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Study of Storage Losses in Food Corporation of India, Nagpur Area Office for Financial Year 2015-16

Rekha Bora

Business Management Department, Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur, India

*Corresponding Author: rekhascm17@gmail.com, Mobile: +91-8668985672

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***Abstract*—** The total production in India is around 280 million tonnes of food grains annually, which includes rice, wheat, cereals, pulses, vegetables and other. The quantum of storage loss and other wastage of foodgrains is very much high. India is the second most heavily populated country after China in the world. It is estimated that India will supersede China by 2025 and will become the most populous country in the world. To feed this huge population is a challenging task and the wastage and losses in foodgrains are taking this challenge to another level of difficulty. According to United Nation Development Programme (UNDP), almost 40 percent of the foodgrains production in India is wasted every year. The reasons behind the wastages are lack of scientific storage structures, lack of storage space, in transit losses, wastage by the users and many more. The wastage quantum of food is the loss of food addition to the loss of resources. The amount of loss not only includes the cost of foodgrains loosed but also includes the cost of resources as well as the loss of the opportunity cost. In India, one major body, who deals with the storage of foodgrains, is Food Corporation of India (FCI). FCI procures and stores the foodgrains like wheat and rice on behalf of the Government of India. FCI uses the scientific methods to prevent the losses in storage and make sure that the stored foodgrains remain in the good condition. Based on the advice from Government of India, FCI releases the foodgrains for the welfare schemes like Public Distribution System, Mid Day Meal or for military quota. In this research work, researcher has studied the quantum of storage loss in FCI, Nagpur Area Office for the year 2015-16. The aim of this research work is to compare the actual losses and prescribed losses limits. The data for this study is collected through the secondary data sources.

***Keywords*—**FCI, Food Corporation Of India, Storage Loss, Rice , Wheat

I. INTRODUCTION

The reported ‘damage’, ‘loss’ or ‘wastage’ of foodgrains in India is extremely high. As our population is increasing with an alarming rate, it is very much needed to look into this issue of foodgrains losses with a different perspective. The thing is that we are not able to provide the food to everyone not because we produce less, but the reason is we waste more. The total production is about 260 million ton, which is more than sufficient to feed our population. But the tragedy is that around 30-40 % of the food produce do not reach to the people. It is a major problem that needs to be looked into right away.

Nearly one third of the Indian population suffer from hunger. Considering that we already produce enough food to feed, this should no longer to be a problem [1].The country has failed to take advantage of the higher production levels. There is a loss of both pre harvest and post harvest agriculture food grains in India. The major contributor of these losses is the lack of scientific storage and cold storage facilities. Only 10 percent of the food grains get the scientific cold storage facilities.

FCI was established in 1965, with the aim to ensure food security in nation. “Ensuring Food Security of Nation” is a tag line of FCI. FCI is having five zonal offices (North, East, South, West, and North- East) [2]. Maharashtra, Madhya Pradesh, Chhattisgarh and Gujarat come under the west zone. Nagpur, Area Office comes under the west zone Maharashtra region. Nagpur area office is catering the requirement of food grains of eleven revenue districts.

Nagpur area office is having its own depots in Ajni, Nagpur, Wardha and Gondia. Based on the requirement FCI, hires depots from State Warehousing Corporations (SWC) & Central Warehousing Corporations (CWC)

FCI, Nagpur area office mainly acts as a storage point for rice and wheat. The foodgrains comes from Punjab, Haryana, and Madhya Pradesh & Chhattisgarh via rail and road. The FCI role is here to safeguard the foodgrains from any kind of losses and maintain the quality. To prevent the infestation proper fumigation and other quality control technique are

used. Nagpur area office is having a storage capacity of 4, 59,795 metric tons. The prescribed storage loss limit for rice is 0.20 % and wheat is 0.00 % annually.

This research paper consists of seven sections. Section I contains the introduction of FCI, Section II contains the Literature review. Section III contains the research methodology used. Section IV contains the basic objective of the study, section V explains about the formulated hypothesis Section VI data presentation and analysis. Section VII contains the conclusion, recommendation and future scope of the study.

II. RELATED WORK

India is used to be considered as an agrarian country, so as the economy. Johnston, Bruce F, and John W Mellor (1961) considered agriculture as an existing industry of major importance, commonly the solitary existing industry of any consequences for all underdeveloped economies. It is also said that around some 40-60 percent of the national income is produced in agriculture and from 50-80 percent of the labour force is engaged in agriculture production [3].

70 percent of the farm produce is stored by the farmers of India. The storage structures are not up to the mark. The storage structures lack the scientific methods of storage. Thus the scientific storage structures are very much of importance.

795 million people in the world are undernourished, which means that each individual in nine individual is undernourished. Asia and the Pacific account for almost 62 per cent of this section. This statistics was published by The Hindu on May 28th, 2015.According to the annual report by the Food and Agriculture Organization of the United Nations released on May 2015, India is having the highest population (194.6 million) of total undernourished people.

The State of Food Insecurity in the World, report stated that, higher economic growth has not been fully translated into higher food utilization and mostly the poor and hungry are failed to benefit much from this overall economic growth. The report also suggests that this is a result of growth not being inclusive. The high percentage of the hungry and malnourished in developing countries is the person who lives in rural areas. Thus the effort to promote growth in agriculture and the rural area is the most important component of a strategy for promoting comprehensive growth and development.

The data published by the Ministry of Food Processing Industries on August, 2016, states that the total harvest and post harvest losses of India is estimated around 92,000 crores. As per the Food Security Act 2013 or Right to Food Act, Government of India is responsible to provide subsidized food grains to almost two-thirds of India's total population. The Government has done so much to enhance the food production and productivity, but still so much need to be done to prevent the damage and losses. Clear-cut responsibility and accountability should be defined in this aspect.

Although the Government has taken measures to reduce the food wastage, but given the depth of the problem, these steps are not up to the mark. Every year a huge quantum of food grain losses is noticed but nobody is made responsible and accountable for that.

The total foodgrains wasted in FCI from 2005-13 is around 1.94 Lakh MT. The damaged stock comprises of around 84 per cent (1, 63,576 MT) of rice and 14 per cent of wheat (26,543 MT). The recovery of these losses in terms of money is not sufficient, because the losses are more than the financial losses.

But despite of so many constraints the achievements of the Food Corporation of India are substantial. Through these operations, it has contributed to a number of objectives of food policy [4].

III. METHODOLOGY

Both Qualitative and Quantitative research method is used. Data collection is done through the secondary data collection sources. Percentage, Mean, Average and One Sample t - test are used for the data analysis.

IV. OBJECTIVES

The objectives of the study are mentioned below.

1. To be aware about the quantum of storage losses in foodgrains.

2. To find out if, storage losses are within the prescribed limits at FCI, Nagpur area office.

V. HYPOTHESIS

1. Ho (Null Hypothesis) - There is no significant difference between the prescribed loss limit and actual storage loss in wheat in FCI, Nagpur area office.

H1 (Alternate Hypothesis) – A significant difference exist between the prescribed loss limit and actual storage loss in wheat in FCI, Nagpur area office.

2. Ho (Null Hypothesis) - There is no significant difference between the prescribed loss limit and actual storage loss in rice in FCI, Nagpur area office.

H1 (Alternate Hypothesis) – A significant difference exist between the prescribed loss limit and actual storage loss in rice in FCI, Nagpur area office.

VI. DATA COLLECTION, PRESENTATION AND ANALYSIS

Data has been collected from 27 depots of FCI, Nagpur AO. Data for stock position is tabulated and presented in tables Table 1 & 2 shows the stock position of wheat & rice respectively. Chart 1 & 2 presents the total storage loss in owned & hired depots of FCI, Nagpur area office for the year 2015-16.

Table 1: Stock Position of Wheat for 2015-16 (Figures are in MT)

Depot	Loss	Loss %
Owned	92.75	0.07
FSD AJNI	46.93	0.08
FSD WARDHA	45.82	0.06
Hired	283.69	0.15
AMARAVATI	6.36	0.13
CWC AKOLA I	2.56	0.19
CWC AKOLA II PEG	-	-
CWC AMARAVATI	-	-
CWC BADNERA PVT PPP	64.32	0.21
CWC WASHIM PVT PPP	16.52	0.06
CWC YAVATMAL II PEG	28.19	0.41
DHAMANGAON	8.32	0.18
GONDIA MIDC PEG	20.58	0.19
MSWC AKOLA	12.31	0.13
MSWC BRAMHAPURI PEG	27.60	0.17
MSWC CHANDRAPUR MIDC PEG	8.02	0.14
MSWC CHANDRAPUR PADOLI PEG	26.50	0.15
MSWC KHAMGAON PVT PPP	19.32	0.07
MSWC KHAMGAON REGULAR	19.32	0.32
MSWC WADSA	14.72	0.17
MSWC YAVATMAL PEG	9.08	0.15
Total	**376.44**	**0.12**

Table2: Stock Position of Rice for 2015-16 (Figures are in MT)

Depot	Loss	Loss %
Owned	1,140.94	0.52
FSD AJNI	493.56	0.60
FSD WARDHA	313.53	0.46
GONDIA	333.84	0.49
Hired	2,575.62	0.46
AMARAVATI	6.59	0.24
AMGAON	67.91	0.22
ARJUNI MOREGAON	5.95	0.05
CWC AKOLA I		-
CWC AKOLA II PEG	121.03	13.73
CWC AMARAVATI		-
CWC BADNERA PVT PPP	401.87	0.70
CWC WASHIM PVT PPP	256.86	0.62
CWC YAVATMAL II PEG		-
DHAMANGAON	149.37	0.49
GONDIA MIDC PEG	61.18	0.25
KARDHA	28.74	0.13
MSWC AKOLA	155.79	0.40
MSWC BRAMHAPURI PEG	276.10	0.56
MSWC CHANDRAPUR MIDC PEG	147.18	1.21
MSWC CHANDRAPUR PADOLI PEG	139.31	0.61
MSWC KHAMGAON PVT PPP	243.98	0.38
MSWC KHAMGAON REGULAR	127.61	0.81
MSWC TUMSAR	8.56	0.12
MSWC WADI HINGNA	131.19	1.32
MSWC WADSA	37.97	0.15
MSWC YAVATMAL PEG	169.38	0.67
SOUNDAD	36.95	0.28
WARTHI	2.12	0.01
Total	**3,716.56**	**0.48**

CHART 1: Storage losses of Wheat & Rice (2015-16) in FCI Nagpur area office (Owned depots)

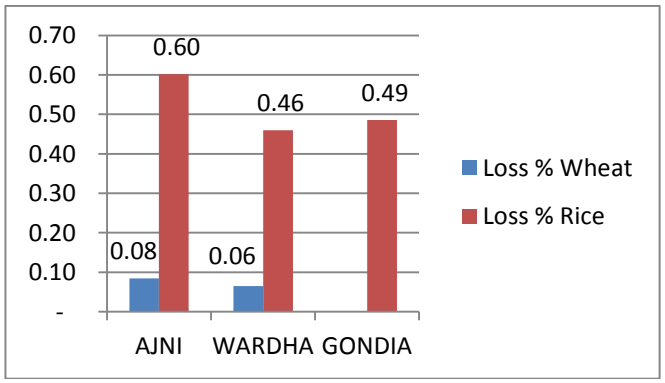
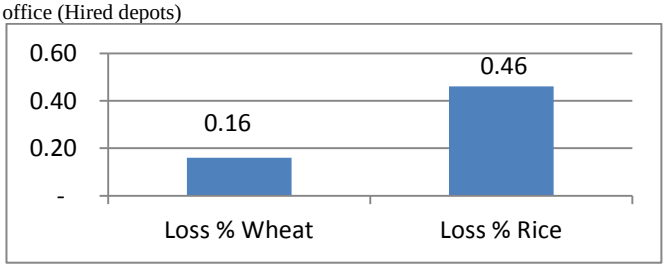


CHART 2: Storage losses of Wheat & Rice (2015-16) in FCI Nagpur area office (Hired depots)



To test the hypothesis number 1, data regarding the stock position of wheat has been collected from all depots of FCI, Nagpur AO. Actual loss percentage is calculated for all the depots and a comparison is done for actual and prescribed losses. One sample t test is calculated to find the significance. Different parameters are calculated for both actual as well as prescribed Norms.

Table 3

Parameters	Actual Loss	Losses Norms
Mean	0.17	0.00
SD	0.09	0.00
SEM	0.02	0.00
N	17.00	17.00
Intermediate values used in calculations		
t		1.3027
Degree of Freedom (df)		16.00
Standard error of differences		0.021

The difference between mean of two groups are 0.15. 95 % confidence interval of this difference ranges from - 0.0726 to 0.0173. The two tailed p value is 0.2111. Thus the difference is not significant.

We accept the null Hypothesis that there is no significant difference between the prescribed loss limit and actual storage loss in wheat in FCI, Nagpur area office.

To test the hypothesis number 2, data regarding the stock position of rice has been collected from all depots of FCI, Nagpur AO. Actual loss percentage is calculated for all the depots and a comparison is done for actual and prescribed losses. One Sample t test is calculated to find the significance. The prescribed loss limit is 0.2 % for rice. Different parameters are calculated for both actual as well as prescribed Norms.

Table 4

Parameters	Actual Loss	Losses Norms
Mean	1.21	0.20
SD	2.73	0.00
SEM	0.56	0.00
N	24.00	24.00

Intermediate values used in calculations	
T	1.80
Degree of Freedom (df)	23.00
Standard error of differences	0.56

The difference between mean of two groups are 1.00. 95 % confidence interval of this difference ranges from -0.1507 to 2.1523. The two tailed p value is 0.0853. The difference is not much significant.

We accept the null Hypothesis that there is no significant difference between the prescribed loss limit and actual storage loss in rice in FCI, Nagpur area office. As the losses are compared on a whole basis, so the differences are not much significant, but in case of certain godowns like CWC Yavatmal, CWC Akola, Badnera, MSWC Chandrapur, Wadi Hingna, Khamgaon, the losses extremely high, which require the focus from the corporation.

VII. CONCLUSION, RECOMMENDATIONS AND FUTURE SCOPE

FCI has been criticized so many times for not maintaining the desired quality of the foodgrains. The non performance of the corporation was highlighted quite a few times. The Parliamentary Committee of 1981-82, recommended that FCI should not be responsible for storage of the food grains. The storage activity should be separated from Food Corporation of India and FCI is also criticized for keeping the food grains in open ambience for longer durations which results in further storage losses and for issuing poor quality

grains for Public Distribution Systems [5]. However in recent time the overall quality of foodgrains procured and stored by FCI has been improved.

Overall storage losses are not significantly high, but in certain depots the losses are way above the prescribed limits. The total storage loss occurred FCI, Nagpur area office for 2015-16 is about 4093 MT (Rice- 3717 & Wheat- 376 MT).

The Corporation should focus on reducing the inventory losses. Better scientific storage structure should be used to store the foodgrains inventory. Nagpur Area Office does not have modified structures like silo. The feasibility of construction of these structures should be checked by Corporation and Government of India. The jute bags, which are used for the storage of foodgrains, should be replaced with the advanced polypropylene bags. These advanced bags prevent the entry of moisture into the bags. Thus the infestation of storage insect can be minimized.

For drying of the food grains, solar dryer must be installed, which will be a cost effective measure. During the study researcher has interviewed employees of FCI and came to know that many a times, the foodgrains remain in the depot for long time, which is also a cause of storage losses. Government should provide a pre liquidation policy for better management of the buffer stock. The Corporation does not follow any transportation model for dispatching the foodgrains. Advance Linear programming models should be introduced to minimize the cost.

This study is done only for FCI, Nagpur Area office and for a small time frame. There is a lot of scope of research as FCI has having five zonal offices and several area offices. There is a need of a detailed research to be done to understand a bigger picture of storage as well as transit losses in the total supply chain process of foodgrains. It is a need of hour to find out the measure to reduce the huge quantum of losses.

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Authors Profile

Miss. Rekha Bora has pursed Bachelor of Agriculture Science from Govind Ballabh Pant University of Agriculture and Technology, Pantnagar, Uttrakhand and Post Graduation in Agriculture Warehousing and Supply Chain Management from National Institute of Agriculture Extension Management, Hyderabad. She is currently pursuing Ph.D. in Business mangement from RTMNU, Nagpur University. She has a work experience of more than eight years in field of Operation Management and Marketing Communication. She has also presented research papers in National and International Confrences.

