Efficiency use resources of the most important salt tolerant crops productivity in Sahl ELTina

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ABSTRACT

The study aimed to estimate the efficiency of resource use for farmers in the Sahel El-Tina region in Port Said Governorate by using a randomly sample of 140 farmers were selected from Sesame and Sugar beet farmers in the study area (Sahl-ELTina). The study crops (Sesame and Sugar beet) were selected according to the cultivated area of each crop. As the cultivated area of Sesame crop reached about 29.11% from the total cultivated area, as the cultivated area of Sugar beet reached about 29.34% from the total cultivated area in study research. Data were collected by questionnaires through a personal interviews with the crops study farmers in the study area of both crops the Sesame and Sugar beet crops. The data were analyzed using the gross margin analysis, assessing the functions of production, costs and resource efficiency, the results for Sesame crop showed that the value of the determination coefficient reached 96.2%, which means that 96.2% of the factors affecting Sesame productivity (organic fertilizers, mechanical work and human labor). The gross margin was about 7600 L.E / feddan as a result of the optimal use of agricultural resources, while the result for Sugar beet crop showed the value of determination coefficient factor increased reached 89.5%, which means that 89.5% of the factors affecting of the Sugar beets productivity are due to the influence of independent agricultural recourses, and the gross margin was reached about 9140 L.E / feddan and the result of the use of resources showed that two of the agricultural resources (cultivated area and human labor were underutilized used, while(nitrogen fertilizers and mechanical work)were over utilized used.

1. INTRODUCTION

Egyptian agriculture faces several basic problems that restrict its implementation of required by domestic needs or export development to faced of the persistent deficit in the trade balance. The most important of these problems are limited water irrigation and scarce in agricultural recourses which cause the decreasing in soil productivity and decreasing in the final crop product also , which require for efficient use of agricultural resources to increase feddan productivity and crops[1]. Mainly the agricultural productivity depends on how the efficiently used available scarce resources (factors) are utilized in the production process. Hence, the cultivation of new soils and reclaimed lands must use improved technologies and agricultural recourses, must be accompanied by efficiency using resource, that raise productivity of factors .in addition to maximizing the benefit from the land water units, providing new job opportunities in the targeted reclamation areas, and increasing the export rates of agricultural products to support the national economy,. Most of the recent gains in agricultural production have resulted from expanding the cultivated area and increasing the production per unit of land area[5]. But the innovative researches on salt tolerant crop and

natural resource management can reveal effective ways to helping farmers to increase both productivity and their income to face salinity by growing salt tolerant crops whether saline water or saline soils. This is by cultivate tolerant salinity crops such as the first study crop Sesame, which is one of the most important oil crops in Egypt, and it cultivated in Sahl ELTina because a tolerant salinity crop and Sugar beet crop, which is the second most important sugar crop after sugar cane in Egypt and is considered a major crop Sahl ELTina r region and it is widely cultivate in the study area, because it is a salinity tolerant crop.

2. Study Objectives

The objectives were to examine the gross margin analysis, factors that impacts and determines the study crops production, assess the production function and cost function to determine the productive volume maximizing profit for each crop and measure the resource use efficiency in Sahl ELTina area.

3. Study area description

Sahel El-Tina region was chosen because it is a new reclamation area and it is characterized by its mixed irrigation system that combines the water of the Nile river and drainage water from EL Salam

Canal. Soil in study research is characterized by heavy clay soil. Study area is reached about 31500 feddans as an area of infrastructure and facilities about 14900 feddans by 30% of the total area, Mainly region consisting of seven villages (1), (2), (3), (4), (5), (6), (7)·(8) region is characterized by growing traditional crops like (wheat, sugar beet, alfalfa, barley and sesame). The study research is on the eastern fringes of the Suez Canal, belongs administratively for south of Port Said governorate, and geographically for north of Sinai. The areas are targeted by the development plan for EL salam canal to reclaim and cultivate about 620 thousand feddans west and east of the Suez Canal·(8) The area of Sahl ELTina is about 50.00 thousand feddans. Agricultural roads, canals, agricultural drains and residential buildings are about 15.8 thousand feddans, and the area designated for vegetable cultivation is about 34.2 thousand feddans spread over 7 villages. Study area has three benefiters categories represented in First category (a) large companies that have more than 500 feddans per company Second category (b) medium companies that have less than 500 feddans per company. Final category (c) small farmers who have between 5-10 feddans The last category is target in this research·(7)

3.1. Natural characteristics of the study area

The studies about Sahl-ELTina it has been shown that there are sand salty soil ,clay, and salty soil study area is consider of saliniaition area with high quantity salt in the water where they are considered very salty water analyzing samples of the ground water are contains high concentration of salts(8).

3.2. Source and irrigation systems

The study area was irrigated from Sheikh Jaber Canal, the second branch of the El Salam canal in the east of the Suez Chanel, was irrigated by mixed water (with fresh water from the Nile River, agricultural drainage water). The water irrigation systems in the study area Sahl El -Tina by a flood irrigation system, and the new irrigation systems like drip irrigation system and sprinkle irrigation system where uses in the sandy lands located southeast and the East of the study area (Sahl El-Tina)

3.3. The current state of land and water resources

Soil quality: The results of the studies and evaluation of soil quality in the study area using the Soil Quality Manual, which shows that the quality of the soil from 46.75% to 60.75% in the village No. (1). While the values of this guide ranged in the other villages from 52.75% to 56.00%, which means that the lands study area are of medium quality, exception of the lands of village No. (3), of low quality, due to the decrease in the area of the Sahl El Tina region. The study area soils needs more

employment, whether human labor , mechanical work, organic fertilizers and the of mineral fertilizers(nitrogen, phosphorous and potassium)are available at reasonable prices for farmers especially in the study area for helping farmers to cultivate the tolerant salt crop for decline soil salinity [8]

3.4. Irrigation water quality

:Sahl El-Tina region uses mixed irrigation water, with mixing ratios between agricultural wastewater and Nile river water, with a high percentage of agricultural wastewater, which led to high costs of washing and plantation operations, poor productivity and efficiency of the irrigation unit used, and low feddan productivity for all crops. [9].

4. Study Crops

4.1. The first crop : Sesame crop was selected because it was represented 29.11% from total cultivated area in the study area (Sahl ELTina) [8]. It is one of the important oil crops, where its seeds are distinguished by its high oil content, which ranges from 50-60%, and its seeds are also distinguished by the high percentage of protein, which ranges from 25-30% and some mineral salts and vitamins. sesame has many uses, as seeds are considered sesame as an important oil crop. which is grown mainly to obtain seeds that are used in the production of some foodstuffs, as its seeds are rich in oil, protein, calcium and phosphorous, and the percentage of oil in Egyptian varieties ranges between 55 -60% and protein from 15 to 25%. the seed shell is characterized by a high percentage of raw fibers and mineral materials calcium and oxalic acid sesame is also a lucrative crop, especially in lands where traditional crops do not exist, as well as in new farming areas, in addition to light and heavy yellow lands, silt and clay lands are well-drained. Although Egyptian agriculture faces many problems, such as climate change or water scarcity. Sesame is very resistant to these conditions and is easy to grow, but at the same time it has many advantages to the soil as well as its nutritional status. Sesame is known among other crops as the dazzling plan·[7]

4.2. The second crop was Sugar beet crop was selected because it was represented 29.34% from total cultivated area in the study area (Sahl ELTina)[8].Sugar beet cultivated in yellow ,light soils, as well as in black soils and good drainage heavy soils. In general, the crop could be cultivated in all types of soils sandy, salty and limestone soils. Sugar beet crop was cultivated in The soils that were not cultivated with any other crops to increase salinity, Sugar beet is a reclamation crop and cultivation for these soils so the other crops can be cultivated after that because it absorbs large quantities of salinity from the soil. The crop was also succeeded in desert lands, which have no high content of stones, and it is considered the second

crop of sugar production after sugarcane in Egypt and the world. Sugar beet mainly cultivated for the purpose of producing sugar in order to fill the gap between the needs and the quantities actually produced and recently the green part was used in the work of silage to feed animals or directly feed animals on the vegetative group of plants[7].

5. Research methodology

5.1. Data collection

This research was carried out in Sahl-ELTina area at Port Saied governorate. In this research were used the primary data ,and were designed questionnaires to meetings 140 total farmers according study crops total farmers in SahlELTina,were selected 80 Sugar beet farmers by 10% from total Sugar beet farmers, From total Sesame crop farmers were selected 60 Sesame crop farmers by 10%from total sugar beet farmers and interviewed for the research, Crops were used in this research Sugar beet for winter season (2019-2020) ,and Sesame for summer season (2019) which represented most cultivated crops from horticulture crops in the research region .

5.2. Analytical Technique

The analytical tools were used gross margin analysis, the simple regression had been used to access the function of production , function of Cost and efficiency of resource .**Gross margin analysis** A gross margin is simply an access or of the income and costs associated with a specific crop in a farming business. Analysis of gross margin is used to regulate which crops are more profitable than others.

A gross margin is calculated using the following formula:

Gross Margin for Activity = Income of gross - Costs of variable

Gross Income for Activity: The growing and marketing income for a particular crop and is normally the total sales value for a particular crop.

Variable Costs for Activity: The expenses for growing a particular crop and include: pumping costs, labor, seed, fuel and oil, contractors, harvesting, packing and freight costs these cost called variable costs because these vary with the amount of area planted, therefore if the area of this particular crop was zero, then the variable costs would also be zero.

Gross Margin: A gross margin is the amount of cash left over from growing any particular crop. It is not an absolute measure of profit but it will determine the best financial result when a number of different crop alternatives are compared. The other set of costs that are omitted from a gross margin analysis are the 'overhead' or fixed costs. Overhead costs are those costs which do not change depending on the crop that is grown.[5]

gross margin as follows: of Model

$$GM = TR - TVC$$

Where:

GM = Gross margin (LE/Feddan).

TR = Total revenue or total value of output from the research crops enterprise (LE / Feddan). It is

The product of average output per feddan x the market price

The price used was market price in the study period.

TVC =Total variable cost or the costs that are specific in producing (crop) output (LE/Feddan). TVC varies according to output and are incurred on variable inputs. This includes cost of inputs like seeds, fertilizer, and harvesting, processing, labor cost (hired/family). [5]

5.3. Analysis Function of Production

Regression model was used to examine input-output relationship and the

implicit form of the model is given by:

$$Y= f(X_1, X_2, X_3, X_4, X_5, X_6, U_i)$$

Where Y = Output from crop Production (ton)

X_1 = cultivated area (feddan)

X_2 = Organic fertilizers (cubic meter)

X_3 = mechanical work (hour/day)

X_4= Human labor (man/day

X_5 = Nitrogen fertilizer (effective unit)

X_6 = quantity of irrigated water (cubic meter)

U = Error term.

The explicit form of this function takes the following forms:

$$Y = a + b_1 X_1+ b_2 X_2+ b_3 X_3+ b_4 X_4+ b_5 X_5+ b_6 X_6 + U_i.$$

Y = estimative value of the crop produced quantity in ton during the observing.

5.4. Analysis of Resource use Efficiency

Efficiency of using Resource was calculated from the analysis function of production. Generally defined the efficiency is as the quantity of resources (Y) per unit of recourse (x) used in the production procedure, , the average of physical productivity (APP), to confirm the resources were utilized efficiently ,the marginal value product (MVP) of the variable resources used was computed and compared with their prices of resources. The following ratio was used to compute the efficiency of resource use.

$$R = \frac{MVP}{MFC}$$

Where:

R = Ratio of efficiency

MVP = Marginal value of product (value added to crop output when added the agricultural inputs which used in the cultivation).

MFC = Marginal cost of factor (cost of unit of a particular resource).

But MVP is estimated as:

$MVP = MPP_{xi}P_y$

$MPP_{xi} = \frac{\partial y}{\partial xi}$

MPP_{xi} is the marginal physical product of a unit of input X_i,

P_y is the price of output.

As regards the efficiency using resource whenever:

MVPxi > MFCxi there is under utilization of resource xi.

MVPxi < MFCxi there is over utilization of resource xi.

MVPxi = MFCxi there is optimum utilization of resource xi. [5]

5.5. Analysis of Function Cost

he Model of regression was used to inspect resources relevance and the underlying composed of the model is presented by:

Tc =b0 +b1q + b2q2+ b3q3 + u.

Where:

Tc =total production cost.

Q = output production .

U = Error term.

6. Results and discussion

The result of the gross margin analysis and retunes for **Sesame** crop in Sahl ELTina area was presented in table (1). Costs of various resources were used and the profit acquire from the sales of the sesame crop were assessed based on the price of market at the study time the total revenue was calculated by multiplying the total quantity of the sesame crop harvested per feddan by the output price per unit. The average total revenue is 20000 LE /feddan. For the production cost of, The total costs are including(total variable costs and total fixed costs) were considered in order to calculate the total cost of production were about15900 LE/feddan. The total variable cost includes(human labor and mechanical work, mineral fertilizers, organic fertilizers, and seeds) were about 12400 L.E/feddan, while total fixed costs includes cost of(land renting, and Irrigation water network) were about 3500 L.E/feddan. The labor used consists of family, hired labor. The gross margin and net farm income (profit) were 7600 ,4100 LE/feddan respectively.

Table 1. Gross margin and returns for Sesame.

Item	(LE/feddan)
Total Revenue	20000[1]
Total variable costs	12400[2]
Gross margin	7600[3]*
Total fixed costs	3500[4]
Total costs	15900[5]*
Net Farm Income/Profit (NFI)	4100[6]*

Source: collected and calculated from questionnaire data, 2019

While: (3)=1-2 , (5)=2+4 , (6)=1-5

6.1. The Statistical Estimate for Production Functions for Sesame

There are many forms could be used in thefunctionsof production , This research has count on the multiple regression, the indepented elements, were cultivated area, organic fertilizers, chemical fertilizers, seeds, human labor and mechanical work and the dependent elements was the amount of feddan production by ardab had been used for the function of resource , during the summer season (2019).

Y = Value of the Sesame produced in ardab during the research. X1= Human labor (man/day) during the study. X2 = mechanical work (hour/day) during the reacearch, X3 = Organic fertilizers in cubic meter during the research.

Equation (1) showed a statically significance relationship between Sesame productivity per Feddan and human labor, machine work and organic fertilizers. if these elements changed by 1%, the gross production will increase by about 96.2%.

$Y = 3.1 + 6.02x_1 + 14.96\,x_2 + 9.84\,x_3$ .... (1)

(2.07)   (2.2)   (2.4)

R^2=96.2%   F=122.3

6.2. The Statistical Estimate for cost Function for Sesame

Equation (2) showed the function of total costs through the maximizing profit value by equalizing the function of marginal costs and average costs had been assessed, during the summer season 2019. This provided the maximizing of productive volume income was about 5.12 ardab, When comparing the maximizing profit value with average actual production of the Sesame sample which amounted about 4.5 ardab/feddan, it was found that the average actual production is less than the maximize the profit value . This reflected the inefficiency of using the available agricultural resources during the production..

$TC = -32.1 + 10.24\,q - 0.001\,q2$ .... (2)

(7.02)   (-2.1)

R^2= 93.2%   F=132

MC=10.24 = 0.002q

q = 5.12 Ardab

6.3. Resource Use Efficiency for Sesame crop

the efficiency used of the resources, Marginal Value Product and the Marginal Factor Cost (MVP and MFC) were estimated. The marginal factor cost which is the unit price for the variable inputs used in sesame production in the study area. Table 2 presented, The MVP was greater than the MFC which reflected all the production recourses were under-utilization, which mean that increase of this recourses use will increase in production. Specifically for every quantity consumed on organic fertilizers, mechanical work and human labor the Sesame returns will increase. Human labor (family

and hired) is very scarce in the study area probably because people now prefer to train their children in school that will eventually pull them away from agriculture, that explain the difference between average actual production and average production that maximize the profit. This is in conformity with the study of Mesike. (2009) which stated that agricultural resources are under-utilize due to the cost of gaining the resources [2].

Table 2. Marginal Value Product (MVP) , Marginal Factor Cost (MFC) of production inputs and resources use efficiency.

Resources	MVP(LE)	MFC(LE)	R=MVP/MFC
labor Human	211	100	2.11
Organic fertilizers	344.4	300	1.15
Machine work	523.6	500	1.04

Source: collected and calculated from questionnaire data, 2019.

The result of the gross margin analysis and retunes for Sugar beet crop in Sahl ELTina area was presented in table (3). Costs of various resources used and the profits gained from the Sugar beet sales were assessed based on the market price during the study time ,the total revenue was calculated =The total quantity of the sugar beet per feddan x the price unit in the study. The average total return is 24000 LE /feddan.For cost of production, The Total costs are including(total variable costs and total fixed costs) were considered in order to calculate the total cost of production were about18860 LE/feddan. The total variable cost includes (Human labor, mechanical work, chemicals fertilizers, organic fertilizers, and seeds) were about 14860 L.E/feddan , while total fixed costs includes (renting of land, and Irrigation water network), were about 4000 L.E/feddan ,The human labor used consists of family, hired labor. The gross margin and net farm income (profit) were 9140 ,5140 LE/feddan respectively.

Table 3. Gross margin and returns for Sugar beet

Item	LE/feddan)(
Total Revenue	24000[1]
Total variable costs	14860[2]
Gross margin	9140[3]*
Total fixed costs	4000[4]
Total costs	18860[5]*
Net Farm Income/Profit (NFI)	5140[6]*

Source: collected and calculated from questionnaire data, 2019.

while: (3)=1-2 , (5)=2+4, (6)=1-5

6.4.The Statistical Estimate for Production Functions for Sugar beet

There are many equations could be used in the thefunctionsof production. This study has depended on the multiple regression the indepented resources, were cultivated area, organic fertilizers, chemical fertilizers, human labor and technical work and the dependent resources was the production quantity per feddan in ton had been used for the output function of resource , during the winter season (2019-2020)

Y = assess value of the Sugar beet produced in ton during the research. $X1$ = the cultivated area per feddan, during the study. $X2$ = human labor (man/day) during the research, $X3$= mechanical work (hour/day) during the study ,$X4$= nitrogen fertilizer in the effective unit during the study.

Equation (3) showed a statically significance relationship between feddan productivity of sugar beet and cultivated area, quantity of organic fertilizers ,human labor , mechanical work and . if these elements changed by 1% the gross production will increase about 89.5%.

$$Y = 2.9 + 5.48x_1 + 0.58x_2 + 0.44x_3 + 0.52x_4 \quad …..(3)$$
$$\qquad (2.01) \quad (2.03) \qquad (3.01)$$

$R^2=89.5$ $F=136.4$

6.5.The Statistical Estimate for cost Function for Sugar beet

Equation No (4) showed the total costs function through the maximizing of profit value by equalizing the marginal costs function and average costs had been assessed, during the winter season (2019-2020). This provided the productivity value maximizing profit was around13.25tons, When comparing the maximizing profit value with average actual production of the sugar beet sample which amounted around 20 tons/feddan, it was found the average actual production is less than the that maximize the profit value . This indicates the inefficiency of using the available agricultural resources during the production step.

$$TC = 29.3 + 9.01 q - 0.34 q2 \quad …………... (4)$$
$$\qquad (12.8) \quad (- 2.7)$$

$R^2= 97.3 \%$ $F=128$

$$MC=\frac{9.01}{0.68} =13.25ton$$

$q = 13.25Ton$

6.6.Resource Use Efficiency for Sugar beet crop

In determining the efficiency of the inputs used, Marginal Value Product and the Marginal Factor Cost (MVP and MFC) were determined The marginal factor cost which is the unit price for the variable inputs used in Sugar beet production in the research area. Table 4 showed that the MVP greater than MFC which reflected the recourses were under utilization. The two resulting ratios were greater Than the unit human labor and cultivated area

indicating that the recourses were under used or being under -utilized on the farms during the sugar beet cultivated in winter season thus the increasing its rate of use will increase the productivity and profit level. Similarly, MVP smaller than MFC which reflected the recourses were over utilization. The two resulting ratios were less than unity from nitrogen fertilizers and machine work indicating that the inputs were excessively used or over- utilized hence decreasing quantity of the inputs use will increase output and profit level, that explain the difference between average actual production and average production that maximize the profit. This is in conformity with the study of V.B. Taru (2008) which stated that the hypothesis that resources are not efficiently utilized.[6]

Table 4. Marginal Value Product (MVP) , Marginal Factor Cost (MFC) of production inputs and resources use efficiency

Resources	MVP(LE)	MFC(LE)	R=MVP/MFC
Cultivated area	4.83	2500	1.75
Nitrogen fertilizer	416	700	0.59
Machine work	352	500	0.7
Human labor	464	100	4.64

Source: collected and calculated from questionnaire data, 2019.

REFRENCE

Arzani A (2008). Improving salinity tolerance in crop plants, Isfahan university,2008.

Mesike CS, Owie OED, Okoh RN (2009). Resource-Use Efficiency and Return to Scale in Smallholders rubber farming System in Edo State, Nigeria, Journal of Sustainable Tropical Agricultural Research,28(3).pb :183-186,2009.

Athar HR, Ozturk M, Ashra M (2011). Strategies for Crop Improvement against Salinityand Drought ,AnOverview ,Discover the world research Part of the Tasks for vegetation Sciences, book series (TAVS, volume 44), 2011.

Arshadulla M (2016). Effect of Salinity growth of Chenopodium Quinoa wild ,International Journal of research in agricultre and forestry ,V3,Issu11,November2016.

Eldeep SM (2012). Farmers resources use efficiency in some horticulture crops production in North Western Coast area, Desert Research center,2012.

Taru VB, Kyagya IZ, Mshelia SI, Adebayo EF (2008). Economic Efficiency of Resource Use in Groundnut Production in Adamawa State of Nigeria, World Journal of Agricultural Sciences 4(s).pb: 896 -900 ,2008.

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وزارة الزراعة واستصلاح الاراضى –قطاع استصلاح الاراضى –مراقبة شرق القناة–منطقة سهل الطينة– بيانات غير منشورة–٢٠١٩

. وزارة الرى والموارد المائية–عهد بحوث الصرف–٢٠٢٠

الملخص العربي

كفاءة استخدام الموارد فى انتاجية اهم المحاصيل المتحملة للملوحة فى سهل الطينة

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استهدفت الدراسة تقدير كفاءة استخدام الموارد للمزارعين في منطقة سهل الطينة بمحافظة بورسعيد باستخدام عينة عشوائية من ١٤٠ بمنطقة الدراسة (سهل الطينة) ، تم اختيار محاصيل الدراسة (السمسم ،بنجر السكر) مزارع تم اختيارهم من مزارعي السمسم وبنجر السكر نحو ٢٩,١١ ٪ من اجمالى المساحة المنزرعة كما وفقا للمساحة المنزرعة من كل محصول ،حيث بلغت المساحة المنزرعة بمحصول السمسم بلغت المساحة المنزرعة ببنجر السكر نحو ٢٩,٣٤٪ من اجمالى المساحة المنزرعة ،تم تجيمع البيانات من خلال استمارات استبيان من خلال مقابلة شخصية مع مزارعى كلا من محصولى الدراسة السمسم وبنجر السكر . تم تحليل البيانات باستخدام تحليل الهامش الإجمالي ، وتقدير دوال الإنتاج والتكاليف وكفاءة الموارد ، اظهرت نتائج تحليل الانحدار للسمسم.أن قيمة معامل التحديد بلغت ٩٦,٢٪ مما يعني أن ٩٦,٢٪ من العوامل التي تؤثر على إنتاج السمسم ترجع إلى تأثير المتغيرات المستقلة (المدخلات الزراعية) ،كما قدر هامش الربح الاجمالى حيث بلغ نحو ٧٦٠٠جنيه/فدان نتيجة الاستخدام الامثل للموارد الزراعية (الأسمدة العضوية والعمل الآلى والعمل البشري)، كما قدرهامش الربح جمالى حيث بلغ حوالى ٧٦٠٠ جنيه / فدان)، بينما أظهرت نتيجة الاستخدام الامثل للموارد الزراعية لبنجر السكر.ان قيمة معامل التحديد ارتفعت لنحو ٨٩,٥٪ ، مما يعني أن ٨٩,٥٪ من العوامل التي تؤثر على إنتاجية بنجر السكر ترجع إلى تأثير المتغيرات المستقلة (المدخلات الزراعية) ،كما قدر هامش الربح الاجمالى حيث بلغ نحو ٩١٤٠ جنيهًا / فدانَّ كما اتضح من تقدير كفاءة استخدام الموارد الزراعية أنه نتيجة الاستخدام الامثل للموارد الزراعية ، فإن اثنين من الموارد الزراعية (المساحة المنزرعة والعمل البشري) غير مستغلتين بكفاءة ، بينما هناك استخدام مفرط(للسماد الازوتى والعمل الآلى).

الكلمات الدالة:ملوحة التربة ،ملوحة المياه،المحاصيل المتحملة للملوحة،هامش الربح، معادلة الانحدار