



HYDROPONICS FOR VEGETABLE CROPS AND ITS EXPECTED ROLE IN IMPROVING THE SELF-SUFFICIENCY RATIO OF THE MOST IMPORTANT STRATEGIC CROPS IN EGYPT

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ABSTRACT

Hydroponics is one of the modern agricultural techniques which applied in many European countries and a few number of Arab countries especially Arabian Gulf countries. Hydroponics comes as one of the alternatives proposed in Egypt to reduce the deficit in food balance and increase the self-sufficiency ratio for many strategic food crops such as wheat and maize. These alternatives based on applying the technique of hydroponics in green houses in the new land to produce the same production of vegetables which obtained from the old cultivated area.

The research aims mainly at

- Evaluating the project of hydroponics financially (for one hundred green houses, fifty for tomatoes and fifty for cucumber) as well as analyzing its sensitivity.
- Studying the economic impact of converting the use of 100%, 75%, 50% and 25% of vegetables cultivated area in the old agricultural land after redirecting it to produce wheat and maize.

The results of financial and sensitivity analysis of the hydroponics project for cucumber and tomatoes indicated the feasibility of the project and recommended to adopt it in the following three cases:

1. The original financial analysis before analyzing of project sensitivity.
2. The financial analysis under condition of increase the production cost by 10% than the original financial analysis.
3. The financial analysis under condition of increase the lending interest rate by 20% than the prevailing rate during the study (16%).

The results showed also that the redirect of 100% of the area cultivated by vegetables in the old agricultural land to produce wheat and maize will result in achieving the highest increase in the self-sufficiency ratio for both crops to reach about 57%, 58% respectively, as well as reducing the yearly consumption of irrigation water by about 69 million m³/year than before. The results estimated the increase in self-sufficiency ratio of wheat and maize which will be achieved through applying the proposal of fourth alternative (redirecting of 25% of the area cultivated by vegetables in the old agricultural land to produce wheat and maize) by about 55%, 54% respectively, while it will reduce water consumption for irrigation by about 17 million m³/year than it was found in the old cropping pattern. Therefore results of fourth proposal are the lowest among other alternatives. The main recommendations of the research could be summarized as follows:

- Studying technically and economically the potential of applying hydroponics technique at the national level (farms of agricultural colleges and research centers).
- Preparing detailed studies for discussing the benefits, costs and risks resulting from applying the hydroponics technique.
- Preparing technical and economic detailed studies to investigate the possibility of adopting new cropping pattern in the old Agricultural land, through redirecting the area cultivated by vegetables to produce wheat and maize, while the old agricultural land production of vegetables could be compensated through applying the technique of hydroponics in the green houses in the new land.

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