Impact Assessment of Government Funding for Subsistence, Smallholder Farmers, Communities, and Households on Food Security: An Advice for Extension Services

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ABSTRACT

This study examined the impact of government funding on food security for subsistence farming, communities, households, and smallholder farmers in Frances Baard Municipality. Food insecurity has been a global phenomenon that has been on the increase since 2015, and it is thought to be a result of growing conflict, pandemic, and climate-related shocks. The analysis methods employed in this study were mainly cluster and discriminant analysis (DA). Simple random sampling techniques were used to select 533 farmers. The cluster analysis results reveal that Land Redistribution for Agricultural Development (LRAD) occupies the highest rank, followed by a Poverty Relief Programme and Land Restitution programme. In contrast, discriminant analysis (DA) results show that an Agricultural Starter Pack Programme is highly likely to increase the impact of food security in households when other interventions are held constant. The study concludes that to improve the food security of the Frances Baard Municipal District, the government should consistently improve the performance of these programmes. To improve the performance of these programmes, it is therefore recommended that the following programmes be resourced: the Agricultural Starter Pack Programme, Comprehensive Agricultural Support Programme (CASP), Expanded Public

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Works Programme (EPWP), Poverty Relief Programme (PRP), and Food Parcel Scheme (FPS).

Keywords: Impact, Food Security, Subsistence, Smallholder Farmers

1.   INTRODUCTION

Food insecurity has been on the rise globally since 2015, owing to rising violence and climate-related shocks, according to experts (Drysdale, Moshabela & Bob, 2019, Swanepoel, Van Niekerk & Tirivanhu, 2021). By 2050, the world's population is estimated to reach 9.7 billion people, Africa accounts for more than half of this rise, making it an increasingly important driver of food demand (Gashu, Demment & Stoecker, 2019). As the world continues to experience widespread food insecurity, ensuring food security for everyone at all times is becoming increasingly difficult (Chakona & Shackleton, 2019).

It has been reported that 232.2 million people are affected by undernourishment; 31.5 percent of these undernourished people in Africa come from Eastern Africa, 23.2 percent in the Southern African region, and 41.3 percent are found in Central Africa (Gashu *et al.,* 2019; Victor & Akadiri, 2019; Boatemaa et a., , 2019). Low agricultural productivity and unequal access to food and land are often cited as reasons for food insecurity in Africa (Adenle, Wedig & Azadi, 2019). James (2011) reports that in Africa, with 2.9 million hectares (primarily GM cotton, GM maize, and GM soybean crops) in 2011, South Africa remained the largest producer of GM foods. However, Burkina Faso (0.5 million ha) and Sudan (less than 0.1 million ha) have now joined the GM party (GM cotton). However, despite its productive capacity; South Africa has high food insecurity (Koyanagi *et al.,* 2019).

Furthermore, South Africa has the highest percentage of income inequality and the highest levels of absolute poverty (Stats SA, 2014; Chakona & Shackleton, 2019, Swanepoel & Van Niekerk, 2018). Approximately 56 percent of South Africa's population is poor, with nearly 28 percent living in extreme poverty, below the food poverty level (Stats SA, 2017). Poverty reduction is a key technique for reducing food insecurity in the country (Chakona & Shackleton, 2019). However, due to the structural characteristics of the national economy and low educational levels, unemployment remains stubbornly high (Stats SA, 2017).

Droughts burden smallholder farmers, mainly due to a lack of resources (Matlou & Bahta,

2019). According to Matlou (2019), because smallholder farmers have fewer resources, most farming households in the Frances Baard District Municipality in the Northern Cape are not resilient to agricultural drought. This study examined the impact of government funding programmes on food security for subsistence farming, smallholder farmers, communities, and households. It analyses the impact of these programmes using their importance and likelihood of improving the stakeholders' food security in the municipal district under study.

2. RESEARCH METHODS

2.1. The Study Location

The study was conducted in the Frances Baard District Municipality of the Northern Cape Province, Republic of South Africa. It is the smallest municipality in the Northern Cape in landmass, located in the Eastern part of the Northern Cape Province (Matlou, 2019). According to Matlou (2019), Frances Baard Municipality accounts for only 3.4 percent of the province's area. It is reported that it accommodates the most significant proportion of the province's population, with 30,85 persons per square km (Matlou & Bahta, 2019). Dikgatlong (2 377.6 km^2), Magareng (1 541.6 km^2), Phokwane (833.9 km^2), and Sol Plaatje (1 877.1 km^2) are the four local municipalities that make up the Frances Baard District Municipality. The district's primary languages are Setswana, Afrikaans, English, and IsiXhosa. (See Figure 1). Frances Baard has more livestock smallholder farmers and can produce better livestock than crops (Matlou, 2019).

FIGURE 1: Frances Baard Municipality Map (Source: Google Maps, 2020)

2.2. Methodology

A positivist research philosophy within a quantitative research design was followed. The primary data was collected from a group chosen by simple random sampling, constituting a 536 sample size. Subsistence and smallholder farmer respondents were selected for this study. The primary data were collected from the farmers' socio-economic and food security programme analysis based on the closed-ended questionnaire. The demographic information analysis was captured in section A of the questionnaire (Appendix A), and section D shows the government funding initiatives. The respondents were asked to evaluate each programme's impact using the semantic differential scales, where one (1) represents no impact and seven (7) represents a high impact.

2.3. Data Analysis

A deductive approach to data analysis was followed to assess the impact of government funding for subsistence farmers, smallholder farmers, and community and household gardens on food security. The government food security programme's assessment was first determined by ranking using cluster analysis. A discriminant analysis was then used to determine the programmes' importance in either food security or insecurity.

2.3.1. Discriminant Analysis (DA)

The dependent variable comprised binary responses such as food security and insecurity (coded as 1 and 2, respectively). The independent variables, mainly government food security initiatives, were measured using semantic differential scales.

2.3.2. Model Specification of Discriminant Analysis (DA)

$F_k = D_0 + D_1X_1 + D_2X_2 + \ldots\ldots + D_pX_p$

Where,

F_k = score of the food security function

D_0 = constant

D = discriminant coefficient for predictor variables

X_{i} = predictor

2.3.3.   Reliability of the Discriminant Analysis Model

Table 1 shows the predicted group membership for food insecurity and security in Frances Baard District Municipality. The results show that the predicted food insecure membership was 46.8 percent, and the one predicted to be food secure, which turned out to be food secure, was 66.3 percent. These results imply that subsistence and smallholder entrepreneurs were predicted to be 66.3 percent, and those to be food insecure were found to be 46.8 percent. It can be deduced that subsistence and smallholder farmers are food insecure and the results are reliable.

TABLE 1: Predicted Group Membership for Food Insecurity and Food Security in Frances Baard District Municipality

Classification Results					
			Predicted Group Membership		
		Food security Cat	Food insecure	Food secured	Total
Original	Count	Food insecure	166	189	355
		Food secure	61	120	181
	%	Food insecure	46.8	53.2	100.0
		Food secure	33.7	66.3	100.0

Notes: a. 53.4% of original grouped cases are correctly classified

3.   RESULTS AND DISCUSSION

3.1.   Farmer's Socio-Economic Characteristics

Fifty-five percent (55.2%) of the farmers fell into the female subsistence and smallholder category, which shows that the female farmers were the majority participants relative to their male counterparts (44.1%). In comparison, 1.5 percent were missing (see Table 2 a and b). According to Table 2a, the farmers' demographic from the ethnic levels points out that black farmers constitute seventy-one percent (71.3%), which indicates that they dominate the other ethnic groups.

TABLE 2a: Social Analysis of the Farmers

Variables	Categories	Frequencies	Percentages
Gender			
	Female	290	55.2
	Male	235	44.1
	Missing	8	1.5
Racial Group			
	White	6	1.1
	Black	380	71.3
	Indian	1	2
	Coloured	125	23.5
	Other	2	0.4
	Missing	19	3.6

Coloured farmers are the second most dominant ethnic group (23.5%) in the sample size. Olofsson (2020) confirms the dominance of the black small-scale and subsistence farmers by stating that they are confined to the overpopulated areas where land access is severely limited and traditional authorities govern land under a communal land tenure system. Mmbengwa et al. 2019) and Zantsi (2020), concur that black farmers are dominant stakeholders in the smallholder and subsistence farming system.

The economic status of the subsistence and smallholder farmers in Frances Baard seems to be primarily unemployed (38.5%), followed by the employed (22.0%), pensioners (20.5%) and self-employed (12.9%) categories. The unemployed category's dominance shows that smallholder and subsistence farming are the trade of the poverty-stricken people in Frances Baard District Municipality. Their educational achievement is dominated by primary and secondary education, implying that they are poorly educated (Mmbengwa *et al.*, 2019; Obi & Ayodeji, 2020, Swanepoel, Van Niekerk, & D'Haese, 2017). Furthermore, it can be observed that these farmers are dominated (58.7%) by single-headed and unmarried households.

TABLE 2b: Economic, Education and Marital Characteristics of the Farmers

Variables	Categories	Frequencies	Percentages
Economic status			
	Employed	117	22.0
	Self-employed	69	12.9
	Pensioner	109	20.5
	Business Entrepreneur	16	3.0
	Unemployed	205	38.5
	Missing	17	3.2
Highest education level			
	Never been to school	35	6.8
	Grade R to Grade 8	171	32.1
	Grade 9 to Grade 12	160	30.0
	Matriculated	89	16.7
	Tertiary Qualification	61	11.4
	Missing	17	3.2
Marital Status			
	Married	213	40.0
	Widowed	43	8.1
	Separated/Divorced	25	4.7
	Never married/Single	240	45.0
	Missing	12	2.3

3.2. Assessing the Importance of the Government Food Security Initiatives

An assessment of the importance of the government food security initiatives was crucial to determine valuable tools which could be used to elevate Frances Baard District Municipality's food security. Table 3 and Figure 2 below present the assessment results of the government food security programmes. According to the results, Land Redistribution for Agricultural Development (LRAD) occupies the highest rank, followed by the Poverty Relief and Land Restitution programmes.

TABLE 3: The Assessment of the Government Food Security Program at Frances Baard District Municipality

Government Programmes	Importance of food security	Rank
Land Redistribution for Agricultural Development (LRAD)	1	1
Poverty Relief Programme (PRP)	0.9134	2
Land Restitution Programme (LRP)	0.7335	3
Municipality implemented food security projects and food	0.5617	4
Unemployment Insurance Fund (UIF)	0.366	5
Expanded Public Works Programme (EPWP)	0.2874	6
Food Parcel Scheme (FPS)	0.2667	7
National School Nutrition Programme (NSNP)	0.2628	8
Land Care Programme (LCP)	0.2612	9
Poverty Relief Programme (PRP)	0.2357	10
Integrated Sustainable Rural Development Programme (ISRDP)	01816	11
Agricultural Starter Pack Programme (ASPP)	0.1722	12
Comprehensive Agricultural Support Programme (CASP)	0.1443	13

The relatively new municipality implemented a food security project, and the food programme occupies the fourth position, followed by the Unemployment Insurance Fund (UIF), Expanded Public Works Programme (EPWP), Food Parcel Scheme (FPS), National School Nutrition Programme (NSNP), LandCare Programme (LCP) and Poverty Relief Programme (PRP). Surprisingly, they rated the top three programmes as initiated at the national level rather than the municipal level, above the district-initiated programme. On the contrary, programmes rated fourth to tenth are within Municipal control and were expected to be highly rated but were not as highly rated as the national programmes.
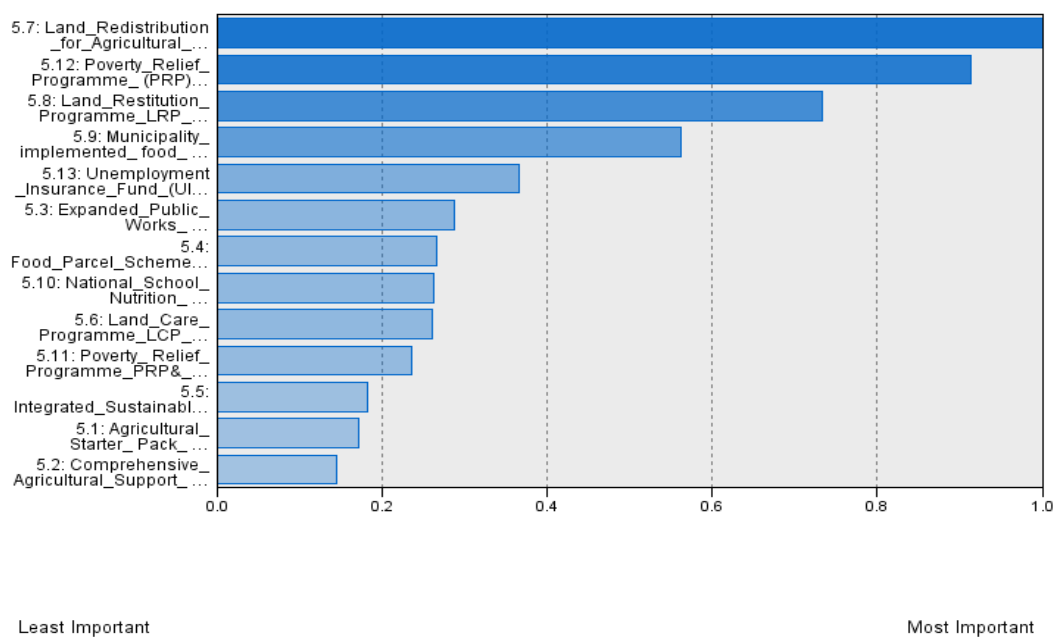
FIGURE 2: The Importance of the Government Programs for Food Security

3.3. Discriminant Analysis on Food Security and Insecurity

The results of the discriminant analysis of food security and insecurity are presented in Table 4. Unlike the importance of the government food security programmes, the discriminant analysis shows that the Agricultural Starter Pack Programme is more likely to increase food insecurity and security by 2.796 percent and 2.684 percent, respectively. This dual impact was also attributed to the Comprehensive Agricultural Support Programme (CASP), which could increase food insecurity by 1.455 percent and food security by 1.436 percent.

The results of the Poverty Relief Programme (PRP), Food Parcel Scheme (FPS), and Expanded Public Works Programme (EPWP) form the top programmes that can impact food insecurity and food security. The impact of food insecurity could be attributed to government dependence on subsistence and smallholder farming sectors. On the contrary, food security could result from the availability of inputs to poverty-stricken farmers who cannot afford quality farm inputs.

According to a study by Swanepoel et al. (2018), the following most important household characteristics showing significance were included in the analysis include access to land, gender of household head and distance from selling markets (where produce would be sold – measured in travelling time from house to market).

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TABLE 4: The Results of Discriminant Analysis on Food Security and Insecurity in Frances Baard District Municipality

Government Programmes	Food security Categories	
	Food insecurity	Food security
1. Agricultural Starter Pack Programme	2.796	2.684
2. Comprehensive Agricultural Support Programme (CASP)	1.455	1.436
3 Expanded Public Works Programme (EPWP)	.978	1.011
4. Food Parcel Scheme (FPS)	1.004	1.005
5. Integrated Sustainable Rural Development Programme (ISRDP)	.913	.921
6. Land Care Programme (LCP)	.956	.959
7. Land Redistribution for Agricultural Development (LRAD)	.939	.874
8. Land Restitution Programme (LRP)	.787	.864
9. Municipality implemented food security projects	.729	.805
10. National School Nutrition Programme (NSNP)	.597	.657
11. Poverty Relief Programme (PRP)	1.187	1.081
12. Unemployment Insurance Fund (UIF)	.743	.647
(Constant)	-24.273	-23.882
Notes: Fisher's linear discriminant functions		

4.   CONCLUSION AND RECOMMENDATIONS

This chapter examined the impact of government funding on food security for subsistence farming, communities, households, and smallholder farmers in Frances Baard District Municipality. It is revealed that males and black communities dominate subsistence and smallholder farming. These farmers are primarily drawn from unemployed households, poor communities, and poorly educated people who are not married. According to the respondents, the Land Redistribution for Agricultural Development Programme (LRAD), Poverty Relief Programme, and Land Restitution Programme have the highest impact. The national government programmes are more impactful relative to the municipal-oriented programmes. Food security programmes are less impactful than agricultural programmes to alleviate food

insecurity. The discriminant analysis reveals a different set of programmes that impact food security. The following programmes are the top five programmes that can ensure food security:

    a) Agricultural Starter Pack Programme

    b) Comprehensive Agricultural Support Programme (CASP)

    c) Expanded Public Works Programme (EPWP)

    d) Poverty Relief Programme (PRP)

    e) Food Parcel Scheme (FPS)

The study concludes that to improve the food security of the Frances Baard District Municipality, the government should consistently improve the performance of these programmes. To improve the performance of these programmes, it is recommended that the mentioned programmes be well-resourced and used to empower subsistence farmers, smallholders, communities, and households to improve their households' food security.

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