AN ECONOMIC EVALUATION FOR LAND RECLAMATION IN ASWAN (CASE STUDY IN SAIDA VALLEY)

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ABSTRACT

The research aimed at studying the current situation in al-saida valley , (Edfu) and propose actual applicable mechanisms in order to maximize the benefits of practicing agricultural activity, the reclaimed lands still suffer from mismanage the resources available , specially water resources .

The productivity and economic indicators showed that mango came on the top regarding the profitibality of the pouud invested (0.97 pounds) , also tomatoes and watermelon were the most crops in using manpower for the value added indicator , tomatoes came at the first rank (2.60 thousand pounds) followed by mango , alfalfa and watermelon by (2.52 ,210 , 1.86 thousand pound) respectively wheat area exceed 6 thousand feddan which meet the nutritional needs for residents of the valley.

The results showed for two scenarios , the first which aiming at maximizing net income under ultimate certainty , the second based on minimizing the risk to the lowest level both scenarios had completely cultivated area (20.791 feddan) as this reflects the production efficiency .

For the first scenario , The area of different kinds ofclover was 50% (feed group), while the total area of grains (wheat - barley - corn of both types) about 10%, medicinal and aromatic plants , about 30%, and vegetables, about 10% of the total cropping pattern .the gross margin for installation under complete certainty, it appears that the total gross margin is estimated at 123.74 million pounds, of which 66.66 million pounds, which represents r winter crops and about 57.08 million pounds, which represents gross margin for the summer and nile crops by 53.87%, 46.13%, respectively.

While the second scenario aimed to achieve the best cropping pattern takes the risk factor into account, so minimizing the differences overall absolute margins of agricultural crops under study, the model assumes planting 40% of the feed crops, 35% of the crops, medicinal and aromatic plants, 15% of grain crops to achieve self-sufficiency ratio required , 10% of crops, vegetables, the gross margin study for this model shows thatThe gross margin estimated at 113 million pounds of which about 53.7 million pounds represents the gross margin for winter crops, and about 59.3 million pounds represents the gross margin for the summer and nile crops by 47.53%, 52.47%, respectively, and show that the gross margin for the installation of the cropping pattern that takes the risk factor in accountAnd maintain stability of income, which was estimated at 113 million pounds higher than the actual installation of the cropping pattern by about 15.356 million pounds, or 13.59%.

INTRODUCTION

In light of population growth and increasing demand for food there is need to apply agricultural policies include the necessity of horizontal and vertical expansion to increase the cultivated areas, Also increase feddan productivity through applying proper agricultural practices under the available technological knowledge.

Land reclamation, planting new areas of desert and form new communities are strategic pillars to develop Egyptian society generally and the agriculture development specially, since reclamation and cultivation of lands aim at increasing the wealth, production and income, population attraction in order to reduce the overpopulation in the large cities in Nile Valley, reduce the unemployment and help in making developed social relations due to the improvement of new lands possession and utilization systems. All of these can be realized through applying the methods of significant product and using the state of art technology in agriculture and irrigation.

As the reclaimable and cultivable lands are limited, the priorities of horizontal expansion in lands should be determined, based on the available resources in these areas (including the human and non-human resources), therefore the reclaimable lands with the irrigating water is concentrated. Thus the areas in the western Nile valley contain the priorities of horizontal expansion such as Al Saida Valley in Edfu, Aswan, as the total area in this valley amounting 25 thousand feddans. On the other hand, there are improper agricultural practices, in particular regarding usage of the available water resources, done in already utilized areas. These practices need to be reviewed to minimize the use costs and save water to increase the horizontal expansion within the area.

This concern requires the application of economic studies with objective of assess the current situation of the reclamation projects in Al Saida Valley located in Aswan to recognize the economic effects and propose actual applicable mechanisms in order to maximize the benefits of practicing the agricultural activity.

Research problem

The reclaimed lands still suffer from mismanage the resources available specially, water resources, in addition to unsound agricultural practices and its influence on the stability and improving the benefits of these practices. This problem is clear in land reclamation projects in Al Saida Valley, Edfu, Aswan.

Research objective

Research objective is recognition of the current situation in connection with the project of lands reclamation in Al Saida Valley, Edfu, Aswan and propose actual applicable mechanisms in order to maximize the benefits of practicing the agricultural activity.

Data Resources and Research Methodology

The research based on secondary data published and unpublished, which was collected from the relevant official authorities such as Ministry of Agriculture and Land Reclamation, and the Central Agency for Public Mobilization and Statistics, as well as a number of researches and studies that addressed the subject of study in one form or another, in addition to data contained in questionnaire forms prepared for this purpose, and was applied to a random sample of farmers in the Al Saida Valley during 2010.

The research based on use of some statistical descriptive and quantitative techniques to process data either the secondary or primary. The percentages, arithmetic mean and other descriptive measurements to

consider the current and expected offer of the agricultural water resources in the respective area and use method of Linear Programming to reduce the probable economic risk, and the percentages to state the extend of the contribution of change in net income related to the crops to total of change in net income of cropping pattern under the ultimate certainty or cropping pattern risk by using MOTAD Model[3] in accordance with the following:

Minimize

$$Z = \sum_{h=1}^{S} Y_{h}^{-}$$

Such that

$$\sum_{j=1}^{n}(Ch_{j} - g_{j})x_{j} + Y_{h}^{-} \geq 0 \qquad \textit{(For all h, h = 1, ..., s)}$$

$$\sum_{j=1}^{n} f_{i}x_{i} = \lambda \qquad \textit{(λ = 0 to Unbounded)}$$

$$\sum_{j=1}^{n} a_{ij}x_{i} \leq b_{i} \qquad \textit{(for all i, i = 1, ..., m)}$$

$$x_{j} , y_{h}^{-} \geq 0 \qquad \textit{(for all h, j)}$$

Whereas

Z = target function $\qquad\qquad$ f_i = gross margin expected to the activity

Y_{h}^{-} = the ultimate differences between the gross margin of the crops cultivated during the period (2001 – 2006)

X_j = Activity or crop $\qquad$ b_i = Entry amount $\qquad$ c = Activity technical reserves λ = Constant

$$\sum_{J=1}^{n} (Ch_{J} - g_{J}) x_{J}$$

= sum of ultimate values to gross margin deviation from the general average of gross margin

Identify the study area

Al Saida valley is located in Edfu, Aswan governorate, this valley contains six villages; Al Shahama includes agricultural societies of Al Salam, Nile Valley, Al Zahraa and Al Tahrir, Amr Bin Al Aas village comprises agricultural societies of Gad Al Haq and Al Ghazaly, Al Eman includes Al Eman agricultural society, Al Samaha village in which there is Al Samaha agricultural society, Al Ashraf village includes agricultural associates of Omar Bin Al Khatab and Abu Bakr Al Seddiq and Al Nomow which include Osman Bin Affan society. Table 1 in Annex states that the number of the project beneficiaries is about 4022 land possessor representing 70.54% of possessing patterns, in the second class the graduates and ladies (divorced and widow women) which represent 15.71% and 13.75% respectively of the patterns of beneficiaries in the study area.

Table (1) also states the total area of the valley which is 25 thousand feddans, the cultivated area amounting 14.90 thousand feddans Table2 representing 59.60% of the allocated area to the project.

RESEARCH RESULTS

Relative importance of significant cropping pattern in villages of Al Saida Valley

Information of Table 2in annex states the relative importance of cropping pattern in the village of the respective valley during the agricultural season (2008/2009). The cultivated area represents 15.80%, of which 0.22% with the same crops in Aswan and in Egypt in general. The data show that the plant of hibiscus came in the top of the crops by about 38.36% followed by crops of peanuts, fenugreek, alfalfa, wheat, barley, tomatoes and beans by about 31.98%, 26.91%, 24.61%, 23.92%, 14.63%, 10.56% and 9.39% respectively of the area of those crops in Aswan.

As it turns out that the production of fenugreek in the valley representing approximately 28.37% of its production in Aswan Governorate, followed by crops of alfalfa, peanuts, wheat, hibiscus, barley, tomatoes and beans by 13.74%, 13.58%, 12.93%, 12.70%, 9.86%, 8.80% and 6.70% of the production of those crops in Aswan during the same agricultural season.

Economic and productivity indicators

The economic evaluation of new land reclamation and cultivation is based on many economic criteries and productivity indicators which measures the performance of those projects at the level of both the investor and the community whether what concerns on profitability for individuals such as profit of the invested pound, net return per feddan which yield by the investor in land reclamation and cultivation or interested in the return of these projects on society such as growing and productivity of these lands and its support to achieve food security, provide new job opportunities and contribute in increasing in GDP.

It should be noted that the study did not show significant differences among the study classes, therefore there is no necessity to consider each pattern separately; the following are results of these indicators estimations:

Invested pound profitability[5]: this indicates the return on the spended pound in the production process, Table (1) shows the profit of the invest in cropping pattern crops to growers of the study sample during the growing season (2008/2009), mango came on the top regarding the profitability of the pound invested, since it was about 0.97 pounds, followed by tomatoes, fenugreek, barley, beans, sesame, watermelon, corn, alfalfa, hibiscus, peanuts and wheat by about 0.46, 0.39, 0.38, 0.28, 0.28, 0.24, 0.22, 0.22, 0.21, 0.20 and 0.15 pounds respectively, indicating that the profits of the capital share invested in the sample is greater than all interest rates prevailing in the savings schemes in Egyptian banking system in accordance with the criterion of invested pound profitability, which led to individual profitability have concern all the beneficiaries of the project lands.

Net return per feddan[6]: This criteries states the difference between the value of total production and costs of production, Table (1) shows net yield per feddan on crops of cropping pattern for study samples during the growing season (2008/2009), the crops of mango, tomato, watermelon and alfalfa achieved the highest net return amounting 1480, 1200, 660 and 620 pounds per feddan respectively, while the crops of fenugreek, barley, hibiscus, bean, peanut, sesame, wheat and corn reached about 540, 450, 420, 400, 362, 330, 290 and 270 pounds respectively. This criteria indicates that the farmers prefer to cultivate fruits, vegetables and alfalfa than cereals, which may lead to the orientation of cultivation of these crops on expenses of cereal crops by farmers in Al Saida valley.

feddan productivity: This criteria states production average per area unit (feddan), also indicates the feddan productivity deviation according to Aswan governorate general average. In order to identify crops with/without productivity worthiness as determined by farmers of the sample in Al Saida valley comparing to same crops in the other areas of the governorate and within the same season.

Table (1) refers to feddan productivity for crops of wheat, barley, tomatoes, bean, fenugreek, hibiscus, peanuts, corn, sesame, alfalfa, watermelon and mangoes, which achieved about 54%, 67%, 83%, 71 %, 105%, 33%, 42%, 51%, 37%, 56%, 41% and 31% of its counterpart lands in Aswan. Thus this criteria shows the low productivity of all crops yield, except fenugreek production which is higher than the counter lands at the level of Aswan. This low productivity is may be to the poor agricultural drainage within the valley which caused the deterioration of the productivity worthiness for most of the valley's land. It also indicates the presence of five crops did not achieve 50% of the productivity of its counter lands at the governorate level, leading to decline of total return per feddan as result of lack of feddan productivity and hence decline in net return per feddan, that means the cost of each unit within the study lands is higher than unit of counter lands, its competitiveness in the domestic market would be poor as result.

Contribute to reduce unemployment rates: This criteria states carrying capacity of cropping pattern to the study sample farmers during season (2008/2009), for providing jobs opportunities for possessors and their families in particular whose living permanently in the valley's villages.

Table (1) shows that the crops of tomatoes, watermelon are utilize about 40 (man/day/feddan) during the season, followed by crops of alfalfa, which utilize about 30 (man/day /feddan) for the agricultural season, throughout the year, while maize crop comes in the last rank as the feddan provides work for 12 (men/day) for three-months, and thus it indicates the success of the project which providing job opportunities to residents of Al Saida valley. According to the average manpower employment in sample study valley, during the growing season (2008/2009) set out in Table (1), the manpower for crop pattern was about 360.925 thousand men/day, which means the possibility of providing about 1.203 thousand job opportunities every day, which can accommodate the possessors residing in valley villages, with collect wages amounting 9.023 million pounds per year, with

average daily wage of about 25 pounds for the worker, representing about 40% of the value added which are estimated at 22.35 million pounds per year.

Table (1): Economic criteries of cropping pattern for sample study in Al Saida valley during (2008/2009)

Statement		Production costs	Productivity per feddan in the Valley	Value of production**	Net return	manpower	Pound prfetability	Value Added	Productivity per feddan in the Aswan
Crop	unit								
Wheat	Ardeb	1900	8	2190	290	22	0.15	1190	14.8
Barley	Ardeb	1200	6	1650	450	16	0.38	1050	8.9
Tomatoes	Ton	2600	6.2	3800	1200	40	0.46	2600	7.44
Beans	Ardeb	1420	5.1	1820	400	16	0.28	1140	7.15
Fenugreek	Ardeb	1440	3.7	1980	540	16	0.39	840	3.51
Hibiscus	Kg	2000	148	2420	420	24	0.21	1420	447
Peanuts	Ardeb	1780	7.6	2142	362	26	0.2	1322	17.9
Corn	Ardeb	1250	8.8	1520	270	12	0.22	920	17.3
Sesame	Ardeb	1200	1.8	1530	330	15	0.28	1110	4.84
Alfalfa	Ton	2880	c/c*100	3500	620	30	0.22	2100	39.4
Watermelon	Ton	2700	2.8	3360	660	40	0.24	1860	6.87
Mangoes	Ton	1520	2.00	3000	1480	22	0.97	2520	6.5

*The productivity of alfalfa is accounted for carat/cutting (feddan = 20 net carat and cut 5 times a year =100 c/c)

** Value of production = the value of main production + value of secondary production (Grain + straw or sticks).

Source: Data collected and calculated from forms of questionnaires related to the study sample for season (2008/2009)

The value added: This criteria states the net benefit which gained from current exploitation of economic resources, table (1) represents the added value to the farmers of study sample for season (2008/2009), according to this criteria tomatoes ranked first of added value of in about 2.60 thousand pounds, followed by crops of mangoes, alfalfa, watermelon, hibiscus, peanuts, wheat, beans, sesame, barley, maize and fenugreek at around 2.52, 2.10, 1.86, 1.42, 1.32, 1.19, 1.14, 1.11, 1.05, 0.92 and 0.84 thousand pounds per feddan respectively

According to estimates of the value added achieved during the agricultural season (2008/2009) to the farmers of the studied sample in villages in Al Saida valley, it was found that the wheat crop of about 6748 feddans achieved value added amounting 8.03 million pounds, after it in the relative importance crops of alfalfa, hibiscus, winter vegetables and summer vegetables of area totaling about 3150, 2761, 532 and 474 feddans respectively, are expected to achieve added values at 5.04, 3.92, 0.96 0.89 million pounds, respectively. Then the rest of crop patter for season (2008/2009) in the last ranks due to its small cultivated areas, these crops of corn, mango, bean and watermelon as its added values are about 89 28, 162, 167.58 and 171 12 thousand pounds respectively as its areas amounted to about 93, 135, 147 and 92 faddan, respectively

Thus according to data from the studied sample, the cropping pattern for season (2008/2009), will yield about 22.345 million pounds, and unit area

will achieve about 592 pounds/year representing 164% of the value of annual premium of the total area utilized for graduates (amounting 6 feddans) and about 50% of the annual premium of beneficiaries and ladies in the valley (amounting 6 feddans).

Rate of self-sufficiency: This criteria reflects the contribution of farmers in the valley in achieving self-sufficiency of wheat to valley residents, based on the feddan productivity achieved during the production season (2008/2009) and the area planted with wheat, upon Table (1) within the Annex, it became clear that wheat area is about 6748 feddans, in order to meet the nutritional needs for residents of valley villages, this area provides up to 8.098 thousand tons of wheat which covers consumption of the holders and their families and remain about 44% of wheat production contribute to bridging the gap of wheat in Aswan Governorate. According to data from questionnaire forms, the consumption of villages' residents (average 6 members/family) was estimated by 188 kg/year in accordance with average of wheat consumption per capita consumption in Egypt[4], the average of wheat annual consumption reached about 4.537 tons.

Cropping patterns proposed to maximize benefits from resources available in Al Saida Valley

The appropriate[7] cropping pattern is the pattern compiling many objectives to reach the most efficient cropping pattern achieving the objective function, which aims to maximize net returns from available agricultural activities under productive constraints and limits.

The method of Linear Programming[8] (LP) is used to achieve the best cropping pattern maximizing gross margin through two scenarios – first of them includes certainty assumption in production, while the second scenario includes the best cropping pattern takes the risk factor in consideration though minimizing the overall absolute differences of overall margins related to respective crops, hence determine the crops highest risks and estimate cost of risk and its expected prospects.

First scenario: The aim of production objective function was achieving the highest value (λ) * then the cropping pattern, which assumes complete certainty and eliminates the impact of the risk factor in the model, is determined. Total absolute differences of overall margins for agricultural crops would be the highest.

Second scenario: The aim of production objective function was achieving the lowest value of (λ) at which the determined cropping pattern, assuming expected highest economic risks in the model Total absolute differences of overall margins for agricultural crops would be the lowest.

The constraints of mathematical LP includes constraints of land and water resources, while the constraints of agricultural soil constrain for winter area not exceed 11056 feddans and summer and Nile area not exceed 9735 feddan. The study included 46 constraints related to cultivated crops (23 crops) at a rate of two constraints for each crop and total crop area of 20,791 feddan as well. The agricultural land resources constraint represents maximum irrigation water available to grow all study crops, as irrigation water used in agriculture may not exceed 200 million cubic meters, representing

about 88.7% of the total irrigation water available for cultivation in this region, amounting to 225.504 million cubic meters.

Substantial cropping pattern

Table (2) states areas of respective substantial cropping pattern and net income for each of them, it was found that the yield of two types of alfalfa come in the first by about 34.51%, second wheat at 30.69% of total cultivated area, the third rank medicinal and aromatic plants by about 20.94%, and maize in its two types is ranked fourth by 2.43% and watermelon ranked fifth by about 1.70%

Thus, the total area of the major crops in the valley is about 90.27% of the total cropping pattern, and major cereals (wheat and maize) represent to 33.12% of the total cropping pattern within the area of study, which reflects the economic and relative importance of cereal crops in particular and the other major mention above in general. Therefore it can be said that structure of cropping pattern within the study area is based on the major crops along with some other crops which its area collectively amounting 9.73% of the total cropping pattern in study area.

Gross margin of substantial cropping pattern

The data of Table (2) indicates that gross margin of the respective cropping patterns is estimated at 97.646 million pounds distributed between the winter crops and summer and Nile crops at 37.04%, 62.96%, respectively. Gross margin of medicinal and aromatic plants ranked first by about 41.34%, and typs of clover came second by about 39.38% of the total sustainable margin, then wheat crop in the third rank by about 15.03%, corn and onion in ranks four and five by 0.78%, 0.77%, respectively, followed by corn and watermelon 0.73%, and thus gross margin of the sex crops collectively reach 98.07% of the gross margin of cropping pattern under study due to the areas of these crops because it's demand is high compared to other crops. While the contribution of other crops collectively amounting 1.93% of the total gross margin for cropping pattern.

It is noted that gross margin for wheat and clover representing approximately 33.7% and henna representing 1.92% of winter crops' total margin, while the gross margin for maize, and hibiscus about 37.43% of summer and Nile crops' total margin. Also it is noted that alfalfa crop reaches 20.71% of the gross margin for the summer crops, reflecting the importance of these crops in the cropping pattern and thus significantly influenced by changes even if a modest within areas of these crops or net income from each. Also there is a great diversity in crops cultivated in cropping pattern in spite of the limited area, which indicates a low economic risk to which agricultural production may be exposed in this region of the side, but the expansion of areas of some crops significantly, such as wheat, corn, sustainable alfalfa and medicinal and aromatic plants may increase the instability of agricultural net return and accordingly, increase the degree of economic risk from the other hand. This makes net income of the cultivate crops unstable, and the variability from year to year a large role in the high level of economic risk.

Table (2): Substantial cropping pattern in Al Saida valley during (2008/2009)

Crop	Area in feddan	%	Gross margin)million pound(	%
Winter crops	**11056**	**53.18**	**36.169**	**37.04**
Wheat	6380	30.69	14.674	15.03
Barley	272	1.31	0.326	0.33
Hannah	202	0.97	1.873	1.92
Temporary Clover	555	2.67	0.610	0.62
Clover sustainable	3010	14.48	17.625	18.05
Onions	208	1.00	0.749	0.77
Tomatoes	225	1.08	0.022	0.022
Winter squash	57	0.27	0.077	0.08
Beans	28	0.13	0.064	0.07
Eggplant	66	0.32	0.022	0.02
Pepper	53	0.25	0.127	0.13
Summer and Nile crops	9735	46.82	61.477	62.96
Alfalfa	3610	17.36	20.220	20.71
Summer Indion corn	302	1.45	0.455	0.47
Maize	204	0.98	0.299	0.31
Hannah	292	1.40	2.707	2.77
Hibiscus	3860	18.57	35.790	36.65
Molokhia	79	0.38	0.065	0.07
Pepper	315	1.52	0.555	0.57
Bean	232	1.12	0.220	0.23
Cucumber	213	1.02	0.177	0.18
Okra	195	0.94	0.217	0.22
Summer eggplant	79	0.38	0.061	0.061
Watermelon	354	1.70	0.711	0.73
Total	20791	100.00	97.646	100.0

Source: calculated from data of Ministry of agriculture and land reclamation, department of economic affairs, many publications of agricultural statistics.

First scenario: The cropping pattern proposed under the first model Table (3) shows the cropping pattern that aiming at maximizing the net income under ultimate certainty, it was found that the cropping area is cultivated completely as this reflects the increase production efficiency in using land and water resources which amounted about 20,791 feddan, this area represents clover in all types amounting 50.01 % (feed group), while total area of grains (wheat - barley - corn of both types) amounting 10.0%, medicinal and aromatic plants 30.0%, and vegetables about 8.77% of the total crop area cultivated in cropping pattern, and thus the total area of these six crops collectively reaches 98.78%. By studying areas of winter crops, it is founded that there is a shortage in areas of temporary clover, wheat, barley and tomatoes at rates 94.41%, 84.33%, 61.03% and 0.89%, respectively, while there is increase in areas of sustainable clover, winter henna, and vegetables at rates 82.72%, 1542.08 %, 987.93% respectively

For the summer crops, it is founded that there is a shortage in areas of hibiscus, summer cucumber, henna, at rates 27.93%, 20.19%, 52.4%, respectively. While there is increase in areas of indion corn and maize by 90.07% , 96.08%, respectively.

Gross margin of the cropping pattern under the 1st model

By studying the gross margin of cropping pattern in the light of certainty as shown in Table (3), it indicates that the total gross margin is estimated at 123.742 million pounds, of which 66.659 million pounds represent gross margin for winter crops and about 57.083 million pounds for the summer and Nile crops by 53.87%, 46.13% respectively. The henna came in the first rank by 25.89% of total margin, followed by sustainable clover and hibiscus at rates of 24.89% and 20.85%, respectively, and wheat by about 1.86%, thus the total gross margin for these four crops together is 73.49%, and the gross margin of rest crops of cropping pattern reaches 26.51%.

The crops of wheat and medicinal and aromatic plants, temporary and sustainable clover are among the highest winter crops in terms of gross margin that reaches 51.63% of the gross margin for cropping pattern and about 95.8% of the total gross margin of respective winter crops, while the crops of alfalfa , hibiscus and henna are among higher summer and Nile crops in terms of gross margin as it contributes about 22.03%, 20.85% and 1.04% respectively, representing 43.92 % of the gross margin for cropping pattern and about 95% of the total gross margin for respective summer and Nile crops.

Crops contribution in changes of total gross margin

Assuming that the factor of risk is neglected, the maximum total gross margin can be achieved is estimated by about 123.742 million pounds, which is 26.1 million pounds higher than its similar margin of substantial cropping pattern by 21.10%. By studying the contribution of cultivated area changes in the total gross margin for cropping pattern under the proposed first model compared to the substantial cropping pattern within Table (4), it is clear that the most important crops that have a significant impact in increasing total gross margin are sustainable clover, and medicinal and aromatic plants, while the crops that have an impact in decreasing in total gross margin are wheat, barley and Egyptian clover

The crops of winter onions, winter tomatoes, and some other vegetables among the crops that have little impact in increasing total gross margin for the cropping pattern under this model, while crops of barley, , beans are among the crops which have little impact in decreasing the gross margin for the cropping pattern.

Second scenario: The cropping pattern proposed under the second model

Table (4) refers to the cropping pattern that based on minimization of the differences of absolute margins related to the concerned crops to reach the cropping pattern that minimize the risk to the lowest level, the model assumes planting 40% of the feed crops, 35% medicinal and aromatic plants and 15% of grain crops to achieve self-sufficiency ratio required and 10% vegetable crops

It is clear that the cultivation of all cropping area reflecting the rise in productive efficiency of using agricultural land resources which amounted to about 20,791 feddan, area of wheat and barley amounting 10.64% of

cultivated area in the winter, the corn is 9.36% of the area cultivated. clover is about 34.99%, medicinal and aromatic plants about 24.75% and vegetables by 17.85% of the total area cultivated in the proposed cropping pattern. Based on that, the total area of the five crops is representing 97.59%. The study of winter crops area shows lack of areas of wheat, temporary clover, and barley at rates of approximately 68.65%, 33.33%, and 22.06%, respectively. While there is increase in areas of sustainable clover, onions, winter tomatoes, zucchini, henna, and eggplant respectively by16.28%, 119.23%, 188.49%, 538.6%, 1242.57%, 221.21%. For areas of the summer crops, there is increase in areas of summer corn by 315.2%, summer indion corn by 264.24%, and henna by 14.38%, , a decrease of hibiscus by 45.6%, alfalfa by 5.65% andsummer by 25.05.

Table (3): The cropping pattern under the first model in Al Saida valley

crop	Area per feddan	%	Change from actul area	Change %	Gross margin (million pounds)	%	Change from actul margine	Change %
Winter crops	11056	53.18	0	0	66.659	53.87	30.49	116.84
wheat	1000	4.81	-5380	-84.33	2.3	1.86	-12.374	-47.42
barely	106	0.51	-166	-61.03	0.127	0.10	-0.199	-0.76
henna	3317	15.95	3115	1542.08	30.755	24.85	28.882	110.68
Temporary clover	31	0.15	-524	- 94.41	0.031	0.03	-0.579	-2.22
Sustainable clover	5500	26.45	2490	82.72	30.805	24.89	13.18	50.51
oinion	228	1.1	20	9.62	0.821	0.66	0.072	0.28
tomatoes	223	1.07	-2	- 89	0.78	0.63	-0.758	-2.9
zucchini	157	0.76	100	175.44	0.212	0.17	0.135	0.52
Kidney bean	138	0.66	110	392.86	0.317	0.26	0.253	0.97
eggplant	166	0.80	100	151.52	0.055	0.04	0.033	0.13
papper	190	0.91	137	258.49	0.456	0.37	0.329	1.26
Summer crops	9735	46.82	0	0	57.083	46.13	- 4.394	-16.84
Alfa alfa	4868	23.41	1258	34.85	27.266	22.03	7.046	27.0
Indion corn	574	2.76	272	90.07	0.866	0 70	0.411	1.57
Summer maize	400	1.92	196	96.08	0.587	0.47	0.288	1.1
henna	139	0.67	-153	- 52.4	1.288	1.04	-1.419	- 5.44
hibiscus	2787	13.38	1078	- 27.93	25.795	20.85	-9.995	- 38 3
molokia	73	0.35	-6	-7.59	0.062	0 05	-0.003	-0 01
papper	200	0.96	-115	-36.51	0.352	0 28	-0.203	- 0.78
Snap bean	75	0.36	-157	-67.67	0.071	0 06	-0.149	-0 57
cucumber	170	0.82	-43	-20.19	0.094	0 08	-0.083	- 0.32
okra	125	0.60	-70	-35 90	0.139	0.11	-0.078	-0.30
Summer eggplant	79	0.38	0	0	0.061	0.05	0	0
watermelon	250	1 20	-104	-29.38	0 502	0.41	- 0.209	- 0 8
total	20791	100			123 742	100	26 096	

Source: Results of the mathematical analysis of MOTAD Model.

Gross margin for the cropping pattern under the potential risk

The study of the gross margin for the second cropping pattern as shown in Table (4) shows that the expected total gross margin is estimated at

113.002 million pounds, of which about 53.715 million pounds represents the gross margin of the winter crops, and about 59.287 million pounds represents the gross margin for the summer and Nile crops by 47.53%, 52.47% respectively, the crops of medicinal and aromatic plants ranked first in terms of gross margin by 51.04% of the total gross margin of concerned crops of cropping pattern, followed in second and third crops of alfalfa and wheat by 16.89%, 4.07%, respectively. Upon this the gross margin of these crops together reaches about 72.0% of the total gross margin for the cropping pattern under the second model, the gross margin of the remaining crops of cropping pattern up to 28.0%.

Table (4): The Cropping pattern under th second model proposed in Al Saida Valley

crop	Area per feddan	%	Change from actul area	Change %	Gross margine (million pounds)	%	Change from actul margine	Change %
Winter crops	11056	53.18	0	0	53.715	47.53	17.546	114.26
Wheat	2000	9.62	-4380	- 68.65	4.6	4.07	-10.074	- 65.6
Barely	212	1.02	- 60	-22.06	0.254	0.22	- 0.072	- 0.47
Henna	2712	13.04	2510	1242.57	23	20.35	21.127	137.58
Temporary clover	370	1.78	- 185	-33.33	0.407	0.36	- 0.203	- 1.32
Sustainable clover	3500	16.83	490	16.28	19.604	17.35	1.979	12.89
Onion	456	2.19	248	119.23	1.642	1.45	0.893	5.82
Tomatoes	650	3.13	425	188.89	2.275	2.01	2.253	14.67
Zucchini	364	1.75	307	538.6	0.491	0.43	0.414	2.7
Kidney bean	200	0.96	172	614.29	0.46	0.41	0.396	2.58
Eggplant	212	1.02	146	221.21	0.07	0.06	0.048	0.31
Pepper	380	1.83	827	616.98	0.912	0.81	0.785	5.11
Summer crops	9735	46.82	0	0	59.287	52.47	-2.19	- 14.26
Alfa alfa	3406	16.38	- 204	-5.65	19.083	16.89	- 1.137	- 7.4
Indion corn	1100	5.29	798	264.24	1.659	1.47	1.204	7.84
Summer maize	847	4.07	843	315.2	1.243	1.1	0.944	6.15
Henna	334	1.64	42	14.38	3.097	2.74	0.39	2.54
Hibiscus	2100	10 10	- 1760	-45.60	31589	27.95	- 4.201	- 27.36
Molokia	130	0.63	51	64.56	0.107	0.09	0.042	0.27
Pepper	420	2.02	105	33.33	0.74	0.65	0.185	1.2
Snap bean	218	1.05	- 14	- 6.03	0.207	0.18	-0.013	- 0.08
cucumber	320	1.54	107	50.23	0.176	0.16	-0.001	- 0.1
Okra	300	1.44	105	53.85	0.335	0.30	0.118	0.77
Summer eggplant	60	0.29	- 19	- 24.05	0.047	0.04	- 0.014	-. 09
Watermelon	500	2.40	146	41.24	1.004	0.89	0.293	1.91
total	20791	100			113.002	100	15.356	

Source: Results of the mathematical analysis of MOTAD Model.

The crops of wheat, sustainable clover, and medicinal and aromatic plants are among the highest winter crops in terms of gross margin as it contributes

to these crops by about 41.77% of the total gross margin for respective cropping pattern and about 87.88% of the gross margin for winter crops under the study, while crops of alfalfa, medicinal and aromatic, and corn are among highest summer crops in terms of gross margin, as it contributes about 50.15% of the total gross margin for respective cropping pattern and about 95.58% of the total gross margin for the summer and Nile under the study

Crops contribution in changes in total gross margin

Table (4) refers to that the gross margin for cropping pattern that takes the risk factor into account and maintains the stability of income is estimated at 113.002 million pounds, which is higher than its similar in substantial cropping pattern by about 15.356 million pounds, or 13.59%. By examine the contribution of planted areas in the total gross margin under the third model compared to substantial cropping pattern, it is clear that the most important crops that have a significant impact on the gross margin decrease for cropping pattern in the light of potential risk are the crops of wheat ,alfalfa and, hibiscus, which is considered one of the crops with significant positive impact in decreasing the gross margin, where the proportion of the contributions of these crops are 65.6%, 7.4%, and27.36% respectively.

For crops that have had a significant negative impact in decreasing the gross margin for the cropping pattern crops under the third model, it includes wheat barely and kidney bean by65,6 % 0.47% and 0.08% respectively .

Areas of agricultural crop groups referring to the model

Table (5) refers to the relative importance of areas of crop groups within the cropping pattern according to MOTAD Model. From the first cropping pattern, it is clear that the group of feeding crops representing 35.0%, followed by set of cereal crop by 34.0%, then medicinal and aromatic by 21.0% vegetables by 10% for each. The second cropping pattern shows decrease of grains in the total crop area to about 10.0%, reflecting the relatively increase at level of econcmic risk in the production of cereal crops, while the percentage of green fodder crops, medicinal and aromatic plants, increased to about 50%, 30% respectively, reflecting the relatively higher level of economic risk to groups of cropping pattern crops within this region. Regarding the third cropping pattern, according to the this model, it clearly appears that the contribution of fodder was 35%, which is contributing in development of animal production in this region as this area reaches 7276 feddan, the contribution of medicinal and aromatic plants is 25% with an area of approximately 5146 feddan, and contribution of grain crops is 20%, or about 4159 feddan which is sufficient to achieve the percentage of food security in the concerned region, and the total gross margin up to 113.002 million pounds, through this cropping pattern about 93.458 cubic meters of water can be provided

Proposed policy for irrigation water development under the risk

Within the framework of problem solving, to achieve its objectives in an integrated manner, it will be necessary to put a policy for development of water resources consider the economic dimensions of the risk factor impact when using water resources in agriculture. This policy also shall cover aspects of the water loss through evaporation and seepage, and

development of irrigation techniques and adjust cropping pattern, to fulfill the objectives of agricultural development and increase the irrigation water available for the purposes of the horizontal agricultural expansion in order to increase the agricultural production and improve the standard of living of this region residents. On the other hand canals must be lined to minimize the water loss and prepare the soil well to prevent accumulation of water in low-lying areas, avoid soil degradation and improve the efficiency of field irrigation and water delivery to watercourses, which could lead to increase the current irrigation efficiency.

Table (5): Relative importance of areas of crop groups within the proposed cropping pattern

Crops Group	1st cropping pattern (area per feddan)	%	2nd cropping pattern (area per feddan)	%	3rd cropping pattern (area per feddan)	%
Grains	7158	34	2080	10	4159	20
Feeding crops	7175	35	10399	50	7276	35
medicinal and aromatic crops	4354	21	6238	30	5146	25
Vegetables	2104	10	2074	10	4210	20
Total	20791	100	20791	100	20791	100

Source: Results of the mathematical analysis of MOTAD Model.

It also must recombine the crops of cropping pattern to consider the potential economic risk in order to play a role in rationalization of irrigation water without prejudice to the basic needs of community of agricultural products, food, manufacturing and exporting crops and expansion in the cultivation of cereal crops and medicinal and aromatic plants due to its economic importance in increasing agricultural water and its low water need compared to other agricultural crops. In addition to their importance in the minimization of the possibilities of economic risk which add a comparative and relative advantage to the products and commodities. As well as contribute to advancing economic development and increase its agricultural return through maximizing the efficiency of agricultural productive resources usage

APPENDIX

Schedule (1): Relative importance for distribution of beneficiarie During agriculture season (2008/2009)   (Sector in Feddan)

Village	society	Sector	Beneficiaries	Beneficiaries classes		
				Graduates	Beneficiaries	Ladies
	Al Salam	1318	203	187	12	4
	Nile Valley	1708	268	202	54	12
Al Shahama	Al Zahraa	2822	437	239	178	20
	Al Tahrir	1420	220	1	210	9
Amr Bin Al Aas	Gad Al Haq	3000	491	2	466	23
	Al Ghazaly	1650	256	1	253	2
Al Eman	Al Eman	3000	495	0	391	104
Al Samaha	Al Samaha	1912	302	0	0	302
Al Ashraf	Omar Bin Al Khatab	2820	459	0	428	31
	Abu Bakr Al Seddiq	1932	322	0	286	36
Al Nomow	Osman Bin Affan	3418	569	0	559	10
Total		25000	4022	632	2837	553
%			100.00	15.71	70.54	13.75

Source: Mubarak's Project for graduates, Upper Egypt Control, December 2009.

Schedule (2): Area, Productivity, Total Outcome and Net Return per Feddan for the most important crops of study in Al Saida Valley, Aswan and Egypt (Value in pound)

	AL Saida Valley				Aswan Governorate				Egypt	
	Area in feddan	Productivity	Feddan outcome	Net return of feddan	Area in feddan	Productivity	Feddan outcome	Net return of feddan	Area in feddan	Productivity
Wheat	6748	8.00	2190	290	28210	14.80	4051	1680	2923256	18.21
Barely	301	6.00	1650	450	2058	8.90	2448	1200	85555	12.95
Tomatoes	532	6.20	3800	1200	5039	7.44	4560	2500	217887	17.70
Beans	147	5.10	1820	400	1565	7.15	2552	1164	170106	9.26
Alfalfa	250	3.70	1980	540	929	3.51	1878	960	7591	5.88
Hibiscus	2761	148.00	2420	420	7197	447.00	7309	3860	12750	502.00
peanut	165	7.60	2142	362	516	17.90	5045	2232	146173	19.05
indion corn	340	8.80	1520	270	13798	17.30	2988	1200	1643213	24.44
Sesame	282	1.80	1530	330	9318	4.84	4114	2460	66354	4.58
Clover	3150	22.00	3500	620	12798	39.40	6268	2894	60376	50.23
Watermelon	92	2.80	3360	660	1871	6.87	8244	3500	118500	12.50
Mango	135	2.00	3000	1480	10995	6.50	9750	4650	1350000	7.80
Cultivated Sector	14903	-	-	-	94294	-	-	-	6801761	-

Source: Collected and calculated from:

(1)   Data of questionnaire forms.
(2)   Data from Agricultural Directorate In Aswan (Department of Statistics and Computer), unpublished data.
(3)   Ministry of Agriculture and Land reclamation, Central Department for Economic Affairs, Agricultural Economy publication 2008, published data.

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التقييم الاقتصادى لمشروعات استصلاح الأراضى بمحافظة أسوان

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إستهدف البحث التعرف على الوضع الراهن لمشروعات إستـصلاح الأراضـى بـوادى الصعايدة التابع لمحافظة أسوان، من خلال دراسة الآثار الإقتصادية لهذه المشروعات من ناحيـة، وإقتراح آليات واقعية قابلة للتطبيق بهدف تعظيم الإستفادة من الموارد المتاحة بتلك المنطقة بهـدف زيادة عوائد ممارسة الأنشطة الزراعية بوادى الصعايدة من الناحية الأخرى، وذلك من خلال تحليل البيانات المتاحة بمنطقة الدراسة، وقد تم إستخدام بعض الأساليب الإحـصائية الوصـفية والكميـة لمعالجة تلك البيانات ، لدراسة العرض الحالى والمتوقع للموارد المائية الزراعية لهـذه المنطقـة وإستخدام أسلوب البرمجة الرياضية الخطية لتدنيه للمخاطرة الاقتصادية المحتملـة، فـضلا عـن النسب المئوية لبيان مدى مساهمة مقدار التغير فى صافى دخل المحاصيل الزراعية إلى إجمـالى التغير فى صافى الدخل للتركيب المحصولى فى ظل اليقين التام أو فى ظل المخاطرة عن التركيب المحصولى الفعلى بإستخدام نموذج الموتاد MOTAD Model.وأشارت نتائج دراسة المؤشرات الاقتصادية والإنتاجية إلى إحتلال المانجو المرتبة الأولى وفقا لربحية الجنية المستثمر بنحو ٠.٩٧ جنية يليها محاصيل الطماطم، الحلبة، الشعير بحوالى ٠.٤٦، ٠.٣٩، 0.38 جنية على الترتيـب، وحققت محاصيل المانجو، الطماطم، البطيخ، والبرسيم الحجازى أعلى صافى عائـد بلـغ نحـو ١٤٨٠، ١٢٠٠، ٦٦٠، ٦٢٠ جنية للفدان على الترتيب، وتبين أن محصولى الطمـاطم والبطيـخ أكثر المحاصيل إستيعابا للعمالة البشرية ويليهما فى الأهمية محصول البرسيم الحجـازى، وبـذلك يتضح مدى نجاح المشروع فى إمكانية إستيعاب العمالة الزراعية بمحافظة أسوان خاصة فى وادى الصعايدة الذى ينتمى معظم المقيمين به لمحافظة أسوان، وإحتل محصول الطماطم المرتبة الأولى وفقا لمعيار القيمة المضافة بنحو ٢.٦٠ ألف جنية يليه محاصيل المانجو، البرسيم الحجازى، البطيخ بحوالى ٢.٥٢، ٢.١٠، ١.٨٦ ألف جنية للفدان على الترتيب، كما تبين أن إنتاج محصول القمـح بقرى الوادى يفى بإستهلاك الحائزين وأسرهم ويتبقى نحو ٤٤% من إنتاج القمح تساهم فـى سـد الفجوة القمحية بمحافظة أسوان.

وأوضحت نتائج الدراسة أن هناك سيناريوهين لتحقيق أفضل تركيب محـصولى يعظـم الهامش الكلى، يستهدف السيناريو الأول تعظيم صافى الدخل فى ظل اليقين التام، حيث تبين زراعة المساحة المحصولية بالكامل مما يعكس إرتفاع الكفاءة الإنتاجية فى إستخدام المـوارد الأرضـية

الزراعية والتي بلغت نحو ٢٠.٧٩ ألف فدان، وتمثل مساحة البرسيم بانواعه حوالي ٥٠%
(مجموعة الأعلاف)، بينما بلغت مساحة مجموعة الحبوب (القمح – الشعير – الذرة بنوعيه) نحو
١٠%، والنباتات الطبية والعطرية نحو ٣٠%، والخضر نحو ٩%، من إجمالي المساحة
المحصولية بالتركيب المحصولي المقترح، وبدراسة الهامش الكلي للتركيب المحصولي في ظل
اليقين التام، يتبين أن الهامش الكلي الإجمالي يقدر بنحو ١٢٣.٧٤ مليون جنية منها ٦٦.٦٦ مليون
جنية تمثل الهامش الكلي للمحاصيل الشتوية ونحو ٥٧.٠٨ مليون جنية تمثل الهامش الكلي
للمحاصيل الصيفية والنيلية بنسبة ٥٣.٨٧%، ٤٦.١٣% علي الترتيب. في حين إستهدف السيناريو
الثاني تحقيق أفضل تركيب محصولي يأخذ عامل المخاطرة في الاعتبار، وذلك بتدنية الفروق
الكلية المطلقة للهوامش الكلية للمحاصيل الزراعية موضع الدراسة، ويفترض هذا النموذج زراعة
٤٠% من محاصيل الأعلاف، ٣٥% من محاصيل النباتات الطبية والعطرية، ١٥% من محاصيل
الحبوب لتحقيق نسبة الإكتفاء الذاتي المطلوبة، ١٠% محاصيل خضر، وبدراسة الهامش الكلي
للتركيب المحصولي لهذا النموذج يتبين أن الهامش الكلي الإجمالي المتوقع يقدر بنحو ١١٣.٠
مليون جنية منها نحو ٥٣.٧ مليون جنية يمثل الهامش الكلي للمحاصيل الشتوية، ونحو ٥٩.٣ مليون
جنية يمثل الهامش الكلي للمحاصيل الصيفية والنيلية بنسبة ٤٧.٥٣%، ٥٢.٤٧% علي الترتيب،
وتبين أن الهامش الكلي للتركيب المحصولي الذي يأخذ عامل المخاطرة في الاعتبار ويحافظ علي
إستقرار الدخل والذى قدر بنحو 113.0 مليون جنية يزيد عن مثيله للتركيب المحصولي الفعلي
بنحو ١٥.٣٥٦ مليون جنية بنسبة ١٣.٥٩%.