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EVALUATING DOMAINS ASSOCIATED WITH ECONOMIC EMPOWERMENT OF SMALL-SCALE FEMALE AGRO-PROCESSORS IN SOUTH AFRICA

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Abstract. Women's economic empowerment has been South Africa's policy priority since the country became a democracy. This paper examines the domains associated with the economic empowerment of small-scale female agro-processors in South Africa. A sequential exploratory mixed methods research design and a close-ended questionnaire were used to collect quantitative data from 503 small-scale agro-processors in five provinces. Qualitative data were collected during five focus group sessions aided by the focus group guide. The results show that production decision-making (β = 0,140; p = 0,003), access to productive resources (β = 0.140, p = 0.001), time allocation (β = 0.327, p = 0.000), and intervention (β = –0.353, p = 0.004) are the critical domains of small-scale agro-processing empowerment. The study revealed that only four domains of women's economic empowerment have significantly improved the economic status of small-scale agro-processors. However, the combination of income, leadership, and intervention (β = 0.009, p = 0.015) was also a significant influencing factor. The study recommends that small-scale agro-processors be provided with necessary policies and legislative control over their production decisions. This authority is coupled with broadening access to productive resources, time allocation, grants, leadership, and projects to actively empower these entrepreneurs.

Keywords: small-scale agro-processing, women's economic empowerment, domains, leadership, income, interventions

INTRODUCTION

Gender equality is identified as a universal right and attempts to increase women's empowerment are a major global priority (Crookston et al., 2021). According to Goulart et al. (2021), women's empowerment is linked to goal five of the Sustainable Development Goals (S.D.G.s), which focuses on achieving gender equality and empowering all women and girls. Women's economic empowerment is part of the strategic goal[s] of most countries, and there are studies on this concept (Kabeer, 1999; Oriana et al., 2014; Sabina et al., 2015; Golla et al., 2018; Crookston et al., 2021). Existing literature on this concept has been highly researched (Laszlo et al., 2020; Jokia et al., 2021; Gupta, 2021). Scott et al. (2016) suggest that economically empowered women can acquire their own economic assets. Doss et al. (2012) define women's economic empowerment as the ability to increase their agricultural income and control their income. At the same time, Crookston et al. (2021) define women's economic empowerment as empowerment for women to advance their economic decisions. Furthermore, women's economic empowerment is defined as a tacit and strategic process of women attaining equal access to and authority over economic resources

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and using them in other areas of their lives (Taylor and Pereznieto, 2014; Hunt and Samman, 2016). According to Kabeer (1999) and Crookston et al. (2021), empowerment can be achieved through the following three dimensions: (1) resources—including education, social support, and assets, (2) agency—the ability to define goals and make decisions, and (3) achievements—well-being and life outcomes that result from the use of agency (Kabeer, 1999 and Crookston et al., 2021).

Various studies have been conducted and frameworks developed to measure and promote gender equality and women's empowerment (G.E.W.E.). The G.E.W.E. indicators have been categorized into the following domains: economic, health, human development, leadership, psychological, security and justice, and sociocultural. The current study focuses on the economic domain, and it focusses on employment indicators, financial decision-making, and income generation (Goulart et al., 2021).

The (initial)[first] framework to measure the domains for women's empowerment in agriculture is the Women's Empowerment in Agriculture Index (W.E.I.A.). It is a survey-based tool co-developed by the International Food Policy Research Institute, the Oxford Poverty and Human Development Initiative, and the United States of America's Agency for International Development (Alkire et al., 2013; Malapit et al., 2017). This well-established, survey-based index is designed to measure the empowerment, agency, and inclusion of women in the agricultural sector (Narayan, 2005; Alsop et al., 2006; Narayan and Petesch, 2007; Ibrahim and Alkire, 2007). Furthermore, it is an innovative new tool composed of two sub-indices, one of which measures the five domains of women's empowerment (see Table 1).

The second framework developed to measure the domains for women's empowerment in agriculture is the Adjusted-WEAI. It provides an alternative to the W.E.A.I. survey instrument; this alternative is shorter and more streamlined while still accurately reflecting the content and coverage of the original index (Malapit et al., 2017). Thus, the A-WEAI survey instrument reflects all five domains of empowerment in agriculture but collects only six out of the ten original indicators. The dropped indicators are autonomy in production; purchase, sale, or transfer of assets; speaking in public; and leisure. The definitions, cut-offs, and aggregation rules remain the same; only the indicator weights have been changed (see Table 1).

The third framework is the pro-WEAI. It includes 12 indicators mapped to three domains reflecting three different types of agencies: intrinsic agency, instrumental agency, and collective agency (see Table 2). A person is deemed adequate on a given indicator if they achieve a certain level. Again, the person is deemed empowered if

Table 1. Comparison of the domains of women's empowerment in agriculture index (W.E.A.I.) and abbreviated women in agriculture index (A-WEAI)

Original WEAI			A-WEAI		
Domain	Indicator	Weight	Domain	Indicator	Weight
Production	Input in productive decisions	1/10	Production	Input in productive decisions	1/5
	Autonomy in production	1/10			
Resources	Ownership of assets	1/15	Resources	Ownership of assets	1/5
	Purchase, sale, and transfer of assets	1/15			
	Access to and decision on credit	1/15		Access to and decisions on credit	1/5
Income	Control over the use of income	1/5	Income	Control over use of income	1/5
Leadership	Group member	1/10	Leadership	Group membership	1/5
	Speaking in public	1/10			
Time	Workload	1/10	Workload	Workload	1/5
	Leisure	1/10			

Source: Alkire et al., 2013; Malapit et al., 2017.

Table 2. Pro-WEAI indicators

Indicator	Definition of adequacy in pro-WEAI
Autonomy in income	Intrinsic Agency More motivated by own values than by coercion or fear of others' disapproval: Relative Autonomy Index1 score ≥1
Self-efficacy	"Agree" or greater on average with self-efficacy questions: New General Self-Efficacy ScaleC score ≥32
Attitudes about intimate partner violence against women	Believes husband is NOT justified in hitting or beating his wife in all 5 scenarios:2 1) She goes out without telling him 2) She neglects the children 3) She argues with him 4) She refuses to have sex with him 5) She burns the food
Respect among household members	Meets ALL the following conditions related to another household member: 1) Respondent respects relation (MOST of the time) AND 2) Relation respects respondent (MOST of the time) AND 3). Respondent trusts relation (MOST of the time) AND 4). Respondent is comfortable disagreeing with relation (MOST of the time)
Input in productive decisions	Instrumental Agency Meets at least O.N.E. of the following conditions for ALL the agricultural activities they participate in, whether related to production, processing, and marketing activities. 1) Makes related decision solely, 2) Makes the decision jointly and has at least some input into the decisions 3) Feels could make decision if wanted to (to at least a MEDIUM extent)
Ownership of land and other assets	Owns, either solely or jointly, at least O.N.E. of the following: 1) At least THREE small assets (poultry, nonmechanized equipment, or small consumer durables) 2) At least T.W.O. large assets 3).Land
Access to and decisions on financial services	Meets at least O.N.E. of the following conditions: 1) Belongs to a household that used a source of credit in the past year AND participated in at least O.N.E. sole or joint decision about it 2) Belongs to a household that did not use credit in the past year but could have if wanted to from at least O.N.E. source 3) Has access, solely or jointly, to a financial account
Control over use of income	Has input in decisions related to how to use BOTH income and output from ALL of the agricultural activities they participate in AND has input in decisions related to income from ALL non-agricultural activities they participate in, unless no decision was made
Work balance	Works less than 10.5 h per day: Workload=time spent in primary activity + (1/2) time spent in childcare as a secondary activity
Visiting important locations	Meets at least O.N.E. of the following conditions: 1) Visits at least T.W.O. locations at least ONCE PER WEEK of [city, market, family/relative], or 2) Visits least O.N.E. location at least ONCE PER MONTH of [health facility, public meeting]
Collective Agency	
Group membership	Active member of at least O.N.E. group
Membership in influential groups	Active member of at least O.N.E. group that can influence the community to at least a MEDIUM extent

Source: Quisumbing et al., 2021.

they have adequate achievements in 9 out of the 12 indicators. Furthermore, this framework includes two subindices measuring men's and women's performance on the 12 indicators. The Gender Parity Index, or GPI, captures women's achievements in the three domains relative to men in the same household (Quisumbing et al., 2021). The literature on women's empowerment also suggests that empowerment in one domain may not necessarily

create empowerment in other domains (Alkire et al., 2013; Malapit et al., 2017; Quisumbing et al., 2021).

Anderson et al. (2021) indicate that published estimates of economic returns to empowering women in agriculture are still relatively rare, primarily based on non-experimental evidence, likely biased towards positive outcomes, and often with limited data quality. At the same time, Slegh et al. (2013) and Derera (2015) assert that the benefits of women's economic empowerment are well-known and documented in the development literature. Golla et al., 2018; Sathiabama (2010); Mayanja and Tipi (2017) indicate that women's economic empowerment enhances national productivity, generates employment, and helps develop economic independence and personal social capabilities among rural women. This includes building self-confidence, enhancing awareness, promoting a sense of achievement, increasing social interaction, improving leadership qualities, solving women's problems within the community, and increasing decision-making capacities at family and community levels. Furthermore, women's economic empowerment is a powerful lever for change, driving gender equality outcomes and broader intergenerational benefits for women, their children, and households (Hendricks, 2019). Women's economic empowerment can contribute to L.E.D., which has a central theme: the creation of jobs (Jokia et al., 2021). Women's empowerment through entrepreneurship is a prospective sector because entrepreneurs create employment for themselves and create jobs for others. Therefore, it reduces gender inequality as well as poverty. According to Nawaz (2009) and Debnath et al. (2020), female entrepreneurship and women's empowerment complement each other. Female entrepreneurship is considered an essential tool in enabling women's empowerment (Maheshwari and Sodani, 2015; Nhleko, 2017). The emphasis on economic empowerment also has potentially transformative effects as it defines how women participate in growth processes and means that they are not merely seen as benefiting from growth (De Haan, 2017). Women's empowerment is likely to lead to better educated and healthier children (De Haan, 2017).

Despite a global focus on gender equality, many persistent factors are still contributing to the disempowerment of women (Crookston et al., 2021). Women's economic empowerment is discussed as the capacity of all women to be wholly involved in, subsidize, and assist in economic growth and development plans (Nhleko, 2017). Women play an important and possibly transformational role in agricultural growth in developing nations, but they are confronted by chronic barriers and economic restraints that limit their continued participation in agriculture, according to Alkire et al. (2013). Mmbengwa (2009) reports that women are empowered through small and medium-sized enterprises (S.M.M.E.s). Research has recognized that small-scale food processing enterprises, as part of the S.M.M.E. regime, have played a significant role in improving the economy of most developed and developing countries (Uzoejinwa et al., 2016). Studies further argue that small-scale agro-processing industries in Sub-Saharan Africa are potential sources of livelihood for many poor people living in this region (Simalenga and Gohl, 1996; Salau et al., 2019; Daninga, 2020). The small and medium-sized agro-processing industries have a functional role in employing a workforce at low capital cost, introducing innovation and entrepreneurship skills, generating higher production volumes, increasing exports, and distributing income across the country because of increased profit from increased investment (Uzoejinwa et al., 2016). According to Augustino (2017) and U.N.I.D.O. (2009), S.A.P.I.s often help motivate women involved in the agro-processing field. According to Simalenga et al. (1996) and Salau et al. (2020), most women work in S.A.P.I.s. Small-scale food processing operations can provide income for many vulnerable people in Sub-Saharan Africa.

Due to this situation, it is globally accepted that small and medium-scale industries, in general, serve as engines of the development of a nation (Kaldor, 1967; Mohamed and Mnguu, 2014). They contribute to employment generation, especially in rural areas, better income distribution, reduced post-harvest food losses, and increased food availability, and act as a training ground for entrepreneurs before investing in large-scale enterprises. In South Africa, commercial agriculture is the leading player in the agro-processing industry, whereas small-scale agriculture plays a limited role despite receiving government support (Mmbengwa et al., 2011). This limited role stems from the fact that small-scale agriculture is resource constrained. The South African government has found it challenging to transform agro-industries into small-scale farming entrepreneurs (Mmbengwa et al., 2020).

This study, therefore, aims to fill this knowledge gap in the literature by evaluating critical domains for the

economic empowerment of women as small-scale agro-processors in South Africa. This paper evaluates the critical domains that affect women's economic empowerment in the small-scale agro-processing industries, unlike earlier studies that have focused on women's empowerment in agriculture. This will enable women's small-scale agro-processors, policymakers, and academia to identify various domains that influence the economic empowerment of women's small-scale agro-processors in South Africa. The specific objectives of the study are as follows:

- To describe the socio-economic characteristics of women in small-scale agro-processors in South Africa's five provinces,
- To identify the critical domains for the women's economic empowerment of small-scale agro-processors in South Africa, and
- To evaluate critical domains for the women's economic empowerment of small-scale agro-processors in South Africa.

The study is relevant considering its potential to contribute to achieving one of the pillars of sustainable economic development under South Africa's National Development Plan (N.D.P.), Industrial Policy Action Plan (I.P.A.P.), and New Growth Path (N.G.P.). The study's findings should also be an important source of information for the establishment of policies and programs aimed at promoting women's economic empowerment in South Africa's small-scale agro-processing industry.

CONTEXTUALIZATION OF THE STUDY

These policies (N.D.P., I.P.A.P., and N.G.P.) have recognized South Africa's agro-processing industry as one of the sectors to spur growth and create jobs due to its strong backward linkage with the primary agricultural sector (DAFF, 2013; Mlambo, 2019). However, I.P.A.P. (DTIC, 2014) notes that the potential of agro-processing has not been fully exploited in the country. For this reason, the enhanced participation of small-scale agro-processors in agro-processing activities can contribute to national objectives such as poverty reduction and job creation. South Africa's agro-processing sector is estimated to contribute about 30.5 percent of the real value-added G.D.P. of the manufacturing sector (Thindisa, 2014).

Furthermore, the agro-processing sector employs an estimated 207,893 people (DTIC, 2014). At that time this figure represented approximately 16 percent of the total employment number for the manufacturing sector and 2.5 percent of the South African economy's total employment number (Limpopo…, 2012). The South African economy experienced a contraction of production in most agro-processing industry divisions during the first quarter of 2013 (DAFF, 2013). During the same period, the agro-processing industry shed 2,369 more formal jobs than it had in the preceding quarter. However, formal jobs were created in the beverages and tobacco, footwear, and rubber products divisions (DAFF, 2013). The average contribution of agro-processing to the output and value-added of the manufacturing sector was 18.2 percent and 19.8 percent, respectively, during 2012–2016. Its contribution to domestic fixed investment was 15.1 percent and to employment 18.0 percent during the same period (International…, 2016).

According to van Lin et al. (2018), the limited participation of rural-based agro-processors, particularly women-owned enterprises, in the agro-processing mainstream value chain in South Africa results from the lack of implementation of the relevant policies. Although government policies aim to empower small-scale agro-enterprises, these policies have not significantly impacted the empowerment of women's agro-processing enterprises (Iheduru, 2004). Ortmann and King (2007) suggest that the agro-processing sector is crucial in supporting small agricultural producers and previously disadvantaged agro-processors in order to achieve commercialization and growth.

Most small-scale agro-processing enterprises are characterized by inefficiency in resource-use, mismanagement, weak responsiveness to market trends, a lack of innovative practices, poor management skills, low levels of trust, and an inability to share information, skills and assets (Child et al., 2005; Miles et al., 2006; Cook and Burress, 2009; DAFF, 2015). Although the Agri-BEE Transformation charter exists to address these challenges, successes from small-scale agro-processors are rare. As a result, several researchers (Lambrecht, 2016; Jordaan et al., 2014; D'Haese et al., 2007; Elfring and Hulsink, 2003; Cook, 1995) have worked on developing a framework in various sectors focusing on value addition, innovation through networking, and organizational performance, but none of these frameworks focused on agro-processing. In South Africa, for small-scale performance agro-processing enterprises, the focus was on internal social dynamics, revenue, and incomes. Nevertheless, none of these

studies focused on developing a framework to empower small-scale agro-processors.

RESEARCH METHOD

Study area

South Africa is located in the southernmost part of the African continent and is bordered by Botswana, Zimbabwe, Mozambique, the Kingdom of Eswatini, and Lesotho. The country comprises nine provinces, namely Limpopo, Mpumalanga, Gauteng, North West, Free State, Eastern Cape, Northern Cape, Western Cape, and Eastern Cape. The study was conducted in five provinces, namely Gauteng, Limpopo, North West, Mpumalanga, and Free State. South Africa is one of the world's most unequal countries, and women face a high level of disempowerment. It has a Gini coefficient of 0.63, and the incidence of poverty is exceptionally high for African women, at 52 percent (SSA, 2021).

Research design

The study was designed to be an explanatory sequential mixed-methods study that yields descriptive and inferential analysis. Hence, its research philosophy was based on a pragmatic paradigm. The mixed-methods approach collects both quantitative and qualitative data sequentially in the design (Creswell and Creswell, 2017). The researcher based the inquiry on the assumption that collecting diverse types of data was the best way to provide an understanding of a research problem which was more comprehensive than using quantitative or qualitative data alone. The mixed-methods approach allowed the study to enjoy both the structure of quantitative research and the flexibility of qualitative inquiry (Cresswell and Cresswell, 2017). The researcher opted for this mixed-methods approach to deepen generalizable quantitative research. This method focuses on creating generalizable outcomes from a qualitative approach and taking a holistic view of tackling a research problem (Strijker et al., 2020). The mixed-methods approach expands and strengthens a study's conclusions, contributes to the published literature, and answers the posed research questions (Schoonenboom and Johnson, 2017).

Population and sampling

The population of the study comprised all small-scale agro-processors in the study area. The study area comprised Limpopo, Gauteng, Free State, North West, and Mpumalanga Provinces. Due to the informal nature of the enterprises and their traditional background and meagre economic contributions, South Africa's government institutions do not have a formal database to derive their accurate population. The population was estimated based on their concentration in various centres located in

Fig. 1. South Africa's map showing provinces
Source: Google Maps, 2019 and Manasoe et al., 2021.

Table 3. Estimated population and sample size for the study

Province	Population	Sample size (n) (1,150/395) · population	Percentage (%) of Sample size in Each Province
Gauteng	300	100	19.9%
Limpopo	200	102	20.3%
North West	150	143	28.3%
Mpumalanga	300	98	19.5%
Free State	200	60	11.9%
Total estimated population	1,150	503	43.5%

Source: Various municipalities and provincial department of agriculture and rural development, 2020.

the study areas (see Table 3). The target population was defined as owners and managers of small-scale agro-processing enterprises located within the study area.

Stratified random sampling was utilized for selecting a sample size of 503 (see Table 3) from an estimated sample frame of 1,150. Stratified random sampling is a probability sampling technique whereby the entire population is first divided into strata. Next, a simple random sample is taken from each stratum, and the combined results from each stratum constitute the representative sample. When randomly selecting people from a population, these characteristics may or may not be present in the sample in the same proportions; stratification ensures their representation (Cresswell and Cresswell, 2017). It is appropriate to identify whether the sample contains individuals in the same proportion as the character appears in the entire population within each stratum. Stratified sampling was appropriate for this study since the number of agro-processing firms differed from one sub county to another. Their products also varied depending on their locations. A simple random sample was obtained from each stratum using computer generated random numbers.

Data collection and analysis

The quantitative data was collected using questionnaires, while the qualitative data was collected using observations and focus group techniques. Qualitative findings were used to confirm and complement the results of the quantitative method. The socio-economic characteristics of small-scale agro-processors were collected using a semi-structured questionnaire. The questionnaires were pre-tested, appropriate experts thoroughly and independently examined the instrument, and necessary corrections were made prior to data collection. The experts gave their critical opinion on the adequacy and relevance of the instrument to the objectives of the study. The observation was harmonized and necessary corrections were made to the instrument before starting the survey. Ethical clearance was obtained before the commencement of the data collection. Participants were requested to provide written or verbal consent for recordings to be made and pictures to be taken before participating in the study.

The study employed two analytical techniques, namely descriptive and inferential statistics. The elements of descriptive statistics such as average, frequency, and percentages were adopted to identify and analyse the socio-economic characteristics of the small-scale agro-processors in the study area. At the same time, one-way factorial Analysis of Variance (ANOVA) was utilized to understand and describe the views of small-scale agro-processors toward the economic empowerment of women. One-way factorial ANOVA is an appropriate method of statistical analysis for assessing the difference between groups on a continuous measurement (Tabachnick and Fidell, 2013). One-way factorial ANOVA is used when multiple independent variables are examined (Allen, 2017). It is a hypothesis-based test, meaning that it aims to evaluate multiple exclusive theories about our data. In one-way factorial ANOVA, there are two possible hypotheses, namely:

- The null hypothesis (H0), which states that there is no difference between the groups and the equality rate.
- The alternative hypothesis (H1), which states that there is a difference between the means and groups.

One-way ANOVA is based on the following assumptions:

- Normality – that each sample is taken from a normally distributed population.
- Sample independence – that each sample has been drawn independently of the other samples.
- Variance equality – that the variance of data in the different groups should be the same.
- Your independent variable – here, "weight", should be continuous – that is, measured on a scale that can be subdivided using increments.

The domain comprised production decisions, access to productive resources, income, leadership, allocations of time, and interventions (Puspitasari and Gayatri, 2020; Shalini and Nasima, 2021). The model below shows how the empowerment domain of small-scale agro-processing was estimated.

$$Y_{ij} = \mu + \alpha_i + E_{ij} \quad (1)$$

where:

Y_{ij} – the economic empowerment domain,
μ – mean of the observation,
α_i – individual contributions,
E_{ij} – individual deviations.

The *F*-statistic was used for statistical tests, testing for the difference in the mean between the factorial layouts.

$$\text{The } F = \frac{\text{between-group variability}}{\text{within-group variability}} = \sum \frac{n_i(\bar{Y}_i - \bar{Y})^2}{(K-1)} \quad (2)$$

where:

$\bar{Y}_i$ – the sample mean in the ith group,
n_i – the number of observations in the i^{th} group,
$\bar{Y}$ – the overall mean of the data,
K – number of the groups.

On the other hand, [size of] the domain of empowerment effects ('size) is estimated using the following formula.

$$\sigma^2 = \frac{(n1 - l)(M_{ss} - M)}{\text{(Number of small-scale agro-processor)}\ (nl)(pl)} \quad (3)$$

where:

σ^2 – partial eta squared,
nl – number of small-scale agro-processors,
pl – number of interventions.

The assumption of normality, which seeks to estimate that the residuals are normally distributed, was determined using this equation.

$$E_{ij} \sim N\ (0, \sigma^2) \quad (4)$$

RESULTS

Descriptive statistics

A total of 503 small-scale agro-processors were sampled in the study. The descriptive results, summarised in Table 4, revealed that females were in the majority [365 (72.6%)], and males were in the minority [138 (27.4%)]. The agro-processing sector, which is mainly made up of women, has the capacity uplift their status and ultimately empower them (Onwufafur and Enwelu, 2013; Mthombeni et al., 2021). Most female small-scale agro-processors are not married (38.1%), compared to those who are married, who constituted 36.7% of the participants. The study further found that most female small-scale agro-processors were self-employed (77.1%), and the next biggest group was pensioners (7.7%). According to Mthombeni et al. (2021), it is worth noting that the elderly agro-processors are not very productive due to the drudgery of agricultural activities; hence fewer of them participated in the study.

Furthermore, the study revealed that female small-scale agro-processors with no schooling, either in primary or secondary education, constituted 73.1% of the participants. However, 24.4% and 2.5% possess (a) certificate and post-diploma qualifications [respectively]. It is worth noting that studies by Proctor et al. (2000) and Mthombeni et al. (2021) state that most small-scale agro-processors are illiterate or semi-literate and have no formal training, and their sources of knowledge on processing and skills are apprenticeships. Melembe et al. (2021) found that most farmers (54.9%) have secondary or high school education, while close to 20% have tertiary education, and less than 10% of the farmers in the study area are without formal education. These findings compare favourably with the findings of the current study.

In addition, 42.7%, 19.7%, 13.2%, and 8.8% of female small-scale agro-processors are involved in drying, powdering, bottling, and canning agro-processing

Table 4. Demographic characteristics of the respondents

Socio-economic variables	Female		Male	
	Frequency	Percent	Frequency	Percent
Gender	365	72.6	138	27.4
Marital status				
Married	134	36.7	47	34.0
Widowed	36	9.8	2	1.4
Divorced	27	7.4	3	2.2
Separated	29	8.0	11	8.0
Never married	139	38.1	35	25.4
No response	0	0.0	40	29.0
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
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
Agro-processing specialty				
Drying	156	42.7	62	44.9
Canning	32	8.8	6	4.3
Bottling	48	13.2	24	17.4
Juicing	23	6.3	11	8.0
Powdering	72	19.7	18	13.0
Paste/puree	14	3.8	4	2.9
Cleaning	20	5.5	13	9.4
Entrepreneurial 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
Educational background				
Agriculture	132	36.2	51	37.0
Science	95	26.0	40	29.0
Commerce	94	25.8	27	19.6
Engineering	17	4.7	16	11.6
Humanities	25	6.8	3	2.2
Medicine	2	0.5	1	0.7
Employment and experience	Mean	SD	Mean	SD
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

Source: survey data, 2020.

activities, respectively. Table 4 indicates that women have lower directorship (0.3%) than their male (1.4%) counterparts. However, the results suggest that women (are)[rate] slightly higher (91.5%) in terms of the ownership of small-scale agro-processing enterprises relative to men (91.3%). Furthermore, the results show that women are dominant (6.6%) at the managerial levels but not in senior management (1.6%). The results indicate that these enterprises are dominated by women (73.1%) who are less educated than men (71%). However, males have much better post-graduate achievement compared to females. Both males and females have an adequate agricultural educational background. Although females have a lower scientific background (26%), they have a much better background in commerce (25.8%) compared to males (19.6%). Lastly, female small-scale agro-processors employ an average of one person; they have over five years' experience in the business and over five years' experience in the agro-processing industry.

The domains for the development of small-scale agro-processors

Tables 5 and 6 show the results of the one-way factorial ANOVA on the domains of the economic empowerment of female small-scale agro-processors. According to the Women's Empowerment in Agriculture Index (W.E.A.I.), the domains for women's economic empowerment include production, resources, income, leadership, and time (Leder, 2016). The study found that domain of production decision making has a significant effect on the economic empowerment of female small-scale agro-processors in the study area, $F(1, 494) = 9.133$, $p < 0.001$, $\eta^2 = 0.018$; access to productive resources, $F(1, 494) = 10.301$, $p < .001$, $\eta^2 = 0.020$; allocation of time $F(1, 494) = 54.077$, $p < 0.001$, $\eta^2 = 0.099$; interventions $F(1, 494) = 39.808$, $p < 0.050$, $\eta^2 = 0.017$. The interaction between income, leadership, and interventions was investigated. Furthermore, it was found that there was a significant effect of the interaction of income, leadership, and interventions, $F(1, 494) = 5.984$, $p = 0.015$, $\eta^2 = 0.012$)]. The results show higher effects for time allocation, followed by access to productive resources, and production decision-making.

The findings concur with Yount et al. (2019), who report that empowerment is a function of adequate time allocated to empowerment initiatives. Therefore, income, leadership style, and policy interventions could inform an entrepreneur's ability to be empowered.

Table 5. The test of the between-subjects effects for the domain of development of small-scale agro-processors

Sources	Type III sum of squares	df	Mean square	F	Sig.	Partial eta squared	Observed power[b]
Corrected model	395.588[a]	8	49,449	39,808	0,000	0,392	1,000
Intercept	16,129	1	16,129	12,985	0,000	0,026	0,949
Production decision making	11,345***	1	11,345	9,133	0,003	0,018	0,855
Access to productive resources	12,795***	1	12,795	10,301	0,001	0,020	0,893
Income	0,833	1	0,833	0,671	0,413	0,001	0,129
Leadership	0,102	1	0,102	0,082	0,775	0,000	0,059
Allocation of time	67,173***	1	67,173	54,077	0,000	0,099	1,000
Interventions	10,642***	1	10,642	8,567	0,004	0,017	0,832
Income × interventions	0,523	1	0,523	0,421	0,517	0,001	0,099
Income × leadership × interventions	7,433	1	7,433	5,984	0,015	0,012	0,685
Error	613,632	494	1,242				
Total	10 614,000	503					
Corrected total	1 009,221	502					

[a]R Squared = 0.392 (adjusted R squared = 0.382).
[b]Computed using alpha = 0.05.
[c]Dependant variable: Development.
Source: survey data, 2020.

Table 6. The parameters of the domain of empowerment of small-scale agro-processing

Parameter	β	Std. error	T	Sig.	95% confidence interval		Partial eta squared
					lower bound	upper bound	
Intercept	2,450	0,68	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	0,24	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

* Computed using alpha = .05
Source: survey data, 2020.

These results are consistent with findings by Sraboni et al., 2014; Hannan et al., 2020; Quisumbing et al. (2021). Additionally, there was 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 the growth of

small-scale agro-processing capacity by 260.9% in the South African context. However, access to information positively affected the business network (β = 0.119, p = 0.054). The implication is that an increase in access to information can bring an 11.9 % increase in business networks for agro-processing enterprises in South Africa.

Table 6 shows that production decision making is a significant domain in the determination of the empowerment of female small-scale agro-processors (β = 0.140, p = 0.003), with a partial eta squared of 0.018. Access to productive resources in women's small-scale agro-processing enterprises was highly significant for their empowerment (β = 0.140, p = 0.001). This result implies that increased productive resource provision could lead to a corresponding increase in these entrepreneurs' empowerment. Allocation of time was also highly and positively significant (β = 0.327, p = 0.000) in empowering small-scale agro-processors in South Africa. The combination of income, leadership, and interventions was positive and significant to influence women's small-scale agro-processor empowerment (β = 0.009, p = 0.015). This result is counterintuitive because all the variables were negatively correlated to the empowerment of small-scale agro-processors individually. The study findings are contrary to Malapit et al. (2017), who found that leadership and time remain in the top domains according to the W.E.A.I. and the A-WEAI.

The significant finding or discovery of the study is that the W.E.A.I. has six domains, not five. The following three domains were identified as key to women's economic empowerment: income, leadership, and intervention.

DISCUSSIONS

The production decision-making results concur with Sell and Minot (2018) and Simelton et al. (2021) that when women are economically empowered, they play a more significant role in decision-making and the well-being of their households and enterprises improve. Anderson et al. (2021) found that an increase of one-unit in female production decision-making is associated with a 32 percent increase in maize productivity and further argued that increasing women's control over agricultural resources leads to increased productivity. The current study found that a unit increase in decision-making power given to small-scale agro-processors is likely to result in a 0.140 increase in empowerment of these enterprises.

Quisumbing et al. (2021) report that access to these resources positively impacts agricultural productivity and, therefore, is crucial in empowering the agro-food value system's agricultural agencies. The current study agrees with the W.E.A.I. index conceptualization and the resource base theory (Ragasa et al., 2021). Anderson et al. (2021) found that adequate allocation of women's time to entrepreneurial activities is likely to provide positive and empowering results. Quisumbing et al. (2021) indicated that the domains that contribute most to women's disempowerment are lack of leadership, time burden, and lack of control over resources.

These theories agree with the results of this study, and the results indicate that time allocation has the highest impact on empowering small-scale agro-processing relative to other empowerment domains (η^2 = 0.099). This impact might be influenced by the focus and dedication of small-scale agro-processors to their planned business activities. The results show that a unit increase in the time allocation of entrepreneurial activity will result in a 327% increase in empowerment. The power to use income and direct group members to implement life-changing interventions is crucial to ensuring that small-scale agro-processors gain empowerment (Aziz et al., 2021; Grantham et al., 2021).

The results also show that interaction amongst income, leadership, and interventions is a critical empowerment factor for small-scale women's economic empowerment. Coincidentally, this interaction has premised the empowerment model in the Broad-Based Black Economic Empowerment Framework that South Africa has implemented. However, this policy's implementation patterns suggest that women's empowerment is mainly in the civil service and the service sector, leaving the production sectors such as agro-processing, farming, and mining on the side-lines. The current research suggests that the combination of income in the form of grant disbursement, leadership in directorship and board membership, and intervention in the form of project support will make a meaningful contribution to women's empowerment. This happens when production decision making, access to productive resources, allocation of time, and interventions are included in planning, as long as there is a deliberate implementation of policy to achieve these strategic goals.

CONCLUSION AND POLICY IMPLICATIONS

This study aimed to evaluate the economic empowerment domains of female small-scale agro-processors in South Africa. The objective of assessing these domains for the economic empowerment of small-scale agro-processors in South Africa was to ensure that small-scale agro-processors can participate in the agro-processing industries, thereby reaping economic benefits such as job creation and self-employment. The study found lower percentages of women than men in the directorships of small-scale agro-processing enterprises. These results imply that women are still lagging behind in their representations in the governance of these enterprises, contrary to the women-empowerment policies of South Africa.

The higher ownership of enterprises by women than men is not surprising. It does not confirm the positive impact of the women empowerment policies because the small-scale agro-processing enterprises are categorized as survivalist enterprises in South Africa. Thus, women establish these enterprises to enable their households to survive and not for asset accumulation. This led to the conclusion that women entrepreneurs in this industry need more capacity, training, and after-care support because they have lower educational exposure than their male counterparts. The lack of equity between the genders in the senior management of these enterprises indicates slow societal transformation, and it further deepens the understanding that women's empowerment efforts are not achieving their intended strategic goals. Although women are highly qualified in their commercial and educational backgrounds, it may be interesting to investigate how these areas could help them to be at the apex of the governance in these enterprises. Furthermore, the commercial and educational background makes women highly suited to this type of entrepreneurship and to being successful.

The five parameters have been successfully identified as the significant domains in influencing the economic empowerment of small-scale agro-processors in South Africa. This study directly mirrors the Broad-Based Black Economic Empowerment (B.B.B.E.E.) Act 53 of 2003. The policy advocates for the development of women's human resources and skills, financial support, and enterprise ownership. Although the policy does not emphasize production decision-making, it emphasizes management, rather than leadership. This study concludes that for South Africa to achieve the economic empowerment of small-scale agro-processors, the evaluated domains could empower participants in these industries. This empowerment could result from an amendment of the current women's empowerment policies to emphasize these critical domains.

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DECLARATION ON INTEREST STATEMENT

The manuscript has been extracted from a PhD thesis.

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