

# Poverty and Land Degradation:

## Prospects and Constraints for Sustainable Land Use in Rural Egypt

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### 1. Abstract

In contemporary Egypt land is scarce, water very scarce but the country is relatively rich in population. The current arable land/man ratio is less than 500m<sup>2</sup> / man. More than 90% of the Egyptian farmers are typically small farmers with holdings of less than two hectares. The absolute majority are having very limited human capital in terms of health, education, extension, information etc. In such a situation, human pressures on the limited resource base are unavoidable and sustainability is doubtful. Therefore, land degradation problems in Egypt are serious and far-reaching. They are related to the climate, but they have also an intimate link with the conditions under which small Egyptian farmers have to live and work.

Among scientists and practitioners, there is near consensus that poverty and resources conservation are in conflict. This fact has to be admitted by policy makers to find a way out of the vicious circle of cause and effect that involves poverty and resources degradation.

Through several agro-socio-economic surveys involving some 1000 small Egyptian farmers, this paper discusses the socio-economic, cultural, institutional and legal aspects of land use and land degradation in Egypt. It describes the accessibility of these farmers to resources and services, their response to their poor income situation and the options they have in conserving their limited land resources for future generations. Policy implications of these conditions to improve the sustainability of small Egyptian farmers are also discussed.

### 2. Introduction

Contemporary Egypt is land scarce, water scarce, but very rich in population. More than 90% of the Egyptian farmers are typically small farmers with holdings less than two hectares. Poverty, ignorance, chronic and other diseases, the climate and the "Government" are all aligned against the small farmers. These farmers are really poor. Of course, their poverty has a lot to do with their way, and the options they have, in using and managing their resources.

Poverty is not only unfair and inhumane, as was repeatedly said. What is even worse is that poverty creates more poverty and destroys the productive capacity of any society. It is well known that poverty is the main factor responsible for uncontrolled population growth. This in turn creates unavoidable destructive pressure on the limited (often fragile) land resources.

Desertification problems in Egypt are serious and far-reaching in terms of the area affected and the millions of people who suffer the consequences. These problems are related to the climate, but they have also an intimate link with the conditions under which the small Egyptian farmers have to live and work.

Bureaucrats and some other people like to blame the farmers for not being able to conserve their land. The farmers, on the other hand, blame the government institutions that they think are useless if not harmful. This approach does not solve the problems, but makes them worse and more complicated. The practical approach lies perhaps in trying to find a way out of the vicious circle of cause and effect that involves poverty, and resources degradation.

From the results of surveys involving some 1000 small Egyptian farmers, this paper discusses the socio-economic, cultural and institutional aspects of land degradation in Egypt. It describes how the small farmers respond to their poor income situation and the options they have for conserving their limited land resources for future generations.

The data and information included in this paper are derived mainly either from previous documents and from intensive field observations and studies carried out in Egypt over the last 20 years. Results of questionnaires and in-depth interviews, group meetings and case studies carried out by the author and his co-workers involving more than 1000 farmers in Middle Egypt were also used. (Kishk and Baily, 1988; Kishk et al, 1988; Ibrahim et al, 1993 and Kishk, 1993a).

### **3. The Issue**

In the vicious circle that involves poverty and resources degradation, the fallacy of confusing cause and effect is quite common particularly among technicians and policy makers. It is important, therefore, to answer a basic question: which comes first, poverty, or land degradation? Of course, land degradation problems spread poverty to more people in the affected areas and to new ones. On the other hand, however, anti-desertification measures in poor nations have failed so far and the desertification process has been dramatically accelerated almost everywhere.

In this context, some people like to analyze the situation and jump to the conclusion that, in one way or another, "the poor deserve what happens to them". It is not usual that this is said in such a frank way; nevertheless, it is the official view adopted by the policy makers who fail to achieve sustainable development for their people.

Governments in poor countries are too busy - dealing with many urgent problems- to remember soil and water conservation. So, they tend to blame the poor farmers for not taking enough conservation measures. The basic question, given the present circumstances of the small poor farmers is: Can they? My plain straight answer is : they cannot. The issue then is that there is a simple and plain fact that should be admitted: resources conservation and poverty are in conflict.

In the following, I shall give some examples which are not exclusive, but I hope will be enough to support the point this paper intends to make.

#### **3.1 Land, Water, People and Food in Egypt**

Mainly because of the scarcity of water, arable land in Egypt was always limited. It was enough, nevertheless, to feed the Egyptian population with some exports until the forties. Slightly in the fifties, modestly in the sixties, alarming and dangerous

since the seventies, Egypt became a net food importer and lost its self-sufficiency that lasted for centuries. Table (1) summarizes the situation. As can be seen, the land / man and the water/ man ratios are steadily declining and the food gap is widening. The situation has reached crisis proportions and it has many serious consequences. Apart from economic and political dependence and the alarming social unrest always following poverty, human pressures on the limited resource base are expected to be tremendous. Agricultural production practices became more intensive (2 crops a year, the second crop is usually sown before the first one is harvested, the haphazard use of huge amounts of chemicals, the promotion of high yielding varieties ...etc.)

**Table (1) Population, Land, Water and Food Gap in Egypt (1800-1990)**

Year	Population (millions)	Land/man fed*/ person	Water/man m <sup>3</sup> /person	Food gap	
				Million ton	Million \$
1800	2.00	1.00	na	--	--
1850	4.60	0.87	na	--	--
1897	9.70	0.51	5084	--	--
1907	11.20	0.48	4414	--	--
1927	14.20	0.39	3484	--	--
1937	15.90	0.33	3484	--	--
1947	19.00	0.31	2604	--	--
1960	26.10	0.23	1893	1.3	150
1970	33.20	0.18	1713	1.7	984
1980	42.10	0.14	1351	7.4	10090
1990	55.00	0.13	1034	?	?

\*One feddan = 0.42 ha

Source : Hamdan (1983) and CAPMAS (1989)

This analysis of the problems Egypt is facing now “in terms of the tangible limits of nature, physical space and human reproductions” is very common in academic writings. As stated by Mitchell (1991), “These apparently natural boundaries shape the kinds of solutions that will follow: improved management of resources and technology to overcome their natural limits”. This is only one side of the coin. The other side was uncovered by few writers. One of the most deep and clear analyses was given by Mitchell in the alternative picture he gave to the problems of Egypt. “The limits of this alternative picture are not those of geography and nature but of powerlessness and social inequality. The solutions that follow are not just technological and managerial, but social and political.” Mitchell (1991)

The average land area per person given in Table (1) does not tell much on how the land is distributed. This is given in Table (2) from which it can be seen that the land is concentrated in few hands (less than 10% of the holders are having about 48% of the total agricultural land. On the other hand, more than 57% of the holders are having less than 25% of the land).

**Table 2: Size distribution of holdings in Egypt in 1987**

Holding size (fed.)	No. of holdings (1000)	% of total holdings (Accu.)	Area held (1000 fed)	% of total area	% of total area (Accu.)
<1.00	796.40	22.25	399.52	6.02	6.02
1.00-	623.90	57.51	830.54	12.54	18.56
2.00-	473.00	76.70	1073.57	16.17	34.73
3.00-	223.20	85.74	722.62	10.88	45.61
4.00-	107.40	90.09	485.81	6.91	52.52
5.00-	173.20	97.11	1098.75	16.56	69.88
10.00-	67.40	99.84	1206.67	18.19	88.17
50.00-	3.10	99.97	194.52	2.93	91.20
100.00-	0.70	100.00	650.24	9.80	100.00
Total	2468.30		6635.00	100.00	

No. of zero holding (landless) = 296,004

Fed. = 0.42 ha.

Source: Ministry of Agriculture, 1991

The following may add some details to this alternative picture of the problem.

### 3.2 Conversion of Farm Land to non-Agricultural Uses

The bulk of farmland in Egypt is located in the Nile valley and Delta. More than 99% (60 million) of the total population lives in less than 3% (3 million hectares) of the total area of the country. Almost all housing, industry and infrastructure are located in the same area. The result is that considerable cropland is being converted to non-agricultural uses of an irreversible nature. There are no reliable data about the areas lost. The available estimates range from 8,000 ha a year (Parker and Colye, 1981) to 40,000 ha a year (World Bank, 1990). The most reliable figure perhaps is 16,000 to 20,000 ha annually (Hamdan, 1983 and Ghabour and Ayyad, 1990). The land lost is among the richest and most productive land in the world. To compensate for these losses, marginal land in the desert is being reclaimed at high cost and doubtful returns.

There are strategies and policies to reduce urban encroachment on the prime farmland. By law, building on agricultural land is a crime. There is a fine of about \$ 3,000 and imprisonment liability. However, if you move around any town or village in Egypt, you will see buildings coming up every day. Many of them are government buildings.

Strategies, policies and legislation to stop or reduce irreversible loss of farmland very often do not work. Everywhere, this problem feeds on itself. Each plot lost not only breeds new houses that demand and consume more resources and services. It also creates speculation among new farmers who will be happy to sell the land and make more money than they can make by keeping it as a producing farm. In this way, land becomes an asset to be converted to money. In Egypt, the average net return from using the land to produce food was \$ 439/ha /year in 1987 (Ministry of Agriculture, 1991). If the land is used for building, the normal price may range from \$0.2 million to more than \$5 million /ha depending on the location. Is there any farmer, rich or poor, who can resist this? In such a situation the absurdity of asking the farmers to conserve the land for their children, does not make any practical sense.

It was just for mental exercise that 150 farmers from 5 villages around Minia (Kishk, 1993b) were asked: Will you be willing to sell your land for building? On every face

there was a look saying something like: “are you a fool or what?” or “what a silly question” Then the sole answer was: “of course, I’ll sell it, who won’t?” and some of them will add: “it will be a very good luck for my children and I can buy a larger plot somewhere else, build a house and do so many things I was not able to do before”.

Removal of topsoil for brick making is another example. The brick factories around cities and towns used to offer to farmers what was to them much money for 50 or 100 cm of top soil of their fields. The average price used to be around \$20,000 for the top 100 cm of a hectare. By law, this is forbidden since 1985. However, the practice still goes on in many places.

An interview with 150 farmers in five villages near Minia indicated that all the farmers were aware of the harmful effects of removing the topsoil on both the land and the crop yields. All of them, however, said that the price offered is more than enough to compensate for the losses. They also said they usually remove earth from their own fields to make bricks for their own uses because it is cheaper and they have no alternative anyway. In such a situation, there is no real decision making because there are no alternatives.

#### **4. Investments for Land Conservation: More Examples:**

What is addressed above is just one example. There are many more examples. In Egypt, and indeed, everywhere, land conservation needs heavy investments. The public sector, being unable to invest enough to face the pressing needs of the current population, will often “forget” to invest for the sake of the future generations. On the other hand, farmers, even when they are rich, cannot make conservation investments on which there is no short-term return. Poor farmers, even if the short-term return is obvious, cannot afford investing money simply because they do not have any savings. Borrowing money is perhaps the answer in this case, but is this possible for the small farmers?

Recent surveys (Kishk, 1993b) showed that out of 150 farmers in the reclaimed land west of Minia, 120 farmers said their income is not enough to cover their needs. About what they usually do to cope with their low income situation, 94 said they borrow money from relatives; 33 said they “sell something”; 17 said they sell their work; 18 said they sell their children’s work and 15 said they do not know what to do. Only 2, out of 150, farmers said they can borrow money from the Agricultural Credit Bank (those two were relatively rich farmers owning more than 15 ha each)

In a similar study in a village near Minia, 98 small farmers were interviewed (Ibrahim et al, 1993). Only 2 of them said they have very small savings for emergencies and none of them has got any investment loan from the Agricultural Credit Bank. Is there any farmer of these who is able to invest money in soil conservation?

#### **5. Technical Assistance for Soil Conservation**

We have seen how the small farmers lack the financial means to invest in soil conservation. Even if they can afford to invest, small farmers still need an efficient, well coordinated program for technical assistance. This should involve problem-oriented research, education and training and very effective extension work. The shortcomings and failures of the institutions doing this kind of work in the poor countries are quite known and will be documented. To make this point clearer, let us have a closer look at some institutional aspects of soil conservation in Egypt.

## **6. Government Institutions Dealing with Land and Water Conservation**

The bureaucratic system in Egypt is several thousand years old, and public sector operation is very complex. In the field of agricultural development, this sector involves several ministries, departments, agencies, authorities, councils, companies and committees. It is very difficult, or even impossible to achieve enough coordination in the planning and execution of interrelated programs. This is just one aspect of the problem. Another is the extreme limitation on the services provided to the small farmers and the difficulties involved in administering services at the local level. In many cases, because of ineffectiveness, overlap and duplication, these services are wasteful of government resources. Even with good intentions, it needs a very patient expert to find his way in this “government puzzle.” So what can we expect from a small farmer who, for nothing but his bad luck, has to deal with one or often more government institutions. He is only frustrated, confused and completely lost. Still, a third aspect of the problem is that in almost all public departments staff is administratively responsible to the local Government authorities, but technically responsible to their central ministries. This dual supervision creates great difficulties and friction and the staff are usually reluctant to do the job because the responsibility is very diffuse to the extent that in reality they are responsible to nobody.

In the light of this, let us discuss some examples:

### **a) Amelioration and Improvement of Salt-affected Soils**

Salinity problems are wide spread in Egypt. About 50% of the cultivated area is currently salt-affected and the whole area is potentially affected (Kishk, 1986). To solve the problem at any scale one will need several things. The first thing to be done is the right diagnosis of the problem. This will need a small laboratory for soil and water analysis and an expert to make a reliable interpretation and give the required recommendations for remedial actions. This “action” may include changes in irrigation practices, installation of drainage networks, leaching and/or application of gypsum.

Given the right recommendations, you have to implement them in the right way and maintain what you have done. This in turn needs technical know-how and money to invest.

In Egypt, this is done in two ways: either through a “National Program” in which the Government is doing the whole thing for the farmers, or the individual farmers are doing it themselves which is not easy, and only very few rich farmers can do it. The small farmers cannot afford it and they have to wait for the National Program. They don’t know even when the turn for their land will come. When it comes (after several years sometimes), the design is made on a very large scale and the differences in soil properties and other variables are not fully considered. Then local contractors will implement the given design without serious inspection or supervision of what they are doing. It happens very often that the contractor will “forget” to maintain the right depth or the right slope of the drain, or forget to place the proper filters. If it happens that everything has gone right to this point, then post-installation maintenance is often neglected. The lack of coordination may add another problem. Sometimes, the field drainage network is completed, but the main drain has not been cleaned or deepened. These examples should be enough for anyone to realize why in many cases the drainage system is installed and the money spent, but the fields are no better than before.

The application of gypsum to sodic soils is another queer story related to this problem. The Ministry of Agriculture is the only agent who sells the gypsum to the farmers. Since it is a serious problem and the farmers are too poor, the Government subsidizes the gypsum (Ten years ago, one ton of gypsum was sold for about one US Dollar including the transportation right to the field, now the price is about 2.5 Dollars). Since it is very expensive for the Government to do this for every one, the small farmers are the ones to whom this service is usually denied. What makes it even stranger, the government implements a "National Program" for sodic soils improvement which includes gypsum application. In areas covered by this program, gypsum is provided free to the farmers at a constant rate of 5 tons/ha, with no account for the actual requirements for every field (which ranges from zero to more than 30 tons/ha). The amount allocated to every area is placed on the sides of the nearest road without informing the local farmers what it is for or how to use it. Therefore, it is left there until it is blown away by the wind.

In some cases, the "National Program" for drainage and gypsum application is implemented in the right way (to be fair, this may be true in about 50% of the cases). When it is done right, an average yield increase of 25% is the sure result. The Government is spending a lot of money on the program, most of it borrowed, and the farmers have to pay back all costs. More than 300 farmers in different villages around Minia where a tile drainage system was installed were asked why they thought the system was not working? At least 50% of the farmers were able to give very good answers. This means that even the "ignorant" farmers know most of the mistakes made, but cannot do anything about it

#### **b) Problems of Soil Fertility and Fertilization**

As has been mentioned earlier, Egyptian agriculture is very intensive. The use of fertilizers is very intensive too. However, they are not used in the best possible way. As a consequence, at least 10% of the agricultural production is lost every year due to the deterioration of soil fertility and related improper fertilization policies and practices (Kishk, 1986). Let us mention only a few examples:

Diagnosis of fertility problems and fertilizers recommendations are more complex than in the case of salinity problems. However, they can be carried out in Egypt by some government and private institutions. Yet, they are only available for very few rich farmers, not for the majority of small farmers, either because they are not aware of the importance or even the existence of such service, or they cannot afford it.

For a long time, fertilizers were highly subsidized in Egypt. This has created a "Black Market" for fertilizers. In this market, the small farmers used to sell their quota of fertilizers to the big farmers to get some cash they badly needed. The result is a general under-dose of fertilizers for the important crops grown by small farmers (wheat, maize, beans, etc.) and an overdose applied to the big farmers' crops (fruit trees and sugar cane).

Another imbalance stems from the traditional practice of using only nitrogen and phosphorus fertilizers. These were sufficient some 30 years ago. Now, after the construction of Aswan High Dam and years of highly intensive agriculture and the introduction of many high yielding varieties, there is a need to apply some other nutrients. At least four other nutrients (K, Fe, Mn and Zn) are becoming more deficient in many soils for many crops. Research has done its task in identifying the problem. Transferring the research results to the users and implementing them is, however, another thing. Farm surveys (Kishk *et al.*, 1988) showed that more than 72 (out of 75) small farmers surveyed in the reclaimed land area near Minia did not know anything about micronutrients. The sources of information about fertilizers or

fertilization were the neighbours for 71, out of 75, farmers, who had never seen or talked to an extension officer in their lifetime. More recently, a field survey including 150 farmers revealed almost the same results (Kishk, 1993b).

Now in the framework of the Structural Adjustment and Privatization Policy imposed on Egypt by the IMF and World Bank, the Government is withdrawing the subsidies for fertilizers and other inputs and lets the system function according to free market mechanisms. While it is too early to evaluate the effects and side effects of this major policy change, some of the potential consequences can be mentioned here. Because of the conditions of the small farmers and the relatively low prices for agricultural products, this policy will not favor these producers or the agricultural production in general. The small farmers -in particular - will be badly hit. They will even be depleted of the very little services they can afford now. They will eat less, produce less, and therefore, they will be less able to use their limited resources rationally. In 1992, after a jump of the price of fertilizers, consumption was 35% less than in 1991 according to a local newspaper in Egypt. It was not stated which farmers cut their fertilizers use, but it is easy to guess. There is a great possibility that similar trends will also occur with other inputs.

### **c) Agricultural Cooperative Societies**

Agricultural cooperative societies are another example of initiatives that may be based on a positive idea, but do not work under certain conditions. The idea is known in many countries. The objectives are more or less the same everywhere and include helping the members in getting the inputs and services they need more easily and in marketing their products at satisfactory prices.

In Egypt, during the early stages of initiating agricultural cooperative societies in the fifties, some achievements in favor of the small farmers were obvious. However, the situation changed gradually later, as was the case in many countries. Now, these cooperative societies reflect wide disparities in income and status among their members. Relatively rich farmers and even "absentee" farmers and other prestigious groups are able to control such cooperatives and make them to serve their own interests. For the majority of small farmers, the cooperatives have a very poor record of performance. Those cooperatives, anyway, play no role in land use planning or soil conservation.

## **7. 6. The poor Farmer: Conserve the Land for Whom?**

What was mentioned above are just a few examples of the links between poverty and land degradation problems. More information about the Egyptian Agriculture, the Egyptian farmers and land degradation problems are given in other works of the author (Kishk, 1982, 1986, 1990a, 1990b, and 1993a). In these works, several points were presented and documented:

- Land degradation problems in Egypt are serious and far-reaching in terms of areas affected and the number of people who suffer the consequences.
- The majority of the Egyptian farmers are too poor, with very small and fragmented holdings, to be able to use their limited resources in an efficient way, not to mention sustainability.
- The absolute majority of the farmers is cut off from inputs and services.

What was missing (or at least not clearly stated) in these works is the intimate link between poverty and land degradation, which is the issue in this paper.

I hope the issue discussed that “poverty and land conservation are in conflict” has become more clear now. Perhaps it is useful to repeat once again what has been truly said many times that there is no value in preserving the resource base without preserving the economic activity that sustains it. Therefore, if the resource base anywhere is in trouble, it is because the resource users, the farmers, are in even worse trouble.

If we would like agricultural development to be sustainable, we should strike a bargain with the farmer: If the farmers protect the land for the community, the community will help protect the farmer in terms of current and future profitability. The community should provide some hope for the farmer and his children because why should any one work for the future if he has not got any. We should admit the fact that with the prevailing poverty “sustainable development” is not possible. Sustainable development simply asks the poor people “to die today in order to live well tomorrow”. The poor cannot exercise this option as “Robert Mungaby” put it in his address to the UN General Assembly in 1987. The only option the poor might have is repeating the practical and realistic Egyptian saying “let me live today and you may kill me tomorrow”.

## **8. Conclusions And Recommendations**

After presenting the most relevant physical, social, economical, political and institutional aspects related to the problem of desertification in Egypt, It is easy to draw some conclusions:

1. The people that are causing desertification, and at the same time and the most affected by its consequences, are the poor and marginalized population with limited access to political power.
2. There is no lack of technical know-how or even of funds required to implement sound water and soil conservation measures.
3. Because of prevailing conditions, conservation measures do not work.
4. Such is the case not only in Egypt. Almost the same situation prevails in many poor countries.

As for recommendations, it seems to make little sense to make any at present. One might rather refer to the recommendations made to deal with the problem of desertification since 1977. It is also relevant to mention that in spite of the enormous amount of recommendations made in the past, in the 1990s the area of the land desertified is larger than in 1977 and the number of people affected by it far greater.

"In view of the great concern that desertification remains unupdated and that international efforts to halt its spread, as envisaged by UN Plan of Action to Combat Desertification (PACD) endorsed by the General Assembly in 1977, remain inadequate" (Bounajuti, 1991), UNEP has arranged for an external evaluation of the PACD to be conducted. This evaluation was undertaken and then discussed by high-level experts of desertification. A summary of this work was published recently (Bounajuti, 1991). The main findings seem to be that the " PACD is based on sound scientific grounds and is an appropriate instrument for arresting desertification". The principles guiding the PACD and its objectives, mechanisms and most of the priorities "were and still remain valid".

After a brief review of the shortcomings of the PACD and their causes (mainly that it was unrealistic and overoptimistic), the evaluation stressed some of the conclusions and recommendations which are included already in the PACD itself. It suggested the preparation of guidelines for more effective implementation of the PACD. Finally, it was stated that "Apart from political will, the keys to the successful implementation of the PACD are coordination between governments, donors and the international community, more efficient use of existing resources and new resources".

Since this, and much more, has been said in the PACD in 1977 and then repeated many times on every occasion and since you can find similar recommendations in many papers, reports and proceedings of many meetings, it doesn't seem to me to make sense to add to this list. And, frankly, I don't know how the repeatedly mentioned recommendations could be implemented. All I know is that many of these recommendations do not work under certain conditions.

Among these conditions are those I have described above for Egyptian agriculture, Egyptian farmers and Egyptian institutions. Under conditions like these, water and land conservation is an extremely difficult task. And conditions like these are prevailing in many countries highly affected by desertification.

These socio-economical-political conditions cannot be changed by recommendations that we might give here, it needs much more than that. We cannot say "apart from political will" because it is the political will that should be changed in the first place. Then, other things may come later. In the long run, both at national and international levels there should be more equity or we all have no future. I may seem that I am pessimistic, but as a scientist I cannot but state the plain facts and try to be realistic.

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