Nexus of agricultural informatisation and sustainable practices: Food security implications for drought-affected maize farmers in Zambia

SHANGAO WANG[1], GERSHOM ENDELANI MWALUPASO[2,3] ⬤ , XIANHUI GENG[2]*,
EMMANUEL KIPROP[2], JOTHAM BETT[2], DANCUN KIBIWOTT KIMWEI[2]

[1]*School of Management, Nanjing University of Posts and Telecommunications, Nanjing, P.R. China*
[2]*College of Economics and Management, Nanjing Agricultural University, No. 1, Weigang, Nanjing, P.R. China*
[3]*Department of Agriculture and Agribusiness, Prince G Consultancy and Academy, Kabwe, Zambia*

Corresponding author: gengxh@njau.edu.cn

The authors are fully responsible for both the content and the formal aspects
of the electronic supplementary material. No editorial adjustments were made.

Electronic supplementary material (ESM)

Supplementary Table S1
Supplementary Figure S1
Supplementary Table S2
Supplementary Table S3

Table S1. IV validation from ivreg2 estimation

Underidentification test (Anderson canon. corr. LM statistic)		40.833
	Chi-sq(2) *P*-val	0.000 0
Weak identification test (Cragg-Donald Wald *F* statistic)		21.417
Stock-Yogo weak ID test critical values	10% maximal IV size	19.93
	15% maximal IV size	11.59
	20% maximal IV size	8.75
	25% maximal IV size	7.25
Sargan statistic (overidentification test of all instruments)		1.017
	Chi-sq(1) *P*-val	0.313 3
Instrumented	agricultural informatisation	
instruments:	power source and possession	

IV – Instrumental Variable
Source: Stock-Yogo (2005), reproduced by permission

(A)   (B)

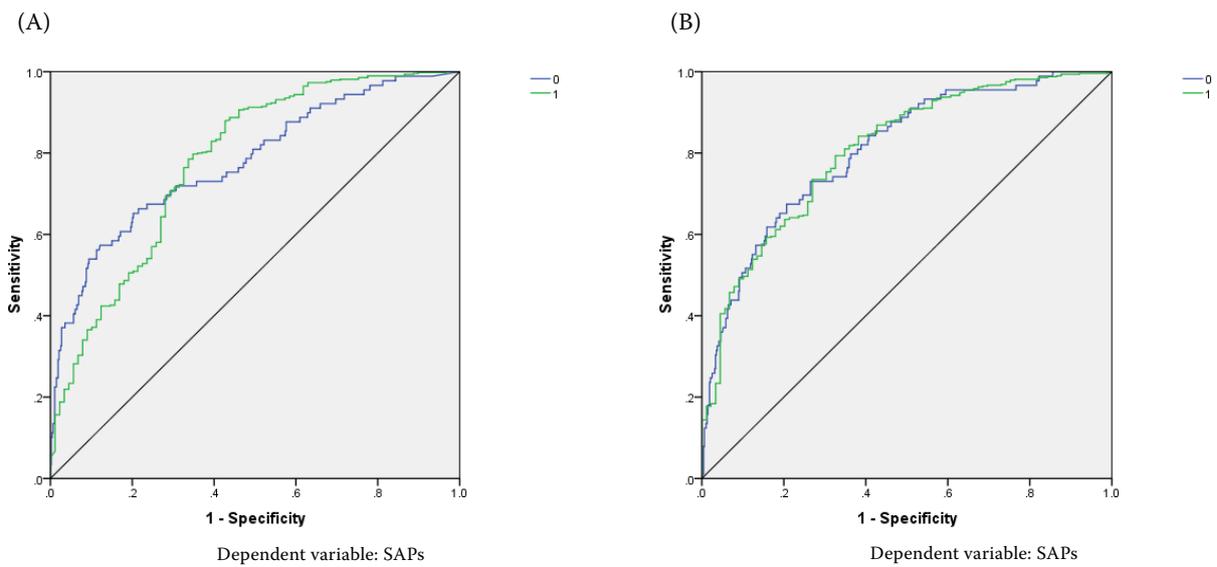Dependent variable: SAPs   Dependent variable: SAPs

Figure S1. Area under the curve from MLP (A) and RBF (B)

MLP – Multi-Layer Perceptron; RBF – Radial Basis Function; SAPs – sustainable agriculture practices
Source:

Table S2. Model summary of MLP and RBF

Aspect	Metrics	MLP	RBF
Training	cross entropy error	141.546	41.230
	incorrect predictions (%)	14.1	13.4
	correct predictions (%)	85.9	86.6
	sample	410	389
Testing	cross entropy error	56.082	17.294
	incorrect predictions (%)	13.9	10.6
	correct predictions (%)	86.1	89.4
	sample	158	179

MLP – Multi-Layer Perceptron; RBF – Radial Basis Function
Source:

Table S3. Estimates from ETR stages 1 and 2

Variable	Selection		Non-AgI-adopters		AgI-adopters	
	Coef	SE	Coef	SE	Coef	SE
Constant	−0.641	0.569	−2.217***	1.858	5.753***	0.346
Gender	0.038	0.229	−1.247	0.833	0.074	0.181
Marital	−0.025	0.216	1.223	0.785	0.136*	0.074
Education	0.085***	0.020	0.059***	0.015	0.070	0.128
Hsize	0.013	0.040	−0.171	0.406	0.035*	0.021
Mland	0.021	0.043	0.151***	0.052	−0.044	0.027
Ncrop	0.005**	0.002	0.079***	0.024	−0.093	0.061
TLU	0.151**	0.062	0.461*	0.239	0.054***	0.019
Extension	−0.494	1.302	−0.291	0.685	0.093	0.144
Market	0.003	0.008	0.047	0.031	0.165***	0.035
Cooperative	0.695***	0.191	0.025**	0.012	0.137***	0.025
Off farm	0.259	0.160	−0.373	0.643	0.025**	0.011
District fixed effects	0.044	0.108	2.047***	0.383	0.355***	0.075
Instruments						
Possession	0.393**	0.160	–	–	–	–
Power	0.358***	0.129	–	–	–	–
Extension residual	0.338**	0.137	–	–	–	–
Model diagnostics						
n	568	–	–	–	–	–
Log likelihood	−1013.82	–	–	–	–	–
LR test of indep. eqns	26.24***	–	–	–	–	–
sigma_1/ _2	–	–	0.142***	0.034	0.890***	0.244
rho_1/_2	–	–	−1.650***	0.229	−0.880	0.553

*, ** and ***significance at 10%, 5%, and 1% levels, respectively
ETR – Endogeneous Treatment Regression; TLU – Tropical Livestock Unit; AgI – agricultural informatisation
Source: