EXPANSION STRATEGIES IN THE AGRO-PROCESSING SECTOR FOR SMALL-SCALE AGRO-PROCESSORS IN SOUTH AFRICA

B Manasoe,
North West University
Potchefstroom, South Africa

V.M. Mmbengwa
North West University
Potchefstroom, South Africa

J.N. Lekunze
North West University
Potchefstroom, South Africa

ABSTRACT
The study was aimed at developing strategies for expansion by small-scale agro-processors in South Africa. This article purports that post-colonial states are organizations that choose to develop citizens in alignment with their needs, and such is the responsibility of post-colonial South African governments towards agro-processors. The study utilizes a quantitative research approach, and data was collected using a questionnaire. A total of 503 small-scale agro-processors from Gauteng, Limpopo, North West, Free State, and Mpumalanga Provinces of South Africa participated in the study. Factor analysis was used to identify the factor loading of the latent variables (unobserved variables), and Structural Equation Modelling (S.E.M.) was used to determine critical tenets for small-scale agro-processors. The study utilized an exploratory research design and a quantitative research approach. Data for this study were collected from 503 respondents across five provinces of South Africa. A stratified probability random sampling technique was used in the selection of respondents across the five provinces. Practically, the study developed a strategic framework for economic empowerment for small-scale agro-processing in South Africa. This study concludes that small-scale agro-processors of South Africa are still struggling with strategic economic empowerment despite existing support from the government in the form of policies. The study recommends that the review of policy and government programmes to support small-scale agro-processors should consider factors for strategic economic empowerment as identified in the framework.

Keywords – Economic empowerment, agro-processing, small-scale, capacity building, business networks, interventions

1. INTRODUCTION

Policy reforms have occurred across all the different sectors of South African since the advent of democracy post-1994 (Rasheed, Wen, Gao, Shai, Jin, Lin, Guo, and Zhang,2016). Despite these policy changes, Uppal (2014) opined that indigent communities in post-colonial African countries still face high levels of disempowerment attributed to ruminants of past colonial policies as most post-colonial governments find it difficult to change the structure of the economy they inherited. Although some African governments have sought a policy of indigenization to close the gap left by colonial policies, argues Andreasson (2010), the economic structures have primarily remained the same in terms of structure. But Osibanjo, Oyewunmi, Abiodum and Oyewunmi. (2019) have argued that if a post-colonial state can be seen as an organization, it may choose to develop its citizens in alignment with their current needs and prepare them for their future needs. Such is the responsibility of post-colonial governments towards agro-processors.

Literature review

Craig (2002) stated that, although various degrees of progress have been through indigenization programs, they have also

been hampered by highly politicized policies. According to Uppal (2014), most countries that have failed to implement strategic sector-based policies or programs have failed to produce the desired results that will change their economic structure. It is incumbent on countries to develop strategic policies that favour the most significant number of people to achieve sustained economic growth, and the post-apartheid South African government has largely failed to follow that direction. Fox & Romero (2017) opined that strategic economic empowerment is essential for positive developmental outcomes such as poverty reduction, inclusive growth, and human rights. Furthermore, Bird (2018) and Eck (2014) assert that strategic economic empowerment increases the citizens' access to resources and opportunities such as skills development, market information, financial services, job opportunities, property acquisitions, and other productive assets. Strategic economic empowerment also increases citizens' access to and control over productive assets, argued the Organisation for Economic Co-operation and Development (O.E.C.D., 2016).

The agro-processing sector of South Africa is not yet fully transformed and still does not reflect the demographic of the country but rather a continuation of the colonial structure. The agro-processing sector of South Africa is still skewed in favour of well-established large-scale commercial enterprises to the neglect of small-scale agro-processors who are left out due to the strategi economic empowerment policies by the government to drive their growth (Mmbengwa, Rambau, and Qin, 2020). However, there has been some progress in the past twenty-five years with some new role-players participating in the agro-processing sector of South Africa (Dimant, Lebone, Mackay, Moloi, Ndebele, Phung and van Heerden 2016). These players from the previously disadvantaged segment of the population are challenged by access to markets, technologies, skills development, poorly developed infrastructure, and limited growth incentives that limit their ability to compete effectively with dominant firms in the sector (Mmbengwa et al.2020).

Hence, Lin, van den Bos & Sterras (2018) have observed that the limited involvement of small-scale agro-processors in the sectors' value chain in South Africa may have emerged from the confusion in policies and lack of a strategic economic empowerment framework to implement policies. Though there exist government policies designed to empower small-scale agro-enterprises, these policies have not significantly impacted the growth of small-scale agro-processors due to fragmented strategies, with no framework to address past inequalities (Iheduru 2004). However, Ortmann & King (2007) suggest that, despite the confusion of policies and frequent changes after that, the sector plays a pivotal role in supporting small-scale, previously disadvantaged farmers towards commercialization and growth.

In South Africa, most small-scale agro-processing enterprises are characterized by inefficiency in resource use, mismanagement, weak responsiveness to market trends, poor innovative practices, poor management skills and lack of trust, inability to share information, skills development, and the use of assets. The Agri-BEE Transformation Charter of South Africa was designed strategically to cater to these challenges. However, evidence of success among small-scale agro-processors in South Africa is rare. Several studies (Cook, 1995; Elfring and Hulsink, 2003; D'Haese, Hylenbroeck, Doyer and Calus 2007; Jordaan, Grove and Backeberg 2014) have researched the development of strategic frameworks in various economic sectors of South Africa. These include value addition, innovation through networking, and organizational performance, but none of these frameworks was on agro-processing.

Furthermore, studies by (Child and Rodrigues, 2005; Miles, Snover, Binder, Sarachik, Mote, and Mantau 2006;

lliopoulos, 2008 and Cook & Burres 2009) have been conducted globally small-scale agro-processing businesses' performance. However, these studies focused on internal social dynamics, revenue, and income of small-scale agro-processing businesses. Thus, business networking is a socio-economic commercial activity in which groups of like-minded entrepreneurs identify, develop, or take advantage of business possibilities (Muranga 2020). Furthermore, Thindisa & Urban (2018) contend that small-scale agro-processors who collaborated and maintained networks had a competitive edge over compatriots who do not network. As a result, good trademark usage may play a role in improving branding and longer-term investments in innovation (Lybbert, Saxena, Ecuru, Kawooya, and Wunsch-Vincent, 2017). This study, therefore, intends to develop expansion strategies targeting the Small-scale agro-processing sector for small-scale agro-processors of South Africa.

2. MATERIALS AND METHODS

South Africa is in the Southern tip of the African continent. The country lies between 600 and 900 meters above sea level and has an estimated 1.22 million square kilometres surface area. Statistics South Africa. (Stats S.A., 2020) 2020 mid-year population estimates for the country stood at 59, 62 million with an average family size of three per household. In this study, five provinces were purposively selected, namely, Gauteng, Limpopo, North West, Free State, and Mpumalanga provinces, in which 64% of the country's agri-business activities take place as shown in Figure 1.

Stats S.A. (2019) and Mthombeni, Antwi, and Rubhara (2021) observed that these provinces are home to most small-scale agro-processing activities in the country and the highest number of entrepreneurs in this sector (Stats S.A., 2019). The structure of the agricultural sector in South Africa is dualistic, with a well-developed commercial sector competing with the resource-poor smallholder farmers (Gwebu & Mathews, 2018). The agro-processing sector contributes approximately R124 million (14%) to South Africa's gross domestic product and employs approximately 451,000 people constituting about 10% of

FIGURE 1: MAP OF SOUTH AFRICA SHOWING PROVINCES. SOURCE: GOOGLE MAPS, 2019.

total employment in the formal agricultural sector. The South African government has prioritized agro-processing due to its potential to generate massive employment because of its backward and forward linkages.

2.1 Research design, sampling, and data collection

The current study utilized and exploratory research design and a quantitative research approach. Data for this study were collected from 503 respondents across five provinces of South Africa. A stratified probability random sampling technique was used in the selection of respondents across the five provinces. The sample respondents met the following criteria: owning, operating, or managing a small-scale agro-processing enterprise. The business should be located within the study area. The owner, manager, or director should have a business or work permit or identity document. The quantitative data was collected using a structured questionnaire. The structured questionnaires were validated using peer review by supervisors, consultants, and senior government officials from the agriculture sector who discussed and criticized parts of the study and their relevance to the research objective. Furthermore, triangulation was performed to validate the study instrument and cross-sectional data.

2.2 Measurement's variables

Factor analysis was used to explore and identify the factor loading of the latent variables (unobserved variables). Structural Equation Modelling (S.E.M.) was used to determine critical tenets for small-scale agro-processors effective and efficient strategies for economic empowerment. The output of small-scale agro-processors was considered as a measure of strategic economic empowerment and the dependent variable in this study. Furthermore, the composite factors of variables, such as capacity-building, entrepreneurship, infrastructure and resources, and transformation, were considered independent variables. The collected data were analysed using methods of central tendencies such as frequencies, standard deviations, percentages, and others.

Further analysis was done by Structural Equation Modelling (S.E.M.). S.E.M. was developed to determine critical tenets for small-scale agro-processors effectiveness and efficiency regarding strategic economic empowerment for small-scale agro-processors of South Africa. Descriptive statistics were used to summarise the characteristics of the small-scale agro-processors and their perceptions on the level of importance of various management practices in agro-processing businesses. It involves the determination of frequencies, mean and standard deviation of the constructs used. For the purpose of this research, frequency tables, means, and standard deviation were used to present the results of descriptive analysis.

2.2.1 Inferential Statistics

The statistical analysis methods discussed in this section include exploratory factor analysis and Structural Equation Modelling (S.E.M.). S.E.M. software package Analysis of Moment Structures (A.M.O.S.) version 16 was used in this research to explore the statistical relationships between the test items of each factor and among the factors. Factor analysis is an interdependence technique used to determine the nature of underlying patterns among many variables (Hair, Halle, Terry-Humen, Lavelle, and Calkins., 2006:104). Kothari (2004:323) defines factor analysis as an underlying dimension that accounts for several observed variables. He further submits that there can be one or more factors, depending upon the nature of the study and the number of variables involved. To achieve the objectives of this study, factor analysis takes either Exploratory Factor Analysis (E.F.A.) or Confirmatory Factor Analysis (C.F.A.) (Cohen, Janicki-Deverts, and Miller., 2007:560). Factor analysis can take any of the following three approaches: the centroid method, the principal components

method, and the maximum likelihood method (Kothari, 2004:323). E.F.A. uses principal component methods to explore previously unknown groupings of variables, to seek underlying patterns, clustering, and groups (Cohen et al., 2007:560). In this study, the researcher first conducted an exploratory factor analysis to examine the dimension of each of the constructs (factor).

2.2.2 Exploratory Factor Analysis

Exploratory Factor analysis (E.F.A.) is a multivariate statistical approach or descriptive technique used to determine the appropriate number of common factors to uncover which measured variables are reasonable indicators of the various latent dimensions (Khine, 2013: 10). In this study, the main objective of E.F.A. was to evaluate the dimensionality of a set of multiple indicators (e.g., items from a questionnaire) by uncovering the smallest number of interpretable factors needed to explain the correlations among them (Williams and Sternthal, 2010:2). With the Factor Analysis method, the Principal Component Analysis (P.C.A.) techniques were more appropriate as a data reduction technique to reduce the larger of 503 respondents to a smaller, more manageable number of composite variables to use in subsequent analyses (Kothari, 2004: 22). This study used the Kaiser's criteria (Eigen value > 1 rule) for the extraction, consistent with the preferred type of Measurement. The study variables were measured using the Likert scale, which is an interval scale and assumes normality implying the study findings can be generalised from the sample to the population under investigation, which are agro-processors. Correlation is a necessary but not conclusive measure of validity, hence can influence the reliability of the factor analysis. There are two ways of checking suitability in the given data to conduct factor analysis: sample size adequacy, which in this study was at least 5 times the number of items in the construct.

The number of factors to keep will be evaluated using three criteria, the Kaiser Criterion, the percentage variance criterion, and the scree plot. The Kaiser's criterion suggests that factors with eigenvalues greater than 1 are more significant as they represent substantial variance explained (Field, 2000: 640). Percentage of variance criterion is used to ensure that the factor extracted together explains a specified amount of variance. Values that account for 70 – 80% of the variance are acceptable (Field, 2000: 436 – 437). However, in social science, a factor accounting for 50 – 60% variances are common and can be considered.

The Eigen values represent the variances explained by the particular item. Extraction Sums of Squared Loadings show results of extraction of items with eigenvalues greater than 1. Factor loadings resulting from orthogonal rotation are correlation coefficients between each item and the factor; they range from -1 to +1. A negative correlation indicates that the items need to be reversely interpreted from the way they are initially stated. Factor loadings are suppression values and are subjective and could vary from 0.32 to 0.5 using the scree plots keep factor before the breaking point or elbow are kept (Field, 2000: 436 – 437). Different scree plot was inspected to estimate the number of possible factors to be extracted. A scree plot test was used to select the number of factors with Kaiser's Eigenvalue greater than 1, their percentage variances contribution, and the Cronbachs' Alpha Coefficient.

2.2.3 Structural Equation Modelling

Structural Equation Modelling (S.E.M.) is a combination of statistical models seeking to clarify and explain the relationships among latent constructs that have multiple measures (Lei & W.U., 2007:33). It was a combination of factor analysis and regression. In the current study, S.E.M. is used to examine the relationships between agro-processing factors. This technique specifies the estimates and evaluates models of linear relationships among a set of observed variables (measured) and

unobserved (latent variable), in contrast to regression analysis which can only model observed variables, and factor analysis which can only model latent variables (Khine, 2014:23).

2.2.4 The goodness of Fit Indices and Model Estimates

The goodness of Fit (G.O.F.) and other model estimates such as standard regression weight (factor loadings) and critical ratio (C.R.) estimate criteria were used to evaluate the S.E.M. G.O.F. describes how well the specified model reproduces the covariance matrix among the indicator items, where the higher the values of the variables the better (Malhotra, 2010:731). Goodness has three main fit measures indices: absolute, parsimony, and comparatives. Each model of fit should be considered because each provides different information about the fit (Kenny, 1998:40). The factor loadings value should be greater than 0.7 (Nunnally (1978:245–246). The measurement model was evaluated using the maximum likelihood estimation technique provided in the A.M.O.S. software.

In this study, the chi-square, the root mean square of Approximation (R.M.S.E.A.), the Incremental Fit Index (I.F.I.), the Comparative Fit Index (CFI), and Tucker–Lewis Index (TLI) were used to assess the model fit. According to Bryne (2010:77-80), an R.M.S.E.A. Value of 0.08 together with I.F.I., CFI, and TLI values above 0.9 indicate an acceptable model fit. Significant chi-square is an indication of poor model fit. Hair, Hostetler, Cook, Harper, Ferrare, Mack, Welch, Izquierdo, and Hovis (2008: 666:667) notes that since the chi-square test is susceptible to the effects of large sample sizes, it should be used in conjunction with other G.O.F. indices. In addition, composite construct reliability and average variances were used to examine the reliability and validity of the measurement model. Convergent validity is achieved when all constructs exceed the critical level of 0.5 for the AVE (Paswan, 2009:36 -37). Furthermore, discriminant validity is achieved when the correlation coefficient is smaller than the square root of the AVE (Malhotra, 2010:741).

2.3 Model specifications

The S.E.M. of ordinal data is often performed using normal theory maximum likelihood estimation based on the Pearson correlation (cont-ML) or using least-squares principles based on the polychoric correlation matrix (cat-LS) (Foldnes, & Grønneberg 2021). The S.E.M. was developed to determine critical tenets for small-scale agro-processors effective and efficient economic empowerment framework in South Africa. Three critical tenets were identified as follows: capacity-building, business networks, and interventions. These tenets are presented in the equations below.

$$Y1i = C1i + \beta 1jX1j + \beta 2jX2j + \beta 3jX3j + E1i \ldots(1)$$

$$Y2i = C2i + \beta 2iX2i + \beta 2iX2i + \beta 3iX3i + E2i \ldots.(2)$$

$$Y3i = C30 + \beta 3iX3i + \beta 3iX3i + \beta 3iX3i + E3i \ldots 3)$$

$$Y4i = C40 + \beta 4iX4i + \beta 4iX4i + \beta 4iX4i + E4i \ldots 4)$$

Where:

$Y1i =$ capacity-building;

$Y2i =$ business networks;

$Y3i =$ interventions;

$Y4i =$ economic empowerment;

$Cni =$ constants;

$\beta ni =$ coefficients of variation;

$Xin =$ independent variables; and $Eni =$ error term.

The model goodness of fit was estimated using Chi-square, the goodness of fit Index (G.F.I.), Tuckers-Lewis's Index, comparative fit index (CFI), standardized root mean

residual, and root means a square error of approximation (R.M.S.E.A.). These were estimated using the following equations:

$$\text{Chi-square} = \text{X2/df} \ldots\ldots\ldots(5)$$

$$\text{G.F.I.} = 1 - FTFs \ldots\ldots\ldots\ldots\ldots(6)$$

$$\text{CFI} = 1 - \max[(\text{X2}T - dfT),0]\ max[(\text{X2}T - dfT),0], (\text{X2}T - dfB),0] \ldots\ldots\ldots(7)$$

$$\text{TLI} = [(\text{X2}BdfB - \text{X2}fdf)]//[(\text{X2}Bdfb) - 1]/\ldots\ldots\ldots(8)$$

$$\text{NFI} = (\text{X2}B - \text{X2}T)\text{X2}B \ldots\ldots\ldots(9)$$

Where:

FT = fit of the target model;

Fs = fit of the solar model;

F = fit function;

B = baseline of the independent model; and

T = target of the model of interest.

2.4 Validity and reliability of the S.E.M.

The study assessed a model fit by using several fit indices such as Chi-square (X2), chi-square/degree of freedom (X2/df), goodness o fit index (G.F.I.), Tuckers-Lewis index, comparative fit index (CFI), standardized root mean residual, and root means a square error of approximation (R.M.S.E.A.) (see Table 1).

The results in Table 1 revealed that the model yielded indices that show a good fit. Analysis revealed that the chi-squared was well fitted given the sample data of χ2/df =4.804. Furthermore, other goodness of fit indexes was: Normed fit index (NFI) = 0.927, Comparative Fit Index (CFI) = 0.940, Root mean squared error of approximation (RMSEA) = 0.087, and the Goodness of fit (GFI) = 0.952. These results suggest that the model was appropriate and was well specified (Moshagen 2012). This is consistent with studies that reported confirmatory factor analysis (C.F.A.) models often fail to meet standards of goodness fit (Marsh, 2007; Marsh, Hau, and Grayson, 2005; Marsh, Ludtke, Muthe, Asparouhov, Morin and Trautwein, 2010 and Marsh, Guo, Dicke, Parker and Craven, 2020), which is contrary to the observation of this model.

The regression weights for the small-scale agro-processing were presented in Table 2. The results reveal that, there was no significant relationship between capacity building and entrepreneurship (β = 0.038, p = 0.535), capacity building and access to productive resources (β = 0.117, p = 0.251); and Business networks and Capacity building (β = -0.002, p < 0.911). These results imply that no causal relationship exists between capacity building and the predictor variables in this sector.

TABLE 1: THE MODEL SUMMARY SHOWING THE GOODNESS OF FIT

Goodness of fit	S.E.M.s values	Recommended threshold	Remarks
Chi-square/degree of Freedom (CMIN/DF)	4.804	≤5.00	Acceptable fit
Normed fit index (NFI)	0.927	≥.90	Acceptable fit
Comparative fit index (CFI)	0.940	≥.90	Acceptable fit
Incremental fit index (I.F.I.)	0.941	≥.90	Good fit
Root mean squared error of approximation (R.M.S.E.A.)	0.087	≤.10	Good fit
Goodness of fit (G.F.I.)	0.952	≤.10	Good fit

Source: Researchers own data.

3. RESULTS AND FINDINGS

Descriptive analysis of responses was presented in the form of tables. These results show that the removal of biases has enhanced the study's reliability. Table 3 indicates the socio-economic characteristics of small-scale agro-processors of South Africa. The study has shown that respondents' profiles were central in determining the actual capacity (Morris, Kamarulzaman, and Morris, 2019; Pratama & Rahadiana, 2019). The study found that females were in the majority 365 (72.6%) compared to males 138 (27.4%) in the agro-processing sector of South Africa. The results contrast the findings of Akpan (2020) and Olive, Aloysius, and Beauty (2020), who reported a similar gender representation in their study where females were 61% compared to 39% males. The results also indicate that most small-scale agro-processing business owners in South Africa were females (91.5%) than males (91.3%). On the same note, the marital status reveals a difference amongst small-scale agro-processors at [214 (42.5%)] and small-scale agro-processors who were married constitute the second highest [181 (36.0%)] group of respondents in the sample.

In this study, the proportional representation in gender was skewed (72.56%) towards females in all the provinces. Similar trends were shown in other personal characteristics, suggesting that more females were willing and available to participate in this study than males. The entrepreneurial position

TABLE 2: REGRESSION WEIGHTS IN SMALL-SCALE AGRO-PROCESSING MODEL

Relationships			β	S.E.	C.R.	P-value	Rej/Sup
Capacity building	←	Entrepreneurship	,038	,061	,620	,535	Rejected
Capacity building	←	Access to productive resources	,117	,102	1,148	,251	Rejected
Capacity building	←	Access to information	2,609***	,096	27,091	,000	Supported
Business networks	←	Capacity building	-,002	,018	-,112	,911	Rejected
Business networks	←	Access to information	,119*	,062	1,926	,054	Supported
Business networks	←	Access to productive resources	,107**	,043	2,476	,013	Supported
Interventions	←	Business networks	,066*	,039	1,686	,092	Supported
Interventions	←	Allocation of time	-,329***	,038	-8,757	,000	Supported
Interventions	←	Production decision making	,289***	,042	6,919	,000	Supported
Market Access	←	Interventions	-,009	,023	-,413	,680	Rejected
Income	←	Market Access	,097***	,034	2,824	,005	Supported
Economic empowerment	←	Income	,141***	,040	3,486	,000	Supported

*Notes: SE= Standardized estimates, CR=Composite reliability, Rej = Rejected and Sup = Supported, *** = P < 0.000, ** = P < 0.050, * = P < 0.100.*
Source, Researchers own data

TABLE 3: SOCIO-ECONOMIC CHARACTERISTICS OF SMALL-SCALE AGRO-PROCESSORS IN SOUTH AFRICA

Gender	Female		Male	
Socio-economic Variables	**Frequency**	**Percent**	**Frequency**	**Percent**
Gender	365	72.6	138	27.4
Position				
Director	1	0.3	2	1.4
Owner	334	91.5	126	91.3
Managing Director	6	1.6	3	2.2
Manager	24	6.6	7	5.1
Total	365	100	138	100
Marital status				
Married	134	36.7	47	34.1
Widowed	36	9.8	2	1.4
Divorced	27	7.4	3	2.2
Separated	29	7.9	11	7.9
Never married	139	38.2	35	25.4
No response	0	0	40	29.0
Total	365	100	138	100
Employment status				
Employed	27	7,4	12	8,7
Self-employed	284	77,8	114	82,6
Pensioner	32	8,8	3	2,2
Entrepreneur	20	5,5	9	6,5
Unemployed	2	0,5	0	0
Total	365	100,0	138	100,0
Highest qualifications				
No schooling	41	11.2	5	3.6
Primary and secondary	226	61.9	93	67.4
Certificate	89	24.4	33	23.9
Diploma	7	1.9	6	4.3
Degree	2	0.6	1	0.8
Total	365	100	138	100
Agro-processing speciality				
Drying	156	42.8	62	44.9
Canning	32	8.7	6	4.4
Bottling	48	13.1	24	17.4
Juicing	23	6.3	11	7.9
Powdering	72	19.7	18	13.0
Paste/puree	14	3.8	4	2.9
Cleaning	20	5.6	13	9.5
Total	365	100	138	100

Employment and Experience	Mean	SD	Mean	SD
Number of employees	1,4164	0,69674	1,5435	1,01894
Experience in the business	5,6466	3,21287	4,6594	2,64022
Experience in the agro-processing	5,3753	3,29484	4,3551	2,71734

Notes: SD = standard deviation
Source: Survey Data (2020)

revealed that, regardless of gender, over 90% of the small-scale agro-processors were business owners. The results suggest that women have more ownership and could be empowered through these types of enterprises (de Satgé, & Phuhlisani 2020). This finding is similar to the trends reported in studies by Adom (2018); Morris et al. (2019), and Akpan (2020).

This study further reveals that 77.8% and 82.6% of small-scale agro-processors who were self-employed of respondents were females and males, respectively. These findings suggest that small-scale agro-processing can create much-needed employment ill respective of gender. The study shows that 87.0% and 91.8% of males and females use their investment funding relative to other funding sources. The mean number of female-owned agro-processing enterprises was 1.4 compared to 1.5 employees for male-owned agro-processing businesses in South Africa. Furthermore, both female and male small-scale agro-processing enterprises have a capacity of at least two employees. The employment capacity of agro-processing businesses agrees with a study by Mmbengwa, Khoza, Rambau & Rakuambo (2019).

In agro-processing enterprises, drying is widespread agro-processing technique amongst both females (42.7%) and males (44.9%) small-scale agro-processors. Besides drying, powdering (19.7%) was the second most common technique of processing, while bottling (13.2%) was the third biggest. Among males, it was observed that bottling was the second favourite technique (17.4%), while powdering (13.0%) was found to be the third favourite technique. The mean years of experience for female small-scale agro-processing enterprises were 5.3% compared to 4.3% for small-scale male agro-processors, as revealed in Table 3.

3.1 Empirical Results

The determinants of the strategic economic empowerment of small-scale agro-processors were analysed and the results were presented in Tables 4, 5, and 6, respectively. The determinants for strategies for the economic empowerment for small-scale agro-processors are identified in other to select the variables that constituted the latent variables. Their internal consistency was used to select the constructs' indicators, as shown in Table 4. Analysis as presented in Table 4 also shows the overall Cronbach Alpha for items consistency. Although the Cronbach Alpha of the entrepreneurship, infrastructure, and resources was 0.607and 0.689, respectively, was lower than 0.700, they were deemed acceptable in this study.

Table 5 also presents the determinants of small-scale agro-processing firms' strategic economic empowerment determinants in South Africa. The results found that the combination of infrastructure and resources, transformation, and capacity building accounts for 16.5% of the variance of agro-processing enterprises' strategic economic empowerment determinants (R2 = 0.165, adjusted R2 = 0.160, F (3, 499) = 32.876. The unstandardized (β), standardized (Beta) regression coefficients, semi partial correlation (Sr2) for each predictor in the regression model were reported.

TABLE 4: DETERMINANTS OF THE ECONOMIC EMPOWERMENT OF SMALL-SCALE AGRO-PROCESSORS

Variables	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Infrastructure and resources					
Power supply	13,1750	10,842	0,460	0,241	0,633
Processing technology	13,2386	9,843	0,515	0,286	0,597
Factory space	13,4056	9,628	0,465	0,228	0,630
Raw material	13,2624	10,086	0,454	0,211	0,636
Overall Cronbach Alpha					0,689
Transformation					
Ownership business	8,8887	7,067	0,570	0,330	0,736
Fairness	8,9821	6,806	0,653	0,428	0,644
Race	8,9642	6,871	0,602	0,376	0,701
Overall Cronbach Alpha					0.773
Capacity building					
Mentorship	18,5984	19,181	0,507	0,304	0,754
Technical skills	18,4254	18,098	0,565	0,358	0,735
Leadership skills	18,3380	17,575	0,588	0,364	0,728
Access to information	18,3479	17,403	0,609	0,417	0,720
Financial skills	18,4175	19,108	0,502	0,298	0,756
Overall Cronbach Alpha					0.780
Entrepreneurship					
Access to market	4,2386	1,756	0,435	0,190	
Transaction cost	4,5586	1,813	0,435	0,190	
Overall Cronbach Alpha					0.607

Source: Researchers own data

The results show that, the capacity building (Beta = 0.274, p = 0.000), transformation (Beta = 0.152, p = 0.000), infrastructure and resources (Beta = 0.075, p = 0.050) were all significant drivers in the strategic economic empowerment of small-scale agro-processing firms. Despite these findings, the influence of these factors was small (F2 = 0.198). However, amongst these factors, the results revealed capacity building has the most impacts, followed by transformation, infrastructural, and resources. This finding is consistent with that of Coppock, Desta, Tezera, and Gebru. (2011); Daninga (2020), whose studies revealed that human capacity building significantly impacted

TABLE 5: DETERMINANTS OF THE ECONOMIC EMPOWERMENT OF THE SMALL-SCALE AGRO-PROCESSORS.

Variables			Collinearity Statistics				
	β	Beta	Lower	Upper	Sr^2	Tolerance	V.I.F.
(Constant)	1,514*** (0.318)		0,890	2,138			
Infrastructural resources	0,026* (0.015)	0,075	-0,004	0,056	0.005	0,849	1,178
Transformation	0,056*** (0.018)	0,152	0,021	0,091	0.017	0,728	1,374
Capacity building	0,073*** (0.013)	0,274	0,048	0,098	0.056	0,744	1,343

*Notes: R^2 = 0.165, Adjusted R^2= 0.160, F (3, 499) = 32.876. *** = P< 0.000, * = P< 0.10, F2 = 0.198 (small effect size)*
Source: Researchers own data

Ethiopia's impoverished communities and Chinese communities, respectively.

Nwankwo and Ezeokafor (2020); Palmioli, Grando, Di Iacovo, Fastelli, Galli, Prosperi, Rovai, and Brunori (2020) in a study also found that capacity building played a significant role in improving farmers who were using the local cassava varieties and food systems. Similarly, Ge, Long, Qiao, Wang, Sun, and Yang. (2020), in a study, also found that agricultural transformation plays a significant role in improving small peasants' livelihood systems' while Ombaka, Karuiki, and Kyalo (2020) found that technical skills, entrepreneurship infrastructure, and entrepreneurship infrastructure network and transformation were significant determinants for growth in agro-processing. As such, findings from this study concurs with findings of other studies and assume that agricultural transformation processes are critical for growth in small-scale agro-processing of South Africa.

Results on the parameters of the domain of empowerment of small-scale agro-processing are presented in Table 6. The results reveal allocation of time (ŋ2= 0.099); production decision making (ŋ2 = 0.018); interventions (ŋ2 = 0.018), and interaction amongst the income, leadership, and interventions (ŋ2 = 0.012) had the most effects in influencing the development of the small scale agro-processing in South Africa. The five domains of empowerment (5DE) in agro-processing were decisions about agricultural production, access to and decision-making power about productive resources, control of the use of income, leadership in the community, and time allocation were highlighted as critical drivers for agro-processing in South Africa (Alkire, Meinzen-Dick, Peterman, Quisumbing, Seymour and Vaz. 2013.; Alkire 2005).

The findings concur to that of Yount, Cheong, Maxwell, Heckert, Martinez and Seymour (2019) who reported that, empowerment is a function of adequate time allocated to empowerment initiatives. Therefore, the combination that could informs entrepreneurs' ability to be empowered is the income, leadership style and policy interventions. These results are consistent with findings by Sraboni, Malapit, Quisumbing and Ahmed. 2014; Hannan, Heckert, James Hawkins, and Yount. 2020, and Quisumbing, Sproule, Martinez and Malapit. 2020. Conversely, there was

TABLE 6: THE PARAMETERS OF THE DOMAIN OF EMPOWERMENT OF SMALL-SCALE AGRO-PROCESSING.

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval		Partial Eta Squared
					Lower Bound	Upper Bound	
Intercept	2,450	0,680	3,603	0,000	1,114	3,786	0,026
Production decision making	0,140	0,046	3,022	0,003	0,049	0,231	0,018
Access to productive resources	0,140	0,044	3,209	0,001	0,054	0,226	0,020
Income	0,101	0,124	0,819	0,413	-0,142	0,344	0,001
Leadership	-0,024	0,085	-0,286	0,775	-0,191	0,143	0,000
Allocation of time	0,327	0,044	7,354	0,000	0,240	0,414	0,099
Interventions	-0,353	0,121	-2,927	0,004	-0,591	-0,116	0,017
Income * Interventions	-0,020	0,031	-0,649	0,517	-0,082	0,041	0,001
Income * Leadership * Interventions	0,009	0,004	2,446	0,015	0,002	0,017	0,012
a. Computed using alpha = ,05							

Source: Researchers own data

a significant causal relationship between capacity building and access to information (β = 2.609, p =0.000). This implies that, a unit increase in access to information could increase small-scale agro-processing capacity building by 260.9% in the South African context. Although access to information was found to have positively affected the business network (β = 0.119, p =0.054). The implication is that an increase in the access to information can bring 11.9 % increase in business networks for agro-processing enterprises in South Africa.

Other variables that were found to be significant were business networks and access to productive resources (β = 0.107, p = 0.013), interventions and business networks (β = 0.066, p =0.092), interventions and allocation of time (β = -0.329, p = 0.000). The latter showed a negative relationship, suggesting that a unit increase in time allocation could probably reduce interventions by 32.9%. On the other hand, production decision-making significantly increases the interventions by 28.9% (β = 0.289, p =0.000) while there was a negative relationship between market access and interventions (β =-0.009, p =0.000).

Furthermore, market access has a propensity to create a 9.7% increase in income for small-scale agro-processing (β = 0.097, p = 0.005). This finding suggests that if the market is created for agro-processing entrepreneurs, their income will increase significantly, thereby contributing to the growth and sustainability of these enterprises. The results further revealed that income generated by small-scale agro-processors could increase these entrepreneurs' strategic economic empowerment by 14.1% (β=0.141, p=0.000). These findings concur with that of Vyas &

Watts (2009), who reported that strategic economic empowerment is about access to the resources that can generate income for agro-processors and supports the notion of a positive relationship between income and economic empowerment. Ombaka et al. (2020), Akpan et al. (2020), Chavan & Alam (2020) also found that income from external sources has a probability of increasing these agro-processing enterprises' competitive advantage. These observations suggest that, increases in income increase economic empowerment.

4. DISCUSSIONS OF FINDINGS

This study has shown that capacity building, business networks, and interventions were critical tenets for the strategic economic empowerment of small-scale agro-processors in South Africa. Findings from the study also reveal the role of capacity building in enhancing the strategic economic empowerment of small-scale agro-processors. These findings are an extension of Nwankwo et al. 2020; Ombaka et al. (2020), Palmioli et al. (2020) found that capacity building played a significant role in improving farmers who were using the local cassava varieties and food systems. Ombaka et al. (2020) revealed that technical skills, entrepreneurship infrastructure network, and transformation also positively affect the agro-processing enterprises' growth. The descriptive analysis from this study has also shown that more females compared to males are small-scale agro-processors. Their mean years of experience in the agro-processing sector was 5 years for females and 4 years for males. The shorter duration displayed by the mean years in experience by agro-processors indicates the necessity for capacity building for small-scale agro-processing enterprises to achieve strategic economic empowerment.

On the issue of business networks, the study's findings were consistent and support findings by Premaratne (2002), Mukherjee, Keshary, Pandya, Dey & Satapathy. (2018), Thindisa et al. (2018), Skryl & Gregorić (2021). These studies observed that the creation of networks of domestic suppliers and access to the availability of funding and interconnectedness between S.M.E.s and significant enterprises are crucial for growth. Okten & Osili (2004) found that network formation helps entrepreneurs tap resources in the external environment successfully, but a study by Fernandes and da Silva (2016) in a study reported a less significant impact of the network on the small-scale agro-processors. However, there was general agreement by these studies that the identified factors are essential for small-scale agro-processing enterprises' sustainability. Although researchers such as Santacoloma, Röttger and Tartanac 2009; Neves 2020; Grando, Bartolini, Bonjean, Brunori, Mathijs, Prosperi, & Vergamini 2020 contended that, network forms the cornerstone of the internal resources of these enterprises and the findings are consistent with the resource-based theoretical framework, whose central tenet is internal resources (Nagano, 2020). The study's findings on networks concur with studies by Shane & Hoverd (2002), Ökten et al. (2004), Setsoafia, Hing, Jung, Azad, and Lim (2015). Networking is essential to small-scale agro-processors and can positively impact their performance and access to finance (Setsoafia et al., 2015). Researchers have identified networking as one of the fastest ways for the owner-manager to understand their business environment, which is crucial for business growth and competitiveness. Okten & Osili (2004) found that network formation helps entrepreneurs tap resources in the external environment successfully.

Findings from this study were also consistent and extended a study by Yount et al. (2019), which reported that empowerment is a function of adequate time allocated to the empowerment initiatives. Therefore, the combination could inform the entrepreneurs' ability to empower the income, leaders, and interventions. This study found the capacity building, business networks, and intervention to be significant determinants of economic empowerment of the small-

scale agro-processors in South Africa. If the findings are implemented, it can be beneficial in enhancing small-scale agro-processors in South Africa.

Findings from this study allow for systematic follow-up on capacity-building programmes as a critical tenet in the strategic economic empowerment of the small-scale agro-processors in South Africa. The findings strengthened the calls for targeted capacity-building programmes for small-scale agro-processors as a strategy of economic empowerment and bridged the gap between established agro-processing enterprises and emerging agro-processing enterprises in South Africa. The study also strengthens the calls for identifying and analysing the current business network environment for small-scale agro-processors as a critical determinant for strategic economic empowerment in South Africa.

5. CONTRIBUTION OF THIS STUDY

The study results have both theoretical and pragmatic implications and were evaluated based on the responses from a sample small-scale agro-processors in South Africa as shown in Figure 2.

Theoretically, the study has added value to existing theory in that capacity building, business networks, and interventions are critical tenets for the strategic economic empowerment of small-scale agro-processors. Practically, the study developed a strategic framework for economic empowerment for small-scale agro-processing in South Africa. The framework will enable small-scale agro-processors are supported through targeted policies in accessing appropriate capacity-building initiatives, business networks, and interventions.

Furthermore, the study findings have significant practical managerial contributions. The managers and owners of small-scale agro-enterprises should encourage their employees to attend courses or capacity development programmes in order for their business to grow and development. In addition, this study will also assist small-scale agro-processing enterprises' managers or owners to identify the necessary empowerment practices that will give them a competitive advantage and enhance their business performance.

The study also found that business networks are a critical factor for the economic empowerment of small-scale agro-processors. Therefore, managers or owners of small-scale agro-processing firms should seek to establish viable business networks that will help them produce products that can compete regionally and globally. The managers of S.M.M.E.s should rely on business networks based on trust and engage in formal strategic business networks to gain from the synergy of the network and influence policy making in their favour. Furthermore, the study found that trademarks are also critical for the economic empowerment of small-scale agro-processors. The managers or owners of small-scale agro-processing firms should strategically prioritize the trademarking of their products to endeavour to become and remain competitive

Furthermore, small-scale agro-processors should be assessed to determine whether they benefit from the capacity building, business networks, and interventions created. The results outlined in figure 3, were reached after modelling the factors of strategic economic empowerment for small-scale agro-processors. The study proves that capacity building, business networks, and interventions significantly impact the economic empowerment of small-scale agro-processors in South Africa.

6. CONCLUSION

Using structural equation modelling, the study examined the critical factors for strategic economic empowerment of small-scale agro-processors in South Africa. From the research findings, it could be concluded that capacity building, business networks, and interventions were critical tenets for

the economic empowerment of small-scale agro-processors. The study has shown that capacity building, business networks, and interventions were critical tenets for the strategic economic empowerment of small-scale agro-processors in South Africa. Hence, small-scale agro-processors of South Africa can enhance their strategic economic empowerment by implementing capacity-building programmes, encouraging the formations and participation in the business networks, and implementing networks. This study recommends that small-scale agro-processors of South Africa establish lobby organizations at local, regional, provincial, and national levels to enhance their networking capacity. The study concludes that for the South African government to achieve inclusive economic growth through strategic economic empowerment, it should strengthen capacity-building efforts, create business networks, and enhance interventions.

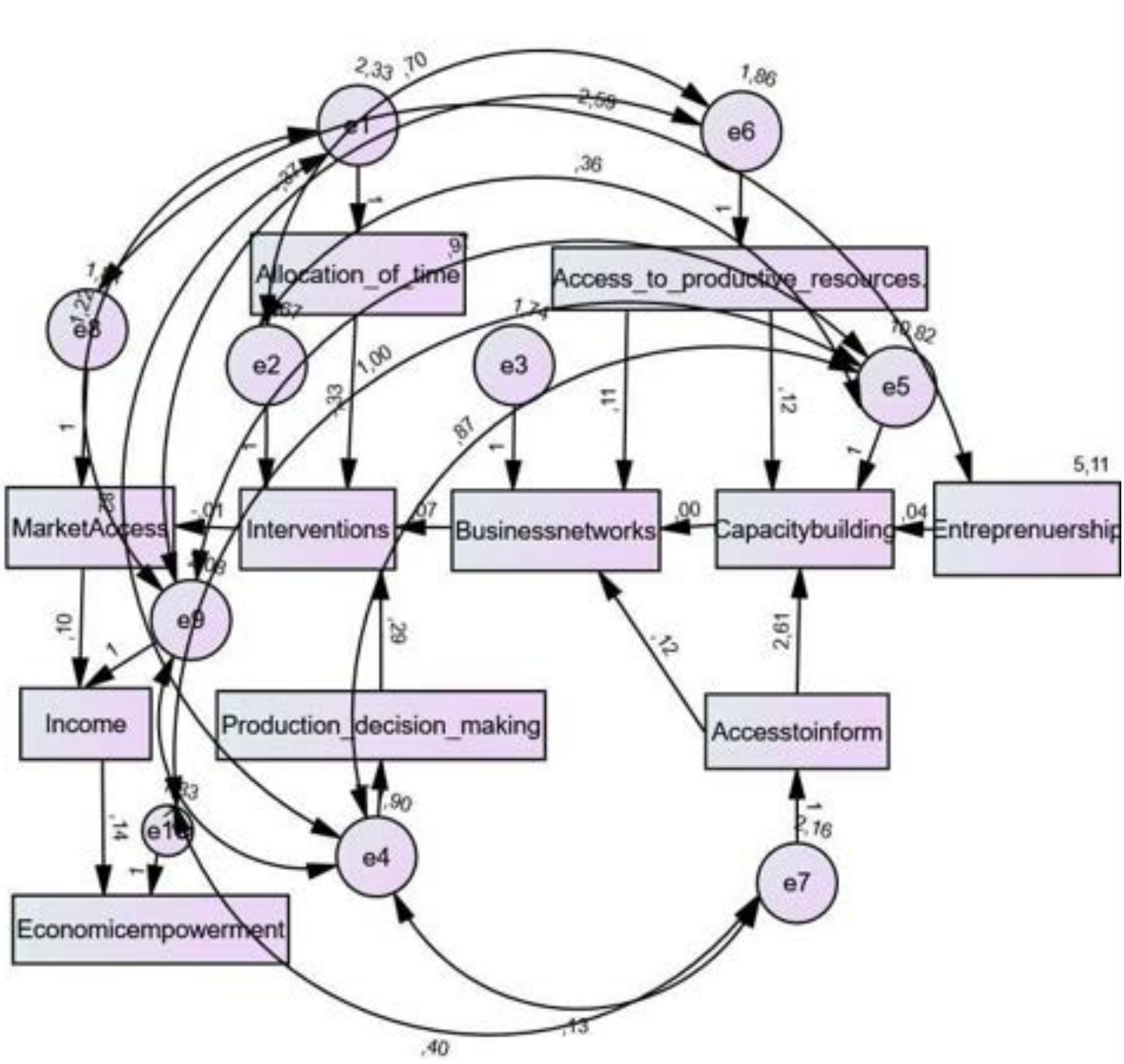

FIGURE 2: STRATEGIC FRAMEWORK FOR ECONOMIC EMPOWERMENT FOR SMALL-SCALE AGRO-PROCESSING IN SOUTH AFRICA. SOURCE: RESEARCHERS OWN DATA, 2020

REFERENCES

Adom, R.K. 2018. Assessing the role of small-scale agro-processors projects as a sustainable livelihood strategy in rural communities in Buffalo City Municipality in Eastern Cape, South Africa. Johannesburg: Wits University. (Thesis: M.A.). http://wiredspace.wits.ac.za/handle/10539/27270

Akpan, S.B., 2020. Access and demand for credit among small scale agro-based processors in Uyo Agricultural Zone, Akwa Ibom State, Nigeria. Nigeria Agricultural Journal, 51(1), pp.132-141.

Akpan, S.B., Offor, O.S., and Archibong, A.E., 2020. Access and demand for credit among small scale agro-based processors in Uyo agricultural zone, Akwa Ibom State, Nigeria. Nigeria Agricultural Journal, 51(1), pp.132-141.

Alkire, S., Meinzen-Dick, R., Peterman, A., Quisumbing, A., Seymour, G. and Vaz, A., 2013. The women's empowerment in agriculture index. World development, 52, pp.71-91.

Alkire, S., 2005. Subjective quantitative studies of human agency. Social indicators research, 74(1), pp.217-260.

Andreasson, S., 2010. Confronting the settler legacy: Indigenisation and transformation in South Africa and Zimbabwe. Political Geography, 29(8), pp.424-433.

Bird, K., 2018. Practical measures to enable the economic empowerment of chronically poor women. Overseas Development Institute.

Chavan, P.P. and Alam, M.S., 2020. Opportunities of Doubling Farmers Income by Post Harvest Value Addition to Agricultural Produce. N.A.S.S. Journal of Agricultural Sciences, 2(1).

Child, J. and Rodrigues, S.B., 2005. The internationalization of Chinese firms: a case for theoretical extension? 1. Management and organization review, 1(3), pp.381-410.

Cohen, S., Janicki-Deverts, D. and Miller, G.E., 2007. Psychological stress and disease. Jama, 298(14), pp.1685-1687.

Cook, M.L., 1995. The future of U.S. agricultural cooperatives: A neo-institutional approach. American journal of agricultural economics, 77(5), pp.1153-1159.

Cook, M.L. and Burress, M.J., 2009. A cooperative life cycle framework. Unpublished manuscript. Columbia, Mo.: University of Missouri Dept. of Agricultural Economics.

Coppock, D.L., Desta, S., Tezera, S., and Gebru, G., 2011. Capacity building helps pastoral women transform impoverished communities in Ethiopia. Science, 334(6061), pp.1394-1398.

Craig, A.D., 2002. How do you feel? Enteroception: the sense of the physiological condition of the body. Nature Reviews Neuroscience, 3(8), pp.655-666.

D'Haese, M., Van Huylenbroeck, G., Doyer, O.T. and Calus, M. 2007. A netchain development perspective on wool farmers' associations in poor communities: A case study in South Africa. Journal on Chain and Network Science, 7(1), art. #. DOI: 10.3920/JCNS2007.x074.

Daninga, P.D., 2020. Capitalizing on agro processing in Tanzania through Sino Africa Co-operation. Journal of Co-operative and Business Studies (J.C.B.S.), 5(1). pp. 2714-2043.

de Satgé, R. and Phuhlisani, N.P.C., 2020. A review of support services for smallholder and small-scale agricultural producers.

Dimant, T, Lebone, K, Mackay, G, Moloi, L, Ndebele, T, Phung, R. and Van Heerden, G. 2016. South Africa survey. Institute of race relations, Johannesburg, Republic of South Africa. Pp. 1-5.

Eck, R., 2014. Economic Empowerment of

Rural Women in Bangladesh.

Elfring, T. and Hulsink, W. 2003. Networks in entrepreneurship: The case of high-technology firms. Small Business Economics, 21(4), pp.409-422.

Field, J., 2000. Lifelong learning and the new educational order. Trentham Books, Ltd., Westview House, 734 London Road, Stoke on Trent, ST4 5NP, United Kingdom U.K. (15.99 British pounds; 25 Euros).

Foldnes, N. and Grønneberg, S., 2021. The sensitivity of structural equation modelling with ordinal data to underlying non-normality and observed distributional forms. Psychological Methods.

Fox, L. and Romero, C., 2017. In the Mind, the Household, or the Market? Concepts and Measurement of Women's Economic Empowerment. Policy Research Working Paper No. 8079. World Bank, Washington, DC. © World Bank. https://openknowledge.worldbank.org/handle/10986/26951 License: CC BY 3.0 IGO."

Ge, D., Long, H., Qiao, W., Wang, Z., Sun, D. and Yang, R., 2020. Effects of rural–urban migration on agricultural transformation: A case of Yucheng City, China. Journal of Rural Studies, 76, pp.85-95.

Google maps. 2019. Map of the Republic of South Africa. https://www.google.com/search?q=Map+of+south+africa&rlz=1C1GCEU_enZA822ZA822&oq=Map+of+south+africa&aqs=chrome..69i57.13553j0j15&sourceid=chrome&ie=UTF-8. Date of Access: 10 October 2019.

Grando, S., Bartolini, F., Bonjean, I., Brunori, G., Mathijs, E., Prosperi, P., and Vergamini, D., 2020. Small Farms' Behaviour: Conditions, Strategies, and Performances. In Innovation for Sustainability. Emerald Publishing Limited.

Gwebu, J.Z, and Matthews, N. 2018. Metafrontier analysis of commercil and smallholder tomato production: A South African case. South African Journal of Science, 114 (7/8). http://dx.doi.org/10.17159/sajs.2018/20170258.

Hair, E., Halle, T., Terry-Humen, E., Lavelle, B. and Calkins, J., 2006. Children's school readiness in the ECLS-K: Predictions to academic, health, and social outcomes in first grade. Early Childhood Research Quarterly, 21(4), pp.431-454.

Hair, J.W., Hostetler, C.A., Cook, A.L., Harper, D.B., Ferrare, R.A., Mack, T.L., Welch, W., Izquierdo, L.R. and Hovis, F.E., 2008. Airborne high spectral resolution lidar for profiling aerosol optical properties. Applied optics, 47(36), pp.6734-6752.

Hannan, A., Heckert, J., James□Hawkins, L. and Yount, K.M., 2020. Cognitive interviewing to improve women's empowerment questions in surveys: Application to the health and nutrition and intrahousehold relationships modules for the project□level Women's Empowerment in Agriculture Index. Maternal & Child Nutrition, 16(1), p.e12871.

Iheduru, O.C. 2004. Black economic power and nation-building in post-apartheid South Africa. Journal of Modern African Studies, art. # 0022-278X. https://doi.org/10.1017/S0022278X03004452.

Jordaan, H., Grové, B. and Backeberg, G.R. 2014. Conceptual framework for value chain analysis for poverty alleviation among smallholder farmers. Agrekon, 53(1). https://doi.org/10.1080/03031853.2014.887903.

Kenny, K., 1998. Making sense of the Molly Maguires. Oxford University Press.

Khine, M.S. ed., 2013. Application of structural equation modelling in educational research and practice (Vol. 7). Rotterdam: Sense Publishers.

Kothari, C.R., 2004. Research methodology: Methods and techniques. New Age International.

Lei, P.W. and Wu, Q., 2007. Introduction to structural equation modelling: Issues and practical considerations. Educational Measurement: issues and practice, 26(3), pp.33-43.

Lin, M., Van den Bos, A., and Sterras, N. 2018. The. Current State of Fruit & Vegetable Agri-. Processing in South Africa: Challenges and. Opportunities. Netherlands Enterprise Agency.

Iliopoulos, D., Malizos, K.N., Oikonomou, P. and Tsezou, A., 2008. Integrative microRNA and proteomic approaches identify novel osteoarthritis genes and their collaborative metabolic and inflammatory networks. PloS one, 3(11), p.e3740.

Lybbert, T., Saxena, K., Ecuru, J., Kawooya, D. and Wunsch-Vincent, S., 2017. Enhancing Innovation in the Ugandan Agri-Food Sector: Progress, Constraints, and Possibilities.

Malhotra, D., 2010. The desire to win: The effects of competitive arousal on motivation and behaviour. Organizational behaviour and human decision processes, 111(2), pp.139-146.

Marsh, H.W., 2007. Students' evaluations of university teaching: Dimensionality, reliability, validity, potential biases and usefulness. In The scholarship of teaching and learning in higher education: An evidence-based perspective (pp. 319-383). Springer, Dordrecht.

Marsh, H.W., Guo, J., Dicke, T., Parker, P.D. and Craven, R.G., 2020. Confirmatory factor analysis (C.F.A.), exploratory structural equation modelling (E.S.E.M.), and set-ESEM: optimal balance between goodness of fit and parsimony. Multivariate behavioural research, 55(1), pp.102-119.

Marsh, H. W., Hau, K-T., and Grayson, D., 2005. Goodness of fit evaluation in structural equation modelling. In A. Maydeu-Olivares & J. McArdle (Eds.), Psychometrics. A Festschrift to Roderick P. McDonald (pp. 275-340). Hillsdale, NJ: Erlbaum.

Marsh, H. W., Lüdtke, O., Muthén, B. O., Asparouhov, T., Morin, A.J.S., and Trautwein, U. 2010. A new look at the big-five factor structure through Exploratory Structural Equation Modelling. Psychological Assessment, 22, 471-491.

Miles, E.L., Snover, A.K., Binder, L.W., Sarachik, E., Mote, P. and Mantua, N. 2006. An approach to designing a national climate service. Proceedings of the National Academy of Sciences, 103(52), pp.19616-19623. https://doi.org/10.1073/pnas.0609090103.

Mmbengwa, V., Khoza, T. M., Rambau, K., and Rakuambo, J., 2018. Assessment of the participation of smallholder farmers in agro-processing industries of Gauteng Province. O.I.D.A. International Journal of Sustainable Development, 11(02), 11-18. https://ssrn.com/abstract=3149148

Mmbengwa, V. M., Rambau, K., and Qin, X., 2020. Key factors for the improvement of smallholder farmers' participation in agro-processing industries of Gauteng province of the Republic of South Africa: lessons for the extension advisory services. South African Journal of Agricultural Extension, 48(2), 153-165. http://dx.doi.org/10.17159/2413-3221/2020/v48n2a545

Morris, K.J., Kamarulzaman, N.H. and Morris, K.I., 2019. Small-scale postharvest practices among plantain farmers and traders: A potential for reducing losses in rivers state, Nigeria. Scientific African, 4, p.e00086.

Moshagen, M., 2012. The model size effect in S.E.M.: Inflated goodness-of-fit statistics are due to the size of the covariance matrix. Structural Equation Modelling: A Multidisciplinary Journal, 19(1), pp.86-98.

Mthombeni, D.L., Antwi, M.A. and Rubhara, T. (2021). Level of participation of small-scale crop farmers in agro-processing in Gauteng Province of South Africa. African

Journal of Food, Agriculture, Nutrition and Development, 21 (1). https://doi.org/10.18697/ajfand.96.19455

Muranga, B.K., 2020. Determinants of Competitiveness of Small and Medium Agro Processing Firms in Kenya (Doctoral dissertation, JKUAT-COHRED).

Nunnally, J.C. (1978). Psychometric theory. New York, NY: McGraw-Hill.

Nwankwo, F.O., and Ezeokafor, U.R., 2020. Agricultural Development Programme (A.D.P.) Capacity Building and Cassava Farmers Productivity in Anambra State. Oyo State, Nigeria

Mukherjee, A., Keshary, V., Pandya, K., Dey, N., and Satapathy, S. C., 2018. Flying ad hoc networks: A comprehensive survey. Information and decision sciences, 569-580. https://doi.org/10.1007/978-981-10-7563-6_59

Nagano, H., 2020. "The growth of the knowledge through the resource-based view," Management Decision, 58(1), 98-111. https://doi.org/10.1108/MD-11-2016-0798

Neves, J. C., 2020. Upper bound on the GUP parameter using the black hole shadow. The European Physical Journal C, 80, 1-10. https://doi.org/10.1140/epjc/s10052-020-7913-y

O.E.C.D., 2016. FDI in Figures. Organisation for European Economic Cooperation Paris.

Okten, C. and Osili, U.O., 2004. Social networks and credit access in Indonesia. World Development, 32 (7), pp. 1225 – 1246. https://doi.org/10.1016/j.worlddev.2004.01.012

Olive, O.O., Aloysius, O.C. and Beauty, D.A., 2020. Food Security And Poverty Status Of Cassava Processors In Awka North Local Government Area Of Anambra State Of Nigeria. The Bangladesh Journal of Agricultural Economics, 41(1), pp.1-16.

Ombaka, B., Kariuki, F.K.K.K. and Kyalo, T., 2020. Moderating effect of social media on relationship between entrepreneurial networking and performance of youth owned agro-processing S.M.E.s in Kenya. International Journal of Research in Business and Social Science (2147-4478), 9(4), pp.41-50.

Ortman, G. and King, R.P., 2007. Agricultural cooperative II. Can they facilitate small-scale farmers in South Africa to input and product market, 46(2).

Osibanjo, O., Oyewunmi, A., Abiodun, A. and Oyewunmi, O., 2019. Quality of work-life and organizational commitment among academics in tertiary education. International Journal of Mechanical Engineering and Technology, 10(2), pp.418-430.

Palmioli, L., Grando, S., Di Iacovo, F., Fastelli, L., Galli, F., Prosperi, P., Rovai, M. and Brunori, G., 2020. Small farms' strategies between self-provision and socio-economic integration: effects on food system capacity to provide food and nutrition security. Local Environment, 25(1), pp.43-56.

Paswan, A., 2009, Confirmatory Factor Analysis and Structural Equations Modeling, An Introduction, Department of Marketing and Logistics, C.O.B., University of North Texas, U.S.A.

Pratama, S.D. and Rahadiana, R., 2019. The Evaluation of Indonesian Labour Market in Optimizing Demographic Dividend in 2016. JKAP (Jurnal Kebijakan Dan Administrasi Publik), 22(2), pp.84-97.

Premaratne, S. P., 2002. Entrepreneurial networks and small business development. Eindhoven: Technische Universiteit Eindhoven.

Quisumbing, A.R., Sproule, K., Martinez, E.M. and Malapit, H.J., 2020. Women's

empowerment in agriculture and nutritional outcomes: Evidence from six countries in Africa and Asia (Vol. 1930). Intl Food Policy Res Inst.

Rasheed, A., Wen, W., Gao, F., Zhai, S., Jin, H., Liu, J., Guo, Q., Zhang, Y., Dreisigacker, S., Xia, X. and He, Z., 2016. Development and validation of K.A.S.P. assays for genes underpinning key economic traits in bread wheat. Theoretical and Applied Genetics, 129(10), pp.1843-1860.

Setsoafia, D. D. Y., Hing, P., Jung, S. C., Azad, A. K., and Lim, C. M., 2015. Sol-gel synthesis and characterization of Zn2+ and Mg2+ doped La10Si6O27 electrolytes for solid oxide fuel cells. Solid-State Sciences, 48, 163-170. https://doi.org/10.1016/j.solidstatesciences.2015.08.001

Santacoloma, P., Röttger, A., and Tartanac, F., 2009. Business management for small-scale agro-industries. F.A.O. Agriculture Management, Marketing and Finance Service Rural Infrastructure, Agro-Industries Division, Food, and agriculture organization of the United Nations, Rome.

Shane, P., and Hoverd, J., 2002. Distal record of multi-sourced tephra in Onepoto Basin, Auckland, New Zealand: implications for volcanic chronology, frequency, and hazards. Bulletin of Volcanology, 64(7), 441-454. https://doi.org/10.1007/s00445-002-0217-2

Skryl, T., and Gregorić, M., 2021. The Impact of the Fourth Industrial Revolution on Network Business Models. In Digital Strategies in a Global Market (pp. 53-65). Palgrave Macmillan, Cham.

Sraboni, E., Malapit, H.J., Quisumbing, A.R. and Ahmed, A.U., 2014. Women's empowerment in agriculture: What role for food security in Bangladesh? World Development, 61, pp.11-52.

Stats SA., 2019. Mid-year population estimates: 2019. (Statistical release P0302). https://www.Stats SA.gov.za/publications/P0302/P03022019.pdf. Date of Access: 10 October 2019.

Thindisa, L., and Urban, B., 2018. Human-social capital and market access factors influencing agro-processing participation by small-scale agripreneurs: The moderating effects of transaction costs. Acta Commercii, 18(1), 1-10. http://dx.doi.org/10.4102/ac.v18i1.500

Uppal, V., 2014. Global experience of Black Economic Empowerment and indigenisation policies. Department for International Development: London, UK.

Vyas, S. and Watts, C., 2009. How does economic empowerment affect women's risk of intimate partner violence in low- and middle-income countries? A systematic review of published evidence. Journal of International Development: The Journal of the Development Studies Association, 21(5), pp.577-602.

Williams, D.R. and Sternthal, M., 2010. Understanding racial-ethnic disparities in health: sociological contributions. Journal of health and social behavior, 51(1_suppl), pp.S15-S27.

Yount, K.M., Cheong, Y.F., Maxwell, L., Heckert, J., Martinez, E.M. and Seymour, G, 2019. Measurement properties of the project-level Women's Empowerment in Agriculture Index. World development, 124, p.104639.