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The Economic Impact of Sugar Beet Cultivation in New Lands (Study of Al-Salam Canal Area Status)

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Abstract: Egypt produces about 1,757 million tons yearly offset by consumption estimated 2,600 million tons yearly. Namely there is a gap around 843 thousand tons and self-sufficiency rate of 68%, which can be achieved through increasing domestic production of sugar as raising total production of sugar crops. This raise could be executed by either extending the cultivated area or raising the production or both, and where the expansion in the cultivation of sugar crops in particular sugar cane is not currently available to the limited available water resources. The sugar beet is the second sugar source after sugar cane in the world and especially in Egypt, as the output of beet sugar is 25% of sugar in Egypt, and 40% of sugar produced in the world as whole. The commercial cultivation of sugar beet has been introduced to Egypt since season (1981-1982). Sugar beet is an important crop that helps in establishing integrated agricultural-industrial societies, especially in the new reclaimed areas, it contributes in many industries such as sugar industry, highly-value animal feed resulting from processing waste. The sugar beet cultivated area across Egypt about 248.308 thousand acres in 2007 - 2008 season. The total production approximately 5,458 million tons, with productivity average is 21.98 tons. The South of El-Kantara Shark has been chosen as it is one of the most important of the recent reclamation and aquaculture region dependent on water of Al Salam Canal. The study aims at identify the current status of sugar beet development across Egypt at levels of evolution of cultivated area, productivity and total production. In addition to study the factor influencing and determining the production of beet crop in the South of El-Kantra Shark through the studying the efficiency of using the economic resources available for produce sugar beet in the concerned area. Also use indicators that may help in achieve competence of production element using. The study aims at observing and analyzing production costs of sugar beet crop. Beside identify the economic impact of sugar beet cultivation in new Lands nearby Al-Salam Canal. The study found that there is an increase in the amount of sugar production by 42.025 thousand tons per year within the study period, offset by an increase in sugar consumption about 57.158 thousand tons per year during the same period, resulting in a growing gap, the increasing rate of such nearly 16.417 thousand tons annually. It also found that there is a raise in the cultivated by 0928 thousand acres per year in new lands and by 10,494 acres annually at the Republic level during the study period. By measuring the economic efficiency with indicators, it has been shown that the value of production in the first category of possession was about 7560 pounds, nearly 7144 pounds for the second category approximately 7350.6 pounds for the total sample. Meanwhile the net return for the first category was about 3570 pounds, nearly 3149 pounds for the second category, and approximately 3358.12 pounds for the total sample of study, that is the first category (less than three acres) is the most profitable and the best in using the economic-agricultural resources efficiently. The study also found the economic impact of sugar beet cultivation in South of El Kantra Shark area lies in the cultivation in the new lands is one of the productivity methods and agricultural patterns used in the exploitation of the available agricultural resources, especially in the new lands. Generally, productivity competence could be increased in Al-Salam Canal area through these patterns, in addition to the added value of agricultural production in the concerned area. Moreover beet is a high-yielding crop compared to the other crops cultivated in the same season, such as wheat, alfalfa, and barley which is one of fodder crops, in addition to being one of the salinity tolerant crops cultivated in the new area of reclamation, which is very close to the study area (Sahl Al-tena region), which can be cultivated with sugar beet crop. This is in addition to sugar beet cultivation motivates of setting up projects that contribute in producing the sugar, which explained the results of the efficiency in the use of land resources available agricultural area of study and thus the

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ability to provide inputs for the establishment of such projects by proposing cropping pattern provides spaces that can meet the needs of such projects, which represents a great exploitation of area resources. The study also found that the cultivation of this crop may provide a direct vacancies that can be provided by agricultural activity and the cultivation of sugar beet crop, and construction of these projects related to this activity, beside a another indirect job opportunities such as working in these industries based on agricultural production; extraction of sugar from sugar beets.

Kew words: Economic Impact, Sugar Beet, New Lands and Al-Salam Canal

INTRODUCTION

The Sugar is one of the strategic commodities for most countries on the levels of production, consumption, export or import. In Egypt, it considers a key commodity and gain a high importance by economic-political decision makers due to it takes part in bridge the gap between production and consumption also to reduce the imports. According to statistics, Egypt produces about 1.757 million tons of sugar every year. However, the consumption reaches 2.600 million tons, which indicates a gap of 843 thousand tons and a self sufficiency of almost 68% that can be achieved through boosting the local production of sugar through increasing the cultivated areas.

The limited water resources weigh negatively on the cultivation of sugar cane that needs nearly 13 - 15 thousand cubic meters of water per acre, compared to 2.5 – 3 thousand cubic meters for sugar beet. Accordingly, the government has recently paid attention to cultivating the sugar beet especially in the recently-reclaimed areas, taking into consideration that this plant with high salinity and saves a great quantity of water.

Globally, sugar beet coming in the second rank after sugar cane as sugar production sources and in Egypt especially. The beet sugar represents 25% of Egyptian sugar and 40% of sugar in the world. The sugar beet growing had entered to Egypt since (1981-1982). It is also an important crop as it contribute in generating integrated industrial-agricultural communities, especially in the new and reclamed areas. Due to the crop growing, sugar industry and producing a high-value fodder from sugar industrialization wastes in these areas. In Egypt, the beet-cultivated area reached to 248.308 thousand acres by 2008 -2008 season, the total production was about 5.458 million tons, the production average was 21.98 tons per acre. The south of El-Kantra Shark area was chosen to be the point of research as it acts the most important cultivating and reclamation areas based on Al-Salam canal.

Study Problem:

The new lands consider an alternative to increase the beet fields without effect on crop physical structure, in Egypt, because it is a fresh soil. The study problem represents in; although there are many motives for cultivate sugar beet in the concerned area (El-Kantra Shark); such as ability of growing sugar beet in these arable land, the deficit in sugar local production, the gap between production and consumption however the achieved raise in sugar-producing crops. In addition to the decrease in productivity which is result of the decline of production per acre; it was 15.5 -18.5 tons/acre by 2006 in south of El-Kantra Shark area. This productivity may increase through the ideal use of the available productive resources. Beside the most critical problem, which encounters Sugar beet growers in the concerned area, is the highly costs.

Study Objective:

This study aims at taking an overview on the current development of sugar beet growing across Egypt, on sides of the cultivated area, productivity and the gross production. Moreover study of factors that impacts and determines the sugar beet production in south of El-Kantra Shark area by observe the efficiency of available economic agricultural resources usage in order to cultivate sugar beet in the concerned area, and use the indicators that support in achieve the competence of production elements usage. Also among objectives; study the beet productivity costs, know the economic impact of sugar beet cultivate in the concerned area.

Research Methodology and Sources:

This study used many economic, descriptive and quantitative methods of data analysis. The simple and physic regression have been used to estimate the productive functions with the dual linear logarithmic figure. Costs functions and some of economic derivatives have been evaluated in order to measure the competence of agricultural resources in sugar beet production. For the study data, it based on the two following sources: **First**: the impractical data from ministry of agriculture and land reclamation and records of statistics division

(agriculture economic central administration) also from directorate of agriculture in Al-Esmaelia (Information Centre).

Second: The field data collected from sample of beet grower's questionnaire in the concerned area in season 20008 – 2009. The questionnaire has been made through interviewing one-hundred of sugar beet growers in south of El-Kantra Shark area then the forms collected. The growers have divided into two categories; farmers cultivate less than tree acres and the others more than three acres. The purpose of questionnaire is to know the competence of available agricultural resources used by the various levels of sugar beet cultivated areas. The south of El-Kantra Shark area has been selected, especially, because it is consider the most important new land in eastern area of Suez Canal also the sugar beet cultivated fields in this area, depends on water from Al-Salam Canal, is about 20% of the total cultivated area in (2008 – 2009).

The Study Results and Discussion Thereof:

A- Development of Sugar Production and Consumption in Egypt:

1- Sugar Production Development in Egypt:

The secular trend formula No. (1) shows the development of sugar production within the study period. It indicates a 42.025 thousand-ton rise in production on a yearly basis during this period. Statistically, the significance of this model became clear, as F value at the level 0.01. The modified coefficient of determination value indicates that 90.4% of the production rise is ascribed to the time factor, while the remaining percentage is a attributed to many other factors not used in this model.

$$\hat{Y}t = \underset{(12,673)^{**}}{855 + 42.025\ X\ t} \qquad (1)$$

$$R^2 = 0.904 \quad , \quad F = 160.6$$

2- Sugar Consumption:

The secular trend formula No. (2) shows the sugar consumption development within study period. It indicates a raise in consumption by 57.158 thousand tons yearly, through this period. Statically, the significance of this model became clear, as F value at the level 0.01. The value of modified determination coefficient states that 68.5% of the consumption raise refers to the time factor, meanwhile the rest percentage is a result of many other factors not used in this model.

$$\hat{Y}t = \underset{(6,166)^{*}}{1323{,}44 + 57.158\ X\ t} \qquad (2)$$

$$R^2 = 0.685 \quad , \quad F = 38.016$$

3- The gap between Sugar consumption & production in Egypt:

The secular trend formula No. (3) shows the development of the gap between sugar consumption and production within study period. It indicates a raise in the gape rate by 16.417 thousand tons yearly, through this period. Statically, the significance of this model became clear, as F value at the level 0.05. The value of modified determination coefficient states that 21.2% of the gap rate raise refers to the time factor, meanwhile the rest percentage is a result of many other factors not used in this model.

$$\hat{Y}t = \underset{(1,834)^{*}}{467{,}150 + 16.417\ X\ t} \qquad (3)$$

$$R^2 = 0.212 \quad , \quad F = 3.363$$

B- at the Level of the Old Lands:

1- Development of Cultivated Old Lands:

The secular trend formula No. (4) shows the development of the sugar-cultivated old lands within study period. It indicates a raise in these cultivated lands by 9.566 thousand acres yearly, through this period. Statically, the significance of this model became clear, as F value at the level 0.01. The value of modified determination coefficient states that 0.63% of area increase refers to the time factor, meanwhile the rest percentage is a result of many other factors not used in this model.

$$\hat{Y}t = 102{,}412 + \underset{(3{,}878)^*}{9.566\ X\ t} \qquad (4)$$

$R^2 = 0.63$ ، $F = 15.39$

2- Development of Production Average in the Old Lands:

The secular trend formula No. (5) shows the development of the sugar beet productivity, in the old lands in Egypt within study period. It indicates that the productivity increase by rate 0.113 thousand tons yearly, through this period. Statically, the significance of this model became clear, as F value at the level 0.05. The value of modified determination coefficient states that 0.76% of area increase refers to the time factor, meanwhile the rest percentage is a result of many other factors not used in this model.

$$\hat{Y}t = 20{,}22 + \underset{(1{,}28)^*}{0.113\ X\ t} \qquad (5)$$

$R^2 = 0.760$ ، $F = 1.658$

3- Development of Gross Production in the Old Lands:

The secular trend formula No. (6) shows the development of the gross production of sugar beet, in the old lands in Egypt within study period. It indicates that the productivity increase by rate 228.296 thousand tons yearly, through this period. Statically, the significance of this model became clear, as F value at the level 0.05. The value of modified determination coefficient states that 0.59% of area increase refers to the time factor, meanwhile the rest percentage is a result of many other factors not used in this model.

$$\hat{Y}t = 200{,}904 + \underset{(3{,}6)^{**}}{228.296\ X\ t} \qquad (6)$$

$R^2 = 0.59$ ، $F = 12.961$

C- at the Level of the New Lands:

1- Development of Cultivated Area of the New Lands:

The secular trend formula No. (7) shows the development of the sugar-cultivated new lands within study period. It indicates a raise in this cultivated lands by 0.928 thousand acres yearly, through this period. Statically, the significance of this model became clear, as F value at the level 0.05. The value of modified determination coefficient states that 0.71% of area increase refers to time factor, meanwhile the rest percentage is a result of many other factors not used in this model.

$$\hat{Y}t = 7{,}402 + \underset{(2{,}269)^{**}}{0.928\ X\ t} \qquad (7)$$

$R^2 = 0.71$ ، $F = 5.14$

2- Development of the New Lands Productivity per Acre:

The secular trend formula No. (8) shows the development of the sugar productivity average per acre in the new lands within study period. It indicates that there is increase about 0.112 tons yearly, through this period. Statically, the significance of this model became clear, as F value at the level 0.05. The value of modified determination coefficient states that 0.76% of increase refers to the time factor, meanwhile the rest percentage is a result of many other factors not used in this model.

$$\hat{Y}t = 16{,}978 + \underset{(2{,}221)^{**}}{0.112\ X\ t} \qquad (8)$$

$R^2 = 0.51$ ، $F = 4.923$

3- Development of Gross Production in the New Lands:

The secular trend formula No. (9) shows the development of the sugar beet gross production average in the new lands within study period. It indicates that there is increase about 20.993 thousand tons yearly, through this period. Statically, the significance of this model became clear, as F value at the level 0.05. The value of modified determination coefficient states that 0.53% of increase refers to the time factor, meanwhile the rest percentage is a result of many other factors not used in this model.

$$\hat{Y}t = 153{,}108 + \underset{(2{,}502)^{**}}{20.993\ X\ t} \qquad (9)$$

$R^2 = 0.53$ ، $F = 6.26$

D- At the Level of Egypt:

- Development of Cultivated Area Across Egypt:

The secular trend formula No. (10) shows the development of the sugar beet cultivated area in Egypt within study period. It indicates that there is increase in the cultivated lands around 10.494 thousand acres yearly, through this period. Statically, the significance of this model became clear, as F value at the level 0.01. The value of modified determination coefficient states that 0.58% of this increase in the area refers to the time factor, meanwhile the rest percentage is a result of many other factors not used in this model.

$$\hat{Y}t = 109{,}814 + \underset{(6{,}476)^{**}}{10.494\ X\ t} \qquad (10)$$

$R^2 = 0.58$ ، $F = 29.98$

- Development of the Productivity per Acre:

The secular trend formula No. (11) shows the development of the sugar beet productivity per acre in Egypt within study period. It indicates that there is increase in the productivity around 0.247 tons yearly, through this period. Statically, the significance of this model became clear, as F value at the level 0.05. The value of modified determination coefficient states that 0.45% of this increase refers to the time factor, meanwhile the rest percentage is a result of many other factors not used in this model.

$$\hat{Y}t = 19{,}234 + \underset{(4{,}33)^{**}}{0.247\ X\ t} \qquad (11)$$

$R^2 = 0.45$ ، $F = 18.74$

- Development of Gross Production in Egypt:

The secular trend formula No. (12) shows the development of the sugar beet gross production average across Egypt within study period. It indicates that there is increase about 247.290 thousand tons yearly, through this period. Statically, the significance of this model became clear, as F value at the level 0.01. The value of modified determination coefficient states that 0.55% of increase refers to the time factor, meanwhile the rest percentage is a result of many other factors not used in this model.

$$\hat{Y}t = 2310{,}535 + \underset{(5{,}64)^{**}}{247.290\ X\ t} \qquad (12)$$

$R^2 = 0.55$ ، $F = 31.80$

Secondly: Productive Efficiency for Study Sample:

The Statistical Estimate for Physical Production Functions (Logarithmic Illustrate) for Beet as per the Cultivated Lands Category in South of El-kantra Shark Area and the Total Sample:

There are many algebraic images could be used in drive the productive functions. Also many attempts may be executed to choose the image, which its results is fit to the economic and statistic base. This study has depended on the phasic and multiple regression, on one hand, the input of the productive function representing in the cultivated area, manure, inorganic fertilizers, herbicide, seeds, labor and machine work. On the other hand, the quantity of acre sugar beet production in ton has been used for the output of function, during beet season 2008 – 2009.

Y = estimative value of the sugar beet produced quantity in ton during the observing. X1 = the cultivated area per acre, during the observing. X2 = the quantity of manure in cubic metre, during the observing. X3 = inorganic fertilizer in the effective unit, during the observing. X4 = quantity of herbicide in liter, during the observing. X5 = the seeds quantity in Kg, during the observing. X6 = labor (man/day), during the observing. X7 = machine work (hour/day), during the observing.

Estimating the Productive Function of Sugar Beet for less than Three-acre Possession Category:

The formula No. (13) shows a statically significance, positive and direct relationship between acre productivity of sugar beet and added quantity of the cultivated area, inorganic fertilizers, seeds quantity, labor and machine. Namely, if these elements increased around 1%, the gross production will increase about 0.197%,

0.389%, 0.026%, 0.273% and 0.021% at the same sequence. The selection coefficient average reached about 0.95, i.e. 95% of variation in gross production of the crop refers to the independent factors which contribute in estimating the function. Statically, the significance of formula became clear at the level 0.01. The total flexibility of production elements reached 0.906; a positive value and less than integer one that is the a agricultural production is in the second phase, the economic production (rationalized). Namely, the sugar beet growers of this category use the available agricultural resources adequately.

$$\hat{\text{Log Yi}} = 1.77 + \underset{(4,4)\,**}{\text{Log X1}}\ 0.197 + \underset{(6,3)\,**}{\text{LogX3}}\ 0{,}389 + \underset{(4,7)\,**}{\text{LogX4}}\ 0.026 + \underset{(5,4)}{\text{Log X5}}\ 0.273 + \underset{**(3,8)\,**}{\text{Log X6}}\ 0.021 \qquad (13)$$

$$R^2 = 0.63 \qquad F = 15.39$$

The values between practices refer to cost (C), and (**)refer to significance level at 0,01 and (*) at 0.05.

Estimating the Productive Function of Sugar Beet for More than Three-acre Possession Category:

The formula No. (14) shows a statically significance, positive and direct relationship between acre productivity of sugar beet and added quantity of the cultivated area, inorganic fertilizers, seeds quantity, labor and machine. If these elements increased around 1%, the gross production will increase about 0.234%, 0.263%, 0.023%, 0.136% and 0.196% at the same sequence. The modified selection coefficient reached about 0.89, i.e. 89% of variation in gross production of the crop refers to the independent factors which contribute in estimating the function. Statically, the significance of formula became clear at the level 0.01. The total flexibility of production elements reached 0.852; a positive value and less than integer one. This reflects that the available agricultural resources are used adequately.

$$\text{Log Yi} = 2.77 + \underset{(3,8)**}{\text{Log X1}}\ 0.234 + \underset{**(5,02)\,**}{\text{Log X3}}\ 0{,}263 + \underset{(6,04)\,**}{\text{Log X4}}\ 0.023 + \underset{(4,6)\,**}{\text{Log X5}}\ 0.136 + \underset{(5,7)\,**}{\text{Log X6}}\ 0.196 \qquad (14)$$

$$R^2 = 0.89 \qquad F = 57.44$$

The values between practices refer to cost (C), and (**) refer to significance level at 0,01 and (*) at 0.05.

Estimating the Productive Function in Logarithmic Form for the Total Sample:

The formula No. (15) shows a statically significance, positive and direct relationship between acre productivity of sugar beet and added quantity of the cultivated area, inorganic fertilizers, seeds quantity, labor and machine. If these elements increased around 1%, the gross production will increase about 0.201%, 0.381%, 0.040%, 0.157%, 0.108% and 102% at the same sequence. The modified selection coefficient reached about 0.89, i.e. 89% of variation in gross production of the crop refers to the independent factors which contribute in estimating the function. Statically, the significance of formula became clear at the level 0.01. The total flexibility of production elements reached 0.989; a positive value and less than integer one. This reflects that the available agricultural resources are used adequately.

$$\text{Log Yi} = 3.84 + \underset{(4,7)**}{\text{Log X1}}\ 0.201 + \underset{(3,8)**}{\text{LogX3}}\ 0{,}381 + \underset{(5,02)**}{\text{LogX4}}\ 0{,}040 + \underset{(6.04)**}{\text{LogX5}}\ 0.157 + \underset{(4,6)\,**}{\text{LogX5}}\ 0.108 + \underset{(5.7)**}{\text{LogX6}}\ 0.102 \qquad (15)$$

$$R^2 = 0.92 \qquad F = 60.4$$

The values between practices refer to cost (C), and (**) refer to significance level at 0,01and(*) at 0.05.

Thirdly: Statistical Estimating for Production of Sugar Beet Costs Function (The Study Sample):

The function of sugar beet production costs has been. The statistical estimated in order to evaluate the economic competence of sugar beet during the study period.

This function has been evaluated for beet season of 2008-2009 in quadratic form as it is the best form which results thereof agree with the economic logic. Also the volume which decrease the costs may be achieved through equalize the marginal costs and the average costs. On the other hand the volume which increase the profit through equalize the marginal production and the marginal costs.

The Function of Acre Productivity Costs for the First Possession Category (Less than Three-acre):

The formula No (16) shows the function of the total costs for the first possession category through which

the volume maximizing profit by equalizing the function of marginal costs equal and marginal revenue has been estimated, (The average of ton price per ton for this category is estimated 315 pounds per ton) during the season 2008-2009. This provided the productive volume maximizing profit was around 21,83 tons. When comparing the volume of maximizing profit with average actual production of the sugar beet sample for first category of possession, which amounted about 24 tons/acre, we find the average actual production of this category is larger than the volume that maximize the profit. This indicates the efficiency of using the available agricultural resources during that phase of production for this possession category.

$$T.C.=2874.57 - \underset{(11,4)^{**}}{174.20\ Y} + \underset{(7,9)^{**}}{11.2\ Y^2} \qquad (16)$$

$$R^2 = 0.94 \quad F = 38.7$$

$$M.C = -174,20 + 22.4\ Y = 315$$

$$-174.20 + 22.4\ Y = 315$$

Y (volume maximizing profit) =21.83 tons/acre
T.C = total costs of sugar productivity per acre in EGP Y = average of sugar production per acre.
(**)refer to significance level at 0,01 and (*) at 0.05 .

The Function of Acre Productivity Costs for the Second Possession Category (More than Three-acre):

The formula No (17) shows the function of the total costs for the second possession category through which the volume maximizing profit by equalizing the function of marginal costs equal and marginal revenue has been estimated, (The average of ton price per ton for this category is estimated 304 pounds/ton) during the season 2008-2009. This provided the productive volume maximizing profit around 22.54 tons. When comparing the volume of maximizing profit with average actual production of the sugar beet sample for this category of possession, which amounted about 25.5 tons / acre, we find the average actual production of this category is larger than the volume that maximize the profit. This indicates the efficiency of using the available agricultural resources during that phase of production for this possession category.

$$T.C = 2640.11 - \underset{(11,44)^{**}}{147.80\ Y} + \underset{(7,9)^{**}}{10.02\ Y^2} \qquad (17)$$

$$R^2 = 0.91 \quad F = 33.4$$

$$M.C = 147,8 + 20.04\ Y$$

$$-147.8 + 20.04\ Y = 304$$

Y (volume maximizing profit) =23.09 tons/acre
T.C = total costs of sugar productivity per acre in EGP Y = average of sugar production per acre.
(**)refer to significance level at 0,01 and (*) at 0.05

Fourthly: Measuring the Economic Competence by Some Indicators:

A- The production Value:

The data shows that the production value of the total sample for the first possession category is 7560 EGP, while the second possession category value of total sample about 7350 EGP.

B- the Net Revenue:

The data (of the study of sugar beet in the south of El-Kantra Shark area) shows that the net revenue for the first possession category is 3570 EGP, while the second possession category net about 3149 EGP and the net value totally reached 3358,12 EGP. It indicates that profit of first possession category (less than three-acre) is greater than the second category and more efficient in using economic-agricultural resources.

Fifthly: the Economic Impact of Sugar Beet Cultivation in the South of El-kantra Shark:

- The cultivation of sugar beet in the new lands is one of the productive methods or a cultivating forms used in the exploitation of the available agricultural resources, especially in the new lands. Through these

methods, the productivity rise of agricultural resources available in the area of Al Salam Canal could be achieved, beside the added value of agricultural production within study area.

- The revenue rise of the sugar beet production comparison with the other competitor crops, in the same season, including wheat, alfalfa, and also barley; cultivated in some areas; that is one of forage crops, beside it is one of the crops cultivated in reclamation as its salinity tolerance. In the same time the soil of the area close to study area is characterized by muddy and salinity nature, hence it can be cultivated with sugar beet crop. The table No. (1) shows a comparison between the value of net revenue of sugar beet on one hand and both wheat and barley on the other hand, the net revenue of these crops 3358 pounds .2455 pounds, 1440 pounds, respectively, which means revenue of the sugar beet crop is 903 pounds higher than the wheat revenue and 1918 pounds than barley. These are the reasons that motivate farmers to cultivate sugar beet instead of the other crops grow in the same season.
- Possibility of setting up projects to produce sugar, the results of the study indicated the efficiency of using the available lands resources of study area and thus providing production inputs for the establishment of such projects by proposing a cropping pattern supply more lands to meet the needs of these projects, which exploit the study area resources.
- Providing direct vacancies through the agricultural activity, including cultivation of sugar beet. And another indirect including, jobs provided by industries based on agricultural production such as extracting sugar from sugar beet.
- The table No. (2) indicates the relative importance of factors that makes farmers prefer to grow sugar beet crop instead of other crops that cultivated in study area such as; wheat, alfalfa and barley. The reasons of preferring correspond to the economic impact of growing sugar beet in the study area, however there is variance in these factors order from the viewpoint of farmers. The table data, which could be ranked according to the weighted average as follows:

- Raising the revenue of sugar beet cultivation as the beet is one of cash crops, the farmers cultivate it to get monetary value.
- Providing direct vacancies through work in the production of beet sugar, the agricultural work is one of the job sources in the new lands.
- Establishing sugar factory to produce sugar from the beet as result of extending sugar beet cultivated area, thereby offering more employment opportunities in the region and raising living standards.
- The preference of farmers growing sugar beet as modern productive methods in the fresh lands, it is fit to the nature of the soil in the high salinity new territories.
- Farmers prefer to cultivate sugar beet in order to gain the high revenue.

Table 1: a comparison between total revenue, total costs and net return of the sugar beet and the other crops in the study area.

Cost Items Crop	Total Revenue	Total Costs	Net Return
Beet	7350	3992	3358
Wheat	5965	3510	2455
Barley	3940	2500	1440

Source: Data has been collected and calculated from the questionnaire forms of the study sample, season 2008 – 2009

Table 2: The relative importance of factors for which farmers prefer to cultivate beet in study area

Relative importance	First choice		Second choice		Third choice		Weighted average	Order
	%	No	%	No	%	No		
Productive method for new lands	10	15	19	20	20	15	16,7	Fourth
Sugar beet revenue increasing (cash crop)	36,7	55	19	20	33,4	25	38,3	First
Providing direct vacancies	26,3	40	23,8	25	13,3	10	30	Second
Ability of establishing projects for sugar production	20	30	28,6	30	13,3	10	26,7	Third
Preference of cultivate sugar than other crops grown in the same season	6,6	10	9,5	10	20	15	10,8	Fifth
Total	100	75	150	100	105	100	75	

Source: Data has been collected and calculated from the questionnaire forms of the study sample, season 2008 – 2009

Recommendations:

- Propose a cropping pattern aiming at increase the area cultivated with sugar beet in south of El-Kantra shark and Sahl El-tena regions and nearby areas. This gives advantage of provide the required quantities of beet sugar establish factories to extract sugar from sugar beet.

- Need to develop a productive policy that would increase the adoption of the increasing beet production through using high-yield seeds of this crop, hence the return will be raise.
- Need to develop a marketing strategy that would put the marketing of sugar beet in the account, because this market does not meet the elements of market mechanisms or perfectly competitive conditions, in which the price balance achieved for both producer and consumer.
- The necessity of establishing more factories for sugar extraction from sugar beet and motivation to be set up such and support it with state-of-the-art technology.

Annexes:

Table 1: Development of cultivated area, Productivity and production at levels of new and old lands and over Egypt totally.

Year	Old Lands			New Lands			Republic Total Lands		
	Area per 1000 Acres	Production Per Ton /Acre	Production Per 1000 Tons	Area per 1000 Acres	Production Per Ton /Acre	Production Per 1000 Tons	Area per 1000 Acres	Production Per Ton /Acre	Production Per 1000 Tons
1998	13775	18,8	1950970	9430	16,24	153143	113205	18,16	2104113
1999	128404	19,93	2559652	9708	16,39	159114	138112	21,31	2718779
2000	124325	21,54	2678032	11298	18,79	212289	135623	20,03	2890359
2001	129795	20,36	242884	12843	16,72	214734	142638	20,03	2857728
2002	140981	20,77	2928403	12820	18,71	239862	153801	20,60	3168311
2003	138873	20,56	2861822	8518	17,91	152557	147932	20,40	3014429
2004	136765	20,43	2795242	4217	15,48	65279	140982	20,40	2860547
2005	160529	20,62	3310454	6798	17,51	119032	167327	20,49	3429535
2006	166736	21,59	3544651	19660	18,32	360171	186396	20,95	3904967
2007	225773	22,29	5033645	22535	18,84	424559	248308	21,98	5458212

Source: Ministry of Agriculture and Land Reclamation - Sugar Crops Council – Bulletin of sugar crops 2009.

Table 2: Development of sugar production and consumption in Egypt within the period (1990-2007).

Year	Production per 1000 Tons	Consumption per 1000 Tons	Gap
1990	4266	10949	6283
1991	4483	9526	5043
1992	4618	9557	4939
1993	4833	9666	4833
1994	4786	10524	5738
1995	5813	11204	5391
1996	5940	11247	5507
1998	5968	12184	6216
1998	6271	12976	6705
1999	6445	13184	6739
2000	6710	13575	6865
2001	6344	14036	7692
2002	6222	14497	8275
2003	6870	16310	9440
2004	6243	16798	9555
2005	8156	19290	11134
2006	7445	1808	10635
2007	7336	16360	9024

Source: Ministry of Agriculture and Land Reclamation - Sugar Crops Council – Bulletin of sugar crops 2009.

Table 6: Average of production costs and acre revenue of sugar beet (in pound) for possession category.

Possession Category	manure	Inorganic	Fertilizer	herbicide	seeds	Labor	Machine work	lease value	Total Costs	Productivity average	Ton Price	Production value	Net acre production Profit of Invested pound
First Possession Category (less than three)	410	630	350	200	700	500	1200	3990	24	315	7560	3570	0,894
Second Possession Category (more than three)	400	610	380	200	635	570	1200	3995	23,5	304	7144	3149	0,788
Total Sample average	405	620	365	200	667,5	535	1200	3992,5	23,75	309,5	7350,6	3358,12	0,841

Source: Data has been collected and calculated from the questionnaire forms of the study sample, season 2008 – 2009