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Effect of Micro-Agricultural Financial Institutions of South Africa financial services on livelihood capital of beneficiaries in North West Province South Africa

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Abstract

Background: This paper examined the effect of Micro-Agricultural Financial Institutions of South Africa financial services on livelihood capital of beneficiaries in North West Province South Africa. A simple random sampling technique was used to select 280 respondents from a total of 344 beneficiaries. A structured questionnaire was used to collect data from November 2015 to March 2016, which was analysed using the Statistical Package for Social Sciences (SPSS) with frequencies, percentages and Wilcoxon signed-rank test.

Results: The results of the study show that there has been a significant change on livelihood assets after MAFISA support. The proportion of access and ownership of livelihood assets increased for most of the indicators of the assets by at least 90% after MAFISA support. Wilcoxon signed-rank test results revealed that access to financial capital from banks improved substantially (Z scores $= 15.556$; p value $= 0.000$) and cooperatives (Z score $= -11.305$; p value $= 0.000$). Respondents are now able to associate and form some networks with others (Z score $= -15.875$; p value $= 0.000$), network with government (Z score $= -15.811$; p value $= 0.000$) and network with the private sector (Z score $= -15.363$; p value $= 0.000$).

Conclusions: The study concludes that access to microfinance leads to significant changes in financial, social, natural, human, physical and social livelihood assets after MAFISA support. The proportion of access and ownership of livelihood assets increased for most of the indicators of the assets by at least 90% after MAFISA support. Statistical significant differences confirmed the changes in the proportion of beneficiaries before and after MAFISA support such as access to financial capital from banks improved substantially and cooperatives, networking with others, network with government and network with the private sector as well as increasing their skills and competencies as well as their physical asset accumulation.

Keywords: Microfinance, Livelihood, Assets, Wilcoxon signed-rank test, Financial support

Background

Micro-Agricultural Finance Institutions of South Africa (MAFISA) was established by government in 2004 with a view to facilitate the provision of equitable access to financial services by economically active rural communities [1]. MAFISA's policy is to empower micro-level producers, processors, micro-entrepreneurs and small producers. The policy states that applicants must demonstrate the willingness and ability to repay and possess clean credit record. Loans of up to R 500,000.00 are offered by the scheme, and the amount may be increased after valid justifications. Collateral is only required for loans above R 25,000.00, and repayments are aligned with the cycle of the enterprise. Funds are transferred directly into the supplier's bank account and not that of the applicant to ensure that people do not use the capital

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for unintended purposes but on agriculture, forestry and fisheries sector to improve their livelihoods.

A livelihood framework was used to measure the impact of MAFISA financial services on beneficiaries' livelihood, with special focus on their capital. Livelihood framework examines the complexity of livelihood, especially the poor. The impact of financial capital, physical capital, human capital, social capital and natural capital of respondents was assessed to ascertain the overall impact on the likelihood of respondents. According to [1], access to microfinance is not in itself sufficient to ensure desired positive impact on the livelihood of clients rather the combination of livelihood assets. According to [2], financial capital is the most important ingredient in establishing a sustainable business that generates good income. According to [3], access to financial capital to acquire fixed assets is important for any business to have a competitive advantage and sustain its operations. Handa et al. [4] assert that microfinance has positive impact on clients as assets increased after association with an intervention measure.

According to [5], social capital is used to generate services that enhance the output realised from other inputs without being used up in the process of production. It is through social capital that people and institutions can pool their resources to achieve goals, which are not individually attainable. Goodwin [2] argues that human capital is investment in people to develop skills, competence and capabilities to be more productive and that natural capital are natural resources needed by firms to produce products. Livelihood outcomes emanate from livelihood strategies and assets such that strategies are comprised of a range and combination of activities and choices that people undertake for them to achieve their livelihood outcomes [6–8]. Bhuiyan [9] defined sustainable livelihood framework as a process that organises various factors to enhance livelihood opportunities for households. Microfinance plays a major role in improving the livelihoods of individuals and households in countries where poverty is rampant [10]. Microfinance is generally considered as a crucial tool used to improve people's livelihoods.

Micro-credit has been reported to have a positive and significant impact on the growth of small and medium enterprises and welfare of poor households [11, 12]. According to [13], microfinance has over the years been the most effective tool used against global poverty. Sebstad and Chen [14] further state that the impacts of microfinance on income and profits are generally positive. Mula and Sarker [15] revealed that women in China, who had access to microfinance, witnessed a significant increase in annual income and savings compared to those who did not; their assets and investments increased,

thus leading to the creation of more employment opportunities.

Kgowedi [16] stated that most financial institutions do not invest their resources and lack of infrastructure in rural areas due to high risk and transactional costs. In South Africa, the drive to increase access to affordable banking also has a political context. Since 1994, economic empowerment has been at the heart of the transformation of the South African society. The introduction of the Banks Act (94 of 1990) led to a phenomenal growth in the industry with the issuing of new banking licences. Smallholder farmers, due to their peculiar characteristics, constitute a very large part of customer base of microfinance institutions in South Africa but are often neglected due to costly transactions and high risks. Lohlein and Wehrheim [17] point out that agriculture and rural development can be fostered through the provision of rural credit because it is a powerful tool to generate successful smallholder farmers and sustainable businesses. Wrenn [18] argues that microfinance institutions must go beyond analysing quantitative data and loan sizes to understanding the impact of these projects on the livelihoods of clients. The research question that emanated for this study is whether there are differences in the acquisition of livelihood assets after intervention by microfinance services, while the main objective of the study was to assess the impact of MAFISA services on the livelihood capital of beneficiaries in the North West Province. The significant differences in the acquisition of livelihood assets before and after MAFISA services were also explored as hypotheses.

Methods

The study was carried out from November 2015 to March 2016 in all four district municipalities of the North West Province (NWP), namely Bojanala Platinum District, Ngaka Modiri-Molema (Central) District, Dr Kenneth Kaunda (Southern) District and Dr Ruth Segomotsi Mompati District. The North West is the fourth largest Province in South Africa, with a land size of 104,882 square kilometres representing 8.7 per cent of the country's total surface area. Agriculture is the second biggest contributor to the Provincial Gross Domestic Product (GDP) after mining. Summer temperatures range from 17 to 31 °C, and the total annual rainfall is about 360 mm.

The population of the study consisted of all smallholder farmers supported by MAFISA in the North West Province. Males and females, including the youth who borrowed capital from the institution to establish new enterprises and expand existing ones, constituted the population of the study. These enterprises were maize, vegetable, sunflower and beef cattle. There are 344 beneficiaries of MAFISA in the province. Simple random sampling was used to select participants for the study.

This was performed throughout the province, and all beneficiaries supported by MAFISA stood equal chances of being selected. A sample size of 280 farmers was randomly selected from the various districts of the Province. The targeted sample size of 280 respondents was dropped to 273 after some incomplete questionnaires were discarded. The sample size of 280 farmers was arrived at using the Raosoft Sampling Technique based on 5% error margin. Respondents consented voluntarily to respond to questions posed to them by enumerators. All respondents were advised not to participate in the study if they felt uncomfortable. The purpose of the study and the need to participate in the study were adequately explained to every respondent.

Completed questionnaires were coded, captured and analysed using version 21 of the Statistical Package for Social Sciences (SPSS). Descriptive statistics, frequencies, percentages, graphs and charts were used to summarise the data. Wilcoxon test was used to assess the livelihood capital (financial, physical, human, social and natural) of respondents before and after they received MAFISA support. In this study, indicators were developed for livelihood asset, which were rated by respondents on a 2-point scale of high and low for each of the indicators before and after MAFISA intervention. The Wilcoxon signed-rank test applies to two-sample designs involving repeated measures, matched pairs, or "before" and "after" measures like the *t* test for correlated samples. The Wilcoxon signed-rank sum test is used for ordered categorical data where a numerical scale is inappropriate but where it is possible to rank the observations and to test null hypothesis that the median of a distribution is equal to some value [19]. The Wilcoxon signed-rank sum test is a nonparametric version of a paired-sample *t* test. This test is used if a researcher does not wish to assume that the difference between the two variables is interval or normally distributed (but assumes the difference is ordinal). Wilcoxon signed-rank test is W, defined as the sum of the positive ranks ($W+$) and sum of the negative ranks ($W-$). For a true null hypothesis, there is equal number of both positive and negative; however, the higher number of positive ranks than negative ranks connotes that the research hypothesis is true [20]. The test is robust and highly efficient for moderate- to heavy-tailed underlying distributions. In particular, it is a real improvement over the sign test and is almost fully efficient when the underlying distribution is normal. Wilcoxon signed-rank statistics can be computed as a sign statistic of the pairwise averages of data [19]. A mathematical explanation of the Wilcoxon signed-rank test for the study is as follows:

$$W = \sum_{i=1}^{Nr} [\text{sgn}(x_{2,i} - x_{1,i})R_i]$$

where $W =$ Wilcoxon signed-rank test; $N_r =$ sample size, $X_{12} =$ measuring levels; for $I = 1, 2,...,n$; $X_1(F_1, P_1, S_1, H_1, N_1)$, "before the project"; $X_2(F_2, P_2, S_2, H_2, N_2)$, "after the project"; R_i, rank; with F, financial capital; P, physical capital; S, social capital; H, human capital; N, natural capital.

Results and discussion

Figure 1 presents the results of access to financial capital by beneficiaries before and after MAFISA support by respondents. The indicators for financial capital show that access and capacity of respondents to government subsidies, Government grant, Income generated, Personal savings and Business investments increased by at least 90%, while personal loans taken and loan shark services decreased by at least 95% after MAFISA support. Wrenn [18] reported that in Kenya, Uganda and Rwanda, the impact of microfinance is underestimated by impact studies which disregard the possible positive externalities on spheres beyond households. Crepon et al. [21] further maintain that microfinance does not only have a positive impact on borrowers, but also on family members. Duvendack and Palmer-Jones [22] point out that microfinance had a positive impact of the livelihoods of beneficiaries.

The results on access to natural capital by beneficiaries before and after MAFISA are presented in Fig. 1. All the indicators used for operationalisation of natural capital show an increasing trend of more than 90% after MAFISA support. According to [23], microfinance allows income diversification, which reduces risk of loss and, therefore, has beneficial effects on environment. Murali [24] stated that linking micro-credits to various activities under natural resource management by self-help groups has provided gainful employment and income to needy people and their participation in conservation and regeneration of resources. Diro and Regasa [25] indicated that natural capital plays an important role in improving the livelihoods of clients through increased income and assets.

Figure 1 shows the findings on access to social capital by beneficiaries before and after MAFISA support. All the indicators for social capital show an increasing trend of more than 90% after MAFISA support. Khatun and Hasan [26] assert that bonding, bridging, norms and reciprocity are easy to use in the function of microfinance that can contribute to reduce poverty and create social capital. World Bank [27] indicated that there is strong relationship between social capital and microfinance such that group lending method creates bonding among the group members prior to receive micro-loan such that group lending mobilises resources and facilitates easy access of the poor to credit market that creates social
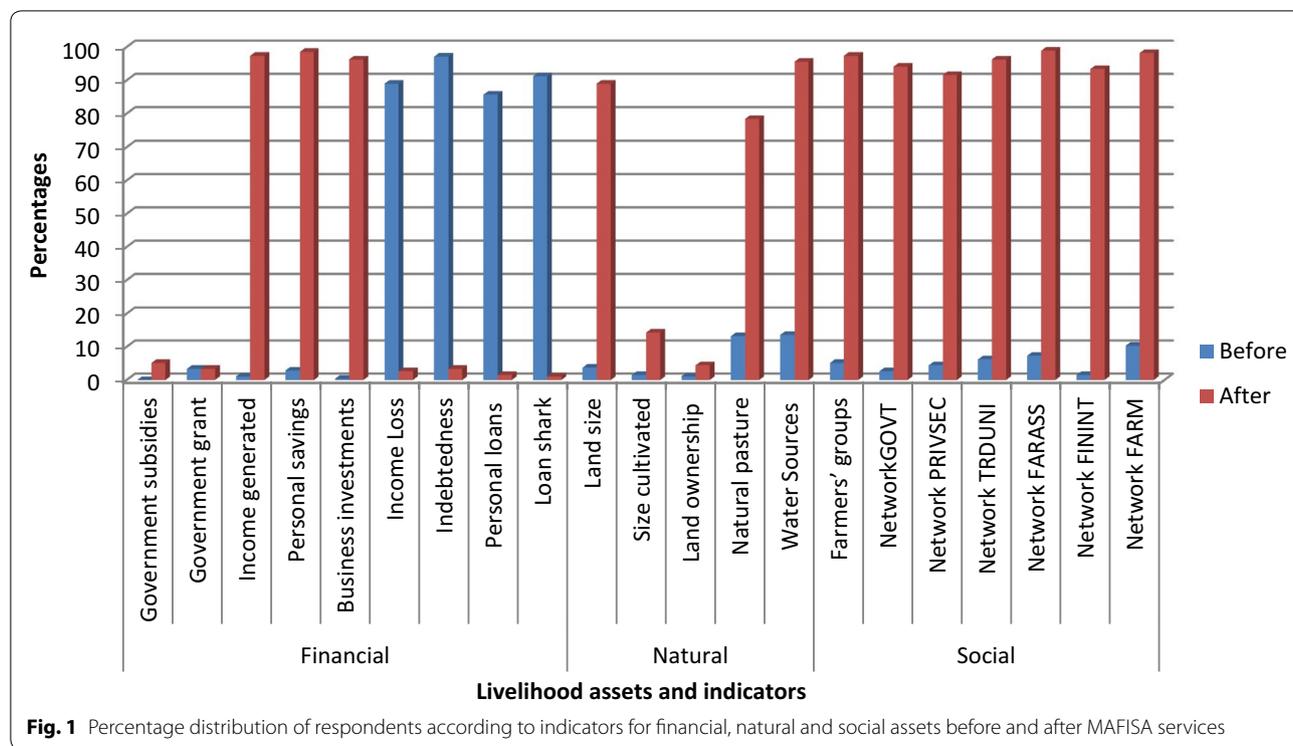
Fig. 1 Percentage distribution of respondents according to indicators for financial, natural and social assets before and after MAFISA services

well-being as well as social capital. Khatun and Hasan [26] reported that Micro Bank helps to increase the income of the poor that impacts positively to raise their standard of living as well as social capital through capacity building and networking. Ameen and Sulaiman [28] reported that microfinance has had significant impact in Bangladesh because microfinance creates social capital that has generated greater economic well-being. Molyneux [29] argues that microfinance diminishes the existing level of positive social capital by creating a socially corrosive competitive individualism; however, socially corrosive competitive individualism can be abated in the field of microfinance through networking.

Khatun and Hasan [26] argue that Micro Bank microfinance connects the marginalised people who are the members' same association through lobbing and networking that create social capital. Makina and Malobola [30] found a positive impact on the livelihoods of beneficiaries of microfinance, including women in rural areas where there is not much development taking place. Krueger and Lindahl [31] list four strong institutional operations through microfinance that help strong cooperation among members. They are relations of trust; reciprocity and exchange; common rules, norms and sanctions; and connectedness, networks and groups. Makina and Maloba [30] observed that lower-income households benefited less than those that are not so poor. This observation, they maintain, is consistent with the findings of

other studies on similar impact assessments. They also observed that if certain groups such as women are not targeted, men tend to benefit far more than women. Enisan and Olowafemi [32] conducted a study in Ondo State, Nigeria, and found that the provision of credit had a significant and positive impact on the welfare of beneficiaries.

Figure 2 presents the results on access to physical capital by beneficiaries before and after MAFISA support. There is a general trend of increase in access and ownership of physical assets by at least 90% after MAFISA except for road and market infrastructure. This exception may be, because these physical assets are not exclusive or peculiar to MAFISA's beneficiaries alone. Gubert and Roubaud [33] stated that microfinance loans beneficiaries in Madagascar improved their number of workers employed, received a higher turnover, more physical capital than non-beneficiaries. Anderson et al. [34] stated that microfinance to poor allows them to undertake micro-enterprises to increase resource capital and ownership. Ramakrishnappa and Rao [35] reported the introduction of various microfinance schemes to assist and enhance the capability of the economically weaker people has brought positive and significant results such that the impact of microfinance on dairy has made India the largest producer of milk in the world.

Adjei [36] asserts that through participation in microfinance programme, clients diversified and accumulated
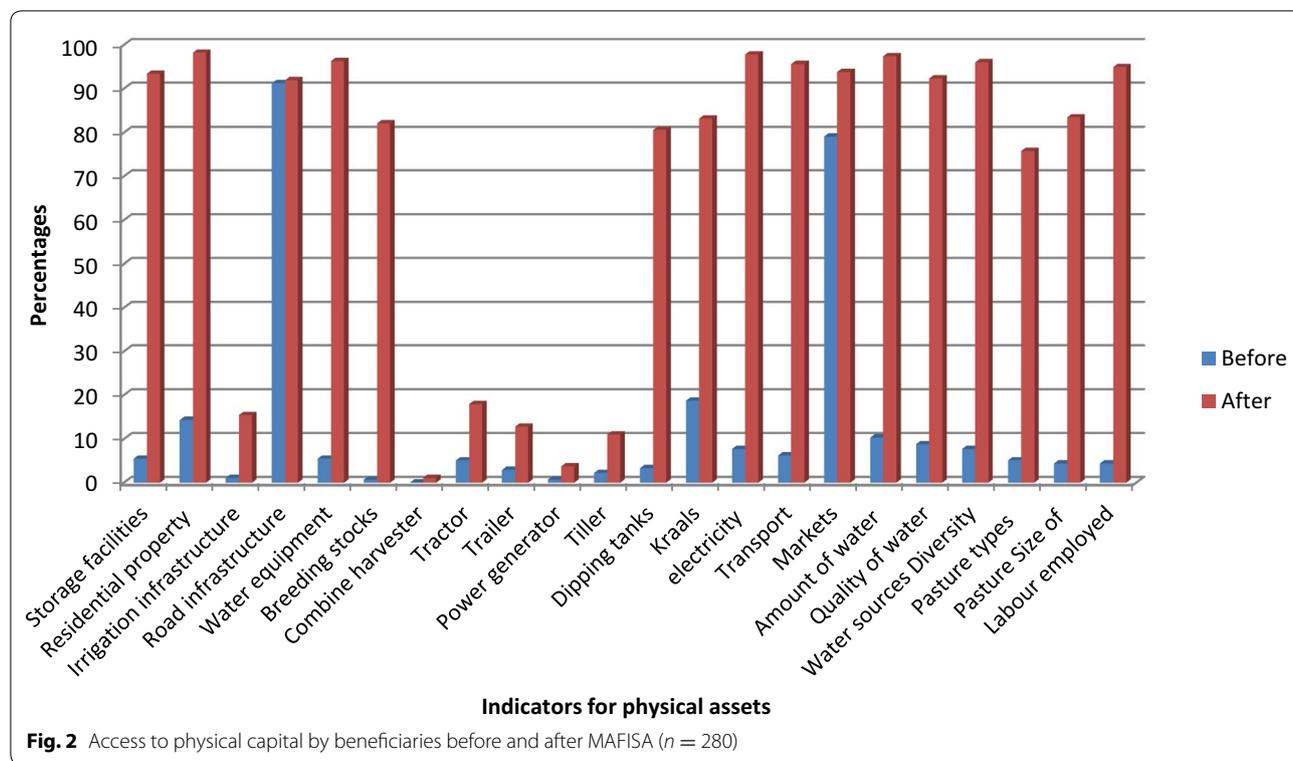
Fig. 2 Access to physical capital by beneficiaries before and after MAFISA (*n* = 280)

various assets in the form of financial, human and physical capital, and thus, participation in the programme significantly improved clients' living standards through asset accumulation. Odell [37] indicated that microfinance facilities have improved beneficiaries' access to socio-economic facilities such as health, nutrition and education through increased incomes. Enisan and Oluwafemi [32] revealed that credit had a positive impact on poverty and changed the livelihoods of households for the better. Access to credit leads to self-reliance, creates employment and makes individuals to be more dependent on themselves, thus creating a conducive environment for the empowerment of others who do not have access to such credit services. Planet Finance [38] stated that in Egypt microfinance had a positive impact on enterprise development and that it serves as the only external source of finance so direly needed by the poor. Gebru and Paul [39] found in Jimma town, west of Ethiopia, that microfinance had a positive impact on their standard of living and that women have more access to microfinance than men.

The findings on access to human capital by beneficiaries before and after MAFISA support are presented in Table 4. All the indicators used for operationalisation of human capital show an increasing trend of more than 90% after MAFISA support. Krueger and Lindahl [31] observed that human capital development is

a prerequisite for reducing poverty in the long run and occupies the prime place in production because without it other factors of production would not be developed. Antoh et al. [40] indicate that microfinance services enable beneficiaries to expand their human capital assets and that microfinance services included education programmes that added up to enhancing beneficiaries outlook regarding the non-financial aspect of poverty reduction through awareness creation and sensitisation workshops. Adjei et al. [36] contend that the overgeneralisation hinders evidence on microfinance effects on human capital development, thereby leading to the generally weak and inadequate research in human capital. Ferka [6] confirms the general assertion by many researchers that microfinance has a positive impact on the welfare of households that borrow from microfinance institutions.

Table 1 shows the result of the differences in the indicators on financial capital before and after MAFISA support using the Wilcoxon signed-rank test. This was because indicators on financial capital were measured on ordinal scale of high and low for before and after MAFISA support to beneficiaries, respectively. From 14 financial indicators tested, 13 indicators showed significant difference while one did not. These are: access to banks ($Z = -15.56$); access to cooperative ($Z = -11.305$); relatives ($Z = -15.558$);

Table 1 Access to human capital by beneficiaries before and after MAFISA support (*n* = 280)

Human capital indicators	Before MAFISA support		After MAFISA support	
	High	Low	High	Low
Financial management skills	13(4.8)	260(95.2)	260(95.2)	13(4.8)
Marketing management skills	11(4.0)	262(96.0)	257(94.1)	16(5.9)
Extension service	35(12.8)	238(87.2)	253(92.7)	20(7.3)
Skills training	12(4.4)	261(95.6)	250(91.6)	23(8.4)
Technical training	12(4.4)	261(95.6)	242(88.6)	31(11.4)
Auctioning skills	18(6.6)	255(93.4)	245(89.7)	28(10.3)
Project management skills	10(3.7)	263(96.3)	250(91.6)	23(8.4)
Employment opportunities created	9(3.3)	264(96.7)	263(96.3)	10(3.7)
Veld management skills	9(3.3)	264(96.7)	215(78.8)	58(21.2)
Grazing management skills	7(2.6)	266(97.4)	213(78.0)	60(22.0)
Grain management skills	6(2.2)	267(97.8)	40(14.7)	233(85.3)
Vegetable management skills	4(1.5)	269(98.5)	46(16.8)	227(83.2)
Poultry management skills	7(2.6)	266(97.4)	219(80.2)	54(19.8)
Piggery management skills	21(7.7)	268(98.2)	215(78.8)	58(21.2)
Training on record-keeping	14(5.1)	259(94.9)	261(95.6)	12(4.4)
Livestock management skills	16(5.9)	257(94.1)	216(79.1)	57(20.9)
Skills on the treatment of diseases	21(7.7)	252(92.3)	214(78.4)	59(21.6)
Skills in soil management	10(3.7)	263(96.3)	49(17.9)	224(82.1)
Water management skills	25(9.2)	248(90.8)	253(92.7)	20(7.3)
Management training skills	17(6.2)	256(93.8)	249(91.2)	24(8.8)
Price determination training skills	31(11.4)	242(88.6)	259(94.9)	14(5.1)
Resources management training skills	17(6.2)	256(93.8)	260(95.2)	13(4.8)
Equipment handling skills	40(14.7)	233(85.3)	255(93.4)	18(6.6)
Crop protection skills	12(4.4)	261(95.6)	41(15.0)	232(85.0)

Figures in parentheses are percentages

income generated ($Z = -16.156$); personal savings ($Z = -16.032$); business investments ($Z = -16.063$); loss of income ($Z = -15.297$); level of indebtedness ($Z = -15.876$); personal loans taken ($Z = -15.100$); and loan shark services ($Z = -15.621$). The *p* values of the results were less than 0.05. This result implies that MAFISA support was able to trigger changes in the indicators of the "livelihoods of beneficiaries" regarding access to MAFISA's financial services. The number of positive ranks for each of the indicators lends credence to the significance difference as shown by the *Z* values. The study by [41] revealed that farmers' access to livelihood capitals such as financial capital improves their farming management abilities and result in their agricultural entrepreneurial capabilities being boosted.

Mumuni and Oladele [41] asserted that financial capital in agriculture is converted and generated into cash for household expenses from farmers' product and is also used for making savings to cater for their needs during bad seasons and challenging times.

The results of physical capital of the project on "before and after" of the project are presented in Table 2, and these results show the differences in the indicators on physical capital before and after MAFISA support using the Wilcoxon signed-rank test. From 15 physical indicators tested, 13 showed significant difference while two did not. These indicators are: storage facility ($Z = -15.300$); residential property owned ($Z = -15.067$); irrigation infrastructure ($Z = -5.935$); water equipment ($Z = -15.685$); breeding stock ($Z = -14.833$); tractor ($Z = -4.959$); tiller ($Z = -4.347$); dipping tanks ($Z = -15.457$); kraals ($Z = -13.191$); availability of electricity ($Z = -15.621$); transport ($Z = -15.493$); and markets ($Z = -4.953$). The *p* values of the results were less than 0.05. This result implies that MAFISA support could trigger changes in the indicators of livelihoods of beneficiaries. These beneficiaries acquired more assets because of the financial support they enjoyed. The number of positive ranks for each of the indicators lends credence to the significant difference as shown by the *Z* values. Wilcoxon signed-rank test compares two related samples such as "before and after" with the same sample population for ranking. Mumuni and Oladele [41] went further to highlight that the test applies to two-sample designs that involve repeated measures and matched pairs before and after the impact on their livelihoods. Nxumalo and Antwi [42] assert that a Wilcoxon signed-rank sum test is a nonparametric version of a paired-samples t test and can be used if research does not want to assume that the difference between two variables is interval or normally distributed.

Table 3 shows the result of the differences in the indicators on social capital before and after MAFISA support using the Wilcoxon signed-rank test. This was because indicators on social capital were measured on ordinal scale of high and low for before and after MAFISA support to beneficiaries, respectively. All the seven social indicators tested showed significant difference. These are: access farmers' groups ($Z = -15.875$); network with government ($Z = -15.811$); network with the private sector ($Z = -15.363$); network with trade unions ($Z = -15.621$); network with farmers' associations ($Z = -15.811$); network with financial institutions ($Z = -15.843$); and network with other farmers ($Z = -15.428$). The *p* values of the results were less than 0.05. This result implies that MAFISA support could trigger changes in the indicators

Table 2 Wilcoxon signed-rank test for financial capital ($n = 280$)

	Ranks	N	Mean rank	Sum of ranks	Z	Asymp. sig (2-tailed)
Financial capital indicators						
Banks	Negative ranks		.00	.00		
	Positive ranks	244	122.50	29,890.00	−15.56	.000
	Ties	29				
Money lenders	Negative ranks	12	13.50	62.00		
	Positive ranks	14	13.50	189.00	−.196	.845
	Ties	247				
Cooperatives	Negative ranks	5	75.00	3.75.00		
	Positive ranks	144	122	10,800.00	−11.30	.000
	Ties	124				
Relatives	Negative ranks	247	124.50	30,751.50		
	Positive ranks	1	124.50	124.50	−15.55	.000
	Ties	25				
Government subsidies	Negative ranks	0	.00	.00		
	Positive ranks	14	7.50	105.50	.000	.000
	Ties	259				
Government grant	Negative ranks	9	9.50	85.50		.000
	Positive ranks	9	9.50	85.50	1.000	.000
	Ties	255				.000
Income generated	Negative ranks	0	0.00	.00		
	Positive ranks	263	132.50	34,716.00	−16.15	.000
	Ties	10				
Personal savings	Negative ranks	1	132.00	132.00		
	Positive ranks	262	132.00	34,584.00	−16.03	.000
	Ties	10				
Business investments	Negative ranks	1	132.50	132.50		
	Positive ranks	263	132.50	34,847.50	−16.06	.000
	Ties	9				
Loss of income	Negative ranks	236	118.50	27,966.00		
	Positive ranks	0	.00	.00	−15.29	.000
	Ties	37				
Level of indebtedness	Negative ranks	257	129.50	33,281.50		
	Positive ranks	1	129.50	129.50	−15.87	.000
	Ties	15				
Personal loans taken	Negative ranks	230	115.50	26,565.00		
	Positive ranks	0	.00	.00	−15.10	.000
	Ties	43				
Loan sharks' services	Negative ranks	246	123.50	30,381.00		
	Positive ranks	0	.00	.00	−15.62	.000
	Ties	27				

of livelihoods of beneficiaries by creating networks with other institutions and people. The number of positive ranks for each of the indicators lends credence to the significant difference as shown by the *Z* values.

Table 4 shows the result of the differences in the indicators on human capital before and after MAFISA support using the Wilcoxon signed-rank test. This was because indicators on human capital were measured on ordinal

Table 3 Wilcoxon signed-rank test for physical capital (*n* = 280)

	Ranks	N	Mean rank	Sum of ranks	Z	Asymp. sig (2-tailed)
Storage facility accessibility	Negative ranks	2	122.50	245		
	Positive ranks	242	122.50	29,645.00	−15.30	.000
	Ties	29				
Residential property owned	Negative ranks	0	.00	.00		
	Positive ranks	229	115.00	26,335.00	−15.06	.000
	Ties	44				
Irrigation infrastructure	Negative ranks	1	21.00	21.00		
	Positive ranks	40	21	840.00	−5.93	.000
	Ties	232				
Road infrastructure	Negative ranks	18	19.50	351.00		
	Positive ranks	20	19.50	390.00	−.162	.871
	Ties	235				
Water equipment	Negative ranks	0	.00	.00		
	Positive ranks	248	124.50	30,876.00	−15.68	.000
	Ties	25				
Breeding stock	Negative ranks	0	.00	.00		
	Positive ranks	222	111.50	24,753.00	−14.83	.000
	Ties	255				
Combine harvester	Negative ranks	0	.00	.00		
	Positive ranks	3	2.00	6.00	0.155	.250
	Ties	270				
Tractor	Negative ranks	6	24.00	144.00		
	Positive ranks	41	24.00	984.00	−4.95	.000
	Ties	226				
Power generator	Negative ranks	2	6.50	13.00		
	Positive ranks	10	6.50	65.00	2.14	.039
	Ties	26				
Tiller	Negative ranks	2	14.50	29.00		
	Positive ranks	26	14.50	377.00	−4.347	.000
	Ties	245				
Dipping tanks	Negative ranks	0	.00	.00		
	Positive ranks	21	106.00	22,366.00	−15.45	.000
	Ties	62				
Kraals	Negative ranks	0	.00	.00		
	Positive ranks	176	88.50	15,576.00	−13.19	.000
	Ties	97				
Electricity availability	Negative ranks	0	.00	.00		
	Positive ranks	246	123.50	30,381.00	−15.62	.000
	Ties	27				
Transport	Negative ranks	1	123.50	123.50		
	Positive ranks	245	123.50	30,257.50	−15.49	.000
	Ties	27				
Markets	Negative ranks	11	31.50	346.50		
	Positive ranks	51	31.50	1606.50	−4.95	.000
	Ties	211				

Table 4 Wilcoxon signed-rank test for social capital ($n = 280$)

	Ranks	N	Mean rank	Sum of ranks	Z	Asymp. sig (2-tailed)
Farmers' groups	Negative ranks	0	.00	.00		
	Positive ranks	252	126.50	31,878.00	−15.875	.000
	Ties	21				
Network with government	Negative ranks	0	.00	.00		
	Positive ranks	250	125.50	31,375.00	−15.811	.000
	Ties	23				
Network with the private sector	Negative ranks	1	120.50	120.50		
	Positive ranks	239	120.50	28,799.50	−15.363	.000
	Ties	33				
Network with trade unions	Negative ranks	1	124.50	124.50.00		
	Positive ranks	247	124.50	30,751.50	−15.621	.000
	Ties	25				
Network with farmers' associations	Negative ranks	0	.00	.00		
	Positive ranks	250	125.50	31,375.00	-15.811	.000
	Ties	23				
Network with financial institutions	Negative ranks	0	.00	.00		
	Positive ranks	251	126.00	31,626.00	−15.843	.000
	Ties	22				
Network with other farmers	Negative ranks	1	121.50	121.50		
	Positive ranks	241	121.50	29,281.50	−15.428	.000
	Ties	31				

scale of high and low for before and after MAFISA support to beneficiaries, respectively. All the 24 indicators on human capital tested showed significant difference. These skills are as follows: financial management ($Z = -15.653$); marketing management ($Z = -15.621$); extension services ($Z = -14.437$); skills training ($Z = -15.427$); technical training ($Z = -14.972$); auctioning ($Z = -15.001$); project management ($Z = -15.492$); employment opportunities created ($Z = -15.937$); veld management ($Z = -14.353$); grazing management ($Z = -14.353$); grain management ($Z = -5.831$); vegetable management ($Z = -6.481$); poultry management ($Z = -14.560$); piggery management ($Z = -14.491$); training on record-keeping ($Z = -15.591$); livestock management ($Z = -14.072$); treatment of diseases ($Z = -13.821$); soil management ($Z = -5.814$); water management ($Z = -15.034$); management training ($Z = -15.232$); price determination training ($Z = -14.969$); resources management training ($Z = -15.525$); handling of equipment ($Z = -14.397$); and crop protection ($Z = -5.048$). The p values of the results were less than 0.05. This result implies that MAFISA support could improve the skills of beneficiaries. The number of positive ranks for each

of the indicators lends credence to the significant difference as shown by the Z values. Nxumalo and Antwi [42] argued human capital's emphasis on empowerment through both formal and informal education. According to [42], the Wilcoxon signed-rank test is robust and highly efficient, especially for moderate- to heavy-tailed underlying distributions.

Table 5 shows the result of the differences in the indicators on natural capital before and after MAFISA support using the Wilcoxon signed-rank test. This was because indicators on natural capital were measured on ordinal scale of high and low for before and after MAFISA support to beneficiaries, respectively. From 11 natural indicators tested, 10 showed significant difference while one did not. These are: size of land ($Z = -15.264$); amount of water used ($Z = -15.236$); quality of water ($Z = -14.905$); size of land cultivated ($Z = -5.691$); ownership of land ($Z = -2.324$); natural pasture ($Z = -13.194$); types of pasture ($Z = -13.892$); size of pasture ($Z = -14.697$); labour employed ($Z = -15.591$); and natural water sources ($Z = -14.900$). The p values of the results were less than 0.05. This result implies that MAFISA support could

Table 5 Wilcoxon signed-rank test for human capital (n = 280)

	Ranks	N	Mean rank	Sum of ranks	Z	Asymp. sig (2-tailed)
Financial management	Negative ranks	1	125.00	125.00		
	Positive ranks	248	125.00	31,000.00	−15.65	.000
	Ties	24				
Marketing management	Negative ranks	1	124.50	124.50		
	Positive ranks	247	124.50	30,751.50	−15.62	.000
	Ties	25				
Extension services	Negative ranks	5	114.50	572.50		
	Positive ranks	223	114.50	25,533.50	−14.43	.000
	Ties	45				
Skills training	Negative ranks	0	.00	.00		
	Positive ranks	238	119.50	28,441.00	−15.42	.000
	Ties	35				
Technical training	Negative ranks	3	118.50	355.50		
	Positive ranks	233	118.50	27,610.50	−14.97	.000
	Ties	37				
Auctioning skills	Negative ranks	1	115.00	115.00		
	Positive ranks	228	115.00	26,220.00	−15.00	.000
	Ties	44				
Project management	Negative ranks	0	.00	.00		
	Positive ranks	240	120.50	28,920.00	−15.49	.000
	Ties	33				
	Total	273				
Employment opportunities created	Negative ranks	0	.00	.00		
	Positive ranks	254	127.50	32,385.00	−15.93	.000
	Ties	19				
Veld management	Negative ranks	0	.00	.00		
	Positive ranks	206	103.50	21,321.00	−14.35	.000
	Ties	67				
Grazing management	Negative ranks	0	.00	.00		
	Positive ranks	206	103.50	21,321.00	−14.35	.000
	Ties	67				
Grain management	Negative ranks	0	.00	.00		
	Positive ranks	34	17.50	595.00	−5.83	.000
	Ties	239				
Vegetable management	Negative ranks	0	21.50	903.00		
	Positive ranks	42	21.50	903.00	−6.48	.000
	Ties	231				
Poultry management	Negative ranks	0	.00	.00		
	Positive ranks	212	106.50	22,578.00	−14.56	.000
	Ties	61				
Piggery management	Negative ranks	0	.00	.00		
	Positive ranks	210	105.50	22,155.00	−14.49	.000
	Ties	63				
Training on record-keeping	Negative ranks	2	126.00	252.00		
	Positive ranks	249	126.00	31,374.00	−15.59	.000
	Ties	22				
Livestock management skills	Negative ranks	2	101.50	101.50		
	Positive ranks	201	101.50	20,401.50	−14.07	.000
	Ties	71				

Table 5 continued

	Ranks	N	Mean rank	Sum of ranks	Z	Asymp. sig (2-tailed)
Treatment of diseases	Negative ranks	1	98.00	98.00		
	Positive ranks	194	98.00	19,012.00	−13.82	.000
	Ties	78				
Soil management	Negative ranks	3	23.00	69.00		
	Positive ranks	42	23.00	966.00	−5.81	.000
	Ties	228				
Water management	Negative ranks	1	115.50	115.50		
	Positive ranks	229	115.50	26,449.50	−15.03	.000
	Ties	43				
Management training	Negative ranks	0	.00	.00		
	Positive ranks	232	116.50	27,028.00	−15.23	.000
	Ties	41				
Price determination training	Negative ranks	2	116.50	233.00		
	Positive ranks	230	116.50	26,795.00	−14.96	.000
	Ties	41				
Resources management training	Negative ranks	1	123.00	123.00		
	Positive ranks	244	123.00	30,012.00	−15.52	.000
	Ties	28				
Equipment handling	Negative ranks	4	112.00	448.00		
	Positive ranks	219	112.00	24,528.00	−14.39	.000
	Ties	50				
Crop protection	Negative ranks	2	17.00	34.00		
	Positive ranks	31	17.00	527.00	−5.048	.000
	Ties	240				

trigger changes in the indicators of livelihoods of beneficiaries. The number of positive ranks for each of the indicators lends credence to the significant difference as shown by the Z values (Table 6).

Conclusions

The findings in this paper are a contribution to the literature on the effect of microfinance on livelihood assets of beneficiaries. Many researches have indicated that microfinance facilities have improved beneficiaries' access to socio-economic facilities such as health, nutrition and education through increased incomes, while other contested the propagated positive impacts of microfinance and claim that microfinance does not reach the poor and even if it does it rather destroys their resourcefulness because of repayment difficulties which inhibits acquisition of vital resources. This study on effect of Micro-Agricultural Financial Institutions of South Africa on livelihood capital of beneficiaries in North West Province South Africa concludes that access to microfinance leads to significant changes in financial, social, natural, human, physical and social livelihood assets after MAFISA support. The proportion of access and ownership of livelihood assets increased for most of the indicators of the assets by at least ninety per cent after MAFISA support. Statistical significant differences confirmed the changes in the proportion of beneficiaries before and after MAFISA support such as access to financial capital from banks improved substantially and cooperatives, networking with others, network with government and network with the private sector as well as increasing their skills and competencies as well as their physical asset accumulation. The findings of this study imply that microfinance can lead to acquisitions and accumulation of important indicators of the five sustainable livelihood capital in order to lead to sustainable

Table 6 Wilcoxon signed-rank test for natural capital (*n* = 280)

	Ranks	N	Mean rank	Sum of ranks	Z	Asymp. sig (2-tailed)
Size of land	Negative ranks	0	.00	.00		
	Positive ranks	233	117.00	27,261.00	−15.26	.000
	Ties	40				
Amount of water used	Negative Ranks	3	122.50	367.50		
	Positive ranks	241	125.50	29,522.50	−15.23	.000
	Ties	29				
Quality of water	Negative ranks	3	117.50	352.50		
	Positive ranks	231	117.50	22,142.50	−14.90	.000
	Ties	39				
Size of cultivated land	Negative ranks	0	.00	.00		
	Positive ranks	35	18.00	630.00	−5.691	.000
	Ties	238				
Ownership of land	Negative ranks	3	8.00	24.00		
	Positive ranks	12	8.00	96.00	−2.32	.020
	Ties	258				
Natural pasture	Negative ranks	2	91.50	183.00		
	Positive ranks	180	91.50	16,470.00	−13.19	.000
	Ties	91				
Types of pasture	Negative ranks	0	.00	.00		
	Positive ranks	193	97.00	18,721.00	−13.89	.000
	Ties	80				
Size of pasture	Negative ranks	0	.00	.00		
	Positive ranks	216	108.50	23,436.00	−14.69	.000
	Ties	57				
Labour employed	Negative ranks	2	126.00	252.00		
	Positive ranks	249	126.00	31,374.00	−15.59	.000
	Ties	22				
Sources of natural water	Negative ranks	1				
	Positive ranks	225			−14.90	.000
	Ties	47				
Diversity of water sources	Negative ranks	5	126.00	630.00		
	Positive ranks	246	126.00	30,996.00	−15.21	.000
	Ties	22				

outcomes livelihoods. It also implies that proper targeting of beneficiaries will lead to improved livelihoods through microfinance.

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