Biophysical Factors Affecting Maize Productivity of Small-Scale Farming System under Three Settlement Schemes in North-East Zimbabwe

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Abstract

After Zimbabwe’s independence in 1980, the land owned by white farmers was soon started to be seized by the rural population. In 1997, a land reform was instituted, and nowadays most of the “white” farm land is redistributed and parcelled into many smallholder farms. However, due to continuous crop cultivation without adequate fertilisation and limited soil conservation, crop yields abruptly declined in Zimbabwe, leading to reduced food security at national level.

The objective of the present study was to identify which factors are limiting maize productivity at village level along three farming settlement schemes, i.e. communal area, old and new settlement areas, in North-East Zimbabwe. The study focused on maize, the main staple crop in the region, and further consisted of two main phases: (i) Land use characterisation and soil assessment in cropping fields from three villages and, (ii) Detailed maize performance assessment, together with a survey regarding crop management and input use.

In the first phase, transect walks were carried out to map the cropping fields in each village. Once cropping fields were mapped by using GPS and ArcView, a nested non-align block design was used to select a representative number of sampling units in each village. The selected sampling units were characterized using the FAO Land Cover Classification System. The purpose of this phase was to understand the maize pattern distribution within the cropping fields and identify the main biophysical characteristics. In the second phase, twenty seven farmers were selected to conduct a detailed study of the farm household and management with emphasis on maize productivity. For each village nine farmers, three from each wealth class (rich, medium and low) were randomly selected. The data collection was sub-divided in two phases: (i) data information of farm household characteristics and crop management and (ii) soil and crop sampling on their plots. Data retrieved during this phase was evaluated by a Multiple Regression, Principal Component, Cluster and Factor Analysis. Data analyses identified main factors by village and wealth classes influencing maize performance. The study aimed to provide a basis to develop a methodological tool to assess and improve land quality of the newly established smallholder farms in Zimbabwe, in the future.

Keywords: Food security, settlement schemes, maize performance, Zimbabwe

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