Application of a Confirmatory Composite Model for Assessing the Extent of Agricultural Digitalization: A Case of Proactive Land Acquisition Strategy (PLAS) Farmers in South Africa

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Abstract : Digitalization in South Africa has received considerable attention from policymakers. The support for the development of the digital economy by the South African government has been demonstrated through the enactment of various national policies and strategies. This study sought to develop an index for agricultural digitalization by applying composite confirmatory analysis (CCA). Another aim was to determine the factors that affect the development of digitalization in PLAS farms. Data on the indicators of the three dimensions of digitalization were collected from 300 Proactive Land Acquisition Strategy (PLAS) farms in South Africa using semi-structured questionnaires. Confirmatory composite analysis (CCA) was employed to reduce the items into three digitalization dimensions and ultimately to a digitalization index. Standardized digitalization index scores were extracted and fitted to a linear regression model to determine the factors affecting digitalization development. The results revealed that the model shows practical validity and can be used to measure digitalization development as measures of fit (geodesic distance, standardized root mean square residual, and squared Euclidean distance) were all below their respective 95%quantiles of bootstrap discrepancies (HI95 values). Therefore, digitalization is an emergent variable that can be measured using CCA. The average level of digitalization in PLAS farms was 0.2 and varied significantly across provinces. The factors that significantly influence digitalization development in PLAS land reform farms were age, gender, farm type, network type, and cellular data type. This should enable researchers and policymakers to understand the level of digitalization and patterns of development, as well as correctly attribute digitalization development to the contributing factors.

Keywords : agriculture, digitalization, confirmatory composite model, land reform, proactive land acquisition strategy, South Africa