10.21608/MEAE.2022.281029

المجلة المصرية للاقتصاد الزراعي
ISSN: 2311-8547 (Online), 1110-6832 (print)
https://meae.journals.ekb.eg/

العوامل المؤثرة علي رأس مال الجمعيات التعاونية الزراعية فى مصر

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بيانات البحث

استلام 2022 /12/29
قبول 2023 / 1 / 18

الكلمات المفتاحية:
الجمعيات التعاونية الزراعية، عدد الأعضاء المساهمين، رأس المال، الزمام.

المستخلص

تؤدى التعاونيات الزراعية دورا هاما فى تنمية القطاع الزراعي إلا أن هذه الجمعيات تواجه العديد من المشكلات التى كان لها تأثير سلبى على دورها فى التنمية الزراعية المصريه، ولقد تركزت مشكلة البحث فى تدهور دور الجمعيات التعاونية الزراعية فى التنمية الزراعية لمصر، وما هى محددات رأس مال الجمعيات التعاونية الزراعية لأهميته فى التنمية الزراعية لمصر. والأهمية النسبية لأعداد الجمعيات التعاونية الزراعية خلال الفترة (2016-2020) حيث جاءت الجمعيات التعاونية للإئتمان الزراعي في المركز الأول من حيث أعداد الجمعيات التعاونية الزراعية حيث بلغ متوسط عددها 4350 جمعية بمتوسط نحو 74.3% من متوسط أعداد الجمعيات التعاونية الزراعية البالغ نحو 5851 جمعية خلال فترة الدراسة، بينما جاءت في المركز الثاني الجمعيات التعاونية الزراعية للإصلاح الزراعي حيث بلغ متوسط عددها 761 جمعية بمتوسط نحو 13% من متوسط أعداد الجمعيات التعاونية الزراعية، وجاءت في المركز الثالث الجمعيات التعاونية الزراعية للأراضي المستصلحة وبلغت 637جمعية مثلت نحو 10.9% من متوسط أعداد الجمعيات التعاونية الزراعية، وأخيراً جاءت الجمعيات التعاونية الزراعية للثروة المائية في المركز الرابع والأخير حيث بلغ متوسط عددها 101 جمعية مثت نحو 1.7% من إجمالى أعداد الجمعيات التعاونية الزراعية البالغ نحو 5851 جمعية خلال فترة الدراسة المشار إليها. وأوضحت نتائج الدراسة أن العوامل المؤثرة علي تطور رأس المال بالجمعيات التعاونية المحلية للإئتمان الزراعي خلال فترة الدراسة (2000–2020) أنه بزيادة كل من عدد الجمعيات التعاونية المحلية للإئتمان الزراعي ألف جمعية وعدد الأعضاء المساهمين للجمعيات التعاونية المحلية للإئتمان الزراعي مليون عضو يترتب عليه زيادة رأس المال بالجمعيات التعاونية المحلية للإئتمان الزراعي زيادة تقدر بحوالي 1588.9 مليون جنية و70.9 مليون جنية علي الترتيب، كما يلاحظ بزيادة زمام الجمعيات التعاونية المحلية للإئتمان الزراعي مليون فدان يؤدى ذلك إلى إنخفاض رأس المال بالجمعيات التعاونية المحلية للإئتمان الزراعي انخفاض معنوي احصائياً يقدر بحوالي 68.1 مليون جنية وهذا لا يتفق مع المنطق الاقتصادي.

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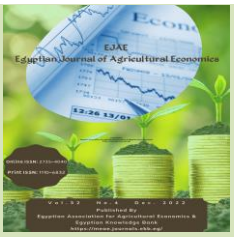
10.21608/MEAE.2022.281029



Available Online at EKb Press
Egyptian Journal of Agricultural Economics ISSN: 2311-8547 (Online), 1110-6832 (print)
https://meae.journals.ekb.eg/

Factors affecting the capital of agricultural cooperative associations in Egypt

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ARTICLE INFO

Article History
Received:29-12- 2022
Accepted:18- **1- 2023**

Keywords:
agricultural cooperative societies, number of contributing members, capital, reins.

ABSTRACT

Agricultural cooperatives play an important role in the development of the agricultural sector. However, these associations face many problems that have had a negative impact on their role in Egyptian agricultural development. The research problem focused on the deterioration of the role of agricultural cooperative societies in the agricultural development of Egypt. What are the determinants of the capital of agricultural cooperative societies due to its importance in the agricultural development of Egypt, and the relative importance of the numbers of agricultural cooperative societies during the period (2016-2020), There for , the agricultural credit cooperative societies came in first place which average number of them reached 4350,it means 74.3% from the all number of agricultural cooperative societies, which is about 5851.association during the study period, while the agricultural cooperative societies for agrarian reform came in second place, with an average number of 761 societies, it means about 13% from the agricultural cooperative societies, and the agricultural cooperative societies for reclaimed lands came in third place, amounting to 637 societies, representing about 10.9% of the average number of agricultural cooperative societies. finally, agricultural cooperative societies for water resources came in the fourth and final place, with an average number of 101 societies, representing about 1.7% of the total number of agricultural cooperative societies, 5851 societies during the study period. The results of the study indicated that the factors affecting the development of capital in the cooperative societies for agricultural credit during the study period (2000-2020) were that the number of local cooperative societies for agricultural credit increased that by increasing each of the number of local cooperative societies for agricultural credit one thousand and the number of contributing members of local cooperative societies for agricultural credit one million members , the capital will increase estimated at about 1588.9 million pounds and 70.9 million pounds, respectively. It is also noted that the local cooperative societies for agricultural credit increased by one million acres. Million pounds, and this is not consistent with economic logic.

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Introduction:

The agricultural cooperative sector is one of the leading sectors in the agricultural development process, especially in developing countries such as Egypt, which is due to the ability of cooperative societies to accumulate individuals and their resources in the form of large economic units, especially in light of the current local economic conditions and global changes and the presence of financial entities and huge economic, that is why it has become necessary for agricultural investment and factors of production and marketing to move in the direction with which it is possible to confront these economic conditions and large entities, through mobilizing and using all available resources and proper organization of the efforts of farmers in order to achieve an increase in their incomes, improve their standard of living and maximize their role in development. This is achieved by relying on an institutional system and establishing cooperative societies that achieve the objectives of their members and contribute to the development of the economy as a whole.

Research problem and objective:

Despite what agricultural cooperatives gain an important role in the development of the agricultural sector, these societies suffer from many problems, which have affected their role in the agricultural development process in Egypt. The capital of agricultural cooperative societies for its importance in agricultural development in Egypt. The research aims to identify the types of agricultural cooperative societies and their development in terms of their numbers, the number of contributing members, the capital of the societies, as well as the areas served, as well as the study of the most important determinants of the capital of agricultural cooperative societies.

Research method and data sources:

In its economic analysis, the research relied on descriptive and quantitative statistical methods of analysis, in addition to the econometric methods represented in estimating some general trend models and multiple linear regression. The research also relied mainly on the available and available published and unpublished data issued by government agencies such as the Central Agency for Public Mobilization and Statistics.

Relative Importance of Agricultural Cooperatives:

It is known that agricultural cooperative societies are divided into four types: (agricultural credit cooperative societies, agricultural cooperative societies for agrarian reform, agricultural cooperative societies for reclaimed lands, and agricultural cooperative societies for water wealth).

The relative importance of the number of agricultural cooperative societies:

Table (1) shows the relative importance of the number of agricultural cooperative societies during the period (2016-2020), where agricultural credit cooperative societies ranked first in terms of the number of agricultural cooperative societies, with an average number of 4350 societies, with an average of about 74.3% of the average number of agricultural cooperative societies. Agricultural cooperative societies amounted to about 5851 societies during the study period, while agricultural cooperative societies for agricultural reform came in second place, with an average number of 761 societies, with an average of about 13% of the average number of agricultural cooperative societies, while agricultural cooperative societies for reclaimed lands came in third place, as Their average number was 637 societies, with an average of about 10.9% of the average number of agricultural cooperative societies. Finally, agricultural cooperative societies for water wealth ranked fourth and last, with an average number of 101 societies, with an average of about 1.7% of the average number of agricultural cooperative societies, which amounted to about 5851 societies during the study period.

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Table (1): The relative importance of the number of agricultural cooperative societies During the period (2016-2020)

the years / associations	2016	2017	2018	2019	2020	average	Relative importance
Agricultural Cooperatives for Agricultural Credit	4310	4312	4313	4310	4504	4350	74.3
Agricultural Cooperatives for Agrarian Reform	761	761	761	761	760	761	13
Agricultural cooperatives for reclaimed lands	630	635	626	626	670	637	10.9
Agricultural Cooperatives for Water Resources	100	101	101	101	101	101	1.7
Total agricultural cooperatives	5801	5809	5810	5798	6035	5851	100

Source: Compiled and calculated from the Central Agency for Public Mobilization and Statistics, Annual Bulletin of Agricultural Cooperative Activity, separate issues.

The relative importance of the number of contributing members in agricultural cooperative societies:

Table (2) shows the relative importance of the number of contributing members to agricultural cooperative societies during the period (2016-2020), where agricultural credit cooperative societies ranked first in terms of the number of contributing members to agricultural cooperative societies, with an average number of 3,988 thousand members, with an average of about 82.8% of the average number of members contributing to agricultural cooperative societies, which amounted to about 4814 thousand members during the study period, while the agricultural cooperative societies for agricultural reform came in second place, where the average number of members reached about 432 thousand members, with an average of about 9% of the average number of members contributing in Agricultural cooperative societies, while agricultural cooperative societies for reclaimed lands came in third place, with an average number of members of about 297 thousand members, with an average of about 6.2% of the average number of members contributing to agricultural cooperative societies, and finally agricultural cooperative societies for water wealth came in the fourth and last place Where the average number of members reached about 96 thousand, with an average of about 2% of the average number of contributing members in the cooperative societies The agricultural sector amounted to about 5851 thousand members during the study period.

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Table (2): The relative importance of the number of contributing members in agricultural cooperative societies, per thousand members, during the period (2016-2020)

the years / assoeiations	2016	2017	2018	2019	2020	average	Relative importance
Agricultural Cooperatives for Agricultural Credit	3885	3667	4033	3908	4446	3988	82.8
Agricultural Cooperatives for Agrarian Reform	425	431	417	439	450	432	9
Agricultural cooperatives for reclaimed lands	298	301	296	296	296	297	6.2
Agricultural Cooperatives for Water Resources	97	97	96	96	96	96	2
Total agricultural cooperatives	4705	4495	4842	4738	5288	4814	100

Source: Compiled and calculated from the Central Agency for Public Mobilization and Statistics, Annual Bulletin of Agricultural Cooperative Activity, separate issues.

The relative importance of the capital of agricultural cooperative societies:

Table (3) shows: the relative importance of the capital of agricultural cooperative societies during the period (2016-2020), where agricultural credit cooperative societies ranked first in terms of capital of agricultural cooperative societies, with an average capital of about 163.1 million pounds, with an average of about 54.3% Of the average capital of agricultural cooperative societies, which amounted to about 300 million pounds during the study period, while the agricultural cooperative societies for agricultural reform came in second place, as their average capital amounted to about 121 million pounds, with an average of about 40.3% of the average capital of agricultural cooperative societies. Agricultural cooperative societies for reclaimed lands came in third place, with an average capital of about 14.1 million pounds, with an average of about 4.7% of the average capital of agricultural cooperatives. About 0.7% of the average capital of agricultural cooperative societies amounting to about 5851 million pounds during the study period.

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Table (3): The relative importance of the capital of agricultural cooperative societies in million pounds during the period (2016-2020)

the years / assoeiations	2016	2017	2018	2019	2020	average	Relative importance
Agricultural Cooperatives for Agricultural Credit	100.1	118.2	159.3	201.5	236.4	163.1	54.3
Agricultural Cooperatives for Agrarian Reform	138.9	115.6	114.7	111.5	124.1	121	40.3
Agricultural cooperatives for reclaimed lands	14.3	14.3	14.1	14.1	14.1	14.1	4.7
Agricultural Cooperatives for Water Resources	2	2	2.2	2.3	2.3	2.2	0.7
Total agricultural cooperatives	**255**	**250**	**291**	**329**	**377**	**300.4**	**100**

Source: Compiled and calculated from the Central Agency for Public Mobilization and Statistics, Annual Bulletin of Agricultural Cooperative Activity, separate issues.

The following is a presentation of the evolution of each type of agricultural cooperative.

The development of local agricultural credit associations:

A- Evolution of the number of local agricultural credit associations:

Table (4) shows the evolution of the number of local agricultural credit associations during the period (2000-2020), and from it it becomes clear that the number of local agricultural credit associations fluctuated between increase and decrease, with the lowest amounting to about 4236 associations in 2003, while it reached its maximum in 2018. It was estimated at about 4,313 associations, while the general average for the period was about 4,277 associations. By studying the general temporal trend equation for the number of local agricultural credit associations during the period (2000-2020), it was found from Table (5) that the linear picture is the best fit for the nature of the data, as the results of the statistical analysis showed that the number of local agricultural credit associations increased by a statistically significant amount of About 4 associations annually, representing about 0.09%, and the significance of the model as a whole was proven. The adjusted coefficient of determination showed that about 82% of the changes in the number of local agricultural credit associations are due to a group of factors whose impact reflects the factor of time.

B- Evolution of the number of members contributing to local agricultural credit associations:

Table (4) shows the evolution of the number of members contributing to local agricultural credit associations during the period (2000-2020), and from it it becomes clear that the number of contributing members to agricultural cooperative societies has fluctuated between increase and decrease, as it reached the lowest in 2003 about 3.13 million members, while it reached its maximum In 2018, it was estimated at 4.03 million members, while the general average for the period was about 3.74 million members.

By studying the equation of the general temporal trend of the number of members contributing to local agricultural credit associations during the period (2000-2020), it was found from Table (5) that the linear picture is the best fit for the nature of the data, as the results of the statistical analysis showed

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that the number of members contributing to local agricultural credit associations is increasing By a statistically significant amount of about 40 thousand members annually, representing about 1.07%, and the significance of the model as a whole was proven. The adjusted coefficient of determination showed that about 48% of the changes in the number of members contributing to local agricultural credit associations are due to a group of factors whose impact reflects the time factor.

Table (4): The Evolution of the Number of Local Agricultural Credit Associations, the Number of Contributing Members and the Capital during the Period (2000-2020)

(The number of associations: one thousand, the number of contributing members: one million members, the reins: one million acres, the capital: one million pounds)

Years	Number of Associations	Number of Members	Capital	Area
2000	4.271	3.51	41.6	5.73
2001	4.265	3.65	47.6	5.55
2002	4.238	3.38	43.8	5.62
2003	4.236	3.13	44.3	5.2
2004	4.236	3.13	44.3	5.22
2005	4.261	3.45	52.2	5.2
2006	4.256	3.58	54.2	5.83
2007	4.251	3.48	59.7	5.81
2008	4.242	3.62	60.8	5.78
2009	4.271	3.62	62.9	5.73
2010	4.275	4.35	67.2	5.95
2011	4.282	4.31	72.7	6.3
2012	4.281	3.81	90.2	6.07
2013	4.289	3.75	134.4	5.79
2014	4.299	3.9	94.9	5.75
2015	4.306	3.98	87.3	6.46
2016	4.31	3.89	100.1	6.25
2017	4.312	3.67	118.2	6.31
2018	4.313	4.03	159.3	5.9
2019	4.31	3.91	201.5	5.43
2020	4.309	4.45	214.3	5.8
Average	**4.277**	**3.74**	**88.16**	**5.8**

Source compiled and calculated from the Central Agency for Public Mobilization and Statistics, Annual Bulletin of Agricultural Cooperative Activity, miscellaneous issues.

C- Capital development in local agricultural credit associations:

It is clear from Table (4) the development of the capital of the local agricultural credit associations during the period (2000-2020), and from it it becomes clear that the capital of the local agricultural credit associations has fluctuated between increase and decrease, as it reached the lowest in 2000 about 41.6 million pounds, while it reached its maximum in In 2020, it was estimated at about 214.3 million pounds, while the general average for the period was about 88.16 million pounds. By studying the equation of the general time trend of the capital of the local agricultural credit associations during the period (2000-2020), it was found from Table (5) that the linear picture is the best fit for the nature of the data, as the results of the statistical analysis showed that the capital of the local agricultural credit associations increased by a significant amount Statistically, it amounted to about 7.17 million pounds annually, representing about 8.13%, and the significance of the model as a whole was proven. It was found from

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the adjusted coefficient of determination that about 76% of the changes in the capital of local agricultural credit associations are due to the impact of the January revolution, as well as a group of factors whose impact reflects the factor of time.

Table (5): Equations of the general time trend of the number of local agricultural credit associations, the number of contributing members and the capital during the period (2000-2020)

Serial	dependent variable	estimated model	R^2	F
1	The number of associations	$\hat{Y}_i = 4.23 + 0.004\ X_i$ (684.9)** (7.8)**	0.76	61
2	Number of contributing members (million members)	$\hat{Y}_i = 3.3 + 0.040\ X_i$ (27.6)** (4.2)**	0.49	18.03
3	capital (one million pound)	$\hat{Y}_i = 9.3 + 7.17\ X_i$ (7.8)** (0.43)	0.76	60.4
4	reins (million acres)	$\hat{Y}_i = 4.5 + 0.03\ X_i$ (2.64)** (38.4)**	0.27	6.9

Where: $\hat{Y}i$: the estimated value of the dependent variable. Xi: the time variable where i = (1, 2, 3, ..., 20).

The value in parentheses indicates the calculated (T) value, (R2) the coefficient of determination, (F) the significance of the model as a whole.

(*)the significance of the regression coefficient at the 0.05 level of significance.

(**)the significance of the regression coefficient at the 0.01 level of significance.

Source: Calculated from data in Table (4) by research.

D- Development of ownership in local agricultural credit associations:

It was clear from Table (4) the development of the control of the local agricultural credit associations during the period (2000-2020), and from it it becomes clear that the control of the local agricultural credit associations fluctuated between increase and decrease, as it reached the lowest in 2003 about 5.2 million acres, while it reached its maximum in 2015 It was estimated at about 6.46 million feddans, while the general average for the period was about 5.8 million feddans. By studying the equation of the general time trend of the control of the local agricultural credit associations during the period (2000-2020), it was found from Table (5) that the linear picture is the best fit for the nature of the data. About 30 thousand feddans annually, representing about 0.51%, and the significance of the model as a whole proved. The adjusted coefficient of determination showed that about 34% of the changes in the control of local agricultural credit associations are due to the impact of the January revolution, as well as a group of factors whose impact reflects the factor of time.

E - Factors affecting capital development in local agricultural credit cooperative societies:

The results of the statistical analysis of the factors affecting the development of capital in local agricultural credit cooperative societies during the study period (2000-2020) show that by increasing the number of local agricultural credit cooperative societies by a thousand, this leads to an increase in capital in local agricultural credit cooperative societies, a statistically significant increase estimated at about 1588.9 One million Egyptian pounds, while the increase in the number of members contributing to the

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local agricultural credit cooperative societies, by one million members, results in an increase in the capital of the local agricultural credit cooperative societies, a statistically insignificant increase estimated at about 70.9 million EGP, or about 70.9 EGP for each member contributing to the agricultural cooperative societies, as it is noted with an increase in control. Local cooperative societies for agricultural credit, one million feddans. This leads to a decrease in the capital of local cooperative societies for agricultural credit, a statistically significant decrease estimated at about 68.1 million pounds, and this is not consistent with the economic logic.

Where the statistical significance was established at the level of significance 0.01 as was the significance of the model as a whole, and the results showed that about 70% of the changes in the capital in the local agricultural credit cooperative societies are due to the changes in each of the number of local agricultural credit cooperative societies as well as the number of contributing members and the reins.

$$\hat{Y}_i = \underset{(-4.74)^{**}}{-6465.9} + \underset{(4.68)^{**}}{1588.9}\, X_{i1} + \underset{(1.55)}{70.9}\, X_{i2} - \underset{(-2.99)^{**}}{68.1}\, X_{i3}$$

$$R^2 = 0.74 \qquad Adj.R^2 = 0.70 \qquad F = 16.5^{**}$$

Where:

$\hat{Y}_i$: The capital of local cooperative societies for agricultural credit in one million pounds.

X_{i1} : Number of local agricultural credit cooperatives.

X_{i2} : Number of members contributing to local agricultural credit cooperative societies, in million members.

X_{i3} : Take control of the local cooperatives for agricultural credit in one million acres.

: The capital of local cooperative societies for agricultural credit in one million pounds.

Source: The results of the statistical analysis of table (4) data using the SPSS program.

The development of agrarian reform cooperatives:

A- Evolution of the number of agricultural reform cooperative societies:

Table (6) shows the evolution of the number of agrarian reform cooperative societies during the period (2000-2020), and from it it becomes clear that the number of agrarian reform cooperative societies has fluctuated between increase and decrease, with the lowest number in the years (2000-2002) 2001 reaching about 757, while A maximum of about 761 associations, while the general average for the period was about 760 associations. By studying the equation of the general time trend of the number of agrarian reform cooperative societies during the period (2000-2020), it was found from Table (7) that the linear picture is the best fit for the nature of the data. About an assembly annually, representing about 0.13%. The adjusted coefficient of determination showed that about 62% of the changes in the number of agricultural reform cooperative societies are due to the effect of a group of factors whose impact reflects the factor of time.

B- Evolution of the number of members contributing to the cooperative societies for agricultural reform:

It is clear from Table (6) the evolution of the number of members contributing to agrarian reform cooperative societies during the period (2000-2020), and from it it becomes clear that the number of contributing members to agrarian reform cooperative societies has fluctuated between increase and decrease, reaching the lowest in 2006 about 328 thousand members, while it reached Its maximum was in 2020, when it was estimated at about 450 thousand members, while the general average for the period was about 377.54 thousand members. By studying the equation of the general time trend of the number of members contributing to agrarian reform cooperative societies during the period (2000-2020), the

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results of the statistical analysis in Table (7) showed that the number of members contributing to agrarian reform cooperative societies has increased by a statistically significant amount, amounting to about 5.12 thousand members annually, representing about 1.36%, as well as the significance of the model as a whole. The adjusted coefficient of determination showed that about 75% of the changes in the number of members contributing to agricultural reform cooperative societies are due to the effect of a group of factors whose impact reflects time.

Table (6): Evolution of the Number of Agrarian Reform Cooperative Societies, the Number of Contributing Members and the Capital during the Period (2000-2020)

(Number of Societies: Association, Number of Contributing Members: One thousand members, Zimam: one million feddans, Capital: one million pounds)

Years	Number of Associations	Number of Members	Capital	Area
2000	757	345	642.76	14
2001	757	351	615.57	12.6
2002	758	357	641.78	14.3
2003	758	345	638.73	12.5
2004	758	345	634.73	12.5
2005	758	357	644.44	22.6
2006	758	328	657.24	25.5
2007	761	358	637.62	32.1
2008	761	365	650.14	31.9
2009	758	349	734.78	75.8
2010	761	354	652.72	100.6
2011	761	395	698.24	105.6
2012	761	366	671.92	96.2
2013	761	354	646.67	100.7
2014	760	381	637.37	101.5
2015	761	417	658.89	125.2
2016	761	425	691.81	138.9
2017	761	431	634.78	115.6
2018	761	417	834.54	114.7
2019	761	439	629.86	111.5
2020	760	450	1079.47	124.1
Average	**760**	**377.54**	**682.57**	**70.87**

Source compiled and calculated from the Central Agency for Public Mobilization and Statistics, Annual Bulletin of Agricultural Cooperative Activity, miscellaneous issues.

C- Capital Development in Agrarian Reform Cooperative Societies:

Table (6) shows the development of the capital of agrarian reform cooperative societies during the period (2000-2020), and from it it becomes clear that the capital of agrarian reform cooperative societies has fluctuated between increase and decrease, reaching the lowest in 2004 about 12.5 million pounds, while it reached its maximum in In 2015, it was estimated at about 125.2 million pounds, while the general average for the period was about 70.87 million pounds. By studying the equation of the general time trend of the capital of agrarian reform cooperative societies during the period (2000-2020), it was found from Table (7) that the linear picture is the best fit for the nature of the data, as the results

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of the statistical analysis showed that the capital of agrarian reform cooperative societies increased by a significant amount Statistically, it amounted to about 7.09 thousand pounds annually, representing about 11.1%, and the significance of the model as a whole was proven. It was found from the adjusted coefficient of determination that about 88% of the changes in the capital of cooperative societies for agrarian reform are due to the impact of the January revolution, as well as a group of factors whose impact reflects the factor of time.

Table (7): Equations of the general time trend of the number of agricultural reform cooperative societies, the number of contributing members and the capital during the period (2000-2020)

Serial	dependent variable	estimated model	R^2	F
1	The number of associations	$\hat{Y}_i = 757.5 + 0.2\ X_i$ (1653.8)** (5.5)**	0.78	30.5
2	Number of contributing members (thousand members)	$\hat{Y}_i = 321.2 + 5.12\ X_i$)** 7.4)** (36.9 (	0.86	54.6
3	capital (million pound)	$\hat{Y}_i = -7.1 + 7.09\ X_i$ (11.1)**) -0.88(	0.87	123.0
4	reins (million acres)	$\hat{Y}_i = 8.9 + 7.9\ X_i$ (9.7)**) 0.87(	0.83	93.2

Where: $\hat{Y}i$: the estimated value of the dependent variable. Xi: the time variable where i = (1, 2, 3, ..., 20).

The value in parentheses indicates the calculated (T) value, (R2) the coefficient of determination, (F) the significance of the model as a whole.

(*)the significance of the regression coefficient at the 0.05 level of significance.

(**)the significance of the regression coefficient at the 0.01 level of significance.

Source: Calculated from data in Table (4) by research

D- Evolution of capital investments in agricultural reform cooperative societies:

It is clear from table (6) the development of the capital investments of cooperative societies for agrarian reform during the period (2000-2020), and from it it becomes clear that the capital investments of cooperative societies for agrarian reform fluctuated between increase and decrease, as it reached the lowest in 2003 about 26.3 million pounds, while it reached Its maximum was in 2016, when it was estimated at about 193.8 million pounds, while the general average for the period was about 95.32 million pounds. By studying the equation of the general temporal trend of the capital investments of agrarian reform cooperative societies during the period (2000-2020), it was found from Table (7) that the linear picture is the best fit for the nature of the data, as the results of the statistical analysis showed that the capital investments of agrarian reform cooperative societies are increasing By a statistically significant amount of about 7.9 thousand pounds annually, representing about 8.3%, and the morality of the model as a whole was proven. The adjusted coefficient of determination showed that about 85% of the changes in the capital investments of cooperative societies for agrarian reform are due to the effect of a group of factors whose impact reflects the factor of time.

E - Factors affecting the development of capital in agrarian reform associations:

The results of the statistical analysis of the factors affecting the development of capital in agrarian reform cooperative societies during the study period (2000-2020) show that by increasing the

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number of agrarian reform cooperative societies by one, this leads to an increase in capital in agrarian reform cooperative societies, a statistically significant increase estimated at about 14.7 million pounds. While the increase in the number of contributing members for agrarian reform cooperative societies by one thousand members results in the increase in the capital of the agrarian reform cooperative societies, a statistically significant increase estimated at about 551,000 pounds, or about 551 pounds for each member contributing to the agrarian reform cooperative societies. This leads to an insignificant increase in the capital of the cooperative societies for agrarian reform, a statistically significant decrease estimated at about 52 thousand pounds. Where the statistical significance was fixed at the level of significance 0.01 as was the significance of the model as a whole, and the results showed that about 73% of the changes in the capital in the agrarian reform cooperative societies are due to the changes in the number of the agricultural reform cooperative societies as well as the number of contributing members and the reins.

$$\hat{Y}_i = -1313 + 14.7\, X_{i1} + 0.551\, X_{i2} + 0052 X_{i3}$$

$$(-3.4)^{**} \quad (3.3)^{**} \quad (2.5)^{*} \quad (0.81)$$

$$R^2 = 0.77 \qquad Adj.R^2 = 0.73 \qquad F = 18.88^{**}$$

Where:

$\hat{Y}_i$: The capital of the cooperative societies for agrarian reform is in the million pounds.

X_{i1} : Number of cooperative cooperative societies for agrarian reform.

X_{i2} : Number of members contributing to agrarian reform cooperative societies, in thousand members.

X_{i3} : Take control of the cooperative societies for agrarian reform in a thousand acres.

The capital of the cooperative societies for agrarian reform is in the million pounds.

Source: The results of the statistical analysis of table (6) data using the SPSS program.

The development of cooperative societies for reclaimed lands:

A- Evolution of the number of cooperative societies for reclaimed lands:

Table (8) shows the evolution of the number of cooperative societies for reclaimed lands during the period (2000-2020), and from it it becomes clear that the number of cooperative societies for reclaimed lands fluctuated between increase and decrease, with the lowest in the years (2000-2002) 2003 reaching about 559 societies, while The maximum was in 2017, when it was estimated at about 635 associations, while the general average for the period was about 603 associations. By studying the equation of the general temporal trend of the number of cooperative societies for reclaimed lands during the period (2000-2020), it was found from Table (9) that the linear picture is the best fit for the nature of the data. About 4 associations annually, representing about 0.66%. It was found from the adjusted coefficient of determination that about 70% of the changes in the number of cooperative societies for reclaimed lands are due to the effect of a group of factors whose impact reflects the factor of time.

B- Evolution of the number of members contributing to cooperative societies for reclaimed lands:

Table (8) shows the evolution of the number of members contributing to cooperative societies for reclaimed lands during the period (2000-2020), and from it it becomes clear that the number of contributing members to agricultural cooperative societies has fluctuated between increase and decrease, reaching the lowest in 2001 about 165 thousand members, while its maximum In 2017, it was estimated at about 301,000 members, while the general average for the period was about 265,000 members. By

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studying the equation of the general time trend of the number of members contributing to cooperative societies for reclaimed lands during the period (2000-2020), the results of the statistical analysis in Table (9) showed that the number of members contributing to cooperative societies for reclaimed lands began to increase by a statistically significant amount, amounting to about 5.37 thousand members annually, representing about 2.03%, and the significance of the model as a whole was confirmed. The adjusted coefficient of determination showed that about 59% of the changes in the number of members contributing to cooperative societies for reclaimed lands are due to the effect of a group of factors whose impact reflects time.

Table (8): Evolution of the number of cooperative societies for reclaimed lands, the number of contributing members and the capital during the period (2000-2020)

(Number of Societies: Association, Number of Contributing Members: One thousand members, Zimam: one million feddans, Capital: one million pounds)

Years	Number of Associations	Number of Members	Capital	Area
2000	605	249	1.37	9.3
2001	592	165	1.42	9.2
2002	559	225	1.27	7.1
2003	559	182	1.15	7.2
2004	559	182	1.15	8.5
2005	589	273	1.32	8.5
2006	589	273	1.34	8.5
2007	592	248	1.35	8.6
2008	592	275	1.35	8.6
2009	593	275	1.36	8.6
2010	594	275	1.36	8.6
2011	596	277	1.36	8.6
2012	606	283	1.39	8.6
2013	623	295	1.46	14.2
2014	628	297	1.48	14.2
2015	629	298	1.45	14.3
2016	630	298	1.46	14.3
2017	635	301	1.48	14.3
2018	626	296	1.5	14.1
2019	626	296	1.5	14.1
2020	632	296	1.5	14.1
Average	**603**	**265**	**1.38**	**10.6**

Source: Compiled and calculated from the Central Agency for Public Mobilization and Statistics, Annual Bulletin of Agricultural Cooperative Activity, separate issues.

C- Capital development in cooperative societies for reclaimed lands:

It is clear from table (8) the development of the capital of cooperative societies for reclaimed lands during the period (2000-2020), and from it it becomes clear that the capital of cooperative societies for reclaimed lands fluctuated between increase and decrease, as it reached the lowest in 2002 about 7.1 million pounds, while it reached its maximum in In 2017, it was estimated at about 14.3 million pounds, while the general average for the period was about 10.6 million pounds.

By studying the equation of the general temporal trend of the capital of cooperative societies for reclaimed lands during the period (2000-2020), it was found from Table (9) that the linear picture is the

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best fit for the nature of the data, as the results of the statistical analysis showed that the capital of cooperative societies for reclaimed lands began to increase by a significant amount Statistically, it amounted to about 390 thousand pounds annually, representing about 3.68%, and the significance of the model as a whole was proven. It was found from the adjusted coefficient of determination that about 71% of the changes in the capital of cooperative societies for reclaimed lands are due to the effect of a group of factors whose impact reflects the factor of time.

Table (9): Equations of the general time trend of the number of cooperative societies for reclaimed lands, the number of contributing members and the capital during the period (2000-2020)

Serial	dependent variable	estimated model	R^2	F
1	The number of associations	$\hat{Y}_i = 556.1 + 3.3\ X_i$)**6.6)** (89.5 (	0.69	43.2
2	Number of contributing members (million members)	$\hat{Y}_i = 205.7 + 5.37\ X_i$)** 5.7)** (17.5 (	0.63	32.7
3	capital (one million pound)	$\hat{Y}_i = 6.3 + 0.39\ X_i$ (6.6)**)** 8.6(	0.70	44.1
4	reins (million acres)	$\hat{Y}_i = 1.2 + 0.01\ X_i$ (5.0)**)** 40.2(	0.57	25.1

Where: $\hat{Y}i$: the estimated value of the dependent variable. Xi: the time variable where i = (1, 2, 3, ..., 20).

The value in parentheses indicates the calculated (T) value, (R2) the coefficient of determination, (F) the significance of the model as a whole.

(*)the significance of the regression coefficient at the 0.05 level of significance.

(**)the significance of the regression coefficient at the 0.01 level of significance.

Source: Calculated from data in Table (8) by research.

D - Development of ownership of cooperative societies for reclaimed lands:

It is clear from Table (8) the development of the reins of cooperative societies for reclaimed lands during the period (2000-2020), and from it it becomes clear that the reins of cooperative societies for reclaimed lands fluctuated between increase and decrease, as it reached the lowest in 2004 about 1.15 million acres, while it reached its maximum in 2020. It was estimated at about 1.50 million feddans, while the general average for the period was about 1.38 million feddans.

By studying the general temporal trend equation for the reins of cooperative societies for reclaimed lands during the period (2000-2020), it was found from Table (9) that the linear picture is the best fit for the nature of the data. About 10 thousand feddans annually, representing about 0.72%, and the significance of the model as a whole was proven. It was found from the adjusted coefficient of determination that about 54% of the changes in the ownership of cooperative societies for reclaimed lands are due to the effect of a group of factors whose impact reflects the factor of time.

E - Factors affecting the development of capital in cooperative societies for reclaimed lands:

The results of the statistical analysis of the factors affecting the development of capital in cooperative societies for reclaimed lands during the study period (2000-2020) show that by increasing the number of cooperative societies for reclaimed lands by one society, this leads to an increase in the

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capital of cooperatives for reclaimed lands, a statistically significant increase estimated at about 162 thousand pounds. While the increase in the number of members contributing to the cooperative societies for reclaimed lands by one thousand members, the decrease in the capital of the cooperative societies for reclaimed lands results in a statistically insignificant decrease estimated at about 15 thousand pounds, or about 15 pounds for each member who contributes to the agricultural cooperative societies. This leads to a decrease in the capital of cooperative societies for reclaimed lands, a statistically insignificant decrease estimated at about 9.34 million pounds, and this does not conform to the economic logic.

Where the statistical significance was established at the level of significance of 0.01 as was the significance of the model as a whole, and the results showed that about 82% of the changes in the capital in cooperative societies for reclaimed lands are due to changes in each of the number of cooperative societies for reclaimed lands as well as the number of contributing members and the reins.

$$\hat{Y}_i = \underset{(-5.9)^{**}}{-70.3} + \underset{(4.5)^{**}}{0.162\ X_{i1}} - \underset{(-1.36)}{0.015\ X_{i2}} \underset{(-1.19)}{-9.34\ X_{i3}}$$

$$R^2 = 0.85 \qquad Adj.R^2 = 0.82 \qquad F = 31.4^{**}$$

Where:

$\hat{Y}_i$: The capital of cooperative societies for reclaimed lands is in one million pounds.

X_{i1} : Number of cooperative societies for reclaimed lands.

X_{i2} : The number of members contributing to cooperative societies for reclaimed lands, per thousand members.

X_{i3} : Take the lead in cooperative societies for reclaimed lands in one million acres.

X_{i3} : The capital of cooperative societies for reclaimed lands is in one million pounds.

Source: The results of the statistical analysis of table (8) data using the SPSS program.

Recommendations:

1- The necessity of striving towards raising the efficiency of the agricultural cooperative structure and increasing its effectiveness by increasing the cooperative awareness of farmers.

2- Conducting real elections for the boards of directors of agricultural cooperative societies, while enabling farmers to monitor their performance.

3- Optimizing the capital of agricultural cooperative societies in proportion to the number of contributing members and the areas served.

References:

1. إبراهيم رشاد, مذكرات مجاهد تعاونى, دار التضامن للطباعة والنشر, القاهرة, 1970
2. أحمد عبد القادر عبد الله الجابرى، الآفاق المستقبلية للدور الإنتاجى للتعاونيات فى تطوير وتنمية القطاع الزراعى بجمهورية مصر العربية، رسالة ماجستير، قسم الاقتصاد الزراعى، كلية الزراعة، جامعة الأزهر، 1998.
3. إيمان فريد قادوس، دراسة لتطوير دور التعاونيات الزراعية المصرية في ظل برنامج الإصلاح الاقتصادي بالقطاع الزراعي، رسالة ماجستير، قسم الاقتصاد الزراعي، كلية الزراعة، جامعة عين شمس، 2004.
4. الجهاز المركزى للتعبئة العامة والإحصاء، نشرة النشاط التعاونى بالقطاع الزراعى، أعداد متفرقة.
5. **Jeffrey, W.** Introductory Econometrics': a modern Approach. Masor, Ohio: South – western Cengage Learning**, 2012**.

10.21608/MEAE.2022.281029

6. **Pillai, R.S. and Bagavathi, T.** Statistics Theory andPractices. New York, USA, **2005.**