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INFORMATION AND TRAINING NEEDS OF COTTON FARMERS ON THEIR FARMING ACTIVITIES IN ZAMBIA

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Abstract

A major reason for farmers' poor yield of farm products and low returns may be adduced to dearth of statistics and teaching about their farming activities. This study, thus, focused on the cotton farmers' information and training needs required their farming activities in Zambia. A simple random sampling technique was used to select 86 cotton farmers for the study. Descriptive statistics were used to examine the data collected while the Kruskal-Wallis H test was used to test the hypothesis. The results revealed that the mean age of the cotton farmers was 45 years while their average yearly income was ZMW 2061.62. The cotton farmers' attendance of business skill development training ($\chi 2 = 14.9$), steady farm budget operations ($\chi 2 = 5.16$), consistent farm financial analysis execution ($\chi 2 = 4.96$) and information and training needs on fertilizer ($\chi 2 = 12.56$), pesticides ($\chi 2 = 4.69$), labour ($\chi 2 = 17.7$), sources of inputs ($\chi 2 = 19.78$), cost on household expenses ($\chi 2 = 8.68$), methods of calculating profit from farming activities ($\chi 2 = 5.18$), income generation from farming activities ($\chi 2 = 5.97$) and non-farming activities ($\chi 2 = 6.02$) were significantly different in the agro-ecological regions of Zambia. The study concluded that cotton farmers' training needs are location-specific. Meaningful and effective training, therefore, require that training institutions need to identify the training needs of farmers in the different agro-ecological regions and develop appropriate training modules for these different regions. This has the potential of higher returns of farm-based productivity and profitability of cotton farmers in Zambia.

Key words**:** *Zambia, information, training, needs, cotton, farmers*

INTRODUCTION

Cotton remains amongst Zambia`s foremost crops positioning next to the basic food products such as maize with respect to its importance and the number of agrarians who cultivate it. Nearly three hundred thousand agrarians produce cotton by the year and making total joint returns of almost US40 Million to the country [12].

Training is the deed of aggregating the understanding and abilities of an individual(s) in undertaking a specific job [20]. This typically focused on enhancing the skill of an individual to do his/her job well. It is the need as the gap between what is going on at present and what ought to go on [22]. It is the gap between the present and the standard level of work output. The training needs of farmers are dissimilar and differ from one crop to another crop [9]. It is important because it induces enthusiasm, builds self-confidence and indoctrinates competence in an individual [1]. It is inevitable for conveying new understanding and bring up-to-date the abilities of the farmers. However, the training of farmers had anticipated added significance and resolution as inputs are being used arbitrarily, not properly sourced for, unsteady farm budget operations and inconsistent farm financial analysis execution by farmers in cotton crop production [20]. Pest prevalence is the main problem of cotton farmers owing to use of indigenous varieties [3; 14; 15; 21; 23].

In order to achieve the goal of reducing the loss of farm output and to be environmentally friendly, farmers have to be prudent in the use of farm inputs with respect to cost, dosage, time, source and method of application with the objectives of maximizing cost-benefit

ratio and output at minimum cost to maximise profit and satisfaction [16].

In regard to the aforementioned issues, this study examined the following objectives: To

(i) profile the personal characteristics of the Zambian cotton farmers;

(ii) assess the production characteristics of the Zambian cotton farmers;

(iii) estimate the training and record-keeping experience of the Zambian cotton farmers;

(iv) evaluate the information and training needs of the Zambian cotton farmers;

(v) determine the factors responsible for Zambian cotton farmers not keeping records.

Based on the objectives of the study, the following hypotheses were tested.

H_{01}: There are significant differences in cotton farmers' training and record-keeping experience in the Agro-ecological regions of Zambia.

H_{02}: There are significant differences in cotton farmers' information and training needs on the farm activities in the Agro-ecological regions of Zambia.

MATERIALS AND METHODS

Study area

The study area is the agro-ecological regions of Zambia. Cotton is a semi-arid crop. It is grown in fringe, little or modest precipitation regions [11; 18]. The foremost cotton-producing provinces in Zambia are Eastern, Southern and Central provinces [17]. Based on agro-ecological characteristics, Zones 1 (AEZ 1) and 2a (AEZ IIa) [10] are the major cotton-producing areas in Zambia. The agro-ecological zones are defined on the base of precipitation array and soil features. Region I obtains less than 800 millimetres of rainfall annually and set up 12 percent of Zambia's aggregate terrestrial space. It entails of loamy clayey soils on the gorge ground and rough to fine loamy trivial soils on the cliff. It is also regarded by small rainwater, dumpy emergent periods, great warmth during the growing seasons, and high threat of dearth. Region II takes rainfall between 800 to 1,000 millimetres on a yearly base and the region institutes 42 percent of the country. It is sub-divided into two, namely, Region IIa (Central, Lusaka, Southern and Eastern fertile plateau of the country and largely comprises intrinsic rich soils) and Region IIb (Western Province and contains sandy soils). Region III is considered by high rainfall between 1,000 up to 1,500 millimetres each year, extended emergent times, low likelihood of famine, and serener heats during the growing term. This region creates 46 percent of the country's total land area. It covers the Copperbelt, Luapula, Northern and North-Western Provinces. Cotton is a drought-tolerant crop and obtains the right amount of rainfall when planted in AEZ Region 1. Cotton production is severely intense in Eastern, Central and Southern provinces respectively [24]. On the other hand, the attentiveness intensities are not as high as likened to food crop production [26].

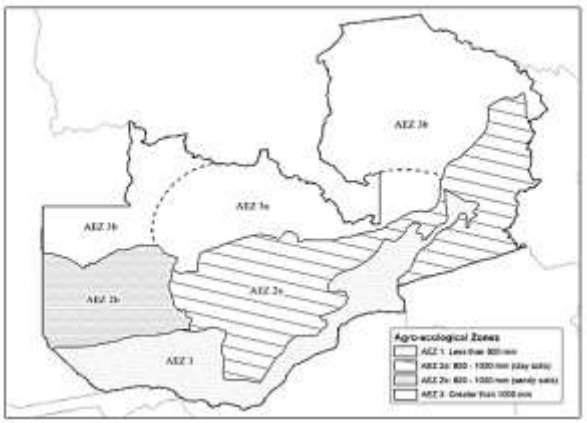

Fig. 1. Agro-ecological zones of Zambia
Source: [10].

Sampling procedure and sample size

Cross-sectional primary data were collected using the survey method. Interviews were conducted using the questionnaire. Simple random sampling technique was used in picking 105 cotton farmers (35 cotton farmers from each region) from the list of 150 cotton farmers (50 cotton farmers from each region serving as the sample frame) who attended the Farmers Business School training session. Only 86 cotton farmers responded to the questionnaire administered constituting about 71% of the sample frame. The data collected were analysed and used for this study.

Data Analysis

Descriptive statistics: These include the use of means, percentages and frequencies. These were used to present the personal

characteristics of respondents and other analysis of subsequent objectives.

Kruskal-Wallis test: This is a one-way analysis of variance by ranks. It tests the insignificant guess that multiple self-determining samples come from the same population. Not like standard analysis of variance, it does not shoulder normality, and it can be used to test ordinal variables. The nonparametric tests for various autonomous samples are useful for determining whether or not the values of a particular variable differ between two or more groups. This is exclusively true when the expectations of analysis of variance are not met.

RESULTS AND DISCUSSIONS

Personal Characteristics of respondents

Table 1 presented the distribution of personal characteristics of the respondents. The result showed that the mean age of the farmers was nearly 45 years while majority of the respondents (60.5%) were above the age of 40 years. This indicated that the cotton farmers were relatively middle-aged. Although it is speculated that the older age group of farmers may affect cotton production in the study area. This finding is supported by [25] who disclosed that cotton farmers in Zambia, had an average age of 47 years while [17] disclosed an average age of 48 years. Besides, the majority (81.5%) of the respondents were male. This is an indication that male farmers dominated cotton production in the study area. This is consistent with other studies which showed that there are fewer female farmers than male farmers participating in the agricultural related activities [5; 6; 7]. Moreover, 94.6% of the respondents were married. Farmers' marital status was an important factor in affecting the production participation decision. It is a proxy for other factors such as household size in explaining the production participation decision [17]. The marital status of the farmers may be adduced to the fact that the societies and culture expect matured individuals particularly farmers to get married. Often times the wives and children see to assist the farmers on their farms. This is an indication that more members of the farm family are likely going to be available for cotton production thus increasing cotton production. This is an advantage because the availability of the farm family members on the farm may reduce the labour cost on the farms. Family labour is an important component of labour for small farmers, because the pressure by the large family size, could lead to land fragmentation, therefore, small farm holdings tend to abound [4]. The effect is that such farmers who are challenged by insufficient land area may not readily adopt an extension package that requires large scale farming. This finding corroborates [17] who reported a high percentage of cotton farmers to be married.

More than half of the respondents (53.1%) had primary school education. The level of education is an important attribute of farmers in decision making. This finding implied that the majority of respondents spent relatively few years in school [25]. They had the basic educational ability to read and write. This might have been helping them to read instructions during seminars and training. It is an important factor in the success of seminars, workshops and training presented. [17] noted that the educational level of the farmers was significant in influencing their production participation decision. This seems to reflect the level of decision making that takes place in crops production. It reflects positively on the level of their decision making on the varieties of crops produced.

Table 1. Personal characteristics of respondents

Personal Characteristics		Region			Total (N=86)
		1 (n=30)	2 (n=32)	3 (n=24)	
Age (Years) $\bar{x} = 44.58$ $\sigma = 12.83$	≤ 30	13.3	21.9	12.5	16.3
	31 - 40	23.3	34.4	8.3	23.3
	41 - 50	26.7	21.9	50.0	31.4
	≥ 51	36.7	21.9	29.2	29.1
Education Level	Vocational	3.4	6.7	13.6	7.4
	Primary	65.5	60.0	27.3	53.1
	Secondary	31.0	30.0	59.1	38.3
	Diploma	0.0	3.3	0.0	1.2
Marital Status	Married	90.0	87.1	100.0	91.6
	Not Married	10.0	12.9	0.0	8.4
Sex	Male	86.2	82.8	73.9	81.5
	Female	13.8	17.2	26.1	18.5

Source: Own Calculation.
Note: Values are in Percentages.

The results further revealed that majority of the respondents (67.5%) had more than 4

children. The average number of children of the respondents was approximately 6 children. Majority of the respondents (84.6%) made sure that their children assisted them on the farm. This is an indication that the large household size of the farmers is as a result of the need for assistance by the household members. Household size is an important variable especially in crops which are labour intensive such as cotton. However, other studies such as [2; 8] found a positive relationship between large family size and efficiency. Their argument was that large household size enhances the availability of labour which may guarantee increased efficiency. Furthermore, 94.6% of the respondents reported that they planted other crops apart from cotton, although, 74.1% considered cotton production as a productive, profitable and worthwhile business. The average yearly income of the respondents was ZMW 2,061.62, and 84.6 % of these cotton farmers indicated that they made about ZMW 2,000 as their yearly income.

Table 2. Production characteristics of respondents

Production Characteristics		Region			Total (N=86)
		1 (n=30)	2 (n=32)	3 (n=24)	
Children $\bar{x} = 6$ $\sigma = 3$	≤4	36.7	37.5	20.8	32.6
	4-7	36.7	34.4	33.3	34.9
	≥8	26.7	28.1	45.8	32.6
Child labour	Yes	84.2	83.3	85.7	84.6
	No	15.8	16.7	14.3	15.4
Other crop(s) production	Yes	88.9	93.3	100.0	93.6
	No	11.1	6.7	0.0	6.4
Cotton production is profitable	Yes	82.8	51.6	95.2	74.1
	No	17.2	48.4	4.8	25.9
Av. Yearly Income (ZMW) $\bar{x} = 2061.62$ $\sigma = 1512.19$	≤2,000	82.4	91.7	80.0	84.6
	≥2,001	17.6	8.3	20.0	15.4

Source: Own Calculation.
Note: Values are in Percentages.

Training and record keeping experience of respondents

Table 3 showed the respondents' training and record-keeping experience. Results revealed that most of the respondents (51.2%) had not attended any pieces of training on business skills development in the past. This implied that the majority of the farmers had not gotten the experiences of farm business management training, workshops and seminars on business development and these experiences are been found useful to them. [19; 26] stated that the inexperience of farmers on training and record-keeping warrants the need for organising training sessions for farmers and serve as the platform for organising training classes. Many (60.8%) of these cotton farmers indicated that they have not been keeping records of activities on their farms. Majority of the farmers (62.7%) further indicated that they do not know how much they spent and realized from their previous cotton production cycle. They have never calculated their profit to know whether they are doing well in the business or not. This is line with [27] who stated that issues related to farmers' business skills development, record-keeping activities, farm budgeting and financial analysis are important synopsis in organising training for farmers.

Table 3. Training and record keeping experience of respondents

Training and Record-Keeping Experience		Region			Total (N=86)
		1 (n=30)	2 (n=32)	3 (n=24)	
Have you attended any training in business skill development before?	Yes	20.7	70.0	56.5	48.8
	No	79.3	30.0	43.5	51.2
Before now, have you been keeping records of your activities on farming?	Yes	25.0	41.4	54.5	39.2
	No	75.0	58.6	45.5	60.8
Do you know how much you spent and how much you realized from your farm last year?	Yes	30.4	26.1	57.1	37.3
	No	69.6	73.9	42.9	62.7
Have you ever calculated your profit to know whether you are doing good business?	Yes	31.0	29.0	56.5	37.3
	No	69.0	71.0	43.5	62.7

Source: Own Calculation.
Note: Values are in Percentages.

Information and training needs of farming activities of respondents

Information and training needs of farming activities of respondents are presented in Table 4.

The areas of farming activities identified were the cost of inputs (fertilizer, herbicides, pesticides, household expenses and farm labour). Others included sources of input, income generation and methods of calculating profit from farming and non-farming activities.

The results showed that sources of inputs ($\bar{x}$ = 2.66), cost of pesticides ($\bar{x}$ = 2.65), cost of fertilizer ($\bar{x}$ = 2.49) and methods of calculating profit from farming activities ($\bar{x}$ = 2.39) were the major identified aspects where training and relevant information were needed the most. This is line with [13] who indicated that the farmers' training should be on their identified training needs as indicated by them.

Table 4. Information and training needs of respondents' farming activities

Cotton farmers' information and training needs of farming activities	$\bar{x}$	σ
Sources of inputs	2.66	1.26
Cost of pesticides	2.65	1.25
Cost of fertilizer	2.49	1.25
Methods of calculating profit from farming activities	2.39	1.27
Cost of herbicides	2.37	1.23
Income generation from farming activities	2.35	1.22
Income generation from non-farming activities	2.14	1.21
Cost on farm labour	2.07	1.15
Cost on household expenses	1.96	1.09

Source: Own Calculation.

Factors responsible for respondents not keeping records

Table 5 revealed the respondents' distribution according to the factors responsible for their reasons for not keeping farm records. The results indicated that most of the respondents (41.9%) never thought that record-keeping was necessary while 26.7% responded that they loved keeping records of their activities but they do not know how to go about it. From this finding, it is obvious that the cotton farmers did not know the importance of keeping records.

Table 5. Factors responsible for cotton farmers not keeping records

Factors responsible for cotton farmers not keeping records	**%**
I cannot read and write	5.8
Record keeping is tiring and difficult	7.0
I never thought record keeping is necessary	41.9
It is not necessary for keeping records	4.7
Love to keep a record but do not know how to do it	26.7

Source: Own Calculation
Note: Values are in Percentages.

This is line with [27] who specified that farmers had wanted to keep records of their farm activities but are incompetent and inexperienced in the technical know-how on how to go by it.

Test of hypotheses

Hypothesis One

Table 6 showed the differences in training and record-keeping experience among cotton farmers in the agro-ecological regions of Zambia. The cotton farmers' training and record-keeping experience on the attendance of business skill development training (χ^2= 14.9), steady farm budget operations (χ^2 = 5.16) and consistent farm financial analysis execution (χ^2 = 4.96) are significantly different in the agro-ecological regions of Zambia. The table indicated the levels of training and record-keeping experience among cotton farmers differed by location of cotton production activities of the farmers.

Table 6. Kruskal-Wallis Test of training and record-keeping experience

Training and Record-Keeping Experience	χ^2	**Asymp. Sig.**	**Decision**
Attended business skill development training	14.93	0.001	S
Regular record keeping activities implementation	4.54	0.103	NS
Steady farm budget operations	5.16	0.076	S
Consistent farm financial analysis execution	4.96	0.084	S

a. Kruskal Wallis Test
b. Grouping Variable: Region
Source: Own Calculation.

Hypothesis Two

Table 7 showed the differences in information and training needs of activities among cotton farmers in the agro-ecological regions of Zambia. The cotton farmers' information and training needs on cost of fertilizer (χ^2 = 12.56), cost of pesticides (χ^2 = 4.69), sources of inputs (χ^2 = 19.78), cost on household expenses (χ^2 = 8.68), cost on labour (χ^2 = 17.7), income generation from farming activities (χ^2 = 5.97), income generation from non-farming activities (χ^2 = 6.02) and methods of calculating profit from farming activities (χ^2 = 5.18) are significantly different in the agro-ecological regions of Zambia. The levels of information and training needs of activities among cotton farmers differed by

location of cotton production activities of the farmers.

Table 7. Kruskal-Wallis Test of information and training needs of activities

Information and training needs of activities	χ^2	Asymp. Sig.	Decision
Cost of fertilizer	12.56	0.002	S
Cost of herbicides	1.15	0.562	NS
Cost of pesticides	4.69	0.096	S
Sources of inputs	19.78	0.000	S
Cost on household expenses	8.68	0.013	S
Cost on labour	17.70	0.000	S
Income generation from farming activities	5.97	0.051	S
Income generation from non-farming activities	6.02	0.049	S
Methods of calculating profit from farming activities	5.18	0.075	S

a. Kruskal Wallis Test
b. Grouping Variable: Region
Source: Own Calculation.

CONCLUSIONS

The study showed that the major identified areas where training and relevant information were needed the most were methods of calculating profit from farming activities, sources and cost of inputs (fertilizer, pesticides, and labour). The farmers never thought that record-keeping was necessary although they loved keeping records of their activities but they do not know how to go about it. However, the cotton farmers' training and record-keeping experience on attendance of business skill development training, steady farm budget operations, consistent farm financial analysis execution and information and training needs on cost of inputs (fertilizer, pesticides, and labour), household expenses, sources of inputs, methods of calculating profit from farming activities, income generation from farming activities and non-farming activities are significantly different across the agro-ecological regions of Zambia.
Based on the results of this study and with respect to effective and meaningful training, it is vital to have business schools for the cotton farmers. Such training institutions need to identify the training needs of cotton farmers in each of the agro-ecological zones and develop appropriate training modules on farm budget operations and financial analysis vis-à-vis the information on the sources and cost of inputs in the different agro-ecological regions of Zambia. This would guide the cotton farmers to have a higher degree of farm-based productivity and profitability achievement in the country.

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