Gender discrimination, skills gaps and challenges within small scale sugar cane production in Mpumalanga

Executive summary

The South African Sugar industry is crucial for the economy and employment in the country. Cane growing sector plays a vital role in the success of the sugar industry and therefore, it is crucial to keep the sector functional by understanding challenges it faces. Moreover, the cane-growing sector consists of a mixture of women and men. However, while women are crucial for the development of the agricultural sector as a whole, they are still burdened by inequalities in production resources such as land, capital, water and extension support. It has been argued that female farmers can increase productivity by 20-30% provided that they have access to the same resources and services as males.

Twelve focus group discussions (FGDs) and survey interviews were conducted with 58 small-scale sugar cane growers in the Buffelspruit, Spoon Seven, Magudu and Nhlangu west areas of Mpumalanga Province. The aim of this study was to investigate gender inequalities amongst SSGs on access to production resources and evaluate the skills gaps in the cane growing industry. 53% of the 58 respondents were females and 47% were males with an overall average age of 64 years.

The results indicate that there are gender inequality gaps when it comes to access to land and extension services, with males having more access than females. The survey results indicated that the growers required skills development interventions in areas of cane husbandry, maintenance of irrigation scheme and business skills such as budgeting, negotiating, reading and writing. The results highlighted gender differences in skills that males and females consider critical, scarce and training required by both genders. The findings also showed that challenges that the growers experience are different for males and females. High production costs, repayments of loans taking too long and not having access to funding or grants for cane production were challenges mentioned by majority of the respondents. While there are various interventions required to support the SSGs in Mpumalanga, the priority interventions requested by farmers included support with farming capital, training on business skills and also training on maintenance of irrigation scheme.

It is recommended that the development bodies, stakeholders and role players within Mpumalanga cane production industry prioritise equality in access to resources, support services and skills development to SSG. It is also recommended that interventions are put into place to attract youth for succession planning as majority of the current farmers are aging. This study has listed some recommendations based on observations on interventions necessary to ensure that farmers become independent and self-sufficient in the near future.

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ACRONYMS

Abbreviation/acronym	Description
Av	Average
Dif.	Difference
FGDs	Focus Group Discussions
Freq	Frequency
ha	Hectares
Max	Maximum
Min	Minimum
SSGs	Small-scale sugarcane growers
Std. Dev.	Standard deviation
Std. Err.	Standard error

1. Introduction

South African Sugar industry has been identified as one of the sectors that are critical to the growth of the economy with its significant contribution to the GDP and R14 billion contribution to the South African economy (SONA, 2019). The SA sugar industry also plays a significant role to the total employment in South Africa with direct employment of approximately 85 000 jobs and indirect employment estimated at 350 000 (SASA, 2019). As of 2019, the 22 949 registered sugarcane growers, with above 80% being small-scale growers, alone played a pivotal role in the SA economy with a total of 837 thousand direct jobs and a contribution of R7 993 million income generated from sugar cane (SASA, 2019).

While the later has highlighted the importance of small-scale growers, these farmers encounter numerous challenges that hinder their growth and capability to contribute effectively to food security compared to commercial farmers (Nchabeleng, 2016). Most of the challenges faced by emerging farmers involve access to training, marketing, governance and management skills. A number of initiatives have been implemented in South Africa to assist emerging farmers but unfortunately, they still face obstacles that include poor access to information, lack of skills and training, and high production and transaction costs which leads to low quality and volumes of produce (Sikwela and Mushunje, 2013; Mpandeli and Maponya, 2014).

The evident importance of the sugar cane growing industry requires a closer attention to the determinants of its success for policy makers and development driving bodies to address any hindrances to the success of this industry. Various studies have listed gender inequality as one of the challenges small-scale farmers experience in South Africa (Hart and Aliber, 2010; World Bank 2018). Gender equality is crucial for agricultural development and for livelihood sustainability and it is Goal 3 of the Millennium development goals and Goal 5 of sustainable development goals (UNDP, 2016). Women comprise, on average, 43% of the agricultural labour force in developing countries and they contribute 60%-80% in food production in the country. Globally, women have broadened and deepened their involvement in agricultural production, while also shouldering the responsibility for household survival (Lastarria-Cornheil, 2008). Despite the pivotal role women play in food security (Ogunlela and Mukhtar, 2009), women receive only a small percentage of available land, limited

access to credit, fewer inputs and less access to agricultural training and information than their male counterparts (FarmingFirst, 2015). This significantly burdens female farmers and is the primary contributor to the low yields produced by female farmers globally (World Bank, 2009).

FAO (2011) argues that if female farmers had the same access to productive resources as men, they could increase yields on their farms by 20-30%. Additional yield from investment in female farmers could reduce the number of undernourished people in the world by 12-17% (FarmingFirst, 2015). Therefore, gender relations not only impact household welfare and food security, but can also have a national and global impact when approached correctly (World Bank, 2009).

African countries such as Zambia, Tanzania and Uganda have looked at gendered access to resources and its impact on sugar cane production (World Bank, 2007; FAO, 2009; Dancer and Sulle, 2015; Rocca, 2016). Various studies have been done in South Africa looking at gender equality and farming resources on different farming enterprises (Namara et al., 2010; Aguilar et al., 2015; Kilic et al., 2015, Sinyolo et al., 2018), however, there are no studies that have looked at gender inequalities in the cane production industry.

This study was commissioned by the RCL Sugar in collaboration with AgriSETA with an aim of investigating gender inequalities in the cane production industry in Mpumalanga province. The study also looked at the skills that farmers consider scarce and critical, and the kills that farmers require to ensure sustainability of cane production.

Thus, the report presents the finding of the research study, which was conducted to understand the gender discrimination, skills gaps and challenges within small scale sugar cane production in Mpumalanga province. The sections in this report are as follows: The first section outlines the Research approach, followed by the Demographic and socio-economic profile of the respondents, Gender dynamics of sugar cane production and Gender, access to services and skills gaps. Following after is the section on Challenges experienced in cane production, priority interventions and Conclusion and recommendations.

2. Research Approach

2.1 Study area and data collection

The data presented in this report was collected during the period of 3 to 28 February 2020. The respondents were sampled from different groups of Small-scale Sugarcane growers from four irrigation schemes, namely; Buffelspruit farmers' association, Nhlangu West farmers' association, Magudu farmers' association and Spoon seven farmers' association. The respondents operated under groups called farmers associations which could also be referred to as 'farmer groups' or 'cooperatives' since they have similar functions and benefits.

2.2 Sampling method and sample size

A sample of 58 SSGs participated in a total of 12 Focus Group Discussions and completion of a survey questionnaire across the four areas.

Purposive sampling method was used for this study. Saunders et al. (2012) describes the method as non-probability sampling method that researchers use with an aim of accessing a particular subset of people, as all participants of a study are selected because they fit a particular profile. Due to the remoteness of the area and the busyness of the growers, the respondents were members of the associations who had attended the monthly association meeting.

2.3 Data analyses

Content analysis was conducted on data collected during FGDs while quantitative data was analysed using Stata 16 and Excel 2016 versions. Frequencies were tabulated for categorical variables while means were tabulated for continuous variables. To test for significance of an associations between categorical variables, a Pearson chi-square analyses was used while continuous differences were analysed using t-test.

3. Results and discussion

3.1 Demographic and socio-economic profile

The results on Table1 indicates the distribution of respondents across the four study areas. The result shows the Buffelspruit had the highest percentage (29%), followed

by Nhlangu West (28%) while Magudu had the smallest representation (19%). There is an almost even distribution of farmers across the four areas.

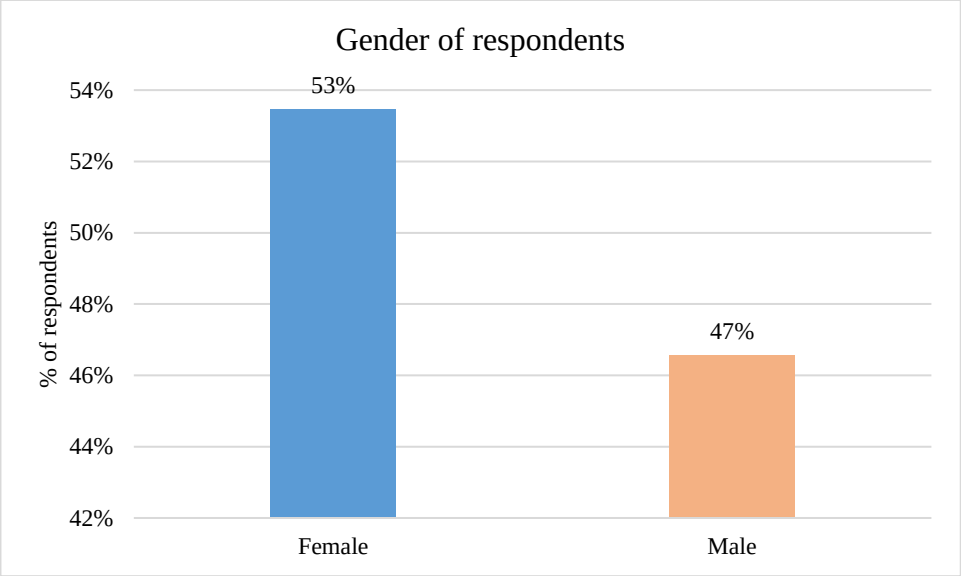
Table 1:Distribution of respondents

Area	Frequency	Representation Percentage
Magudu	11	19%
Spoon Seven	14	24%
Nhlangu West	16	28%
Buffelspruit	17	29%
Total	**58**	**100%**

3.1.1 Analyses on gender of the respondents

The results on figure1 below illustrates the gender composition of the respondents. The results show that majority of females (53%) were interviewed than male respondents (47%). The result does not imply that the composition of female is higher than that of males amongst the SSGs in Mpumalanga.

Figure 1: Gender of the respondents



3.1.2 Analyses on age of the respondents

The average age of the interviewed SSGs is 64 years, with the youngest farmers at 37 years and oldest farmers at 90 years of age (figure2). None of the respondents were from youth 35 years of age and younger. This does not imply that there is no youth involved in cane production in Mpumalanga. However, during the Focus Group

Discussions, farmers reported that they have attempted to recruit more youth to join in cane production. It was reported that the attempts have been unsuccessful because youth perceives cane production as an intensive job and unprofitable. The concern raised by most farmers is that there might be no succession once the old farmers retire since their young family members don't seem to be attracted to cane production.

This challenge is in line with FAO et al. (2014) who reported that worldwide, South Africa included, the participation of youth in agricultural activities is very minimal due to certain challenges in the sector.

Figure 2: Overall age of respondents in years

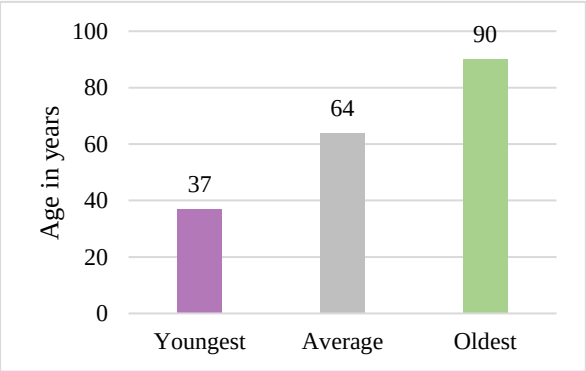


Table 2: T-test results of age by gender of the respondents

Gender	Age composition (years)		
	Youngest	Average	Oldest
Male	45	65	82
Female	37	63	90
t= 0.7990 p= 0.4277^{ns}			

Note: ^{ns} means not statistically significant

Looking at the age of respondents and gender dynamics, table2 above indicates that the youngest male SSG was 45 years while the oldest was 82 years. Females had the oldest respondents at 90 years of age. The results indicate that the average age for males is 63 years while it is 65 years for females. This is above the estimated average age of 62 years of a South African farmer (StatsSA, 2016). This result indicates a challenge which is in line with IFAD (2019) who reported that an aging workforce in farming is one of the things that hinder agricultural development in the developing countries. The t-test probability of 0,4277 on table2 above suggests that the difference in age and gender of SSGs is not statistically significant, implying that there was no association between the two.

3.1.3 Analysis on marital status of the respondents

The marital status was regenerated to 'married' and 'unmarried' whereby latter combined those who were single, widowed and divorced/separated. Figure 3 below indicates that 59% of the total respondents were married while the rest fell under the unmarried category. The statistically significant at 1% Pearson chi-square results on table below suggest that there is a strong relationship between marital status and gender of SSGs. The results on the marital status by gender of the interviewed SSGs (table3) indicate that the majority (74%) of the male respondents were married compared to those who were unmarried. The results also show that a higher number of females who were interviewed was unmarried compared to the ones who were married. The finding is consistent with StatsSA (2016) who reported that percentages of married males are higher than those of females mainly because males are most likely to remarry should they be widowed compared to females in South Africa.

Figure 3:Marital status of respondents

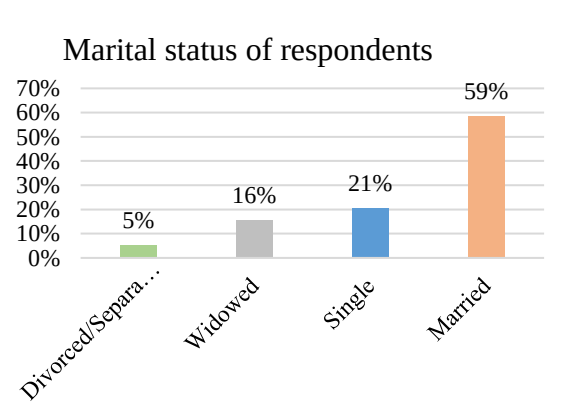


Table 3: Chi-square results of marital status by gender

Marital status	Males		Female	
	Frequency	Percent	Frequency	Percent
Married	20	74%	14	45%
Unmarried	7	26%	17	55%
Total	**27**	**100%**	**31**	**100%**
Pearson X^2 (3)= 10.4996 p = 0.015***				

*** Statistically significant at 1%

3.1.4 Analysis on educational level of the respondents

The results on the graph below (figure4) illustrates that a significant number of respondents had some form of formal education (79%) while only 21% of the respondents had no formal education. The results on table 4 indicate that there were more females with no formal education (26%) than males (15%) while the males had a higher percentage (11%) of respondents with a Tertiary qualification than female

respondents (6%). The chi-square results on table 4 below suggest that the findings of

Figure 4:Education level of the respondents by gender

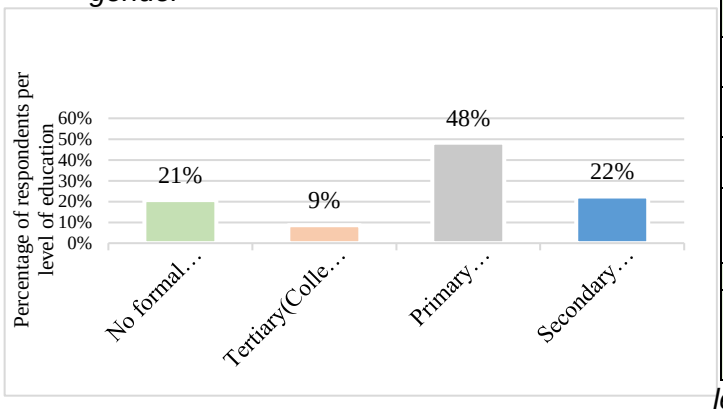


Table 4:Chi-square results of respondents' education level

Highest education level	Males		Females	
	Frequency	Percent	Frequency	Percent
No formal education	4	15%	8	26%
Primary Education	14	52%	14	45%
Secondary education	6	22%	7	23%
Tertiary (College/ University)	3	11%	2	6%
Total	27	100%	31	100%

Pearson X^2 (3)= 1.3408 p = 0.719^{ns}

Note: ^{ns} means not statistically significant

males having higher education levels than female SSGs is not statistically significant. The result is in line with (UNDP, 2016) who reported that historically, South African females had a high percentage of no formal education and very few of them enrolled for tertiary education compared to males. StatsSA (2017) however, presents a changing curve with more females than males obtaining formal education and enrolling in higher education institution.

3.1.5 Analysis on household size of the respondents

The results on figure 5 and table 5 below indicate that the maximum size of the household of the interviewed SSGs was 20 people while the minimum people per household was 8. The results indicate that the female growers' households were smaller than the male growers' households. The insignificant chi-square results suggest that there is no association between gender and the size of SSG's household size.

Figure 5: Summary of household sizes of the respondent

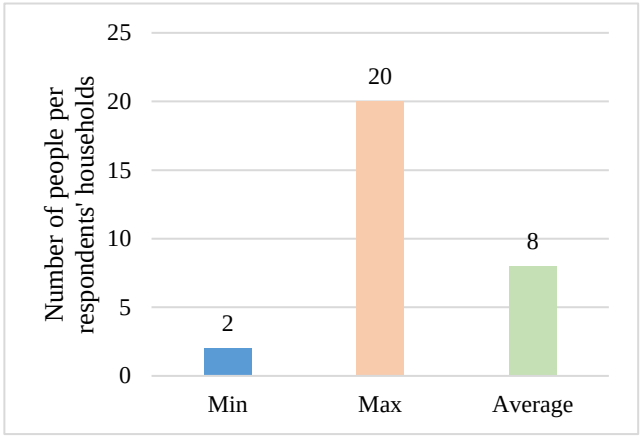


Table 5:T-test results of respondents' household size by gender

Gender	Household Size (people/HH)		
	Min	Average	Max
Male	2	8	15
Female	3	7	20
t =-0.5121 p = 0.6106^{ns}			

Note: ^{ns} means not statistically significant

3.1.6 Analysis on monthly household (HH) income of the respondents

The statistically significant results on table 6 indicate that households that belonged to males had higher monthly income than those for females. The households that belonged to female growers had an average household income of R1 599,86 while some of the female growers' households had a minimum of R0,00 per month. The figure 6 below indicates that households that belong to male growers had a maximum of R34000,00 of income per month while none of them had less than R1780,00 a month. The results of some households having no income at all are different from (StatsSA, 2000) who reported that 46% of South Africans depended on a household income of less than R1 000,00 a month.

Figure 6: Monthly HH income by gender

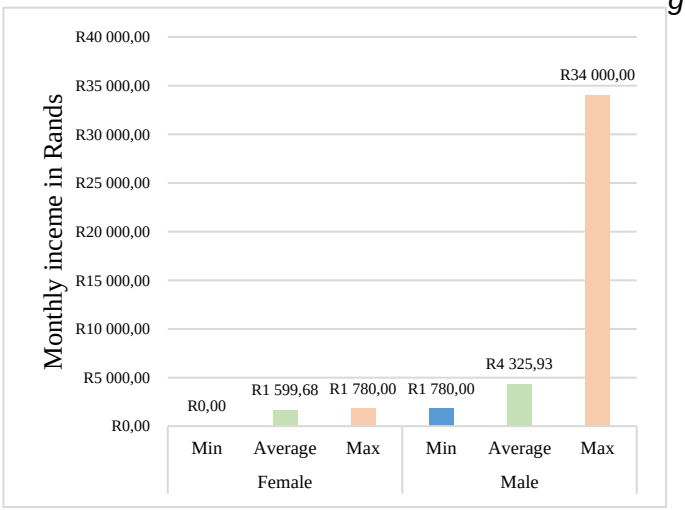


Table 6: T-test results for monthly HH income by gender

Gender	Average HH monthly income	Dif.	Probability
Female	R 1599,677		
Male	R 4325,926	R2726,25	0.0399**

**Statistically significant at 5%

Figure 7 below shows the results on the main source of household income for the respondents. The results indicate that a majority (69%) of growers relied on social grants as their main source of monthly income while very few (5%) depended on farm income. During the group discussions, a majority of farmers reported that they focus on their main farming enterprise which is cane production which yields them income annually, hence the lower number of growers getting monthly income from other farming activities. Those who reported not to participate on other enterprises farming activities justified that cane production alone requires a lot of their time and energy and money for inputs and labour.

Table 7: Chi-square results for association between gender and main HH source of income

	HH main source of income					
Gender	Farm income	No monthly income	Social grants	employment salary	non-farm business	Total
Female	3,2%	3,2%	77,4%	12,9%	3,2%	100%
Male	7,4%	0%	59,3%	25,9%	7,4%	100%
Pearson X^2 (4) = 3.8272 p = 0.430^{ns}						

Note: ^{ns} means not statistically significant

The chi-square results on table 7 above suggest that there is no association between the source of HH income and gender of the respondents. Figure 8 illustrates the main source of monthly income by gender. The result indicates that 84% of female respondents depended on social grants while only 14% depended on employment salary. The results also show that male respondents depended on other sources of money such as non-farm business and farm income while females only depended on employment salary and social grants. This results could be because males are able to undertake some of the work that women consider too difficult. It could also because of the aging of the female representatives that limits them participating in other income generating activities. Four percent (4%) of the households that belonged to female respondents does not have any monthly source of income at all.

Figure 7: Respondents' main source of monthly household income

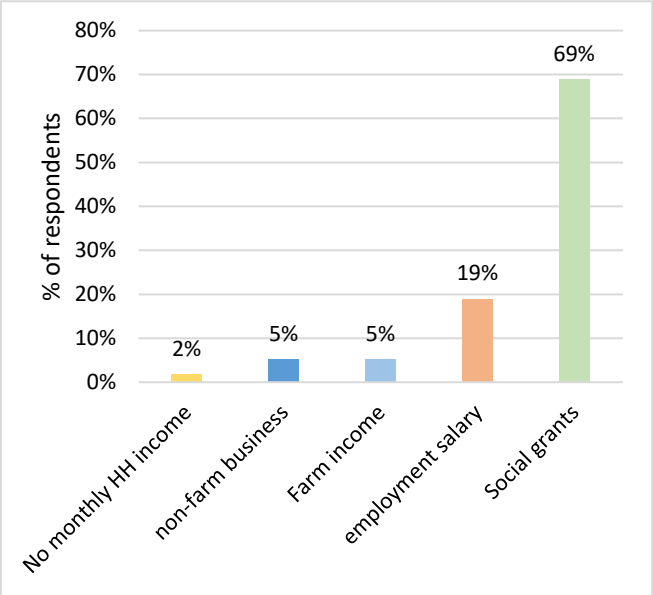
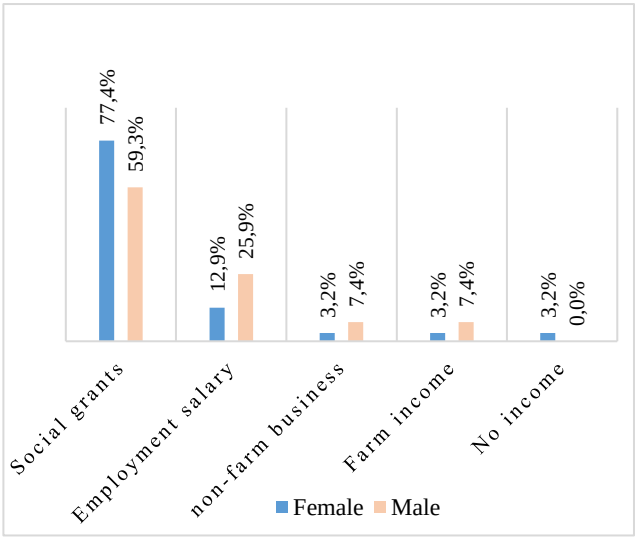


Figure 8: Main source of household income by gender of the respondents



4. Gender dynamics of sugar cane production

The average land size under cane production for the interviewed SSGs was 7ha while some farmers have a minimum of 2 ha (figure 9). Some farmers had a maximum of 26 hectares.

Figure 9: Overall minimum, average and maximum land size of cane growers

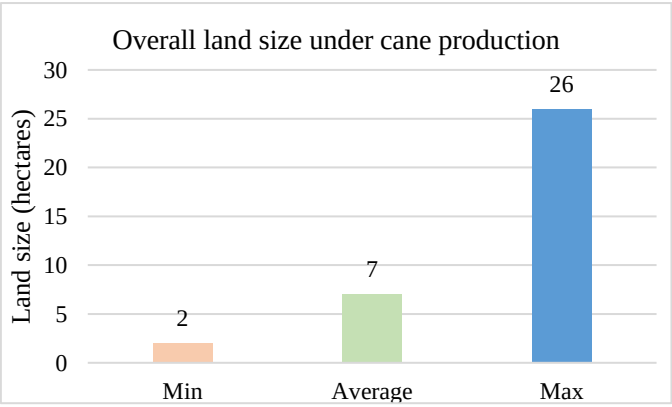


Table 8:T-test results for respondents' land size under cane production by gender of respondents

	Land size in hectares		
Gender	Mean	Std. Err.	Std. Dev.
Female	6,180645	0,517654	2,882177
Male	8,444444	1,073487	5,578002
t=-1.7181		p = 0.0528**	

**Statistically significant at 5%

The significant t-test results indicate that the differences in land size under cane production among the respondents are associated with gender. Table8 indicates that

males have bigger land sizes (8ha) under cane production than females (6ha). This could be due to the historical patriarchal nature of many rural societies where males had more access to land and land rights (Thamaga-Chitja, 2010).

Figure 10: Respondents' number of years in cane production

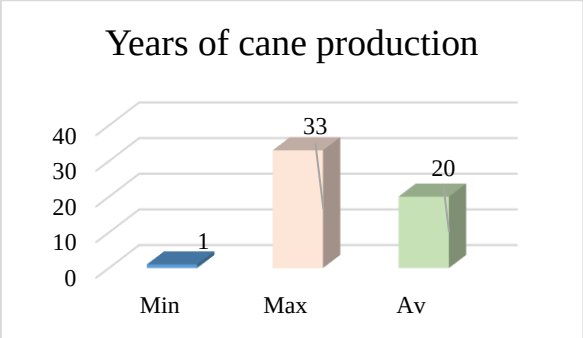


Table 9:T-test results respondents' number of years in cane production by gender

	Number of years in cane production		
Gender	Mean	Std. Err.	Std. Dev.
Female	23	0,517654	2,882177
Male	17	1,073487	5,578002
t= 2.7930		p = 0.0071***	

***Statistically significant at 1%

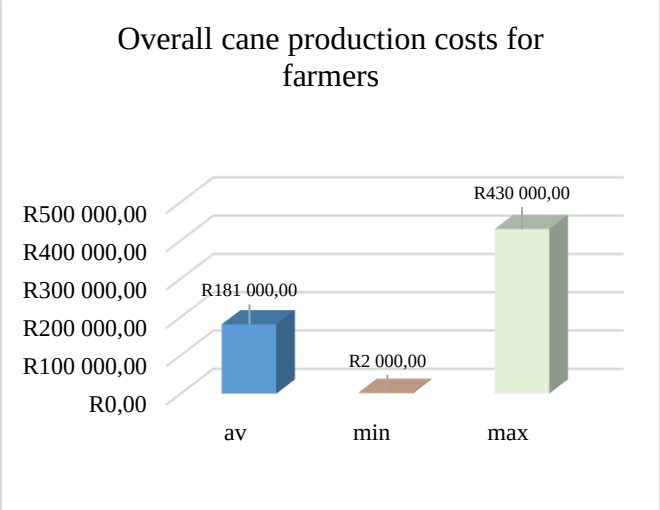
Figure10 above indicates that some farmers have been involved in cane production for a 1 year while some have been producing for 33 years. The highly significant t-test results on table suggest that female respondents have been involved in cane production longer than male respondents. The average years that females have been involved in cane production is 23 while it is 17 for males. The historical out migration of males from rural areas while females remained at home and focused on farming to sustain household livelihoods could be the reason for the result. The females having longer years of participation in cane farming could be of an advantage when it comes to challenges as experience does give one a better approach of dealing with challenges especially if they were once experienced before.

Males reported higher cane production costs compare to female respondents. This statistically significant result on table10 below could be due to male growers holding bigger pieces of land than females which results in more production inputs used and more labour.

Figure 11:Respondents' cane production cost per farming season

Table 10:T-test results for respondents' cane production costs by gender of respondents

	Number of years in cane production		
Gender	Mean	Std. Err.	Std. Dev.



Female	R159771,8	12655,83	70464,68
Male	R206037,00	16517,84	85829,2
T = -2.2540		p = 0.0281**	

**Statistically significant at 5%

The respondents were asked to recall the income they made from cane production after the production costs have been deducted during 2018/2019 season. The results on figure 12 indicate that some respondents generated a maximum income of R50 000 from cane while some made no profit at all. The average income made from cane was about R15 000.

Figure 12: Respondents' income from cane production

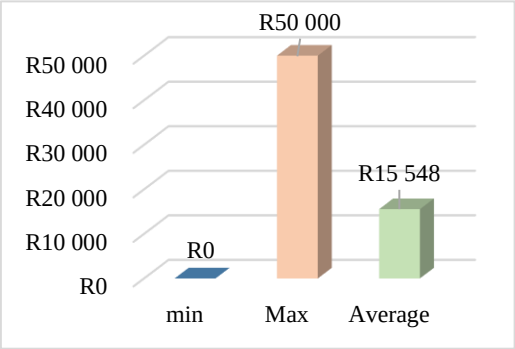


Table 11:T-test results for respondents' income from cane production by gender

	Income from cane production (in Rands)		
Gender	Mean	Std. Err.	Std. Dev.
Female	R 11793,55	2221,411	12368,29
Male	R 19859,26	4339,822	22550,38
t=-1.7181		p=0.0913***	

*** Statistically significant at 10%

The statistically significant results on table 11 above indicate that the income from cane for male respondents was higher than for female SSGs. This result could be because males had more land under cane production than females, hence the bigger income from cane.

To understand the SSGs' perception on profitability of cane production, the respondents were requested to choose from the three categories which were (i)

Profitable (ii) Break-even and (iii) non-profitable. While a significant number of respondents reported that cane production was unprofitable (53%) (figure 13), the chi-square results on table12 shows that the perception was not associated with gender. The table illustrates that 52% and 55% of males and females, respectively, felt that cane production was not profitable.

Figure 13: Perceived profitability of cane production by SSGS

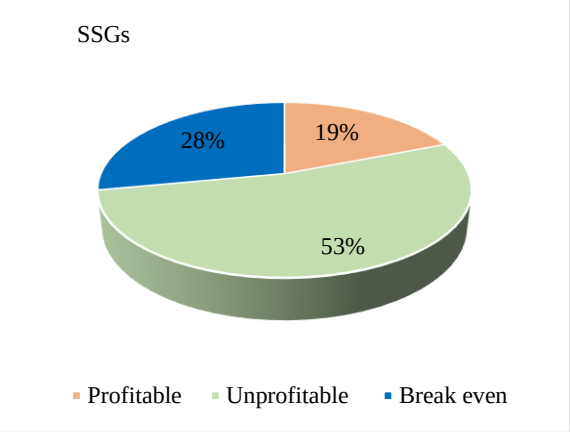


Table 12:Chi-square results of respondents' profitability perception by gender

	Profitability perception			Total
Gender	Unprofitable	Break-even	Profitable	
Female	55%	26%	19%	100 %
Male	52%	30%	18%	100 %
Pearson X^2 (2) = 0.1059 p = 0.948^{ns}				

Note: ^{ns} means not statistically significant

5. Gender, access to services and skills gaps

5.1 Gender and access to support to services

Success of farmers lies in access to support services such as training, access to inputs, loans, extension and cooperative membership (Sinyolo, 2014). Farmers were asked whether they had received any agriculture related training in the past 12 months. Figure 14 indicates that 79% of the respondents received some kind of agricultural training while only 21% did not. The chi-square results on table 13 suggest that there was no significant gender difference in accessing agricultural training. The relatively similar percentages of males and females who received training suggests that there was no association with gender.

Figure 14:Percentages of farmers who received agricultural related training in the past 12 months

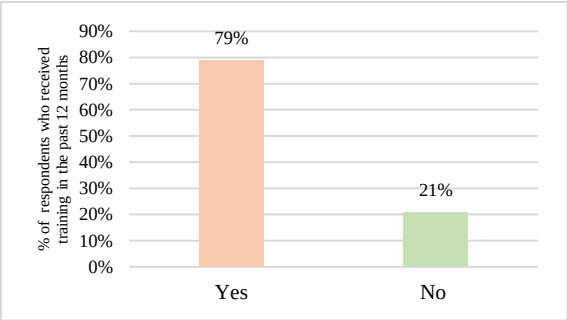


Table 13:Chi-square results on respondents who received agricultural training by gender

	Agricultural training received?		
Gender	Yes	No	Total
Male	74,07%	25,93%	100%
Female	83,87%	16,13%	100%
Pearson X^2 (2) = 0.8441 p= 0.358^{ns}			

Note: ^{ns} means not statistically significant

During the FGDs, growers reported that they have loan services who offer loans for farming at an interest of between 12% and 15%. Majority of respondents (83%) reported that they had an active farming loan. However, there was no association between a respondent having a farming loan and their gender (table4).

Figure 15: Percentage of growers who had an active farming loan

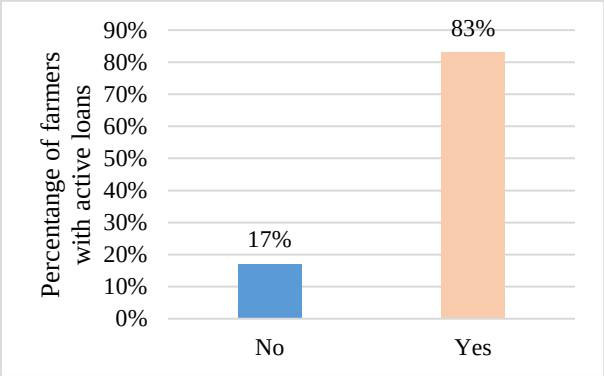


Table 14: Chi-square results of respondents who had active farming loans by gender

	Active loan?		Total
Gender	No	Yes	
Male	22,22%	77,78%	100%
Female	12,9%	87,1%	100%
Pearson X^2 (1) = 0.8783 p=0.349^{ns}			

Note: ^{ns} means not statistically significant

Extension officers or agricultural advisor are the crucial support services for small-scale farmers and play a vital role in the success of many farming communities. The respondents were asked to recall the number of times they had engaged or had a visit from the extension officers or advisors. While the average times that growers had a visit from advisers/extension officers was 34, some farmers had 120 and some had only 2 visits in the past 12 months (figure 16). The 120 visits were reported by farmers from Magudu whom during FGDs reported that they have a fulltime employed advisor who plays a vital role in advising and managing their farm.

The chi-square results on table 15 indicate a highly significant association between gender and number of extension visits. Males had an average of 50 visits while females only had 20 visits in 12 months. The respondents reported during the FGDs that the advisers/extension officers normally arrive in their farms at around 1pm. Females mentioned that during this time they would have left the farm to go to their homes to prepare for children before they come back from school.

Figure 16: Number of adviser/extension visits in the past 12 months

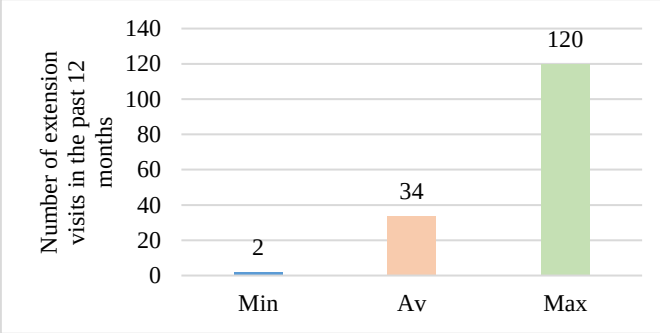


Table 15:T-test results on number of extension visits by gender

	Number of extension visits		
Gender	Mean	Std. Err.	Std. Dev.
Female	20	4,900898	27,28704
Male	51	9,709069	50,4498
t=-1.7532		p=0.0053***	

***Statistically significant at 1%

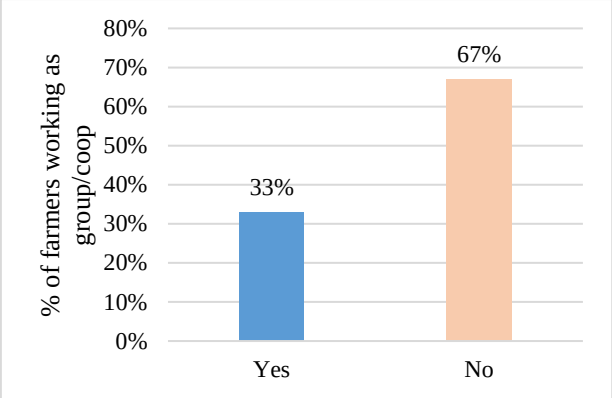
The interviewed respondents are all members of farmers' association based in each of the irrigation schemes the respondents are farming under. Most farmers reported that they were farming individually on their plots while some reported that they farmed as a collective. Table 16 below indicates a significant relationship between working as a group and gender. The results suggest that males are more likely to work as a group that females. This finding is not consistent with various studies who have reported that women are more likely to participate in collective action.

Figure 17: Percentage of farmers working as a cooperative/farming group

Table 16:Chi-test results of farmers working as a group by gender

	Working as a coop/farming group		
Gender	No	Yes	Total
Female	93,55%	6,45%	100%
Male	69,23%	30,77%	100%
Pearson $X^2(1)$= 5.7803 p= 0.016**			

**Statistically significant at 5%



Since all the interviewed SSGs were members of farmers' associations, the respondents were requested to list the benefits of being members if there were any. A multiple response chi-square test of association was conducted to analyse the relationship between the respondent's list of benefits and gender. Figure 18 and table 17 illustrate the benefits that were listed by male and female respondents. The chi-square results on table 17 indicates that there was a statistically significant association between gender of the respondent and the benefits listed. While there are no benefits which were dominantly listed by males, females had majority of respondents who listed (i) Better loan access and payment (78%) (ii) Gives a voice (80% (iii) Share input costs (80%).

Figure 18: Benefits of being association member by gender of the respondents

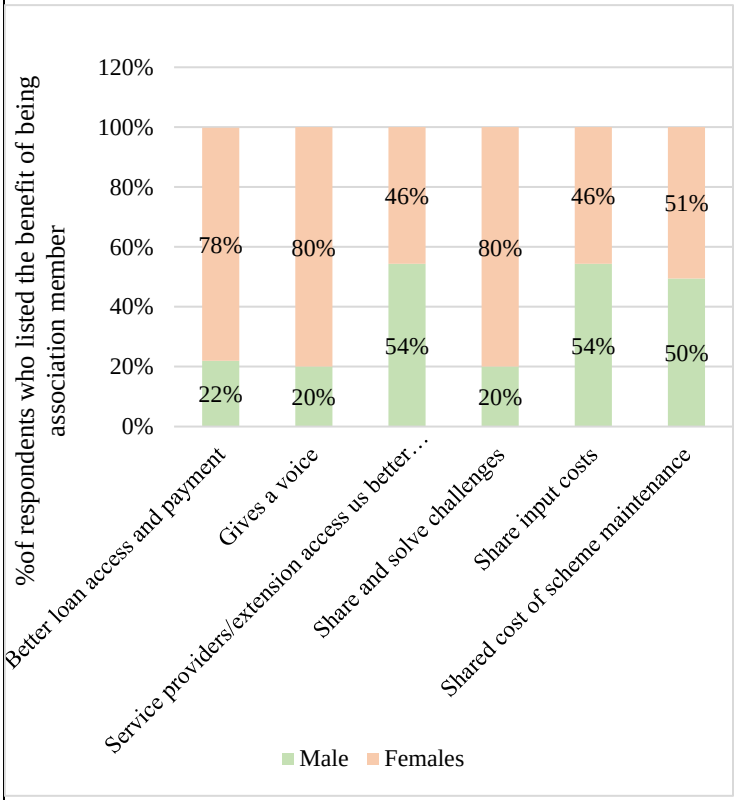


Table 17: Frequency and chi-square results of respondents who listed the benefits of being association member by gender

Benefits of being association member	**Frequency by gender**	
	Male	Females
Better loan access and payment	2	7
Gives a voice	2	8
Service providers/extension access us better in groups	31	26
Share and solve challenges	31	26
Share input costs	2	8
Shared cost of scheme maintenance	31	26
Pearson $X^2(2) = 5.9595$ p= 0.051**		

**Statistically significant at 5%

5.2 Critical skills

To understand their perception of skills that are critical to SSGs, respondents were asked to list at least five skills that they consider critical in cane production. A multiple response chi-square test of association was conducted to analyse the association between the respondent's list of critical skills and gender. The table illustrates thirteen skills that were listed by the respondents as critical and also shows the frequency of how many respondents listed a particular skill. The five mostly listed critical skills were (i) Fertilizer application which was listed by majority of the respondents (76% of the

sample), followed by (ii) Pests and disease control (74%), (iii) irrigation of crops (67%), (iv) Weed control (55%) and (v) Soil preparation.

The table below highlights the different skills that were listed by males and females. While the percentages of males and females who listed particular skills are relatively similar, chemical mixing was one skill whereby there was a significant difference in percentage of females who felt that it was a critical skill (75%). The result implies that female respondents felt that chemical mixing is a critical skill more than males (25%).

Table 18:Critical skills list

Critical skills	**Frequency of respondents who listed the critical skill out of 58**	**% of respondents who listed the critical skill out of 58**	**% of respondents who listed the critical skill by gender**		
			Female	Male	Total percentage by gender
Budgeting	19	33	58	42	100
Cane husbandry	12	21	50	50	100
Chemical mixing	4	7	75	25	100
Fertilizer application	44	76	55	45	100
Irrigation maintenance	16	28	38	62	100
Irrigation of crops	39	67	59	41	100
Knowledge of good seed varieties	12	21	33	67	100
Pests and disease control	43	74	56	44	100
Production cost calculation	17	29	53	47	100
Seed application	19	33	47	53	100
Soil preparation	26	45	50	50	100
Soil testing	5	7	60	40	100
Weed control	32	55	59	41	100
Pearson X^2 (31) = 37,2441 p=0.204					

5.3 Scarce skills

The respondents were asked to list at least 5 skills that they consider scarce in the cane growing industry. A multiple response chi-square test of association was conducted to analyse the association between the respondent's list of scarce skills and gender.

Table 19: Scarce skills list

Scarce skills	**Frequency of respondents who listed the scarce skill out of 58**	**% of respondents who listed the scarce skill**	**%of respondent who listed the scarce skill by gender**		
			Female	Male	Total percentage
Budgeting	18	31	72	28	100
Chemical mixing	9	16	56	44	100
Fertilizer application	7	12	57	43	100
Health and safety	12	21	33	67	100
Irrigation maintenance	13	22	54	46	100
Irrigation of crops	3	5	67	33	100
Knowledge of good seed varieties	20	34	40	60	100
Pests and disease control	18	31	78	22	100
Production cost calculation	7	12	71	29	100
Production planning	4	7	50	50	100
Pump operation and fixing sprinklers	19	33	47	53	100
Seed analysis	4	7	50	50	100
Soil testing	14	24	36	64	100
Time management	6	10	33	67	100
Weed control	6	10	53	47	100
Pearson X^2 (42) = 45,278 p=0.337					

The results indicate that the percentages of respondents who listed any of the scarce skills were relatively similar, with no skill listed by the majority of the respondents. It is noted from the results that the 'pump operation and fixing of sprinklers' was listed by the bigger percentage of the respondents (33%) than other scarce skills and the majority of those who listed the skill was males (53%). During the FGDs, farmers

reported that at times they experience hindered access to water due to irrigation sprinklers getting blocked by sand or not having someone to operate the pump. Farmers would then have to pay and wait for the services of fixing minor issues at the expense of their crops dying as a results of prolonged waiting. Farmers reported that if they could get trained on maintenance and operation of the irrigation scheme, challenges such as crop loss could be eliminated.

Knowledge of good seed varieties was also listed as a scarce skill by a significant number of respondents (34%). Farmers reported during the FGDs that they would like to learn about seed varieties that would strive under harsh conditions such as drought and still yield maximum production.

The results also indicated that female respondents were the majority who listed 'Pests and disease control (78%), Budgeting (72%) and Production cost calculation (71%)' as scarce skills. The result indicates that female respondents realised that these business skills are scarce than male respondents.

5.4 Production skills training needs

To ensure successful cane production, farmers are required to have certain skill. To understand the production skills gaps, the respondents were requested to list the production skills they need to be trained on. A multiple response chi-square test of association was conducted to analyse the association between the respondent's list of production skills training needs and gender. On one hand, production skills such as Pests and disease control (78%), Irrigation scheme management (59%), Cane husbandry and Knowledge of good seed varieties (50%) were listed by most of the respondents as training they require. On the other hand, fertilizer application (19%) and Seed application (5%) were the least mentioned production skills that respondents required to be trained on. Overall, the results on table 19 shows that production training across all levels of production (before harvesting), starting from soil amending, planting the seeds, taking care of the crops, protection from weed and pests and diseases to managing the irrigation.

It is worth noting that it was female respondents only (100%) who listed seed application as production skill training they required. Majority of respondents who listed

weed control as training required were also females (72%). Male respondents were more interested in receiving training on skills such as soil testing (65%) and knowledge of good seed varieties (59%).

Table 20: Respondents' production skills training needs

Production skills training needs	Frequency of respondents who listed the production skill training need out of 58	% of respondents who listed production skill training need	%of respondent who listed the production skill training need by gender		
			Female	Male	Total
Cane husbandry	29	50	52	48	100
Chemical mixing	18	31	56	44	100
Fertilizer application	11	19	45	55	100
Irrigation scheme management	34	59	62	38	100
Knowledge of good seed varieties	29	50	41	59	100
Pests and disease control	45	78	62	38	100
Production planning	10	17	60	40	100
Seed application	3	5	100	0	100
Soil testing	17	29	36	65	100
Weed control	18	31	72	28	100
Pearson X^2 (37) = 33,018 p=0.653					

5.5 Business skills training needs

To generate this variable, the respondents were asked a question whether they required training on the five business skills listed in the table below. The table below indicates that the percentages of males and females who reported that they require any of the listed business skills were relatively the same. The results on table 20 indicate that 'business acumen/negotiation skills' (88%) followed by 'budgeting skills' (76%) were listed by the majority of respondents as required skills. This could imply that farmers realise the need to treat their farming as a business instead of just an enterprise.

During the completion of the survey questionnaires, it was observed that even though the questionnaire was written in the local language, majority of the respondents lacked the reading and writing skills. Those respondents preferred that enumerators read the

questions for them and they give their responses. This indicated and emphasised the need for training on reading and writing for the SSGs.

Table 21: Respondents' business skills training need

Business skills required	% Respondent require training on business skills out of 58 respondents?		% of respondents who answered 'yes' to required business skills by gender		Chi-square results	
	No	Yes	Female	Male	Pearson X^2 value	Probability
Writing	35	65	55	45	$X^2(2) = 1.2035$	0.548
Budgeting	24	76	52	48	$X^2(1) = 0.1012$	0.750
Reading	38	62	56	44	$X^2(1) = 0.1694$	0.681
Counting	33	67	54	46	$X^2(1) = 0.0076$	0.931
Business acumen/negotiation skills	12	88	57	43	$X^2(1) = 1.9801$	0.159

5.6 Challenges experienced in cane production

To understand the challenges SSGs experience in the cane growing industry, the respondents were requested to list the challenges and the multiple response chi-square test was used to analyse the frequencies and association of responses to gender.

High production/transaction costs was listed as a challenge by majority of respondents (90%). During the FGDs, farmers reported that they spend a lot of money and time in production of cane and get a relatively low income in return. This challenge could be referenced by the results in tables 11,12 and 13 which indicated that farmers spent significant amounts on production cost on cane production while very little income was generated and that lead to majority of respondents saying cane production is not profitable.

Out of the 58 respondents, 32 (53%) reported that repayments of farming loans were taking too long and that was a challenge. During the FGDs, a significant number of farmers reported that ever since they took the loans, they have never seen profit and feel like the loan repayments take all the money. The concern that growers might never

be able to be independent and sustainably run their cane growing business due to the fact that since they started farming they took loans which as they pay for, they can't have enough to save to the next replanting season. This forces farmers to re-borrow after finishing the payment of the first loan and this chain seems to be unbreakable.

Poor condition of irrigation infrastructure was also listed by a slightly bigger percentage of respondents (36%) compared to other challenges. During the FGDs in all the four studies areas of data collection, farmers reported that they have experienced water shortages due to pump breakage, pipe burst, water pipe not reaching water level in the river or the water sprinklers not working. The mentioned challenges mean that proper management or renovation of irrigation infrastructures is required to address the water challenge.

The table also indicates that challenges such as cane theft (83%) and wild animals and livestock grazing on crops (77%) and Lack of access to grants and funding (75%) were listed by female respondents while majority of those who listed production land too small (100%), load shedding (83%) and limited hours of irrigation (75%) were males.

It was an interesting observation that only males reported their land sizes to be too small as a challenge while the findings on table 8 in the previous section indicated that female farmers have smaller sizes of land than males.

Table 22: Challenges experienced by respondents in cane production

Challenges experienced by SSGs	**Frequency of respondents who listed the challenge out of 58**	**% of respondents who listed the challenge**	**%of respondent who listed the challenge by gender**		
			Female	Male	Total
Cane buyer demands early harvest of cane which leads to reduced profit	12	21	58	42	100
Cane theft	6	10	83	17	
Drought/water shortages	19	33	47	53	100
High production/transaction costs	52	90	54	46	100
Lack of access to grants and funding	16	28	75	25	100
Limited hours of irrigation	8	14	25	75	100
Load shedding	6	10	17	83	100

Loan repayment taking too long	31	53	52	48	100
Low water level/pressure for irrigation	11	19	55	45	100
Not understanding the pricing of cane	27	47	44	56	100
Planting and harvesting season planned by extension officers without consulting farmers	7	12	57	43	100
Poor condition of irrigation infrastructure	21	36	43	57	100
Production land too small	7	12	0	100	100
Theft of irrigation infrastructure	17	29	59	41	100
Wild animals and livestock grazing on crops	13	22	77	23	100
Pearson X^2 (52) = 55,9904 p=0.328					

5.7 Priority interventions

SSGs were requested to list at least two priorities that they would like to have looked at first by the SETA and other relevant stakeholders. The aim of this activity was to get an idea of what are the urgent interventions required. Overall, the priorities that were listed by a bigger number included (i) Support with farming capital and inputs (38%) (ii) Training on irrigation water management (29) and (iii) Training on budgeting (21%).

While only 1% of the respondents listed training on writing as an intervention that needs to be prioritised, this does not disregard the results on table 20 above which indicated that 65% of the respondents reported that they require this kind of training. The results also indicate that 100% of responses that considered this training as a priority intervention were females.

It is worth noting that while the percentages of males and females who listed a particular priority intervention are relatively similar, the SSGs who listed 'Support for fixing irrigation infrastructure' as an intervention required were all males (100%). This could be because in most societies males are more associated with hardware activities, fixing things, hence the concern for the irrigation infrastructure.

Table 23: List of priority actions

Priority actions	**Frequency of respondents who listed the priority action out of 58**	**% of respondents who listed priority action out of 58**	**%of respondent who listed the priority actions by gender**		
			Female	**Male**	**Total**
Funding for fence	9	15	67	33	
Funds for extension of suction pipe to reach water level	2	3	50	50	100
SETA to provide mentorship programme	9	15	56	44	
Support for fixing irrigation infrastructure	3	5	0	100	100
Support with farming capital and inputs	22	38	59	41	100
Training on application for grants/funding	11	19	82	18	100
Training on budgeting	12	21	50	50	100
Training on business management	3	5	67	33	100
Training on irrigation water management	17	29	41	59	100
Training on pests and disease control	4	7	75	25	100
Training on soil testing	10	17	40	60	100
Training on writing	1	1	100	0	100
Pearson x2 (29) = 25,2442 p=0.666					

5.8 Priorities and NSDP

The National Skills Development Plan (2030) supports the transformational and redress imperatives in South Africa through a strong focus on addressing equity in relation, amongst others, to gender and youth (Department of Higher education and training, 2019).

The National Skills Development Skills Plan's outcome 6 recognises the need for development support for entrepreneurship and cooperative development, which include small-scale farmers and farmers' associations in this case (Department of Higher education and training, 2019). The NSDP recognises that entrepreneurship and cooperative development is less about obtaining formal occupational qualifications and more about applied, peer and mentored learning and support (Department of Higher education and training, 2019). The priority interventions that are listed above are consistent with the interventions by the NSDP. Hence, the support of farmers with equal access to information, equal access to resources and capital, support with development of production skills and business skills and support with access to mentorship should be prioritised to fulfil the goals of the NSDP.

6. Conclusion and recommendations

The results and discussions above have indicated inequalities in access to resources and services, and different skills needs by gender of the respondents.

The majority of the SSGs interviewed were females, however, this does not imply that Mpumalanga cane production industry had more females than male grower.

While the female respondents had the higher age in average than males, they also had longer years of participating in cane production than males. The survey findings indicated that female farmers had limited sources of household income compared to males while they also had lesser monthly household income and even lower income from cane production.

The results have shown that female respondents had unequal access to very crucial production resources and services such as land and extension support services than males. The males holding bigger land pieces and having more access to extension support services than females could be a burden to female farmers and could result in lesser productivity to females.

The results indicated that there are gender differences in skills that respondents consider critical. While critical skills such (i) Fertilizer application (76% of the sample), followed by (ii) Pests and disease control (74%), (iii) irrigation of crops (67%), and (iv) Weed control (55%) were listed by majority of the respondents, there was also a clear indication that majority of farmers who considered chemical mixing skills were females (75%).

There results also indicated gender differences in skills that growers consider scarce. On one hand, majority of male respondents are the ones who listed skills such as 'knowledge of good seed varieties (60%) and 'pump operation and fixing of sprinklers' (53%). On the other hand, majority of respondents who listed skills such as Pests and disease control (78%), Budgeting (72%) and Production cost calculation (71%) were females.

The minor gender differences in production training skills required was highlighted by the results. It was noted that 'seed application' as a production skill required was only listed by female respondents. Weed control with 72% of respondents who listed it being females also suggested that majority of female respondents required the skill compared to males.

There were no clear gender differences noted on the respondents' business training requirements. The results showed that an average of 72% of total respondents required all five business skills that were listed but the majority (88%) required business acumen/negotiation skills.

Gender indifferences were also highlighted from the lists of challenges the SSGs experience. Female respondents reported challenges such as cane theft (83%), wild animals and livestock grazing on crops (77%) and lack of access to grants and funding (75%) while male respondents reported challenges such as production land being too small (100%), load shedding (83%) and limited hours of irrigation (75%).

Another gender differences were identified on the priority interventions required by the growers. It was noted that all the respondents who were interested in training on writing skill as a priority were females (100%) while 100% of those who listed support for fixing irrigation infrastructure were all males (100%). Another observation was that females wanted training on application for grants/funding prioritised (82%), Training on pests and disease control (75%) and funding for fence (67%) to be prioritised.

Various gender inequalities or differences in access production resources, access to support services and skills gaps between males and females SSG have been outlined by this report.

This study then recommends that the relevant role players, stakeholders and development bodies consider improving equal access to land and extension support for both males and females. About the issue of extension visits, SSGs mentioned that extension officers/advisers normally visit the farms in the afternoons when female farmers are gone home to prepare lunch for their families. This social issue needs to be put into account upon planning farm visits to ensure access and support to all the growers.

It is recommended that RCL put measures in place to train famers on Adult Education and Learning intervention for growers who require training in literacy and numeracy. The same applies for training required by farmers on production skills and other interventions that look at cooperatives development could be implemented within farmers' associations.

The issue of youth not willing to participate in cane production has to be addressed. Strategies on ways of making cane growing industry attractive to youth may be developed and implement. The Sugar Industry Master plan could introduce a solution to this challenge by developing new skills needs which might attract youth into the industry.

To ensure self-sustained and maintained production of cane by the SSGs, the following are recommended based on the results and observations:

- Basic training on reading and writing should be the first intervention before in-depth training on business skills. It was observed that some farmers could not understand the invoice they presented to us from the cane buyer. It is of

relevance for a farmer to be able to understand the deductions and gross income from cane when they look at their statement since it will guide them on whether there were loses or gains. However, it was not the case with the respondents.

- Farmers need to be trained on maintaining of the irrigation scheme. For famers to be less dependent on external service providers who maintains their irrigation schemes, it is recommended that farmers learn how to replace sprinklers, fix burst pipes and operate the engine pumps.
- Farmers need to have knowledge of production planning. It is necessary that farmers understand the planting and harvesting seasons and learn to decide on their own, with less dependence from the advisors. This is to make sure that in the absence of the advisors/extensions, farmers can produce on their own.
- Farmers reported that they are not familiar with the seeds varieties to use, application of fertilizer, pests and diseases control, weed control and mixing chemicals in general. They further reported that the reason for this is because they depend on contractors whom they hire to perform the mentioned farming activities. Therefore, it is crucial that farmers receive training on these critical skills to make sure that they can perform these activities on their own even when they have access to contractors.
- Capital for farming is a crucial essential for farming. Farmers reported that they have access to farming loans which majority of the respondents were currently repaying. However, they also reported that it has been difficult for them to save any of the income from cane for the coming production seasons which forces them to continue depending on loans. A relief from loans and support with grants should give farmers a start into saving income from cane for the next planting seasons. Therefore, as listed by farmers under priority interventions, it is recommended that farmers receive capital support.

Considering the age of majority of the farmers, this study estimates that with the above recommendations implemented, it could take up to two production seasons at least for growers to be less dependent to external stakeholders such as extension/advisors and contractors.

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8. Annexures

Annexure 1: **Survey Questionnaire attached**

Annexure 2: **Focus Groups Discussions Photos**

Photo: Nhlangu West Small-scale sugarcane growers

Photo: Magudu Small-scale sugarcane growers