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Efficiency of Push-pull Technology Dissemination Pathways for Stemborer and Striga Control in Western Kenya: Data Envelopment Analysis Approach

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Abstract

"Push-pull" technology (PPT) has widely been promoted as a control measure for stemborer and *striga* weeds in maize fields in Kenya. The technology is relatively knowledge-intensive; and provision of information about it is critical for its adoption and continued use. Research funding is becoming limited thus knowledge of efficiency in resource utilisation is a prerequisite in optimising the adoption process. This study focused on the efficiency with which information about PPT is passed on to farmers. Efficiency analysis is linked to the relative difficulty encountered in estimating the performance of production units. In our case, efficiency was viewed as a ratio of inputs in terms of the expenditures on each dissemination pathway, to the output as the number of recipients who become aware of the technology and end up using it. Secondary data from project records was used and three dissemination pathways evaluated namely field days (FD), farmer field schools (FFS) and farmer teachers (FT) were evaluation. Data envelopment analysis (DEA) was used where each dissemination pathway was treated as a decision making unit (DMU). Two DEA models were estimated using the assumption of variable returns to scale (VRS): Model one considered the number of farmers trained per pathway as the output, while model two considered the proportion of adopters as the output. The results showed that in the first scenario, FD had the highest efficiency (90 %), followed by FFS whose efficiency was slightly above 60 % and finally FT with efficiency of 40 %. In the second scenario, FT led with an efficiency score of 70 %, followed by FD (58 %) and finally FFS (52 %). On average, the pathways were operating below the efficient scale suggesting that adjusting the scale of operation would probably improve the overall efficiency of the pathways. There is still a scope for the institution to increase the number of farmers trained for each pathway using the current levels of resources. Use of FD is more efficient than FFS and FT in the short-run, but in the long-run, use of FTs would be appropriate since the ultimate goal of dissemination is to optimise adoption.

Keywords: Dissemination pathways, efficiency, push-pull technology

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