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## Performance Measurement of Farming Systems in Resource Management Using Non-Parametric Model – A Case from North Syria

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### Abstract

Many studies and researches show that when water is available for irrigation, there is an increase in use of other production inputs such as labour and capital in farm activities. This may lead to inefficient use of other production inputs in farm activities resulting to a significant reduction in the farm income of the farming families. In this study, efficiency use analysis of the available resources was carried out in two farming systems.

1. First farming systems (FS1) that do not experience water scarcity.
2. Second farming system (FS2) that experience water scarcity.

The two farming systems are mainly differentiated by source and availability of water resources. There is no significant difference in availability of other resources between the two farming systems.

To analyse technical efficiency of the available resources, Data Envelopment Analysis (DEA) method was used. This method applies two models which are constant return of scale and variable return of scale. The first model was used for analysis in this study.

Results showed that in both farming systems, technical efficiency of resource utilisation was better in cotton and vegetables cultivation as compared to wheat, maize and sunflower cultivation.

Results also show that the average technical efficiency in FS1 was 70.6% and 73.25% in FS2. Technical efficiency is higher in FS2. Due to water scarcity, these farmers have reduced utilisation of production inputs such as capital and labour in farming activities and diverted them to off-farm activities. On the other hand, due to adequate water for irrigation, farmers in FS1 have over utilised their production inputs thus lowering technical efficiency in farm activities.

Despite a lower technical efficiency in farm activities, farmers in FS1 achieved higher farm income than FS2. However, the difference is not significant. Although farmers in FS2 have less water, they managed their resources better than FS1. Therefore the farm income of both farming systems was almost equal.

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