added by the agricultural sector during a specific period of time. In other words, agricultural domestic product includes the value of all agricultural goods and services that are produced within the country's borders during the year.

**Agricultural investment loans**: These are loans provided by financial institutions to farmers and agricultural companies to finance investment projects aimed at developing the agricultural sector.

**Short-term loans**: These are loans that do not exceed a year in duration and are used to purchase seeds, fertilizers, and pesticides. They contribute to providing capital for ongoing agricultural operations and paying farmers' financial obligations until their agricultural crops are marketed at the appropriate time.

**Medium-term loans**: These are loaning whose duration does not exceed five years and are used to purchase agricultural machinery, livestock, and establish orchards. The productivity of an acre is taken as a basis for estimating lending rates so that it is sufficient to cover the burden of the loans taken.

**Long-term loans**: These are loaning whose duration exceeds more than five years and are used in operation,

reclamation and cultivation of lands, and the establishment of orchards. The productivity of an acre is taken as a basis for estimating lending rates so that it is sufficient to cover the burden of the loan.

**Indicators for measuring the efficiency of agricultural investments:**

1- **Investment rate = total investment / gross domestic product**

It indicates the volume of investment required to produce one unit of domestic product. If the value of this criterion is less than one, it indicates the efficiency of investment directed to the agricultural sector, and if the value of the criterion is greater than one, it indicates the inefficiency of agricultural investment.

2- **Return on investment = GDP / total investment**

It is the inverse of the investment rate, as it shows the value of the product resulting from agricultural investment, that is, it indicates the efficiency of investment. If the value of this indicator is less than one correct, it indicates the inefficiency of agricultural investment, and vice versa, if the value of this indicator is greater than one correct, this indicates the efficiency of agricultural investment.

3- **Endemization coefficient** = the ratio of agricultural investment to national investment / the ratio of agricultural domestic product to national domestic product. It shows the extent of the agricultural sector's contribution to the gross domestic product. If the value of this indicator is less than one correct, this indicates the efficiency of the investment, and if the value of this indicator is Greater than one correct, this indicates inefficiency of the investment.

4- **Employment coefficient (capital intensification coefficient**) = total agricultural investments / number of agricultural workers

Whenever the value of this indicator is less than the correct one, this indicates the intensity of the use of labor, that is, an increase in the number of workers in a greater proportion than the increase in investments, and whenever the value of this indicator is greater than the correct one, this indicates the intensity of the use of capital.

5- **Investment multiplier** = change in domestic product / change in investment

This indicator indicates the value of the product resulting from changing the investment by one unit. An increase in the value of this indicator above the correct one indicates the efficiency of the investment, and a decrease in the value of this indicator above the correct one indicates the inefficiency of the investment. However, if the value of this indicator is negative, this indicates the efficiency of the investment. The GDP in the current year was less than the GDP in the previous year while investment in the current year was greater than the previous year, or vice versa, that is, investment in the current year was less than the previous year while the GDP in the current year was greater than the previous year.

**Results:**

**First: The development of some variables related to the subject of the study during the period (2000-2022):**

**A - The development of national and agricultural investments, the national and agricultural domestic product, and the relationship of investment to the national product.**

It is clear from the data in Table (1) the value of national investments during the study period (2000-2022), as the minimum value of national investments reached about 63.582 billion pounds in 2001, while its maximum amounted to about 1192.6 billion pounds in 2022, with an average period of about 352.677 billion pounds. EGP, and by studying the general time trend equation during the study period, it was revealed from Equation No. (1) in Table (2) that national investments took a general, statistically significant, increasing trend at the level of 1%, amounting to about 43.15 billion pounds, with a rate of change amounting to about 12.2% annually of the average value of investments. Nationalism during the study period, and the value of the coefficient of determination was about 0.79, which indicates that about 79% of the changes occurring in national investments are due to the element of time, and the rest is due to other variables that are not present in the model.

As for the value of agricultural investments, it was shown from Table (1) that it fluctuated between ups and downs during the study period, as its minimum reached about 5.371 billion pounds in 2012 and its maximum amounted to about 37.819 billion pounds in 2022, with an average period of about 13.733 billion pounds, and by studying an equation The general time trend during the study period shows from Equation No. (2) in Table (2) that agricultural investments took a general, statistically significant increasing trend at the level of 1%, amounting to about 1.15 billion pounds, with a rate of change amounting to about 8.37% annually of the average value of agricultural.

Investments during the study period. The value of the coefficient of determination was about 0.65, which indicates that about 65% of the changes occurring in agricultural investments are due to the time element and the rest is due to other variables that are not present in the model.

As for the value of non-agricultural investments, it was shown from Table (1) that their minimum was about 55.385 billion pounds in 2001 and their maximum was about 1,154.781 billion pounds in 2022, with an average period of about 338,944 billion pounds.

**Table (1):** National and agricultural investments and agricultural gross domestic product during the period (2000-2022)

| Years | Total national investments one billion pounds | Total agricultural investments one billion pounds | Total non-agricultural investments one billion pounds | % of agricultural investments from national | The gross national product is one billion pounds | Gross agricultural domestic product billion pounds | Gross non-agricultural domestic product billion pounds | % of the national agricultural GDP | % of agricultural investments from agricultural GDP |
|---|---|---|---|---|---|---|---|---|---|
| **2000** | 64.449 | 8.134 | 56.315 | 12.62 | **315.667** | **52.657** | **263.010** | **16.68** | 15.45 |
| **2001** | **63.582** | 8.197 | **55.385** | 12.89 | 332.544 | 54.871 | 277.673 | 16.50 | 14.94 |
| **2002** | 67.512 | 9.594 | 57.918 | **14.21** | 354.564 | 58.369 | 296.195 | 16.46 | **16.44** |
| **2003** | 68.103 | 6.404 | 61.699 | 9.40 | 390.619 | 63.822 | 326.797 | 16.34 | 10.03 |
| **2004** | 79.556 | 7.559 | 71.997 | 9.50 | 456.322 | 69.252 | 387.070 | 15.18 | 10.92 |
| **2005** | 96.456 | 7.420 | 89.036 | 7.69 | 506.511 | 75.292 | 431.219 | 14.86 | 9.85 |
| **2006** | 115.741 | 8.044 | 107.697 | 6.95 | 581.144 | 81.766 | 499.378 | 14.07 | 9.84 |
| **2007** | 155.342 | 7.791 | 147.551 | 5.02 | 710.387 | 99.953 | 610.434 | 14.07 | 7.79 |
| **2008** | 199.535 | 8.073 | 191.462 | 4.05 | 855.302 | 113.104 | 742.198 | 13.22 | 7.14 |
| **2009** | 197.137 | 6.862 | 190.275 | 3.48 | 994.055 | 135.465 | 858.590 | 13.63 | 5.07 |
| **2010** | 231.827 | 6.743 | 225.084 | 2.91 | 1150.590 | 160.970 | 989.620 | 13.99 | 4.19 |
| **2011** | 229.066 | 6.834 | 222.232 | 2.98 | 1309.906 | 190.159 | 1119.747 | 14.52 | 3.59 |
| **2012** | 246.068 | **5.371** | 240.697 | **2.18** | 1713.146 | 188.785 | 1524.361 | 11.02 | **2.85** |
| **2013** | 241.612 | 8.384 | 233.228 | 3.47 | 1924.808 | 209.748 | 1715.060 | **10.90** | 4.00 |
| **2014** | 265.091 | 11.627 | 253.464 | 4.39 | 2205.594 | 241.493 | 1964.101 | 10.95 | 4.81 |
| **2015** | 333.709 | 13.414 | 320.295 | 4.02 | 2473.100 | 278.459 | 2194.641 | 11.26 | 4.82 |
| **2016** | 392.039 | 16.279 | 375.760 | 4.15 | 2674.410 | 318.878 | 2355.532 | 11.92 | 5.11 |
| **2017** | 514.309 | 17.339 | 496.970 | 3.37 | 3602.970 | 401.651 | 3201.319 | 11.15 | 4.32 |
| **2018** | 721.128 | 24.699 | 696.429 | 3.43 | 4563.654 | 505.361 | 4058.293 | 11.07 | 4.89 |
| **2019** | 957.800 | 31.425 | 926.375 | 3.28 | 5444.030 | 598.612 | 4845.418 | 11.00 | 5.25 |
| **2020** | 796.400 | 28.739 | 767.661 | 3.61 | 5879.632 | 687.050 | 5192.582 | 11.69 | 4.18 |
| **2021** | 882.500 | 29.102 | 853.398 | 3.30 | 6336.733 | 762.054 | 5574.679 | 12.03 | 3.82 |
| **2022** | **1192.600** | **37.819** | **1154.781** | 3.17 | **7457.122** | **858.421** | **6598.701** | 11.51 | 4.41 |
| **Mean** | **352.677** | **13.733** | **338.944** | **3.89** | **2270.992** | **269.834** | **2001.157** | **11.88** | **7.12** |

Source: (1) Collected and calculated from the website of the Ministry of Planning, Monitoring and Administrative Reform.
(2) Collected from bulletins of the Central Agency for Public Mobilization and Statistics, various issues.

**Table (2):** The general time trend for both national and agricultural investments and national and agricultural gross domestic product during the period (2000-2022)

| No | Data | Equation | Average | Rate of change % | $R^2$ | F |
|---|---|---|---|---|---|---|
| 1 | **National investments in billion pounds** | $Y_t^{\wedge}$ =-165.142 + 43.152 $X_t$ (8.88) ** | 352,677 | 12.2 | 0.79 | (78.9)** |
| 2 | **Agricultural investments in one billion pounds** | $Y_t^{\wedge}$ =-0.064 +1.150 $X_t$ (6.27) ** | 13.733 | 8.37 | 0.65 | (39.4)** |
| 3 | **Non-agricultural investments in billion pounds** | $Y_t^{\wedge}$ =-165.077 + 42.002 $X_t$ (8.96) ** | 338.944 | 12.39 | 0.79 | (80.3)** |
| 4 | **National GDP in billion pounds** | $Y_t^{\wedge}$ =-1287.18 + 296.515$X_t$ (10.33) ** | 2270.992 | 13.06 | 0.84 | (106.7)** |
| 5 | **Agricultural GDP in billion pounds** | $Y_t^{\wedge}$ =-125.54 + 32.948 $X_t$ (9.67) ** | 269.834 | 12.21 | 0.82 | (95.24)** |
| 6 | **Non-agricultural GDP in billion pounds** | $Y_t^{\wedge}$ =-1161.64 + 263.566 $X_t$ (10.39) ** | 2001.157 | 13.17 | 0.84 | (107.9)** |

Where: $\hat{Y}_t$ = indicates the estimated value of the variable under study $X_t$ = refers to the time variable, where (t = 1, 2, 3, ……,23). $R^2$ Indicates the coefficient of determination used (**) Indicates significant at the level of 0.01

Source: Collected and calculated from data in Table (1).

By studying the general time trend equation during the study period, it was revealed that: Equation No. (3) in Table (2) shows that non-agricultural investments took a general, statistically significant, increasing trend at the level of 1%, amounting to about 42 billion pounds, with a rate of change amounting to about 12.39% annually of the average value of non-agricultural investments during the study period. The value of the coefficient of determination was also About 0.79, which indicates that about 79% of the changes occurring in non-agricultural investments are due to the time element and the rest is due to other variables that are not present in the model.

As for the percentage of agricultural investments from national investments, it was shown from Table (1) that it fluctuated between rises and falls during the study period, as its minimum reached about 2.18% in 2012 and the maximum amounted to about 14.21% in 2002, while the percentage of agricultural investments from national investments reached the last period in 2022 is about 3.17%.

The value of the national domestic product during the study period (2000-2022), as shown in Table (1), also indicates that the minimum level of the national domestic product reached about 315.667 billion pounds in 2000, while its maximum amounted to about 7457.122 billion pounds at the end of the period in 2022. With an average period of about 2270.992 billion pounds, and by studying the general time trend equation during the study period, it was revealed from Equation No. (4) in Table (2) that the national domestic product took a general, statistically significant increasing trend at the level of 1%, amounting to about 296.515 billion pounds with a rate of change of About 13.06% annually of the average value of the national domestic product during the study period, and the value of the coefficient of determination was about 0.84, which indicates that about 84% of the changes The decrease in the national GDP is due to the time component, and the rest is due to other variables that are not present in the model.

As for the value of the agricultural domestic product, it was shown from Table (1) that its minimum amounted to about 52.657 billion pounds in 2000 and its maximum amounted to about 858.421 billion pounds in 2022, with an average period of about 269.834 billion pounds. By studying the general time trend equation during the study period, it is revealed From Equation No. (5) in Table (2), the value of the agricultural domestic product took a general, statistically significant, increasing trend at the level of 1%, amounting to about 32.948 billion pounds, with a rate of change amounting to about 12.21% annually of the average value of the agricultural domestic product during the study period. It also amounted to the value of the coefficient of determination is about 0.82, which indicates that about 82% of the changes occurring in the agricultural domestic product are due to the time component, and the rest is due to other variables that are not present in the model.

As for the value of non-agricultural domestic product, it was shown from Table (1) that its minimum amounted to about 263.010 billion pounds in 2000 and its maximum amounted to about 6598.701 billion pounds in 2022, with an average period of about 2001.157 billion pounds, and by studying the general time trend equation over the period The study shows from Equation No. (6) in Table (2) that the value of the non-agricultural domestic product took a general, statistically significant increasing trend at the level of 1%, amounting to about 263.566 billion pounds, with a rate of change amounting to about 13.17% annually of the average value of the non-agricultural domestic product during the study period. The value of the coefficient of determination was about 0.84, which indicates that about 84% of the changes occurring in the non-agricultural domestic product are due to the time component and the rest is due to other variables that are not present in the model.

As for the percentage of agricultural domestic product from the national domestic product, it was shown from Table (1) that it fluctuated between rises and falls during the study period, as its minimum reached about 10.90% in 2013 and the maximum reached about 16.68% in 2000, while the percentage of agricultural domestic product reached of the national share at the end of the period in 2022, about 11.51%.

As for the percentage of agricultural investments from the agricultural GDP, it was shown from Table (1) that it fluctuated between rises and falls during the study period, as its minimum reached about 2.85% in 2012 and the maximum amounted to about 16.44% in 2002, while the percentage of agricultural investments from the GDP amounted to the local agricultural rate at the end of the period in 2022 is about 4.41%.

**B- The development of some economic variables affecting agricultural investment**

By studying the development of the most important variables affecting agricultural investment during the period (2000-2022), it was shown from Table (3) that the most important of these variables are the number of agricultural workers, the wage of the agricultural worker, net agricultural income, agricultural exports, agricultural imports, crop area, and the interest rate on Agricultural investment loans, the value of agricultural loans, the inflation rate, the value of agricultural worker productivity.

**Table (3):** The most important economic variables affecting agricultural investment during the period (2000-2022)

| Years | The number of workers is one million workers | the wage of an agricultural worker is one thousand pounds | the agricultural income is one billion pounds | Agricultural exports in billion pounds | Agricultural imports in billion pounds | Crop area in one million acres | Interest rate on investment loans% | value of agricultural loans in billion pounds | inflation rate % | The value of worker productivity thousand pound |
|---|---|---|---|---|---|---|---|---|---|---|
| 2000 | 4.920 | 3.717 | **50.70** | 1.491 | 12.473 | **13.922** | 13.4 | 8.15 | 3.9 | **10.741** |
| 2001 | 4.974 | **3.528** | 53.62 | 1.996 | 13.419 | 14.028 | 13.4 | **8.14** | **1.9** | 11.071 |
| 2002 | 5.023 | 4.116 | 60.50 | 3.005 | 15.940 | 14.35 | 13.6 | 9.12 | 3.2 | 11.62 |
| 2003 | 5.084 | 4.137 | 68.55 | 4.906 | 16.591 | 14.474 | 13.4 | 8.43 | 6.8 | 12.554 |
| 2004 | 5.162 | 4.809 | 82.54 | 5.580 | 18.313 | 14.551 | 13.3 | 8.47 | 11.7 | 13.416 |
| 2005 | 5.241 | 5.418 | 92.89 | 5.859 | 23.398 | 14.905 | 12.7 | 8.90 | 6.2 | 14.366 |
| 2006 | 5.330 | 5.754 | 102.37 | 5.633 | 22.843 | 14.92 | 12.9 | 10.16 | 7.4 | 15.341 |
| 2007 | 5.431 | 6.636 | 116.31 | 7.798 | 31.524 | 15.176 | 12.2 | 10.80 | 12.6 | 18.404 |
| 2008 | 6.965 | 7.476 | 136.76 | 17.064 | 49.518 | 15.237 | 12.6 | 11.02 | 12.2 | 16.239 |
| 2009 | 6.876 | 8.022 | 138.05 | 25.106 | 43.986 | 15.495 | 11 | 12.04 | 11.2 | 19.701 |
| 2010 | 6.728 | 13.272 | 150.71 | 29.206 | 58.589 | 15.334 | **10.7** | 6.03 | 10.1 | 23.925 |
| 2011 | 6.820 | 13.734 | 179.68 | 30.562 | 89.377 | 15.354 | 11.8 | 8.57 | 11.7 | 27.883 |
| 2012 | 6.386 | 14.448 | 190.82 | 27.740 | 100.060 | 15.565 | 12.2 | 8.15 | 19.5 | 29.562 |
| 2013 | 6.703 | 18.480 | 203.82 | 35.107 | 99.264 | 15.49 | 11.9 | 7.24 | 8.7 | 31.292 |
| 2014 | 6.689 | 18.816 | 223.70 | 37.883 | 115.046 | 15.69 | 11.8 | 9.00 | 11.2 | 36.103 |
| 2015 | 6.691 | 22.302 | 224.91 | 38.712 | 112.713 | 15.637 | 13.8 | 11.10 | 9.9 | 41.617 |
| 2016 | 6.478 | 32.928 | 256.92 | 51.188 | 146.710 | 15.999 | 16.3 | 11.40 | 6.2 | 49.225 |
| 2017 | 6.510 | 35.994 | 326.794 | 89.614 | 244.855 | 16.038 | 18.0 | 9.60 | **29.5** | 61.698 |
| 2018 | 5.602 | 42.588 | 324.811 | 88.921 | 264.059 | 16.061 | 18.4 | 14.20 | 21.2 | 90.211 |
| 2019 | 5.510 | **50.652** | 346.431 | 90.418 | 278.043 | 16.215 | **19.5** | 13.80 | 13.6 | 108.641 |
| 2020 | 5.310 | 29.316 | 364.90 | 85.998 | 262.434 | 16.286 | 19.1 | 16.70 | 6.2 | 129.388 |
| 2021 | 5.232 | 30.618 | 442.60 | 102.762 | 277.904 | 16.375 | 18.5 | 19.80 | 4.8 | 145.653 |
| 2022 | 5.290 | 35.83 | **634.523** | 142.972 | 393.499 | 16.597 | 18.4 | **22.40** | 10.4 | **162.272** |
| Mean | **5.868** | **17.939** | **207.518** | **40.414** | **116.981** | **15.378** | 14.3 | **11.01** | 10.44 | 47.00 |

Source: Collected and calculated from
(1) bulletins of the Central Agency for Public Mobilization and Statistics, various issues
(2) Economic Affairs Sector bulletins, income and foreign trade bulletins, and agricultural economics bulletins
(3) Ministry of Planning, Monitoring and Economic Development on the international information network www.mop.gov.eg

**Table (4):** The general time trend of the most important economic variables affecting agricultural investment during the period (2000-2022)

| No | Data | Equation | Average | Rate of change % | $R^2$ | F |
|---|---|---|---|---|---|---|
| 1 | The number of workers is one million workers | Yt^ = 5.481 + 0.032 Xt (1.38)- | 5.868 | 0.54 | 0.08 | 1.91 |
| 2 | the wage of an agricultural worker is one thousand pounds | $Y_t^{\wedge}$ =-4.895 +1.903 $X_t$ (9.51) ** | 17.939 | 10.61 | 0.81 | 90.41 |
| 3 | the agricultural income is one billion pounds | $Y_t^{\wedge}$ =-29.79 +19.776 $X_t$ (11.03) ** | 207.518 | 9.53 | 0.85 | 121.64 |
| 4 | Agricultural exports in billion pounds | $Y_t^{\wedge}$ =-24.961 +5.448$X_t$ (10.84) ** | 40.414 | 13.48 | 0.84 | 117.47 |
| 5 | Agricultural imports in billion pounds | $Y_t^{\wedge}$ =-66.669+15.304 $X_t$ (10.81) ** | 116.981 | 13.08 | 0.84 | 116.96 |
| 6 | Crop area in one million acres | $Y_t^{\wedge}$ =14.069 +0.109 $X_t$ (23.34) ** | 15.378 | 0.71 | 0.96 | 545 |
| 7 | Interest rate on investment loans% | $Y_t^{\wedge}$ =10.75 + 0.29 $X_t$ (4.44)** | 14.30 | 2.03 | 0.48 | 19.69 |
| 8 | value of agricultural loans in billion pounds | $Y_t^{\wedge}$ =5.997 + 0.417 $X_t$ (4.54)** | 11.01 | 3.79 | 0.49 | 20.67 |
| 9 | inflation rate % | $Y_t^{\wedge}$ =6.02 + 0.37 $X_t$ (1.99)- | 10.44 | 3.54 | 0.15 | 3.97 |
| 10 | The value of worker productivity thousand pound | $Y_t^{\wedge}$ =-24.31 + 5.94 $X_t$ (7.81)** | 47 | 12.64 | 0.74 | 60.97 |

Where: $\hat{Y}_t$ = indicates the estimated value of the variable under study $X_t$ = refers to the time variable, where (t = 1, 2, 3, ……,23). $R^2$ Indicates the coefficient of determination used (**) Indicates significant at the level of 0.01 (-) indicates insignificance at either probability level.

Source: Calculated from Table (3)

By studying the number of workers in the useful agricultural sector from data table (3), the minimum amount of agricultural labor amounted to about 4.920 million workers in 2000 while the maximum amounted to about 5.290 million workers in 2022 and the average for the period was about 5.868 million workers. By studying the general time trend equation for agricultural labor. It is clear from the data in Table (4) that it is not statistically significant at either of the two probability levels.

As for the agricultural worker's wage variable, it ranged between a minimum of about 3,528 thousand pounds in 2001, and a maximum of about 50,652 thousand pounds in 2019. By studying the general time trend equation, it was revealed from Equation No. (2) in Table (4) that it took a statistically significant increasing trend. At the 1% level, it a0mounted to about 1,903 thousand pounds, with a change rate of about 10.61%, with a coefficient of determination indicating that 81% of the change in the agricultural worker's wage is due to the time element, and the rest is due to other factors that are not present in the equation.

As for agricultural income, its minimum reached about 50.70 billion pounds in 2000, increasing until it reached the maximum amounting to about 634.523 billion pounds in 2022, with an average period of about 207.518 billion pounds. By studying the general time trend equation, it is clear from equation (3) in the table (4) This variable took a statistically significant increasing trend, amounting to about 19.776 billion pounds, with a change rate of about 9.53% of the general average. The value of the coefficient of determination also indicated that about 85% of the changes occurring in agricultural income are due to the time factor, and the rest is due to other variables. Not present in the equation.

As for the value of agricultural exports, it was shown from the data in Table (3) that their minimum amounted to about 1.491 billion pounds in 2000, increasing until it reached the maximum amounting to about 142.972 billion pounds in 2022, with an average period of about 40.414 billion pounds, and by studying the equation The general time trend shows from equation (4) in table (4) that this variable took a statistically significant increasing trend amounting to about 5.448 billion pounds with a rate of change amounting to about 13.48% of the general average. The value of the coefficient of determination also indicated that about 84% of the changes occurring in the value of agricultural exports is due to the time factor, and the rest is due to other variables that are not present in the equation.

As for the value of agricultural imports, it was shown from the data in Table (3) that their minimum

amounted to about 12.473 billion pounds in 2000, increasing until it reached the maximum amounting to about 393.499 billion pounds in 2022, with an average period of about 116.981 billion pounds, and by studying the trend equation. The general time frame showed from Equation (5) in Table (4) that this variable took a statistically significant increasing trend, amounting to about 15.304 billion pounds, with a rate of change amounting to about 13.08% of the general average. The value of the coefficient of determination also indicated that about 84% of the changes occurring in imports Agriculture is due to the time element and the rest is due to other variables that are not present in the equation.

As for the cropped area, it was shown from the data in Table (3) that its minimum amounted to about 13.922 million acres in 2000, increasing until it reached the maximum amounting to about 16.597 million acres in 2022, with an average period of about 15.378 million acres, and by studying the time trend equation. It was shown from equation (6) in table (4) that this variable took a statistically significant increasing trend, amounting to about 0.109 million acres, with a rate of change amounting to about 0.71% of the general average. The value of the coefficient of determination also indicated that about 96% of the changes occurred in the crop area. It is due to the time element and the rest is due to other variables that are not present in the equation.

As for the interest rate on agricultural investment loans, it was shown from the data in Table (3) that its minimum amounted to about 10.7% in 2010, and the maximum amounted to about 19.5% in 2019, with an average period of about 14.5%. By studying the general time trend equation, it became clear from the equation (7) in Table (4) that this variable took a statistically significant increasing trend, amounting to about 0.29%, with a rate of change amounting to about 2.03% of the general average. The value of the coefficient of determination also indicated that about 48% of the changes occurring in the interest rate on agricultural investment loans are due to the element of time and the rest is due to other variables that are not present in the equation.

As for the value of agricultural loans, it was shown from the data in Table (3) that their minimum amounted to about 8.14 billion pounds in 2001, increasing until it reached the maximum amount of about 22.40 billion pounds in 2022, with an average period of about 11.01 billion pounds, and by studying the trend equation. It appears from Equation (8) in Table (4) that this variable took a statistically significant increasing trend, amounting to about 0.417 billion pounds, with a rate of change amounting to about 3.79% of the general average. The value of the coefficient of determination also indicated that about 49% of the changes occurring in its value Agricultural loans are due to the time element, and the rest is due to other variables that are not present in the equation.

As for the inflation rate, it was shown from the data in Table (3) that its minimum amounted to about 1.9% in 2001. It increased until it reached the maximum amount, which reached about 29.5% in 2017, with an average period of about 10.44%. By studying the general time trend equation, it appears from equation (9) in table (4) that this variable took an increasing trend that is not statistically significant at either of the two probability levels.

As for the value of agricultural worker productivity, it was shown from the data in Table (3) that its minimum amounted to about 10.74 thousand pounds in 2000. It increased until it reached its maximum level, which reached about 162.27 thousand pounds in 2022, with an average period of about 47 thousand pounds. By studying the general time trend equation, it was revealed from equation (10) in table (4) that this variable took a statistically significant increasing trend, amounting to about 5.94 thousand pounds, with a rate of change amounting to about 12.64% of the general average. The value of the coefficient of determination also indicated that about 74% of the changes occurring in the value of agricultural worker productivity is due to the time element, and the rest is due to other variables that are not present in the equation.

**Second: Measuring indicators of the efficiency of agricultural investments, represented by the investment rate, return on investment, localization rate, employment coefficient, and investment multiplier.**

By measuring the indicators of agricultural investment efficiency, represented by the investment rate, return on investment, localization rate, employment coefficient, and investment multiplier, it was shown from the data in Table (5) that the investment rate index fluctuated between ups and downs, reaching a minimum of 0.028 in 2012 and a maximum of about 0.164 in 2002, with an average period. It reached about 0.071, and this shows the efficiency of agricultural investment during the study period (2000-2022) as a result of the investment rate falling below the correct one.

As for the index of return on agricultural investment, it was shown from the data in Table (5) that the value of the index fluctuated between rise and fall, as its minimum reached about 6.084 in 2002 and the maximum reached about 35.149 in 2012, with an average period of about 17.988. This shows the efficiency of agricultural investment during the study period (2000-2022) as a result of the value of the return-on-investment index being higher than the correct one.

As for the localization rate index, it was shown from the data in Table (5) that the value of the index fluctuated between rise and fall, as its minimum reached about 0.198 in 2012 and the maximum reached about 0.863 in

2002, with an average period of about 0.406, and this shows the efficiency of agricultural investment during the study period (2000-2022) as a result of the localization rate index falling below the correct one.
While the lowest value of the employment coefficient index (capital intensification coefficient) was about 0.841 in 2012, while the maximum value was about 7.149 in 2022, with an average period of about 2.422, as the index value was less than the correct one during the years 2009 and 2012, and this indicates the intensity of labor use. In these two years, while the value of the index for the rest of the years of study and the average period of study were greater than the correct one, and this indicates the intensity of use of capital in these years and in the average period.

**Table (5):** Agricultural investment rate, return on investment and localization coefficient for agricultural investment in Egypt during the period (2000-2022)

| Years | Agricultural investment rate | Return on investment | Localization rate | Employment coefficient | Change in agricultural investment | Change in agricultural GDP | Multiplier of investment |
|---|---|---|---|---|---|---|---|
| **2000** | 0.154 | 6.474 | 0.757 | 1.653 | - | - | - |
| **2001** | 0.149 | 6.694 | 0.781 | 1.648 | 0.063 | 2.214 | 35.143 |
| **2002** | **0.164** | **6.084** | **0.863** | 1.910 | 1.397 | 3.498 | 2.504 |
| **2003** | 0.100 | 9.966 | 0.576 | 1.260 | -3.190 | 5.453 | -1.709 |
| **2004** | 0.109 | 9.162 | 0.626 | 1.464 | 1.155 | 5.430 | 4.701 |
| **2005** | 0.099 | 10.147 | 0.518 | 1.416 | -0.139 | 6.040 | -43.453 |
| **2006** | 0.098 | 10.165 | 0.494 | 1.509 | 0.624 | 6.474 | 10.375 |
| **2007** | 0.078 | 12.829 | 0.356 | 1.435 | -0.253 | 18.187 | -71.885 |
| **2008** | 0.071 | 14.010 | 0.306 | 1.159 | 0.282 | 13.151 | 46.635 |
| **2009** | 0.051 | 19.741 | 0.255 | 0.998 | -1.211 | 22.361 | -18.465 |
| **2010** | 0.042 | 23.872 | 0.208 | 1.002 | -0.119 | 25.505 | **-214.328** |
| **2011** | 0.036 | 27.825 | 0.206 | 1.002 | 0.091 | 29.189 | **320.758** |
| **2012** | **0.028** | **35.149** | **0.198** | **0.841** | -1.463 | -1.374 | 0.939 |
| **2013** | 0.040 | 25.018 | 0.318 | 1.251 | 3.013 | 20.963 | 6.958 |
| **2014** | 0.048 | 20.770 | 0.401 | 1.738 | 3.243 | 31.745 | 9.789 |
| **2015** | 0.048 | 20.759 | 0.357 | 2.005 | 1.787 | 36.966 | 20.686 |
| **2016** | 0.051 | 19.588 | 0.348 | 2.513 | 2.865 | 40.419 | 14.108 |
| **2017** | 0.043 | 23.165 | 0.302 | 2.663 | 1.060 | 82.773 | 78.088 |
| **2018** | 0.049 | 20.461 | 0.309 | 4.409 | 7.360 | 103.710 | 14.091 |
| **2019** | 0.052 | 19.049 | 0.298 | 5.703 | 6.726 | 93.251 | 13.864 |
| **2020** | 0.042 | 23.907 | 0.309 | 5.412 | -2.686 | 88.438 | -32.926 |
| **2021** | 0.038 | 26.186 | 0.274 | 5.562 | 0.363 | 75.004 | 206.623 |
| **2022** | 0.044 | 22.698 | 0.275 | **7.149** | 8.717 | 96.367 | 11.055 |
| **Mean** | **0.071** | **17.988** | **0.406** | **2.422** | **-22.737** | **-551.961** | **18.798** |

Source: Calculated from data in Table (1)

As for the investment multiplier index, which results from the change in agricultural investment divided by the change in agricultural domestic product, it was shown from the data in Table (5) that the investment multiplier index began to fluctuate between a minimum of about -214.328 in 2010 and a maximum of about 320.758 in 2011, with an annual average of about 18,798 during the study period, meaning that whenever agricultural investment changed by one unit, the value of agricultural output changed by about 18,798 billion pounds. The

negative sign also indicates that investments in the current year are less than investments in the previous year, so the negative value of the investment multiplier is -214.328 in 2010. Resulting from the decrease in the value of investment in 2010, which amounted to about 6.743 billion pounds, compared to the value of investments in the previous year 2009, which amounted to about 6.834 billion pounds.

**Third: The impact of the most important economic variables on agricultural investment**

By studying some of the variables that affect agricultural investment in Egypt, it was demonstrated that the statistical estimation of multiple regression of some economic variables affecting agricultural investment was carried out, and several attempts were made to reach the best model that includes the variables most affecting agricultural investments, and by using the backward method to reach the best of these variables using linear, semi-logarithmic statistical models. The logarithm of the following variables:

Agricultural investment in billion pounds (Y), agricultural domestic product in billion pounds ($X_1$), agricultural worker's wage in thousand pounds ($X_2$), net agricultural income in billion pounds ($X_3$), value of agricultural exports in billion pounds ($X_4$), value of agricultural imports in billion pounds ( $X_5$), the crops in the million acres ($X_6$), the price of benefit on the agricultural loans of the investment ($X_7$, the value of agricultural loans in milliliters ($X_8$), the rate of inflation ($X_9$), the productivity of the agricultural worker in a thousand pounds ($X_{10}$), the number of workers With agriculture per million workers ($X_{11}$), and by testing all the previous variables, it was found that the best model whose variables agree with economic and statistical logic after excluding economically and statistically illogical variables using the backward method.

Using the multiple regression method for the economic factors mentioned above, it became clear that the best form was the double logarithmic function and that the variables that most influenced agricultural investments during the study period were the value of agricultural domestic product ($X_1$) and the value of agricultural loans ($X_8$).

According to the following equation:

$$\log Y^{\wedge} = -0.609 + 0.335 \log X_1 + 0.890 \log X_8$$

(3.85) ** (3.59) **

R2 = 0.83 F = 48.9

The results of function estimation indicated a positive relationship between agricultural investments and both the value of agricultural domestic product and the value of agricultural loans during the study period, whereby increasing the value of agricultural domestic product by one unit leads to an increase in agricultural investments by 0.335 billion pounds, with the significance of the variable at the 1% level. Also, increasing the value of agricultural loans by one unit leads to an increase in agricultural investment by about 0.890 billion pounds during the study period. The significance of the variable was proven at the level of 1%, and the significance of the function was demonstrated at the level of 1%, where the value of (F) reached about 48.9, and it reached the value of the coefficient of determination is about 0.83, which indicates that these variables together are responsible for about 83% of the changes that occur in the value of agricultural investments, and the rest is due to other variables not mentioned in the model.

**Fourth: Geographical distribution of the volume of agricultural investment loans in Egypt**

This part includes a study of the relationship between investments and agricultural investment loans, as agricultural investment loans play an important role in promoting investment in the agricultural sector, by providing the necessary capital for various agricultural investment projects in the agricultural sector according to the type of loans, whether they are short-term, medium-term, or long-term loans, with a study of the most important governorates across the Republic using these investment loans.

**1- Geographical distribution of the total agricultural investment loans nationwide for the year 2021**

Table (6) shows the geographical distribution of the total investment loans granted by the Agricultural Bank of Egypt during the year 2021, which amounted to about 19,768 million pounds, divided into short-term, medium-term, and long-term loans, as the value of short-term investment loans at the level of the governorates of the Republic amounted to about 7,595.8 million. The percentage of short-term loans in relation to the total loans was about 38.4%, and the governorates that used the most short-term investment loans in proportion to the total loans were: Sharkia, Dakahlia, and Menia, with a percentage of about 55.4%, 48.6%, and 44.1%, respectively.

As for medium-term investment loans, their value at the level of the governorates of the Republic amounted to about 11,319.2 million pounds, and the percentage of medium-term loans in relation to the total loans was about 57.3%, and the governorates that used the most medium-term investment loans were: Kafr El-Sheikh, Behera, and Gharbia, with a percentage of about 77.9%, 74.7%, 57.7%, respectively, of the total agricultural investment loans.

As for long-term investment loans, their value at the level of the governorates of the Republic amounted to about 853.01 million pounds, and the percentage of long-term loans in relation to the total agricultural investment loans was about 4.3%, and the governorates that used the most long-term investment loans were: Ismailia, Qena, and Kafr El-Sheikh, with a percentage of about 27.1%. %, 21.6%, and 5.2% respectively of the total agricultural investment loans.

It turns out that the most used types of agricultural investment loans in 2021 are medium-term loans, followed by short-term and then long-term.

**Table (6):** Geographical distribution of the total short-, medium- and long-term agricultural investment loans for the most important governorates of the Republic for the year 2021

| Governorates | Short-term loans, one million pounds | % of total loans | Medium-term loans, one million pounds | % of total loans | Long-term loans, one million pounds | % of total loans | Total |
|---|---|---|---|---|---|---|---|
| Behera | 625.226 | **23.45** | **1991.724** | **74.72** | 48.700 | **1.83** | 2665.650 |
| Dakahlia | **1084.887** | **48.63** | **1132.673** | **50.78** | 13.140 | **0.59** | 2230.700 |
| Gharbia | **887.457** | **40.52** | **1264.252** | **57.73** | 38.392 | **1.75** | 2190.101 |
| Sharkia | **1193.133** | **55.44** | 881.619 | **40.97** | **77.315** | **3.59** | 2152.067 |
| Kafr El Sheikh | 284.965 | **16.89** | **1313.581** | **77.87** | **88.385** | **5.24** | 1686.931 |
| Menoufia | **731.514** | **43.81** | 880.779 | **52.75** | **57.556** | **3.45** | 1669.849 |
| Menia | 634.707 | **44.12** | 765.709 | **53.22** | 38.268 | **2.66** | 1438.684 |
| Qena | 129.097 | **21.12** | 350.322 | **57.31** | 131.830 | **21.57** | 611.249 |
| *Ismailia | 89.427 | **25.91** | 162.187 | **47.00** | 93.490 | **27.09** | 345.105 |
| Other | 1935.344 | **40.51** | 2576.384 | **53.93** | 265.93 | **5.57** | 4777.654 |
| **Total** | **7595.757** | **38.42** | **11319.23** | **57.26** | **853.006** | **4.32** | **19767.99** |

* Includes the cities of Canal and Sinai

Source: collected and calculated from the annual bulletin of cooperative activity in the agricultural sector, the Central Agency for Public Mobilization and Statistics.

**2- Geographical distribution of the total short-term agricultural investment loans nationwide for the year 2021**

By studying the geographical distribution of short-term agricultural investment loans at the governorate level and at the level of investment projects, it was revealed from the data in Table (7) that these projects are represented in livestock, production requirements, consumer loans, agricultural-related businesses, youth loans, the social fund, Islamic financing sources, and loans. By guaranteeing deposits and finally facilities and installments, the most funded of these projects was from the Agricultural Bank of Egypt, and the most important in terms of value were the livestock project, agricultural-related businesses, and loans guaranteed by deposits, according to the relative importance of these projects in relation to the total short-term loans.

The total value of livestock projects amounted to about 3,508.7 million pounds out of the total value of short-term loans amounting to about 7,595.8 million pounds for the year 2021, at a rate of about 46.2% of the total short-term loans distributed among the governorates of the Republic, and the governorates most used for livestock projects in relation to the total loans were governorates. Al-Minya, Al- Sharkia, Al-Dakahlia, and Al-Behera amounted to about 74.5%, 67.1%, 60.8%, and 51.3%, respectively, of the total value of short-term loans. As for the percentage of livestock projects in relation to the total of the republic, the governorates with the highest absorption of livestock projects were Al-Sharkia, Al-Dakahlia, and Al-Minya, Behera, with a percentage of about 22.8%, 18.8%, 13.5%, and 9.1%, respectively, of the total of the Republic, as the four governorates participated in a percentage of 64.2% of livestock projects at the level of the Republic.

As for the second type of projects, it was agricultural-related businesses, which amounted to about 3,107.3 million pounds out of the total short-term loans amounting to about 7,595.8 million pounds for the year 2021, at a rate of about 40.9% of the total short-term loans, and the governorates were the most used for agricultural-related business projects in relation to the total loans. Menoufia, Gharbia, Qalyoubia, and Behera governorates amounted to about 65.6%, 53.5%, 48.3%, and 39.7%, respectively, of the total value of short-term loans. As for the percentage of business projects related to agriculture in relation to the total republic, it was the highest governorate in terms of absorption of businesses related to agriculture. Menoufia, Gharbia, Dakahlia, and Sharqia, with a percentage of about 15.4%, 15.3%, 10.9%, and 9.9%, respectively, of the total of the republic, the four governorates participated in 51.5% of agricultural-related business projects nationwide.

As for the third type of projects, they were loans guaranteed by deposits, which amounted to about 537.9 million pounds out of the total short-term loans amounting to about 7,595.8 million pounds for the year 2021, at a rate of about 7.1% of the total short-term loans. The governorates that used the most loans guaranteed by deposits in relation to the total loans were governorates Qalyoubia Gharbia, Kafr El-Sheikh, and Dakahlia, with a percentage of about 19.6%, 18.6%, 16%, and 4.6%, respectively, of the total value Short-term loans. As for the percentage of loans guaranteed by deposits in relation to the total republic, the highest absorption was in the governorates of Gharbia, Qalyoubia Dakahlia, and Kafr El-Sheikh, with a percentage of about 30.7%, 13.2%, 9.4%, and 8.5%, respectively, of the total republic, where the four governorates participated with a percentage of 61.8% of the total loans guaranteed by deposits nationwide.

The total percentage of the three projects amounted to about 94.2% of the total short-term loans, while the rest of the projects represented in production supplies, consumer loans, sources of Islamic financing, installments and facilitation, youth loans, and the social fund amounted to about 5.8% of the total short-term loans.

**3- Geographical distribution of the total medium-term agricultural investment loans nationwide for the year 2021**

By studying the geographical distribution of medium-term agricultural investment loans at the governorate level and at the level of investment projects, it was revealed from the data in Table (8) that these projects are represented in livestock, poultry and fish wealth, loans to workers, businesses related to agriculture, youth loans and the social fund, loans guaranteed by deposits and loans. Consumer, real estate financing, facilitation, and installments. The most funded of these projects was from the Agricultural Bank of Egypt, and the most important in terms of value were the business project related to agriculture, livestock, youth loans, and the Social Fund, according to the relative importance of these projects in relation to the total medium-term loans

The value of business projects related to agriculture amounted to about 6,081.7 million pounds out of the total medium-term loans amounting to about 11,319.2 million pounds for the year 2021, at a rate of about 53.7% of the total medium-term loans. The governorates that used these projects most in relation to the total loans were Menia, Behera, Sharkia, and Dakahlia governorates. With a percentage of about 74%, 65.8%, 62.4%, and 57.9%, respectively, of the total value of medium-term loans, as for the percentage of business projects related to agriculture in relation to the total republic, the governorates with the highest absorption of agricultural-related businesses were: Behera, Kafr El-Sheikh, Gharbia, and Dakahlia, with a percentage of About 21.6%, 12.4%, 10.9%, and 10.8%, respectively, of the total of the Republic, as the four governorates participated in 55.7% of business projects related to agriculture at the level of the Republic.

**Table (7):** Geographical distribution of the most important short-term investment loans for the most important governorates of the Republic for the year 2021

| Governorates | Livestock project | % of total loans | % of the total republic | A project related to agriculture | % of total loans | % of the total republic | Loans project guaranteed by deposits | % of total loans | % of the total republic | Other* | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sharkia** | 800.33 | **67.08** | **22.81** | 306.643 | 25.70 | **9.87** | 34.367 | 2.88 | 6.39 | 51.79 | 1193.1 |
| **Dakahlia** | 659.87 | **60.82** | **18.81** | 339.884 | 31.33 | **10.94** | 50.358 | **4.64** | **9.36** | 34.77 | 1084.9 |
| **Gharbia** | 213.08 | 24.01 | 6.07 | 475.166 | **53.54** | **15.29** | 164.99 | **18% .59** | **30.67** | 34.22 | 887.46 |
| **Menoufia** | 170.49 | 23.31 | 4.86 | 479.771 | **65.59** | **15.44** | 17.782 | 2.43 | 3.31 | 63.47 | 731.51 |
| **Menia** | 472.74 | **74.48** | **13.47** | 128.987 | 20.32 | 4.15 | 22.463 | 3.54 | 4.18 | 10.52 | 634.71 |
| **Behera** | 320.48 | **51.26** | **9.13** | 248.125 | **39.69** | 7.99 | 27.662 | 4.42 | 5.14 | 28.96 | 625.23 |
| **Qalyoubia** | 86.33 | 23.77 | 2.46 | 175.47 | **48.32** | 5.65 | 70.988 | **19.55** | **13.20** | 30.39 | 363.18 |
| **Kafr El Sheikh** | 107.03 | 37.56 | 3.05 | 111.863 | 39.25 | 3.60 | 45.552 | **15.99** | **8.47** | 20.52 | 284.97 |
| **Other** | 678.33 | 37.88 | 19.33 | 841.43 | 46.99 | 27.08 | 103.78 | 5.80 | 19.29 | 167.1 | 1790.7 |
| **Total** | 3508.7 | **46.19** | 100 | 3107.34 | **40.91** | 100 | 537.95 | **7.08** | 100 | 441.8 | **7595.8** |

* Refers to low-value loans such as production supplies, consumer loans, Islamic financing sources installments and facilities, youth loans, and the social fund.

Source: Collected and calculated from the annual bulletin of cooperative activity in the agricultural sector, the Central Agency for Public Mobilization and Statistics.

**Table (8):** Geographical distribution of the most important medium-term investment loans for the most important governorates of the Republic for the year 2021

| Governorates | A project related to agriculture | % of total loans | % of the total republic | Livestock project | % of total loans | % of the total republic | Youth Loans and Social Fund Project | % of total loans | % of the total republic | Other* | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Behera | 1310.363 | **65.79** | **21.55** | 622.641 | 31.26 | **14.62** | 12.501 | 0.63 | 2.62 | 46.219 | 1991.72 |
| Kafr El Sheikh | 755.285 | 57.50 | **12.42** | 442.57 | 33.69 | **10.39** | 83.619 | **6.37** | **17.55** | 32.107 | 1313.58 |
| Gharbia | 660.819 | 52.27 | **10.87** | 486.224 | **38.46** | **11.42** | 32.835 | 2.60 | 6.89 | 84.374 | 1264.25 |
| Dakahlia | 655.912 | **57.91** | **10.79** | 422.524 | **37.30** | 9.92 | 21.085 | 1.86 | 4.42 | 33.152 | 1132.67 |
| Sharkia | 550.051 | **62.39** | 9.04 | 235.794 | 26.75 | 5.54 | 41.324 | **4.69** | **8.67** | 54.45 | 881.62 |
| Menoufia | 292.633 | 33.22 | 4.81 | 499.986 | **56.77** | **11.74** | 43.974 | **4.99** | **9.23** | 44.186 | 880.78 |
| Menia | 566.377 | **73.97** | 9.31 | 146.084 | 19.08 | 3.43 | 30.324 | 3.96 | 6.36 | 22.924 | 765.71 |
| Qena | 133.844 | 38.21 | 2.20 | 128.884 | **36.79** | 3.03 | 40.182 | **11.47** | **8.43** | 47.412 | 350.32 |
| Other | 1156.414 | 42.23 | 19.01 | 1274.07 | 46.52 | 29.92 | 170.694 | 6.23 | 35.82 | 137.391 | 2738.57 |
| Total | 6081.698 | **53.73** | 100 | 4258.777 | **37.6243** | 100 | 476.538 | **4.21** | 100 | 502.215 | 11319.23 |

* Refers to low-value loans such as poultry and fish wealth, employee loans, consumer loans, installments and facilities, loans guaranteed by deposits.

Source collected and calculated from the annual bulletin of cooperative activity in the agricultural sector, the Central Agency for Public Mobilization and Statistics

As for the second type of project, it was livestock, which amounted to about 4,258.8 million pounds out of the total value of medium-term loans amounting to about 11,319.2 million pounds for the year 2021, at a rate of about 37.6% of the total medium-term loans distributed among the governorates of the Republic, and they were the governorates most used livestock projects were Menoufia, Gharbia, Dakahlia, and Qena governorates at a rate of about 56.8%, 38.5%, 37.3%, and 36.8% respectively, of the total value of medium-term loans, as for the percentage of livestock projects in relation to the total value of the republic was the governorates with the highest absorption of these projects were Behera, Menoufia, Gharbia, and Kafr El-Sheikh, with a percentage of about 14.6%, 11.7%, 11.2%, and 10.4%, respectively, of the total of the Republic, as the four governorates participated in a percentage of 48.1% of the livestock projects at the level of the Republic.

As for the third type of projects, it was youth loans and the Social Fund, which amounted to about 476.5 million pounds out of the total medium-term loans amounting to about 11,319.2 million pounds for the year 2021, at a rate of about 4.2% of the total medium-term loans. The governorates were the most used of youth loans and the Social Fund in relation to the total loans Qena, Kafr El-Sheikh, Menoufia, and Sharkia governorates amounted to about 11.5%, 6.4%, 5%, and 4.7%, respectively, of the total value of medium-term loans. As for the percentage of youth loans and the Social Fund in relation to the total of the republic, the governorates with the highest absorption were Kafr El-Sheikh, Menoufia., Sharkia, and Qena, with a percentage of about 17.6%, 9.2%, 8.7%, and 8.4%, respectively, of the total of the republic, where the four governorates participated with a percentage of 43.9% of the total Youth loans and the social fund at the republic level.

The total percentage of the three projects amounted to about 95.5% of the total medium-term loans, while the remaining projects amounted to about 4.5% of the total medium-term loans.

**4- Geographical distribution of the total long-term agricultural investment loans nationwide for the year 2021**

By studying the geographical distribution of long-term agricultural investment loans at the governorate level and at the level of investment projects, it was revealed from the data in Table (9) that these projects are represented in livestock, consumer loans, loans guaranteed by deposits, agricultural-related businesses, youth loans, the social fund, and facilities and installments. The most funded of these projects is from the Agricultural Bank of Egypt, and the most important in terms of value are the youth loans project and the social fund, the loan project guaranteed by deposits, and agricultural-related businesses, according to the relative importance of these projects in relation to the total long-term loans.

The value of youth loans and the Social Fund amounted to about 699.01 million pounds out of the total value of long-term loans amounting to about 853.01 million pounds for the year 2021, a rate amounting to about 82% of the total long-term loans. The governorates most used these for the youth loans project and the Social Fund in relation to the total loans, including Ismailia Governorate. The cities of Canal and Sinai, Kafr El-Sheikh, Sharkia, and Qena, with a rate of about 99.7%, 96.3%, 94.6%, 87.4%. respectively, of the total value of long-term loans, as for the percentage of youth loans and the Social Fund in relation to the total republic, the governorates with the highest absorption were Qena, Ismailia, including the cities of the Canal, Sinai, Kafr El-Sheikh, and Sharqia, with a rate of about 16.5%, 13.3%, 12.2%, and 10.5% respectively, of the total republic, the four governorates contributed 52.5% of the total youth loans and the social fund at the republic level.

As for the second type of projects, they were loans guaranteed by deposits, which amounted to about 77.3 million pounds out of the total long-term loans amounting to about 853.01 million pounds for the year 2021, at a rate of about 9.1% of the total long-term loans. The governorate was the most used of loans guaranteed by deposits in relation to the total loans. El Wadi- El Gidid, Gharbia, Menoufia, and Alexandria accounted for about 99.7%, 26%, 6.2%, and 4.9%, respectively, of the total value of long-term loans. As for the percentage of loans guaranteed by deposits in relation to the total republic, the governorates with the highest absorption were El Wadi- El Gidid, Gharbia, Menoufia, Kafr El-Sheikh, with a percentage of about 70.3%, 12.9%, 4.6%, and 4.2%, respectively, of the total of the Republic, as the four governorates participated with a percentage of 92% of the total loans guaranteed by deposits at the level of the Republic.

The third project indicated the value of agricultural-related businesses, which amounted to about 43.2 million pounds out of the total long-term loans amounting to about 853.01 million pounds for the year 2021, at a rate of about 5.1% of the total long-term loans. The governorates most used for these projects in relation to the total loans were Alexandria, Behera, Qena and Gharbia, with a rate of about 42.7%, 17%, 11.8%, and 5.6%, respectively, of the total value of long-term loans. As for the percentage of business projects related to agriculture in relation to the total republic, the governorates with the highest absorption were Qena, Behera, Alexandria, and Menoufia, with a rate of about 36.1%, 19.2%, 12%, and 5.5%, respectively, of the total of the Republic, as the four Governorates participated in 72.8% of business projects related to agriculture at the level of the Republic.

**Table (9):** Geographical distribution of the most important long-term investment loans for the most important governorates of the Republic for the year 2021

| Governorates | Youth Loans and Social Fund Project | % of total loans | % of the total republic | Loans project guaranteed by deposits | % of total loans | % of the total republic | A project related to agriculture | % of total loans | %of the total republic | Other* | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Qena** | 115.169 | **87.36** | **16.48** | 1.076 | 0.82 | 1.39 | 15.585 | **11.82** | **36.08** | 0.00 | 131.830 |
| **Ismailia (1)** | 93.229 | **99.72** | **13.34** | 0.000 | 0.00 | 0.00 | 0.261 | 0.279 | 0.60 | 0.00 | 93.490 |
| **Kafr El Sheikh** | 85.122 | **96.31** | **12.18** | 3.262 | 3.69 | **4.22** | 0.000 | 0.00 | 0.00 | 0.00 | 88.384 |
| **Sharkia** | 73.138 | **94.60** | **10.46** | 0.912 | 1.18 | 1.18 | 1.336 | 1.728 | 3.09 | 1.929 | 77.315 |
| **Menoufia** | 41.759 | 72.55 | 5.97 | 3.567 | **6.20** | **4.61** | 2.366 | 4.111 | **5.48** | 9.864 | 57.556 |
| **Behera** | 36.790 | 75.54 | 5.26 | 0.192 | 0.39 | 0.25 | 8.300 | **17.04** | **19.22** | 3.418 | 48.700 |
| **Gharbia** | 23.221 | 60.48 | 3.32 | 9.973 | **25.98** | **12.90** | 2.137 | **5.566** | 4.95 | 3.061 | 38.392 |
| **El Wadi- El Gidid** | 0.000 | 0.00 | 0.00 | 54.370 | **99.69** | **70.30** | 0.146 | 0.268 | 0.34 | 0.024 | 54.540 |
| **Alexandria** | 6.285 | 51.82 | 0.90 | 0.593 | **4.89** | 0.77 | 5.175 | **42.67** | **11.98** | 0.075 | 12.128 |
| **Other** | 224.300 | 70.68 | 32.09 | 3.393 | 1.35 | 4.39 | 7.884 | 3.145 | 18.25 | 15.09 | 250.671 |
| **Total** | 699.013 | **81.95** | 100 | 77.338 | **9.07** | 100 | 43.190 | **5.06** | 100 | 33.47 | **853.006** |

* Refers to low-value loans such as livestock, consumer loans, installments, and facilities.

(1) Includes the cities of Canal and Sinai

Source: Collected and calculated from the source. Collected and calculated from the annual bulletin of cooperative activity in the agricultural sector, the Central Agency for Public Mobilization and Statistics.

The total percentage of the three projects amounted to about 96.2% of the total long-term loans, while the remaining projects amounted to about 3.8% of the total long-term loans.

**Investment map of the most important agricultural projects from the Agricultural Bank of Egypt**

A study of the agricultural investment projects from the loans financed by the Agricultural Bank of Egypt for the year 2021 at the republic level showed that the total value of the loans amounted to about 19,768 million pounds, distributed among short-, medium- and long-term loans with a value of about 7,595.76 million pounds, 11,319.23 million pounds, and 853.01 million pounds, respectively, representing about 38.42%, 57.26%, and 4.32%, respectively, of the total value of agricultural investment loans, amounting to about 19,768 million pounds, respectively.

At the governorate level[7], Behera Governorate ranked first in terms of the total value of agricultural investment loans, with a value of about 2,624.57 million pounds, representing about 13.3% of the total value of loans financed by the Agricultural Bank of Egypt at the republic level for the year 2021, amounting to about 19,768 million pounds. In second place is Dakahlia Governorate, with a value of loans amounting to about 2,193.32 million pounds, representing about 11.1% of the total value of loans, followed by the governorates of Gharbia, Sharkia, and Menoufia, with a value of loans amounting to about 2,146.22 million pounds, 2,068.54 million pounds, and 1,813.56 million pounds, respectively, in rank from third to fifth, with a percentage It amounted to about 10.8%, 10.5%, and 9.2%, respectively, of the total value of loans for the year 2021 .Thus, it became clear that the previous five governorates used loans worth 10,846 million pounds, representing about 54.9% of the total value of loans, which amounted to about 19,768 million pounds, meaning that more than half of the value of agricultural investment loans was used by the previous five governorates.

By studying the investment map of the most important agricultural projects financed by the Agricultural Bank of Egypt, whether short, medium or long-term, it was shown from Table (10) that the most important investment projects were agricultural-related businesses. Agriculture, livestock, youth loans, social fund and deposit-guaranteed loans at the total loan level.

It was shown from the data in Table (10) that business projects related to agriculture were financed by short-, medium- and long-term loans at a rate of about 33.66%, 65.87%, and 0.47%, respectively, of the total value of business projects related to agriculture, amounting to about 9232.23 million pounds, which represents About 46.7% of the total value of loans financed by the Agricultural Bank of Egypt for the year 2021, amounting to about 19,768 million pounds.

As for livestock projects, they were financed by short-, medium- and long-term loans at a rate of about 45.12%, 54.77%, and 0.11%, respectively, of the total value of livestock projects, amounting to about 7,775.74 million pounds, at a rate of about 39.33% of the total value of loans financed by The Agricultural Bank of Egypt for the year 2021, amounting to about 19,768 million pounds.

As for youth loan projects and the Social Fund, the data in Table (10) indicated that these projects were financed by short-, medium- and long-term loans at a rate of about 0.69%, 40.26%, and 59.05%, respectively, of the total value of these projects, which amounted to about 1,183.76 million pounds. At a rate of about 5.99% of the total value of loans financed by the Agricultural Bank of Egypt for the year 2021, amounting to about 19,768 million pounds.

**Table (10):** Investment map of the most important agricultural projects funded by the Agricultural Bank of Egypt for the year 2021

| Statement | Short-term loans in millions of pounds | | Medium-term loans in millions of pounds | | Long-term loans in millions of pounds | | The total value of the project is in one million pounds | The total value of the three loans is in one million pounds | % of the project value relative to the total loans |
|---|---|---|---|---|---|---|---|---|---|
| | value | % | value | % | value | % | value | value | % |
| **A project related to agriculture** | 3107.34 | 33.66 | 6081.70 | 65.87 | 43.19 | 0.47 | 9232.23 | 19768 | 46.70 |
| **Livestock project** | 3508.69 | **45.12** | 4258.78 | **54.77** | 8.27 | **0.11** | 7775.74 | 19768 | **39.33** |
| **Youth Loans and Social Fund Project** | 8.21 | 0.69 | 476.54 | 40.26 | 699.01 | 59.05 | 1183.76 | 19768 | 5.99 |
| **Loans project guaranteed by deposits** | 537.95 | **55.83** | 348.18 | **36.14** | 77.34 | **8.03** | 963.47 | 19768 | **4.87** |
| **Other** | 433.57 | | 154.03 | | 25.20 | | 612.8 | 19768 | **1.30** |
| **Total** | 7595.76 | **38.42** | 11319.23 | **57.26** | 853.01 | **4.32** | 19768 | 19768 | **100.00** |

Source: Collected and calculated from data in tables (7), (8), (9)

As for loan projects guaranteed by deposits, the data in Table (10) indicated that these projects were financed by short-, medium- and long-term loans at a rate of about 55.83%, 36.14%, and 8.03%, respectively, of the total value of loan projects guaranteed by deposits, amounting to about 963.47 million pounds. A percentage representing about 4.87% of the total value of loans financed by the Agricultural Bank of Egypt for the year 2021, amounting to about 19,768 million pounds.

In addition, there are some small-sized projects that have been listed under "others" and are represented in projects of consumer loans, facilities, installments, production requirements, poultry and fish wealth, real estate financing, and employee loans, with a total percentage of about 3.1% of the total value of loans financed by the Agricultural Bank of Egypt for the same year.

At the republic level, the data in Table (10) indicated that all projects were financed by short-, medium- and long-term loans at a rate of about 38.42%, 57.26%, and 4.32%, respectively, of the total value of loans, which amounted to about 19,768 million pounds, distributed among the loans. Short, medium and long-term, with a value of about 7595.76, 11319.23 and 853.01 million pounds, respectively.

**Recommendations:**

The research reached several recommendations, the most important of which are:

- ✓ Working to increase investments directed to the agricultural sector, as the research has shown the high efficiency of agricultural investment, which leads to achieving sustainable economic development.
- ✓ Paying attention to increasing long-term agricultural investments and directing them to large agricultural projects, land reclamation, horizontal expansion, and adding new areas, thus increasing production, which leads to increasing the rate of self-sufficiency, providing new job opportunities, and increasing agricultural industrialization, as the percentage of long-term investments is very low, as the research results indicated.
- ✓ Increasing agricultural investments in the governorates of Ismailia, the Canal cities, and Sinai due to the low percentage of agricultural investments in them, especially the short and medium term.
- ✓ Expansion of agricultural investments in the rest of the governorates of the Republic, as most of the investments are directed to a specific number of governorates, as the research results showed.

- ✓ Working to reduce the interest rate on agricultural investment loans by trying to reduce administrative expenses and working to encourage investors to invest in the agricultural sector.

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