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ORIGINAL ARTICLE

# The partial budget analysis for sorghum farm in Sinai Peninsula, Egypt

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**KEYWORDS**

Net income;
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**Abstract** Before changing from one production method to another, the farmer considers many factors, such as agro ecological requirements, availability of required additional production resources (labor, credit, skill, farmland, equipment, etc.), additional costs, and additional income resulting from the change, the research was interested to estimate the effect on net benefit of changing from one level of Nitrogen-fertilizer application to another (100, 200, and 300 kg N/Feddan), partial budget was used to assess the costs and benefits associated with a specific change in a sorghum farm, and partial budget is based on a unit so data were collected from one sorghum farm in Sahl El Tina. The results indicated that the marginal rate of return of changing from Treatment 1 (100 kg N/Feddan) to Treatment 2 (200 kg N/Feddan) was 9.61, and a changing from Treatment 2 (200 kg N/Feddan) to Treatment 3 (300 kg N/Feddan) gave marginal rate of return of 0.72, so Treatment 2 of (200 kg N/Feddan) was recommended.



## Introduction

Farmers are constantly making adjustments in their farms for smooth operations and profitability. Many times, these choices involve actions to enhance the financial return of the farm, while other times these decisions are taken out of necessity to minimize the effects of unfavorable conditions or events such as drought or changes in the market conditions. Some of these decisions are relatively simple requiring making choices among alternatives within an enterprise while others are complex involving a total overhaul of the business and its enterprises. Alternative choices within an individual enterprise can have a differential impact on farm profitability. Therefore, making the best decision may make the difference between profit and loss for that enterprise. Partial budgeting is very useful in making such changes in a farm (Alimi and Alofe, 1992).

Partial budgeting is a tool used to assess the costs and benefits associated with a specific change in a farm. This tool specifically focuses on the implications of the intended change in a business operation by comparing the benefits and costs resulting from implementing the alternative with respect to the current practice. Partial budgeting is a planning and decision-making framework that is used to compare the costs and benefits of alternatives faced by a farm business.

It focuses only on the changes in income and expenses that would result from implementing a specific alternative. Thus, all aspects of farm profits that are unchanged by the decision can

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be safely ignored. Nutshell allows you to get a better handle on how a decision will affect the profitability of the enterprise, and ultimately the profitability of the farm itself. However, the value of a partial budget analysis is highly dependent upon the quality of the information used in the analysis (Tigner, 2006).

This budgeting approach is called partial because it does not include all production costs, but only those which change or vary between the farmer's current production practices and the proposed one(s). PBA allows assessing the impact of a change in the production system on a farmer's net income without knowing all costs of production (Roth, 2002).

Forage sorghum is a crop that has a potential under some soil/crop/livestock situations in Egypt. Like other crops, it responds to good management; paying attention to the details of producing forage sorghum will improve the likelihood of success with the crop. Too often it has been regarded as an emergency crop and not managed to obtain its top potential. Consider several key aspects of forage sorghum management to ensure success: (1) grow it in a situation where it is adapted and will result in economical feed, (2) pay attention to fertilizer requirements and planting date, (3) select a hybrid adapted to the area, and (4) harvest on time and with good silage management practices. With these considerations, forage sorghum can be an important crop alternative for livestock farms in Egypt.

*Objective*

The objective of a partial budget in sorghum production was estimating the effect on net benefit of changing from one level of N-fertilizer application to another.

*Data and methodology*

Partial budgeting is a tool used to assess the costs and benefits associated with a specific change in an individual enterprise within the business operation (Horton, 1982).

This tool specifically focuses on the implications of the intended change in a business operation by comparing the benefits and costs resulting from implementing the alternative with respect to the current practice, partial budget, like an enterprise budget, is based on a unit (a 1 sorghum farm) but it is different from an enterprise budget in the type of costs used. An enterprise budget uses total costs (variable input costs plus fixed input costs) while only variable input costs are used in a partial budget. In a partial budget, income is the gross farm gate benefit. The net benefit is the difference between the gross farm gate benefit and total variable input costs.

*Study area*

Sahl El-Tina is an important area in Sinai Peninsula, and it was selected to represent marginal ecosystem. The irrigation water was obtained from mixed water (Nile water + drainage waters) of El Salam Canal. The soil is characterized by severe salt affected, differs in depth and stratified profile layers. The soil salinity and salinity of irrigation water for these farms varied between 12.5–15.6 dS/m and 1.6–2.3 dS/m (1000–1100 mg/L), respectively. In addition, the poverty and inappropriate management practices beside the marginal soil and water resources are the problems of agriculture development in this area.

*Types of budgets*

A budget is a formal quantitative expression of plans on production inputs and output (Alimi and Alofe, 1992).

Budgets indicate the type, quality, and quantity of production resources or inputs needed, and the type, quality, and quantity of output or product obtained. Three types of budgets are used in agriculture:

- whole-farm budget
- enterprise budget
- partial budget.

*Whole-farm budget*

A whole-farm budget is a quantitative expression of the total farm plan summarizing the income, costs, and profit income is what a farmer realizes from farming activities, costs are what the farmer puts into production, and profit is the difference between income and costs. In a whole-farm budget, the unit of analysis is the entire farm. A whole-farm budget may consist of several enterprises.

*Enterprise budget*

An enterprise is a single crop or livestock type produced on a farm. An enterprise budget lists all income and costs of a specific enterprise to provide an estimate of its profits.

Each enterprise budget is developed on a single common unit, such as hectares for crops or head for livestock. An enterprise budget allows comparison of profits or profitability among different enterprises on the same farm. Enterprise budgets, such as whole-farm budgets, are in three parts: income, costs, and profit.

An enterprise budget is different from a whole-farm budget in the following:

- The number of enterprises considered (only one in an enterprise budget; in a whole-farm budget, all enterprises in the farm are included).
- The size of enterprises (a single unit for an enterprise budget, the entire farm for a whole-farm budget).

*Partial budget*

A partial budget shows the effect of change(s) in farm operations. For example, farmers know that fertilizer application will likely increase sorghum yield, and thus the gross income. The use of fertilizer also results in additional costs. To decide whether to use fertilizer for sorghum production or not requires a partial budget analysis. A partial budget could be prepared to ascertain the effect on net benefit of:

- Substituting one enterprise for another without any change in the entire farmland area.
- Changing to different levels of a single technology.
- Changing to different technology.