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"Evaluation Of Warehousing System In Allahabad City, India"

Nitin Borkar[1], Avanish Kumar[2], Vijay Nakade[3], Dilansing Karande[4]

[1]M.Tech Food Laws and Policies, Department of Food Process Engineering, Sam HigginBottom Institute of Agriculture, Technology and Sciences- Deemed University
P.O-Naini, Allahabad, U.P-211007, India1

[2]Assistant Professor, Department of Food Process Engineering, Sam HigginBottom Institute of Agriculture, Technology and Sciences- Deemed University
P.O-Naini, Allahabad, U.P-211007, India

[3]M.Tech Food Engineering, Department of Food Process Engineering, Sam HigginBottom Institute of Agriculture, Technology and Sciences- Deemed University
P.O-Naini, Allahabad, U.P-211007, India

[4]M.Tech Food Engineering, Department of Food Process Engineering, Sam HigginBottom Institute of Agriculture, Technology and Sciences- Deemed University
P.O-Naini, Allahabad, U.P-211007, India

Abstract

In the present dissertation, Survey was undertaken to evaluate the present status of warehouses and warehousing system in Allahabad, Uttar Pradesh. The survey consisted of the overall 10 warehouses in Allahabad. Their storage capacities, facilities being provided were evaluated. The study further revealed that the capacity of warehouses is sufficient to satisfy the demand of population. But the lack of modern facilities for enhancing the quality and quantity of food grains was observed. The storage capacity of warehouses in Allahabad is 240919MTs while the wastage was 23312MTs (11.80%). Most of the warehouses needs to adopt and implement the modern facilities and techniques for the modernization of warehousing system. Proper precautionary measures, along with the beneficial policy were further suggested in the studies. The hygienic and cleanliness improvement was a major part of the suggestions in later part. It was also noted that the warehouses owned by FCI are superior to that of non FCI warehouses. So, it can be calculated that there is need of hour to adopt modern techniques of warehousing system in Allahabad and India also for the betterment of further warehouses.

Key words: Warehousing system, Storage capacity, Food Corporation of India, State warehousing system, Central warehousing system, beneficial policy.

1. Introduction

Traditionally, warehousing involves the storage of raw material, work-in-process inventory or finished goods in a covered space in the most suitable way for a specific time period. With the growing importance of logistics and supply chain management throughout the world, warehousing has emerged as one of the vital component of the supply chain. Globally, USD 100 billion warehousing industry has undergone significant changes in the last decade owing to the growth in world trade and expansion of international markets as well as increasing application of new technology. Internationally, warehousing industry is classified into three different type's viz. public warehousing, private warehousing and Contract warehousing **Recto (1980).**

In India, warehousing industry is mostly dominated by public sector undertakings *viz*., Central Warehousing Corporation (CWC), State Warehousing Corporations and others. The total covered capacity available with FCI for storage of Food grains including the capacity hired from Central Warehousing Corporation and State Warehousing Corporations was 261.21 lakh tonnes as on 1.3.2005. The hired capacity with the Food Corporation of India was 109.80 lakh tonnes as on 1.3.2005. Warehousing activities of CWC include food grain warehouses, custom bonded warehouses, container freight stations, inland clearance depots and air cargo

complexes. Ports act as the interface for sea borne trade movement.

As per 2011 census India's population is 1.23 billion. India will overtake China's population by 2050. Our population might be 1.71 billion by 2050, while China's population will be 1.31 billion. Therefore the problems of storage, movement and utilization of the food grains will be of equal magnitude. Considerable attention is, no doubt being paid to the imported grains for proper storage. But, the producers' stocks, which constitute nearly 75 per cent of the total food grain production, have not received adequate attention for proper storage. What is worse is a developing nation not only produces less, it loses much of its valuable production due to poor and unscientific storage conditions. In the present context of food grain trade, it is worthwhile assessing the planning done for food grains trade, its production, its distribution and the present arrangement for storage and warehousing.

Storage implies preserving. It is the process of carrying surplus production for future consumption. It includes all types of storage, whether traditional method or scientific methods of storage, whether controlled or ambient and maintained by the private or public agencies. Ware housing means scientific facilities for storage of commodities, generally combined with the elements of trade and profit. The storage is a broader term and warehousing forms a part of it **Lingamurthy *et al.* (1981)**

'Warehouse' means any building, structure or other protected enclosure which is used for the purpose of storing goods on behalf of depositors but does not include cloak rooms attached to hotels, railway stations, the premises of other public carriers and the like. A licensed warehouse is required to obtain weather, grader and sampler licenses as well from the licensing authority, which satisfies itself about the storage worthiness of the structure to be licensed before the grant of the license.

Warehousing is an economic activity and denotes a dynamic aspect of commercial storage. It provides for safe keeping of goods in an orderly manner at suitable locations for easy retrieval when required for use. Warehousing is a trade involving deposit of goods, merchandise, chattel, commodities and wares in the warehouses for safe custody and return on payment of warehousing charges. The Central and State Warehousing Corporations accept only such commodities for storage as can be stored under the provisions of the warehousing Corporations of the Warehousing Corporations Act, 1962 and notifications issued there under **Chibber, (1982).**

Warehouse provides protection to goods against heat, wind, storm, moisture, etc. and also cut down losses due to spoilage, wastage etc. This is the basic function of every warehouse. In addition to this, warehouses now-a-days also perform a variety of other functions. The basic function of warehouses is to store large stock of goods. These goods are stored from the time of their production or purchase till their consumption or use. A warehouse provides protection to goods from loss or damage due to heat, dust, wind and moisture, etc. It makes special arrangements for different products according to their nature. It cuts down losses due to spoilage and wastage during storage.

2. Methodology

Warehousing is the concept related to collection, storage and distribution of the grains at timely intervals. Warehouses are composed of mainly CWC (central warehousing corporation) and SWC (state warehousing corporation). Besides these, there are privately owned warehouses which are available on rent for the purpose of grain storage. Government warehouses are generally owned by FCI. Methodology is the strong foundation for systematic and scientific research or investigation. It is imperative to give the details of investigation and methods adopted by the investigator in finding out the fact or problems.

2.1 Concept of warehousing

India is predominately an agricultural country. It is rapidly progressing in the field of agricultural production, storage, marketing and transport. As a result of effective utilization scientific knowledge at all level, purposefully planning, growth and welfare oriented policies of central and state governments. India is fast emerging as a slf sufficient country. In India, agriculture provides living for more than two thirds of our total population and even then food protection is not enough to meet the demands and we are compelled to import. The population is growing at an annual rate of 2.5 % while the urban population alone at 4%. The rate of increase of food production has to catch up with the requirement.

2.2 Functions and objectives

The recommendations of all India Rural Credit Survey Committee paved the way for enhancement of agricultural produce (Development & Warehousing) corporations Act 1956 (Since replaced by The warehousing corporation act, 1962) and Establishing of the Central and state warehousing corporations.

Warehousing envisaged of three tier system. Under the scheme, centers of all India importance are served by the Central warehousing corporation centers of secondary markets and districts levels are to be served by the state warehousing corporations, while the village and the community levels are to be looked after by cooperatives.

Subheadings should be as the above heading "2.1 Subheadings". They should start at the left-hand margin on a separate line.

2.2.1 Functions of central warehousing corporation, as provided in the warehousing corporation act,1962 are:

- To acquire and build godowns and warehouses at such suitable places in India as it thinks fit.
- To arrange facilities for the transport of agriculture's produce, seeds, manures fertilizers, agricultural implements and notified commodities to and from warehouses.
- To subscribe to the share capital of a state warehousing corporation.
- The corporation may, at its and at the request of some parties concerned, undertaken disinfestations service outside its warehouses in respect of agricultural produce or notified commodities

2.3 Questionnaires

- Name of warehouse: State, District, Tehsil, Capacity?
- Average annual figures of produce commodity-wise that remains at the centers of storage purposes after expert etc and how much accommodation commodities is available for it?
- General assessment of custom throughout the year. how much custom do you except commodity-wise from month to month, which will come to the corporation proposed warehouse having regard to the normal period of storage of a comoditity whether this custom will insure the present of occupancy of the warehouse throughout the year, if not, quantities is of various commodities expected to the stored from month to month?
- Can some good godown accommodation be hired in the initial stages for starting a warehouse if so following detail is given?
  - Dimension of the covered area in the building,
  - Type of construction,
  - Name and address,
  - Where situated,
  - Distance from railway goods sheds?
- How many employees do you have? How many Permanent employees do you have?
- What all-grading method for agriculture produce do you adopt?
- What other facility do you provide to farmers apart from storing the grains and providing the inputs?
- What all quality control measures do you take? Who is your actual customer and how do you sell?

  Farmers, Traders, FCI, Others.
- How much wastage happens at your end?
- What steps do you take in eliminating the wastage?
- Percentage of loss reduced by storing in scientific godown?
- Which months of the year you have the maximum utilization?
- Which all products contribute maximum to your Godown storage utilization?
- What all quality control measures do you take?

2.4 Selection of the Study Area

The Allahabad region of Uttar Pradesh state has been considered for the study to provide representative sample to consider the unique characteristics covering diversified regions in the UP State. The public undertaking under the Government of Uttar Pradesh the largest warehousing services is catering to the large population in the state. Hence, it was imperative to select the Uttar Pradesh State Warehousing Corporation purposively for the investigation.

3. Results and Discussion

In the present dissertation, survey was done on the current status of warehousing system in India as well as Allahabad. Agriculture is the backbone of Indian economy and the agricultural productivity is increasing day by day. It is being achieved due to implementation of modern techniques in agriculture. The storage of agricultural produce is most important. So to facilitate this, warehouses are constructed and operated by CWC and SWC. The present status of warehouse in India is given below in table.

3.1 Need for Modern Warehousing in India

The warehousing capacity available in India, in public, cooperative and private sector is about 112.37 LTs. Due to record level of procurement in the last five years, several States have been facing a problem of covered storage capacity. In the Rabi Marketing Season (RMS) 2012-13, the Food Corporation of India (FCI) had procured 380.23 lakh tonnes of wheat which was around 100 lakh tonnes higher than the earlier record procurement. During last few years, the procurement of food grains (Wheat and Rice) by the Government agencies for the Central Pool has increased substantially. The procurement of these commodities during last six years is given below:

Table 3.1 Current Status of Warehousing Capacity in India

Sr. No.	Name of Organization/ Sector	Storage Capacity LTs
1	Food Corporation of India (FCI)	33.60
2	Central warehousing corporation (CWC)	10.13
3	State warehousing corporation (SWC)	23.00
4	State Civil Supplies Department	11.30
5	Cooperative Sector	15.37
6	Private Sector	18.97
	Total	**112.37**

Table 3.2 Procurement of Wheat during last six years Rabi Seasons (RS) (Lakh tonnes)

RS 2007-08	RS 2008-09	RS 2009-10	RS 2010-11	RS 2011-12	RS 2012-13
111.28	226.82	253.81	225.14	283.85	280.23

Table 3.3 Procurement of Rice during last six years Kharif Seasons (KS) (LM tones)

KS 2006-07	KS 2007-08	KS 2008-09	KS 2009-10	KS 2010-11	KS 2011-12
251.07	**284.91**	**336.83**	**320.00**	**341.96**	**344.63**

Therefore, availability and augmentation of storage capacity is one of the main priorities of the Government of India. There is a need that sufficient modern warehousing capacity should be created in the country to store and preserve the food grains procured for the Central Pool. The procurement trend shows that the Central Pool stock may reach all time high level of 750.17 lakh tones on 01-06-2012. The Govt. agencies i.e. FCI and State agencies were having 438 lakh tones covered capacity as on 31-03-2011. For the storage of such a high level of stocks in Central Pool, the FCI has also formulated a scheme for hiring of private godowns.

3.4 Capacity of Warehouses in Allahabad

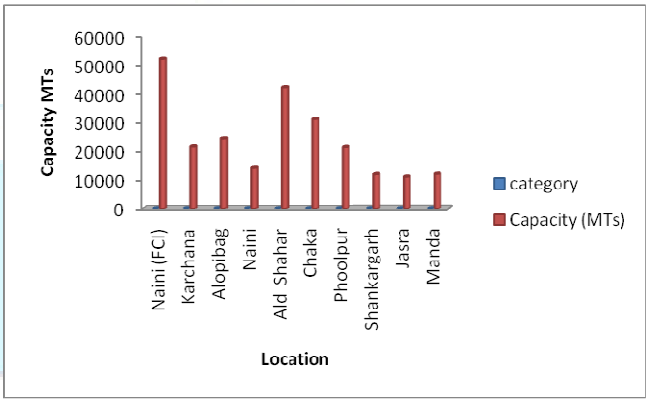
The survey to analyze and evaluate the present status of warehousing system and facilities in Allahabad region of Uttar Pradesh was done. The warehouses in Allahabad are basically divided into three main categories such as 1. Owned depot managed by FCI, 2. Hired but Managed by CWC and 3. Hired but Managed by SWC. The survey was carried out in 10 locations of warehouses in Allahabad *viz.,* Naini (FCI), Karchana, Alopibag, Naini, Allahabad Shahar, Chaka, Phoolpur, Shankargarh, Jasra and Manda. The capacity wise distribution of warehouses in Allahabad is given below.

Table 3.4 Capacity of warehouse in Allahabad

Location (Depot code)	category	Capacity (MTs)
Naini (FCI)(NH6001)	A1	51970
Karchana(NH6004)	B1	21400
Alopibag(NH26006)	B2	24360
Naini(NH26007)	B2	14000
Allahabad Shahar(0944001)	B2	42100
Chaka(0944022)	B2	31000
Phoolpur(0944007)	B2	21230
Shankargarh(0944012)	B2	11867
Jasra(0944019)	B2	11009
Manda(0944020)	B2	11983
Total		240919

Category: A1: Owned depot Managed by FCI
B1: Hired but Managed by CWC
B2: Hired but Managed by SWC

Fig 3.4 Capacity wise distribution of warehouses in Allahabad.



3.5 Warehouses in Allahabad

The survey was done to evaluate the present status of warehouses in Allahabad. The survey comprised of Location of warehouse, Storage capacity, Storage facility, Operation system and Security facilities. According to the survey, findings recorded are as follows.

Table 3.5 Warehouses in Allahabad

Particulars Sr. No.	Location of Warehouse (Allahabad)	Storage Capacity (Tonnes)	Operation Systems	Security Facilities	Rating (Scale) (1-10)
1	Naini (FCI)	51970	Modern	7	6
2	Karchana	21400	Traditional	5	5
3	Alopibag	24360	Modern	6	7
4	Naini	14000	Traditional	5	4
5	Allahabad Shahar	42100	Modern	12	7
6	Chaka	31000	Modern	4	6
7	Phoolpur	21230	Modern	10	7
8	Shankargarh	11867	Traditional	6	5
9	Jasra	11009	Traditional	7	6
10	Manda	11983	Modern	10	7

Warehouses in Allahabad were evaluated for the survey on the basis of facilities being provided. The locations selected were Naini (FCI), Karchana, Alopibag, Naini, Allahabad Shahar, Chaka, Phoolpur, Shankargarh, Jasra and Manda. The facilities included capacity of warehouse, facility such as trolleys, pulleys, escalators, etc. The modernization of warehouse and security staff was analyzed. Rating was given on the 10 point scale.

3.6 Warehouse capacity and wastage in Allahabad

The storage capacity of warehouses in Allahabad is given in the table 4.6. Allahabad is having 10 warehouses located in various parts. Some of them are owned by Government (FCI), while others are owned by individuals or local bodies. Total capacity of warehouses in Allahabad is 271036 MTs, while the incoming stand at 197433 MTS and outgoing is 174121 MTS. The difference clearly indicates that there is some wastage during the warehousing system. The overall status and capacity of all the warehouses in Allahabad is given in detail below.

Table 3.6 Warehouse capacity and wastage in Allahabad

Sr No.	Location	Capacity (MTs)	Incoming (MTs)	Outgoing (MTs)	Wastage (MTs)
1	Naini (FCI)	51970	37012	32703	4309
2	Karchana	21400	16260	14230	2030
3	Alopibag	24360	18350	15210	3140
4	Naini	14000	10500	8512	1988
5	Allahabad Shahar	42100	38520	35311	3209
6	Chaka	31000	28600	24521	4079
7	Phoolpur	21230	17534	15490	2044
8	Shankargarh	11867	10000	9654	346
9	Jasra	11009	9867	8780	1087
10	Manda	11983	10790	9710	1080
	Total	240919	197433	174121	23312

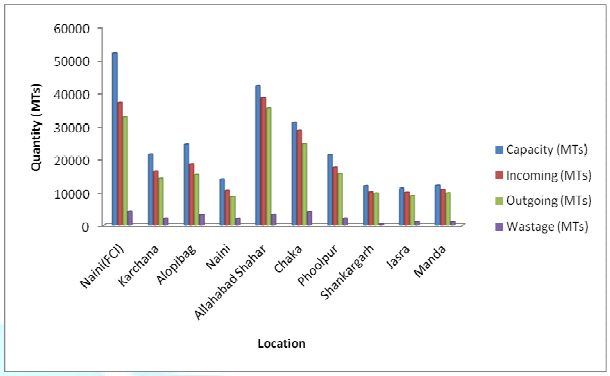


Fig 3.6 Warehouse capacity and wastage in Allahabad

3.7 The Warehousing (Development and Regulation) Act 2007

It was enacted and notified in September 2007. The Act will ensure that the farmers are able to keep their goods in certified warehouses and use warehouses receipt as a negotiable instrument. With the full implementation of this Act, farmers would find it easy to take loans from commercial banks against negotiable warehouse receipts and not resort to distress sales to take care of their urgent cash needs. The Act has since been given effect to in September, 2010. A regulatory Authority namely Warehousing Development & Regulatory Authority (WDRA) has been set up on 26.10.2010 under the Act to register and regulate warehouses issuing negotiable warehouse receipts and to implement other Provision of the Act.

3.8 Challenges in post harvest storage, handling and protection of foods

3.8.1 The main challenges include:

- Unreliable supply of electricity and frequent power rationing affects warehouse operations e.g. milling and processing leading to high operational costs.
- Inadequate budgetary provisions for routine repair and maintenance of the ware houses and electrical wiring systems often limit use of modern technologies to enhance operational efficiency. Most of the stores lack basic equipment e.g. moisture meter, power extinguishers etc.
- Most of the warehouses were found to be using manual labour for activities such as sorting, cleaning, and packaging. This was due to non functional motors/elevators/ lifts and worn out wiring systems.
- Poor infrastructure lead to high transport costs of grains from farm to the warehouses which translate into high operational costs.

- Most of the old warehouses had problems of roof leakage, poor ventilation and worn out concrete floors.
- Most of the warehouses' capacities are under-utilized i.e. they are full during the harvesting period and then become partially or totally empty a few months after the crop harvests. This has prompted the stores' operators to convert them from storing grains to non-agricultural products such as cement and soft drinks. Other stores were being used for coffee curing while a few others have been turned into churches.
- In some cases, village or ward governments failed to lease their warehouses to other traders/business people because they were not handed over properly from respective Local Government Authorities (LGA), and this affects full utilization of these facilities.
- Lack of insecticides/pesticides application to preserve the stored grains for longer periods has led to untimely sales of stored produce, thus farmers end up realizing low prices.
- The grains procured from farmers have high moisture content (more than 14%) hence, difficult to store. In some cases, the grain was found to be contaminated with foreign materials.
- Lack of capital to invest in new storage technologies. Inadequate funds also led to poor conditions of the stores due to poor maintenance and servicing of the warehouses.
- Poor agricultural policies, inflation, high prices, corruption and export bans affect the traders operations, especially those dealing with imports and exports.
- The export ban is the major issue affecting most farmers as well as food processors in the country. The government policy and development issues seems to be conflicting because on one side the government wants to alleviate poverty which can be achieved by allowing 24 farmers to sell across borders and fetch higher prices but on the other hand if farmers were left free to sell across the borders there is the possibility of compromising the country's food security situation.
- Unscrupulous middlemen who leap all the benefits of trade at the farmer's expense and even hinder farmers from entering directly into the markets.
- Poor management and ownership disputes and lack of tenants to hire the stores.
- Unfair competition from unregistered companies who trade without regulations.
- Limited storage space and land in high potential grain production areas.

3.8.2 Remedies to minimize grain storage loss - Expected impact:

Temperature & moisture are the main factors which speed up most chemical reactions (increase with increasing temperature) particularly if some quantity of moisture is there. The food grains which contain moisture of other biological materials keep better under refrigeration (low temperature) than at high temperatures. Thus rain & its products at moisture levels unsafe for storage in summer may be stored as temperatures prevailing in winters. Moisture is by far the most important factor to bring about deterioration of grains in storage. If the grain moisture content is maintained at low level, say 9-10 % clean grain can be stored for many years.

In summer, it is recommended that:

- Store only that grain which is clean devoid of dirt-dust foreign matter, broken grains and with not more that 11% of moisture.
- Store only in weather – tight hermetic steel bins as designed by Indian Grain Storage Institute, Hapur and other bins which do not allow entry of moisture, insects, rodents, etc.
- Clean up and dispose all waste grain, feed and stray seeds/grains that have accumulated around the storage bins.
- Fumigate the bin as soon as the grain is poured in and there after 4-5 weeks later this treatment may be repeated.
- Inspect the grain frequently but at least one a month by taking samples. Re-fumigate, if an insect infestation is discovered.
- At all times the moisture content of the grain should continue to remain low enough do that not to allow any fungal/bacterial growth.
- Good housekeeping is an effective sanitation program and this is the simplest and best technology to prevent storage losses.

3.9 Cleanliness and hygiene in the warehouses:

During storage, the food grains, and other agricultural commodities are deteriorated by physical and biological factors. These factors include moisture, temperature, insects, rodents, birds and storage fungi. Losses by these factors may be reduced to minimum level by maintaining cleanliness and hygiene in the warehouses. The following steps should be taken to ensure cleanliness and hygiene in the godowns/warehouses:

- The floor space in the godowns/warehouses should be cleaned daily.
- The stacks (food grains bags) should be brushed at weekly intervals and after every fumigation.
- Cleanliness should be maintained in entire warehousing complex.
- The sweepings including dead insects after spraying of insecticides and Fumigation should not be left in

godowns/warehouses and should be immediately removed.

- The waste material and dead stock items including used old gunny bags, wooden crates, polythene sheets etc. should not be stored in warehouse. These should be stored in separate rooms.
- Spilled grain should be immediately collected, sieved and filled in grain bags (palla bags).
- Timely for insect pest control should be carried out in the warehouses. Similarly, rodent control operations in and around warehouses should also be carried out as and when required and dead rats should be collected and buried in the earth.
- Measures to check bird entry in the warehouses should be carried out and these should not be allowed to contaminate the grain and other commodities with their excreta and dead birds.
- Warehouses can be made bird proof by fixing wire meshes (size 0.6cm) on windows, ventilators and other possible entries. Polythene strips or nylon curtains may be used on doors of godowns / warehouses to check the entry of birds.
- Proper and timely aeration which reduces the grain temperature and moisture and also eliminates the proceeds infestation should be carried.
- Warehouse official shall insure that vegetative growth, if any, is removed at periodical intervals to keep the premises free from birds, reptiles, rat burrows etc.
- Warehouse shall insure that there are adequate light arrangements in the warehouse.
- Warehouseman shall insure that all the drinking water coolers, drinking water taps are clean and hygienic and clean drinking water is available for its staff.
- Warehouseman shall insure that all the pipes entering the warehouse are fixed with wire mesh properly to check the entry of rats.
- All the roofs of the warehouses should be painted with waterproof material and should be leak proof.
- During periodic inspection of goods/warehouses, official shall ensure that proper hygiene and cleanliness is maintained.
- A location wise register about the cleanliness and hygiene in the warehouse.

3.10Suggestions for safety of warehouses

3.10.1 Fire precaution Dos and Don'ts

Dos

- Keep the godowns neat and clean.
- Build stack strictly to stack plan.
- Insure "no smoking" and display "no smoking" boards.
- A range periodical check of electrical installation
- Observe the local fire regulations.
- Keep air in late and windows free from instructions.
- Maintain contact with the nearest service stations
- Conduct periodical mock fire drill.
- In case of fire
  - Raise fire alarm
  - Use appropriate fire extinguishers
  - Inform nearest fire service station.
  - Insure safety of inmates
  - Inform your senior officer.
  - Inform police security.
  - Render first aid to insure safety.
  - Rush them to hospital if necessary.

Don't

- Do not store/ keep mats gunnies in loss condition
- Do not store hazardous and non-hazardous goods together
- Do not carry naked fire lamp or lighted candles in the premises
- Do not lock the alleyways and haulages.
- Do not allow losses or temporary connection or pendant electric lights
- Do not allow accumulation of wastages or growth or grass in the vicinity.
- Do not miss use fire extinguishers, hydrants and buckets.
- Do not use water or fires or electrical origin (shock hazard) or inflammable liquid fires (will splatter)
- Do not keep fire fighting equipments inside the godowns.

Conclusion

At the end of present study, it can be concluded that present warehousing system in Allahabad is satisfactory in the sense of capacity to fulfill the requirement of population but the facilities being provided were not modern. The management system of warehouses was evaluated and it was found that, there is lacking of implementation of modern warehousing storage facility to facilitate to facilitate the proper functioning of warehouse management system. Modern warehousing storage facilities include the Fumigation, insecticide spray and proper preventive facilities. It can be also suggested to adopt modernization of receipts and overall record keeping of warehouses along with preventive measures implementation for betterment of warehousing system in Allahabad.

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References

[1] **Alaouze C.M. Sturgess N.H. And Watson A.S. (1978)** Australian wheat storages: A dynamic programming approach. *Australian Journal of Agricultural Economics*, 22(3) :158.

[2] **Anonymous (2004)** *Rainbow Revolution, Horticulture at Glance,* Published by National Horticulture Board, pp. 23-26.

[3] **Ashraf A.F. (2000)** Business performance of co-operative oil mills – A management appraisal. M. Sc. (Agri.) Thesis, University of Agricultural Sciences, Dharwad.

[4] **Brahm P. And Dinesh K.S. (1997)** Infrastructural requirements for the development of agro-processing industries in rural India. *Agricultural Economics Research Review*, 10 : 325.

[5] **Brahm Prakash And Sushila Srivastava, (1996)** Co-operative marketing societies in India :Role, performance, constraints and prospects. *Indian Journal of Agricultural Economics, Indian Journal of Agricultural Economics*, 51 : 816.

[6] **Chibber C. N. (1982)** Warehousing corporation in India – A Study Silver Jubilee Celebration of Central Warehousing Corporation, Hauz Khas, New Delhi.

[7] **Dalvi V.D. Thatae G.G. And Bourude S.G. (1992)** Economics of cashewnut in Sindhadurg district of Maharashtra state. *The Cashew*, 6(3) : 14-19.

[8] **Jagadish Prasad (1997)** Private trade and co-operatives for marketing vegetables in Bihar : A case study. *The Bihar Journal of Agricultural Marketing*, 5 : 310-18.

[9] **Joshi M.G. Wadkar S.S., Veerkar P.D. And Powar A.G. (1999)** Comparative economics of scale of processing alphonso mango into pulp in South Konkan region. *The Bihar Journal of Agricultural Marketing*, **7**(2) : 190-194.

[10] **LingamurthyN. Jagaiah T. And Alme V. (1981)** Functional aspects of Warangal agricultural market in Andhra Pradesh. *Indian Jour nal of Marketing*, 12(5&6) : 14.

[11] **Mutters RG, Thompson JF (2009)** *Rice Quality Handbook*. UC ANR Pub 3514. Oakland, CA. p 141.

[12] **Nagesh, A. R. (1990)**, Investment in production and marketing of cashew in Karnataka : An economic analysis. *M. Sc. (Agri.) Thesis*, University of Agricultural Sciences, Dharwad.

[13] **Raheja S. K. And Mehrothra P. C. (1980)** A study of food grains storage facilities. Practices and problems in India in Delhi state. *Agricultural Situation in India*, 34(10): 713.

[14] **Rai K. N. And Grover R. K. (1996)** Status and potential of agro-processing industries in Haryana. *Indian Journal of Agricultural Marketing*, 10(2): 50.

[15] **Recto A. E. (1980)** optimal location and sizes of Palay Warehouses in the Philippines. *Journal of Agricultural Economics and Development*, 10(2) : 182.

[16] **Reuss R. & Cassells J. (2005)** Modelling port-harvest grain development to deliver better storage outcomes for growers. GRDC Final Report CSE00033. November 2005.

[17] **Saxena H.K. And Mathur S.C. (1981)** Economics of storage of wheat at farmers level. *Indian Journal of Marketing*, 12(7) : 3.

[18] **Sharma (2002)** Role of Rajasthan State Warehousing Corporation in scientific storage. *Indian Journal of Marketing*, 32 : 6-9.

[19] **Sharma R.L. Sharma, S.K. And Thakur R.K. (1995)** Marketing of vegetable sin Himachal Pradesh. *Indian Journal of Agricultural Marketing*, 9 : 44-50.

[20] **Sharma (1995)** Marketing of vegetable sin Himachal Pradesh. *Indian Journal of Agricultural Marketing*, 9 : 44-50.

[21] **Siddaram H. Honde (2004)** Management of dairy processing units : A case of agricultural implements manufacturing units in Hubli-Dharwad. *M. Sc. (Agri.) Thesis*, University of Agricultural Sciences, Dharwad.

[22] **Singh D. And Khosla R.K., (1978)** Post-harvest food grain losses in India review. *Agricultural Situation in India*, 33(8) : 499.

[23] **Srivastava R.M., (1980)** Fundamentals of Corporate Finance, Wisdom Publications, Allahabd.