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An Investigation into the Factors that Contributed to Poor Management of FRA Maize Procurement Process in Zambia in 2010-2011 Farming Season: A Case of Nyimba District in Eastern Province.

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Abstract— the study mainly focused on an investigation on factors that contributes to poor management of FRA maize in Nyimba District in the eastern part of Zambia. In the past years it was reported that thousands of the bags of maize went to worst and the government lost huge revenue.
K.Wood noted that FRA has accumulated massive maize stocks that could only be sold domestically or in regional export markets at a major financial loss. Much of the FRA‟s maize was at risk of spoilage due to inadequate storage facilities and poor prospects for exports. The research was conducted in Nyimba District in eight agriculture camps. In the research, the population number of 500 was divided by 10 to obtain the researcher's required sample size of 50 representatives. The sample comprised of 29 males and 21 females. This translates into 58% and 42% of males and females respectively. This shows that more males were interviewed on factors that contribute to poor management of FRA maize. Among the factors that contributed to poor management of FRA,
maize was lack of good quality grain bags, lack of chemicals, and purchasing maize with high moisture contents, agency failure to sensitize
farmers on maize storage, climate change and political interference.
Poor management could lead to pest organisms causing reductions in weight or volume, quality losses can occur as changes in color, smell or taste; contamination with toxins, pathogens, insects or rodent excreta; reduction in nutritional value. Or loss of viability if the harvest was meant for storage for long period of time such for strategic food reserve. If no measures would be put in place to eradicate or control insect pests then maize would continue to be attacked by pests. Hence the government should address these issues of poor management of maize in order to avoid the major outcry of the community that the programme was draining huge public treasury at the expense of developmental project. The Government through FRA should employ competent and credible warehouse managers. The Ministry of Agriculture and Livestock through FRA should provide adequate chemicals; tarpulins and grain bags and other necessary requirements to all the satellites. The Government should rehabilitate the silos and build new big storage facilities.

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I. Introduction

This chapter elucidates an overview of the entire study and presents the underlining investigation of factors that contributes to the poor management of Food Reserve Agency (FRA) maize in the year 2010/11 farming season in Nyimba District. According to MA, about 80% of people in the district depend on agriculture activities and this implies that they are major players in the FRA exercise. The FRA, a government parastatal, was established in 1996 by the Food Reserve Act of 1995. The FRA's original function was to establish and administer a national food reserve crop. Marketing and "market facilitation" were officially added as FRA functions when the Food Reserve Act was amended in 2005 (GRZ 2005). Pursuant to the section 712(3) and Act cap 225 of the laws of Zambia. Food Reserve Agency (FRA) was created with the sole purpose of procuring, managing and maintaining of the National maize strategic reserves through the buying of maize from the small-scale farmers. The Agency's current objectives include raising rural incomes, improving national food security, and stabilizing crop prices (FRA). Maize remained the most important crop in Zambia and the FRA's emphasis has been almost exclusively on maize.

In the year 2010/11 and 2011/12 farming marketing season Zambia recorded the subsequent bumper harvest country wide. This triggers the Food Reserve Agency to purchase maize in bulk compared to the expected projection or tonnage of maize budgeted for consumption in the country. It was clear evident that although Zambia has recorded such significant produce in the consecutive years. A lot of maize went to worst countrywide and this has been attributed to poor storage facilities, lack of planning and political appeasement to the farmers on the expense of other developmental projects. Worse still Zambia failed to clinch a big deal of offloading maize to other countries due to its exorbitant price of maize sold per tonne. This was attributed to the reasonable prices that were offered in the region than Zambia. However, the small deal that Zambia managed to clinch saw the small tonnage of maize been exported to the neighboring countries. This meant that huge tones of maize were marooned in many parts of the country. This was worsened by poor management and lack of storage facilities in the country. This implied that Zambia lost billions of monies from this exercise. Therefore, FRA has purchased maize from small scale farmers at higher price and normally sold at a giveaway price to other countries despite the huge cost attached to this such as transport, storage and administration.

In the year 2010/11/ marketing season FRA purchased 244,869 x 50 kg bags of maize and in the year 2011/12 respectively it purchased 557,157 x 50 kg bags of maize only in Nyimba District in the Eastern province of the country. The district has only three main holding depots namely Mtilizi, Nyimba main and Mchimadzi depot. These depots could accommodate up to the capacity of 7500

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metric tons which represented 150, 000 x 50 kg number of bags only.

In 2010/11 Nyimbia didn't offload any grain bag either to the market or inter district transfer. This implies that the district had carryover stocks in 2011/12 marketing season. The total number of bags was 802,026 x 50 kg maize which meant to be stored in three sheds which had the capacity of 150,000 x 50 kg bags of maize. The warehouse managers bemoaned laxity and lack of support from FRA. This triggers poor management of the stock which was compounded by lack of storage facilities. These resulted into huge losses through pilfering, rotten maize and soaked maize due to untimely rains and unpreparedness of FRA to overcome natural calamities. Other stocks were attacked by grain weavers due to lack of chemicals to fumigate the maize.

On 10th July the district was directed to destroy all discolored and rotten maize. In total FRA destroyed about 49,534 X 50 Kg bags of maize from the three main holding sheds (Nyimba main, Mtilizi ,Mchimadzi) and from other satellite depots. In terms of monetary losses this transited into three billion two hundred nineteen million seven hundred and ten thousand kwacha (K3, 219, 710,000) in order currency. In other ways this huge money was burnt to ashes in the poor district like Nyimba with about 80% percent of people living in a less than a dollar per day.

General Objective

To investigate the factors that contributes to poor management of FRA maize procurement process in Zambia in 2010/11 farming season

METHODOLOGY

Description of study area

The research was conducted in Nyimba District in eight agriculture camps. In the research, the population number of 500 was divided by 10 to obtain the researcher's required sample size of 50 representatives. Therefore, every number 10 representatives from the population were picked to be a member of the sample and questionnaires were distributed to all the 50 picked representatives. Each respondent got 2 days to fill and complete the questionnaire. FRA District Office and some NGOs were also interviewed. Random sampling was used in this study.

The literature from previous studies carried out was reviewed and the FRA reports were one of the major sources for secondary data collection.

Study Location

The study area is Nyimba District In Eastern Province.Nyimba district is both a valley and plateau. It has a total surface area of 2,500 Km^2 (1,125, 000 ha) of which only 27, 000 ha is estimated to be under agricultural activities. The district has a population of 80, 350 people (40, 942 female and 39,408 male) of whom 60 % live on the plateau and the rest dwell in the valley (NDCR, 2011).

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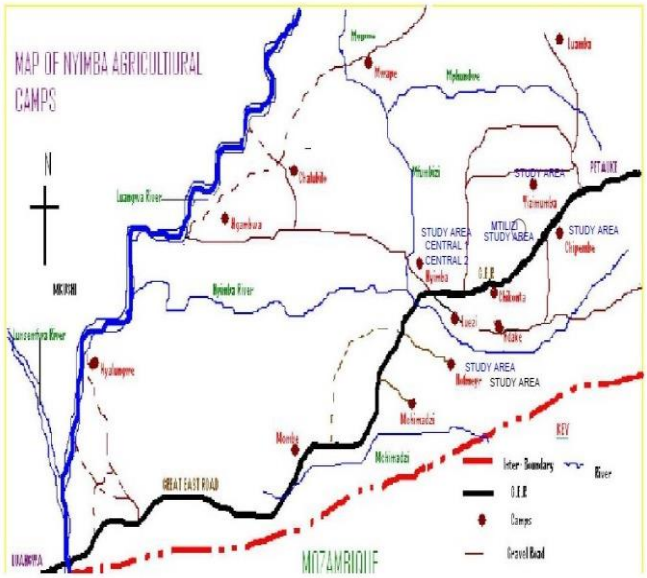

Source:MA(2011)

Data Analysis

Data collected was processed using Excel and SPSS soft wares in order to generate descriptive statistics, percentages, and frequencies as presented in the data.

DATA ANALYSIS RESULTS

A. Sex of sample group

The sample comprised of 29 males and 21 females. This translates into 58% and 42% of males and females respectively. This shows that more males were interviewed on factors that contribute to poor management of FRA maize than females. The data was illustrated in the table below.

Table 4.1 Sex of Respondents

Sex	Frequency	Percentage
Male	29	58
Female	21	42
Total	**50**	**100**

Source: field Data, 2013

1) Figure 4.2 Sex of Respondents

The age range of respondents was from 17 years to 58 years with the mean age being 47 years. The ages of females were 19 years and 54 years and whilst males ranged from 17 to 58 years. 42 % of the total number of respondents represented females and 58% represented males.

The data is shown in the table and graph below.

2) Table 4.2 Distribution by age of the respondents

Age range	Male	Female	Sub total	Percentage
>18	5	2	7	14
19 – 28	3	6	9	18
29 – 38	6	4	10	20
39 – 48	5	5	10	20
49– 58	10	4	14	28
Total	**29**	**21**	**50**	**100**

Source: Field data, 2013

3) FIGURE 4 .2 Distribution by age of the respondents

The marital status of the respondents showed great variation: 5 respondent who constituted 17 % of males were all single; 19 of the males were married with a representation of 65%.3 males were divorced which represent 10% and 2 were on widows and this represent 6%.2 respondents of females with a representation of 9% were not married, a total number of 15 females with a representation of 71% were married and only 3 females were widows which represent 14% of the respondent. No respondent was on separation representing 0%. There was only 1 divorced female respondent which represented 4.7%. The respondent data was illustrated in the table and graph below.

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Table 4.3 Marital status of the respondents

Sex	Marital status				
	Single	Married	Divorced	Separated	Widowed
Male	5	19	3	0	2
Female	2	15	1	0	3
Total	**7**	**34**	**4**	**0**	**5**

Source: Field data, 2012

4) FIGURE 4.3 Marital status of the respondents

B. 4.5 Employment status of the respondents

The information below shows the employment status of the respondent. The total number of those in formal employment was 31 and this represented 62% and those in informal employment was 19 and this represented 38% of the total number of respondents.

The table below shows the employment status

1) Table 4.4 Employment status of respondents

Age	Status	
	Formal Employment	Informal Employment
0 -18	0	7
19 – 28	4	5
29- 38	8	2
39 – 48	10	0
49-58	9	5
Total	**31**	**19**

Source: Field data, 2012

4.6 Level of education

`The possible levels of education were categorized into four, namely primary, secondary, and tertiary and none. There were 43 respondents of whom 16 were females who had attained primary education. This category represents 39.8% of the total number of the interviewees. The 32 respondents who had gone up to secondary level represent 29.6 % of the respondents and these consist of 19 males and 13 females.26 respondents comprising of 17 males and 9 females and this represent 24.1%. The total number of 7 respondents had not been to school at all and these were 2 males and 5 females. The table below shows the statistical representation of data.

2) Table 4.5 Level of education of the respondents

Level of education	Number		Sub- total	
	Male	Female	Number	%
Primary	27	16	43	39.8
Secondary	19	13	32	29.6
Tertiary	17	9	26	24.1
None	2	5	7	6.5
Total	**65**	**43**	**108**	**100**

Source: Field data, 2013

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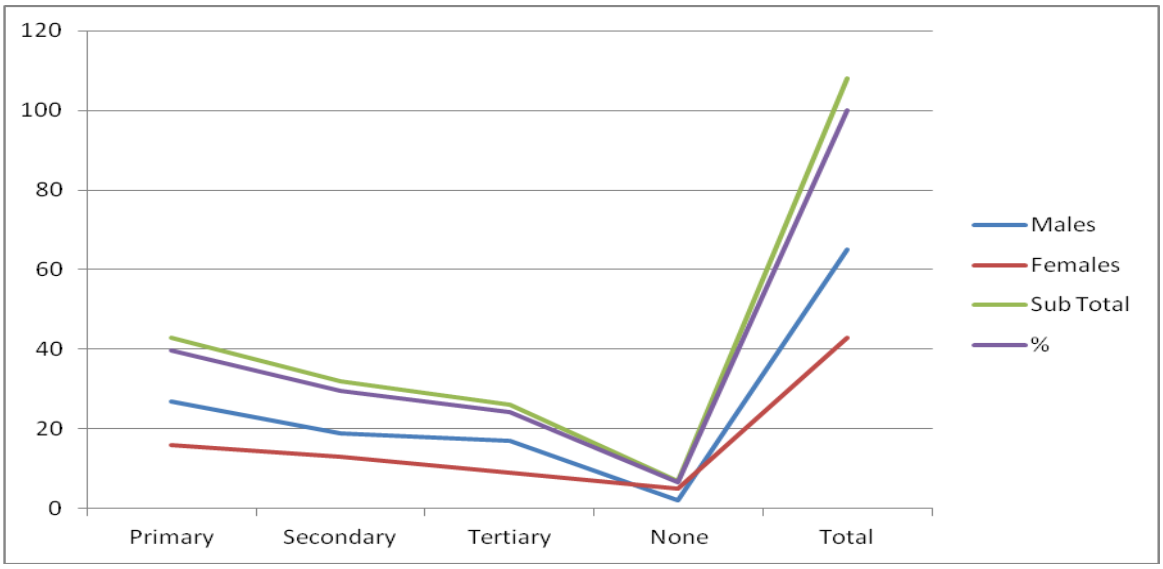
1) *FIGURE 4.5 Level of education of the respondent*



Source: data from table 4.5

C. 4.7 FRA clients

The agency buys maize mainly from small scale farmers and in some cases the briefcase buyers cease the opportunity of supplying to the agency. Among the respondents were the small-scale farmers which represented 26 % and briefcase buyers represented 30%. The table below gives the data.

1) *Table 4.6 Type of respondents who supply maize to FRA*

Age	Farmer	Briefcase buyer
0 -18	5	0
19 – 28	4	3
29- 38	2	9
39 – 48	0	2
49-58	5	1
Total	**13**	**15**

Source: Field data, 2013

D. 4.8 Research response by gender

The above table shows the total number of the respondents by gender. There were 50 Respondents out of whom 21 were females which represented 42% and 29 were males' representing 48%.

Most of the FRA maize was poorly graded because the producers (farmers) lack the technique of grading maize. On the other hand, the agency and the Bureau of Standards have not assisted the sellers on establishing the quality of standards. This has been one of a major contributing factor of poor maize that was bought by the agency. The agency lacks the capacity to effectively grade the maize and it does not even follow the recommended system but mainly depend on physical grading. This physical grading was not efficient and it compromises the grading quality. Some of the recommended grading system are shown below.

1) *Table 4.7 Grading system*

	Maximum limits
Grade A	Grade B
Foreign matter, % m/m	0.5
Inorganic matter, % m/m	0.25
Broken grains, %m/m	2.00
Pest damaged grains %, m/m	1.00
Rotten & diseased	2.00

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grains,%m/m
Discloured grains, %m/m 0.50
Moisture, %m/m 13.5
Immature shrivelled grains, %m/m 1.00
Filth, % m/m 0.10
Source: data from table 4.7

On 10th may 2012 the destruction of rotten and discolored maize commenced from the three main sheds (Nyimba main, Mtilizi, Mchimadzi) and satellite depots. The table below gives the quantitative information. In this table the first five columns represent the mean cost of maize destroyed from various sheds. The sixth column was the main shed -level mean cost from each shed at the district level.

2) ***Table 4.8 Maize destroyed per shed***

Shed	**Quantity x 50kg**
Nyimba main	14,662
Mtilizi	20,150
Mchimadzi	2,913
Kacholola	602
Ndake	240
Hofmyre	1087
Central 1	684
Malubambe	1300
Chipembe	857
Total	**42,495**

Source: FRA reports 2012

The diagram below showing rotten maize per satellite depot

Table 4.9 Maize Stock locations

Location	Total Qty(50 kg)	Outdoor stocks 50 kg	Indoor stocks 50kg
Nyimba Main	104,219	82,383	21,836
Mtilizi	71,958	58,252	13,706
Mchimadzi	48,607	37,740	10,867
Kabvuma	3,306	-	3,306
Lutheran	6.000	-	6,000
Mwanda	365	-	365
FTC	505	-	505
Kacholola	6,240	350	5,890
Chikhontah	2,663	2,663	-
Chimpanje	3,484	3,484	
Chipembe	5,262	5,262	-
Chinambi	7,134	7,134	
Chipendo	3,895	3,895	
Kacholola	271	271	
Malubambe	2,717	2,717	
Mchimadzi	3,962	3,962	
Msima	1,205	1,205	
Mtilizi main	29,703	29,703	
Mtilizi Schemes	2,694	2,694	
Ndake-Luezi	1,753	1,753	
Nyimba Central	3,103	3,103	
Simaba	2,043	2,043	
Vizimumba	3,382	3,382	
Total	314,471	251,996	62,475

Source:FRA reports 2012

Out of maize purchased only 186,910 was moved out of Nyimba. The graph depicts the total maize stored per satellite X 50 kg
On average it shows that the percentage of maize that was stored outside was quite high compared to the one stored inside. This was attributed to lack of storage facilities in the district and as the results there was rampage of poor management of maize because the agency has failed to contain the situation.

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The average cost of maize management per satellite depot was nearly ZMK 100,000 per bag. However, the distribution of chemicals to the satellite was highly skewed. Figure below was a histogram of chemicals distributed to the satellite depots, with a "normal" distribution curve for this sample's mean and variance superimposed. In this figure, it was clear that chemicals distribution was below the average bags of maize purchased -mean (the peak in the normal curve).

3) Table 4.10 Chemical distribution

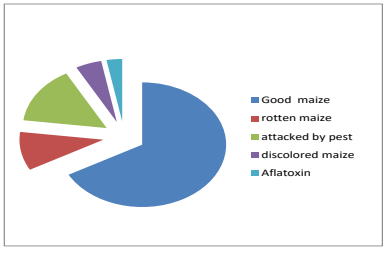
Satellite name	Quantity of chemicals %
Mchimadzi main	42
Nyimba main	55
Mtilizi main	57
Kacholola	6
Lutheran	2
FTC	3
Chikontah	1
Chipembe	2

Source:FRA reports 2012

About 33 % of the total quantity of maize that was purchased in the year 2011/12 season was declared unfit for human consumption due to discolored, pest attacked, rotten and aflatoxin. This was the result of multifacets of factors that contributed to poor management of maize.

The pie chart below shows the status of maize in the year 2011/12

4) FIGURE 4.12 Maize status 2011/12 season



Source:FRA reports 2012

In order to determine the effects of poor management of FRA maize, the study looked at the relationship between good maize storage over a certain period and variables determined in the succession years from 2006/7 to 2012/13. (Insect pests, chemicals, empties and taupulins). These data were represented in the table below.

The variable insect represents total number of maize bags that are attacked, variable taupup represent the number of tents that were provided to the district per year, variable chemip represent total number of chemicals used for spraying and fumigation, variable emptp represent the total number of sacks that were provided per year. Other variables are also taken into consideration.

The order of the observations was listed alphabetically by year, but there was nothing about this ordering that affects any subsequent analysis.

a) Table 4.11 Data set on various FRA variables from 2006-2012

Obsno	insect	Taupup	Chemip	Emptp
2006/7	2016	4	16	40,610
2007/8	3745	7	17	80,489
2008/9	4819	7	26	100,713
2009/10	4726	9	24	199,205
2010/11	20,500	10	67	244,869
2011/12	50,942	18	100	557,175
2012/13	21,053	2	158	311,592

Source: FRA reports 2012

Notes:Insect pest attacked maize
Taupulins provided to cover maize
Chemicals provided for spraying maize
Empties provided for maize

The following multiple regression model explains the effects of poor managements of FRA maize.

$$R = 0.897 \quad n = 50$$

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Where
y = Observation
X 1= insect pests
x2 = tarpulins
X3= Chemicals
x4 = Empties
e

	Coef.	Std.Err	t	P >/t/	(95% Cof	interval)
	obsno					
Insect	0.09041103	.1441253	6.27	0.000	-.7411093	-1366359
Taupap	0.01404516	.0501831	-2.85	0.005	1.187276	-.6209444
Chemip	1. 4810357	.5163117	2.87	0.004	0.2416779	-.0444593
Emptp	0.43788722	.1528501	-2.83	0.005	2.495448	-.4666219

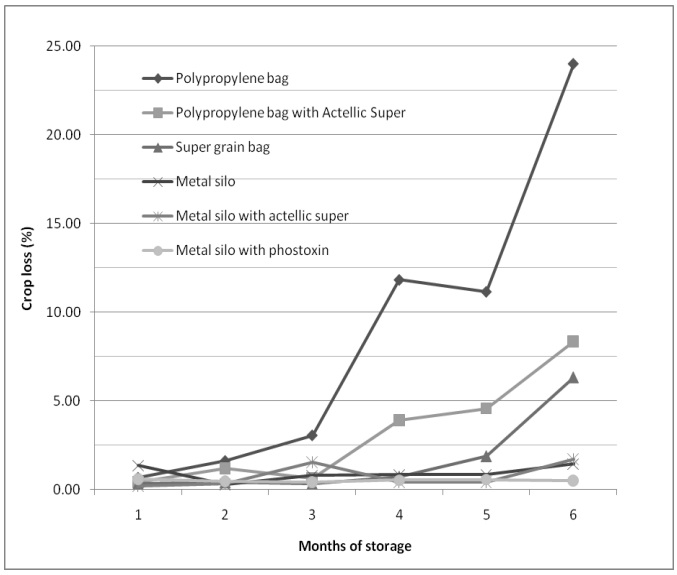
The regression produces four coefficients. The coefficients reported by the regress represent the effect of poor management of maize. All the coefficients had a positive sign indicating that there was direct relationship between good management of maize and the four variables. The researcher therefore upheld the null hypothesis and the alternative hypothesis has been rejected.

The graph shows the amount of crop loss observed for a period of six months for three sites combined. In most of the options apart from the metal silos, % crop loss increases with time and was highest in the sixth month. The polypropylene bag with no pesticide registered the highest % loss, reaching 24% in the sixth month. The second highest loss was found in the polypropylene bag with actellic super (8.4% in the sixth month) followed by the super grain bag (6.3%). percentage loss observed in the metal silos, whether with pesticide or not, was small: 1.7% for metal silo with actellic, 1.4% for metal silo without pesticide and 0.5% for metal silo with phostoxin.

I.

II.

FIGURE 4.13 CROP LOSS IN PERCENTAGE OF WEIGHT OF STORED MAIZE



Source: FRA 2011

In order to ascertain the usefulness of the good management of FRA maize the researcher did a regression based on the maize kept by the agency in three main depots. Table below shows the results after regressing the % loss with the cross effects of the treatment and time. As such, the coefficients were to be interpreted as loss, in % of initial quantity, per month. The coefficients for the

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polypropylene (PP) bag without pesticide (control) and super grain bag are positive and significant. Hence, percentage loss per month was 2.82% for the control, 1.03% for the polypropylene bag with actellic super and 0.54% for the super grain bag. The % lossesfrom the shed were negligible.

1) Table 4.12 Regression over time, cross effects with the different treatments

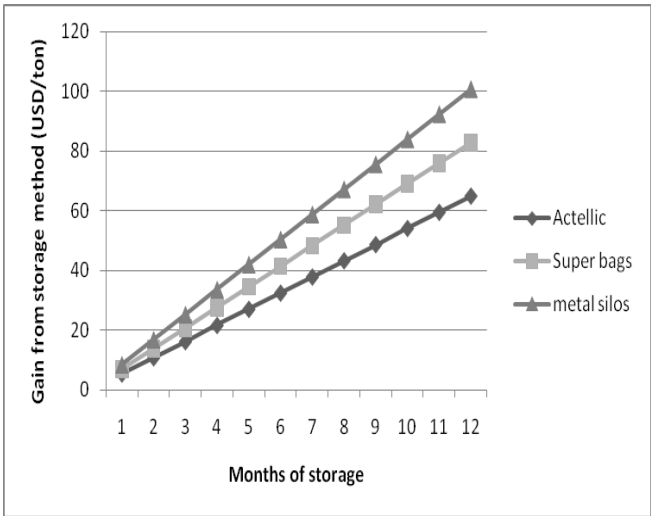
Cross effect of time with	Coefficient	Error Std	P value
Polypropylene bag, no pesticide	2.82	0.25	0.000
Polypropylene bag, actellic super	1.03	0.23	0.000
Super bag	0.54	0.25	0.035
Shed , no pesticide	0.21	0.26	0.416
Shed , actellic super	0.23	0.24	0.351
Shed , phostoxin	0.12	0.26	0.637

Source:FRA 2010

R Square 0.38, N 6

The researcher also considered the benefit from technology as it was calculated as the loss abated as compared to the control. Assuming linear loss functions based on the trial data (Table 4.22), the researcher calculated the value of one tone of maize stored and priced at USD 300. The benefit from the technology was the difference from the control. Figure below shows the different gains from using the various technology options. In this case, the metal silos/shed was combined since for all them, loss per month was negligible.

2) FIGURE 4.14 Grain from storage method



Source: **Table 4.12**

This shows that good management of maize in terms of storage could produce tremendous benefits to the agency. The major cry of losing huge money on the treasury would be the thing of the past. The trials show that the polypropylene bag with no pesticide and shed with no pesticide has a big coefficient (meaning loses) compared to the polypropylene bag with pesticide and shed with pesticide. The researcher deduced that the agency has a big coefficient and hence huge loses.

DISCUSSION

The Agency was mandated to provide polypropylene grain bags during the marketing season. In some season's farmers were told to use their own grain bags. Most of farmers used poor quality bags which could not withstood the heat and ended up bursting thereby exposing the grains to the unexpected rains and other adverse. Most of the FRA maize was poorly graded because the

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producers the farmers lack the technique of grading maize. On the other hand, the agency and the Bureau of Standards have not assisted the small scale famers on establishing the quality of standards. This has been also one of the major contributing factors of poor maize bought by the agency.Most of the small scale farmers used the old technology of moisture testing. This method was not reliable and was prone to high errors. This was attributed to the inability of the agency to provide the modern method of testing moisture contents. It was felt that this method of testing which involved mixing of a handful of grains with half a handful of dry salt in a dry soda bottle and then shook it for 2-3 minutes and allow it to settle and if salt remained on the walls of the bottle, then the grain has high moisture content was not efficient for the big exercise like FRA. This contributed to the agency its purchase of maize with a high moisture content.

It was found that many farmers who sold maize to FRA failed to adequate dry the maize. Maize drying was another critical step in reducing the moisture content, thus preventing fungal growth, aflatoxin production and consequent contamination. The farmers maintained that maize was dried in the field before cobs were removed.

It was discovered that small scale farmers who were the major clients of FRA often wait for too long to start harvesting; when they delay, the maize would start rotting. Apart from this, maize that has been left to stay too long in the grainer tends to 'open its ears'. According to scientific studies, this made it easy for pests to get into the maize cob and start infestation even before staking and harvesting has started. Prolonged stay often allows fungal pathogens such as aflatoxins to spread.Losses due to late harvesting and poor storage can be huge. Research has shown that for every 100 bags farmers harvest in the district, 20 bags were lost due to rotting, especially during periods of heavy rains and also as a result of poor storage methods and handling.

It also noted some varieties of maize open the husks (ears) when they reach maturity; if it was raining, the water entered the maize cob and the maize acquires a yellow colour and eventually starts rotting. When maize ears open, weevils and other pests gain easy access and start destroying the maize even before it was harvested. Maize that was left to stay in the grainer after it matures was also prone to fungal infestations.It was discovered that many small scale farmers store maize while on the cob for long period. Research has shown that maize on the cob was more prone to weevil damage.

It was stated that the agency bought maize with high moisture contents. Maize with a high moisture level develops moulds and rotting; they grew and release toxins, generally referred to as mycotoxins (aflatoxins are just one of them). A lot of maize from small scale farmers in the district has been condemned in some years because of aflatoxin. Most of the maize that was harvested early or during the rains has moisture content as high as 37 per cent. The farmer has to reduce by all means the moisture level to about 12.5 per cent, which was

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the recommended level for long-term storage. Due to lack of dependable facilities at each satellite depot to dedicate the moisture levels the agency buys high moisture content maize which was discovered that at a later stage developed toxins.

It was noted that the past few years the district has been characterized by climatic change. It was very likely that precipitation has increased by 0.5 to 1% and it was likely that rainfall has increased by 0.2 to 0.3% in most part of the district particularly in the plateau areas. It was also likely that there has been a 1% to 2% increase in the frequency of heavy precipitation events in the valley of the district. Increases in heavy precipitation events could arise from a number of causes, e.g., changes in atmospheric moisture, thunderstorm activity and large-scale storm activity.FRA did not took into consideration some measures to curb any nature challenge. For instance, in the year 2011/12 marketing season the agency purchased 560,819 x 50 kg bag of maize and out this about 50,000 x 50 bags of maize worthy K 3,250,000 rebased were soaked by rains in various satellite depots. This happened because the agency failed to anticipate the prolonged rainfall which occurred throughout the marketing season. This clearly indicated the unpreparedness of the agency in case of the nature calamite.

The findings show that the agency purchased maize every year for the sole purpose of strategic food reserve in the country. Unfortunately, the three (3) sheds that were in the district had a small capacity to accommodate all the maize bought in the consecutive years. Hence the agency failure to ensure that every year they offload the huge stock to the market in order to create space for the coming marketing season was inevitable. For example, in 2011/12 one of the factors that contributed to poor management of maize was failure to offload maize from the main sheds from the previous season.

It was discovered that some important maize insects were: maize weevil, Sitophilus zeamais Motschulky; rice weevil, Sitophilus oryzae (L.); rust-red flour beetle; tropical warehouse moth, Ephestia cautella Walk; and Tribolium constaneum Herbst. These insect pests could cause heavy losses to stored maize.The agency was still using the convention method of controlling insect pest .This compromise the immunity of the insects because if the pests were not treated well they tend to develop immunity. The agency lacks these new adopted technologies to control insect infestation. The first method involved removing the air from the sealed stack to immediately reduce oxygen concentration favorable to insect growth. The second method was removing the air from the sealed stack, then fumigating with CO2 at the rate of 1 kg/MT.

It was noted that the agency also lacked good storage facilities. There were only three credible sheds with a total tonnage of 3500. While the district purchases over 5000 metric tonnes per season. Small quantities of bags were kept in the

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sheds and a huge tonnage was stored outside the sheds. This made it impossible to bag-storage management of maize.

Each year the agency engaged private transporters to ferry the maize from the satellite depots to the main holding depots. The transportation part lacked monitoring from the agency, as most of the transporters did not adhere to the laid down transportation rules as per prescribed in the transporters' contracts. Like use of tents during transportation and avoidance of spillage and pilfering while in transit. Some transporters did not carry the tents to cover the maize once in transit. This meant that maize was soaked whilst in transit during rainy season. The transportation pace was quite slow because some of the transporters deviate some of the already contracted vehicles to other duties. In the subsequent years the transporters were held responsible for the loss of 3000 bags x 50kg of maize while in transit. This contributed to the already crippled transportation of maize and normally it derails the transportation pace of maize. This clearly shows that most of the transporters have failed to live to the expectation of the agency. The district purchased maize from the fifteen (15) satellite depots throughout the district. The agency failed to provide adequate tarpulins to cover the fifteen satellite depots and the three (3) main holding depots. In 2011/12 season the agency provided eight (8) tarpulins out of the total required number of 50. This was a clear indication of poor management of maize because huge stacks of maize were partially or not covered by the tarpulins. In times of unexpected rains, the maize had high chances of getting soaked at different depots. This was against the laid down procedures that any bag of maize that was purchased should be covered at the depots regardless of weather patterns.

It was discovered that the agency every year provided the black polythene sheets to all satellite depots mainly for the usage of stacking purpose. Due to lack of tents to cover the maize the agency mainly has resorted to use the black polythene sheets which were weak to act as tents. This sheets when exposed too much to sun shine, they worn out and thereby making the maize vulnerable to rains and other adverse.

After every three (3) layers of the stacked bags of maize the buyer designated at the satellite depot had to spray the chemicals to the maize. Unfortunately, the agency experienced the shortage of chemicals and most of the maize at various satellite depots was attacked by weevils and other pests. In 2011//12 season a total number of 20,700 x 50 kg bags of maize were reported destroyed by weevils. The six depots (FTC, Cathoilc, Livestock, Kacholola, Machimadzi and Nyimba main) that were inspected by the fumigation expertise from SCCI shows that all satellites had high level of pest infestation.

Every year the agency engaged security guards from the recognised security companies to guard maize at the main holding depots. However, these security guards from security companies did not

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perform according to the expectations of the agency. To the surprise of the agency the security guards stopped providing the needed security to the maize and joined the people that stole maize.In 2011/12 season Scorpion security guard company was engaged by the agency to provide security to the three main holding depots (Mchimadzi, Nyimba central1 and mtilizi) which stored maize both in the inside and outside the sheds. According to the FRA district report a total of 10,000 x 50 kg bags of maize was allegedly stolen. The maize which was stacked outside the sheds was more vulnerable to theft compared to the one that was kept inside. This was evident by the fact that most of the guards were arrested by the police and slapped by the charges of maize theft. Hence some of the losses of the agency were attributed to theft by the security personnel who took advantage of already porous management of maize by the agency. In 2011/12 season the agency allegedly paid approximate a lot of money to the unscrupulous people for maize which was not supplied to the agency.

The agency mainly depended on physical check out of the grains. This system was not the best method of certifying the quantity and quality of the maize because the system has many human errors involved. Some grain bags were nicely bagged on top and underneath the bags which contained foreign materials. Although the agency claimed to be using probing sticks. These sticks are only found at the main holding depots and the satellite depots had none. However, the probing stick was the traditional methods of detecting the foreign materials in the grain bag. Most of the grain bags have been accepted with a lot of foreign materials as the result.

The agency also bought soaked maize from the farmers due to poor methods of maize certification. This traditional method of storage was vulnerable to rains because maize was not covered on top. Despite some of the maize been soaked by rains, FRA went ahead and purchased soaked maize for fear of victimization by politician because the programme was hijacked for political gain.

The agency engaged casual workers to work at both satellite depots and the main holding depots. Most of the times the agency failed to pay the workers on time and many of them would either went on go slow or looked for green pasture elsewhere. This resulted into lose of morale and enthusiastic towards work and contributed to poor performs of the casual workers. The work of the casual workers involved sewing the grain bags, stacking, weighing, re bagging and cleaning the surrounding. These works were more important in maize purchasing exercise and failure to do this would result into poor management of maize.

It was discovered that there was too much political interference in the management of the FRA pragramme. The Warehouse managers and the buyers were sometimes imposed by the politicians either from the Member of Parliament and the

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District Commissioner ‘s office or sometimes from the higher offices. These Managers and the buyers did not have the needed qualifications to run the programme effectively. Sometimes good ideas that were recommended to them by the technocrats in this field were brushed off. This has been viewed as one of the major contributing factors.

CONCLUSION

The study revealed some of the factors that contributes to poor management of FRA maize and among them are lack of modern storage facilities, lack of appropriate technology to control insect pests, lack of chemicals, poor drying practice ,poor certification of maize quality and quantity, lack of tarpulins, use of black polythene sheets as tents, lack of own security personnel, poor grading standards, Lack of grain bags, purchasing maize with high moisture contents, lack of paying casual workers dues, poor transportation ,climate change. It was therefore, in this vain that effective management of maize by FRA would play an important role in stabilizing food supply by soothing seasonal food production. With only 3 existing storage sheds in the district, the Agency has been overwhelmed in holding the carryover stocks at the expense of new stocks. The three sheds that were built with a sole purpose of temporary holding depots became permanent holding depots. This contributed to storage problems most of the years as old stocks were not offloaded to the market in time in order to create space of new stock on the onset the programme.

RECOMMENDATIONS

The Government through the Ministry of Agriculture and Livestock should rehabilitate the silos and build new big storage facilities. The Government through FRA should employ competent and credible warehouse managers.

The Government through the line Ministries should come up with the appropriate technologies to detect moisture contents.

The Ministry of Agriculture and Livestock through FRA should prepare adequate for the nature climatic change e,g prolonged rainfall.

The Ministry of Agriculture and Livestock through FRA should provide adequate chemicals, tarpulins and grain bags and other necessary requirements to all the satellites.

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