

الملاحق

جامعة الزقازيق  
كلية الزراعة بمشتر - فرع بنها  
قسم الاقتصاد الزراعي

استمارة استبيان

خاصة

بالتقييم الاقتصادي لاستخدام الموارد المائية في الأراضى الجديدة

اسم المنطقة :

رقم الاستمارة:

تاريخ جمع البيانات: / / ١٩٩٩

إعداد

داليا فاروق إبراهيم جاب الله

أولاً :- البيانات الشخصية

الاسم :

السن : التاريخ سنة

الحالة التعليمية :- أمي ( ) يقرأ ويكتب ( )

مؤهل متوسط ( ) مؤهل عال ( )

الحالة الاجتماعية :- أعزب ( ) متزوج ( )

أرمل ( ) مطلق ( )

عدد أفراد الأسرة :- ( ) فرد

عدد الأفراد المساهمين في العمل الزراعي :- ( ) فرد

كل الوقت ( ) جزء من الوقت ( )

## بيان الحيازة الزراعية ونوع التربة

المساحة ( ) فدان

نوع التربة

الجملة		مزرعة		مشارة		إيجار		ملك	
ف	ط	ف	ط	ف	ط	ف	ط	ف	ط

## ثالثا : بيانات المياه ومصادرها

مياه جوفية ( ) [ بئر سطحي ( ) بئر عميق ( ) ]

أمطار ( ) سيول ( )

نظام الري :- رش ( ) تنقيط ( ) سطحي ( )

رسيلة إمداد الأرض بالمياه :- شبكة ري ( ) مضخة ( )

مواصفات المضخة :-

نوعها ( )

قدرتها ( حصان )

نوع الوقود المستخدم ( ديزل / بترين / جاز ) سعر اللتر ( )

قطر ماسورة السحب ( البوصة )

كمية التصريف ( م<sup>3</sup> / الساعة )

تكاليف وسائل الري ( السنوية ) لموسم زراعي انتاجي

البند	سنة الشراء	ثمن الشراء	*تكاليف التشغيل	**تكاليف الصيانة	***تكاليف قطع الغيار	العمر الافتراضي	التمن لي لمائة العمر الانتاجي	الجملة	الزمام المستخدم
المضخة									
شبكة ري									
تنقيط									
رش									
	عمق البئر	درجة الملوحة	تصرف / ساعة	تكاليف الحفر	تكاليف الصيانة	عدد ساعات السحب اليومي	الجملة	الزمام المستخدم	ملاحظات
الآبار العميقة									
الآبار السطحية									

\*الوقود المستخدم + العامل المشغل للمضخة + الحارس

\*\* الصيانة الدورية ( تغيير الزيت والفلتر ) × عدد مرات الصيانة في السنة الزراعية

\*\*\* العمرات للموتور + شراء خراطيم سحب المياه



## شكـ ت المتعلقة بالانتاج والمياه :-

### أ - مشكلات الانتاج :-

- ١- ارتفاع تكاليف خدمة الاراضي نعم ( ) لا ( )
- ٢- عدم توافر الميكنة الزراعية وارتفاع اسعارها نعم ( ) لا ( )
- ٣- ارتفاع نسبة الملوحة بالمياه نعم ( ) لا ( )
- ٤- صعوبة حفر الآبار وارتفاع تكاليفها نعم ( ) لا ( )
- ٥- ارتفاع تكاليف صيانة الآبار نعم ( ) لا ( )
- ٦- عدم توفر البذور والشتلات المناسبة نعم ( ) لا ( )
- ٧- انتشار الامراض والآفات الزراعية نعم ( ) لا ( )
- ٨- صعوبة تسويق المحاصيل الزراعية نعم ( ) لا ( )
- ٩- عدم توفر الاسمدة والمبيدات باسعار مناسبة نعم ( ) لا ( )
- ١٠- صعوبة تحليل المياه والتربة نعم ( ) لا ( )
- ١١- ارتفاع اجور العمالة الزراعية نعم ( ) لا ( )
- ١٢- بعد المسافات بين الاسواق لبيع المحاصيل الزراعية في المناطق الجديدة نعم ( ) لا ( )

### ب - مشكلات المياه :-

- ١- تتأرب المسافات بين الآبار نعم ( ) لا ( )
  - ٢- عدم استمرارية الآبار الانتاجية لفترات طويلة نعم ( ) لا ( )
  - ٣- ارتفاع تكاليف حفر الآبار نعم ( ) لا ( )
  - ٤- انخفاض التصرفات من الآبار بصفة دائمة نعم ( ) لا ( )
- كيفية التغلب علي المشكلات :-

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ماهي وجهة نظرك في الفترة المستقبلية لزيادة مساحات الاستصلاح ؟

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أى المحاصيل الزراعية التي زرعتها بأرضك أكثر استهلاكاً للمياه وأيها أقل استهلاكاً للمياه ؟

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أى طرق الري أفضل من وجهة نظرك ؟ ( من حيث استهلاك المياه وإنتاجية المحاصيل والتكلفة والصيانة والعمر الإنتاجي )

# **ECONOMIC EVALUATION OF USING WATER RESOURCES IN NEW SOILS**

*by*

***Dalia Farouk Ibrahim GabAllah***

B.Sc. in Agricultural Co-Operation Science  
High institute of Agricultural Co-Operation (1995)

**Complimentary studies**

**Agricultural economic and extension  
Faculty of Agricultural - Moshtohor  
Zagazig University - Benha Branch (1996)**

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of  
Master Agricultural Science Economics*

**Department of Agricultural Economics  
Faculty of Agricultural Moshtohor  
Zagazig University  
Benha Branch**

**1999**

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المستخلص باللغة الانجليزية

## ***ABSTRACT***

### ***The Economic Evaluation For Using The Water Resources Within The New Soils***

The Egyptian agriculture is considered the main source to provide the population with food and clothing, it is one of the most important resources of the national income where it contributes with about 31% of the Gross Domestic Product (GDP), it employs about 34% of the total Egyptian employment and faces a group of determinants where the land and water occupy the first place among them, then comes the irrigation systems, therefore the water importance as the life support appears, since without water the seed won't germinate even if the suitable land was available. The importance of the study lies in providing a model for the economic evaluation for using water resources as they are the main determinant for any horizontal expansion in Egypt, and within the new and desert lands. The study aimed at identifying the water resources available in Egypt in general and groundwater resources in particular. Ras Sidr Town, South Sinai governorate was selected as a study sample. Ras Sidr is considered one of the first agriculture centers in South Sinai where the planted area estimated to about 8.5 thousands feddans of the total area cultivated in South Sinai which is about 18.6 thousand feddans. The study showed that the groundwater is the main source of water required for the majority of the agriculture within the region, also the importance of choosing the suitable crops for using there waters and according to the water salinity (availability) and in the light of the investment direct to land reclamation and uses of groundwater resources within these lands.

المخلص باللغة الانجليزية

## *Summary*

The Egyptian agriculture is considered the main source to provide the people with food and clothes, it is one of the important sources of the national income where it contributes with about 31% of the GDP and 21% of the total Egyptian exports, it employs about 34% of the total Egyptian labour force. It is necessary to provide the agriculture supports so that it can play its role, these supports faced with a group of determinants where land and water occupy the first place among them. Land and water are two sides of the development triangle, the third side is the irrigation system used to irrigate crops. Accordingly, without water seeds don't germinate even if the suitable land was available.

In the past agriculture played its role in satisfying the food needs and in exporting the surplus, but due to the increase of population growth rate compared to that of agricultural land area, this besides the farmer practices which jeopardized the agriculture and limited its ability to meet its obligations. Among these practices were shoveling, degradation and constructing housing and other projects. During the last three decades about 22500 feddans were deducted this besides the increased emigration from rural to urban areas or from rural areas to petrol sector, all this has led to a reduction in the agriculture participation in providing food, and raw material. This, asked for the necessity to search for practical solutions that could be easily achieved for the agricultural development. Vertical expansion policy through solving the old land problem by raising their productive efficiency via implementing soil properties improving projects, rationalization the irrigation water use, development of irrigation systems and developing the agricultural production procedures. On other hand horizontal expansion of new land was important to encourage investments in desert to minimize unemployment and increase the agricultural share in GDP.

The study aimed at defining and determining studies and researches related to water resources within the new reclaimed lands and the best economic ways to use these resources. This can be achieved through, agricultural mechanization, planting new varieties of seeds, define the available water resources in Egypt in general and the groundwater resources in particular within the new reclaimed and desert land, and identifying the available and possible crop patterns within the new and old land and the economic return of each in the light of the available and possible water resources and evaluating the different ways of irrigation systems especially in the new land and ways to obtain the groundwater resources and their use. The methodology of the study depending on the descriptive, statistical and quantitative analysis of the available secondary data as well as cross section data collected from the study sample.

The study included four chapters in addition to the introduction, summary in Arabic and English, results and recommendations.

The introduction included the importance, objectives and problem of the study, data sources and methodology.

The First chapter dealt with review literature of the studies and researches conducted in the field of the water resources and the new land with respect to data sources, methodology and results.

The second chapter dealt with water, land and irrigation systems. The traditional and non traditional water resources in Egypt and their potential were highlighted. More detailed investigation was given to the groundwater and their potential at present and in future. In addition to the above modern irrigation systems were explained as the best and efficient irrigation methods within the new and desert lands in particular. The traditional water resources are represented in the river Nile, storm water, floods, groundwater while the non traditional water resources are represented in the agriculture drainage water, treated sewage sanitary

water, and desalination of sea water. Thereafter water resources uses were highlighted as for agriculture, housing, industry and navigation.

The second part of that chapter dealt with land resources regarding area and their classification with respect to its productivity. Accordingly, the cultivated area was estimated to be about 8 million feddans. Also, land reclamation development in Egypt was explained and divided into seven phases, the first before 1952 revolution, the second from 1952 until 1960, the third from 60/61 to 64/1970, the fourth from 70/71 to 79/1980, the fifth from 1980 to the end of 1986, the sixth from the end of 1986 to 1997, the seventh is the contemporary period and a future view in the light of the horizontal expansion strategy till the second decade of the twenty first century. The third part of this chapter completes the development triangle of water and land, which as the irrigation methods. In the light of this the irrigation methods are different according to the available water quantity, its location and time of application, while selection of the irrigation methods is attributed to a group of controls at the top of which are the availability extent of water quantitatively and source of this water, type and age of the crop to be irrigated and its growth phase, this besides the prevailing atmospheric conditions, farmers experience and other controls required by the water application method. There are many irrigation ways each differs from others according to what previously pointed to at controls and calibres in this part focused was put on these systems which suit the agriculture within the new and desert land, in addition to advantages and disadvantages of each system was highlighted. There are three irrigation systems which are: surface irrigation, drip irrigation, and sprinkler irrigation, each irrigation system has its advantages and disadvantages, the economic factor is considered the preference basis when selecting the appropriate irrigation method.

The surface irrigation (flood irrigation) is the prevailing system within more than 90% of lands planted in Egypt. This system is usually

used in case of abundance of irrigation water and is used in old lands in the delta where a high percentage of salinity and alkalinity exists which need to be removed. Surface irrigation is considered the easiest and cheapest irrigation method and the lowest investment cost of irrigation water networks compared with the cost at the other systems, also it allows salt removing from soil. Drip irrigation system, which is used since 1960' where the cultivated crops are irrigated by dropping water from drippers placed on distribution pipes with slow rates.

It became necessary to use the modern irrigation systems which help in achieving the optimum use of irrigation water in reclaimed areas and desert land. With respect to our local circumstances, it is the more widely used system in the desert land or under the condition of greenhouses. Sprinkler system, which spreaded in the last half of this century in the dry and semi-dry regions to irrigate the majority of crops in all land types, especially in the reclaimed desert land.

The third chapter deals with the study sample of Ras-Sidr town in South Sinai governorate where Sinai peninsula is considered the strategic depth for Egypt from the East. After Israel withdrawal Egypt started to develop Sinai in the fields of agriculture, mining, tourism and industry. The main determinate factor of development within all these activities is water especially in agriculture, the development of water resources in Sinai is considered the cornerstone for every expansion projects area . About 127 thousand feddans were assigned for public sector to be reclaimed in Sinai which represent about 40.6% of the total area . Total investments allocated was L.E. 387 thousands which represents 36% of total investments allocated for the expansion projects in the five year plan 92/1997.

At new projects about 153 thousand feddans is assigned for public sector to be reclaimed which represent 76.5% of total area allocated to the new projects, their investments are about L.E. 446 thousands,

representing 64.3% of total investments allocated to the new projects within the five year plan 92/1997.

The study pointed out that Sinai peninsula has touristic, industrial and agricultural numerous resources, in the light of this Egypt gave importance attention to develop these resources, at the top of these resources land and water, since the availability of these resources is considered the backbone for any possible development. Also this study dealt with the land and water resources in Sinai and reasons of choosing it as a sample of the field study.

Sinai peninsula is divided to three land groups with respect to their suitability for agriculture, first group include the good land suitable for agricultural expansion and estimated to about 900 thousand feddans, the second group includes the lands having medium suitability for plantation, which estimated to about 1300 thousand feddans, and the third group which is the land of limited exploitation of unsuitable for the agricultural exploitation.

Water resources in Sinai peninsula are represented in rain water and flood water. The estimated quantity which can be useful is ranged from 90-235 or about 90.235 millions  $m^3$ /year according to the density at the rainy storms, the majority of those storm rains are concentrated in North Sinai. Groundwater and their future possibilities is estimated by 20 millions  $m^3$ / year from the deep groundwater, where water depth varies between (300-500m), these waters are concentrated in south Sinai.

Sinai is divided into two governorates North Sinai and South Sinai. North Sinai is about 31 thousand  $km^2$ , which is greater than the Delta area, and characterized by availability of flat rich land with alluvium, which makes most of its land suitable for agriculture.

Agriculture is concentrated in different areas of North Sinai, these areas are characterized with new and advanced ways of cultivation not available in the valley. Irrigation system, are drip and sprinkler. The

planted areas are concentrated at four centers, Al-Arish, Bear Al-Abd, Sheikh Zwied and Rafah, water suitable for agriculture is limited to rain and flood water only.

South Sinai governorate area is about 28 thousands km<sup>2</sup>, its soils is characterized by calcium percentage rise and existence of salts in land and water. There are many deep and shallow groundwater wells. South Sinai depends on groundwater in agriculture and doesn't depend on rain except for small percentage. Drip irrigation system is prevail, where, sprinkler irrigation shouldn't be followed due to great salinity percentages in water which damage the buds of plants and precipitates the salts on the plant leaves. There are eight administrative centers which differ with respect to the planted areas such as Ras Sidr, Tur Sinai, Abou Zamma, Abou Radis and Nweheb, where Ras Sidr is considered of first agricultural centers, thereby there are other three centers which are Dahab, Sant Catrine and Sharm El Sheikh free from any type of agriculture since they are considered touristic and religious areas. Crops which are cultivated in South Sinai are olives, vegetables, fruit field crops, and pulm trees. Olives is considered one of the most important permanent crop followed by fruit, vegetables and field crops, while palm trees is concentrated in Newebah and Tor Sinai. Accordingly, Ras Sidr Town was chosen as a study area for many reasons, it considered of first centers in terms of cultivated area and has the largest number of wells and diversity of the planted crops, also it is considered as attraction district for the inhabitants, and because of the research station subjected to desert research center, and availability of most irrigation systems (drip and sprinkler). It contains three regions suitable for agriculture which are Ras Sidr, Abou Sowaera and Al Basasia with an areas of 4811, 3208, and 481 feddans respectively, and the total planted area is 8500 feddans. Agriculture is considered the most important activity where the majority of inhibitents are engaged in the land cultivation. It was noticed that only

850 feddans were cultivated in 1995 were reached to about 8.5 thousands feddans in 1998. Ras Sidr is characterized by the existence Ras Sidr Valley region, this is a narrow valley but it is characterized by large groundwater storage where it can meet the irrigation requirement for about 15 thousand feddans. The estimated volume of deep groundwater amounted to 5 million m<sup>3</sup>.

From the above mentioned it can be said that:

- The cultivated area has been increased in southern Sinai from about 1.2 thousand feddans in 1990 to about 8.5 thousand feddans in 1998.
- The actual inhabitants in southern Sinai was increased from 6 thousand to 67 thousand between 1990-1998, were the number of inhabitants involved in agriculture were increased from 3000 to 4000 within the same period. On other hand, inhabitants in Ras Sidr were increased from 8 thousand in 1990 to 16 thousands in 1998 and those are involved in agricultural are increased from 450 persons 1990 to 12.5 thousand in 1998.
- Education status of the inhabitants turned out to be the secondary schools technical diploma are dominant in the educational domain. Also the married people as social status are the majority in the educational domain.
- The shallow groundwater wells counted to 82 wells serving about 1205 feddans where the deep wells counted to 18 and served an area of about 394 feddans.
- The cost of establishing a drip irrigation system unit amounted to L.E. 1650 per feddan with a life span of five years.
- The fourth chapter dealt with the economic analysis of the data collected from the study sample. Hundred farmers were interviewed and a simple calculation about costs and revenues were estimated. Also, yield per feddan of different crops cultivated were

estimated, in addition, net return per unit of water is estimated for different cultivated crops. The following are some results of these estimations:

\* Yield of separated olives amounted to about 3.5 tons per feddan where intercropping amounted to about 3 tons per feddan.

\* The average yeild/feddan for intercropping wheat ammounted to 5.5 ardab (one ardab = 250 kg) and about 6.5 ardab for seperated wheat. But for the intercropping barley yield/feddan amounted to about 6 ardab and about 7 ardab for separated barley.

- Statistical tests indicated that yield increaes was significant for all crop except for Guava and barley.

Net return per unit of water used for Tomato, Apple, Fig, Gogoba and intercropping barley, pomegranade, intercropping wheat, separated wheat and Guava estimated at L.E. 1.88, 1.13, 1.01, 10.1, 0.86, 0.81, 0.53, 0.262, 0.23, 0.21 per unit of water used respectively.