ENCROACHMENT ON AGRICULTURAL LANDS IN EGYPT: A CASE STUDY IN AN EGYPTIAN VILLAGE.
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Abstract
The main objectives of this study were to: (1) investigate various dimensions of the encroachment problem on agricultural lands, (2) present formal estimates of losses in agricultural lands in Egypt resulting from encroachment, (3) present a case study on encroachment on agricultural lands in an Egyptian village to assess losses in agricultural lands, identify actual cases and areas of clearance of encroachment, identify cases and types of sanctions implemented against individual encroachments, and identify reasons for encroachment by individuals. The study depended on different types of data concerning encroachment on agricultural lands in Egypt at different levels. A case study was conducted in the village of Shoeshai in Menoufiah governorate in the Delta. Data concerning the research problem in this village were gathered through personal visits to the encroachment locations, interviews with different individuals and key informants among people, and agricultural engineers at the agricultural cooperative of the village. Regression analysis was applied to predict losses in agricultural land in the coming ten years. Results showed that there has been great increase in encroachment on agricultural land in Egypt since the 25th of January 2011 revolution. The case study showed that a great increase in encroachment on agricultural land has occurred during the last three years. Great differences were found between formal estimates and actual losses in agricultural land. Greater number of cases and greater losses in agricultural land were predicted. Several reasons for encroachment were identified. Roles of the government and the agricultural extension organization in the country were emphasized.

Keywords: Agricultural land, casestudy, Egypt, Egyptian village, encroachment, urbanization
1. Introduction:
Encroachment on agricultural lands is an important problem in many countries of the world due to the population pressure and industrialization. This problem has been facing Egypt for a long time as it is one of the world’s most densely regions. Its population is estimated to be around 82 millions living on 4% of its total area which is estimated to be one million square kilometer. This means that the population density in Egypt is about 2050 persons per each square kilometer. Egypt’s population has been growing rapidly. It had been doubled for the first time over a period of fifty years between 1897 and 1947. During that period the population had increased from 9.7 million to over 19 million. It had been doubled for the second time over a period of 30 years (between 1947 and 1976), and it had been doubled for the third time during the following thirty years from 1976 to 2006. During that latter period, the population had increased from 36.6 million to 72.8 million. Based on the rate of increase in population, it was estimated to be 79.6 million in January 2011, and over 81 million in January 2012 (Central Agency for Public Mobilization and Statistics, 2011).

Agriculture is an important economic sector in Egypt. The majority of Egypt’s population (57%) are living in rural areas and depend mainly on agriculture. According to the present Ministry of Agriculture of Egypt records, the total cultivated agricultural lands in Egypt is 7.8 million faddan (5.4 million faddan in the old agricultural areas and 2.4 million faddan in the new reclaimed areas). A real pressure on agricultural lands in Egypt has been occurring as a result of population growth and urbanization. Encroachment on agricultural lands is a critical desertification problem that has been facing the successive Egyptian governments. Therefore, timely and accurate information is needed for national planners to identify the real problem of encroachment on agricultural lands and the actual size of losses in these lands.

2. The research problem:
Encroachment on agricultural lands in Egypt has been a major problem facing the successive Egyptian governments during the last few decades. This problem has several dimensions. There are also several reasons and motivations for individual encroachment on agricultural lands. The author noticed that the formal estimates of losses in agricultural lands in Egypt over the last 30 years due to encroachment were under estimated and far below reality. Meanwhile, the formal estimates of clearance of areas of agricultural lands encroached on were over estimated and far above reality. Accordingly, the actual losses in agricultural lands could greatly exceed these formal estimates, and the actual figures of clearance of areas of agricultural lands encroached on could be far below the formal estimates. The author also
observed that there are many agricultural laws and legislations issued for agricultural lands protection in Egypt but they are not effective. The current agricultural laws and legislations still permit building on agricultural land but under certain conditions. The required conditions for issuing licenses for building on agricultural lands have not been adopted. In addition, no sanctions have been made so far against individuals for their encroachment on agricultural lands. All these factors encourage individuals for more and more encroachment on agricultural lands and make the problem more complicated.

3. Objectives:
The aim of this study is to investigate the above issues through achieving the following objectives:

First: Investigate various dimensions of the encroachment problem on agricultural lands in Egypt.

Second: Present formal estimates of losses in agricultural lands in Egypt resulting from individual encroachment on these lands.

Third: Present a case study on encroachment on agricultural lands in the village of Shoeshai in Menoufiah governorate, Egypt in order to:

(a) Assess losses in agricultural lands resulting from encroachment on agricultural lands in this village during the last 25 years, and predict this phenomenon in the village in the next ten years.

(b) Identify actual implemented cases and areas of clearance of encroachment on agricultural lands.

(c) Identify cases and types of sanctions, if there has been any, implemented against individual encroachments in the village.

(d) Identify reasons for encroachment on agricultural lands among people in this village.

4. Methodology:
In order to achieve the objectives of this study, data concerning encroachment on agricultural lands in Egypt at the national level were obtained from records at the Central Administration for Agricultural Lands Protection at the Ministry of Agriculture in Cairo. The data obtained from this source are concerning different agricultural laws and legislations issued for agricultural lands protection, and areas converted to buildings in the country during the period from 1983 to present according to formal estimates.
A case study was conducted on the village of Shoeshai in Menoufiah governorate. This is the author’s village where he was born and brought up. He knows its people well and keeps good relationships with them. This enabled him to collect necessary data for this study. The data gathered on this village were concerning areas converted to buildings, the results of the application of agricultural laws against individual encroachment on agricultural lands, and reasons for encroachment. These data were collected through personal visits to the encroachment locations, interviews with different individuals, key informants among people, and agricultural engineers and the head of the agricultural cooperative of the village. The author was able to gather data on individual encroachment on agricultural lands in Shoeshi during the periods 1989 – 2013. Regression analysis was applied on these data to predict encroachment on agricultural land in the village in the next ten years.

To make more realistic estimates of areas of agricultural lands converted to buildings, a different approach was adopted. This approach was based on personal assessment of agricultural engineers of the areas encroached on in the village. Field visits were made to the encroachment locations to assess actual areas utilized for buildings. These two estimates of areas converted to buildings in Shoeshai (formal or recorded areas and agricultural engineers’ assessment) during the period 1989 – 2013 were compared. The technique of regression analysis was applied to make future prediction of encroachment on agricultural land of the village using SPSS.

5. Review of literature:

Researchers have dealt with the problem of encroachment on agricultural land in different parts of the world. In the USA, Vining, et. al. (1977) investigated the possibility that the amount of land lost to urbanization might be predominantly land that was ideal for agriculture, or prime farmland, which was highly limited in supply. They also investigated the rate of loss of prime farm land to urbanization. They revealed that prime farm land would be more likely to be urbanized than other land. Dillman and Cousins in their study in 1982 confirmed Vining, et. al’s tentative hypothesis that urban development is selective of the prime agricultural land within counties (Dillman and Cousins, 1982).

In Canada, Hofmann (2005) found that urban expansion has devoured a large amount of Canada’s best agricultural land over the last few decades. She also found that although the area of cultivated land in Canada had grown by one – fifth between 1991 and 2001, the amount of available dependable agricultural land had declined by 4 %. This situation has forced farmers to cultivate lower quality land which is often unsuitable for stable, long term
agricultural production in addition to harm environmental effects occurred (Hoffman, 2005). In the greater Vancouver in Canada, tension existed where urbanization encroached onto agricultural land. Condon, et. al. (2010) emphasized the need for land use plans and public policies to encourage and enhance agriculture. Brouwers (2009) emphasized that 94% of Canada’s lands are unsuitable for farming and only a small percentage of suitable lands (0.5%) is designated as class 1. She reported that 14,000 square kilometers of best agricultural land in Canada had been lost to urban uses.

In Puerto Rico, Lopez, et. al. (2001) found that over 17 years (from 1977 to 1994), urban areas had increased from 11.3 % to 24.4 %, and that urban growth on agricultural lands had increased by 41.6 % which caused a loss of 6 % of potential agricultural lands. They assured that if this pattern of encroachment by urban growth on farm lands continued, Puerto Rico’s potential for food production in the future could be greatly limited.

In China, Yeh and Li (1999) found that the loss of valuable agricultural lands by the encroachment of urban development in the Pearl River Delta region was very severe, and that agricultural land loss had been much aggregated by land speculation and related to other economic factors. It was concluded that there was an urgent need to develop a sustainable land development strategy to protect the fertile agricultural land from further necessary losses. Skinner, et. al. (2001) examined the relationship between the evolution of local government structures and practices and implementation of agricultural land protection policies in Zhejiang Province in China. They found that despite the development of a comprehensive legal frame work for agricultural land protection, the interpretation of policy at local levels continues to permit the loss of agricultural land to be traded – off against increased economic growth. This suggested a need to re-evaluate the role of local levels of government in China with respect to agricultural land protection issue; to look as much at the ways policies are implemented as at policies themselves.

In Australia, Kelleher (2001) investigated urban encroachment and loss of prime agricultural land and found that potential existed for substantial future land losses from agriculture in some local government areas due to urban or rural residential encroachment on prime agricultural land.

In Turkey, Doygun (2009) estimated the areal loss of olive groves due to urban sprawl of the city of Kahramanmaras. Results revealed that the area of olive groves decreased by 25% over the period 1985 to 2006 while the number of parcels increased from 170 to 445. Most of the total area loss was due to building construction. The paper emphasized an urgent need to (1) revise the national and municipal land management practices, (2) balance the gap between the
short and long term economic benefits that urban and community development plans ignore, and (3) monitor land use changes periodically.

In Nigeria, Adeboyejo and Abolade (2009) examined household responses to urban encroachment on the rural hinterland in the Ogbomoso city in S. W. Nigeria. They found that over a period of 90 years between 1914 and 2007, a total of 2,890 hectares of rural land was engulfed due to the city expansion and encroachment on fertile agricultural land. They suggested—among other things—that specific policies and programs need to be implemented to discourage further encroachment into peri-urban areas. Fapajuwo, et. al. (2012) found in their study on the adoption of soil conservation techniques among farmers in South West Nigeria that urbanization was regarded as a very serious constraint to the adoption of soil conservation techniques by most farmers included in their study.

In Egypt, Choucri in her article (2012) emphasized the limitation of agricultural fertile lands in Egypt, and that laws and legislations do not prohibit land owners from building on their lands with certain limits. She also emphasized the limitations of using the villages’ boundaries desert for construction and the importance of land reclamation for compensating the loss of agricultural lands. Elnaggar, et. al. (2006) in their Cairo case study report, pointed out that over the last 40 years, the prohibition and control of informal urbanization on agricultural lands did not work in the past. They emphasized the need for proper alternatives for poor and low-income families. They also emphasized that incentives could guide urbanization to desert lands in future. Fahim, et. al. (1999) stated that the expansion of urban centres onto productive agricultural lands has been a critical desertification problem facing the Egyptian government. They found that the rate of urban expansion and corresponding loss of agricultural lands evaluated for two cities in the Nile Delta during the more recent period 1987 - 1995 was much greater than it was during the earlier period 1950 – 1987. They emphasized the need for a scientifically gathered database to provide reliable information on the state of agricultural lands in Egypt.

6. Dimensions of encroachment on agricultural lands:

These dimensions can be viewed as follows:

(1) Social and socio-psychological dimension:

There are many aspects of social and socio-psychological nature related to the encroachment problem on agricultural lands. Of these are: the farmer’s need to better housing conditions, the farmer’s need for a bigger house due to his family rapid growth, and the farmer’s need for an independent house for a married son.
(2) Economic dimension:

The economic dimension of this problem can be viewed in two different ways: the individual interest and the national interest. At the individual level, the increasing demand for building lands has led to a tremendous increase in the prices of agricultural lands surrounding the boundaries of the village buildings. Some farmers who own lands close to village buildings tend to sell their lands at higher prices and buy land in different geographic locations at lower prices. Farmers can make great profits from this type of trade off. They may buy a larger area of agricultural land or utilize these profits in building new houses on their lands as well. At the national level, the losses in the area of agricultural land will greatly affect the total agricultural production of the country which imports large proportions of its people requirements from agricultural products. This problem also affects agricultural sustainability in Egypt due to its serious impact on the ability of future generations to obtain their requirements of agricultural products.

(3) Educational dimension:

The first technique proposed by Daga (2012) to protect land resources is education. The agricultural extension system has a great role to play to preserve land resources. This role can be played effectively if, and only if, alternative solutions to housing problems are made available to rural people. Some officials suggested vertical expansion of construction as a solution to this problem. But the author believes that this is not a practical solution particularly for farmers in Egypt. However, it may be a good solution for employees. Whenever practical alternatives are made available to rural people, the agricultural extension system can play an effective role in this area of land protection.

(4) Legislation dimension:

Several laws and legislations have been issued to protect agricultural lands in Egypt. The first law was issued in 1966 (No. 53) to prevent any operations affecting soil fertility. In 1983, the decree No. 116 was issued to modify the previous law in order to prevent building on agricultural land in addition to leaving lands uncultivated and erosion. In 1985, the decree No. 2 was issued also to modify the decree No. 116 issued in the year 1983 to be applied on any kind of misuse of agricultural lands or implementing any action affecting soil fertility. A financial sanction was determined against any encroachment ranging from 500 L.E. as a minimum and 10,000 L.E. as a maximum fine, in addition to some other compulsory actions to return the encroachment on land to agricultural utilization.

In 1996, the prime Minster as a Deputy of the Military Governor issued his decision to add the sanction of jail between two years as a minimum and five years as a maximum, in
addition to other actions to return the encroachment on land to agricultural utilization. However, at the present time, the law No. 2 issued in the year 1985 is applied. Provided that alternatives are made available, encroachment on agricultural lands must be prohibited by not only setting up laws and legislations, but also adopting these laws and legislations with severe sanctions against individual encroachments. Without effective and adopted laws and legislations, the problem of encroachment on agricultural lands can’t be avoided.

(5) Judicial dimension:
According to laws and legislations, sanctions must be implemented against any deviancy. The court should play its role effectively - again- provided that alternatives are made available. There should be quick and severe sanctions against individual encroachment. This issue should be given priority by the court over any other issues.

(6) Political dimension:
The domination of political corruption had encouraged people for encroachment on agricultural lands. People usually exploit the pre-election periods to get illegal permission for their encroachment. Unless the laws and legislations were implemented, there will be no way to preserve our agricultural lands.

(7) Administrative dimension:
The domination of administrative corruption at all levels had also encouraged people for encroachment on agricultural lands. Some people try to get illegal approvals through some corrupted officials. Again, unless the laws and legislations were implemented promptly, there will be no way to preserve our agricultural lands.

(8) Environmental dimension:
The encroachment on agricultural lands has several environmental impacts. It causes land desertification. It has harm impact on agricultural sustainability and limited land resources.

(9) Statistical dimension:
It is necessary that accurate, correct and complete information on agricultural lands are made available to planners and decision makers. Formal estimates of losses due to individual encroachment must reflect the reality. Underestimation of losses in agricultural lands and overestimation of removals or clearances may satisfy officials at upper levels but will never help the decision maker to take the right decision to avoid such problem.
7. Results:

Results of this study can be presented as follows:

7.1 Encroachment on agricultural lands by individuals in Egypt:

According to formal estimates, the total area of agricultural land encroached on by individuals in Egypt during the period 1983 to the 2nd of September 2013 was 193606.3 faddan(1). The total area of cases recorded to be cleared was 103896.6 faddan or 53.7% of the total encroachments. According to formal estimates too, the total area of agricultural land encroached on in the country during the period 25th of January 2011 to the 2nd of September 2013 was 35608 faddan, and the total area recorded to be cleared was 4744.7 faddan or 13.3% only of the total area of land encroached on during the same period (Table 1).

The area of land encroached on during the period 25/1/2011 – 2/9/2013 represent 18.4% of the total area of encroachment during the period 1983 – 2/9/2013. The yearly average area of land encroached on has increased from 5851.8 faddan during the period 1983 – 25/1/2011 to 13695.4 faddan during the period 25/1/2011 until present. This dramatic increase in encroachment on agricultural land since the 25th of January 2011 has been due to the lawlessness situation which dominated the country during and after the 25th of January 201 revolution.

In addition, there have been different types of legal encroachment. The most important of these are:

(a) Implementing infrastructure projects and projects for public interest such as schools, religious institutes, health units, drinking water stations, …, etc.
(b) Permitted licenses issued to different people to construct houses and different kinds of agricultural and nonagricultural projects.
(c) New spatial mapping of the Egyptian villages or expansion of village buildings’ boundaries which caused great losses in agricultural lands in Egypt. Data concerning this matter could not be obtained since these expansions and new spatial mapping - as stated by officials at the Ministry of Agriculture - were made by the Ministry of Housing and Construction and were not available for the whole country.

The author believes that these estimates are far below the reality. According to some local press reports, the areas encroached on in the country reached about one million faddan of agricultural lands. The case study results will help understanding this issue.
7.2 Case study results:

As stated in the methodology, a case study was conducted in the village of Shoeshai in Ashmoon district, Menoofiah governorate in the Delta. The total area of agricultural lands of Shoeshai was 1267 faddan (One faddan = 4200 m\(^2\)) held by 1414 farmers with an average size of holding of 0.9 faddan. The results of this case study can be presented as follows:

7.2.1 Losses in agricultural lands in Shoeshai:

The total losses in agricultural lands in Shoeshay due to individual encroachment without license during the period 1989 – 2013 was 22.3 faddan according to formal or recorded estimates of these areas. But these losses were estimated to be 45.8 faddan or over two folds of the recorded areas according to agricultural engineers’ assessment (Table 2). This means that the actual losses in agricultural lands due to encroachment could greatly exceed the formal or recorded estimates.

In addition to these losses due to individual encroachment on agricultural lands without license, there have been two other kinds of losses. The first was resulted from encroachment with license which was recorded during the period 2005 – 2012 only, and was estimated to be 2.5 and 4.5 faddan according to formal estimates and the agricultural engineers’ assessment respectively. The second type of losses was that resulted from new spatial mapping of the village in 2006 which was estimated to be 16 faddan. Accordingly, the total losses in agricultural lands of Shoeshai village during the period 1989 to June 2013 was 40.8 faddan (3.2% of the total cultivated land of the village) according to formal estimates, and 66.3 faddan (5.2% of the total cultivated land of the village) according to agricultural engineers’ assessment (Table 3). There are other areas which were not included in these estimates due to missing data, unrecorded cases, waste land which left uncultivated for the sake of private interest, and the legal encroachment for public interest (schools and religious institutes) which would increase the actual losses in agricultural lands of the village.

The results of this case study showed that great proportions of the total number of cases of encroachment and the areas encroached on have occurred during the last 3.5 years. The majority of encroachment cases (56% of numbers and around 65% of areas) have occurred during the last 3.3 years (from 25/1/2011 – 11/6/2013. This dramatic increase in encroachment during this period could be due to the 2010 parliament election in 2010, and
the lawlessness situation which dominated the country during and after the 25th of January 2011 revolution.

In order to predict encroachment on agricultural land in the village of Shoeshai during the next ten years, regression analysis was applied on the data shown in Table 2. A nonlinear regression function was adopted since the straight line was not sufficed. The following simple quadratic equation was applied (Hoel and Jessen, 1982: 336):

\[ Y = b_0 + b_1 x + b_2 x^2 \]

A summary of the results of this analysis is given in Table 4. \( R^2 \) was 0.61 for number of cases and 0.57 for areas of losses in agricultural land. F and t tests were highly significant. The predicted number of cases of encroachment in the next five years was found to be about 267 and would increase to be 427 in the next ten years. The predicted area of losses in agricultural land was found to be 6.9 faddan in the next five years and would increase to be 11.1 faddan in the next ten years.

The results of this case study are consistent with the data on encroachment presented at the national level which showed dramatic increase of encroachment occurring since the 25th of January 2011 revolution.

These results of the case study also showed the absence of any encroachment in 1997 and 1998 in the village which might be due to the fear from the military governor order issued in 1996. The agricultural engineers’ estimates of areas of agricultural lands encroached on in the village exceeded two folds of formal or recorded estimates of these areas (Table 2).

7.2.2 Implementation of laws and legislations:

In order to explain how laws and legislations are implemented against encroachment, it should be indicated that the cultivated agricultural lands of any village are divided among agricultural engineers of the village who are responsible for agricultural lands protection. The agricultural engineer must record any encroachment on agricultural land belonging to him and inform the director of the agricultural co-operative who in turn must make an official record of the encroachment case and transfer it to the district agricultural administration. The district agricultural administration should give a formal notice to the police station of the district which belongs to the Ministry of Interior. Based upon this, a combined force composed of representatives of the district agricultural administration, the district police station and the local unit which belongs to the Ministry of Local Development accompanied with the director of the village agricultural co-operative should go to the field location and
clear the encroachment. The encroachment case must be transferred to the Court to apply the law and take its final decision against it.

With regard to issuing licenses for building on agricultural lands, the agricultural laws still permit land owners to obtain such licenses with certain limits and under certain conditions. The conditions for building houses are: (1) The farmer must hold an area of five faddans at least of agricultural land, (2) That holding should have been stable for three years, (3) The license is issued to use an area of 100 square meter for each five faddans for building a house with a maximum area of 250 square meter, and (4) A proof that the farmer doesn’t have a house in the district must be submitted with the request documents. To obtain a license for building stores for farm equipment and materials, another condition should be added, that is the building should not exceed one floor and according to submitted drawers. To obtain a license for building a cooler to keep agricultural products, the size of agricultural land holding for the farmer should not be less than ten faddans. These conditions have not been applied since they were set up because of the existing corruption which dominated different agencies of the country in the last few decades.

The case study undertaken on the village of Shoeshai revealed at two important results. The first was that all encroachment buildings were completed and the agricultural land encroached on never returned back for agricultural utilization. No one single case of the above encroachments in the village has been cleared and returned back for agricultural utilization. The second was that no sanctions of any kind (fine or jail) against any encroachment case was decided and implemented by the Court for any encroachment case in the village until present. Licenses for building on agricultural lands are sometimes issued in spite of all legal restrictions.

In the light of what normally happens? Could one expect an end to such encroachment on agricultural lands under the absence of the application of effective laws and legislations?

7.3 Reasons for individual encroachment on agricultural lands:

The most important reasons for encroachment on agricultural lands were identified from the author’s experience, his meetings and discussions with different people in the village and other villages, and his meetings and discussions with different agricultural officials and engineers at different levels. These reasons can be summarized as follows:

(1) The need for a bigger house:

The main reason for individual encroachment on agricultural lands is the need for a bigger house to accommodate the increasing number of family members due to population growth.
The rapid and continues increasing number of family members makes it difficult for families to continue living in the same houses. When sons get older and reach the marriage age, families face a real problem. The old houses could not accommodate all family members. A farmer who left his old house and built a new one on his agricultural land said: “Our old house could no longer accommodate all family members. We are now seven or eight persons. How could we live in that small house? We own a piece of agricultural land and could build a bigger one on our land”.

(2) The need for an independent house for a married son:

Egyptian rural people always prefer to keep their sons living with them in the same house as a compound family. But sometimes family dispute or conflict prevents most families from achieving this objective. Conflict between the son’s wife and her mother in law always occurs. Conflict between different generations, fathers and mothers on one side, and sons and their wives on the other always occurs. This problem becomes more complex if two or three sons got married and all lived in the same house. They can’t get along with each other for a long time. Sooner or later conflict occurs and sons have to move to live independently from their families. These are some statements of what farmers said: A farmer whose son got married and convinced his son to remain in the same house said: “My son who is a university graduate and was appointed to work as a teacher in a nearby village, got married. He and his wife who is a teacher too lived with us in the same house. They couldn’t stay more than six months due to our family dispute. My son left the house and rented a small flat in a nearby village. I had to build a separate house on my agricultural land to keep him with us in our village, it is not easy for us to let him renting a small flat in another village.” This could happen to many people in any village who owns agricultural land and can afford for constructing new houses.

(3) The need for better housing conditions:

Old houses in the Egyptian villages were built using mud brakes. Most houses are windowless and lack proper housing conditions. Some people left their old houses and built new houses on their agricultural lands. When discussing with some of them to know their reasons and motivations, a farmer was living in a small old house in the central crowd part of Shoeshay village left his old house and built a new one on his agricultural land said: “We suffered from very low housing conditions. We moved to live on our field where we enjoy better housing conditions, and where we find wider space and our children have bigger areas to play”. Another farmer who sold one faddan of his agricultural land to build a house on another piece of his agricultural land close to the village boundaries said: “The house for me
is more valuable than one faddan of agricultural land”. He asked: “Don’t you agree with me on that? Which is better: “having one faddan of agricultural land or living in a good house? He added: “I believe that a good house is far better”.

(4) The need to achieve economic profit:
Farmers who own agricultural lands in areas surrounding the village buildings might be willing to sell their lands for buildings at high prices and buy bigger areas of other lands far from the village at lower prices. The prices of lands sold for buildings could be four or five times as much as the prices of other lands. Farmers can make great profit from this trade off process. Some farmers may make this trade off process and buy similar area of the other cheaper land in order to save money to construct new houses or utilize it for some other purposes.

(5) Ineffective application of conditions for issuing licenses for building on agricultural lands encouraged many people to convert their lands to non-agricultural uses.

(6) Ineffective application of sanctions against encroachment.

(7) The availability of cash money needed for construction:
Some people have liquid money achieved from savings, agricultural production, trade, and working in some Gulf countries. Those people can afford for constructing new houses. They are ready to buy a piece of agricultural land close to the village buildings even at high prices in order to construct more reasonable houses. This is very common among rural people in Egypt.

(8) The need to save time and effort:
Working in agriculture is completely different from working in any other job or profession. Farmers have to go to their fields early in the morning taking their animals with them to carry out and implement different farming operations and activities. Some activities need to transfer things, products, and materials from houses to fields and vice versa. At the time of sun set, they come back with their animals to their houses. These activities need much time and effort. Some farmers reported that they preferred to move and build new houses on their agricultural lands to save time and effort.

(9) The availability of electricity:
To improve standard levels of rural people, the successive Egyptian governments had been trying since the early sixtieth to provide rural areas with pure drinking water and electricity. The pure drinking water station was built in Shoeshay village in the early sixtieth. But electricity was provided in the late sixtieth and early seventieth. The expansion of the provision of electricity had been made over time to cover all main roads surrounding these
villages. These changes encouraged many farmers to leave old houses and move to build new houses on their fields. A farmer interviewed said: “there is no problem with electricity, it is available, no problem with drinking water, even if it was not available, we can obtain it by using a manual underground water pump”.

Conclusion:
At the national level, the problem of encroachment on agricultural lands in Egypt is very serious. Accurate information is not available. There has been underestimation of areas encroached on, non-adoptions of legislations and laws and the absence of any kind of sanctions against previous cases of encroachment.

The current situation in the village of Shoeshai is not different. There has been a fast rate of encroachment on agricultural lands particularly during the last three years. As the author observed, many people decided to sell their houses in the residential area and move to construct new houses on agricultural lands for several reasons. This situation has led to an unbelievable increase in the prices of agricultural lands particularly of lands along the main roads. The situation in other villages is not dissimilar from the situation in Shoeshi village. If this problem remains unsolved, great losses in agricultural lands will occur and will certainly have a dangerous impact on the limited agricultural lands in Egypt.

The Egyptian government must put an end to this problem. This can’t be achieved unless the government provides proper alternatives to people. The only possible alternative is to establish new communities in the desert areas (agricultural or non-agricultural communities). All necessary infrastructure goods and services should be made available in these new communities. Attractive job opportunities, proper means for transportation and communication facilities should be provided. If, and only if, the government could provide this alternative, then efforts are needed to encourage people particularly youth to move to settle in these new communities. If the government succeeded in achieving this, then she could apply the following procedures:

First: Implement the military governor order issued in 1996, or alternatively, establish a military agency for agricultural lands protection.

Second: Establish a special Court to deal with all previous encroachments on agricultural lands in the country in order to take severe and quick decisions against encroachment and implement these decisions.
References:


Table 1: Number of cases, areas encroached on, and removals in Egypt during the period 1983 – 2013

<table>
<thead>
<tr>
<th>Period</th>
<th>Length of period (years)</th>
<th>Encroachment</th>
<th>Removals</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>No. of cases</td>
<td>Area (Faddan)</td>
</tr>
<tr>
<td>1983 – 25/1/2011</td>
<td>27</td>
<td>417334 (2)</td>
<td>157998.3 (81.6%)</td>
</tr>
<tr>
<td>25/1/2011 – 2/9/2013</td>
<td>2.6</td>
<td>832662</td>
<td>35608 (18.4%)</td>
</tr>
<tr>
<td>Total</td>
<td>29.6</td>
<td>1249996 (3)</td>
<td>193606.3 (100.0%)</td>
</tr>
</tbody>
</table>

(1) One faddan = 4200 m²
(2) These figures include the number of cases recorded from 1/10/2003 – 25/1/2011 only.
(3) These figures include the number of cases recorded from 1/10/2003 – 2/9/2013 only.
Source: Calculated from data collected from the Central Administration for Agricultural Lands Protection, Ministry of Agriculture, Cairo.
Table 2: Estimates of encroachment on agricultural lands in Shoeshi village during the period 1989 - 2013

<table>
<thead>
<tr>
<th>Year</th>
<th>No. of cases</th>
<th>Area (m²)</th>
<th>Formal estimates</th>
<th>Agric. Engineers’ assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1989</td>
<td>40</td>
<td>2591</td>
<td></td>
<td>5960</td>
</tr>
<tr>
<td>1990</td>
<td>34</td>
<td>2969</td>
<td></td>
<td>5782</td>
</tr>
<tr>
<td>1991</td>
<td>27</td>
<td>2321</td>
<td></td>
<td>4699</td>
</tr>
<tr>
<td>1992</td>
<td>29</td>
<td>2776</td>
<td></td>
<td>6131</td>
</tr>
<tr>
<td>1993</td>
<td>25</td>
<td>2366</td>
<td></td>
<td>5266</td>
</tr>
<tr>
<td>1994</td>
<td>23</td>
<td>2341</td>
<td></td>
<td>5048</td>
</tr>
<tr>
<td>1995</td>
<td>10</td>
<td>967</td>
<td></td>
<td>2013</td>
</tr>
<tr>
<td>1996</td>
<td>8</td>
<td>939</td>
<td></td>
<td>2100</td>
</tr>
<tr>
<td>1997</td>
<td>13</td>
<td>1351</td>
<td></td>
<td>2772</td>
</tr>
<tr>
<td>2000</td>
<td>10</td>
<td>943</td>
<td></td>
<td>2247</td>
</tr>
<tr>
<td>2001</td>
<td>16</td>
<td>1698</td>
<td></td>
<td>3329</td>
</tr>
<tr>
<td>2002</td>
<td>51</td>
<td>2861</td>
<td></td>
<td>7541</td>
</tr>
<tr>
<td>2003</td>
<td>26</td>
<td>1480</td>
<td></td>
<td>4469</td>
</tr>
<tr>
<td>2004</td>
<td>12</td>
<td>858</td>
<td></td>
<td>2015</td>
</tr>
<tr>
<td>2005</td>
<td>31</td>
<td>2533</td>
<td></td>
<td>4910</td>
</tr>
<tr>
<td>2006</td>
<td>17</td>
<td>1132</td>
<td></td>
<td>3242</td>
</tr>
<tr>
<td>2007</td>
<td>38</td>
<td>1862</td>
<td></td>
<td>5085</td>
</tr>
<tr>
<td>2008</td>
<td>14</td>
<td>985</td>
<td></td>
<td>2629</td>
</tr>
<tr>
<td>2009</td>
<td>2</td>
<td>120</td>
<td></td>
<td>350</td>
</tr>
<tr>
<td>2010</td>
<td>150</td>
<td>14367</td>
<td></td>
<td>26370</td>
</tr>
<tr>
<td>2011</td>
<td>134</td>
<td>13071</td>
<td></td>
<td>24370</td>
</tr>
<tr>
<td>2012</td>
<td>211</td>
<td>25861</td>
<td></td>
<td>36192</td>
</tr>
<tr>
<td>2013 (1/1/ - 30/6/ 2013)</td>
<td>47</td>
<td>7447</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total cases</td>
<td>968</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total area (m²)</td>
<td>93839</td>
<td>192382</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total area (faddan)</td>
<td>22.3</td>
<td>45.8</td>
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<td></td>
</tr>
</tbody>
</table>

Source: Data collected from records of the agricultural cooperative association of the village.
Table 3: Total areas converted to buildings in Shoeshai village, Ashmoon district, Menofiah Governorate, Egypt during the period 1989–2013

<table>
<thead>
<tr>
<th>Type of encroachment</th>
<th>Shoeshi village</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. of cases</td>
</tr>
<tr>
<td></td>
<td>Formal</td>
</tr>
<tr>
<td>Buildings without license (1989 – 2013)</td>
<td>968</td>
</tr>
<tr>
<td>Buildings with license (2005 – 2011)</td>
<td>76</td>
</tr>
<tr>
<td>New spatial mapping (2006)</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>1044</td>
</tr>
</tbody>
</table>

Sources:

(1) Table 2
(2) The agricultural cooperative association of the village.

Table 4: A Summary of regression analysis results

<table>
<thead>
<tr>
<th>Item</th>
<th>Variables</th>
<th>$R^2$</th>
<th>Un-standardized coefficients</th>
<th>Standardized coefficients</th>
<th>t</th>
<th>Sig.</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. of cases</td>
<td>Constant</td>
<td>0.61</td>
<td>73.09</td>
<td>-14.98</td>
<td>21.55</td>
<td>3.39</td>
<td>0.003</td>
<td>19.28</td>
</tr>
<tr>
<td></td>
<td>T</td>
<td></td>
<td>-14.98</td>
<td>3.97</td>
<td>0.15</td>
<td>-2.038</td>
<td>-3.77</td>
<td>0.001</td>
</tr>
<tr>
<td></td>
<td>$T^2$</td>
<td></td>
<td>0.75</td>
<td>0.15</td>
<td></td>
<td>2.618</td>
<td>4.85</td>
<td>0.000</td>
</tr>
<tr>
<td>Area (m$^2$)</td>
<td>Constant</td>
<td>0.57</td>
<td>7542.09</td>
<td>-1674.30</td>
<td>2580.33</td>
<td>2.92</td>
<td>0.008</td>
<td>16.45</td>
</tr>
<tr>
<td></td>
<td>T</td>
<td></td>
<td>-1674.30</td>
<td>475.57</td>
<td>-2.00</td>
<td>-3.52</td>
<td>0.002</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$T^2$</td>
<td></td>
<td>83.18</td>
<td>18.47</td>
<td>2.56</td>
<td>4.50</td>
<td>0.000</td>
<td></td>
</tr>
</tbody>
</table>

Source: Calculated from data in Table 2.