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# CAN FARMERS IN EGYPT SHOULDER THE BURDEN OF IRRIGATION MANAGEMENT?

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## Abstract

*Problems facing water deficit, a way of increasing water demands over supplies, have been raised rapidly amongst the priorities being addressed by the Government of Egypt. The government is mandated to plan, construct, operate, manage, and maintain the water system. However, with the growing water demands and the limited water resources available for the country, water management became a very difficult task because of many challenges facing the water sector in the country. Therefore, Egypt, as many other countries, attempts this critical issue by emerging policies on water. This has led Egypt to reform policies, technologies, institutions, and development strategies to manage water more effectively. One of these strategies is the irrigation management transfer (IMT) that has been a major strategy adopted to encourage farmers to play a more important role in irrigation management and related water services and also share the cost of O&M of irrigation and drainage systems. IMT policy is launched in Egypt as a pilot phase to expand water users' participation at secondary levels of the irrigation and drainage systems. Four pilot areas (5,000–8,000 acre) representing all categories and geographical locations of agricultural lands of Egypt were selected to implement this policy.*

*This study was conducted in these pilot areas prior to the start of any IMT activities to describe, analyze, and explain farmers' attitudes toward irrigation maintenance and implementation of IMT process. Socio-economic questionnaires were designed and used as the main tool for data collection. After the field pre-test of the survey instrument, a sample of 240 farmers, 60 from each pilot area, was selected using the sampling frame of multi-tiered process, and the statistical data analysis was done using SpssWin software.*

*The major result of this study is that, without proper education and interface with farmers, there is widespread resistance to the idea farmers assuming management and maintenance responsibilities beyond the on-farm level. It would have to proceed very cautiously, and yield responsive results if it were to survive in the face of the attitudes the farmers have shown, with their strong belief in the necessity of the role of the government. Meanwhile, farmers expressed great confidence in the IMT process and its objectives*

## 1 INTRODUCTION

For several millennia, Egypt has been primarily a hydraulic-agriculture based country. The Nile River has been the main provider of the water resources, in the absence of significant rainfall or groundwater development. In recent decades, the national water resources have come under increasing pressure. Among the ten riparian countries that are serviced by the Nile River, Egypt's fixed share of Nile water, at 55.5 billion m<sup>3</sup>/year, must meet the rising demands of population that is rapidly growing and urbanizing. Moreover, the liberalization of the economy, and particularly the agricultural sector, has made it more difficult to predict water demand on the part of farmers.

Historically, the state has assumed the responsibility of water delivery down to the level of the branch canal, and retained control of management and distribution at the mesqa (farm ditch) level to the farmers. Consequently, earlier irrigation-improvement projects, such as EWUP, ISM, and IIP (APRP, 1998), focused exclusively on increasing farmers' participation in

irrigation improvement at the mesqa level. However, increasing financial burdens on the state are being increasingly felt at all levels of the government infrastructures. As in the case of Egypt, governments around the world are attempting to reduce their recurring expenditures on irrigation and stabilize deterioration of scheme infrastructure without sacrificing the productivity of irrigated agriculture. Many governments assume that the transfer of management responsibility to farmer organizations will improve the accountability of the irrigation service to farmers, make the service more cost-efficient, motivate farmers to invest more in maintaining irrigation systems and, ultimately, make irrigation systems and irrigated agriculture more sustainable.

Based on considerable experiences in other countries (Miskovsky and Runstuk, 1999; Wijedasa, 1999; Samad and Smidt, 1999; Johnson III, 1999; Nelson, 1999; Valdes et al., 1999; Maurya, 1993; Sahin, 1993; Navalawala, 1993) where irrigation management transfer (IMT) has successfully given farmers a larger role in O&M of irrigation and drainage systems, it is believed that a similar effort may affect positively on irrigated agriculture in Egypt as reported by countries with similar socio-economic and hydraulic agriculture conditions to those of Egypt (APRP, 2001). Thus, IMT policy was initiated in Egypt and the government has set in motion a long-term evolutionary process that will allow the government to significantly reduce its costs while continuing to expand its coverage and services in other areas. This IMT modality affords farmers and the private sector the opportunity to assume managerial and financial control of operation and maintenance of the irrigation system beyond the mesqa level.

Therefore, it was thought necessary to carry out a socio-economic study prior to implementation of IMT process to examine the water users' attitudes toward carrying out O&M of irrigation and drainage systems at the secondary canal level and to provide a baseline data source that can be used to allow the government to periodically assess impacts of IMT process.

## 2 METHODOLOGY

The initial pilot phase of the IMT program in Egypt has four specific areas under implementation (Moustafa and Cardinalli, 2002). The four IMT pilot areas were selected to represent all categories of agricultural lands and their geographical locations in Egypt (Table 1 and Figure 1). They included two areas in the old lands of the Nile Delta and the Nile valley (II and III), and one in the new lands (I) and one in the old-new lands (IV) of the Nile Delta.

**Table 1.** Irrigation management transfer (IMT) pilot areas in Egypt

Land Category	Pilot Area	Location	Total Area (Acre)	Main Feature
New Lands	New Al-Shabab (I)	Sharqaiya (Nile Delta)	4,700	High water delivery cost
Old Lands	• El-Nazl area of El-Bahr El-Sagheer (II)	Mansoura (Nile Delta)	7,700	Partially improved tertiary command area
	• Beni Abeid of Serry Canal (III)	Minya (Nile Valley)	5,000	Improved system under USAID-funded IIP
Old-New Lands	Al-Azema area of South Tahrir (IV)	Beheira (Nile Delta)	4,600	Opportunity for Integrated water resources, surface and ground water

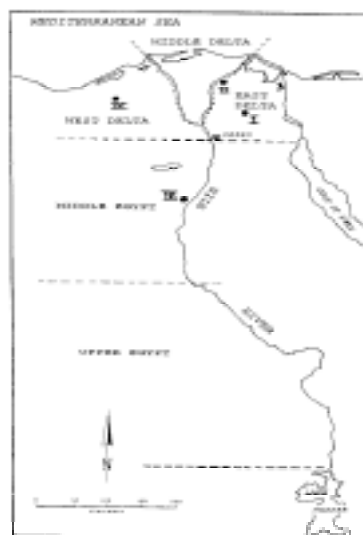
Site selection criteria were focused on highly problematic areas where improvement of the management system is needed and their land categories in terms of position, accessibility,

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infrastructures, services and facilities are representing the predominant conditions in the Nile Delta and Nile Valley of Egypt. Moreover, the data collected in this study was prior to the start of any IMT activities so that the water users' views expressed in this study do not reflect any level of understanding of the water user associations (WUAs) and IMT concepts, objectives and procedures.

A questionnaire was designed and used as the main tool for collection of the data. It was pre-tested in twelve cases of the pilot areas for wording, phrasing, skip pattern, and response categories, and was effectively divided into two questionnaires of similar structure that take into account both the old and new lands.

The questionnaires comprised basic socio-economic data as well as other technical information such as irrigation conditions, water shortage, drainage problems and seasonal cropping pattern. The central core of the questionnaires was to examine attitudes of the farmers, as the water users, toward irrigation maintenance and IMT process. Furthermore, the questionnaires broke maintenance issues down into several specific operations, such as weed removal, gate maintenance, pitching, etc. The respondents to compare the perceived abilities of the water users, the government, and the private sector to perform various maintenance functions were reported. Moreover, responses to the potential extension of the water users associations (WUAs) from the mesqa level to the branch canal level, and the conditions that ought to prevail in order for such a plan to be implemented were measured. Finally, impact of IMT on the performance of the irrigation network was measured.



**Figure 1.** Location of IMT pilot areas in the Nile Delta and the Nile Valley

A sample of 240 water users was selected; 60 from each of the four pilot areas. The sampling frame used a multi-tiered process, using the boundaries of the four pilot areas as the initial basis, since fluidity in the renting market over the last few years meant there were no reliable records of the precise location of farmers' lands on the canals. The collected data was statistically analyzed using SpssWin software to produce frequency tabulations broken down at the pilot level. Then, the results were used to make comparisons between the water users' attitudes across the maintenance and IMT issues in old, new, and old-new lands.

While aware of the considerable theoretical differences between the terms "farmer" and "water user," liberty has been taken to use them interchangeably and the movement between one word and the other is merely for stylistic reasons. These words are used to refer to the actual holder of the land, who cultivates and nurtures the crops and uses the water for irrigation.

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### 3. RESULTS AND DISCUSSION

#### 3.1. IRRIGATION MAINTENANCE

This section examines farmers' level of satisfaction with the current irrigation system. It reveals a pattern of polarization among the four pilot areas. Only in Area III do we find that the farmers are satisfied with irrigation maintenance. In the other three areas, the majority is dissatisfied with maintenance. Table 2 shows farmers' responses to the question of whether they are satisfied with regular maintenance. The table clearly shows that an overwhelming majority of farmers in Area III (91.5%) is satisfied with regular maintenance. In direct opposition to that, the great majority in Area II (61.6%), Area I (75%), and Area IV (56.7%), are not satisfied with regular maintenance. Attitudes, as Table 2 shows, are not radically different with regard to emergency maintenance.

This pattern may be explained by the fact that the Area III is one of the areas where the irrigation improvement project has been implemented. In that area, a continuous flow of water has existed since a major overhaul of the system was undertaken about five or six years ago. The one factor that is missing there is a water users association of the sort present in Area III. A second observation, made clear in the table, is that farmers of Area I are the least satisfied on both fronts. This may be explained not only in economic terms (by the fact that they are the poorest), but also in political terms. That is, their make-up is much more heterogeneous than any of the other three groups in terms of geographic origins of the farmers, the size of holdings, and other socio-economic characteristics. This diversity hampers their collective bargaining potential and their ability to make their voices heard.

A closer look at water users' attitudes toward the main seven aspects of maintenance process (weed removal, bank maintenance, gate maintenance, mechanical drainage, bridge maintenance, pitching and booster pump stations) reveals more diversity of opinions, especially in Area IV. First, with the exception of the process of weed removal and pitching, there is a higher degree of satisfaction on the part of Area IV farmers. Second, the booster pump stations evoke the most dissatisfaction of all maintenance operations, not only in Area IV but also in Area I. Third, there was no difference in the overall and detailed pictures of Area III farmers' feelings about the subject. Area III farmers show a much higher degree of satisfaction with every aspect of the maintenance operations. Fourth, there is a high degree of similarity between Area II and Area I farmers, in terms of both the quantitative (satisfied/not satisfied) and the qualitative (proportional distribution of responses) aspects of their responses. Farmers in both of those areas have negative opinions about all aspects of maintenance operations.

**Table 2.** % distribution of farmers' attitudes toward regular and emergency irrigation maintenance

Type of maintenance and extent of satisfaction	Old lands		New lands Area (I)	Old-new lands Area (IV)
	Area (II)	Area (III)		
Regular maintenance				
S	36.7	91.5	23.3	41.6
NO	1.7	-	1.7	1.7
NS	61.6	8.5	75.0	56.7

Emergency maintenance				
S	33.3	86.4	20.0	45.0
NO	6.0	5.1	1.7	1.7
NS	60.7	8.5	78.3	53.3

S= Satisfied ; NO= No Opinion; NS= Not Satisfied

Thus, it appears that the overall quality of maintenance is far from satisfactory and that there is a pressing need for massive improvement on this front. The results also indicated that the on-going irrigation improvement program in Egypt would be of great help convincing the farmers to carry out O&M activities as indicated by the responses of Area III farmers

### 3.2. IRRIGATION MANAGEMENT TRANSFER (IMT)

The idea of the IMT is simply to transfer the responsibility of managing parts of the irrigation system, namely the branch canal, from the government to the farmers. This section examines farmers' attitudes on the proposed transfer, and aims to discover whether they believe they could perform the various aspects of irrigation system maintenance, as discussed in the previous section. It further attempts to evaluate their views of their abilities compared to the abilities of both the government and the private sector.

#### 3.2.1 Water Users Ability for O&M

On the first question, whether farmers think they could perform the maintenance operations discussed earlier, the survey revealed that they have very little confidence in their ability to perform the necessary tasks. This low level of confidence cuts across all pilot areas. It does not appear to vary much, although it may be weakly related to the size of holdings, to the particular land category, or to education. The results show that the great majority of water users lean heavily on the negative side. It is indicated that a relatively high percentage of farmers in the four pilot areas believe that they could perform the task of weed removal by themselves. Area II farmers are most confident (33.3% responding positively), whereas Area III farmers are least confident (20.3%). Area IV farmers consistently show a higher proportion of positive responses across all seven aspects of maintenance. Their rate of positive response is almost double that of the water users in the other three areas, except with regards to weed removal. The percentage of those uncertain is extremely small across the waterfront.

A comparison of users' views of their own ability to perform the various maintenance tasks to their view of the abilities of the government and the private sector reveals some interesting variations between the four pilot areas (Table 3). There is a particularly striking difference between the farmers' views of Area IV and those of the other areas. Area IV farmers appear to be almost evenly split in their choice between the government and the private sector as being able to perform the various maintenance operations better than the water users. About 40% of Area IV farmers believe the government is better able to do the job than either the water users or the private sector. Another 40% (about the average across all maintenance tasks) believe the private sector could do the job better than either the government or the users. A substantial portion (ranging between 15% on the subject of pitching and 20% on the subject of booster pump stations) believes that water users are more qualified than either the private sector or the government to perform maintenance tasks.

**Table 3.** Water users' evaluation of the ability of the government, the private sector, and the users to perform various maintenance tasks, (%)

Maintenance tasks and parties involved	Old lands		New lands	Old-new lands
	Area (II)	Area (III)	Area (I)	Area (IV)
<b>Weed removal</b>				
The water users	20.0	6.8	10.0	18.3
The government	65.0	88.1	78.3	41.7
The private sector	15.0	5.1	8.3	40.0
DNK				
NR/NA				
<b>Bank maintenance</b>				
The water users	8.3	1.7	3.3	16.7
The government	75.0	93.2	80.0	41.7
The private sector	16.7	5.1	13.3	41.6
DNK			3.4	
NR/NA				
<b>Gate maintenance</b>				
The water users	5.0	1.7	3.3	18.3
The government	75.0	93.2	80.0	43.3
The private sector	16.7	5.1	13.3	38.4
DNK	3.3		3.4	
NR/NA				
<b>Mechanical drainage</b>				
The water users	5.0	1.7	3.3	16.7
The government	76.7	93.2	80.0	43.3
The private sector	16.7	5.1	13.3	40.0
DNK	1.6		3.4	
NR/NA				
<b>Bridge maintenance</b>				
The water users	3.3	3.4	3.3	16.7
The government	81.7	91.5	80.0	43.3
The private sector	13.3	5.1	13.3	40.0
DNK	1.7		3.4	
NR/NA				
<b>Pitching</b>				
The water users	5.0	3.4	3.3	15.0
The government	83.3	91.5	76.7	31.7
The private sector	11.7	5.1	15.0	35.0
DNK			5.0	18.3
NR/NA				
<b>Booster pump station maintenance</b>				
The water users				
The government			3.3	20.0
The private sector			78.3	40.0
DNK			15.0	40.0
NR/NA			3.4	
	100.0	100.0		

DNK = Do Not Know; NR/NA = Not Reported/Not Applicable

However, as Table 3 shows, the farmers of Area II, Area III and Area I view matters differently. Both Area II and Area I water users show a relatively stronger belief than Area III water users in the ability of the private sector to perform maintenance operations, as well as in their own ability. The belief in government ability holds for all areas although it varies in degree. Meanwhile, Area III water users put all their trust in the government. This may be confirmed

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with the previous observation that farmers of Area III are the most satisfied with regular and emergency maintenance (Table 2) as the irrigation improvement project has been implemented there. Thus, the water users there were the most ready to rely on the government.

In sum, the water users strongly believe, across all of the maintenance questions, that the government is most able to perform the maintenance operations. The government's proportional share in these questions was uniformly high. It never dipped below 65% in any of the three areas (other than Area IV) on any of the maintenance aspects. This is possibly due to modernized infrastructures of the irrigation network that have been done by the government. The state thus finds itself in an awkward position that it should modernize infrastructures in order to enable transferring of irrigation management. It should moreover boost its own image as an efficient service provider. It appears, however, that such an effect may be negated by education, as it is evident in the case of Area II.

### 3.2.2 Cost of O&M

The same pattern held when water users were asked about cost of maintenance operations. The majority believed that the government could perform the tasks more cheaply, except in Area IV. The results show that the percentage of water users who think that they could do the job more cheaply is slightly higher than the percentage of those who think that they could do the job well. There is also a considerable higher percentage of those who are uncertain about this issue.

The high proportion of those who think that the water users could not do the job cheaper than the government is not surprising, considering that, until now, farmers have never carried the financial costs of the maintenance operations beyond their fields. In other words, their actual cost to date has been zero, and they may think that any change could only be more expensive for them. This line of logic, however, does not explain the relatively high proportions of water users in Area IV who think that they could do it cheaper than the government.

Venturing into educated guess, the author's interpretation is that with their higher educational level, Area IV farmers could read the question as comparing two hypothetical situations, whereas the others saw it as an actual one. It is possible therefore that with their larger holdings, higher levels of education, and their professional profiles, Area IV water users would rather keep the government at bay whenever possible, while the poorer farmers have a tendency to depend on it more.

### 3.2.3 Timing of O&M

When asked whether the farmers are able to carry out the tasks in less time than the private sector, the majority of the farmers in the four pilot areas believed that the private sector is more efficient than they are (Table 4). As shown in this table, there is very little variation between the four areas in this respect. However, it is interesting to note that in the case of Area III, in the absence of "government" as a potential response the farmers show a higher degree of confidence (2-3 times higher) in their ability to perform the tasks and there is also a sizeable portion that are uncertain. This seems to confirm the earlier conclusion about the relationship between poverty and dependence on the government.

By the same token, a higher percentage of Area IV water users seem to believe in the efficiency of the private sector. With the exception of pitching, where 58% believed that the private sector could do the job in less time than the farmers, between 70% and 72% regarded the private sector as being more able to perform all the maintenance tasks in less time. However, as far as pitching is concerned, the water users were not necessarily more confident in the abilities of the private sector; there was simply a much higher portion listing themselves as "uncertain" in this category.

### 3.2.4 Crop Water Requirements

Water users in the four pilot areas are polarized in their attitudes on whether they would do better than the government in accounting for crop water requirements while doing maintenance operations (Table 5). The results indicated that old lands farmers were on one side of the fence, and the new lands farmers were on the other side. The latter were more likely to believe that farmers would be more sensitive to crop water requirements, and this held true for all operations in which water flow is interrupted by maintenance, as is the case during the winter blockage. By contrast, farmers in old lands took the opposite position, showing that the government would be more sensitive.

Again, Area III farmers, in percentages ranging between 81% and 86%, did not believe water users would perform better than government. In Area II, the situation was less polarized, where between 55% and 58% saying that the government would take better care. In Area I and Area IV, about two thirds believed across the board that the local residents would take better care. There is also a notably high degree of uncertainty in Area II (about 22%), four times that in Area IV, about 7 times that noted in Area I, and 15 times that in Area III.

### 3.2.5 Continuation of O&M

When asked about specific maintenance operations, there was not a single operation where less than 65% of water users thought the government should continue management. Table 6 details the opinions of water users on the operations the government should continue to perform. The clear polarization of attitudes is notable here, especially in comparison to the other results that measured the attitudes of farmers toward the various spheres of IMT program and the various aspects of maintenance. In the previous results, there were always portions that were undecided. Those undecided constituted about 10-25% of the water users.

However, in Table 6, there is almost a complete absence of uncertainty – in only one category do those undecided proportionally count for something (18.4% in pitching). In other words, there is no middle ground here. The farmers have strong feelings about where their interests lie, and they are convinced it is in the government’s continued performance of the maintenance operations.

**Table 4. % Water users' opinions on whether they could perform maintenance operations in less time than the private sector**

Maintenance tasks and response categories	Old lands		New lands Area (I)	Old-new lands Area (IV)
	Area (II)	Area (III)		
<b>Weed removal</b>				
Yes	18.3	16.9	10.0	25.7
DNK	13.3	16.9	15.0	3.3
NO	68.4	66.2	75.0	70.0
NR/NA				
<b>Bank maintenance</b>				
Yes	10.0	13.6	13.3	25.0
DNK	13.3	18.6	15.0	3.3
NO	76.7	66.1	71.7	71.7
NR/NA		1.7		
<b>Gate maintenance</b>				
Yes	8.3	11.9	13.3	25.0
DNK	15.0	18.6	15.0	3.3
NO	76.7	69.5	71.7	71.7
NR/NA				



Mechanical drainage				
Yes	10.0	10.2	11.7	25.0
DNK	16.7	18.6	15.0	3.3
NO	73.3	71.2	73.3	71.7
NR/NA				
Bridge maintenance				
Yes	8.3	10.2	11.7	25.0
DNK	20.0	18.6	15.0	3.3
NO	71.7	69.5	73.3	71.7
NR/NA		1.7		
Pitching				
Yes	8.3	13.6	11.7	23.3
DNK	18.4	18.6	15.0	18.3
NO	73.3	67.8	73.3	58.3
NR/NA				
Booster pump station maintenance				
Yes			11.7	25.0
DNK			15.0	3.3
NO			73.3	71.7
NR/NA	100.0	100.0		

**Table 5.** % distribution of water users' attitudes on whether they would show more care for crop water requirements during maintenance than the government does

Task	Old lands		New lands	Old-new lands
	Area (II)	Area (III)	Area (I)	Area (IV)
Bank maintenance				
Yes	20.0	13.6	63.3	68.3
DNK	23.3	1.7	3.3	6.7
NO	55.0	84.7	33.4	25.0
NR/NA	1.7			
Gate maintenance				
Yes	16.7	11.9	65.0	68.3
DNK	25.0	1.7	3.3	6.7
NO	58.3	86.4	31.7	25.0
NR/NA				
Bridge maintenance				
Yes	16.7	13.6	63.3	68.3
DNK	25.0	1.7	3.3	6.7
NO	58.3	84.7	33.4	25.0
NR/NA				
Pitching				
Yes	20.0	15.3	65.0	65.0
DNK	21.7	1.7	3.3	20.0
NO	58.3	81.3	31.7	15.0
NR/NA		1.7		

**Table 6.** % distribution of water users' attitudes on the government's continued performance of maintenance operations

Operations and response categories	Old lands		New lands Area (I)	Old-new lands Area (IV)
	Area (II)	Area (III)		
Weed removal				
Yes	73.5	71.2	82.1	73.7
DNK				
NO	26.5	28.8	17.9	16.3
NR/NA				
Bank maintenance				
Yes	91.8	82.7	83.9	81.6
DNK				
NO	8.2	17.3	16.1	18.4
NR/NA				
Gate maintenance				
Yes	91.8	84.6	83.9	83.7
DNK	4.1			
NO	4.1	15.4	16.1	16.3
NR/NA				
Mechanical drainage				
Yes	91.8	84.6	87.5	83.7
DNK				
NO	8.2	15.4	12.5	16.3
NR/NA				
Bridge maintenance				
Yes	89.8	86.5	82.1	81.6
DNK	4.1			
NO	6.1	13.5	17.9	18.4
NR/NA				
Pitching				
Yes	91.7	84.6	82.1	65.3
DNK	2.0			18.4
NO	6.3	15.4	17.9	16.3
NR/NA				
Booster pump station maintenance				
Yes			83.6	81.6
DNK				
NO			16.4	18.4
NR/NA	100.0	100.0		

The water users do not lack a rationale for their position. Table 7 gives the detailed percent distribution and the rank of each reason farmers gave the government not to abandon responsibility for maintenance operations. Between 64.4% (Area III) and 83.3% (Area I) of

respondents in the four pilot areas said the government has greater technical expertise. Between 63.3% (Area II) and 80% (Area IV) said the government has the financial resources to handle maintenance.

Despite the heavy reliance on the government, few farmers admitted to “being used to the state doing everything”. The majority of water users in the four areas, between 74.6% in Area III and 90% in Area II, refused this idea. The author takes this to mean that the state is viewed by water users in the light of the national capabilities it has, not as a provider. This brings to the fore the conditions under which a project such as irrigation management transfer may be implemented.

In sum, the analysis of water users’ attitudes shows what might be called the triumph of tradition over modernization. Water users would be content for the government’s role at the branch canal level to persist as it has over the thousands of years of the history of irrigation in Egypt. Only minor changes in attitude seem to result from changes in the background socio-economic characteristics of the users. The overwhelming majority of farmers believe that the government should never lift its hands from maintenance operations. To put it in figures, those who believed so stood at a minimum of 80% in Area IV and a maximum of 90% in Area I. About 84.7% in Area III and 81.7% in Area II believed that the government should keep control of the branch canals.

**Table 7.** % distribution of farmers’ reasons for the government to continue performance of maintenance operations

Operation and response category	Old lands				New lands		Old-new lands	
	Area (II)		Area (III)		Area (I)		Area (IV)	
	%	Rank	%	Rank	%	Rank	%	Rank
The government has the technical know-how								
Yes	71.7	1	64.4	2	83.3	1	70.0	2
No	28.3		35.6		16.7		30.0	
The government has the legal authority to execute Procedures								
Yes	36.7	4	49.2	3	31.7	4	46.7	3
No	63.3		50.8		68.3		53.3	
Avoid disputes among the farmers								
Yes	46.7	3	27.1	4	23.4	5	18.3	5
No	53.3		72.9		76.6		81.7	
The state collects tax revenue; it should work for it								
Yes	11.7	6	13.6	8	36.7	3	13.3	6
No	88.3		86.4		63.3		86.7	
We are used to the state doing every thing								
Yes	10.0	7	25.4	5	15.0	6	11.7	7
No	90.0		74.6		85.0		88.3	
Farmers’ abuse of the authority given to them								
Yes	25.0	5	22.0	6	8.3	8	11.7	7
No	75.0		78.0		91.7		88.3	

The lack of the necessary legislation to enable the NGOs to perform such tasks								
Yes	1.7	8	15.3	7	13.3	7	23.3	4
No	98.3		84.7		86.7		76.7	
The government has the financial means to perform the tasks								
Yes	63.3	2	67.8	1	80.0	2	76.7	1
No	36.7		32.2		20.0		23.3	

## Conclusion

It appears that the overall quality of irrigation and drainage maintenance in Egypt is far from satisfactory and that there is a pressing need for massive improvement on this front. The ongoing irrigation improvement program in Egypt would be of great help convincing the farmers to carry out O&M activities.

The water users have very little confidence in their ability to perform the necessary tasks. The belief in government ability holds for all study areas although it varies in degree. The majority believed that the government could perform the tasks more cheaply and efficiently.

The results of the study can be used as a baseline data source that, in turn, can be used to allow the government to efficiently track program activities, to mitigate problem areas and bottlenecks, and to periodically assess IMT program impacts toward achieving overall success. Further, it will be of great help for IMT program to be expanded in future to additional command areas and to higher levels of the irrigation/drainage system.

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