EVALUATION OF ON-FARM IRRIGATION DEVELOPMENT PROJECTS BY USING SIMULATION MODEL

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ABSTRACT

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The research problem:

- water shortage.
- Low efficiency of surface irrigation.
- Lack of water productivity.

The experimental fieldwork was conducted at the On-farm Irrigation Development Project in Asuit Governorate, Upper Egypt.

The objective of this work was to study the performance of the improved surface irrigation system and compare it with the conventional surface irrigation system. The performance indicators were conveyance efficiency, application efficiency, field water use efficiency, and crop yield. and this research was to evaluate the modified surface irrigation systems' design under old land conditions of Egyptian agriculture based on the simulation model.

Design based on: Determine and calculate the actual water need based on the data of the crop pattern and cultivated areas, and inventory the needs of the partners in control

The development of the field irrigation system depends on the use of the main pipeline (low-pressure pipeline) instead of the current earthen mesqas and maraw's or those built above the ground, in addition to a branch pipeline either perpendicular or parallel to the main pipeline There are main valves on the main pipeline, which in turn either feeds the branch pipeline or pours into the mesqas inside the field, and from each branch line comes out a set of exits (Hydrants) Which covers a specific area. On top of the mainline, there is a pump station to pump water directly into the

mainline Data analysis revealed that:

There is a different difference in hydraulic design velocity, because the basic design with higher diameters is supposed to be, and accordingly, the speeds are very reduced, and the pressure loss is very reduced, but the cost is high.

There are technical and financial differences: The modified design of the diameters was modified based on the calculated behaviors, both in scenarios 1 and 2, according to different operating methods and the number of daily working hours. Accordingly, an economic study was conducted compared to the basic design and the modified design. It was found that the economic study is different by 50% for scenario 1 and 30% for scenario 2 less than the main design.

Keywords: Surface irrigation, Conveyance efficiency, Water use efficiency, Application efficiency, Simulation model, Irrigation Design and Pipe test.

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