

Status of Central Sector Scheme of Grameen Bhandaran Yojana/ Rural Godowns Scheme : A Case Study



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Executive Summary

I. Background

Post-harvest management plays an important role in the production and marketing as the considerable quantity of the valuable produce is lost every year due to improper post-harvest management. Therefore, crisis in food availability is not only caused by the natural disasters, but also by absolute lack of post-harvest management. With due consideration to the storage problem being faced by the farming community, the Government of India has launched Grameen Bhandaran Yojana (GBY)/ Rural Godowns Scheme (RGS) in 2001-02 all over the country. In this context, we have analysed the significance of GBY in six sample states such as Madhya Pradesh, Haryana, Gujarat, Karnataka, Odisha and Meghalaya. All these states supported the farmers to protect farm produce from the post-harvest losses and consequently to avoid distress sale and increase the food security of the country. The guidelines of the scheme have been subsumed with other ongoing scheme of Development/ Strengthening of Agricultural Marketing Infrastructure, Grading and Standardization (AMIGS) during 2004 and again into Agricultural Marketing Infrastructure (AMI) sub-scheme of Integrated Scheme of Agricultural Marketing (ISAM) w.e.f. 2014. The scheme is being implemented by the Directorate of Agricultural Marketing and Inspection (DMI), Department of Agriculture, Cooperation & Farmers' Welfare, Government of India. The National Cooperative Development Corporation (NCDC) and National Bank for Agriculture and Rural Development (NABARD) have collaborated with DMI in implementation of GBY. The DMI acts as a nodal office for implementing GBY scheme by opening at least one sub-office in every state.

Based on the discussions and understanding of the need for the study, the following specific objectives were addressed;

- To assess the extent of coverage of the scheme and capacity utilization of the storage facilities created under this scheme.*
- To identify and review the constraints in implementation and performance of the scheme.*
- To understand and assess the extent of participation of various categories of beneficiaries/ entrepreneurs under this scheme.*
- To assess overall performance and impact of the scheme with respect to laid down objectives of the scheme.*

II. Methodology

The present study followed an exploratory case study method to identify the generalizable facts by in-depth understanding of the issues through an objective and subjective data collected from the various sources and stakeholders involved in the scheme. The purposive sampling technique was applied to select the sample States and to represent various performance scenarios across the country. Hence, it was proposed three scenarios such as high, medium, and low performance in terms of the scheme implementation. Accordingly, two States were selected across the country to represent each scenario, keeping in mind to represent different regions of the country as well. It was decided to have three samples per district to represent different performance scenarios, so that the total sample per states amounts to nine beneficiaries. Nevertheless, the total samples selected for the study accounts 15 samples per state in respect of Madhya Pradesh and Gujarat; 11 in relation to Karnataka; nine to represent Odisha; eight in respect of Haryana; and four with regard to Meghalaya. So that, the total sample size accounts to 62 from six states. In addition, about thirty indirect beneficiaries of the godowns (farmers) were also chosen for the study in the sample states, excepting in the case of Haryana and Meghalaya, wherein none of the beneficiaries used these godowns for storing the produce. Scientifically prepared, pre-tested questionnaires and checklists were used to collect the relevant information from these stakeholders through a one to one interaction, along with Focused Group Discussion (FGD).

III. Major Findings

- *As on March 2019, the scheme has been implemented in 27 states of the country and had sanctioned 38,964 projects by spending an amount of Rs. 2957.57 crores to create a storage space of 655.48 lakh tonnes.*
- *Almost half of the capital subsidy amount extended to the creation of storehouses concentrated in the leading states such as Madhya Pradesh, Maharashtra, Haryana and Andhra Pradesh, in the order of their percentage to the total subsidy spent all over India.*
- *Although, a greater number of godowns were seen in the case of Gujarat and Karnataka, the larger size godowns were distributed in respect of Telangana, Jharkhand, Jammu and Kashmir and Tripura.*

- *It is revealed that the construction and implementation of the scheme was on the basis of demand driven and not on the State involvement. Hence, the present study was illustrated up on the performance basis of storage capacity created under the scheme.*

IV. High Performing States (HPS)

- *These states are agriculturally prosperous having a better irrigation facility either from the canals or borewells covered in more than one districts of the state, and their contribution to the Central Pool is much higher among all other States.*
- *Although there are many numbers of godowns and the storage space created was high in these states, still there is an increased demand for the storage space because of the increased procurement from the government agencies from the pre-registered farmers without a quantitative restriction.*
- *A larger proportion of the godowns in these states were constructed under the PEG Scheme of the Government of India under PPP mode, and through private entrepreneurs. As a majority of the beneficiaries are private entrepreneurs or businessmen and there is an assurance of utilization of godowns for a specified period in these states, and hence, there is an increased demand for godowns in these states. None of the beneficiaries have utilized these godowns to store their own produce.*
- *The average storage unit capacities created in these states was much higher (>2700MT).*
- *Because of the Government procurement, no one thinking of availing the benefits of Pledge Loan provisions. As soon as the harvest is over, the farmers thinking of bringing their produce directly to the Procurement Centers to sell at MSP as per the FAQ standards.*
- *A majority of the private entrepreneurs have started thinking and coming up with a Silo structures for storing of grains in these states.*
- *The capacity utilization of the godowns in these states was to the extent of more than 90 per cent mainly because of the government procurement of foodgrains for the Central Pool by the FCI and its associates.*

V. Medium Performance States (HPS)

- *These states are moderate in terms of GBY/RGS implementation. In these states, a certain part of the State is equipped with the better irrigation facilities through different sources such as canals and borewells.*
- *Although the number of godowns in these states, the average capacity of the godowns were less than 1000MT. These godowns distribution is higher in the foodgrains (either rice or wheat) belt areas.*
- *A better social integration and better participation of the SC/ST and women were noticed in these states may be due to a smaller size of the godowns in these areas.*
- *The capacity utilization of the godowns were to the tune of optimal level, mostly used for their own purposes to store either the agricultural produce, feed and fodders, and inputs. Areas where the government procurement was available, higher distribution of godowns with a larger size (up to 4000MT) were also noticed in these states, and are efficiently used for more than 11 months in a year.*
- *The godowns were used primarily for storing their own produce and to some extent from their friends / relatives with or without formal rental agreements in these states. Hence, a majority of them were owned and managed by the beneficiaries only. Hence, it was observed that the quality adherence was relaxed and norms prescribed by the FCI or other agencies were not followed by these private owners.*

VI. Low Performance States (LPS)

- *Although, agriculture is a chief occupation in these States, their contribution to the national economy is lower.*
- *There is a lower demand for the godowns in these areas due to lower marketable surplus.*
- *Per unit Capacity of the Godowns were larger in size (> 1300 MT), but restricted to the agriculturally prosperous areas.*
- *Government procurement is negligible in these states.*
- *The godowns hired for the purpose of government procurement for a limited period are managed by the outsourced parties appointed by the government agencies and hence are managed scientifically. Whereas in the case of godowns owned by the beneficiaries are*

taken care by the owners manually and hence, there will be a nominal adherence of the quality control practices in such godowns.

- *The capacity utilization of the godowns were to the tune of sub-optimal level in the case of a few states and are mostly used to store the procured paddy under government intervention for a short-term period of 4-6 months. Areas where the government procurement was available, higher distribution of godowns with a larger size (up to 4000MT) were also noticed in these states, and are efficiently used for more than 11 months in a year.*

VII. Overall Performance of the GBY

- *It is noticed that the storage capacity created under the GBY was highest in the case of High Performing States (HPS), followed by the Medium Performing States (MPS) and the Low Performing States (LPS). Whereas the number of godowns was highest in respect of MPS, followed by HPS and LPS.*
- *The per unit capacity created was highest in the case of HPS, subsequently to LPS and MPS. The results indicate that the distribution of godowns is on the demand driven basis across the country.*
- *NABARD found to be a main financial agency through which the subsidy was channelized through a credit linked loans from the financial institutions refinanced by the NABARD. NCDC has focused more on cooperative institutions like PACS.*
- *The higher capacity utilization was noticed in the states, where there was a government intervention in procurement of foodgrains for the Central Pool as compared to the rest of the places.*
- *Lack of assistance from local administration, requirement of a large capital, non-availability of pledge loan facility, lack of awareness, non-availability of pledge loan facility, non-availability of skilled manpower, lack of title deeds/ land ownership documents (specially in North-Eastern States), and lack of demand from the users, were found to be a common constraints as expressed by a large proportion of beneficiaries*
- *Overall, a higher proportion of the beneficiaries from the group of individuals (other than the farmers such as businessmen, farmer-trader, entrepreneurs etc.) were participated in a greater number as compared to the SC/ST/Women and farmers category under this scheme. Hence, a majority of the small and marginal farmers and women participation seems to be negligible in these areas.*

- *There was a greater amount of inflow of private investment (>Rs.11800 crores) at the country level to the post-harvest management – a sub sector of agriculture, since the inception of the program. Thereby, it has helped the sector to increase directly in the form of increasing food security, prevention of post-harvest losses and generated employment opportunities in the rural areas of the State/s.*
- *Ineffective National System of Warehouse Receipts by the WDRA was found across the states, thereby, a major proportion of the farmers avoided keeping their produce in the godowns due to their immediate financial requirements.*

Based on the study results the following Recommendations were made at the country level:

VIII. General Recommendations

1. ***Increase farmer's participation in the scheme:*** *Average storage capacity of godowns in MPS were <1000MT and the distribution of these godowns indicates that they are well distributed in agriculturally prosperous regions of the state/s. Regarding the usage of godowns, it is limited to a few farmers, while most of the farmers tend to sell the produce to meet the pressing demand for money. Hence, it is recommended that the extensive awareness programs to be organized about the advantages of arresting immediate sale (distress sale) by storing in the godowns and the facility of pledge loan to enhance the farmers participation in the RGS scheme by the implementing agency DMI.*
2. ***Database on storage capacity:*** *GBY is one among the numerous schemes of the Government that aim at creation of storage space for the agricultural produce in the country. As there are multiple agencies involved, there is a need for comprehensive integration of storage space available at all levels (till Gram Panchayat) to facilitate effective and efficient planning and execution of foodgrains and input storage across the country. The Ministry of Agriculture, Government of India (MoA, GOI), may initiate the process of building such database.*
3. ***Improve the participation of Women/SC/ST and Small and Marginal Farmers in the scheme:*** *In spite of providing an additional quantum of subsidies to the women/ SC/STs, their participation still remained far from the satisfactory level. Similar is the case with the small and marginal farmers across the country. Hence, three-pronged strategy is recommended to encourage their participation viz., a) Suitable awareness programme*

should be developed by the CCSNIAM to sensitize about the RGS. b) To off-set the higher costs of creation of godowns (Rs. 25 lakhs for 500MT godowns), the Ministry of agriculture should increase the incentives such as higher rate of subsidy and lower rate of interest. c) Since godown construction is a costly affair to the individuals, the focus should be given to the group or associations of farmers.

4. ***The Interest Subvention Scheme*** is being implemented by NABARD and RBI, aims at providing short term credit to the farmers at subsidised interest rate. The policy came into force with effect from Kharif 2006-07. Interest subvention for post-harvest loans was introduced as a measure to check distress sale, post-harvest loans for storage in accredited warehouses against Negotiable Warehouse Receipts (NWRs) are available for up to six months for KCC holding small & marginal farmers. This scheme aims to give relief to the small and marginal farmers for their prompt repayment of crop loans, and who have availed pledge loan at nine per cent for the produce, the Central Government has approved an interest subvention of two per cent i.e. an effective interest rate of seven per cent for loans up to six months. However, indirect interactions with different stakeholders of RGS across six states in the country, no instance of farmer or owner of Godown availed the benefit under this provision. Under such circumstances, the GoI should ensure that the scheme is implemented flawlessly by suitable modifications/ adaptations at various stakeholders of RGS. At the same time, CCS NIAM should organize Training the Trainers (ToT) programs to the concerned departments for effective operationalization of the scheme.
5. ***WDRA accreditation and availing Negotiable Warehousing Receipts:*** By maintaining the prescribed quality standards in the rural godowns, it is easier to get WDRA Accreditation and availing NSWRS. Hence, CCS NIAM, need to develop a knowledge module focussing on the beneficiaries of RGS.
6. ***One Village, One Godown:*** It is recommended to develop the multi-purpose godowns in every village, throughout the country, to realize the concept of 'One Village, One Godown' mainly to harvest an opportunity of temporary storage done by the farmers during the harvesting season.
7. ***Development of SOPs for temporary storage space:*** Traditionally, Indian farmers used to store the produce temporarily at home. Though this practice is declined, there is a significant space is available within the villages. However, a Standard Operating Procedures (SOPs) should be developed to identify and use such space for the temporary storage.

8. **Creation of 'Online Platform' for the effective usage of rural godowns:** To facilitate effective functioning of online platforms such as 'Apna Godam', the DMI should facilitate to develop a dynamic software application of storage space to enable all the stakeholders for effective utilization of the same.
9. **Need to facilitates FPOs - Farmer producer Organizations (FPOs),** were formed by the group of farm producers for the purpose of farm or non-farm activities. A majority of the farmers in these groups belonged to the marginal and small farmers categories. Although, they have been formed and functioning, the weaker financial conditions of these groups, they are unable to create the required infrastructure. But they have been experiencing the benefits of economies of scale through their operations. It is also found during our survey that the involvement of FPO and subsequently higher benefits were observed in two categories of states, viz., Gulbarga district in respect of Karnataka, (Medium performance) and Kalahandi district in the state of Odisha (Low Performance states). In the case of Gulbarga district, an FPO, which used to procure foodgrains from its members and non-members of the villagers during the harvest period at a prevailing rate of APMC, and stored in a godown, hired on rent. After a reasonable price appreciation, it has disposed the foodgrains. Since, the storage space is essential for both storing foodgrains as well as crop inputs, the FPO has decided to construct a godown to suit its requirement. In this direction, it had purchased a required land as well, and is currently in the process of mobilizing the required capital for the construction of the godown. As regard to FPO in Kalahandi district of Odisha, paddy is procured at MSP rates by the State agencies at a limited quantity. Hence, the FPO started procuring only Grade A paddy from its members and used to store it in rented godowns. After a while, the FPO used to sell the produce at reasonable appreciation. However, during the recent FENI cyclone, the godown used to hire by the FPO was seriously damaged, and hence, they are in search for a suitable godown. They want to construct a godown for itself, but was incapable due to current financial situation. But over the years, the members have assured that they will construct. As scientific godown is a costly affair to the individuals and the groups, **the Government and the Financial Institutions like NABARD, NCDC should facilitate and support the FPOs rather than individuals.**
10. **Utilization of godowns for the purposes of Model Agriculture Produce and Livestock Marketing Act, 2017 (APLM ACT) -**The godowns have been used by the beneficiaries to store feed and fodders in the state of Gujarat. In Karnataka also, it has been observed that the space created under RGS, is used for livestock operations. However, with the new Model Agriculture Produce and Livestock Marketing Act, 2017 (APLM ACT), the godowns may also

be utilized to facilitate the trading of livestock and their associated products, to enhance the competition.

11. Facilitating Centres for Contract Farming at the Village/ Gram Panchayat Level- *As per the provisions of Model Agriculture Produce and Livestock Contract Farming and Services (Promotion & Facilitation) Act, 2018, the places where the contract farming is successfully running, the rural godowns available in these areas can be used as a collection centers by storing the harvested produce temporarily, till the produce lifted by the companies, instead of storing them in a unscientific manner near the farm/ farmers houses.*

IX. Agency-wise recommendations

- 1) **WDRA:** *The basic objective of the RGS was to encourage the farmer to procure Pledge loan, and thus avoid distress sale. The WDRA should take steps to enable the RGS godowns to register and avail pledge loan through NSWRS. Hence, WDRA should engage concerned institutions to evolve suitable measures to ensure ease of pledge loan for the farmers.*
- 2) **DMI:** *Being a nodal implementing agency, DMI can consider the following recommendations to make RGS more effective:*
 - a. *In association with MoA & FW, bring suitable changes in the guidelines to enable social integrations.*
 - b. *Making provisions in guidelines to permit groups such as Farmers Associations and FPOs, as eligible under RGS.*
 - c. *In association with NABARD, the financial institutions, ensure the timely completion of Joint Inspections and release of 2nd installment soon after, if eligible.*
 - d. *Work in tandem with WDRA to ensure that more RGS godowns are eligible for Pledge Loan.*
 - e. *In association with CCS NIAM, develop knowledge modules for sensitization and/or awareness programs for different stakeholders for better performance of RGS.*
 - f. *In association with SWCs, ensure that required storage space created and the minimum quantity of foodgrains to be kept under CAP method.*
 - g. *As the number of staff in each state is limited too small (two to three) and closed their offices in a few states for a temporary period (Ex: Meghalaya) due to inadequacy of the staff, to execute the multifarious tasks allocated them. Hence, RGS has received a least attention. Therefore, it is recommended to enhance the manpower for effective implementation of the central schemes related to agricultural marketing.*

3) Bankers: Success or failure of the program depends on the last mile connectivity of stakeholders, viz., bankers, beneficiaries, and farmers. Awareness programs should be conducted for the bankers to appreciate that the storage space is an essential requirement for the food security of the country than a farmer alone. Hence, the banker should ensure that there is an optimum level of implementation of the scheme. During the scrutiny of the applications, the banker should also consider the economic viability of the project, the scope for social integration in addition to the repayment capacity of the proponents.

4) Cooperative and Panchayat Raj institutions (PRIs) /Local Self Governance Institutions: These institutions have been given a responsibility of operationalization of the godowns in several districts. However, it was observed that most of these godowns under their control, were sub-optimally utilized. Therefore, there shall be extensive training programs in line with the regional variations for different stakeholders of PRIs to ensure that these godowns were utilized optimally.

X. Specific Recommendations to High Performing States (HPS)

- 1. Awareness programme on maintaining quality standards in godowns:** Checks and balances evolved by the FCI and State Warehousing Corporations during the course of time have ensured that the post-harvest management practices are adequate enough to secure the required quality of foodgrains stored in the godowns. There should be a suitable provision to store the foodgrains procured below the FAQ. There should be strict adherence to the quality standards in the case of the foodgrains kept under CAP. To maintain these quality standards in the rural godowns, DMI should increase the monitoring the frequencies suitably. Under these circumstances, as a complementary measure CCS NIAM should facilitate required awareness program to the concerned stakeholders across the HPS.
- 2. Encouraging Godowns for common usage:** The average storage capacity of godowns created under the GBY, in HPS are is more than 3000MT and every inch of the created storage space was on lease with FCI or other State Agencies, depriving the farmers an opportunity to store and sell at higher prices, later. Hence, creation of suitable storage capacities should be encouraged in these states.

XI. Specific Recommendations to Medium Performing States (MPS)

- 1 **Awareness programme on benefits of retaining produce during glut period:** Each godown in these medium performance states presents a live instance of benefits of retaining the farm produce till glut period is over, after every harvest season. However, a majority of the farmers are unable to adopt this practice due to the immediate cash requirements on one hand and difficulties in securing pledge loans on the other hand. It is limiting the benefits of RGS to a few of the farmers. Under these circumstances, as a supplementary measure, CCS NIAM should facilitate required awareness program to the concerned stakeholders, viz., a) Owners of the godowns to equip themselves to be eligible for pledge loan from the financial institutions, b) financial institutions to ensure speedy disbursement of pledge loans, and c) farmers, particularly the small and marginal about the possibility of getting pledge loan.
- 2 **Value Addition and FPO:** The average storage area of godowns in MPS is less than 2000MT which is inadequate to accommodate even fifty per cent of the produce from that particular village. However, if large capacity godowns are built, most of the space will be left underutilized during lean months. Therefore, a different strategy like value addition, establishing linkages with the organized retailers, consumers through FPO/ Associations etc., should be explored by the beneficiaries with the help of DMI. Such an approach would also help in progress towards increasing farmers household income.
- 3 **Social Integration:** As compared to HPS, the capital costs in MPS are lower for the construction of rural godowns. Hence, Sthree Shakthi (women SHGs) and other collective farmer groups should be encouraged to get involved in the construction of multi-chamber godowns, which in addition to storage, can also serve as nuclei for their operations.

XII. Specific Recommendations to Low Performing States (LPS)

- 1 **Optimal Utilization:** It was observed that either of the two factors, viz., no surplus marketable produce or normal practice of selling off the entire marketable produce immediately after harvest, have resulted in low demand for the storage space, in-turn low performance of the rural godowns. North East States represent the first category, while Odisha belongs to the second. In the case of former group, the DMI should explore the economic feasibility of cold storages depending upon their cropping patterns. For the later, possibility of using the godowns as Rice Receiving Centers may yield multiple benefits.
- 2 **Value Addition:** States like Kerala, Goa and other NE States which represent LPS, a detailed study may be conducted to examine the value addition to farm produce using these storage spaces may enhance capacity utilization in these areas.

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ACRONYMS AND ABBREVIATIONS

ADRTC	Agriculture Development and Rural Transformation Centre
AEZ	Agri-Export Zones
AMI	Agricultural Marketing Infrastructure
AMIGS	Agricultural Marketing Infrastructure, Grading Standardization and Post-harvest management
APMC	Agricultural Produce Market Committees
APMR	Agricultural Produce Markets Regulation
CAGR	Compound Annual Growth Rate
CAP	Cover and Plinth
CBA	Cost-Benefit Analysis
CCS NIAM	Chaudhary Charan Singh National Institute of Agricultural Marketing
CFFG	Contract Farming Facilitation Group
CIPHM	Central Institute for Post-Harvest Management
CMR	Custom Milled Rice
CWC	Central Warehousing Corporation
DACFW	Department of Agriculture, Cooperation and Farmers Welfare
DCP	Decentralized Procurement Scheme
DMI	Directorate of Marketing and Inspection
DES	Directorate of Economic and Statistics
EMI	Equated Monthly Installment
eNAM	electronic National Agriculture Market
eNWS	electronic Negotiable Warehousing System
FAQ	Fair Average Quality
FCI	Food Corporation of India
FGD	Focused Group Discussion
FPO	Farmer Producer Organization
GBY	Garmin Bhandaran Yojana
GCA	Gross Cropped Area
GDP	Gross Domestic Product
GSDP	Gross State Domestic Products

GSVA	Gross State Value Added
HAFED	Haryana State Cooperative Supply & Marketing Federation Limited
HPS	High-Performance States
HSWC	Haryana State Warehousing Corporation
ICAR	Indian Council for Agricultural Research
IMD	India Meteorological Department
ISAM	Integrated Scheme for Agricultural Marketing
ISEC	Institute for Social and Economic Change
ISS	Interest Subvention Scheme
ITC	Indian Tobacco Company
KMS	Kharif Marketing Scheme
KSAMB	Karnataka State Agricultural Marketing Board
LMT	Lakh Metric Tonnes
LPS	Low Performance States
MIDH	Mission on Integrated Development of Horticulture
MMT	Million Metric Tonnes
MoA &FW	Ministry of Agriculture and Farmers Welfare
MPS	Medium Performance States
MPSAMB	Madhya Pradesh State Agricultural Marketing Board
MSP	Minimum Support Price
MSR	Marketed Surplus Ratio
MT	Million Tonnes
NABARD	National Bank for Agriculture and Rural Development
NAFED	National Agricultural Cooperative Marketing Federation of India Ltd
NCDC	National Cooperative Development Corporation
NDDB	National Dairy Development Board
NER	North-East Region
NGO	Non-Government Organizations
NHM	National Horticulture Mission
NIAM	National Institute of Agricultural Marketing
NIPF	National Institute of Public Finance
NPA	Non-Productive Assets

NSA	Net Sown Area
NTFP	Non-Timber Forest Products
NWRS	Negotiable Warehouse Receipt System
OSCSC	Odisha State Civil Supplies Corporation Ltd
OSWC	Odisha State Warehouse Corporation
PCB	Primary Cooperative Banks
PDPS	Price Deficiency Payment Scheme
PDS	Public Distribution System
PEG	Private Entrepreneurs Guarantee Scheme
PHL	Post Harvest Losses
PPSS	Private Procurement and Stockiest Scheme
PSS	Price Support Schemes
RBI	Reserve Bank of India
RMS	Rabi Marketing Scheme
RKVY	Rashtriya Krishi Vikas Yojana
RRBs	Regional Rural Banks
SC/ ST	Scheduled Castes/ Scheduled Tribes
SEZ	Special Economic Zone
SFC	State Financial Corporations
SHG	Self Help Groups
SWC	State Warehousing Corporation
TPDS	Targeted Public Distribution System
WDRA	Warehouse Development and Regulatory Authority
ZP	Zilla Panchayats

I. INTRODUCTION

1.1. Overview of Indian Agriculture

India has a total geographical area of 32.80 lakh Sq. Km., which qualifies it to be the seventh largest country in the world. As per the 2018 records by the Directorate of Economics & Statistics of India (DES), 14.03 lakh Sq. Km. or 140.71 million hectares has been dedicated to agricultural purposes in terms of the Net Sown Area (NSA), which accounts for 42.80 per cent of the geographical area. The cropping intensity of 141.55 has been achieved with a Gross Cropped Area (GCA) of 198.36 million hectares. This agricultural area has provided livelihood to nearly 60 per cent of the Indian population for the last several decades through various farming activities. Thus, the importance of agriculture for Indian economy can be gauged based on the land employed for the agricultural purposes coupled with a high percentage of population dependency on agriculture. The importance of agriculture does not fade, although the percentage of agricultural workers to total workers has decreased in India from 58.2 per cent in 2001 to 54.6 per cent in 2011 (Agricultural Statistics at a Glance, 2018). It is an undisputed fact that the contribution of the agricultural sector to Indian Gross Domestic Product (GDP), measured by any method, has tapered down to revolve around 15 to 20 per cent during the current century as compared to the first few decades of post-Independence period, wherein half of the GDP was accounted for by the agricultural sector. Still, it remains a fact that the industrial sector, especially agro-based industries, may cease to exist without agriculture for the reason that they supply the raw materials for agro-based industries.

In India, as much as 60 per cent of the NSA is under the mercy of rain. Almost 80 to 85 per cent of the total annual rainfall is received during the June to September months. Over and above, the country is subject to frequent droughts, floods and other natural calamities in one state or the other, and a few states face drought perpetually for several years. Despite these constraints, India is the largest producer of millets in the world and the second largest producer of rice and wheat in the recent past. Horticulture is also an important sector of Indian farming. Horticultural crops occupied an area of 254.31 lakh hectares with an annual production of 311.71 lakh metric tonnes (GOI, 2018). India is the largest producer of banana, mango and papaya in the world. The value of the output generated from horticulture constitutes over one-third of the total value of output

generated by the agricultural sector, to the Indian economy. This amounts to around 3.57 per cent of Indian GDP of 2016-17 at constant (2011-12) prices (Horticulture at a Glance, 2018, Ministry of Agri. and Farmers Welfare, GoI).

Kharif, Rabi and Summer are the three main crop seasons of India. However, considering the vast geographical area of the country, it is difficult to precisely classify or demark months of a year into the seasons. The Indian Meteorological Department (IMD) has identified four seasons. They are: 1) Winter from December to February; 2) Summer or pre-monsoon from March to May; 3) Monsoon or rainy season from June to September; 4) Autumn season or Post-monsoon in October and November. The cropping pattern, in general, depends mainly on climatic conditions, soil suitability and availability of water. The agricultural land of India is distributed in 30 different states. Each state has a unique climatic condition, widely varying soil characteristics and different types of water resources. In fact, all these agriculturally important factors differ from one district to another within the state. Economic returns or the profit from crop cultivation is another aspect that has top priority for Indian farmers. As such, the precise cropping pattern of India cannot be confined to a few crops. However, based on the normal area under different crops, the crops of India can be classified as food crops, oil seed crops, horticultural crops and plantation cash crops. With due regard to all these factors, **Table 1.1** was compiled to provide glimpses of cultivated crops of India along with their Compound Annual Growth Rate (CAGR) for the period from 2008 to 2018 with respect to area, production and productivity.

The table reveals that the rate of growth in terms of total foodgrains area has shown a very nominal rate, whereas the production and productivity were increased to an extent of two per cent during the period 2008 to 2018 at the all-India level. However, across different categories of foodgrains, almost all categories have exhibited a negative growth, excepting total pulses. The positive growth of pulses was more than two per cent in all respects such as area, production, and productivity. Across crops, urad (>4%), moong (>4%), tur (>3%) and gram (>2%) have displayed a higher growth with regard to area, production, and productivity in the order of merit. Maize (1.62%), followed by wheat (0.94%) and rice (0.06%) were grown to an extent of less than two per cent in reference to area, and around two to three per cent in the matter of production and productivity. These results were statistically significant at various levels.

Table 1.1: CAGRs of area, production, and productivity of major crops in India during 2008 to 2018

				(% growth)
Sl. No.	Crops	Area	Production	Yield
1.	Rice	0.06	1.87**	1.81***
2.	Wheat	0.94*	2.06**	1.11
	Coarse cereals	-1.62***	1.74*	3.41**
3.	Jowar	-4.16***	-5.37***	-1.27
4.	Maize	1.62***	4.36**	2.71**
5.	Bajra	-2.76**	0.97	3.84*
6.	Ragi	-2.01*	-1.73	0.26
7.	Barely	-0.53	0.97	1.49*
8.	Small millets	-5.09	-0.02	5.26
	Total cereals	-0.13	1.91**	2.04**
9.	Tur	2.99*	6.36**	3.26*
10.	Masur	-0.24	3.73*	3.93*
11.	Gram	2.12*	3.11*	0.97
12.	Moth	-2.68	6.04	8.62
13.	Moong	3.79*	8.47*	4.4
14.	Urad	5.95**	10.35***	4.14**
	Total pulses	2.47*	4.78**	2.27*
	Total foodgrains	0.4	2.12	1.71
15.	Sunflower	-16.81	-15.63	1.42
16.	Rapeseed and mustard	-0.49	0.97	1.47*
17.	Groundnut	-2.16*	2.7	4.99*
	Total oilseeds	4.14*	-0.74**	0.79
18.	Jute	-1.60***	-0.34	1.34*
19.	Mesta	-8.24***	-3.75**	5.09**
20.	Cotton	2.26*	3.17*	0.89
21.	Coconut	1.17*	4.36**	3.16**
22.	Areca nut	2.40***	6.34***	3.84***
23.	Banana	1.80**	1.54**	-0.06
24.	Mango	-0.59	5.04	4.73*

Note: Area in thousand hectares; Production in thousand hectares; **Note:** ***, **, * denotes one, five, and 10 percent, level of significance.;

Source: (1) Directorate of Economics and Statistics, Government of India; (2) Horticulture Statistics Division Department of Agriculture, Government of India, 2018.

While the total production and productivity is being constantly augmented, the governments have started creating better marketing facilities with suitable infrastructure in order to enable the farming community to get remunerative prices for the produce. Prior to Independence, the government policies were focused more on keeping the food prices for the consumers and agro-

raw materials for the industry in check. After Independence, the need to protect the interests of the farmers and to provide them with incentive prices to augment the production of agricultural commodities was also felt. Recognising the defects like losses to the farmers in terms of undue low prices, higher costs of marketing and considerable physical losses of the produce in the agricultural marketing system which the farmers had to face, the government, with a view to establishing a mechanism to monitor the market conduct, introduced from time to time several mandatory regulations. Regulation and development of primary agricultural produce markets was taken up as an institutional innovation and construction of well laid out market yards was considered as an essential requirement for regulating the practices in primary wholesale markets.

The Berar Cotton and Grain Market Act of 1887 was the first Act which empowered the British Resident to declare any place in the assigned district a market for the sale and purchase of agricultural produce and constitute a committee to supervise the regulated markets. This Act became the model for enactment in other parts of the country. An important landmark in the agricultural marketing scene in the country has been the recommendation of the Royal Commission on Agriculture, 1928, for the regulation of marketing practices and establishment of regulated markets. In pursuance of this, the Government of India prepared a Model Bill in 1938 and circulated to all the states but not much headway was made till Independence. Later, most of the states enacted Agricultural Produce Markets Regulation (APMR) Acts during the sixties and seventies and put these in operation.

1.2. Current Status of Agricultural Marketing in India

The central and state governments constantly launched and implemented a several agricultural development programmes right from the year of Independence. All these agricultural development programmes considerably helped to boost agricultural production throughout the country. The surge in foodgrain production, within a span of four to five decades after Independence, went beyond the main objective of achieving self-sufficiency. Farmers were behind this entire production augmentation struggle. But the rise in production was not reflected by way of an increased economic prosperity of the farming community. The poor marketing system for agricultural produce is recognised as the main reason for the inability of farmers to reap the economic benefits of increased production. The precise reasons were: 1) the farmers were receiving much lower price than the consumers were paying; 2) higher marketing cost; 3) physical losses of the produce. Hence, the government initiated mandatory marketing regulations

so as to monitor the market conduct. It was considered essential to develop primary agricultural produce markets as an institutional innovation and it started developing market yards.

As on 31st of March, 2014, the number of regulated markets in the country amount to 2483 principal markets and 4631 sub-market yards across the country. However, in many Union Territories and states, the APMR Act has not been enacted in the country. Moreover, there are 5964 wholesale markets and 22,759 primary markets in operation in the country. The details of each markets mentioned are provided in **Table 1.2**.

1.3. Marketed/ Marketable Surplus in India

Almost all the agricultural produce is traded in the regulated markets of India. Major reforms in the agricultural marketing system such as the setting up of Agricultural Produce Market Committees (APMCs), Marketing Boards, system of Minimum Support Price (MSP) and eNAM etc., have played a significant role in managing the market surplus. However, many states of India do not have markets exclusively for those crops which are produced in high quantity in that particular state. Hence, the farmers have no option other than selling their produce through APMCs only. On the other hand, several APMCs in the country have been dominated by trading in a single crop. These APMCs have monopsonic characteristics due to licence-based agents and the absence of private competition. Under such a situation, the farmers have no alternative choices of markets. With due concern about this fact, an effort was made to compile **Table 1.3** to comprehend the Marketed Surplus Ratio (MSR) of the major crops of India.

Table 1.2: State-wise Number of Wholesale, Rural Primary and Regulated Markets in India as on 31.03.2014

States/UTs	Number of Markets			Regulated Markets		
	Whole Sale	Primary	Total	Principal	Submarket Yards	Total
Andaman and Nicobar	0	28	28	Nil	Nil	Nil
Andhra Pradesh	337	568	905	337	568	905
Arunachal Pradesh	22	63	85	16	115	131
Assam	405	735	1140	20	206	226
Bihar	325	1469	1794	*	*	*
Chandigarh	1	0	1	1	0	1
Chhattisgarh	2	1132	1134	68	116	184
Delhi	30	0	30	7	8	15
Goa	4	24	28	1	7	8
Gujarat	205	129	334	199	201	400
Haryana	281	194	475	107	174	281
Himachal Pradesh	42	35	77	10	44	54
Jammu and Kashmir	23	8	31	4	8	12
Jharkhand	201	602	803	28	173	201
Karnataka	210	730	940	155	357	512
Kerala	348	1014	1362	**	**	**
Madhya Pradesh	0	1321	1321	251	285	536
Maharashtra	881	3500	4381	305	576	881
Manipur	24	94	118	**	**	**
Meghalaya	35	89	124	2	0	2
Mizoram	10	105	115	#	#	#
Nagaland	19	174	193	18	0	18
Odisha	398	1150	1548	54	382	436
Puducherry	4	5	9	4	5	9
Punjab	424	1375	1799	149	275	424
Rajasthan	443	312	755	131	312	443
Sikkim	7	12	19	1	0	1
Tamil Nadu	300	677	977	277	6	283
Tripura	84	470	554	21	0	21
Uttar Pradesh	584	3464	4048	250	365	615
Uttarakhand	36	30	66	25	33	58
West Bengal	279	3250	3529	42	415	457
Total	5964	22759	28723	2483	4631	7114

*Note:**: Agriculture Produce Market Regulation (APMR) Act Repealed; **: APMR Act Not Enacted; #: APMR Act not Implemented;

Source: Lok Sabha Unstarred Question No. 3525, dated 11.08.2015.

Table 1.3: Average Marketed Surplus Ratio (MSR) of Major crops of India

Details of Crops	Marketed Surplus ratios		
	2012-13	2013-14	2014-15
Foodgrains: Cereals			
Rice	81.51	82.00	84.35
Wheat	77.49	73.11	73.78
Maize	84.32	86.98	88.06
Jowar	64.14	70.62	66.64
Bajra	76.77	71.11	68.42
Barley	67.39	80.63	77.67
Ragi	29.53	44.11	48.92
Pulses			
Arhar	84.33	86.99	88.21
Gram	83.67	89.58	91.10
Urad	89.65	80.71	92.25
Moong	85.55	92.22	90.65
Lentil	88.75	90.23	94.38
Oilseeds			
Groundnut	93.54	95.20	91.63
Rapeseed & mustard	90.41	94.49	90.94
Soybean	95.32	95.23	97.60
Sunflower	99.18	99.29	100.00
Sesamum	90.50	94.47	95.37
Safflower	0.00	0.00	100.00
Niger seed	97.67	0.00	97.78
Commercial Crops			
Sugarcane	77.84	93.10	85.37
Cotton	99.41	97.32	98.79
Jute	100.00	100.00	98.59
Onion	99.23	99.29	91.29
Potato	86.17	93.74	89.54

Note: Average MSP is calculated for three years i.e., 2012-13, 2013-14 and 2014-15 for marketed surplus ratio.

Source: Directorate of Economic and Statistics, Department of Agriculture, Cooperation and Farmers Welfare, Government of India.

Table 1.3 reveals that the Marketed Surplus Ratio (MSR) is minimum in the case of cereals under the foodgrains category as compared to rest of the groups such as pulses, and oilseeds, commercial crops. However, across cereals, the MSR was ranging from 67 per cent to 88 per cent, excepting in the case of ragi crop, wherein the ratio was less than 49 per cent. It implies that excepting in respect of ragi, more than 30 per cent of the cereals were kept for self-consumption (including seeds) and the ratio of ragi was more than 50 per cent, may be due to less demand in the market. With regard to pulses, the MSR ranged from 80 per cent to 94 per cent. With regard to oilseeds, the ratio seems to be more than 90 per cent, while the ratio was 78 per cent to 100 per cent in respect of commercial crops. It indicates that the farmers have been producing most of these crops keeping in mind the market, rather than self-consumption. The lower MSR for sugarcane might be due to its value additional activities such as jaggery and other by-products.

1.4. Reduction in Post-Harvest Losses

The farmers have to store their marketable surplus for a longer period of time if they expect a higher price for their produce and to avoid distress sale (immediately after harvest). This involves a risk of qualitative and quantitative loss of the produce, which is termed as Post Harvest Losses (PHL). However, the PHL is not only to storage. It does occur at various stages starting from the harvesting to threshing, drying and transportation. One of the studies by the World Bank in 1999 estimated that every year, India incurs seven to 10 per cent PHL of the total foodgrains production. This loss is estimated from a farm-to-market stage. But the PHL extends further to an extent of four to five per cent at marketing and distribution level. However, as per the data culled out for the Triennium ending 1998-99 from Directorate of Marketing and Inspection (dmi.gov.in), the overall post-harvest losses worked out to be less than three (2.43%) per cent of the total production of seven important cereal crops and five important pulse crops taken together. **Table 1.4** provides the crop-wise post-harvest losses for each of the 12 crops. Although the percentage appears to be small, the absolute quantity loss was in terms of lakh tonnes which is almost equivalent to the total foodgrains produced in Australia annually. However, these losses were found to be decreasing in the recent years, may be due to various infrastructure development activities by the governments in post-harvest management, a sub sector of agriculture in the country. The Post-Harvest Losses occur at various stages of crop processing. Hence, stage-wise PHL has been worked after classifying all the 12 crops as cereal and pulse crops.

It has been shown in **Figure 1.1** for better visualisation. It can be unambiguously seen from **Figure 1.1** that pulses are more prone to PHL than the cereals at all stages. It can also be seen that PHL at transportation stage is much higher than at any other stage in cereals as well as in pulses. The lowest percentage of losses during storage stage is an indication that more care is being taken to store the produce.

**Table 1.4: Post-Harvest Losses of important crops of India
(Triennium ending 1998-99)**

(in '000 tonnes)

Crops	Quantity of Post-Harvest Losses ('000 Tonnes)	Percent to total Production (%)
Paddy	3319.57	2.71
Wheat	1222.45	1.79
Jowar	234.20	2.20
Bajra	150.30	1.89
Maize	267.52	2.45
Barley	34.74	2.16
Ragi	86.90	3.81
Red Gram	50.14	2.20
Bengal Gram	250.36	3.74
Green Gram	27.70	2.38
Black Gram	32.77	2.46
Lentil	64.65	7.14
All Crops	5741.30	2.43

Source: dmi.gov.in; Abstract of reports on Marketable Surplus and Post-Harvest Losses of Foodgrains in India.

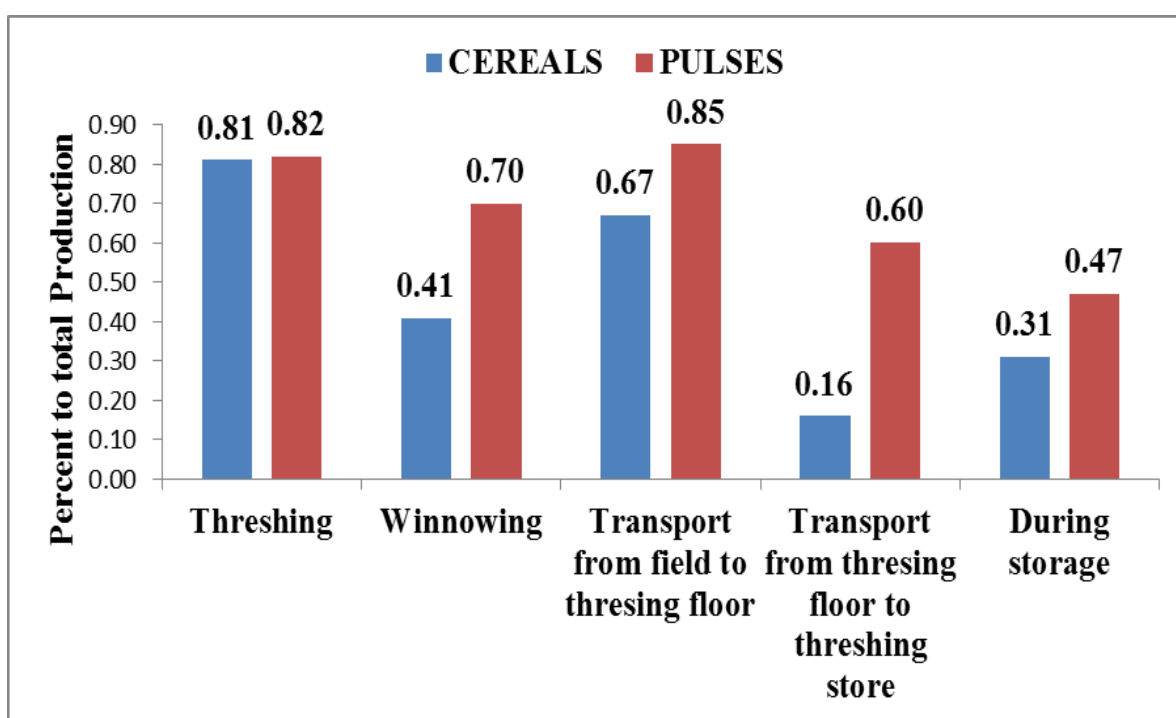


Figure 1.1: Stage-wise Post Harvest Losses for Triennium ending 1998-99

The reduction of post-harvest losses was also noticed in the study conducted by the Central Institute for Post-Harvest Management (CIPHM) and Indian Council for Agricultural Research (ICAR) during the period between 2004 (Base period) and 2010 (Repetitive period) (**Table 1.5**). It is very clear that the post-harvest losses were significant across crops during the period. The highest losses were reported in respect of jowar (6.10%), followed by rice (5.80%), grams

(4.70%), other pulses (3.83%) and maize (3.40%). The rest of the crops indicated a less than two per cent reduction. It is also inferred that the losses were reduced much more in respect of cereals - major foodgrains in the country. These reductions in the post-harvest period may be directly related to the storage space created under various schemes including the GBY/ RGS as it was a major programme dedicated to the creation of storage godowns for foodgrains.

Table 1.5: Post-Harvest Losses between 2004 and 2010

Sl. No.	Name of major Foodgrains	CIPHM Study, 2004* (%)	ICAR study, 2010** (%)	Decrease in PHLs (%)
1	Wheat	8.00	6.00	2.00
2	Rice	11.00	5.20	5.80
3	Maize	7.50	4.10	3.40
4	Jowar	10.00	3.90	6.10
5	Bajra	6.00	4.80	1.20
6	Gram	9.00	4.30	4.70
7	Other Pulses	9.50	5.67	3.83

Source: Jha et.al., (2015)

1.5. Review of policies and programs relating to the Agricultural Marketing and Warehousing

The developments in agricultural production technologies, improvements in the means of transport and storage facilities and marketing infrastructure have transformed agriculture into a commercial activity. Food production potential, by and large, has reached its maximum. Hence, the central and the state governments have been attempting to improve agricultural marketing and post-harvest management by way of creating more infrastructure in terms of constructing buildings and scientific godowns. Regulated market reformation has also been taken up seriously by governments to address the marketing and post-harvest challenges being faced by all categories of farmers in the country.

Various programmes and developmental schemes in association with various institutions that could help the farmers to get remunerative prices in the country are discussed hereunder as follows:

- a) Minimum Support Prices (MSP) for some important agricultural produce
- b) Procurement of foodgrains by the Food Corporation of India for Central Pool
- c) Price Support Schemes (PSS)

- d) Price Deficiency Payment Scheme (PDPS)
- e) Private Procurement and Stockiest Scheme (PPSS)
- f) Warehousing Institutions
- g) Agricultural Marketing Infrastructure (AMI)
- h) Private Entrepreneurs Guarantee (PEG) Scheme
- i) National Agricultural Market (e-NAM)
- j) Model State/ UT Agricultural Produce and Livestock Marketing (Promotion and Facilitation) Act, 2017.
- k) The Model Contract Act 2018:
- l) Interest Subvention Scheme on Crop Loans extended to Post Harvest
- m) RBI Master Direction on Priority sector Lending
- n) Orienting Banks towards electronic negotiable Warehouse Receipt System

a) Minimum Support Prices (MSP) for some important agricultural produce: MSP is a form of market intervention by the GOI, to insure agricultural producers against any sharp fall in the farm prices. These prices are announced by the GOI at the beginning of the sowing season for certain crops on the basis of the recommendations of the Commission for Agricultural Costs and Prices (CACP). These prices are announced with an objective to support the farmers from distress sales and to procure foodgrains for public distribution. These prices were approved by the government every year for Rabi and Kharif crops separately. There has been a substantial increase in these prices over the years, due to increased cost of cultivation and the government's commitment towards empowering the farming community.

b) Procurement of foodgrains by the Food Corporation of India for Central Pool: The procurement of foodgrains (rice, wheat and coarse grains) for the central pool is done through the FCI and state agencies at the MSP declared by the GOI for the corresponding marketing season. Prior to the commencement of the Kharif Marketing Season (KMS) and Rabi Marketing Season (RMS), uniform specifications (FAQ Standards) of foodgrains are formulated and notified by the Department of Food and Public Distribution so as to protect the interests of the farmers as well as consumers. Foodgrain stocks conforming to the uniform specifications are procured on MSP for the Central Pool. As of now, the GOI announces MSP for 23 commodities, but effectively price support operations are undertaken primarily for wheat, rice and pulses. In order to ensure the supply of quality foodgrains to consumers and to minimise storage losses caused due to long

storage, GOI has adopted policies to optimise the level of procurement and to liquidate old stock in such a manner that the FCI does not carry any issuable stocks for more than two years.

c) Price Support Schemes (PSS): This scheme is implemented at the request of the concerned state government which agrees to exempt the procured commodities of pulses, oilseeds, and copra from levy of mandi tax and assist central nodal agencies in logistic arrangements, including supply of gunny bags, working capital for state agencies, creation of revolving fund for PSS operations, etc., as required under the scheme guidelines. The procurement of these commodities is undertaken directly from pre-registered farmers within a stipulated period and conforming to the prescribed FAQ norms by the central nodal agencies through the state level agencies at the MSP announced by the Government as and when prices fall below the MSP. The Central Government restricted the procurement to 25 per cent of the actual production of the commodity during that season. More than 25 per cent of production can also be done by the state agencies at their own cost and through their own agencies.

d) Price Deficiency Payment Scheme (PDPS): The scheme envisages direct payment of the difference between the MSP and the selling/modal price to pre-registered farmers selling oilseeds of prescribed FAQ norms within the stipulated period in the notified market yard through a transparent auction process. All the payments are done directly into the bank account of the farmers and there is no physical procurement. Under this scheme, the Central Government bears the price deficiency up to 25 per cent of the MSP value including two per cent administrative cost. If the state intends to give more than 25 per cent of the price deficiency, it should bear it by itself.

e) Private Procurement and Stockiest Scheme (PPSS): The states will have the option to implement PPSS by sending a proposal for the procurement of oilseeds to the GOI. Such procurement should be from the pre-registered farmers on selected APMCs involving the selected private stockist. The private stockist should be from those empanelled by the state/ UT government as per extant guidelines. Such stockists will not be allowed to sell the procured quantities during the procurement period notified under PDSS/ PSS for that particular commodity in the state. They shall be totally responsible for all forms of handling including storage and transportation, as also disposal. The maximum eligible service charge shall be 15 per cent of the MSP notified for the year and the crop commodity under consideration. Such a

private stockist shall procure the selected oilseeds at a maximum of 25 per cent of the production in the district/APMC at MSP.

f) Warehousing Institutions: Various agencies have been functioning in the organised sector of the country such as FCI, CWC, SWC, other state agencies, cooperatives and the private sector. As per the secondary data, the current capacity of the organised warehouses operated by all these agencies is about 152.71 million tonnes as detailed in **Table 1.6**. The creation of storage capacity through FCI, CWC or SWC depends on the budgetary allocations made by either Central or State governments, respectively. Lower storage capacity with the government agencies is a proof of inadequate budgetary allocation due to various factors varying from deficit budget to differential priorities within agricultural sector, more so towards the post-harvest management. However, realization of importance of scientific post-harvest management has led the government to introduce the RGS to enable the private participation through incentivization as subsidy. This might be a reason for greater participation of private sector.

Table 1.6: Storage Capacity of Warehouses with various Institutions in India

Sl. No.	Name of the Organization/ Sector	Storage Capacity in Million Tonnes
1	FCI (excluding CAP and the capacity hired from CWC, SWCs, State Agencies, and Private)	12.73
2	CWC	10.10
3	SWC (Excluding CAP storage)	24.08
4	Other State Agencies (Excluding CAP Storage)	11.66
5	Cooperative Sector	16.51
6	Private Sector	77.68
	Total	152.76

Source: Annual Report 2018, WDRA

g) Agricultural Marketing Infrastructure (AMI): For the development of Agricultural Marketing Infrastructure including storage infrastructure, the Ministry of Agriculture & Farmers Welfare has implemented a capital investment subsidy sub-scheme "Agricultural Marketing Infrastructure (AMI)" under the Integrated Scheme for Agricultural Marketing (ISAM). The erstwhile two schemes viz. (i) Grameen Bhandaran Yojana (GBY) implemented since 01.04.2001, and (ii) Scheme for Strengthening/ Development of Agricultural Marketing Infrastructure, Grading & Standardization (AMIGS) implemented since 20.10.2004, have been subsumed into one scheme known as Agricultural Marketing Infrastructure (AMI) w.e.f. 01.04.2014. The new operational guidelines of AMI Sub-Scheme of ISAM have been approved

for implementation with effect from 22.10.2018 to 31.03.2020 for a period coterminous with the 14th Finance Commission.

The main objectives of the scheme are (i) to develop agricultural marketing infrastructure including storage infrastructure for effectively managing the marketable surplus of agriculture including horticulture and allied sectors including dairy, poultry, fishery, livestock and minor forest produce; (ii) to promote the creation of scientific storage capacity for storing farm produce, processed farm produce and agricultural inputs etc. to reduce post-harvest and handling losses and (iii) to provide infrastructure facilities for grading, standardisation and quality certification of agricultural produce and to promote pledge financing and marketing credit, and a negotiable warehousing receipt system. It is a credit-linked, capital investment back end subsidy Central sector sub-scheme.

h) Private Entrepreneurs Guarantee (PEG) Scheme: The GOI announced PEG Scheme 2008 for the construction of storage godowns in Public Private Partnership (PPP) mode through private entrepreneurs, CWC, and SWC. The assessment of additional storage capacities required under the scheme is based on overall procurement / consumption and storage space already available. Under the scheme, FCI gives a rental guarantee of 10 years to private investors and 9 years to CWC/ SWC/ state agencies. In some of the states like Haryana, the PEG is merged with GBY for the sake of subsidy.

i) National Agricultural Market (e-NAM): With an objective to usher reforms in the agri-marketing sector and promote online marketing of agri commodities across the country and to provide maximum benefit to the farmers, the government has approved a scheme to implement National Agriculture Market (NAM) on 01.07.2015. Under the scheme, a web-based platform has been deployed across 585 regulated markets to promote online trading, digitalisation of the entire functioning of markets, outline gate entry, lot making, bidding, generation of e-sale agreement and e-payment etc., remove information asymmetry, increase transparency in the transaction process and enhance accessibility to markets across the country. Further to facilitate assaying of commodities for trading on e-NAM, common tradable parameters have been developed for 124 agricultural commodities. Till 31st March 2019, 1.57 crore farmers, 1.22 lakh traders and 68,463 commission agents have been registered on e-NAM and have done a trade of 2.46 crore MT of agricultural produce worth Rs. 66,237 crore. Besides this, to broad base the eco-system, 713 FPOs from 16 states have been registered on e-NAM.

j) Model State/ UT Agricultural Produce and Livestock Marketing (Promotion and Facilitation) Act, 2017: In order to provide better marketing facilities to the farmers, APLM (P&F), Act, 2017 was implemented by the GOI for its adoption by states/UTs. The model Act provides for alternative marketing channels such as the setting up of private markets, direct marketing, farmer-consumer markets and special commodity markets to facilitate farmers in marketing their produce at competitive and remunerative prices. This will enable WDRA registered warehouses to act as a hub for effective trading of the goods stored in these warehouses based on the eNWRs.

k) The Model Contract Act 2018: As per this Act, all services in the agriculture value chain, including pre-production, production and post-production services, come under its ambit along with contract farming activity. This Act lays a special emphasis on protecting the interests of the farmers, considering them as the weaker of the two parties entering into a contract, the ministry states. It brings the contract farming outside the ambit of the APMC Act. It gives no right or title of interest of the land to the sponsor. Similarly, no rights, title ownership or possession is to be transferred or alienated or vested in the contract farming sponsor. The Act provides for the promotion of Farmer Producer Organization (FPOs)/Farmer Producer Companies (FPCs) to mobilise small and marginal farmers. The FPO/FPC can also be a contracting party if so, authorised by the farmers. The contracting party will be obliged to buy the entire pre-agreed quantity of one or more of agricultural produce, livestock or its product of contract farming producer as per contract. It also envisages the setting up of a Contract Farming Facilitation Group (CFFG) for promoting contract farming and services at village/panchayat level.

l) Interest Subvention Scheme (ISS) on Crop Loans extended to Post Harvest: In order to provide short-term crop loans up to Rs 3 lakh to farmers at an interest rate of seven per cent per annum, the Interest Subvention Scheme on Crop Loans by small and marginal farmers is being implemented by the GOI since Kharif 2006-07. Under the scheme, an interest subvention of two per cent per annum is provided by lending institutions (banks) on the use of their own resources. Besides two per cent subvention, the farmers are also provided three per cent additional interest subvention on prompt repayment of crop loan on or before the due date.

In order to discourage distress sale by farmers and to encourage them to store their produce in warehouses, from the year 2010-11, the benefit of interest subvention has been made available to small and marginal farmers having Kisan Credit Card for a further period of up to six months

post the harvest of the crop on the produce stored in warehouses registered with the authority against the Negotiable Warehouse Receipts (NWRs)/ eNWRs at the same rate as that available on crop loan. The GOI, on February 2019, has approved the continuation of the scheme for a period of two years till 2019-20.

m) RBI Master Direction on Priority sector Lending: The Reserve Bank of India (RBI) Master Directions (Priority Sector Lending Chapter III- Targets and Clarifications), 2016 prescribes that loan against pledge / hypothecation of agricultural produce can be granted against warehouse receipts.

n) Orienting Banks towards electronic negotiable Warehouse Receipt System: Though these assurances have been given for positive action in the matter the outcome was not satisfactory till date. Having been fully convinced of the security features of eNWRs and its transparency/ transferability some of the banks have already initiated this process on-boarding with the Repositories and accepting eNWRs for pledge financing.

1.6. Launching of GBY in India

The construction of storehouses, on their own, is beyond the financial capacity of even the large farmers. The initiatives that were taken up before 2001 by the government for agricultural development were not designed to offer capital subsidy to build warehouses to store their marketable surplus produce in such a way that they could minimise the post-harvest losses. With due consideration to the storage problem being faced by the farming community, the Government of India has launched Grameen Bhandaran Yojana (GBY)/ Rural Godowns Scheme (RGS) in 2001-02 all over the country. The GBY is a Capital Investment Subsidy Scheme for the purpose of either to construct a new godown or to renovate an old godown or to expand an existing godown. The guidelines of the scheme have been subsumed with other ongoing scheme of Development/Strengthening of Agricultural Marketing Infrastructure, Grading and Standardization (AMIGS) during 2004 and again into Agricultural Marketing Infrastructure (AMI) sub-scheme of Integrated Scheme of Agricultural Marketing (ISAM) w.e.f. 2014.

The Rural Godowns Scheme plays a vital role in promoting agriculture marketing, rural banking and financing and ensuring food security in the country. It enables the markets to ease the pressure during harvest season and to maintain the supply of agricultural commodities during off

season. Hence, it solves the problems of glut and scarcity, which are the usual problems in agricultural marketing. Though warehousing is an independent economic activity, yet it is closely linked with production, consumption and trade. The main objective of the scheme is creation of a scientific storage capacity with allied facilities in the rural areas to meet the requirements of farmers for storing farm produce, processed farm produce and agricultural inputs; promotion of grading, standardisation and quality control of agricultural produce to improve their marketability; prevention of distress sale immediately after harvest by providing the facility of pledge financing and marketing credit; strengthening of agricultural marketing infrastructure in the country by paving the way for the introduction of a national system of warehouse receipts in respect of agricultural commodities stored in such godowns and to reverse the declining trend of investment in agriculture sector by encouraging private and cooperative sectors to invest in the creation of storage infrastructure in the country.

1.6.1. Method of implementation of the Scheme

All over India, the scheme is being implemented by the Directorate of Agricultural Marketing and Inspection (DMI), Department of Agriculture, Cooperation & Farmers' Welfare, Government of India. The National Cooperative Development Corporation (NCDC) and National Bank for Agriculture and Rural Development (NABARD) have collaborated with DMI in the implementation of GBY. The DMI acts as a nodal office for implementing the GBY scheme by opening at least one sub-office in every state. The DMI, in association with the National Institute of Agricultural Marketing (NIAM), Jaipur and other national/state level institutions, have organised training to create general awareness on the GBY scheme to farmers as well as to entrepreneurs covering the topics pertaining to construction, maintenance and operations of rural godowns. The beneficiaries of the GBY scheme all over India include: individual farmers; registered Farmer Producer Organisations; Scheduled Caste, Scheduled Tribes and women. A few cooperatives have availed finance through NCDC for the renovation of storage projects as well.

1.6.2. State of Affairs of GBY in India

The status of the GBY scheme has been largely confined to only intrastate comparison despite it not being a fully justified comparison. This is because no two states have precisely similar storage space requirement or the cost of construction of godowns or quantity of marketable

surplus of each agricultural crop or with respect to availability of marketing infrastructure. The study was confined to state-to-state comparison for the following reasons:

- Due to non-availability of year-wise physical and financial data for each state, statistical tools like Compounded Growth Rate or Average Growth Rate etc. could not be applied.
- The implementing authorities had not fixed targets. Even if the target was fixed, the data was not made available. Hence, ascertaining the status of GBY as target related performance was completely restricted. The data pertaining to demand by farmers and entrepreneurs for the construction or renovation or expansion of godowns has not been collected by the implementing agency. As such, the assessment of the GBY scheme in relation to demand could not be attempted.
- It may not be appropriate to compare the performance between NCDC and NABARD for the reason that both the institutions have been working with a different set of rules and constraints.

Since GBY is a Central scheme, as at the end of March, 2019, the scheme has been implemented by 27 states of the country and had sanctioned 38,964 projects by spending an amount of Rs. 2957.57 crore to create a storage space of 655.48 lakh tonnes. Almost half of the capital subsidy amount extended to the creation of storehouses has been concentrated in Madhya Pradesh, Maharashtra, Haryana and Andhra Pradesh in the order of their percentage to the total subsidy spent all over India. **Table 1.7** lists all the 27 states according to the percentage share of subsidy provided, out the total subsidy.

Table 1.7 reveals that only eight states have consumed around 73 per cent of the total all India subsidy amount of Rs. 2957.75 crore to construct a more than 80 per cent of the total number of godowns under the GBY scheme and created around 70 per cent of the total storage capacity created across the country. Although the number of godowns was more (about 30% of the godowns in India) in the case of Gujarat (11,663) however, the average capacity created works out to be much smaller (383 MT). Similar was the case with Karnataka (4508 godowns at 12% of all India with an average capacity of 840 MT) and West Bengal (2552 godowns with an average capacity of 620 MT). The larger godowns of more than 5000 MT were seen in respect of Telangana, Jharkhand, Jammu and Kashmir and Tripura. The average capacity of godowns accounts to 1683 MT at the all India level. Table 1.7 is also shown in **Figure 1.2** for better understanding of the GBY scenarios.

Table 1.7: State-wise number of projects, storage capacity created and Subsidy amount

Sl. No.	Name of state	No. of projects	Capacity in Tonnes	Subsidy Amount in Rs. Lakhs	Percentage to all India total			Average Capacity of storage created (MT)
					No. of project (%)	Capacity (%)	Subsidy amount (%)	
1	Madhya Pradesh	3828	10625861	55630.13	9.82	16.21	18.81	2775.83
2	Haryana	2017	6557370	36898.93	5.18	10.00	12.48	3251.05
3	Maharashtra	3581	6670711	26565.86	9.19	10.18	8.98	1862.81
4	Andhra Pradesh	1338	5408801	26365.81	3.43	8.25	8.91	4042.45
5	Gujarat	11663	4472390	25387.80	29.93	6.82	8.58	383.47
6	Punjab	1745	6741842	23124.67	4.48	10.29	7.82	3863.52
7	Telangana	760	4625223	22994.51	1.95	7.06	7.77	6085.82
8	Karnataka	4508	3787601	18405.37	11.59	5.77	6.25	840.20
9	Uttar Pradesh	1119	5322569	16838.82	2.87	8.12	5.69	4756.54
10	Rajasthan	1471	2720573	8542.17	3.78	4.15	2.89	1849.47
11	Chhattisgarh	594	1943545	7419.21	1.52	2.97	2.51	3271.96
12	Assam	325	987169	5687.54	0.83	1.51	1.92	3037.44
13	Tamil Nadu	1127	1407402	4977.42	2.89	2.15	1.68	1248.80
14	West Bengal	2552	1581523	4900.46	6.55	2.41	1.66	619.72
15	Odisha	691	1009180	4026.81	1.77	1.54	1.36	1460.46
16	Uttarakhand	287	772269	3355.15	0.74	1.18	1.13	2690.83
17	Bihar	1000	503742	2104.90	2.57	0.77	0.71	503.74
18	Jharkhand	26	157316	730.12	0.07	0.24	0.25	6050.62
19	Jammu & Kashmir	14	83027	684.79	0.04	0.13	0.23	5930.50
20	Kerala	206	90511	476.54	0.53	0.14	0.16	439.37
21	Tripura	5	28764	296.61	0.01	0.04	0.10	5752.80
22	Meghalaya	16	21012	186.75	0.04	0.03	0.06	1313.25
23	Himachal Pradesh	87	27486	158.51	0.22	0.04	0.05	315.93
24	Nagaland	1	814	6.78	0.00	0.00	0.00	814.00
25	Arunachal Pradesh	1	945	6.30	0.00	0.00	0.00	945.00
26	Mizoram	1	302	2.52	0.00	0.00	0.00	302.00
27	Goa	1	299	0.94	0.00	0.00	0.00	299.00
	Total	38964	65548247	295775.42	100.00	100.00	100.00	1682.28

Source: NABARD, 2019

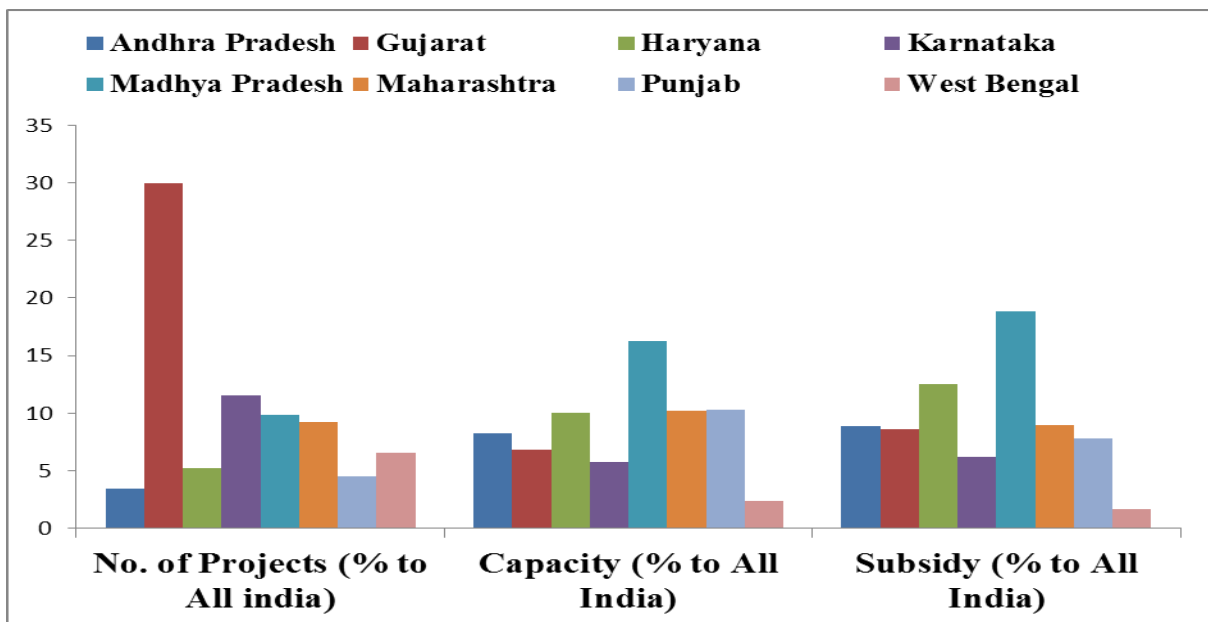
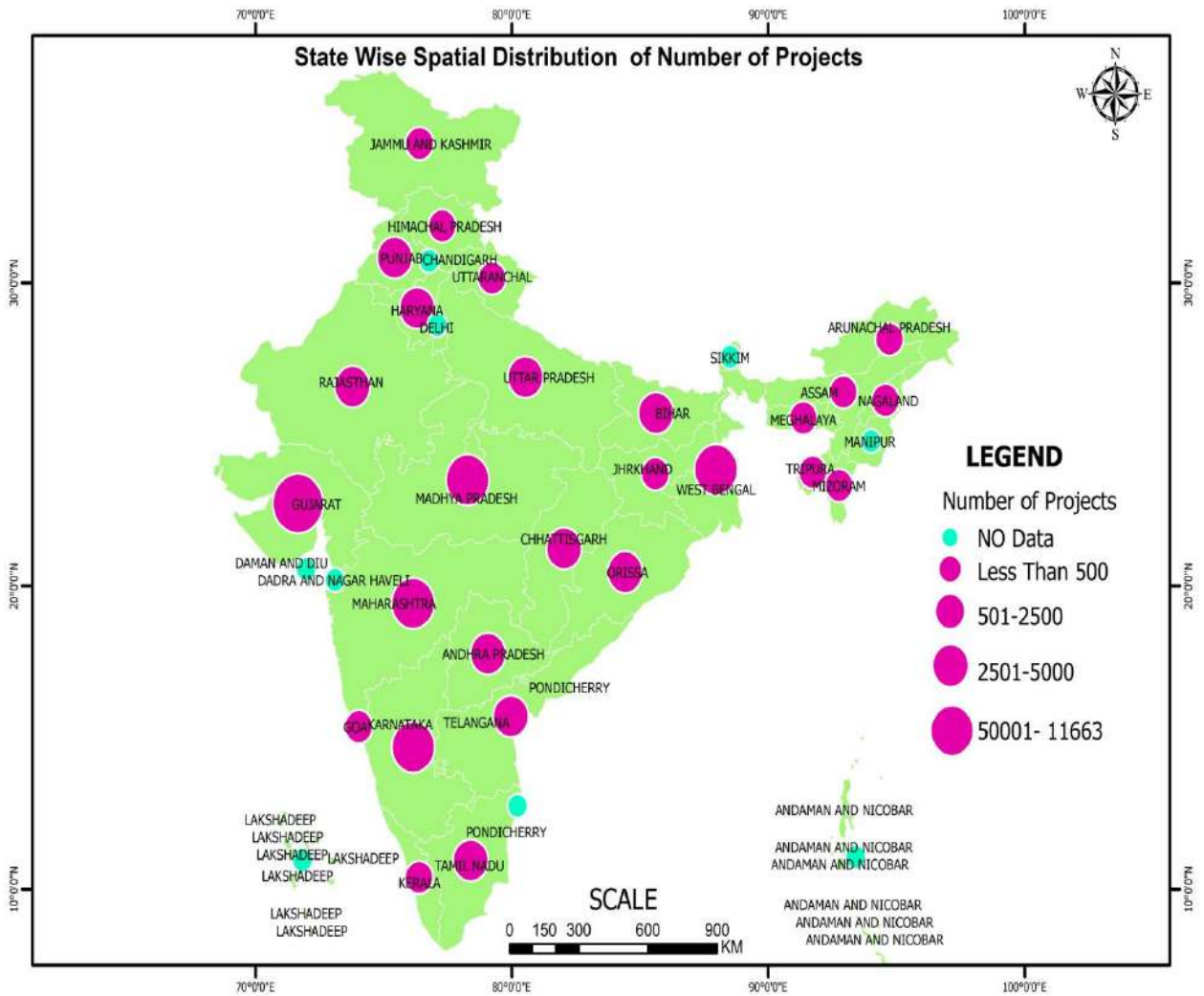


Figure 1.2: Percentage share of eight important states in all India total

In a nutshell, it can be said that the benefits of GBY are not as widespread as they should have been. As many as nine states have not managed to construct even 100 godowns in their respective states since the inception of GBY scheme in the country. However, it can be concluded that the construction and implementation of the scheme was on the basis of demand driven and not on the state involvement. They may have genuine problems to construct godowns more than they have done so far or they may not require more than what they have constructed. However, the present study is illustrated upon the performance basis of storage capacity created/ number of godowns created under the scheme.

An effort was also made to understand the number of godowns registered with the Warehouse Development and Regulatory Authority (WDRA) for understanding the status of implementation of a negotiable Warehouse Receipt System under these warehouses in the country. It is also one of the objectives of the GBY that the godowns constructed under the scheme should avail the important provisions of the WDRA, which ensures the users of the godowns (farmers) are able to retain their produce till they get better prices in the market and avail the pledge loans from the banks. Therefore, information on state-wise number of godowns registered is presented in **Table 1.8**.

Table 1.8: State-wise Number of registered godowns as on March

Sl. No.	State	No. of Godowns Registered	Percent to total
1	Andhra Pradesh	26	2.46
2	Assam	2	0.19
3	Bihar	6	0.57
4	Chhattisgarh	0	0.00
5	Delhi	0	0.00
6	Gujarat	154	14.57
7	Haryana	9	0.85
8	HP	0	0.00
9	Jharkhand	1	0.09
10	Karnataka	30	2.84
11	Kerala	9	0.85
12	Madhya Pradesh	305	28.86
13	Maharashtra	121	11.45
14	Odisha	2	0.19
15	Punjab	8	0.76
16	Puducherry	1	0.09
17	Rajasthan	173	16.37
18	Tamil Nadu	147	13.91
19	Telangana	24	2.27
20	Uttarakhand	0	0.00
21	Uttar Pradesh	35	3.31
22	West Bengal	3	0.28
23	Tripura	1	0.09
	Total	1057	100.00

Source: NABARD, 2019

It is noticed from **Table 1.8** that as on 31st of March, 2019, 1057 godowns were registered with the WDRA in India with an average capacity of 79.09 LMT. Out of them, Madhya Pradesh, Rajasthan, Gujarat, Tamil Nadu, and Maharashtra together account for more than 90 per cent of the godowns in India on the basis of their order of merit. In terms of number of godowns registered, Madhya Pradesh tops the list with 305 godowns.

It is worth mentioning here that a majority of the rural godowns constructed under GBY have not been registered with the WDRA as the technical specifications of the rural godowns are disparate and not able to adhere to the specifications mentioned in the Negotiable Warehouse Receipt System (NWRS). A majority of the farmers also felt that registration with the WDRA is a costly affair and hence they are not registered. Moreover, the bankers are not in favour of the NWRs in respect of rural godowns. Further, issues related to the pledge loans are discussed in detail in the subsequent sections.

II. REVIEW OF LITERATURE AND METHODOLOGY

2.1. Review of Literature

A comprehensive summary of previous research on a topic related to the study was made to understand the concepts and decide on the methodology to be followed for the study. Based on the available literature, a few important studies have been chosen, reviewed, and presented in this section.

Recto (1980) in his study tried to determine the optimal size and locations of the warehouses for the paddy/rice marketing system, while investigating the ways by which the marketing costs of the product could be minimised. He examined the transport and storage systems in each of the 13 regions of the Philippines during 1975-77. He found that the warehousing facilities were inefficiently located, and there was a shortage of storage facilities in a few regions while surpluses in other regions. There had been an improvement in the production of rice, with a corresponding improvement in the marketing infrastructure and services. A large amount of the crop would have been lost through the inefficient handling and processing.

Reddy and Narasimhan (1980) found that locating the colossal godowns of the Central Warehousing Corporation adjacent to the market yard of the Hindupur regulated market was to the best advantage of growers and traders.

Mansour and Christensen (2000) used a unique approach to assess the demand for warehouse space. Typically, the demand for warehouse space had been modelled using population or employment measures. Warehouse inventory rather than employment was used to model the space demand. Warehouse inventory was proxied by the date on freight shipments. Detailed information on the location and freight activity of manufacturing plants and distribution centres across the United States, particularly in Dallas, Los Angeles, and Seattle were used. Warehouse employment was then compared to the freight shipments in determining the demand for warehouse space.

Sharma (2002) in his study on the role of the Rajasthan State Warehousing Corporation (RSWC) in providing scientific storage observed that the corporation has been able to meet the basic

objective of providing a scientific storage facility for agricultural produce at a reasonable charge in the state. He reported that the corporation not only used its own capacity up to an optimum, but also hired the same from other agencies. The study revealed that the fertilisers and foodgrains were stored in a large quantity and RSWC had not been able to attract commercial crops for storage, and the poverty-stricken agriculturists in Rajasthan were selling their produce at the price fixed by the traders.

Saxena (2003) found that the storage makes it possible to take advantage of the anticipated increase in prices. Processing units like flour mills/ rice mills demand wheat and paddy throughout the year. For the efficient running of the mills and for the economy as a whole, an adequate supply of raw material is essential. This requirement can only be met through a good storage system. Storage also creates immense job opportunities in different walks of life starting from the labourers to transporters, traders, and financiers, and a variety of government officials are required to closely watch and monitor the various functions of a gigantic marketing process. It is thus an instrument for the development of a vibrant economy in which a sizeable part of the population is involved in production, trading and various other functions in which storage has a pivotal role to play in the growth and development of a country.

Shunmugam (2008) reported that warehousing in India has largely remained in the public domain with a poor capacity utilisation due to various reasons such as a mismatch between physical locations of the facilities and the need for the same, lack of awareness among the farmers and traders, small marketable surplus with the producers, storing it at their own facility, a lack of cost-effective transportation facilities, lack of norms governing the maintenance of such scientific warehousing facilities, and complicated formalities followed in enabling storage for farmers and traders. As the warehousing sector developed, with a full play of linkages to be created among the players and institutions in the agricultural supply chain ecosystem, it would help achieve the ultimate objective of creating win-win supply chains for the producers, intermediaries and the consumers.

Sinha Anjani (2008) pointed out the need for a radical thinking to transform the warehousing sector. In developed countries, bulk storage of foodgrains and other produce is done in big silos, which saves the handling cost, storage cost and the cost of packaging and the labour cost relating to manual handling. In India, to develop a silos system and infrastructure related to it, the country needs investment of more than Rs 1,00,000 crore. As the government is unable to go it alone for

this investment, private entrepreneurs should be attracted for such investments, with a guaranteed return and a recurring income or assured business. The issue of marketability of investment comes into the picture if the private investment comes into creating rural warehousing for the purpose of offering its services to the farmers and small traders.

Jairath (2010) stated that the total storage capacity available at the end of 2010 with the CWC, SWC, and FCI was about 75 million tonnes. It was estimated that about 25 million tonnes of grains were stored in the form of cover and plinth. Construction of rural godowns under the NCRG scheme was initiated in 1979 and now amounted to rural godowns of 15 million tonnes capacity. The researcher asserted that keeping in view the agricultural production in the country, the available storage facilities/capacities appeared inadequate. Looking at the production trends and assuming 70 per cent as marketed surplus, a storage capacity of 150 lakh metric tonnes was needed for the country.

Neacsu and Madar (2010), in their study on grain storage at farm and warehouse level, explained that the traditional grain traders throughout the world had tended to depend upon a fairly rapid turnover of stocks as a means of minimising the losses due to pests and other factors. The maize cobs, sorghum and millets stored through air storage were in solid wall bins, where the roof is usually made of thatched grass, with a generous overhang to protect the mud walls from erosion. Such silos can serve for 30 or even 50 years, and hence they concluded that the underground storages are common in India and these types of storage are useful for all types of foodgrains and millets.

Phillips and Throne (2010) observed that the grain losses in the storage accounted for 10 to 20 per cent of the overall production, and the preliminary storage losses were due to inadequate storage capacities, insect and pest infestations.

The Central Warehousing Corporation continues to operate the truck terminal, spread over an area of 17.08 acres, at Petra Pole (West Bengal) on the Indo-Bangladesh border for providing support services to the import/export trade with Bangladesh through the land route. The performance of this facility also improved during the year, and it handled 1.76 lakh import/export trucks, recorded a 92 per cent capacity utilisation and earned revenue of Rs 294.59 lakh during 2010-11 as against 1.62 lakh trucks handled with a revenue of Rs. 254.30 lakh earned through 89 per cent of capacity utilisation during 2009-10 (Anon., 2011).

The warehousing capacity available in India with the public, cooperative, and private sector was 108.75 million MT viz., Food Corporation of India (FCI) having a capacity of 32.05 MT, the Central Warehousing Corporation (CWC) had 10.07 MT, the State Warehousing Corporations (SWCs) had 21.29 MT, the State Civil Supplies Departments had 11.30 MT, the cooperative sector had 15.07 MT, and the private sector had a capacity of 18.97 MT, respectively. The storage capacity available with the FCI and a part of the warehousing capacity available with the CWC and SWCs were used for the storage of foodgrains procured by the government agencies for the Central Pool. Hence, the storage space available in the country was not sufficient to cater to the procured stocks (Anon., 2012).

The study conducted by Esther et al. (2014) reveals that although the production of the foodgrains was steadily increasing over the years, the post-harvest losses were constant at 10 per cent. Out of this, six per cent was due to the absence of proper storage facilities. In India, foodgrains were stored using the traditional structures by small and marginal farmers. Hence, there was a need for research to develop management guidelines for safe storage and drying to ensure quality management of the stored grains.

Tanksale and Jha (2014) developed a mathematical model to optimise the foodgrains storage and transport for the public distribution system in India, and the results of the study indicate that improper planning and scheduling of the movement of foodgrains resulted in excess transportation cost and underutilisation of the available storage capacity, which would in turn increase the operational cost of FCI.

Javed et al. (2015) in their study on the overview of grains drying and storage problems indicated that on-farm storage was important in India as it stores the surplus for a short duration. They also revealed that the use of driers and scientific storage practices, if followed, can reduce the loss to an extent of about six per cent, which would save Rs 13,500 million every year, and made available an additional nine million tonnes of grains to feed the people.

According to the report of the National Institute of Public Finance (2015), a majority of the respondents across the surveyed districts displayed no shortage of warehousing facilities. Due to consecutive years of bad yields, there was an excess supply of warehousing facilities in most the districts surveyed, driving rents down in the low productivity areas. On the other hand, there was

a lack of warehousing mainly due to the low necessity for storage. This was true of North 24 Parganas, where the banks reported that the warehousing capacity in the rural areas was very small, and the culture of warehousing was yet to really take off.

Adigal and Singh (2015) reported that the total turnover of CWS increased from Rs. 849.25 crore to 1528.19 crore during 2013. In the same year, the report reflects, about Rs. 2.03 lakh MT was used for enhancing the storage capacity created. However, the average capacity utilisation was reduced to 86 per cent and 93 per cent during 2012-13, mainly due to a lower stock position of FCI in view of a shortfall in wheat procurement as well as liquidation of stocks through PDS and export. This reveals that the utilisation of the storage space is subject to various reasons and it will not be constant forever.

Bagave Tushar Dilip (2016) reported that about 76 per cent of the traders had their own warehouses or storage facilities. These storage structures were in the form of mandi godowns, simply constructed spaces, simple dry warehouse and proper scientific warehouse etc. These traders used these godowns to keep or store the commodities for a particular period to get a higher price in the market. The rest 24 per cent did not have the facility of warehouses.

Prashanth K (2016) found that in the total capacity of utilisation of 43000 MT of Central Warehouse Corporation, the percentage of utilisation by the farmers was 18.48, while traders were 46.45 and the remaining 35.07 per cent was unutilised by others in 2005-06. It is also observed that the utilisation by the farmers and traders has increased to 23.81 and 55.96 per cent in 2014-15. While in the case of private warehouses, there is 100 per cent utilisation by the farmers themselves and no traders were operating in the warehouses.

Mallikarjuna gouda (2007) indicated that most of the time, foodgrain price varies from month to month. As a result, the farmers did not get a higher price in the later days, as they did not anticipate price variations, and felt that the storage of produce may not be advantageous. It is also revealed that sometimes, farmers did not get an adequate storage space for their small quantity of produce, and lack of awareness, no proper guidelines, location and transportation problems were also encountered during the storage period, and hence, they kept away from the storage.

2.2. Methodology Followed for the Study

2.2.1. Need for the Study

The scheme is operational since 2001-02. As part of the monitoring and evaluation, the scheme is evaluated from time to time by the planners, policy makers and programme implementers to ensure accountability and improvement of the programme. Consequently, the programme has been modified and implemented in different names over the period. In November, 2013, the GBY was integrated with the Integrated Scheme for Agricultural Marketing (ISAM) for the XII Plan (2012-2017). The guidelines were again revised and implemented as Agricultural Marketing Infrastructure (AMI)-a sub-scheme of ISAM from 2018. All along, the programme was implemented with a varying degree across the states, while a few states had implemented it pro-actively. It is interesting to note that irrespective of regions, zones and other geographical locations, some of the states have performed better in terms of utilisation of funds allotted and vice versa. With this background, the implementation agency, Directorate of Marketing and Inspection (DMI), has taken interest in understanding the present status of the programme and its implementation, reasons for the varying degrees of performance across states, participation of beneficiaries and their views, issues in implementation, utilisation pattern of storage godowns and the overall impact of the scheme through an evaluation by a case study method across the country. Since Institute for Social and Economic Change (ISEC) is a premier institute and has been actively working on related issues, the Choudri Charan Singh National Institute of Agricultural Marketing (CCS, NIAM) – an autonomous body working under the aegis of the Ministry of Agriculture and Farmers Welfare (MoA & FW), Government of India, requested the Agriculture Development and Rural Transformation Centre (ADRRTC) of the ISEC to take up this task. Accordingly, ADRRTC has prepared a framework to NIAM for their perusal and consideration.

2.2.2. Specific Objectives of the Study

Based on the discussions and understanding of the need for the study, the following specific objectives are proposed;

- a. To assess the extent of coverage of the scheme and capacity utilisation of the storage facilities created under this scheme.
- b. To identify and review the constraints in implementation and performance of the scheme.

- c. To understand and assess the extent of participation of various categories of beneficiaries/ entrepreneurs under this scheme.
- d. To assess the overall performance and impact of the scheme with respect to laid- down objectives of the scheme.

2.2.3. Sources of data

The present study relied on both secondary and primary data. The secondary data were collected through various sources in respect of state-wise progress of rural godowns in terms of their physical and financial targets and their achievement, guidelines followed in the implementation of the programme, the number of detailed project reports received, rejected and approved in the respective states, coverage of newly constructed and renovated godowns, details of funding agencies and subsidy provided, total investment etc. Similarly, primary data was collected from various stakeholders involved under this scheme such as nodal officers, implementing agencies in the state, beneficiaries of the scheme/ owners of the godowns, farmers, financial institutions, etc. Scientifically prepared, pre-tested questionnaires and checklists were used to collect the relevant information from these stakeholders through a one-to-one interaction, along with Focussed Group Discussion (FGD). To understand the ground reality of the projects implemented, field surveys have been conducted in each sample state and the data collected from the stakeholders. The collected secondary and primary data was tabulated and analysed to get the inferences for the evaluation of the study.

2.2.4. Sample selection

The present study followed an exploratory case study method to identify the generalisable facts by in-depth understanding of the issues through objective and subjective data collected from the various stakeholders involved in the scheme. For the purpose of the study, states were selected based on the capacity of storage created and the number of godowns sanctioned under GBY from the available secondary data. The purposive sampling technique was applied to select the sample states and to represent various performance scenarios across the country. Hence, three scenarios such as high, medium, and low performance were proposed in terms of the scheme implementation. Accordingly, two states were selected across the country to represent each scenario, keeping in mind representation for different regions of the country as well. Consequently, as per the latest data available with the DMI (as on 31/03/2015), two states each

selected to signify High Performance states were - Madhya Pradesh (Central Region) and Haryana (North Region), Medium Performance states were Gujarat (West Region) and Karnataka (South Region), and Odisha (East Region) and Meghalaya (North-East Region) as Low Performance states. The selected states, criterion, details of beneficiaries and users can be seen in **Table 2.1**.

Table 2.1: Sampling Framework

Performance Scenario	States	Region	Actual Rank* in the Country	No. of Beneficiaries	Sample farmers	FGD
High	Madhya Pradesh	Central	1	15	30	06
	Haryana	North	2	08	-	-
Medium	Gujarat	West	8	15	30	08
	Karnataka	South	9	11	30	04
Low	Odisha	East	15	09	30	03
	Meghalaya	North East	23	04	-	-
	All India/ Total			62	120	21

*Note:**States are selected based on the Capacity of Storage created under GBY & the number of projects sanctioned till March 2015; FGD – Focus Group Discussion

Source: Authors;

A minimum of three beneficiaries from each district were met in almost all the selected states, excepting in the case of Meghalaya, wherein only four beneficiaries were drawn out of the total eight projects sanctioned under the GBY and are distributed within two districts only. In addition, about 30 indirect beneficiaries of the godowns (farmers) were also chosen for the study in the sample states, excepting in respect of Haryana and Meghalaya, wherein none of the beneficiaries used these godowns for storing their own produce. They have hired them out to someone else for rent or stored items related to their own business.

2.3. Major Limitations of the Study

The scheme was implemented from 2001 onwards, and the guidelines were modified time and again. The availability of database was found to be grossly inadequate and hence, the following were the major limitations for the study.

- a. Non-availability of beneficiary contact details with the implementing agencies.
- b. Outdated database of beneficiaries.
- c. Lack of centralised database on storage space available in the state / Central level.

- d. Since the godowns come under private ownership, due documentation related to the godowns was not maintained.

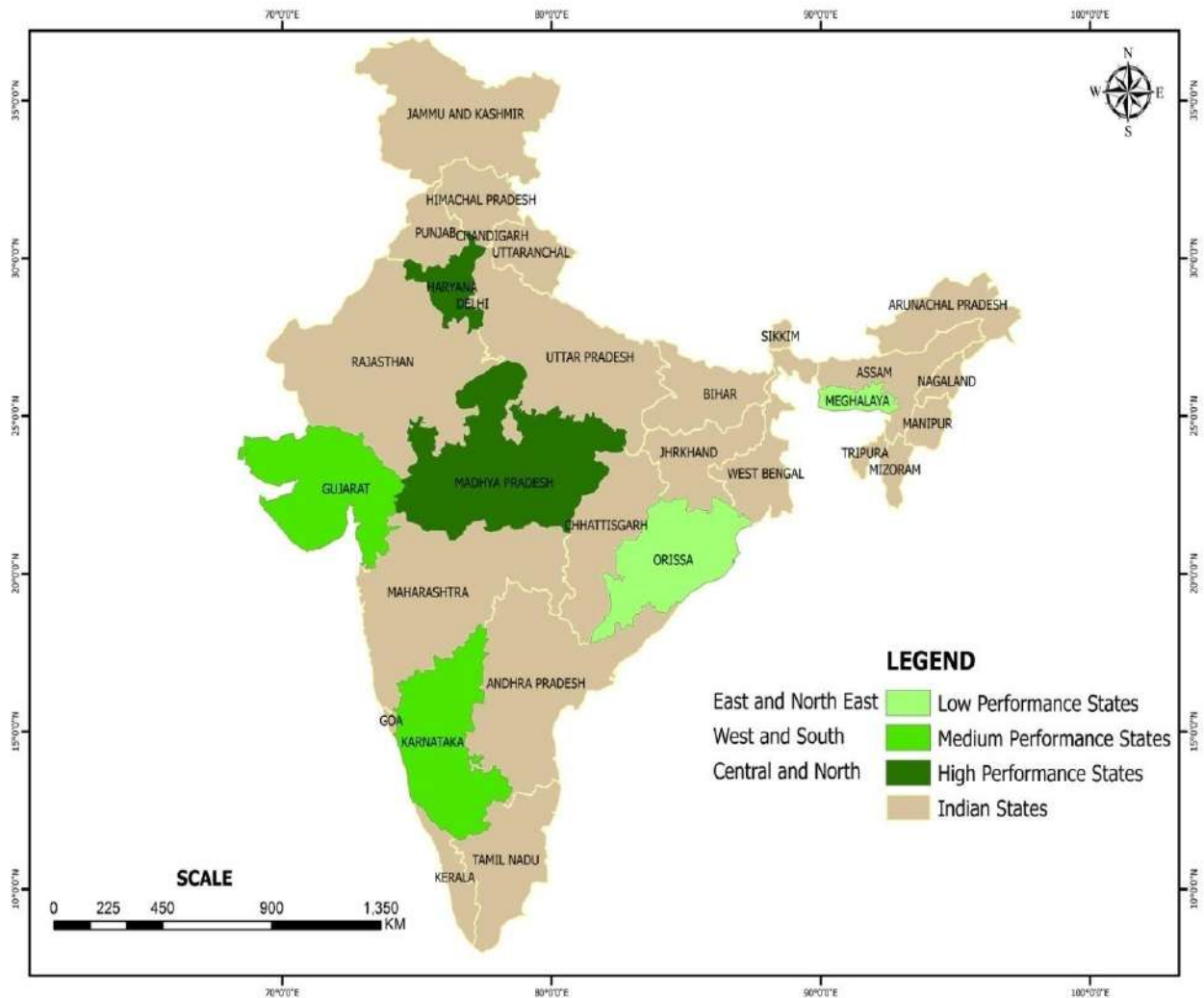


Figure 2.1: Selected States

1.4. Structure of the Report

As the study is based on the exploratory Case Study Method, the Chapters of the report are given in the following manner:

Chapter I – Introduction

Chapter II – Reviews and Methodology

Chapter III – Performance Evaluation of GBY

Chapter IV – Summary, Conclusion and Recommendations

Chapter V – Case Studies

References

III. PERFORMANCE EVALUATION OF GBY

The Government of India has introduced ‘Gramin Bhandaran Yojana (GBY), a capital investment subsidy Scheme for construction/ Renovation/ Expansion of Rural Godowns across the country and the main objectives of the scheme were a) Reduction of loss in quantity and quality and b) Creation of scientific storage capacity and thus prevention of distress sale.

An attempt is made through the study to understand the extent of success that RGS has achieved in reduction of losses in quantity of foodgrains from the year 2009-10 onwards, and the results are presented in Table 3.1. The results are worked out by taking into consideration of the storage space created under RGS (since inception) as a function to the India’s foodgrain production capacity of the country (from 2009-10 onwards) are compared with the average marketable surplus (72.58%) and reduction in post-harvest-losses (@2.43%). It is very encouraging to observe that the RGS has successfully saved a significant quantity of foodgrains from post-harvest losses to an extent of 15.52 LMT to 20.30 LMTs per annum. In monetary terms, the value of foodgrain saved through RGS from post-harvest losses amounts to approximately Rs.80 crores to Rs.366 crores per annum as per the average MSP (2018-19) of rice and wheat.

Table 3.1: Contribution of RGS to protection of Foodgrains at All India Level

(in 000’ tons)

Sl. No.	Year	All India Foodgrains production	Marketable Surplus* for @ 72.58% under no scientific storage case	Business as Usual case of Post-harvest losses@ 2.43%	Under scientific Storage (capacity as function of production@ 40.35%)	Available foodgrains to PSHL	Post-harvest losses** @2.43%	Food grains saved due to RGS
1	2009-10	218107	158302	3847	63875	94427	2295	1552
2	2010-11	244482	177445	4312	71599	105846	2572	1740
3	2011-12	259286	188190	4573	75935	112255	2728	1845
4	2012-13	257135	186629	4535	75305	111324	2705	1830
5	2013-14	265045	192370	4675	77621	114749	2788	1886
6	2014-15	252023	182918	4445	73808	109111	2651	1794
7	2015-16	251566	182587	4437	73674	108913	2647	1790
8	2016-17	275111	199676	4852	80569	119106	2894	1958
9	2017-18	285014	206863	5027	83469	123394	2998	2028
10	2018-19	285210	207005	5030	83527	123479	3001	2030

Source: * Kannan, E. (2014); **Jha et.al., (2015)

Although the study followed an exploratory case study method for evaluating the status and performance of the Rural Godowns Scheme or Gramin Bandaran Yojana, the report was prepared in such a way to understand the overall performance at the all India level followed by the Case studies. To explain various performance scenarios of the GBY implementation, the selected sample states were classified into three main categories such as;

3.1 High-Performance States (HPS)

3.2 Medium Performance States (MPS) and

3.3 Low Performance States (LPS)

These performance groups were made on the basis of the capacity of storage space created under the GBY since the inception of the programme (**Table 3.1**). It reveals from the table that the highest capacity of godowns were created in Madhya Pradesh (106 LMT) and Haryana (66 LMT) and hence are belonged to the category of HPS. Whereas, in the case of Gujarat and Karnataka, the capacity of storage created ranges between 38 LMT to 45 LMT, respectively and are considered under the category of MPS. In respect of Odisha and Meghalaya, the capacity of storage created under GBY is less than 10 LMT, which represents the LPS.

Table 3.1: Distribution of rural godowns in selected States of India

Sl. No.	States*		Number of godowns	Capacity Created (LMT)
1	HPS	Madhya Pradesh	3828	106.3
2		Haryana	2017	65.57
3	MPS	Karnataka	4508	37.88
4		Gujarat	11663	44.72
5	LPS	Odisha	691	10.09
6		Meghalaya	16	0.21

Note: *HPS – High Performing States; MPS – Medium Performing States; and LPS – Low Performing States;

Source: DMI

Accordingly, the States and districts were selected for the representation of different performance scenarios across the country. In this Chapter, an effort was made to explain different scenarios and the performance of the GBY in these categories.

3.1. High-Performance States

Specific observations and characteristics of the high-performing states are explained as follows:

3.1.1. Surplus Production States

These states are agriculturally prosperous having a better irrigation facility either from the canals or borewells covered in more than one districts of the state. The states are known for a major agricultural crop/s production in the country. Accordingly, both the Madhya Pradesh and Haryana are a major foodgrains producing states in the country and their contribution to the Central Pool is much higher among all other States.

3.1.2. Higher demand for Godowns

As stated earlier, these states are the major producers of foodgrains in the country and the Government of India has been procuring or directly involved in purchasing of foodgrains primarily for the Central Pool through FCI. Although there are many numbers of godowns and the storage space created was high, still there is an increased demand for the storage space because of the increased procurement from the government agencies from the pre-registered farmers without a quantitative restriction. Looking into the storage space created under the GBY, the present storage space is able to occupy 57 per cent of the foodgrain production in the Haryana state whereas it is 42 per cent as regard to Madhya Pradesh, which shows the existing demand for godowns in the States.

Moreover, in the case of Haryana, a majority of the godowns were constructed under the PEG Scheme of the Government of India under PPP mode, through private entrepreneurs. The PEG scheme is also converged with GBY for the sake of subsidy component. Under the scheme, FCI gives a rental guarantee of 10 years to private investors and 9 years to CWC/ SWC/ State Agencies through Tri-Party Agreement. Whereas in the case of Madhya Pradesh, the State Agencies have made an arrangement with the GBY beneficiaries for a three-year lease agreement for effective utilization of the godowns for storing the produce procured for the Central Pool. As a majority of the beneficiaries are private entrepreneurs or businessmen and there is an assurance of utilization of godowns for a specified period, there is an increased demand for godowns in these states.

None of the beneficiaries have utilized these godowns to store their own produce. Almost all the farmers and the beneficiaries were selling at the rate of MSP to the Government Procurement only and hence are losing an opportunity cost of availing better prices in the lean period by avoiding sales at MSP. The farmers in these states were satisfied to sell their produce at the MSP and are not thinking of market prices.

3.1.3. Higher Average Unit Capacity

The average storage unit capacities created in these states was much higher. For instance, the average capacity of storage godowns was worked out to be 2776 MT in the case of Madhya Pradesh and 3251 MT in respect of Haryana. The smaller godowns were negligible in these States.

3.1.4. NABARD is a major financing Agency under GBY

Under GBY, NABARD and NCDC were the two major financing agencies involved in channelizing the subsidy which is linked to the institutional credit from the financial institutions refinanced by the NABARD. However, in the case of Haryana and Madhya Pradesh, a majority (>90%) of the subsidies under GBY were released through the NABARD only. Projects promoted by the NCDC were limited to the Cooperatives to a meagre extent.

3.1.5. Hampering National System of Warehouse Receipts

Because of the Government procurement, no one thinking of availing the benefits of Pledge Loan provisions. As soon as the harvest is over, the farmers thinking of bringing their produce directly to the Procurement Centers to sell at MSP as per the FAQ standards. They are not aware of the scheme as such and do not know about the advantages of storing the produce in the scientific godowns during peak period and selling in the lean period at a remunerative price. Hence, the question of Pledging never raised in these states.

3.1.6. Very high capital costs preventing major chunk of community from participation

Because of the high cost of construction of the godowns, a majority of the small and marginal farmers and the SC/STs participation seems to be negligible in these states. As the preference of the procurement agencies is towards the larger size godowns, there is no demand for smaller godowns and hence, it is away from the reach for the other sections of the societies except businessmen / an entrepreneur / a large farmer. Even the bankers were much interested in their repayment capacity rather than the project proposals. Hence, there is a need for an inclusive approach in these states. The states may encourage and prioritize the group of farmers through the association or FPOs with a better incentive mechanism.

3.1.7. Shift away from Brick and Mortar to Silos

Due to the increased demand for godowns in the States, a majority of the private entrepreneurs have started thinking and coming up with a Silo structures for storing of grains especially in the case of Haryana. Although, these structures have better advantages than the normal godowns, the cost of constructions will be much higher and it is possible only through the private entrepreneurs. Encouraging such a business may hamper and deter the participation of the farming community in these States.

3.1.8. Increased inflow of private investment in post-harvest management

One of the important aspects of the scheme is that it has brought a private investment to the tune of Rs. 2225 crores in the case of Madhya Pradesh and Rs. 1476 crores in respect of Haryana to the post-harvest management – a sub sector of agriculture, since the inception of the program. Thereby, it has helped the sector to increase directly in the form of increasing food security, prevention of post-harvest losses and generated employment opportunities in the rural areas of the State/s.

3.1.9. Utilization of the godowns

The capacity utilization of the godowns in these states were to the extent of more than 90 per cent mainly because of the government procurement of foodgrains for the Central Pool by the

FCI and its associates. None of the beneficiaries have stored their produce for the market, entire godowns were either hired or leased out for those purposes.

3.2. Medium Performance States (MPS)

Important observations and characteristics of the medium performance States are explained herewith as follows:

3.2.1. States with a moderate post-harvest infrastructure

These states are moderate in terms of GBY/RGS implementation. In these states, a certain part of the State is equipped with the better irrigation facilities through different sources such as canals and borewells. Karnataka and Gujarat were representative states under this scenario. In term of agricultural production, both the states are highly diversified in terms of cropping pattern. The major crops in the state of Karnataka are paddy, tur, coffee, grapes, and sugarcane. Similarly, Gujarat is known for tobacco, cotton, groundnut, castor and minor millets. The nature of the crop production in Gujarat indicates that there is a moderate marketable surplus, unlike wheat and paddy in other states. Hence, the creation of the godowns under the GBY is moderate. Whereas, in the case of Karnataka, Raichur has a better canal irrigation facility and hence, paddy was a major crop grown more than one season in the district, while Kalaburagi was famous for tur dal (red gram) popularly known as tur bowl of the country, which is mainly grown in the kharif season. Hence, a majority of the godowns were constructed under GBY were distributed in these districts only.

3.2.2. Moderate demand for godowns

As discussed earlier, the marketable surplus in these states are moderate due to the nature of the crops grown. Hence, there is a moderate demand for godowns in both the Karnataka as well as Gujarat. More interestingly, the number of godowns appears to be more in these states, but the size of the godowns were small at the aggregate (<1000 MT). This indicates the demand driven nature of distribution of godowns in these States. As regard to Karnataka, a slightly higher demand is seen in the districts of Raichur and Kalburgi as the districts are famous for paddy and tur, respectively. Similarly, Ahmadabad, Gandhinagar, Banaskantha, Sabarkantha and Mehsana boast of the largest developed irrigation potential in respect of Gujarat and hence, a majority of

the godowns are distributed in these districts. One of the key features of the godown utilization in these areas is that the majority of the beneficiaries have used these godowns to store their own agricultural products such as crops, feed and fodders, inputs, equipment etc. Only in the case of Raichur and Kalaburagidistricts in Karnataka, it is noticed that the godowns were hired /leased out with a specified period and amount.

3.2.3. Lesser Average capacity of the Godowns

The average capacity of the godowns constructed under GBY in these states was lesser in size. However, the per unit capacity of the godowns in the case of Karnataka works out to be 840 MT and Gujarat is 383 MT. These godowns distribution is higher in the foodgrains (either rice or wheat) belt areas. It is observed that the total storage space created under GBY could able to accommodate 41 and 31 per cent of the foodgrain produced in a year in relation to Karnataka and Gujarat states, respectively.

3.2.4. Negligible Government Intervention in Procurement

The government intervention in foodgrain procurement for the Central Pool is negligible in these States and this might be one of the reasons for smaller nature of the godowns in these areas. In the case of Karnataka, only a limited quantity of tur (red gram) is purchased at MSP under the Price Support System (PSS) with the involvement of State Government is noticed in respect of Kalburgi district. Procurement of these commodities, are undertaken directly from pre-registered farmers within a stipulated period and conforming to the prescribed FAQ norms by the Central Nodal Agencies through the State level agencies at MSP announced by the government as and when prices fall below the MSP.

3.2.5. NABARD is a major financing Agency under GBY

As noticed in the case of High Performing States, a majority (>90%) of the subsidies under GBY were released through the NABARD only in the case of Gujarat and Karnataka. However, projects promoted by the NCDC were limited to the Cooperatives in the horticultural dominant areas in Karnataka especially for the produce like Arecanut and Coffee. A majority of the NCDC godowns were constructed by the Cooperatives were utilized for Agricultural input distribution such as fertilizers, chemicals and other PDS items.

3.2.6. Higher participation of farmers and weaker sections as beneficiaries

It is worth to mention here that although the RGS was meant for the farming community, the participation was negligible in other two scenarios. Whereas, in the case of MPS, about 26 per cent and 22 per cent of the beneficiaries in respect of Gujarat and Karnataka were belonged to the category of farmers, and about 43 per cent and 11 per cent of the beneficiaries availed subsidy under the category of SC/STs and women.

3.2.7. Ineffective National System of Warehouse Receipts

The minimum capacity of the godowns to register under the WDRA is 1000MT and the criteria prescribed by the WDRA were found to be difficult to meet by the majority godowns constructed under GBY/ RGS. Hence, a majority were unable to get the benefits of NSWs. Moreover, banks or financial institutions have not come forward to provide Pledge Loans for the produce retained under these godowns because of their bitter experiences in one or the other cases as expressed by them. More importantly, a majority of the beneficiaries were not aware of the facilities of pledge loan in these sample areas. Hence, there is a need to educate the beneficiaries of the godowns and streamline the WDRA guidelines to suit to the needs of the GBY beneficiaries for effective implementation of the NSWs.

3.2.8. Very high capital costs preventing the small and marginal farmers as well as women and SC/STs

The high cost of construction of the godowns, a majority of the small and marginal farmers and the SC/STs participation seems to be one of the major reasons for lower participation in these states. This might be a reason for not going for higher capacities godowns in these areas. Besides this, the bankers were much interested in their repayment capacity rather than the project proposals.

3.2.9. Increased inflow of private investment in post-harvest management

One of the important aspects of the scheme is that it has brought a private investment to the tune of Rs. 1016 crores in the case of Gujarat and Rs. 736 crores in respect of Karnataka to the post-harvest management - a sub sector of agriculture, since the inception of the program. Thereby, it

has helped the sector to increase directly in the form of increasing food security, prevention of post-harvest losses and generated employment opportunities in the rural areas of the State/s.

3.2.10. Capacity Utilization of the Godowns were moderate

The capacity utilization of the godowns were to the tune of optimal level, mostly used for their own purposes to store either the agricultural produce, feed and fodders, and inputs. In the case of Karnataka, Raichur and Kalaburagi districts have utilized these godowns to store government procured tur dal (red gram). Since, Raichur is predominant with paddy, a majority of the farmers and traders have stored paddy in these godowns. Rest of the places, it is noticed that the beneficiaries have stored coconut, arecanut and other agricultural produces.

3.2.11. Adherence to Quality Control Measures in Godowns

Average capacity of godown is less than 1000 MT and most of them were owned and managed by themselves. Further, these godowns were used primarily for storing their own produce and to some extent from their friends / relatives with or without formal rental agreements. Moreover, the average duration of the storage was less than six months, it was observed that the quality adherence was relaxed and norms prescribed by the FCI or other agencies were not followed by these private owners. Most of the owners have not maintained any sort of records pertaining to utilization of the storage capacity created. It was found out during the field work that before storing the kharif paddy, the godowns were cleaned mandatorily. Later, the preventing measures were depending upon the quality of produce stored.

Since there is no government procurement of foodgrains in these states, an effort was made to understand the reasons for not storing the produce in the godowns instead of selling immediately after the harvest and the reasons are illustrated as follows:

- a. Uncertainty of better prices in the later period of time.
- b. Storage involves the additional burden of costs such as storage cost, bagging, cleaning, loading/ unloading charges, wastages/ shrinkages etc.
- c. Non-availability of pledge loans.
- d. Change in cropping pattern as the people started cultivating more of commercial (Plantation crops) or cash crops (Vegetables) than the field crops.

- e. Due to a lack of skills and management of godowns (by the owners themselves), rise in quality control issues.

3.3. Low Performance States (LPS)

Important observations related to the low performing states and their characteristics are detailed below:

3.3.1. States with a lower agricultural production and post-harvest infrastructure

These states include Odisha and Meghalaya and are belonged to East and North-East regions of the country. Although, agriculture is a chief occupation in these States, their contribution to the national economy is lower. Similarly, the development in post-harvest infrastructure creation is much lower as compared to other two scenarios discussed above. Rice is a predominant crop in Odisha followed by pulses, oilseeds, jute, roselle, sugarcane and coconut, while Meghalaya has significant forestry industry, but the important crops being potatoes, rice, maize, pineapples, bananas, papayas and spices. Excepting paddy in respect of Odisha, all other crops in these states were had a lower marketable surplus.

3.3.2. Lower demand for godowns

There is a lower demand for the godowns in these areas due to lower marketable surplus. It is also clear from the distribution of godowns under GBY that only 691 godowns were built up in the case of Odisha and eight in respect of Meghalaya as on 31st March 2019. The other important feature of the godowns created under GBY in these areas reflects a varying demand for godowns across states. More than half of the godowns constructed under Odisha are scattered around the rice belt areas of the state. There is no demand from other areas as reported by the implementing agencies. As a function of production, the existing godowns capacities could able to cater less than 28 per cent of the foodgrain produced in these states, which reflects the existing demand for the godowns.

3.3.3. Per unit Capacity of the Godowns were larger in size, but restricted to a few areas

It is one of the important features of the GBY distribution in these states that the average capacity of the godowns constructed in these states was of more than 1000 MT. In particular, per unit capacity of the godowns in Odisha is 1460 MT as compared to Meghalaya (1313 MT). However, a majority of these godowns were found only in the rice belt areas of Odisha, while a few godowns in the Ri-bhoi districts of Meghalaya.

3.3.4. NABARD is a major financing Agency under GBY

As noticed in the case of High Performing States, a majority (>90%) of the subsidies under GBY were released through the NABARD only in the case of Odisha and Meghalaya. However, the projects promoted by the NCDC were limited to the Cooperatives in the Odisha.

3.3.5. Negligible Government intervention in Procurement

There was a government intervention for paddy in the case of Odisha and most of the godowns constructed under GBY were utilized for the same purpose. The paddy was procured by the Primary Agricultural Cooperative Societies (PACS) at the rate of MSP from the pre-registered members. Since a majority of the beneficiaries are the millers, they were storing both the paddy and the milled rice for the Central Pool. As regard to Meghalaya, there was no such procurement from the Government.

3.3.6. Very high capital costs preventing the small and marginal farmers as well as women

The high cost of construction of the godowns especially in the case of north eastern region is a big challenge for the beneficiaries. Hence, a majority of the small and marginal farmers and women participation seems to be negligible in these areas.

3.3.7. Ineffective National System of Warehouse Receipts

The major reasons for the ineffective NSWRS in the lower performing states such as;

- a. Because of the government procurement of paddy in the Odisha state, there was no question of utilization of NSWRs raised for the beneficiaries.
- b. Millers in Odisha cannot access Pledge Loan as paddy is under dynamic rotation.
- c. Although the procurement was completely absent in Meghalaya, the NSWRs was ineffective due to lesser awareness among the beneficiaries and inattention of the bankers.

There is a need to educate the beneficiaries of the godowns and streamline the WDRA guidelines to suit to the needs of the GBY beneficiaries for effective implementation of the NSWRs.

3.3.8. Nominal adherence of the quality control practices

The godowns hired for the purpose of government procurement for a limited period are managed by the outsourced parties appointed by the government agencies and hence are managed scientifically. Whereas in the case of godowns owned by the beneficiaries are taken care by the owners manually and hence, there will be a nominal adherence of the quality control practices in such godowns.

3.3.9. Increased inflow of private investment in post-harvest management

The scheme has brought a private investment to the tune of Rs. 161 crores in the case of Odisha and about Rs. 7.50 crores in respect of Meghalaya to the post-harvest management – a sub sector of agriculture, since the inception of the program. Thereby, it has helped the sector to increase directly in the form of increasing food security, prevention of post-harvest losses and generated employment opportunities in the rural areas of the State/s.

3.3.10. Capacity Utilization of the Godowns were moderate

The capacity utilization of the godowns were to the tune of sub-optimal level in the case of Odisha and are mostly used to store the procured paddy under government intervention for a short-term period of 4-6 months. As regard to Meghalaya, the smaller godowns were used to keep Non-Timber Forest Produces (NTFPs). There is a need for improving the capacity utilization of godowns through innovative ways.

3.4. Overall Performance of the GBY

The overall performances of the godowns are illustrated as follows:

3.4.1. Extent of coverage and capacity utilization of the godowns

Based on the different performance scenarios across the country, it is noticed that the storage capacity created under the GBY was highest in the case of High Performing States (HPS), followed by the Medium Performing States (MPS) and the Low Performing States (LPS). Whereasthe number of godowns was highest in respect of MPS, followed by HPS and LPS. This reflects that, the per unit capacity created was highest in the case of HPS, subsequently to LPS and MPS. The results indicate that the distribution of godowns is on the demand driven basis across the country. Among the major financing agencies, NABARD found to be a main financial agency through which the subsidy was channelized through a credit linked loans from the financial institutions refinanced by the NABARD.NCDC has focused more on cooperative institutions like PACS.

Regarding the capacity utilization of the godowns, the higher capacity utilization was noticed in the states, where there was a government intervention in procurement of foodgrains for the Central Pool as compared to the rest of the places. There were two types of agreements were observed with respect to the time period of utilization of the godowns. Accordingly, the godowns were taken on lease for a period of ten to nine years in the case of Haryana under PEG Scheme amalgamated with GBY. Three years of guarantee in respect of Madhya Pradesh, Karnataka (for tur crop only)and Odisha (for paddy only) by the State Procurement Agencies. In the absence of government procurement, a majority of the beneficiaries have utilized the godowns to an extent for their own usage or hiring to other users. Consequently, the godowns were classified on the basis of utilization for less than six months and more than six months in the analysis. As revealed by the more than 50 per cent of the beneficiaries, the godowns were utilized for more than six months in the case of Madhya Pradesh, Odisha and Meghalaya states, while it was 100 per cent in relation to Haryana. On the other hand, a less than six months usage of the godowns were reported by more than 50 per cent of the farmers from Madhya Pradesh, Karnataka, Gujarat, and Meghalaya. Because of non-availability of the usage details, godowns were also categorised into sub-optimal utilization, optimal utilization, and low utilization in some of the states.

3.4.2. Constraints in Implementation of the GBY

Although the implementation of the scheme of GBY has registered a significant success, it has been observed during the field work that there were some constraints which have negatively influenced the success of the program. For better presentation of the results, the constraints were categorized into the performance scenarios. In the case of HPS, lack of assistance from local administration was a major problem as expressed by a majority of the beneficiaries, followed by requirement of a large capital, non-availability of pledge loan facility, and lack of awareness. With regard to MPS, Non-availability of pledge loan facility was a prime constraint, followed by lack of assistance from local administration, non-availability of skilled manpower, lack of awareness and requirement of a large capital on the basis of their order of merit. As regard to LPS, lack of title deeds/ land ownership documents (specially in North-eastern States), non-availability of pledge loan facility, lack of demand from the users, requirement of a large capital, lack of assistance from local administration were the major constraints as expressed by a large proportion of beneficiaries. The important constraints are explained in detail as follows:

3.4.2.1. Lack of information from the local administration

As discussed in the constraints, a majority of the farmers expressed that there is a lack of information from the local administration related to the post-harvest management, storage management, pest-diseases control measures, marketing information, and availability of pledge loan facilities from the local administration such as Department of Agriculture, Horticulture, FCI, DMI, NABARD, Banks etc., as they are the major threats for the successful implementation of the GBY.

3.4.2.2. Requirement of a high capital investment

It is observed during filed survey that a large proportion of the beneficiaries under GBY was captured by the businessmen, traders, and large farmers due to a high capital cost. Therefore, it is a biggest challenge for the small and marginal farmers, SC/ST farmers, and women to arrange 20 per cent of the project cost as a margin money and the initial investment, which is prohibitively high and has prevented them from considering the construction of godowns under GBY. Moreover, the bankers give a priority to the repayment capacity of the proponent rather than the demand for godowns in almost all States.

3.4.2.3. Lack of awareness about the scheme

In the State of Karnataka, though the DMI and NABARD have conducted awareness campaigns and programs for the officers of regional financial institutions/ banks, the programme was unable to reach the masses in many parts of the rural areas of all the states. It is also found that a majority of the beneficiaries have come to know about the scheme through the Government Officials of APMCs, Print Media and the Banks, which were away from the reach of the farming community in almost all the States excepting a few States in HPS. Hence, there is a need for creating awareness about the scheme on the farming community.

3.4.2.4. Lack of demand

Due to the limited size of land holdings and operation size, a large portion of the farmers in MPS and LPS fall into the category of small and medium, with an operational land size below one hectare and hence their income will be just enough to subsistence, moreover their sources of income is at the end of a season. With no significant means of income in between, farmer is forced to take loans for agricultural and non-agricultural purposes. End of the season, he is under pressure to repay the loans as soon as the harvest is done during glut period. This attitude has resulted in sub-optimal demand for storage space in these states, which can be addressed through educating the farmers on the benefits of scientific storage, formation of FPOs and smoothening the guidelines of WDRA for the NSWRS for immediate financial requirements.

3.4.2.5. Non-availability of skilled manpower and poor management of godowns

The scientific godowns should be managed properly to reduce the post-harvest losses during storage. However, farmers were not educated and there is no either capacity building activities nor skilled manpower for the management of godowns as observed in almost all the states during field survey. Although, the high-performing States such as Madhya Pradesh and Haryana, have a third-party arrangement for a better management of the rural godowns, the majority farmers not aware of these quality control measures.

3.4.2.6. Lack of Title Deeds/Land ownership documents

It is a major issue across all the states in NER. The government administered revenue system operates only in the plains and valleys of Assam, a portion of Tripura and Manipur. On the other hand, Village level Customary Land Tenure System operates in hilly states of Arunachal Pradesh, Meghalaya, Mizoram, Nagaland and in hilly Parts of Assam, Manipur and Tripura. In all the six states of NER, there is no patta land, which can serve the purpose of collateral against bank loans. Land ownership documents provided by the local village council are not acceptable to the banks as guarantee.

3.4.2.7. Absence of awareness on pledge loan

The major constraint observed during the survey that a large proportion of beneficiaries were not aware of the pledge loan facilities for retailing their produce in the godowns and availing the benefit of pledge loan due to non-registration of the godowns under WDRA and smaller size of the godowns.

3.5. Extent of participation of beneficiaries

As regard to participation of the beneficiaries under GBY, a majority of the beneficiaries (>67 per cent in respect of Madhya Pradesh, Haryana, Karnataka and Odisha) availed subsidy under the category of individuals, which include the persons other than the farmers such as businessmen, farmer-trader, entrepreneurs etc., and are eligible for 15 per cent of the subsidy; a less than 25 per cent have availed the subsidy in the category of farmers in the case of Karnataka, Gujarat, Odisha and Meghalaya, and none of the farmers in respect of Madhya Pradesh and Haryana. However, about 40 to 50 per cent of the beneficiaries utilized the GBY through SC/ST and Women quota with a 33 per cent rate of subsidy in the States like Haryana, Gujarat and Meghalaya, still the proportion was less than 20 per cent in relation to Madhya Pradesh, Karnataka and Odisha.

3.6. Further course of actions required in the following

- **The main objectives of the scheme include the creation of scientific storage capacity with allied facilities in rural areas to meet the requirements of farmers for storing farm produce, processed farm produce and agricultural inputs-** Excepting the states where there was a government intervention of foodgrain procurement, it is noticed that a larger proportion of smaller godowns were utilized these godowns for themselves to store agricultural produces and inputs. Only in the case of Karnataka, coconut was stored for a value addition purpose (to extract dry copra, coconut oils etc.) rather than selling immediately after the harvest. In the case of Meghalaya, godowns were used to store the NTFPs like bay leaf and broom sticks, collected from neighbour villages but sold them once the prices are favourable in the market.
- **Promotion of grading, standardization and quality control of agricultural produce to improve their marketability** - It is very clear from the study that there were no such activities found across the states. There is a need for promotions of such value chain activities instead of storing the produce and selling in the later period.
- **Prevention of distress sale immediately after harvest by providing the facility of pledge financing and marketing credit** –Although the objective of the scheme was appreciative, the practical issues needs to be resolved to implement it successfully, such as relaxation of the criteria prescribed by the WDRA for godowns established under GBY and creation of awareness among the beneficiaries as well as farming community. The facility was not at all found suitable for the places where there was a government procurement of foodgrains for the Central Pool. However, awareness on this facility was nil among a main user of the scheme.
- **To reverse the declining trend of investment in the agriculture sector by private/cooperative sectors to invest in the creation of storage infrastructure in the country** - GBY Scheme has led to a creation of storage space to the tune of 655LMT across the country and brought about Rs. 11831 crores private investment into the sub sector - post-harvest management of the agricultural sector in the country. This reflects the good trend in improving the storage infrastructure by the private and cooperative sector, which needs to be continued to reduce the post-harvest losses in Indian agriculture.
- **To develop marketing infrastructure to effectively handle and manage marketable surpluses of agricultural and allied produce including horticulture livestock, poultry, fishery, bamboo, minor forest produce and such like produce supportive to enhance**

farmers' income - There is a huge potential for making significant increase in the household income levels by harnessing the marketable surpluses of agricultural and allied sectors through formation of SHG or FPO to involve more and more small and marginal farmers, SC/STS and women participants under the scheme. The revised scheme, as described in above sections, can play very significant role.

3.7. Recommendations

3.7.1. General Recommendations

- 1. Increase farmer's participation in the scheme:** Average storage capacity of godowns in MPS were <1000 MT and the distribution of these godowns indicates that they are well distributed in agriculturally prosperous regions of the state/s. Regarding the usage of godowns, it is limited to a few farmers, while most of the farmers tend to sell the produce to meet the pressing demand for money. Hence, it is recommended that the extensive awareness programs to be organized about the advantages of arresting immediate sale (distress sale) by storing in the godowns and the facility of pledge loan to enhance the farmers participation in the RGS scheme by the implementing agency DMI.
- 2. Database on storage capacity:** GBY is one among the numerous schemes of the Government that aim at creation of storage space for the agricultural produce in the country. As there are multiple agencies involved, there is a need for comprehensive integration of storage space available at all levels (till Gram Panchayat) to facilitate effective and efficient planning and execution of foodgrains and input storage across the country. The Ministry of Agriculture, Government of India (MoA, GOI), may initiate the process of building such database.
- 3. Improve the participation of Women/SC/ST and Small and Marginal Farmers in the scheme:** In spite of providing an additional quantum of subsidies to the women/SC/STs, their participation still remained far from the satisfactory level. Similar is the case with the small and marginal farmers across the country. Hence, three-pronged strategy is recommended to encourage their participation viz., a) Suitable awareness programme should be developed by the CCSNIAM to sensitize about the RGS. b) To offset the higher costs of creation of godowns (Rs. 25 lakhs for 500MT godowns), the Ministry of agriculture should increase the incentives such as higher rate of subsidy and

lower rate of interest. c) Since godown construction is a costly affair to the individuals, the focus should be given to the group or associations of farmers.

4. **The Interest Subvention Scheme** is being implemented by NABARD and RBI, aims at providing short term credit to the farmers at subsidised interest rate. The policy came into force with effect from Kharif 2006-07. Interest subvention for post-harvest loans was introduced as a measure to check distress sale, post-harvest loans for storage in accredited warehouses against Negotiable Warehouse Receipts (NWRs) are available for up to six months for KCC holding small & marginal farmers. This scheme aims to give relief to the small and marginal farmers for their prompt repayment of crop loans, and who have availed pledge loan at nine per cent for the produce, the Central Government has approved an interest subvention of two per cent i.e. an effective interest rate of seven per cent for loans up to six months. However, indirect interactions with different stakeholders of RGS across six states in the country, no instance of farmer or owner of Godown availed the benefit under this provision. Under such circumstances, the GoI should ensure that the scheme is implemented flawlessly by suitable modifications/ adaptations at various stakeholders of RGS. At the same time, CCS NIAM should organize Training the Trainers (ToT) programs to the concerned departments for effective operationalization of the scheme.
5. **WDRA accreditation and availing Negotiable Warehousing Receipts:** By maintaining the prescribed quality standards in the rural godowns, it is easier to get WDRA Accreditation and availing NSWRS. Hence, CCS NIAM, need to develop a knowledge module focussing on the beneficiaries of RGS.
6. **One Village, One Godown:** It is recommended to develop the multi-purpose godowns in every village, throughout the country, to realize the concept of 'One Village, One Godown' mainly to harvest an opportunity of temporary storage done by the farmers during the harvesting season.
7. **Development of SOPs for temporary storage space:** Traditionally, Indian farmers used to store the produce temporarily at home. Though this practice is declined, there is a significant space is available within the villages. However, a Standard Operating Procedures (SOPs) should be developed to identify and use such space for the temporary storage.
8. **Creation of 'Online Platform' for the effective usage of rural godowns:** To facilitate effective functioning of online platforms such as 'Apna Godam', the DMI should

facilitate to develop a dynamic software application of storage space, to enable all the stakeholders for effective utilization of the same.

9. Need to facilitate FPOs: Farmer producer Organizations (FPOs), were formed by the group of farm producers for the purpose of farm or non-farm activities. A majority of the farmers in these groups belonged to the marginal and small farmers categories. Although, they have been formed and functioning, the weaker financial conditions of these groups, they are unable to create the required infrastructure. But they have been experiencing the benefits of economies of scale through their operations. It is also found during our survey that the involvement of FPO and subsequently higher benefits were observed in two categories of states, viz., Gulburga district in respect of Karnataka, (Medium performance) and Kalahandi district in the state of Odisha (Low Performance states). In the case of Gulburga district, an FPO, which used to procure foodgrains from its members and non-members of the villagers during the harvest period at a prevailing rate of APMC, and stored in a godown, hired on rent. After a reasonable price appreciation, it has disposed the foodgrains. Since, the storage space is essential for both storing foodgrains as well as crop inputs, the FPO has decided to construct a godown to suit its requirement. In this direction, it had purchased a required land as well, and is currently in the process of mobilizing the required capital for the construction of the godown. As regard to FPO in Kalahandi district of Odisha, paddy is procured at MSP rates by the State agencies at a limited quantity. Hence, the FPO started procuring only Grade A paddy from its members and used to store it in rented godowns. After a while, the FPO used to sell the produce at reasonable appreciation. However, during the recent FENI cyclone, the godown used to hire by the FPO was seriously damaged, and hence, they are in search for a suitable godown. They want to construct a godown for itself, but was incapable due to current financial situation. But over the years, the members have assured that they will construct. As scientific godown is a costly affair to the individuals and the groups, **the Government and the Financial Institutions like NABARD, NCDC should facilitate and support the FPOs rather than individuals.**

10. Utilization of godowns for the purposes of Model Agriculture Produce and Livestock Marketing Act, 2017 (APLM ACT) -The godowns have been used by the beneficiaries to store feed and fodders in the state of Gujarat. In Karnataka also, it has been observed that the space created under RGS, is used for livestock operations. However, with the new Model Agriculture Produce and Livestock Marketing Act, 2017

(APLM ACT), the godowns may also be utilized to facilitate the trading of livestock and their associated products, to enhance the competition.

11. Facilitating Centres for Contract Farming at the Village/ Gram Panchayat Level-

As per the provisions of Model Agriculture Produce and Livestock Contract Farming and Services (Promotion & Facilitation) Act, 2018, the places where the contract farming is successfully running, the rural godowns available in these areas can be used as a collection centers by storing the harvested produce temporarily, till the produce lifted by the companies, instead of storing them in a unscientific manner near the farm/ farmers houses.

3.7.2 Agency-wise recommendations

- 1) **WDRA:** The basic objective of the RGS was to encourage the farmer to procure Pledge loan, and thus avoid distress sale. The WDRA should take steps to enable the RGS godowns to register and avail pledge loan through NSWRS. Hence, WDRA should engage concerned institutions to evolve suitable measures to ensure ease of pledge loan for the farmers.
- 2) **DMI:** Being a nodal implementing agency, DMI can consider the following recommendations to make RGS more effective:
 - a. In association with MoA & FW, bring suitable changes in the guidelines to enable social integrations.
 - b. Making provisions in guidelines to permit groups such as Farmers Associations and FPOs, as eligible under RGS.
 - c. In association with NABARD, the financial institutions, ensure the timely completion of Joint Inspections and release of 2nd installment soon after, if eligible.
 - d. Work in tandem with WDRA to ensure that more RGS godowns are eligible for Pledge Loan.
 - e. In association with CCS NIAM, develop knowledge modules for sensitization and/or awareness programs for different stakeholders for better performance of RGS.
 - f. In association with SWCs, ensure that required storage space created and the minimum quantity of foodgrains to be kept under CAP method.
 - g. As the number of staff in each state is limited too small (two to three) and closed their offices in a few states for a temporary period (Ex: Meghalaya) due to inadequacy of the staff, to execute the multifarious tasks allocated them. Hence, RGS has received a least

attention. Therefore, it is recommended to enhance the manpower for effective implementation of the central schemes related to agricultural marketing.

3) Bankers: Success or failure of the program depends on the last mile connectivity of stakeholders, viz., bankers, beneficiaries, and farmers. Awareness programs should be conducted for the bankers to appreciate that the storage space is an essential requirement for the food security of the country than a farmer alone. Hence, the banker should ensure that there is an optimum level of implementation of the scheme. During the scrutiny of the applications, the banker should also consider the economic viability of the project, the scope for social integration in addition to the repayment capacity of the proponents.

4) Cooperative and Panchayat Raj institutions (PRIs) / Local Self Governance Institutions: These institutions have been given a responsibility of operationalization of the godowns in several districts. However, it was observed that most of these godowns under their control, were sub-optimally utilized. Therefore, there shall be an extensive training programs in line with the regional variations for different stakeholders of PRIs to ensure that these godowns were utilized optimally.

3.7.3. Specific Recommendations to High Performing States

- 1. Awareness programme on maintaining quality standards in godowns:** Checks and balances evolved by the FCI and State Warehousing Corporations during the course of time have ensured that the post-harvest management practices are adequate enough to secure the required quality of foodgrains stored in the godowns. There should be a suitable provision to store the foodgrains procured below the FAQ. There should be strict adherence to the quality standards in the case of the foodgrains kept under CAP. To maintain these quality standards in the rural godowns, DMI should increase the monitoring the frequencies suitably. Under these circumstances, as a complementary measure CCS NIAM should facilitate required awareness program to the concerned stakeholders across the HPS.
- 2. Encouraging Godowns for common usage:** The average storage capacity of godowns created under the GBY, in HPS are is more than 3000MT and every inch of the created storage space was on lease with FCI or other State Agencies, depriving the farmers an opportunity to store and sell at higher prices, later. Hence, creation of suitable storage capacities should be encouraged in these states.

3.7.4. Specific Recommendations to Medium Performing States (MPS)

1. **Awareness programme on benefits of retaining produce during glut period:** Each godown in these medium performance states presents a live instance of benefits of retaining the farm produce till glut period is over, after every harvest season. However, a majority of the farmers are unable to adopt this practice due to the immediate cash requirements on one hand and difficulties in securing pledge loans on the other hand. It is limiting the benefits of RGS to a few of the farmers. Under these circumstances, as a supplementary measure, CCS NIAM should facilitate required awareness program to the concerned stakeholders, viz., a) Owners of the godowns to equip themselves to be eligible for pledge loan from the financial institutions, b) financial institutions to ensure speedy disbursement of pledge loans, and c) farmers, particularly the small and marginal about the possibility of getting pledge loan.
2. **Value Addition and FPO:** The average storage area of godowns in MPS is less than 2000MT which is inadequate to accommodate even fifty per cent of the produce from that particular village. However, if a large capacity godowns are built, most of the space will be left underutilized during lean months. Therefore, a different strategy like value addition, establishing linkages with the organized retailers, consumers through FPO/ Associations etc., should be explored by the beneficiaries with the help of DMI. Such an approach would also help in progress towards increasing farmers household income.
3. **Social Integration:** As compared to HPS, the capital costs in MPS are lower for the construction of rural godowns. Hence, Sthree Shakthi (women SHGs) and other collective farmer groups should be encouraged to get involved in the construction of multi-chamber godowns, which in addition to storage, can also serve as nuclei for their operations.

3.7.5. Specific Recommendations to Low Performing States (LPS)

1. **Optimal Utilization:** It was observed that either of the two factors, viz., no surplus marketable produce or normal practice of selling off the entire marketable produce immediately after harvest, have resulted in low demand for the storage space, in-turn low performance of the rural godowns. North East States represent the first category, while Odisha belongs to the second. In the case of former group, the DMI should explore the economic feasibility of cold storages depending upon their cropping patterns. For the later, possibility of using the godowns as Rice Receiving Centers may yield multiple benefits.

2. **Value Addition:** States like Kerala, Goa and other NE States which represent LPS, a detailed study may be conducted to examine the value addition to farm produce using these storage space may enhance capacity utilization in these areas.

3.8. Summary and Conclusions

Post-harvest management plays an important role in the production and marketing as the considerable quantity of the valuable produce is lost every year due to improper post-harvest management. Therefore, crisis in food availability is not only caused by the natural disasters, but also by absolute lack of post-harvest management. Under this background, the introduction of GBY from the Government of India has a high relevance to the country, but also to the individual farmers. In this context, we have analysed the significance of GBY in six sample states such as Madhya Pradesh, Haryana, Gujarat, Karnataka, Odisha and Meghalaya. All these states supported the farmers to protect farm produce from the post-harvest losses and consequently to avoid distress sale and increase the food security of the country. The government procurement of foodgrain in a leading foodgrain producing states have really ensured the food security of the country in terms of procurement of paddy, wheat, and a few oilseeds and pulses to the Public Distribution System (PDS). In rest of the States, the godowns have helped to store the agricultural produce at least for a temporary period either by the beneficiaries of the scheme or by the traders and farmers. Thereby, it arrested the post-harvest losses to the country as a whole. A few of the farmers were also benefited by storing the produce for a limited period and selling at the market when prices improved. Smaller godowns constructed by the farmers were also used to store other than agricultural products such as feed and fodders, inputs and equipment.

In the context of inadequate economic viability of farmers to construct own godowns, our study examined the status and performance of GBY in the sample states. Based on the analysis of both primary, secondary data and field observations, the following summaries inferences were made:

- The distribution of godowns across states reflects the nature of the scheme is demand driven and hence, a majority of the godowns were concentrated in intensive agricultural areas within the states.
- The average size of the godowns constructed under the scheme works out to be around 1682 MT for the country. The higher size of the godowns was found in the MSP dominant states/

government procurement dominated states. The higher numbers and smaller godowns found in Gujarat where there is no procurement of foodgrain by the Government.

- The higher and longer capacity utilization of the godowns was noticed in the case of MSP dominant states as compared to the rest of the places. Based upon the interactions, it was noticed that the utilization of the godowns founds to suit the local demands and returns are realized at a normal profit.
- As regard to the participation of the beneficiaries in the program, other than farmers (business men, trader and entrepreneurs) participation found to be highest followed by the farmers and SC/ STs, and women.
- The limited participation of small and marginal farmers, SC/ST and women was hindered by the huge initial capital and mandatory margin money requirement under the scheme.
- Lack of assistance from local administration, requirement of a large capital, non-availability of pledge loan facility, lack of awareness and lack of demand by the users/farming community were the major constraints in implementation of the program as expressed a majority of the GBY beneficiaries.
- The scheme has brought bout Rs. 11831 crores private investment into the sub sector of agriculture - post-harvest management, which needs to be continued to reduce the post-harvest losses in the Indian agriculture.

To conclude, so far, the scheme has created a storage capacity to an extent of about 655 LMT which is sufficient to hold less than 40per cent of the annual foodgrain production in the country and definitely helped to reduce the post-harvest losses. However, in view of increasing population, and also the commitment of the states under National Food Security Act, measures have to be taken to enhance the storage availability across states. At the same time, through preferential subsidy approach, the participation of SC/STs and farmers associations like FPO/ FPCs may also be encouraged.

IV. CASE STUDIES

4.1. High Performance States

A. Madhya Pradesh

B. Haryana

4.2. Medium Performance States

C. Gujarat

D. Karnataka

4.3. Low Performance States

E. Meghalaya

F. Odisha

4.1. HIGH PERFORMANCE STATES

A. MADHYA PRADESH

A.1. Overview of Agriculture in Madhya Pradesh

Madhya Pradesh state is situated in the central region of the country and known as Heartland State of India. The state is surrounded by Uttar Pradesh in the North, Chhattisgarh in the East, Maharashtra in the South and Gujarat and Rajasthan in the West. Madhya Pradesh State is the second largest state by area and Sixth largest state by population in India. Agriculture is one of the main sources of the state economy and plays an important role by contributing immensely to the economy. Agriculture sector, provides employments to about 73 per cent of population which directly or indirectly depends on agriculture for their livelihood. There are 11 agro-climatic zones with variety of soil types and agro-climatic conditions, which largely support to cultivation of wide range of agricultural, horticultural and plantation crops with highly diversified cropping pattern in the state. Madhya Pradesh state has the largest reserves of diamond and copper in the country as it has rich sources of minerals. The Major perennial rivers of state namely, Narmada, Betwa, Chambal rivers originate in Madhya Pradesh and flow to the seven bordering states and receive major rainfall during July to September. The natural calamities such as drought flood and hailstorm are the major natural threats to the agriculture production in the state.

The varied Agro-Climatic zones with diverse soil and climatic condition, which support to cultivation of a wide range of crops with diversified cropping pattern, which resulted Madhya Pradesh state to stand in the top most position for food grain production and becoming self-sufficient in food grains for not only the state but also contributing to meet the needs of other states. The state contributes record production of leading crops such as, pulses, oilseed, cereals, garlic, sugarcane and coriander. Madhya Pradesh state also has highest cattle population in the country (animal censuses 2019).

Madhya Pradesh state has almost 40 per cent of area under organic farming of total agricultural land in India, which is due to highest number of cattle population and diversified cropping pattern, which not only helps to cultivate organic farming, but act as scoping mechanism for minimizing risk associated with dry land and rainfed agricultural crops. The diversified cropping

pattern and use of large-scale animal-based inputs, which improves the soil health and thereby facilitate in sustaining the inclusive growth of agricultural sector through sustainable development.

Madhya Pradesh achieved highest agricultural growth in the country about 18 per cent, per annum. In spite of the above developments, there are several challenges which need to be addressed for prolong growth and development of agriculture in general and small & marginal, economically weaker section of the society in particular. Out of total geographical area of 308 thousand sq, about 69 per cent of area is cultivated and rest 31% area is under forest cover with abundant natural resources. Favourable soil and climatic conditions help the state to be a leading producer of cereals, coarse cereals, pulses, oilseeds (soybean) and commercial crops in the country. In spite of that, risk and uncertainty in agricultural production and yield remain quite high. Since the rainfall amount is highly erratic and varies widely across different parts of the State and hailstorm and flood resulting in to clock and steady agricultural growth.

A.2. Performance and Challenges of Agriculture

Madhya Pradesh is an agrarian state. The primary sector accounts for 42.89 per cent of the state's GVA, as of 2017-18. It is among the fastest growing states in India. The state is rich in natural resources, agriculture, fuels, minerals and biodiversity. Upcoming theme based SEZs near Jabalpur, industry parks in Indore and food parks at multiple locations aim to promote sectoral growth. The structural transformation, the changing sectoral shares of the economy in Madhya Pradesh, the economic activities have shown structural changes over a period of time and agricultural sector is experiencing a decline in terms of share in Gross State Domestic Products (GSDP). Overall economy of Madhya Pradesh has increased by 4.69 per cent in year 2007-08 to 5.69 per cent during 2017-18. The share of primary sector in GSDP was found to be decreased from 24.79 per cent (2007-08) to 21.25 per cent (2017-18), while the share of secondary sector and tertiary sector increased. The share of agriculture sector has also been found to be decreased from 22.08 per cent (2007-08) to 20.23 per cent (2017-17) in total GSDP of Madhya Pradesh (Economic survey 2018-19).

The main crop production in the state comprising, wheat, paddy maize, bajra, jowar, urad, moong, arhar, gram, til, mamtil, sunflower, groundnut, soybean, cotton, peas, masoor, mustard, toria and safflower. Based on availability of soil types, climatic condition the suitable crops are

cultivated in three major seasons. These seasons have their own strengths and weakness for crop production and productivity in the state. Therefore, suitability of crops and cropping pattern have emerged based on the seasons. The major crops in *kharif* season are maize, paddy, groundnut, sugarcane bajra, tur, green gram and other vegetables etc. whereas, wheat, gram, paddy, til, mamtil, sunflower, groundnut, soybean, cotton, peas, masoor, mustard, toria and safflower are major crops grown in rabi season. The North Western part of the state is suitable for the cultivation of temperate fruits, and the south-western part is suitable for a high-quality agricultural produce, tropical fruits, exotic vegetables, and herbal and medicinal plants.

A.3. Performance of Gross Cropped Area, Area, Production and Yield of Principal Crops

A.3.1. Cropping Pattern of Madhya Pradesh

Madhya Pradesh state is the land of diversity in agriculture production as revealed by **Figure 1**. The principal crops grown in Madhya Pradesh are Cereals crops (highest area of 36.08%) followed by Oilseeds (31.56%), Pulses (29.49%) and 2.86 per cent of area grown in the case of commercial crops.

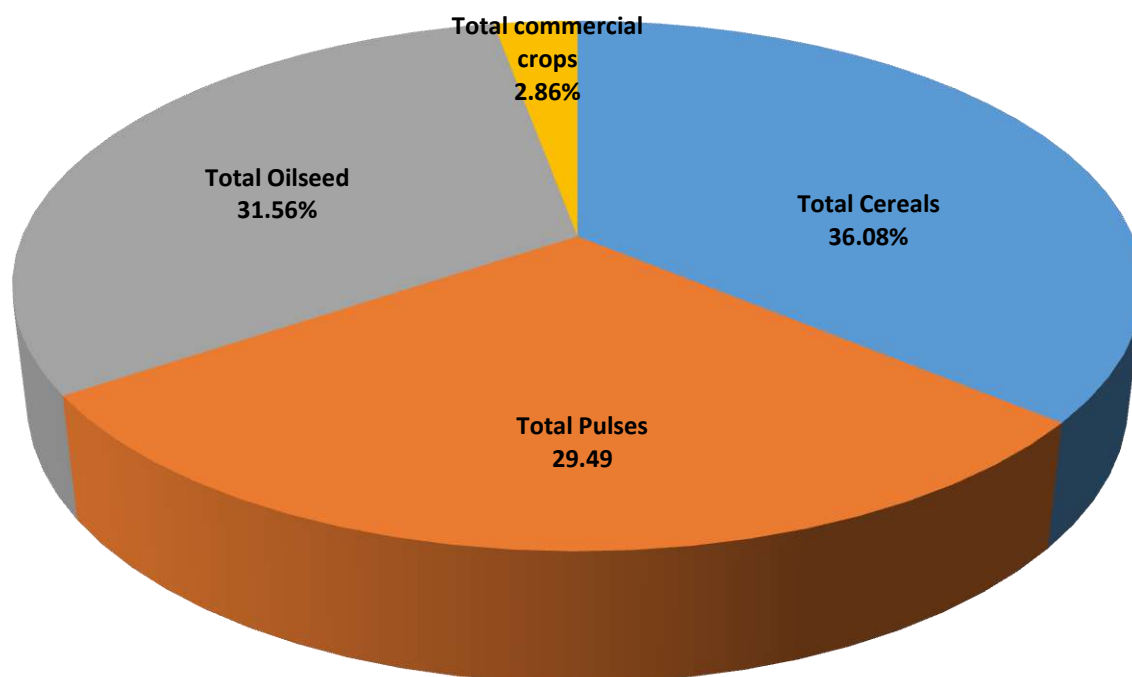


Figure A.1: Cropping pattern of Madhya Pradesh during 2018-19

A.3.2. Change in Cropping Pattern of Madhya Pradesh

Given the land resources, agricultural production and profitability can be increased by the adoption of scientific cropping pattern. The adoption of technologies for cropping system relies on many factors such as physical, social and economic resources, which are available or are made available at the time when farmers needed. Literatures reveal that, the location specific and farm-based cropping pattern have to be evolved with due consideration of vital determinants such as land, topography, water availability, intensity and duration of sunlight, labour availability, cash or credit, power source and market demand. In this background, the cropping pattern of Madhya Pradesh has been analyzed and results are presented in **Table A.1**.

It could be seen from the table that the gross cropped area of the state has increased by 15.19 per cent during the year of 2018-19 (24130 thousand ha) over the year 2009-10. In Madhya Pradesh agriculture crops are grown in two main seasons, namely, *kharif and rabi seasons*. The proportion of area put under cultivation was found higher in rabi season (19.11%) compared to *Kharif* season (16.08%). The highest gross cropped area under pulses crop was found to be increased by (36.06%) followed by oilseeds (8.24%).

The crop wise analysis of percentage change over the 2009-10 to 2018-19 shown that, the other cereals crops such as minor millets, and other crops was the a major cereals crops during the *Kharif* with a share of (56.26%) of gross cropped area followed by the bajra (50.99%), kodokutki (16.53%), Maize (15.54%) and jowar (11.50%) while, gross cropped area under paddy declined by (-7.54%). Among the pulses crops, urid was the main pulses crop during the *kharif* season with share of (71.35%) followed by mung (37.81%), tur and kulthi together accounted about 50 per cent each. Whereas, groundnut was the major oilseed crops during the *kharif* seasons with a share of (42.91%) followed by Seasmum (32.49%) and rest of all the crops bellow five per cent of share while, share of gross cropped area of other oilseed crops was declined (20%).

In *Rabi* season, farmers allocated more area for wheat as reflected with an increase in share (9.29%) while other cereal crops and barley declined (-40.00% and 2.56%). Among the pulses crops, highest share was found in the case of gram (40.28%) followed by pea (21.01%), Lentil (14.59%) and other pulses (7.69%) while negative share was noticed in the case of teora (-20.75%). As in the case of oilseed crops, households also grown oilseed crops like sunflower (100%), linseed (57.89%) and rape seed & mustard (12.07%). Besides, these farmers were also

growing commercial crops like sugarcane (16.59%) and cotton (7.10%) to be increased during the period from 2009-10 to 2018-19. It could also be seen from the **Table A.1**, Madhya Pradesh cropping pattern, pulses crops occupied more area, i.e., 60 per cent gross cropped area followed by cereals (20.31%) oilseeds (8.22%) and commercial crops (1.57%).

Table A.1: Cropping Pattern of Madhya Pradesh

(000'ha)

Sl. No.	Season /Crops	2009-10	2018-19	Percentage change over 2009-10 to 2018-19
I	Kharif			
1	Paddy	1584	1465	-7.54
2	Jowar	428	477	11.50
3	Maize	849	981	15.54
4	Bajra	202	305	50.99
5	Kodo Kutki	248	289	16.53
6	Other Cereals	23	36	56.52
A	Total Cereals	3334	3553	6.56
7	Tur	642	805	25.39
8	Urid	557	954	71.35
9	Mung	85	117	37.81
10	Kulthi	20	25	25.00
11	Other Pulses	4	5	30.15
B	Total Pulses	1308	1907	45.78
12	Groundnut	204	292	42.91
13	Soybean	5552	5779	4.08
14	Sesamum	361	478	32.49
15	Niger	92	97	5.96
16	Other oilseeds	5	4	-20.00
C	Total Oilseeds	6214	6650	7.02
	Subtotal of Kharif	10856	12601	16.08
II	Rabi			
17	Wheat	4645	5077	9.29
18	Barley	77	75	-2.60
19	Other Cereals	5	3	-40.00
D	Total Cereals	4727	5155	9.05
20	Gram	2888	4051	40.28
21	Pea	248	300	21.01
22	Lentil	699	801	14.59
23	Teora	53	42	-20.75
24	Other Pulses	13	14	7.69
E	Total pulses	3901	5208	33.52
25	Rape seed & Mustard	727	815	12.07
26	Linseed	95	150	57.89
27	Sun flower & others	1	2	100.00
F	Total Oilseeds	823	967	17.47
28	Cotton	593	635	7.10
29	Sugarcane (G)	48	56	16.59
G	Total Commercial Crops	641	691	7.82
	Subtotal of Rabi	10092	12021	19.11
	Principal Crops			
30	Total Cereals	8061	8707	8.02
31	Total Pulses	5209	7115	36.60
32	Total Oilseed	7037	7617	8.24
33	Total commercial crops	641	691	7.82
	Gross Cropped Area	20948	24130	15.19

Source: Ministry of Agriculture & Farmers Welfare, Govt. of India and data analysed by author.

A.3.3. Growth Rates of Principal crops

The growth rate of area, production and yield of principal crops of Madhya Pradesh from 2009-10 to 2018-19 has been analysed and results are presented in **Figure A.2** and **Table A.2**. The production increased significantly at the rate of (10.92%) followed by yield (6.70%) and 4.22 per cent in the case of area growth rate during the same period. The absolute production of principal crops saw quite fluctuating trends, i.e.,13915 thousand tons in 2009-10, which increased (16016thousand tons) in 2010-11 and declined to 14952thousand tons during 2011-12, again increased to 33450thousand tons during 2018-19. Similar trend was observed in the case of yield of principal crops. While, trend in area was shown increasing over the period, i.e., 11913 thousand hectares in 2009-10 to 17042 thousand hectares during 2018-19.

Table A.2: Growth Rates of Principal crops (2009-10 to 2018-19)

Sl. No	Year	Principal Crops		
		Area (000ha)	Production (000 MT)	Yield (Kg/ha)
1	2009-10	11913	13915	1168
2	2010-11	12459	16016	1285
3	2011-12	12863	14952	1162
4	2012-13	13504	20395	1510
5	2013-14	14137	23690	1676
6	2014-15	14331	22978	1603
7	2015-16	15460	28687	1856
8	2016-17	15658	30387	1941
9	2017-18	17068	33224	1947
10	2018-19	17042	33450	1963
11	CAGR (%)	4.22	10.92	6.70

Source: Ministry of Agriculture & Farmers Welfare, Govt. of India and data analysed by author.

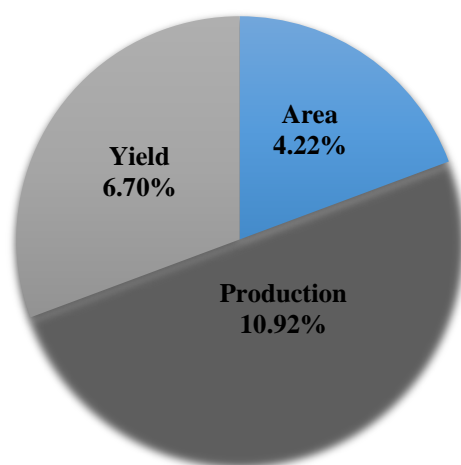


Figure A.2: Growth Rates of Principal crops

A.3.4. Foodgrain production in Madhya Pradesh Vis-à-vis India during 2009-2018

Madhya Pradesh state is mainly an agriculturally based state, with almost (54.60%) of its workforce engaged in farming, it is much higher than all-India average of 47 per cent (Labour Bureau, 2015-16). Madhya Pradesh is basically a food grain and oilseed producing state with around 80 per cent of its gross cropped area (GCA) devoted to food grain production (Table 1). The growth rate of food grain production in Madhya Pradesh Vis-à-vis in India can be seen from **Table A.3** and **Figure A.3** during 2009-10 to 2018-19. It is reflected that growth rate of food grain production in Madhya Pradesh was considerably increased to the rate of (11.22%) which is much higher than all India growth rate of 2.25 per cent (**Table A.3** and **Figure A.3**). This is due to the expansion of area under food grain crops, GOI, policies, measures taken by the state government to make rapid strides in agriculture, Three interventions stand out-expanded irrigation backed by reliable power supplies for groundwater irrigation, strong procurement system put in place for wheat along with bonus on its MSP, and expanded network of all-weather roads to connect farmers to markets and thereby reducing market risk. **Table A.3** and **Figure A.3**, reveal that the share of foodgrain production in Madhya Pradesh increased from 6.38 per cent in 2009-10 to 11.73 per cent during 2018-19, reflected by persistently increasing over the period, except during 2011-12. The share of foodgrain production of the State in terms of total foodgrain production in the country, has grown to a highest share of per cent, with a few ups and downs during the period.

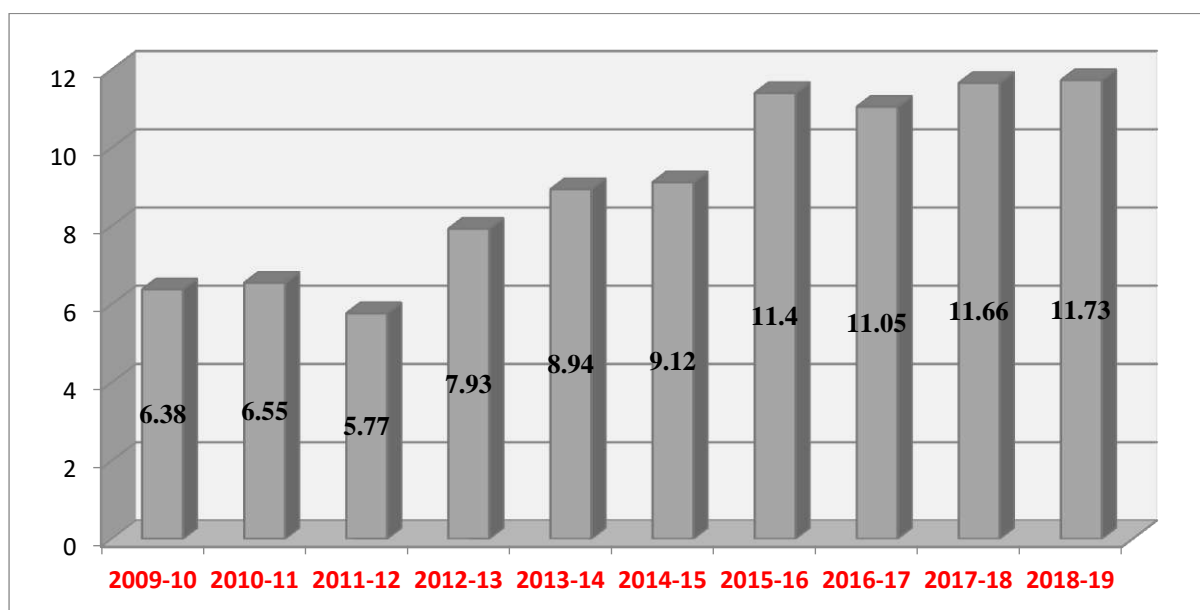


Figure A.3: Share of Madhya Pradesh Food Grain Production to Total India's Food Grain Production during 2009-10 to 2018-19 (%)

Table A.3: Food grain production in Madhya Pradesh Vis-à-vis India during 2009-2018 (000 Tons)

Sl. No	Year	Madhya Pradesh	India	Share of Madhya Pradesh in total food grain production (%)
1	2009-10	13915	218107	6.38
2	2010-11	16016	244482	6.55
3	2011-12	14952	259286	5.77
4	2012-13	20395	257135	7.93
5	2013-14	23690	265045	8.94
6	2014-15	22978	252023	9.12
7	2015-16	28687	251566	11.40
8	2016-17	30387	275111	11.05
9	2017-18	33224	285014	11.66
10	2018-19	33450	285210	11.73
11	CGR (%)	11.22	2.25	

Source: Ministry of Agriculture & Farmers Welfare, Govt. of India and data analysed by author.

A.3.5. Drivers of Agricultural Growth performance in Madhya Pradesh

The major crops grown in different parts of Madhya Pradesh are rice, wheat, jowar, maize, tur, gram, soybean, rapeseed and mustard, Sesamum, cotton, sugarcane and horticultural crops. The growth performance of major crops in Madhya Pradesh is presented in **Table A.4** and **Figure A.4**. Table reveals that excepting area under jowar, mustard and rapeseed and cotton, rest of all the crops have shown a positive growth rates during the period. Among cereal crops, the growth rate of area under maize has increased by (5.95%) followed by wheat and rice contributing about five per cent each. While, the growth rate of jowar, have been considerably declined by 9.10per cent. As regard to pulses, a impressed growth rate was found in the case of tur area (7.19%), followed by gram (1.26%); Nevertheless, the growth rate of mustard and rapeseed and cotton reflected a negative growth to an extent of(-0.96%)while, growth rate of sesamum has significantly increased by(7.47%) followed by soybean(0.98%). The growth rate of commercial crops such as cotton have registered a negative growth rate of 1.27 per cent, while tobacco area reflected considerably positive growth rate of (6.66%). It can be seen from the table, overall growth rate of area under cereals, pulses, total food grain, oilseeds and commercial crops reflected significantly positive growth as revealed in (**Figure A.4**).

As regard to production, a highest positive growth rate was found to be in the maize which was 15.86 per cent, followed by rice (14.38%) and wheat (12.00%). Whereas, the production growth rates of jowar have declined at the rate of 4.10 per cent, among cereals. The overall cereal

production growth rate was quite considerable. Similarly, pulse crop growth rate was also quite impressive during the study period, a highest growth rate was found to be in tur (16.36%) followed by gram (3.48%). Looking into the overall production growth rate of pulse crops grew at the rate 7.76 per cent and total food grain production growth rate was 11.21 per cent during period. In case of oilseeds a highest production growth rate was reflected in Sesamum (8.13%) followed by Mustard and rapeseed (0.71%) while negative growth rate was noticed in the case of soybean and total oilseed production (-1.49 and -0.71%), respectively. The growth rate of tobacco and cotton was quite impressive by reflecting the growth rate of 8.59 per cent and 6.69 per cent, respectively.

In terms of yield, cereals, pulses, total foodgrain, oilseed and commercial crops (Cotton and Tobacco) have exhibited a positive growth during the study period. Among, the cereals a highest positive growth rate of yield was found in rice (9.70%) and lowest in jowar (5.49%) by reflecting overall growth rate of cereal crops 7.95 per cent. With regard to tur and gram, the growth rate has been considerably increased by 8.55, 2.19 per cent and overall yield growth rate of pulses was also quite striking (3.04%). Looking into growth rate of mustard and rapeseed and sesamum has been considerably increased at the rate of (1.69%) and (0.35%), respectively, while growth rate of soybean has declined by 1.59 per cent during the period. Although yield of soybean was declined but at aggregate level oilseed crops was increased at the rate of 1.07 per cent. In the case of cotton and tobacco, the growth rate has considerably increased at rate of 8.08per cent, and about one per cent, per annum, respectively.

Table A.4: Crop specific Growth performance in Madhya Pradesh during 2009-2018 (%)

Sl. No.	Particulars	Area	Production	Yield
1	Rice	4.26***	14.38	9.70
2	Wheat	4.73***	12.00***	6.93
3	Jowar	-9.10***	-4.10*	5.49**
5	Maize	5.95***	15.86	9.35
	Total Cereals	3.94	12.20	7.95
6	Tur	7.19***	16.36***	8.55*
7	Gram	1.26*	3.48*	2.19*
	Total Pulses	4.58	7.76	3.04*
	Total Food Grains	4.22	11.21	6.70
8	Mustard and rapeseed	-0.96	0.71	1.69*
9	Sesamum	7.74***	8.13**	0.35
10	Soybean	0.98	-1.49	-1.59
	Total oilseed	0.37	-0.71	1.07
11	Cotton	-1.27	6.69*	8.08*
12	Tobacco	6.66***	8.59***	1.72**

Source: Ministry of Agriculture & Farmers Welfare, Govt. of India and data analysed by author.

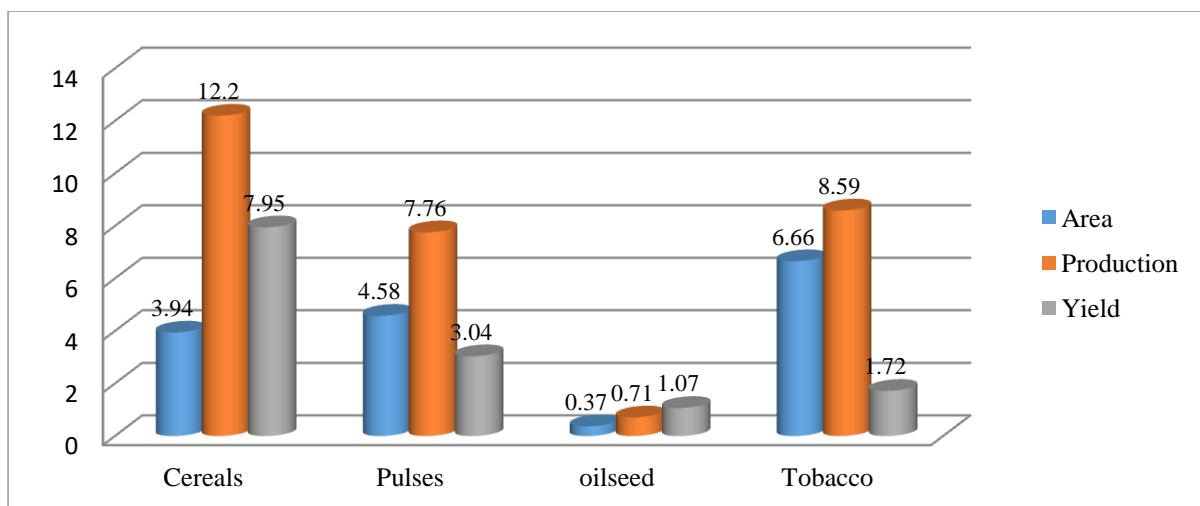


Figure A.4: Growth rate of Principal crops of Madhya Pradesh

A.4. Status of Agricultural Marketing in Madhya Pradesh

Agriculture marketing plays an important role not only stimulating production and consumption but also in accelerating the pace of economic development. Further, marketing of farm produce is a key economic activity as it is required to maintain equilibrium in demand and supply of food and food products for the consumers and a sustainable farm income to the farm households. It can be seen from the (Table A.5 and Figure A.5), the marketed surplus of farmers ranges from 79.50 to 98 per cent. The state erected a system of wheat procurement, connecting villages to markets through a network of roads and ensuring ample power supply to rural areas to run tube wells for irrigation. MP's achievements serve as lessons for states like Odisha, Bihar, and Uttar Pradesh where there is ample scope for expansion of ground-water irrigation by providing reliable power supplies to rural areas, development of roads and improvement in procurement systems for their main crops. It is necessary to understand the status of agricultural marketing and marketable surplus in Madhya Pradesh. It is found to be relevant in discussing the issues related to better marketing channels, warehouse facilities and other essential infrastructure for ensuring adequate returns on agricultural output of farmers.

Madhya Pradesh state has made a rapid stride in adoption and implementation of agricultural marketing reforms for supporting and developing agriculture marketing system in the State. Madhya Pradesh stands second in the country in terms of per capita farm output. Although MP is mainly a food grain producing state, there are indications of diversification into horticulture. A large proportion of area under horticultural crops has jumped considerably and supplies a large

quantity to the agro-based industries which has high avenues for generation of skilful employment and self-employment opportunities both in rural and urban areas. Better technology, for post-harvest management and market linkages are essential for increasing returns from agro-products.

The Madhya Pradesh State Agricultural Marketing Board MPSAMB (commonly known as Mandi Board) came into existence in 1973 under the provisions of *M.P. Krishi Upaj Mandi Adhiniyam 1972*. Madhya Pradesh state has its own agricultural marketing arrangements through APMC Markets located in every district and sub-markets at every taluka / block with all infrastructure facilities like yards, godowns, weighments etc. These APMCs facilitate the whole process of marketing of agricultural produces in the State. Prior to 1939, there were only 57 regulated markets, later on with the passage of time and also due to increased surplus, the number of regulated markets increased to 1777 in 1974 and 7566 in the year of 2012. Further, 516 regulated markets are there in the state out of which 246 are main wholesale markets having elaborate infrastructure also known as *Krishi Upaj Mandi* and the balance 270 having lower level of infrastructure known as *Sub Mandi*. In addition to these there are *haat bazars* in the rural areas where farmers and other people congregate periodically to sell their farm marketable surpluses and buy their essential requirements. Second tier of the MPSAMB structural channel is the Regional office, which have their demarcated area of operation and the Mandis situated in the said area of operation are affiliated to the division office for administrative control. There are 7 division offices in the State individually having a minimum 18 to a maximum of 45 Mandi Committees under its jurisdiction. Third tier consists of regulated markets. These are in the nature of physical and institutional infrastructure at the first contact point for farmers to en-cash their farm marketable surpluses. Mandis in the state are of A, B, C and D grade

A.4.1. New initiatives of Madhya Pradesh agricultural marketing

The efficient marketing system is of vital importance to an area under all condition and each stage in its development. In areas of dense population living at subsistence level, the seasonal failure of a basic food crop can bring about wide spread famine and suffering, meanwhile other parts may be holding supplies more than adequate for their needs. Such disaster is lessened by transportation and readily available buffer stock facilities, availabilities of communication between one part to another, availabilities of information on current stocks and future requirement and the reliability of the existing trade organization in recognizing and responding

to needs of the community. All these conditions reflect the role of marketing in the overall set up of the area.

In the present era of liberalization, the agricultural marketing is liberalized to create an opportunity for the alternative marketing channels for selling the agricultural produce. Private companies, co-operatives or any legal entry may establish and operate the agricultural marketing infrastructure and supporting services as competitive measures with the markets established by APMCs. Direct purchase of agricultural produce from the farmers' field by individuals as well as companies, societies, co-operatives are encouraged to reduce the number of intermediaries thereby providing opportunity in increasing the share of farmer in consumer Rupee. Producer or Consumer markets are established for the direct sale to the processors or consumers. Contract farming is popularized for the assured sale at the predetermined price before sowing. Specialized market yards for special commodities also are developed to provide a commodity specific modern market infrastructure for the particular crops grown in a particular area.

Public-Private Participation for establishment and management of markets for agricultural produce to encourage the private investment and professionalism in agricultural marketing including post harvest handling of agricultural produce and encouraging value addition to share the burden and provide healthy competition with APMC's. e-market, e-marketing, and e-trading for speedy and distance transactions. Market Stabilization is also found to be created at State level to safeguard the interests of the producers in the wake of sudden and anticipated fall in the prices of agricultural produce. Marketing extension cell is also found to be established for market driven extension service to farmers to adopt the improved practices of marketing to fetch the better price. Agricultural Produce Marketing Standards Bureau is also set up for grading, standardization and quality certifications of all the agricultural produce. The other areas related to agriculture and horticulture as well as animal husbandry and products of live stocks, forestry, apiculture and sericulture are also well equipped and provided a suitable platform to increase the farm income as a subsidiary occupation.

ITC has emerged as a new marketing channel in field of farm products. The company "e-Chou pal" initiative is enabling Indian agriculture to significantly enhance its competitiveness by empowering Indian farmers through the power of internet. ITC's Agri Business Division, one of India's largest exporters of agricultural commodities, has conceived e-Chou pal as a more efficient supply chain aimed at delivering value to its customers around the world on a

sustainable basis. The e-Choupal model has been specifically designed to tackle the challenges posed by the unique features of Indian agriculture, characterized by fragmented farms, weak infrastructure and the involvement of numerous intermediaries, among others. www.mpmadboard.gov.in.

A.4.2. Marketed Surplus in Madhya Pradesh

Looking into the predominant situation of agricultural segment in Madhya Pradesh, collection and maintenance of farm marketed surplus of foodgrain assumes a great significance. In any developing economy, the marketed surplus or producer's surplus of farm products plays a major role, as it is the quantity, which is actually made available to the non-producing population of the country. From the marketing point of view, surplus is more important than the total production of commodities. The arrangement for marketing and the expansion of markets have to be made only for the surplus quantity available with the farmers, and not for the total production. The rate at which agricultural production expands, determines the pace of agricultural development, while the growth in the marketed surplus determines the pace of economic development in the State and the country as well. An increase in production must be accompanied by an increase in the marketable surplus for the economic development of the nation. Though the marketing system is more concerned with the surplus which enters or is likely to enter the market, the quantum of total production is essential for this surplus.

Agricultural marketing in Madhya Pradesh has made notable progress since independence, but many constraints still today remain unresolved. A dynamic and vibrant marketing system with an ample supply chain infrastructure is necessary to keep pace with the changing agricultural production and growing marketable surplus. Moreover, efforts should be made at all legal and policy levels to strengthen the rural economy and create rural employment, which will surely augment production and productivity, leading to storage security, food security, and inclusive agriculture growth of the state. There is also an increasing pressure on the agriculture produce economy to respond to the challenges and opportunities that the global markets pose in the era of globalization and liberalization.

To meet the ever-increasing demand of food grains, state is heavily dependent on the availability of adequate local supplies. The main agricultural produce marketed in the APMC market yards

of Madhya Pradesh are Wheat, Rice, Jowar, Maize, Tur, Gram, Sesamum, Soybean, Rapeseed-mustard, Cotton, Tobacco, Horticulture crops, Plantation crops, Fodder crops and other crops as these are the major crops grown in the state. Hence, their share in agriculture GDP also notable, mainly due to the implementation of marketing reforms in the state such as setting up of Agricultural Produce Market Committees (APMCs), Marketing Boards, the system of Minimum Support Price, and eNAM etc., have played a significant role in rising the marketed and marketable surplus. Looking at the role of Madhya Pradesh in the country's food security, it is important to collect the information about the marketed surplus ratios for the major crops grown. The present study is very much relevant and important in providing the information about marketed surplus as well as post-harvest losses of major foodgrains.

Table A.5 and **Figure A.5** reveal that the share of marketed surplus of major crops in the Madhya Pradesh is quite impressive since a decade. In the case of foodgrains, and other food crops, the marketed surplus is generally less as most of the small and marginal farmers produce and consume for their own and the leftover is marketed. But, in the case of non-food crops viz. Cotton, Sugarcane, Soybean etc., which is used as raw material in agro-based industry, almost all the production (98%) is available for sale excepting a small quantity kept for the seed purpose. On the other hand, even food crops with a large marketable surplus (say above 50%) can be regarded as cash or commercial crops. Among crops, except Wheat, marketed surplus of foodgrains ranges from 90 to 97 per cent during the period, whereas wheat ratio varied between 73 per cent to 80 per cent. In the case of oilseeds, the ratio of marketed surplus ranged between 90 per cent to 98 percent. Whereas in respect of cotton, the ratio was more than 98 per cent during the decade.

Table A.5: Average Marketed Surplus Ratio of Major crops in Madhya Pradesh

Details of Crops	Marketed Surplus ratios			Overall
	2012-13	2013-14	2014-15	
Food grains: Cereals				
Rice	87.91	90.77	93.09	90.59
Wheat	80.55	85.66	73.58	79.93
Maize	92.58	90.26	91.52	91.45
Jowar	89.32	85.66	98.53	91.17
Pulses				
Arhar	94.07	93.43	93.36	93.62
Gram	89.04	90.30	93.31	90.88
Urad	98.05	90.30	93.31	93.89
Lentil	96.00	95.48	98.63	96.70
Oilseeds				
Rapeseed and mustard	97.49	98.31	97.39	97.7
Soybean	95.32	90.91	97.60	94.6
Sesamum	96.77	96.52	96.64	96.6
Niger seed	-	-	97.78	97.8
Commercial Crops				
Cotton	99.96	100.00	100.00	99.80

Note: Average MSP is calculated for three years i.e., 2012-13, 2013-14 and 2014-15 for marketed surplus ratio.; *Source:* Directorate of Economic and Statistics, Department of Agriculture, Cooperation and Farmers Welfare, Government of India.

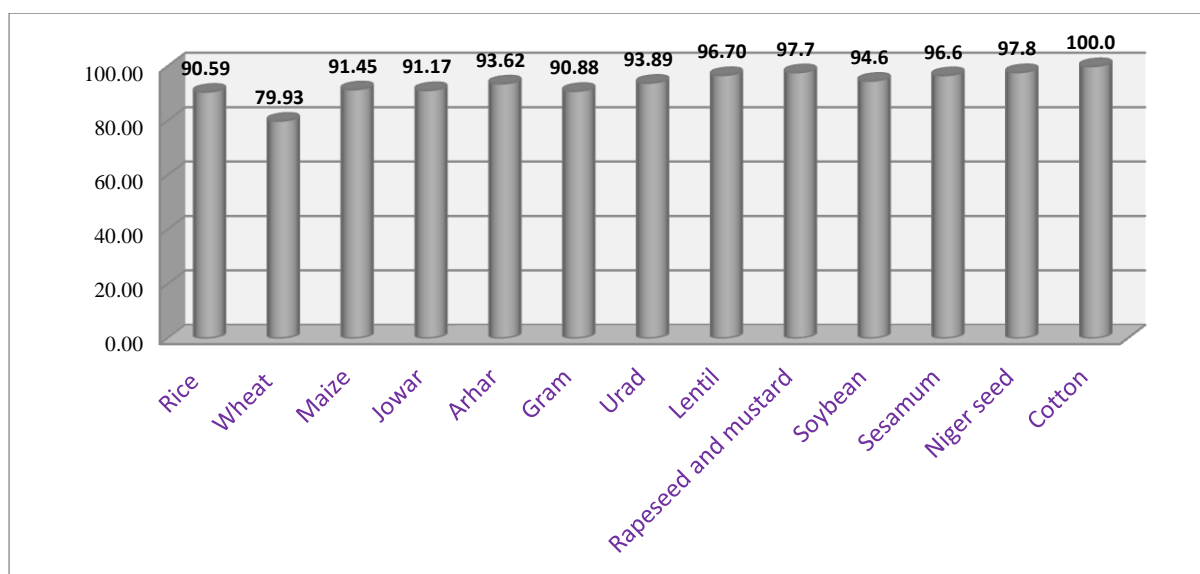


Figure A.5: Average Marketed Surplus Ratio of Major crops in Madhya Pradesh

A.4.3. Post-Harvest Losses in Madhya Pradesh

The growth of agriculture sector in Madhya Pradesh during the period of 2009-10 to 2018-19 was around 9.82 per cent per annum, which is the highest growth rate registered in agriculture among the major state of India over a ten-year period. The last five years have been even more

spectacular: agricultural GDP grew at 15.21 per cent per annum. The agriculture development in the case of Madhya Pradesh is a worth learning for many other states of India, who are struggling to gain development in agriculture. The major sources and drivers of agricultural growth in Madhya Pradesh was irrigation cover expanded for wheat cultivation, acreage and production under the crop increased significantly. Consequently, the government strategized to improve the supply chain of wheat by re-modelling the procurement system through digitization and initiated 'e-Uparajan' and by increasing storage capacity significantly. The third important factor that contributed to agriculture growth is the expansion of all-weather roads are major factors. Apart from this, agriculture technology, mechanisation and government intervention through procurement of food grains that have contributed to robust agricultural growth in the state. In this connection, Madhya Pradesh state agriculture has reflected a demand driven production rather than supply driven.

During the post-harvest management, the farm produced on the farmers' field have to undergo a series of operations such as harvesting, threshing, winnowing, bagging, transportation, storage, processing and exchange before they reach the consumer, and there are appreciable losses in crop output at all these stages. Due to the glaring gaps in the marketing infrastructure, the existing markets operate inefficiently and the transaction costs are high. Multiple handling of produce by various players in the fragmented supply chain, the lack of warehouse and cold storage also results in a high post-harvest loss. Hence, it is essential to produce and process agriculture commodities keeping in view of the changing consumer pattern of tastes and preferences, and increasing the shelf life of the produce and reduce the post-harvest losses. Estimation of post-harvest losses has been made by different studies in the past. A High-level Expert Committee on the Cold Storage constituted by the Department of Agriculture and Co-operation has estimated that about 25 to 30 per cent of highly perishable and perishable goods, and eight to 10 per cent of semi perishable to non-perishable (most of foodgrains only) are loosed annually, due to lack of post-harvest technology, non-existence of integrated transport, storage and marketing facilities, etc. As per the Millennium Study, it was estimated that about seven per cent of foodgrains and 30 per cent of fruit and vegetables are lost due to inadequate handling facilities.

Though increase in agricultural production and productivity is a priority of the agriculture sector today, improved post-harvest handling and processing are essential to ensure high-quality products and higher value addition. Value of agricultural output can be increased considerably by

following improved methods of post-harvest practices. In this connection, it is worth to note here that the average post-harvest losses of food grain production at various stages in the Madhya Pradesh state was estimated and presented in **Table A.6** and **Figure A.6**. On an average the post-harvest loss is to the extent of one to six per cent in foodgrains in the state while the proportion is much more in the case of perishable commodities. Although, the government has taken various measures to curb these post-harvest losses, the proportion of the post-harvest losses remains same due to various issues. Since there is no time series database on the state-wise post-harvest losses, the results from the study conducted by the Directorate of Marketing Inspection, GOI for the year 2005 are extracted and presented in Table 6. Among the different crops, the highest post-harvest losses were found to be in the case of ragi, which is about 6.23 per cent whereas, lowest in the case of wheat to the share of 1.20 per cent (**Table A.6** and **Figure A.6**).

**Table A.6: Post-Harvest Losses of Different Crops in Madhya Pradesh
(Triennium ending 1998-99)**

Crops	Total quantity of production	Post-Harvest losses quantity	(in '000 tonnes)	
			Post-Harvest losses	losses (%)
Paddy	8560.11	119.04		1.39
Wheat	8555.23	102.40		1.20
Jowar	794.44	16.62		2.09
Bajra	140.00	4.05		2.89
Maize	1051.36	29.98		2.85
Barley	111.86	3.58		3.20
Ragi	3.69	0.23		6.23
Tur	292.83	5.42		1.85
Bengal Gram	2833.62	106.85		3.77
Green Gram	41.61	0.90		2.16
Black Gram	182.85	4.21		2.30
Lentil	264.54	16.01		6.05
Total	22832.14*	409.29*		2.99#

Source: Ministry of Agriculture & Farmers Welfare, Govt. of India and data analysed by author.

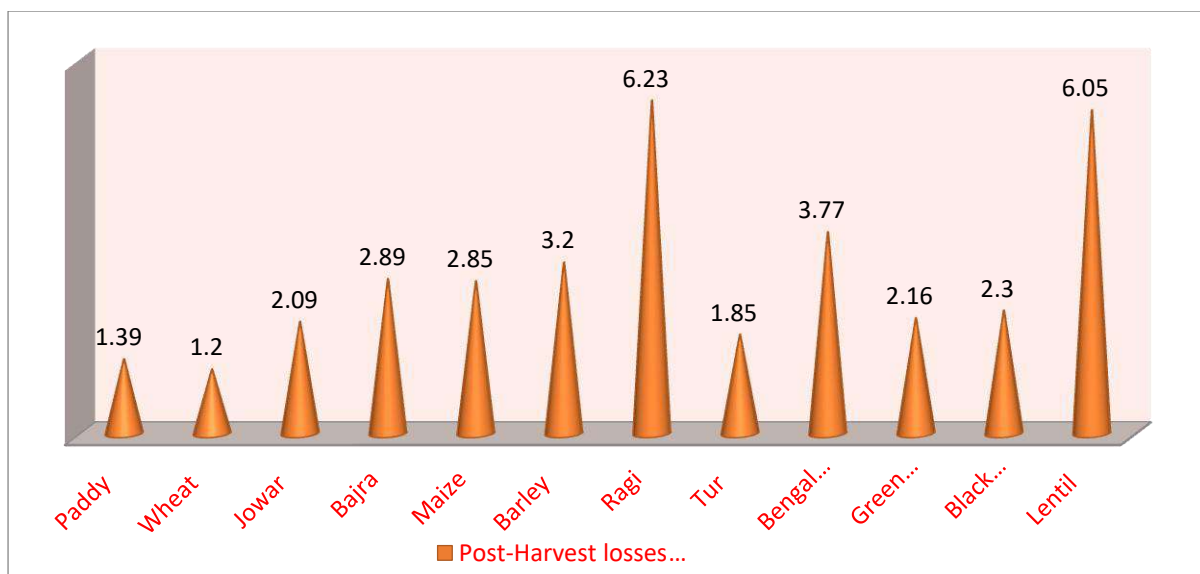


Figure A.6: Post-Harvest Losses of Different Crops in Madhya Pradesh

A.5. Government Interventions in Post-Harvest Management of Agricultural and Horticultural Crops

In 2018-19, Madhya Pradesh contributed over 7.28 million metric tonnes (MMT) of wheat to the central procurement pool which is 0.56 million metric tons higher than 2017-18. This was the second highest procurement of wheat among the state that year and even higher than that of Uttar Pradesh. The traditional four highest contributors to central procurement pool are Punjab, followed by Haryana, Madhya Pradesh and UP. The event capped a remarkable period of eight years, which saw Madhya Pradesh emerge as the state with the highest growth rate in agriculture. Long clubbed with the so-called BIMARU group of poor northern, central and eastern states, MP successfully broke ranks to set a scorching pace of growth, which has been unparalleled in the past quarter century. In this connection, Madhya Pradesh stands third in the country in terms of per capita food grain. The horticulture sector is the supplier for large number of agro based industries which has high avenues for generation of skill full employment and self-employment opportunities both in rural and urban areas of the state. Hence, Madhya Pradesh government has undertaken various measures to improve the production, marketing and post-harvest management practices through adoption of better technology. Market linkages are essential to increase in revenue from agro-products. Looking into the importance of infrastructure in agricultural and rural development, the state has tried to create more infrastructures related to the post-harvest management. In this section, we have made an attempt to bring out some of the government initiatives and schemes which have focused to address the challenges of small &

marginal farmers, and to create storage infrastructure capacity for the farming community. In this connection, the Madhya Pradesh State government has created storage infrastructure through various institutions and funding from different government schemes such as;

- i Central Warehouse Corporation
- ii Madhya Pradesh State Warehouse Corporation
- iii Private Entrepreneurs Guarantee (PEG) Scheme
- iv National Horticulture Mission (NHM) / Mission on Integrated Development of Horticulture (MIDH)
- v Rastriya Krishi Vikas Yojana (RKVY)
- vi Garmin Bhandaran Yojana (GBY)

A.5.1. Agency wise number of Godowns available and Percentage of storage space Utilization Status in Madhya Pradesh

The information on state level storage capacity created under Central Warehousing Corporation under National System of Warehouse Receipts is presented in **Table A.7 and Figure A.7**. As revealed from the table, highest registered godowns belong to the CWC (36.63%) followed by NABARD (29.23%),SWC (18.26%) and the rest with other agencies.

Table A.8 and Figure A.8 shows the percentage of utilization of storage capacity under different agencies. It is revealed that almost all the agencies have utilized more than 80 per cent of their capacity except SWC, PEG and SWC. The highest percentage of storage space utilized by FCI owned as reflected (94%) followed by CWC covered (92%), Private (silo) 90 per cent, SWC covered PEG(89%), CWC covered PEG(85%), SWC covered(79%) and least 78 per cent of storage space utilized by SWC PEG as per the Food Corporation of India (FCI)Madhya Pradesh. It is also noticed that in states like Madhya Pradesh the procurement of foodgrain is implemented, the WDRA registered godowns utilization found to be better as compared to own usage by the owners or private beneficiaries. A Majority of the godowns constructed under GBY have been registered with the WDRA have been used to store procured foodgrains by FCI. For instance, paddy & wheat in Madhya Pradesh and Haryana, wherein the storage capacity was more than 1000 MT.

Table A.7: Agency wise number of Godowns available in Madhya Pradesh

Sl. No	Agencies	Number of Godowns	Percentage
1	FCI	233	2.81
2	CWC	3034	36.63
3	SWC	1512	18.26
4	NCDC	1024	12.36
5	NABARD	2421	29.23
6	Others	58	0.70
	Total	8282	100.00

Source: MPW, WDRA

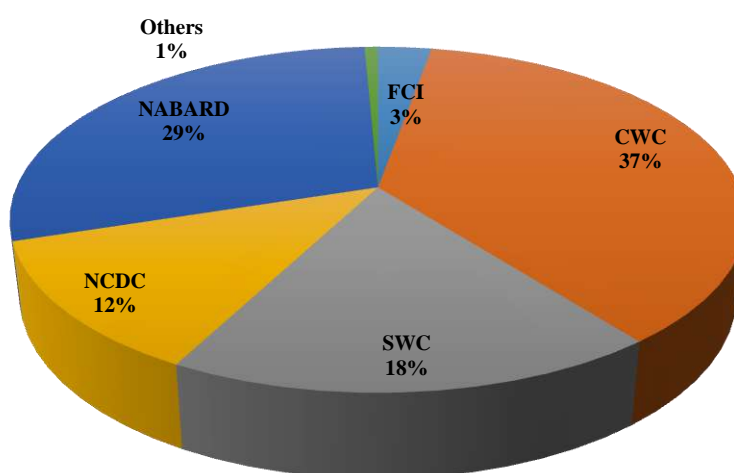


Figure A.7: Agency wise percentage of Godowns available in Madhya Pradesh

Table A.8: Percentage of storage space Utilization - Status as on 31.12.2019

Sl. No.	Agencies/Depot	Percentage Utilization
1	FCI OWNED	94%
2	CWC Covered	92%
3	CWC covered PEG	85%
4	SWC covered	79%
5	SWC covered PEG	89%
6	SWC PEG	78%
7	Pvt. (Silo)	90%
	Total	86.57%

Source: FCI, Madhya Pradesh, Capacity available with FCI for storage of foodgrains, as reported by the Regions.

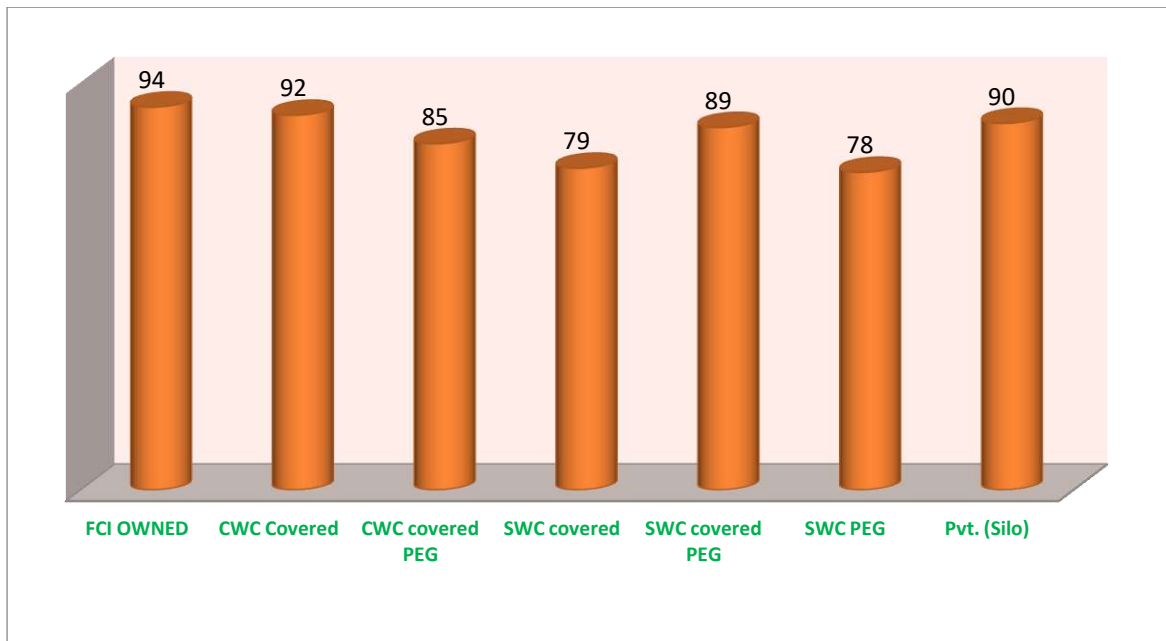
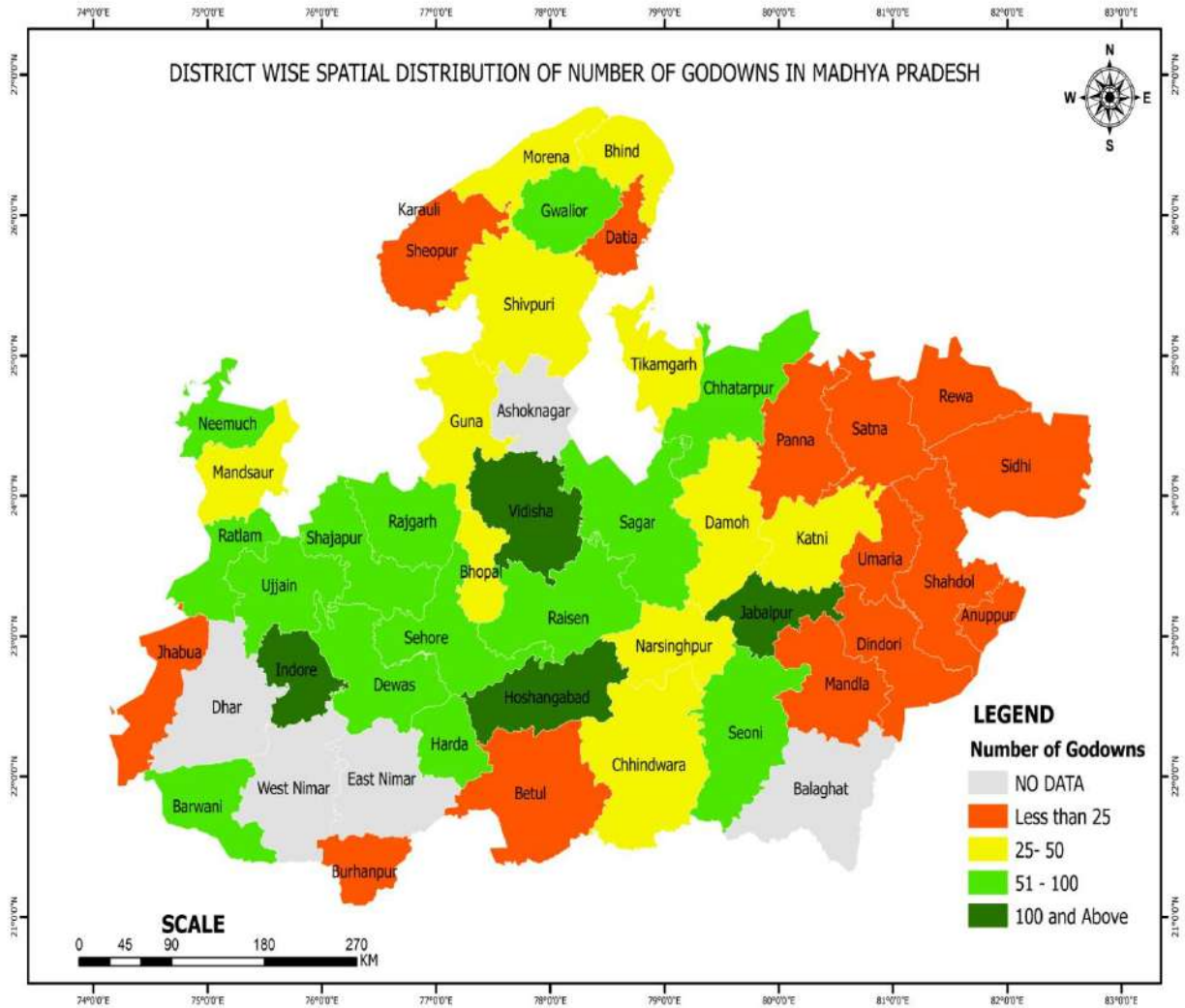
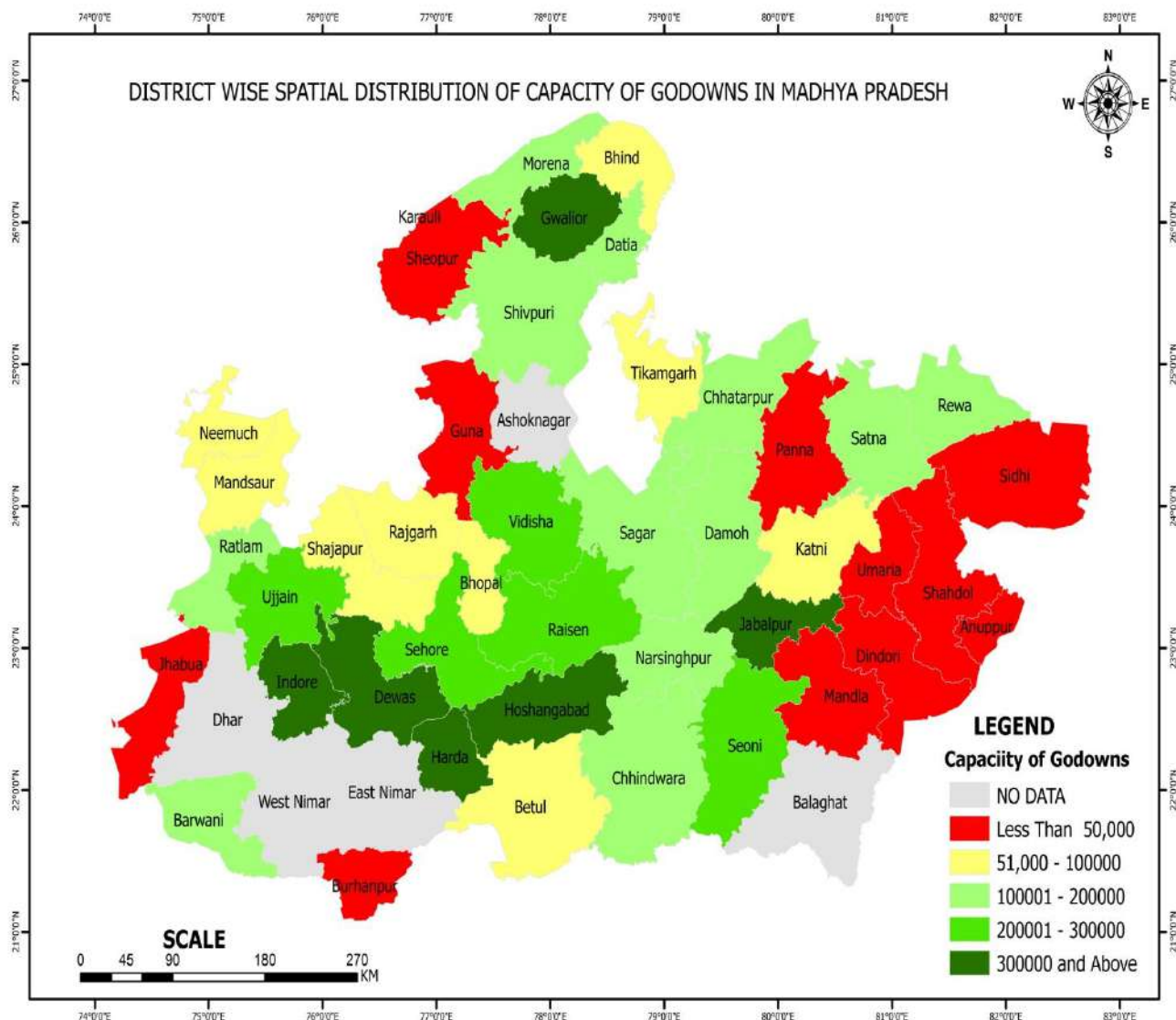


Figure A.8: Percentage of storage space Utilization- Status as on 31.12.2019



A.5.2. District-wise storage space available with different agencies in Madhya Pradesh

The information on district wise storage capacity created under Central Warehousing Corporation under National System of Warehouse Receipts is presented in **Table A.9** and **Figure A.9**. Table revealed that the godowns listed under WDRA from all sources of organization/ institutions. One of the important provisions of the WDRA registration is that the godowns constructed under the regulation of Negotiability of Warehouse Receipts, ensures the users of the godowns (farmers) to retain their produce till they get better prices in the market and avail the pledge loans from the Nationalized Banks for their immediate requirements. As per the registration storage capacity, Jabalpur tops the list (7.82%), followed by Hoshangabad(7.58%), Gwalior(5.90%), Vidisha (4.64%) Sehore (4.59%), Dewas (4.56%), Indore (4.13%), and the rest

falls below four per cent of total space created in the state. It is worth to mention here that a majority of the rural godowns constructed under GBY have not been registered with the WDRA as the technical specifications of the rural godowns are disparate and not able to adhere to the specifications mentioned in the Negotiable Warehouse Receipt System (NWRs). A majority of the farmers also felt that the registration with the WDRA is also a costly affair and hence they have not registered. Moreover, the bankers are not in favor of the NWRs in respect of rural godowns. Further, issues related to pledge loans are discussed in detail in the subsequent sections.

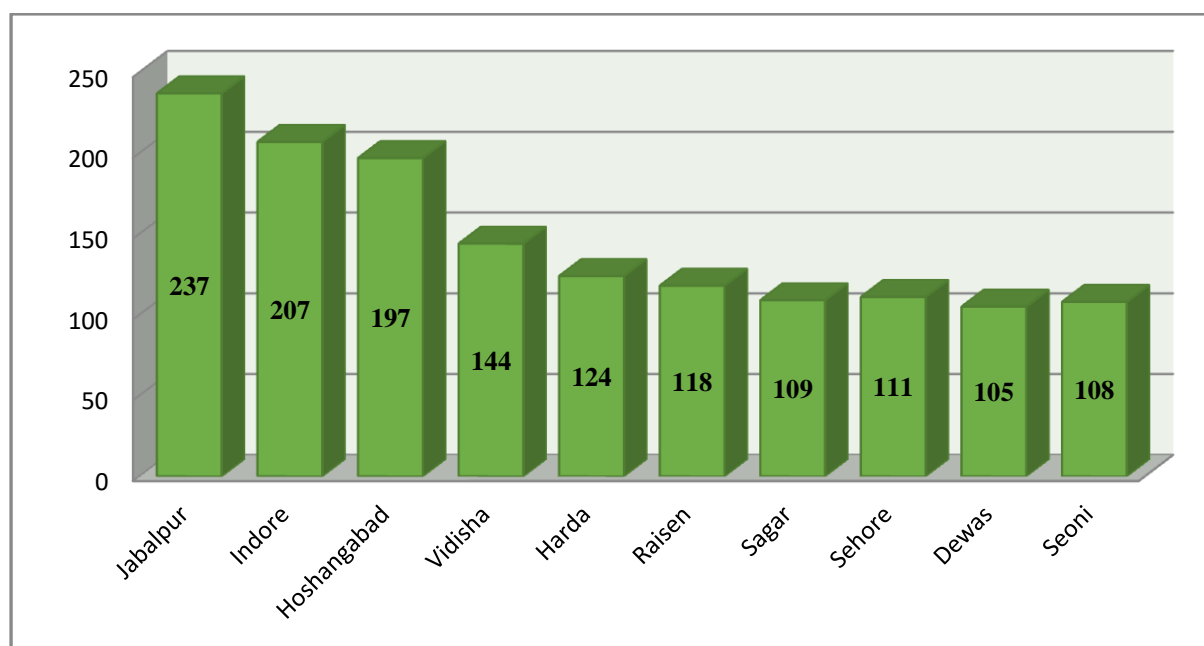


Figure A.9: Top ten districts having highest number of Godowns

Table A.9: District-wise storage space available with different agencies in Madhya Pradesh
(Lakh MT)

Districts	No of godowns	Capacity of godowns	Percentage
Jabalpur	237	6.64	7.82
Indore	207	3.51	4.13
Hoshangabad	197	6.45	7.58
Vidisha	144	3.95	4.64
Harda	124	5.07	5.97
Raisen	118	3.04	3.58
Sagar	109	1.79	2.10
Sehore	111	3.90	4.59
Dewas	105	3.87	4.56
Seoni	108	2.96	3.48
Ujjain	99	3.00	3.52
Chatarpur	87	1.86	2.19
Gwalior	90	5.02	5.90

Districts	No of godowns	Capacity of godowns	Percentage
Shajapur	74	0.84	0.99
Khargone	68	0.93	1.09
Neemuch	70	1.17	1.37
Khandwa	65	1.71	2.01
Ratlam	65	1.39	1.63
Rajgarh	62	1.15	1.36
Narsinghpur	62	1.56	1.83
Morena	55	1.59	1.87
Chhindwara	55	1.50	1.77
Tikamgarh	52	1.17	1.38
Damoh	48	1.31	1.54
Katni	47	1.05	1.23
Balaghat	43	0.98	1.15
Bhopal	45	1.16	1.36
Badwani	39	0.23	0.27
Shivpuri	40	1.78	2.09
Mandsaur	36	0.79	0.93
Bhind	34	0.77	0.91
Guna	31	0.30	0.35
Ashoknagar	32	1.38	1.63
Betul	28	1.11	1.31
Datia	25	2.12	2.50
Satna	28	2.66	3.13
Rewa	23	1.63	1.91
Panna	9	0.30	0.35
Burhanpur	10	0.03	0.04
Mandla	8	0.58	0.68
Sheopur	15	0.40	0.47
Barwani	7	0.14	0.17
Jhabua	8	0.07	0.08
Sidhi	6	0.78	0.92
Agar Malwa	11	0.22	0.26
Shahdol	10	1.24	1.46
Alirajpur	6	0.71	0.84
Dindori	3	0.06	0.07
Gadarwara	4	0.04	0.04
Itarsi	5	0.03	0.04
Lateri	7	0.03	0.04
Singrauli	8	0.85	1.00
Umariya	3	0.66	0.78
Total	2983	84.99	100.00

Source: MPW, WDRA

A.6. Status of GBY in Madhya Pradesh

It is noticeable that the existing initiatives that have been implemented all over the country were not getting capital subsidy to economically weaker sections to construct their own warehouses to avoid the distress sale. Furthermore, there is also a necessity of the government initiatives to support farming community to a large extent. In the light of this, the Government of India has introduced a Grameen Bhandaran Yojana (GBY) during 2001, and implemented through the Directorate of Marketing and Inspection in collaboration with NABARD, NCDC, and other financial institutions to address the limitations of other government initiatives that have been already implemented all over the country and more so to support those farm communities who are economically weak and non-viable to construct godowns. Garmin Bhandaran Yojana is a Capital Investment Subsidy Scheme for Construction/ Renovation/ Expansion of Rural Godowns. Since, it is a Central Scheme, the Government of Madhya Pradesh also implemented the same on the same period. The guidelines of the scheme have been subsumed with other ongoing scheme of Development/ Strengthening of Agricultural Marketing Infrastructure, Grading Standardization and Post-harvest management (AMIGS) during 2004 and again into Agricultural Marketing Infrastructure (AMI) sub scheme of Integrated Scheme of Agricultural Marketing (ISAM) w.e.f. 2014.

Rural godowns scheme plays a fundamental role in promoting agriculture marketing, rural banking and financing, and ensuring Food Security in the country. It enables the markets to ease the pressure during harvest season and to maintain supply of agricultural commodities during off season. Hence, it solves the problems of miss matching of market demand and supply, glut and scarcity, which are main problems in agricultural marketing. Though warehousing is an independent economic activity, yet is closely linked with production, consumption and trade. The main objective of the scheme is to create scientific storage capacity with allied facilities in the rural areas, to meet the requirements of farmers for storing farm produce, processed farm produce and agricultural inputs; promotion of grading, standardization and quality control of agricultural produce to improve shelf life of the produce, marketability; prevention of distress sale immediately after harvest by providing the facility of pledge financing and marketing credit; strengthening of agricultural marketing infrastructure in the country by paving the way for the introduction of a National System of Warehouse Receipts in respect of agricultural commodities stored in such godowns and to reverse the declining trend of investment in agriculture sector by

encouraging private and cooperative sectors to invest in the creation of storage infrastructure in the state.

A.6.1. Method of implementation of the Scheme

In Madhya Pradesh state, the GBY scheme was implemented by the Directorate of Agricultural Marketing and Inspection (DMI). It acts as a nodal agency for implementing the scheme. DMI has a head office located in Bhopal. Along with National Institute of Agricultural Marketing (NIAM), Jaipur and other National/ State level Institutions, DMI officials have organized training to create general awareness of the scheme for farmers and entrepreneurs for construction, maintenance and operations of rural godowns. The scheme is implemented by the Department of Agriculture, Cooperation & Farmers' Welfare, and Government of India in collaboration with the National Cooperative Development Corporation (NCDC) and National Bank for Agriculture and Rural Development (NABARD). The credit linked back-ended subsidy for investment has been followed in the state. All three categories of beneficiaries such as individual farmers, registered Farmer Producer Organizations, Schedule Caste/ Schedule Tribes/ women have been availed the benefits under this scheme throughout the state. A few of the renovation of the storage projects availed by the cooperatives financed by NCDC.

A.6.2. Methodology of the Study

The present study is based on both secondary and primary data.

A.6.2.1. Secondary data sources

The secondary sources such as Directorate of Economics and Statistics, Government of India, Directorate of Marketing and Inspection (DMI), Faridabad, NABARD and NCDC have been referred to collect the data on area and agricultural production of Madhya Pradesh, number of godowns sanctioned with their capacity of storage, Rural Godowns beneficiary list, location and their addresses etc. In addition, various journals, reports, and guidelines available with the libraries, websites/ search engines were also been used in finalizing the methodology and writing the report.

A.6.2.2. Primary data collection

To collect the primary information from the beneficiaries of the scheme, users of the godowns, implementing officers of NABARD/ NCDC, Officials of implementing agencies, and bankers, pre-tested separate set of questionnaires have been designed and used to record their feedback with regard to the sources of information on GBY, profile of the users, cropping pattern & their storage methods, usage pattern of the godowns, costs incurred and benefits obtained, issues in availing the loans, constraints in management of the godowns, utilization etc., and to record their suggestions for improvement of the scheme. Further, a Focused Group Discussion (FGD) was carried out to extract the reliable information from the group of farmers/ users of the godowns. The collected primary data through the questionnaires were tabulated and organized for the analysis of the data and inferences were drawn from the evaluation study leading to recommendations and suggestions. Descriptive statistics, CAGR, Cost-Benefit Analysis have used to derive inferences.

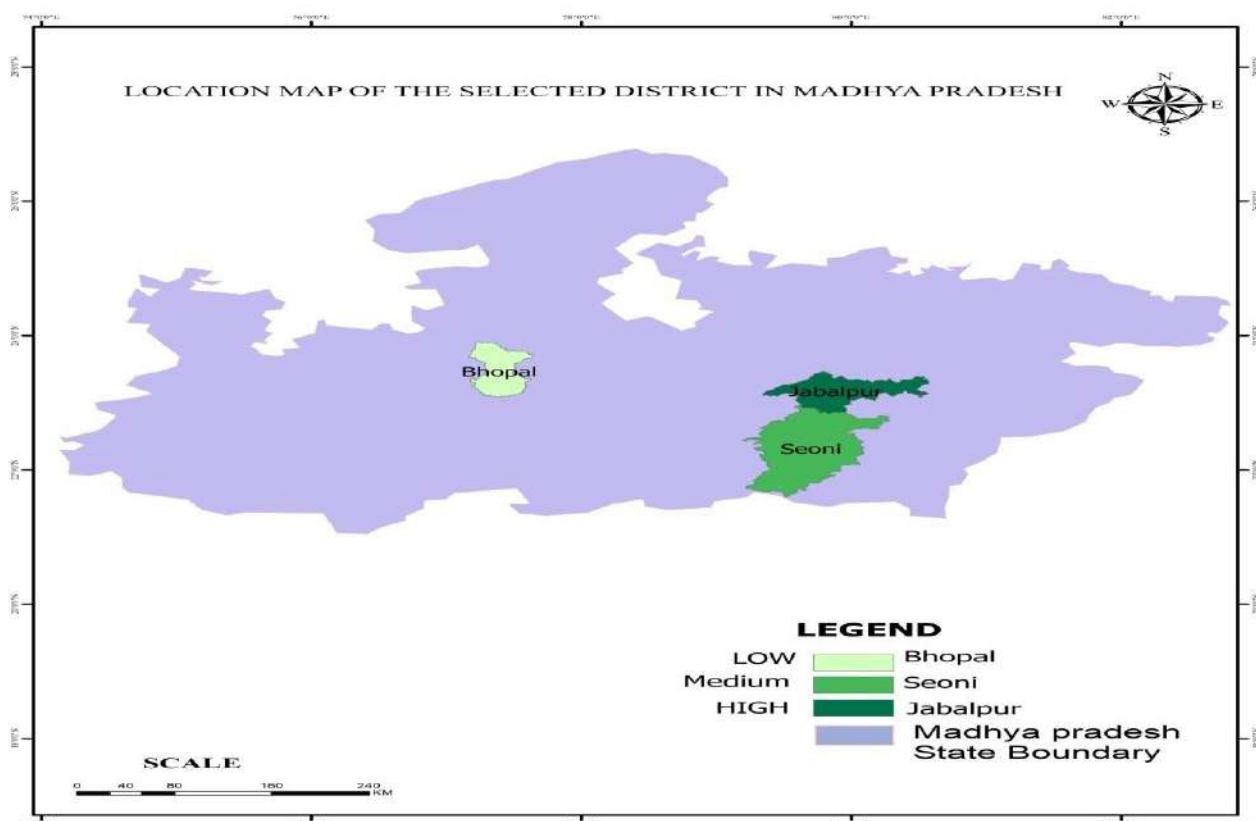
A.6.3. Sampling Method

The district-wise total number of rural godowns sanctioned by the NABARD and NCDC (till 31st March 2019) in the state of Madhya Pradesh is a criterion used to select the samples. A detailed list of number of godowns was collected from the state level offices of NABARD and NCDC with the help of state nodal agency, DMI. The districts are categorized on the basis of number of godowns and their storage capacity in each district. The average storage capacity created is used as a yard stick to classify the godowns into three categories such as high performing, medium performing and low performing districts. Within a top five districts in each category, one district was considered as a sample to represent the particular category. Accordingly, the districts selected for the state of Madhya Pradesh are Jabalpur district, represent high performing category, followed by Seoni under the medium performing district, and Bhopal as a low performing district (**Table A.10**). A brief profile of the sample district is given in the subsequent sections.

Table A.10: Classification of Districts based on the performances

S.I. No.	Particulars	Districts
1	High performing district	Jabalpur
2	Medium performing	Seoni
3	Low performing	Bhopal

Source: NABARD



A.6.3.1. High Performing District - Jabalpur

In this category, the number of godowns and their utilization seems to be better as compared to other categories. Jabalpur district is situated in the Mahakoshal region of Madhya Pradesh in central India on the holy banks of the Narmada River. The district is encompassed by 23°10' 7.5720" Northern Latitude and 79° 55' 54.6492" East Longitudes. The geographical area of the Jabalpur district is 10,160 sq.kms. District Headquarters Jabalpur is well connected by road, Train line *etc.* Jabalpur, Panagar, Sihora are the Cities in this district having road connectivity to major towns and remote villages. Jabalpur is about 300 KM by road to Bhopal (Capital of Madhya Pradesh). The district is divided into 7 talukas and it has 1474 inhabited villages and 7

towns. There are many irrigation projects in Jabalpur district like, Rani Awanti Bai Sagar Pariyojna, Apar Paryat Sichai Pariyojna, Devri Talab Pariyojna, Hatoli Talab Priyojna and Chhatarrpur Talab Pariyojna. Bargi dam is 43K.M. from Jabalpur situated near Mankeri Village. There are two major canals are subdivided as left Canal and Right Canal. The canal which extended from left of dam, which is 17 K.M., cover Jabalpur, Patan of Jabalpur district, and this canal, also covered other district as well like Narsingpur district. This canal serves the irrigation possibilities on approx. 1.57 lack hectare lands (**Jabalpur District at a Glance, 2017-18**).

Jabalpur is an important administrative, industrial, and business center of Madhya Pradesh. Apart from this, the Narmada basin's alluvial soil helps in producing sorghum, wheat, rice, and millet in the villages around Jabalpur. Commercial crops include pulses, oilseeds, cotton, sugar cane, tobacco and medicinal crops. The district is also well connected with road and railway transportations. Hence, there is a more demand for the godowns. It is also found that the size of the godowns in this area is in the rage of medium to large size. Moreover, a majority of these godowns are filled up with more of cereals, pulses, oilseeds, tobacco and dry & green fodder especially, fodder from wheat and paddy (**Jabalpur District at a Glance, 2017-18**).

A.6.3.2. Medium performing District - Seoni

The district is situated Satpura plateau in the South of Jabalpur Division. The district lies between latitude 21° 36' & 22°57'North and longitude 79°19' & 80°17' east. The districts headquarter lies on Nagpur Varanasi national high way no.27. Seoni is one of the forest rich districts of Madhya Pradesh. The total forest area in this district is 3, 28,200 hectares. There are two territorial divisions, two production divisions, one social forestry division and one forest development corporation division in the district. There are 1612 villages in district, out of which 1375 villages are either in forest areas or nearby forest boundary. The district is under Seoni division of MP. There are 05 Sub Division, 06 Taluks, and 08 Development Blocks in the district. The District Headquarter is Seoni. District is rich in timber resources such as teak is most important tree growing in and around the district. Waingana River is the lifeline of the district. The chief river is the Wainganga, with its affluent the Sagar, Theli, Bijna and Thanwar; other streams are the Timar and the Sher, tributaries of the Nerbudda. Major crops grown in the district such as paddy, wheat, maize, chickpea (gram), and soybean. The district is popular for timber production and principle crops like rice, wheat, maize, chickpea production and many godowns constructed in the district were used to store paddy, wheat and other produces which were

procured by government through central procurement pool, as noticed during the field survey. Overall, it is found that the size of the godowns was big and their utilization was to a maximum extent (**Seoni District at a Glance 2017-18**).

A.6.3.3. Low performing District - Bhopal

Bhopal district is bounded by the districts of Guna to the north, Vidisha to the northeast, Raisen to the east and southeast, Sehore to the southwest and west, and Rajgarh to the northwest. Bhopal district is geographically situated in the central part of the state. The district lies between latitude 77.12 & 77.35 North and longitude 23.15 & 23.45 east. Total geographical area of Bhopal district is 2772 Sq. Km of which Dense Forest is 41 Sq. Km, open forest 192 Sq. Km. Total forest area is 233 Sq. Km extending over 8.41 % of the total geographical area. There are 517 villages in Bhopal district. There are 2 Sub Division, 2 Taluks, and 2 Development Blocks in the district. The sources of potable water in Bhopal include piped water supply from surface water sources and individual water sources i.e. groundwater. The majority of Bhopal people drinking water supply is met by two surface water sources such as Upper Lake and Kolar reservoir. Besides, there are tube wells, hand pumps and a few large diameters dug wells. Bhopal also has an unaccounted number of privately owned dug wells and borewells. This district is popular for timber production and principle crops like wheat, paddy, soybean, maize, tur, gram and cotton. The size of the godowns constructed under GBY are of large, all most all godown are completely utilized by government to store the procured paddy and wheat under MSP and some extent of processed rice as observed during the field survey (**Bhopal District at a Glance 2017-18**).

A.6.4. Performance of GBY in Madhya Pradesh

Madhya Pradesh spans over 30.8 million hectares of land and comprises around 6.0 per cent of India's population. The state is primarily an agricultural state, with almost 70 per cent of its workforce engaged in agriculture, much above the all-India average of 55 per cent. Unlike other states where the share of agriculture in GDP has been falling, MP has undergone a reverse structural change after 2018-19. Between 2010-11 and 2018-19, the share of agriculture in GDP declined from 22.5 per cent to 15.85 percent (2004-05 prices), which reflected the national trend. However, after 2018-19, the share of agriculture in GDP has increased from 22.5 to 21.40 per cent (**2018-19, Sources: GSVA by Economic Activities, Central Statistics Office; PRS**).

Madhya Pradesh is primarily an agricultural state, mainly a food grain and oilseed growing state with around 62 per cent of its gross cropped area (GCA) devoted to food- grains and 32 per cent to oilseed. In 2018, Madhya Pradesh contributed about 8 million metric tonnes (MMT) of wheat to the central procurement pool. This was the second highest procurement of wheat by any state that year and even higher than that of Haryana, traditionally the second highest contributor after Punjab. The event capped a remarkable period of eight years, which saw Madhya Pradesh emerge as the state with the highest growth rate in agriculture. A study conducted by the Central Institute for Post-Harvest Management has indicated that about one to seven per cent of food grain was lost during the post-harvest stage in the Madhya Pradesh. These losses assume significance, as the quantities involved are huge and a country like India cannot afford such a national loss. In this connection, the Government of India has introduced '**Gramin Bhandaran Yojana (GBY)**', a capital investment subsidy scheme for construction/ Renovation/ Expansion of Rural Godowns across the country. The Scheme was introduced in 2001-02 on the recommendations of an Expert Committee constituted by the Department of Agriculture and Cooperation, Ministry of Agriculture, Government of India. The main objectives of the scheme include:

- Creation of scientific storage capacity and thus prevention of distress sale
- Reduction of loss in quantity and quality
- Creation of additional employment opportunities in rural areas
- Assistance in the easy procurement of food grains by FCI and other agencies
- Renovation and up-gradation of existing storage capacity created by co-operatives with the assistance of NCDC
- Encouraging private and co-operative sector investment in the creation of storage infrastructure in the major producing zones and the major consumption zones in the country
- Reduction in pressure on existing storage facilities with public agencies and co-operatives and reduction in pressure on the transport system in the post-harvest period these area micro level problems.

Further scheme has focused on small and marginal farmers constitute a major share of farming community in the state, do not have the storage facilities to retain the farm products with themselves till the market prices are remunerative. It is very much essential to provide facilities for scientific storage so as to avoid produce deterioration and enable them to meet their credit requirement. The Government of India through GBY scheme, provided an opportunity to

establish rural godowns to enable small and marginal farmers to increase their holding capacity and make them to sell their produce at remunerative prices by avoiding distress sale.

A.6.4.1. Distribution of godowns under GBY

The GBY was implemented by the Department of Agriculture, Cooperation & Farmers' Welfare, Government of India in collaboration with the National Bank for Agriculture and Rural Development (NABARD) in Madhya Pradesh. The Directorate of Agricultural Marketing and Inspection (DMI), acts as a nodal office for implementing the scheme. The credit linked back-ended subsidy for investment has been followed in the state. The project for the construction of rural godowns under this scheme can be availed by the individuals, farmers, groups of farmers/growers, firms, non-government organizations (NGOs), Self Help Groups (SHGs), companies, corporations, co-operatives, federations and agricultural produce marketing committees in the country. Moreover, the entrepreneur will be free to construct godowns at any place, as per his/her commercial judgment, excepting a condition that it should be under the limits of the Municipal Corporation area. In addition to this scheme, Food Corporation of India has also announced its Private Entrepreneurs Guarantee (PEG) Scheme for creation of storage space in the Madhya Pradesh by availing subsidy under GBY. Several entrepreneurs have made use of these schemes and have created a huge storage space in the state as noticed during field survey. This lead, to Madhya Pradesh is the Third position in the country in terms of its storage capacity.

A.6.4.2. District wise Storage Space Created for Procured Produce

The establishment of rural godowns under GBY scheme was used by various categories of beneficiaries such as individuals, farmers, groups of farmers/growers, firms, non-government organizations (NGOs), Self Help Groups (SHGs), companies, corporations, co-operatives, federations and agricultural produce marketing committees. Moreover, the entrepreneur will be free to construct godowns at any place, as per his/her commercial judgment except that it should be outside the limits of the Municipal Corporation area. In addition to this scheme, Food Corporation of India has announced its Private Entrepreneurs Guarantee (PEG) Scheme for creation of storage space in the state. Several business peoples have made use of these schemes and have helped in the creation of a large storage space. As a result, state is the third position in the country in terms of its storage capacity. The information on district-wise distribution storage

capacity created by Open, Covered and Shed storehouse in Madhya Pradesh is presented in **Table A.11** and **Figure A.10**.

It can be seen that out of the total capacity of storage space created under GBY, Jabalpur, Hoshangabad, Harda, Dewas, Sehore, Vidisha and Indore were the top eight districts, which occupied more than half (45%%) of the storage created. It is worth to note that, within these eight districts, more than 15 per cent of the capacity created found in Jabalpur and Hoshangabad, followed by Harda (5.83%) and rest of the districts had a less than four per cent of the storage capacity created. Overall, it appears that the projects under GBY were distributed on demand driven basis in the state of Madhya Pradesh.

Table A.11: District wise storage capacity created since inception of GBY

Districts	No of godowns	Capacity of godowns	Percentage
Jabalpur	182	510253	7.73
Indore	157	266529	4.04
Hoshangabad	152	497309	7.54
Vidisha	105	287791	4.36
Harda	94	384651	5.83
Raisen	89	229411	3.48
Sagar	87	142492	2.16
Sehore	85	298679	4.53
Dewas	83	306195	4.64
Seoni	83	227380	3.45
Ujjain	77	232950	3.53
Chatarpur	72	153927	2.33
Gwalior	69	384651	5.83
Shajapur	62	70194	1.06
Khargone	58	79138	1.20
Neemuch	58	96804	1.47
Khandwa	55	144449	2.19
Ratlam	54	115410	1.75
Rajgarh	53	98668	1.50
Narsinghpur	48	120534	1.83
Morena	47	135858	2.06
Chhindwara	46	125652	1.90
Tikamgarh	45	101468	1.54
Damoh	39	106643	1.62
Katni	39	86805	1.32
Balaghat	38	86340	1.31

Districts	No of godowns	Capacity of godowns	Percentage
Bhopal	38	97798	1.48
Badwani	34	20183	0.31
shivpuri	34	151064	2.29
Mandsaur	29	64000	0.97
Bhind	26	58842	0.89
Guna	26	24899	0.38
Ashoknagar	23	99298	1.50
Betul	23	91121	1.38
Datia	21	178422	2.70
Satna	19	180314	2.73
Rewa	18	127234	1.93
Panna	7	23440	0.36
Burhanpur	6	1952	0.03
Mandla	6	43519	0.66
Sheopur	6	16116	0.24
Barwani	5	10093	0.15
Jhabua	4	3409	0.05
Sidhi	3	39200	0.59
Agar Malwa	2	4057	0.06
Shahdol	2	24895	0.38
Alirajpur	1	11849	0.18
Dindori	1	1936	0.03
Gadarwara	1	935	0.01
Itarsi	1	678	0.01
Lateri	1	462	0.01
Singrauli	1	10660	0.16
Umariya	1	21998	0.33
Total	2316	6598551.28	100.00

Source: NABARD

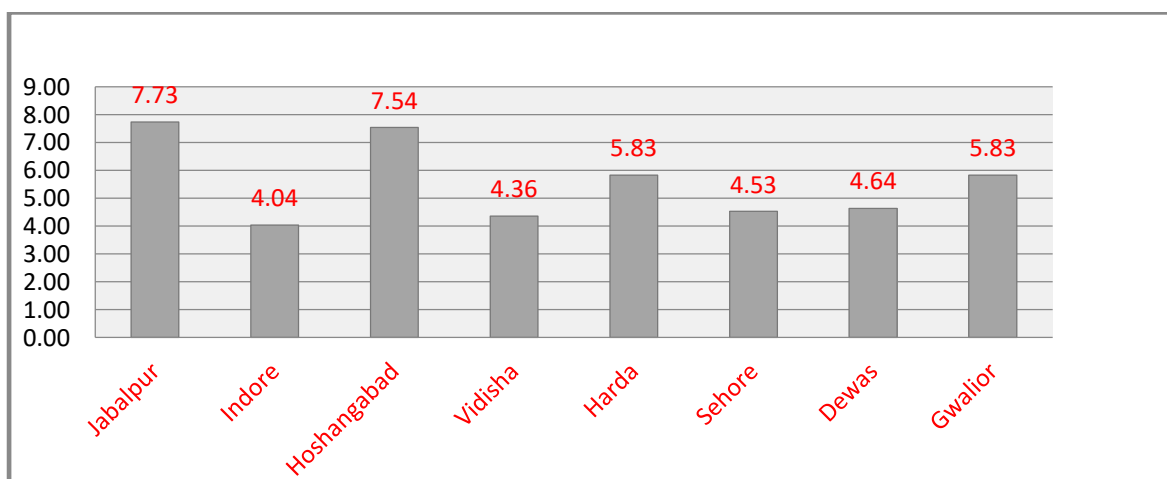


Figure A.10: Top Eight Districts storage space created in Madhya Pradesh

A.7. Profile of the Beneficiaries

Having stated the status of warehouses in Madhya Pradesh as a whole, a brief summary of the beneficiaries are analyzed and presented in **Table A.12**. The beneficiaries by category shows that the individuals availed the highest benefits, as reflected more than (57%) as their eligible subsidy rate is 15 per cent followed by Cooperative about 33 per cent while, women and SC/ST groups taken together accounted for 10 per cent as their rate of subsidy is 33 per cent. The average age of the beneficiaries was 41 years having better education. Education level shows that all the beneficiaries are literate. Among different levels of education possessed by the beneficiaries, a majority (29%) had possessed a pre-university and above education level, followed by Matriculation (71%). This is due to a majority of the beneficiaries are farmer cum traders and cent businessmen. Hence they didnt possess higher education. Average number of family members was four persons with an average annual income of Rs. 3.84 lakhs. In addition, they had an agricultural Net Operated Land to an extent of 43.80 acres.

Table A.12: Profile of the Beneficiaries of GBY

Sl. No.	Particulars	Unit
1	Category-wise Usage of Godowns	(% of respondents)
	Individuals	57.14
	Cooperative	32.86
	SC/ST and Women	10.00
	Farmers	-
2	Average age of the beneficiary (Years)	41.00
3	Education level (% of respondents)	
	Illiterate	-
	Primary (1 to 4)	-
	Higher primary (5 to 9)	-
	Matriculation (10)	71.00
	Pre- university (10+2) & above	29.00
4	Average No. of family members (Numbers)	4
5	Average Annual Income (Rs.)	384000
6	Net operated area (Acres)	43.80

Source: Primary data

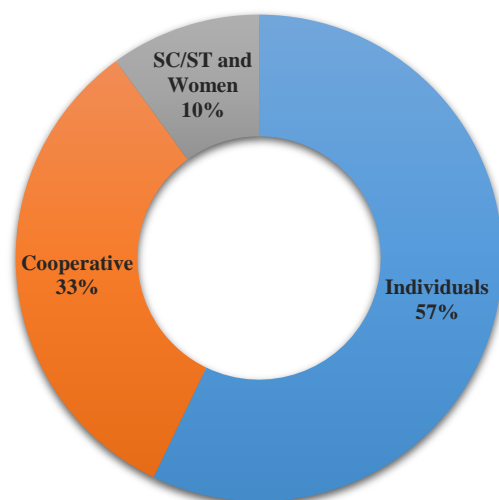


Figure A.11: Category-wise Usage of Godowns

A.8. Cropping pattern of the Beneficiaries

The previous year cropping pattern of the beneficiaries have been collected and illustrated in **Table A.13**. It is clearly visible from the table that the beneficiaries have undertaken crop cultivation in two seasons in a year. This is mainly due to availability of a large number of water resources such as canals, check dams, and water harvesting structures made available by the Madhya Pradesh government for cultivation of crops in major seasons in year. Major crop grown by the beneficiaries include cereals such as wheat, maize and paddy, commercial crop - tobacco, vegetables, and fruit crops like banana in the sample area but only major crops were taken into consideration of analysis. From the above analysis, it is found that the cropping pattern in Madhya Pradesh has undergone significant changes over time. Wherever water is not a constraint and assured irrigation is available, beneficiaries were growing paddy and wheat. In other areas, banana, bajra, jowar and tobacco were cultivated both as a solo or mixed cropping. Across sample districts, higher proportion of wheat, paddy, maize, and tobacco were observed in the case of Jabalpur. Wheat, bajra, and Chilli were noticed in respect of Bhopal district, while a mixed cropping pattern was observed in the case of Seoni. In addition, a higher proportion of green peas cultivation was also noticed during the survey. Across crops, only wheat, paddy and maize were noticed in both the seasons. Banana was available throughout the year, while tobacco is an annual harvesting.

Table A.13: Information on Crop-wise Area, Production and Marketable Surplus

(Qty in Qtl)

SI. No	Crops	Area (Acre)	Production	Consumption	Stored	Sales
Kharif						
1	Paddy	11	260	11	259	Local market yard
2	Maize	12	277	5	272	Local market yard
Rabi						
3	Wheat	17	315	30	285	Local market yard

Source: Primary data

In terms of area under cultivation, as revealed by the table about 17 acres of land is devoted towards wheat cultivation as compared to other crops during rabi season, this is due to Madhya Pradesh is primarily a food grain growing state with around 62 per cent of its gross cropped area (GCA) devoted to food grains and 32 per cent to oilseeds at state level. Whereas, maize and paddy were available throughout the year in an average 12 and 11 acres of land, respectively. Interestingly, excepting tobacco, almost all these crops were grown by the beneficiaries and sold through procurement process of central at the MSP and rest of sold in the local market yard as soon as the produce is harvested without storing and waiting for a favorable price in the market. Only in the case of tobacco, the produce was kept in the godowns for three to four months or till they get a reasonable price in the market. In respect of tobacco and banana, a few sold to the brokers at the farm gate/ local market yard. There were number of intermediaries involved in the marketing of the agricultural produce, hence, a majority were selling their produce to these intermediaries at the local market at distress price. On an average, 75 to 80 per cent of the produce grown by the farmers were sold in these markets and the rest was kept for own consumption.

Interestingly, these results are on par with the marketed surplus as indicated in the **Table A.5**. Marketable surplus is the only income for the farmers, their income level depends on the price at which they sell in the market. A majority cases, the producers were selling as soon as the harvest is over/ peak season due to non-availability of storage spaces with them. It is a general knowledge that during peak season, the demand will be lesser and prices will be at lower levels. Therefore, it is important to store the produce, till the remunerative prices in the market. This is where the role of GBY played an important role by creating storage places at the rural areas in general and particularly, at farm houses.

A.9. Sources of information on GBY

In order to understand, how the beneficiaries got information on GBY, the sources of information were collected and displayed in **Table A.14**. It is noticed that a majority have got the information from the Media (40.86%), followed by Bank officials (23.35%), Panchayat Mukhiya (14.29%), who generally interact directly with the Development Officers including the lead banks in their areas very often. About 22 per cent have also expressed that they got information from the APMCs. The other sources enlisted by the beneficiaries are co-farmers, friends and relatives, etc.

Table A.14: Sources of information on GBY

Sl. No	Particulars	Percentage
1	Bank	23.35
2	Media	40.86
3	APMC	21.50
4	Panchayat President	14.29

Source: Primary data

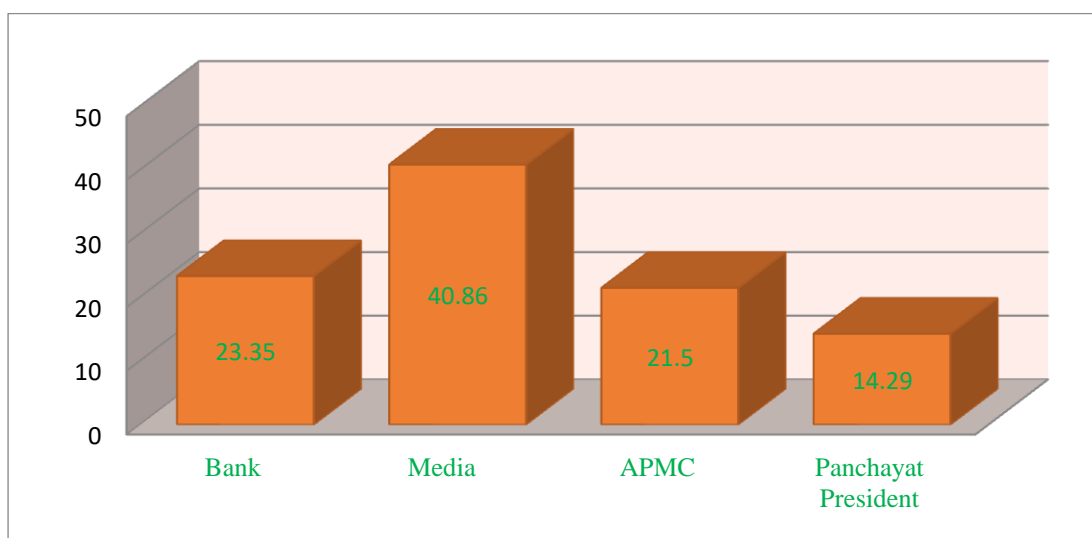


Figure A.12: Sources of information on GBY

A.10. Distribution of Beneficiaries

To have an idea, the beneficiaries were grouped into the classification as enlisted in the GBY guidelines and the results are shown in **Table A.15**. Table reveals that a majority of the beneficiaries availed benefit from the GBY, in the order of Individual (47.14%), followed by

Cooperatives (42.86%), and SC/ST/Women (10%). The individuals are the persons other than farmers category, he might be a businessmen, entrepreneur, farmer, group of farmers, etc., and are eligible for 15 per cent subsidy; farmers are the individuals having agriculture as their main occupation and availed subsidy at the rate of 25 per cent under farmers quota; SCs/STs include the individual men from SC/STs and women from all categories, and are eligible for 33 per cent subsidy. Even though their proportion of beneficiaries are limited due to high investment for construction of godowns. Hence, other categories business class peoples and entrepreneurs utilizing more benefits from this scheme.

It is worth to mention here that in the case of Madhya Pradesh, a many APMCs, Zilla Panchayats (ZPs), and the Cooperative societies have availed the benefit under Individual categories and constructed godowns in the rural areas, mainly to facilitate storage and to avoid distress sale from the farmers. A few cases, godowns were handed over to the Gram Panchayats and Trustees by the APMCs, to enhance their capacity utilization. However, in many cases, these godowns space were utilized for agricultural produce storage/ sale of agricultural inputs by the Cooperative societies. But, in a few cases, they have been utilized for public distribution centres (PDS)/ rationing, and to conduct ceremonies etc. Out of the sample, 15 such projects were visited and found that they have been utilized for storage of food grain under central procumbent poll, in respect of both Bhopal and Jabalpur districts. During the visits, we also found that a majority of the NABARD sanctioned projects were large in size (ranged from 1000 to 2000 MT), and mostly used to store food grain by central government. A very few NCDC godowns are utilising for agricultural inputs such as fertilizer and pesticides.

In order to attract private entrepreneurs, the scheme was made available to the traders as well as businessmen to invest on the godowns this was major trend in Madhya Pradesh. The bankers have classified these entrepreneurs/ traders and associations under Individual category provide subsidy benefits from NABARD. Accordingly, a majority have constructed the rural godowns with a larger size and rented to the either state government or central government for storage of buffer stock. On the other hand, a group of farmers or FPOs also availed the benefit under this scheme to a certain extent.

Table A.15: Classification of the Sample Beneficiaries as per GBY Guidelines

Sl. No.	Beneficiaries	Percentage
1	Individual	47.14
2	Cooperatives	42.86
3	SC/ST/Women	10.00

Source: Primary data

A.11. Godowns Capacity Utilization

It is found that a majority of the rural godowns availed by the beneficiaries were used to store agricultural main products, by-products or horticultural produces only. Since, there were no availability of records on storage details with the beneficiaries, the average utility of the godowns were collected. Accordingly, the utilization of the godowns were classified into three categories in Madhya Pradesh such as;

- a. Sub-optimal utilization
- b. Optimum utilization
- c. Own use

a. Sub-optimal utilization

The godowns that are of larger in size (> 500 MT), which have not been utilized properly in the places where the godowns are constructed without a proper business plan. Farmers in Madhya Pradesh, have no tendency to store their produce and sell due to government procurement takes place for entire produce of farmers in the state. Hence, a majority of godowns on rental basis were found in the state. Such types of godowns were found especially in the case of Jabalpur and Seoni districts. During the interaction with the beneficiaries, it was found that the project plan was prepared by some Consultants and the bank managers concentrated more on repaying capacity of the proponent rather than project report. However, a larger godowns were fully utilized in the places where assured irrigation facilities were available. For instance, such godowns are found in Bhopal and part of Jabalpur districts.

b. Optimum utilization

These godowns are of 200 MT to less than 500 MT, wherein the medium and large farmers availed subsidies under GBY to construct godowns with a primary objective of storing their own/ relatives produce for a temporary period of 3-4 months or till the prices are favour or to wait till the next harvest period. Interestingly, none of them aware of a pledge loan facilities and warehouse receipt systems in the state of Madhya Pradesh. This category also includes the godowns constructed with the support of ZPs, APMCs and Cooperative Societies, but were utilized throughout the year for selling agricultural inputs, PDS, farm equipment etc was noticed during field survey of Jabalpur district NCDC godowns.

c. Own use

These godowns are of smaller size (less than 200MT), usually availed by the medium farmers to store their own produce, inputs and other farm equipment. Some of beneficiaries have converted these godowns into other purposes such as a part of residential house, storage of dry and green fodders, cattle shed, commercial shops after the repayment of loans to the bank. Most of the time, these godowns will be utilized for more than ten months in a year.

On the basis of duration of the storage, the godowns are classified into three categories and presented in **Table A.16** and **Figure A.13**. It is noticed from the table that, a highest number of users (50%) stored their produce in the godowns beyond six months, subsequent three to six months (30%) and one to three months(20%).It is found that wheat, and paddy were kept for PDS purpose beyond six months by the government. Since a majority of the godowns rented to the government only to store the procured wheat and paddy under central or state procurement pool.

Table A.16: Storage characteristics of the users

Sl. No	Duration (months)	% of users
1	1 to 3	20.00
2	3 to 6	30.00
3	6 to 12	50.00

Source: Primary data

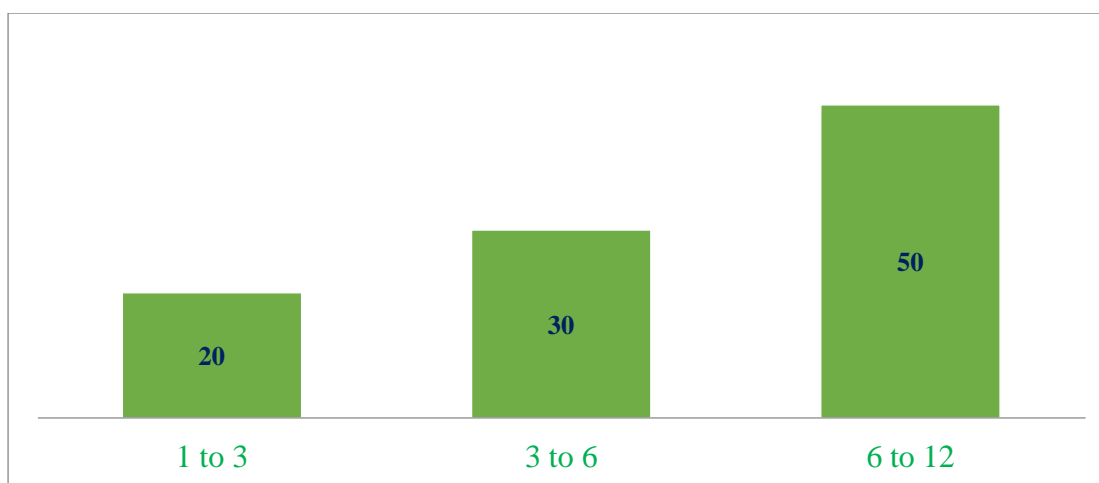


Figure A.13: Duration of produces Stored in Madhya Pradesh (months)

A.12. Economic Benefits obtained from the Godowns

A.12.1. Sale of Agricultural Produce

An attempt was made to verify whether beneficiaries have realized additional prices benefits by keeping their produce in the godowns in the case of Madhya Pradesh and the results are presented in **Table A.17**. The price at which the farmers sold their produce was compared with the prevailing MSP in the agriculture year and actual prices received by the farmers in the same year at open market, to work out the economic benefits, as the farmers of Madhya Pradesh more than 90 percent of wheat and paddy were procured by government and rest of the produce were sold in open market. Whereas, the maize produces were not procured by the government. Hence, a majority of the Madhya Pradesh farmers they store the maize in godowns in sale in later period, provided their economic condition is good. As the farmers of Madhya Pradesh, who sold their produce in open market, unable to recollect the prices during the harvest period. It is noticed that a maximum benefit obtained (12.11% hike) was reflected in the case of maize followed by paddy (4.06%), and Wheat (2.86%). It is worth to note that a majority of the wheat and paddy were sold to the government at MSP and rest of a meager quantity sold in the open market. Hence, economic benefits from these crops were not much reflected in the state. Whereas, a few maize growing farmers were stored for a limited period, they realized better prices than the prices at peak period/ harvest period. This manifestation of positive impact was possible mainly due to the creation of rural godowns under GBY by preventing sales during glut phase of the market. For details of absolute incremental benefits realized by the farmers is presented in **Table A.17**.

Table A.17: Crop-wise Economic Benefits obtained from the Godowns (Rs. /Qtl)

SI No.	Crops	Minimum Support Price (MSP)	Actual Price Received by the Farmer After Storage Period	Incremental Benefits due to GBY	
				Rs/Qtl)	Percentage
1	Paddy	1750	1821	71	4.06
2	Maize	1700	1912	212	12.11
3	Wheat	1840	1890	50	2.86

Source: Primary data

A.12.2. Employment Generation due to the Rural Godowns

Further, due to the establishment of rural godowns, the beneficiaries have been contributing in the form of employment generation in the form of hiring labour for a security, loading and unloading, management of the godowns etc. The rate of employment generation was worked out based on the size of the godowns and presented in **Table A.18**. It is noticed that on an average, a less than 500MT godowns have generated 95 man-days of permanent and 250 man-days of casual labours were engaged for entire year; more than 500 to 1000MT godowns have generated about 458 man-days of permanent and 450 man-days of casual labours were engaged for entire year. Similarly, in the case of more than 1000MT to 2000MT godowns, the employment generation is about 1180 man-days of permanent and 900 man-days of casual labours were engaged for a year. It is noticed that higher the capacity of the godowns, better will be the infrastructure and skill level of workforce.

Table A.18: Employment Generation due to the Rural Godowns

Sl. No.	Details	<500 MT	>500 to 1000 MT	>1001 to 2000 MT
Permanent Worker				
1	Average No. of workers/godowns	-	2	3
2	No. of work days	360	360	360
3	No. of working hours	2	10	8
4	No. of Man-days	95	458	1180
Casual Worker				
1	No. of Man-days	250	450	900

Source: Primary data

A.13. Perception of the stakeholders

In this section, we have made an attempt to collect the information from the beneficiaries as well as the users of the godowns on different aspects of agricultural produce storage and their benefits as follows:

A.13.1. Reasons for Immediate Sale by the farmers

It can be seen from the **Table A.19**, the reasons for immediate sale/ distress sale by the farmers, as it is a common phenomenon noticed across the state. It is found that about 70 per cent of the farmers sold their produce as soon as the harvest to meet the immediate requirements, like to repay the loan, purchase of inputs (seeds, fertilizers, pesticides, equipment), family functions such as festivals, marriages, children education fee etc. In many cases, they will be repaying the amount already spent on the same purposes in the last season or for the next season. Not aware of the pledge loan facility was the next important reason specified by the 25 per cent of the farmers. However, about 15per cent, expressed that there is no storage facility to store their produce was the reason for immediate sale. More importantly, about 10 per cent farmers also expressed their misconception that the storage reduces the weight in the later stages. They explained that because of the thresher harvest, immediate sale helps to gain advantages of weight because of the higher moisture content, the seller may reduce a meagre value for the same.

Table A.19: Reasons for Immediate Sale by the farmers

Sl. No.	Reasons	Percentage
1	To meet the immediate requirements (purchase of inputs, family expenses, to clear the debts with the formal or informal sources)	50.00
2	No storage facilities	15.00
3	Not aware of pledge loans	25.00
4	Storage reduces the weight	10.00

Source: Primary data

A.13.2. Level of Awareness on the Benefits of Scientific Storage of Agricultural produces

To understand the awareness level of the farmers and beneficiaries on the benefits of scientific storage of agricultural produce, a few questions were posed to the farmers and their responses are displayed in **Table A.20**. It is very clear from the results that more than 50 per cent of the farmers were aware that the scientific storage helps to get a better price in the later stages, protect

the farm produce from pest and diseases attack (40%) scientifically and avoids wastage (10%). Although, they knew that immediate sale of produce is a distress sale, farmers are selling immediately to overcome from the immediate financial requirements.

Table A.20: Level of Awareness on the Benefits of Scientific Storage of Agricultural produces

Sl. No.	Benefits	Percentage
1	To avail better price	50.00
2	Protection from pest and rodents attack	40.00
3	To avoid wastages	10.00

Source: Primary data

A.13.3. Types of storage structure used to store the produce

Information on traditional storage methods were also collected from the farmers and beneficiaries to understand the methods of storages in the earlier stage/ practice which they are following in their house and their status as on today. It is seen from **Table A.21** that a more than 40 per cent of the farmers store their produces in small rooms inside the residential houses. Further, about 30 per cent stored their produce in the Wood/bamboo structures, about 20 per cent expressed that they store their produce in Kothis and 5 per cent each of the farmers stored their produces in Mud structure, bins, gunny bags, or containers. A majority of the farmers were also expressed that, till today there are using these storage structures to store agricultural produce kept for own consumption. From this we can conclude that a majority farmer household are storing the produce in the traditional structures only due to non-availability of scientific storage structures in the rural areas. Whereas, in recent days a very few farmers storing their agriculture produce in scientific warehouses.

Table A.21: Information on Types of storage structure used to store the produce

Sl. No	Storage Structure	Percentage
1	Mud structure	5.00
2	Wood/bamboo	30.00
3	Small Rooms	40.00
4	Kothis	20.00
6	Any others (Bags)	5.00

Source: Primary data

A.13.4. Perception of farmers on advantages of Godowns vis-a-vis Traditional storages

Perception on scientific storage versus traditional practices were collected from the farmers and beneficiaries and the results are expressed in **Table A.22**. It is observed that a highest number of farmers (about 47%) expressed that there will be no wastage in the godowns followed by scientific storage in godowns reduces the losses from the pests/ rodents/ birds/ moisture to an extent of 26.67 per cent as compared to the traditional storage structures. About 11 per cent of the farmers stated that there is no pilferage and availability of insurance. However, more than seven per cent farmers appreciated the godowns for the reasons of quality maintained.

Table A.22: Perception of storage users on advantage of Godowns v/s Traditional storage practices

Sl. No.	Particulars	Percentage	Increase or Decrease (%)
1	Quality maintained	5.00	18.00
2	Reduced losses from pests/ rodents/ birds/ moisture etc.	26.67	52.00
3	No wastage	46.67	85.00
4	No pilferage (stealing)	11.00	90.00
5	Insurance facility	10.66	10.00

Source: Primary data;

A.13.5. Additional services provided by the godown owners to the users

It can be seen from the **Table A.23**, the addition services provided by the godowns owners to the farmers. A majority of the farmers availed the benefits of marketing service facilitated by the godown owners which is about 40 per cent, followed by good services such as loading and unloading/payments relaxation etc (30 %) and rest of 30 per cent of the farmers availed the benefits of market price information facilitated by the godown owners in the Madhya Pradesh.

Table A.23: Additional services provided by the godown owners to the users

Sl. No	Particulars	Percentage
1	Market price information	30.00
2	Advice on marketing	40.00
3	Good services (loading/unloading/payment relaxation etc)	30.00

Source: Primary data

A.13.6. Constraints expressed by the beneficiaries of the GBY Scheme

The owners of the godowns were asked to enlist the issues or constraints faced and suggestions for improvement of the GBY scheme as per their opinions. Accordingly, we have categorized and discussed the constraints and suggestions in **Tables A.24**. Table explains the constraints of the owners/beneficiaries of the GBY in obtaining the benefits of the scheme and management of the godowns. It discloses that a lack of assistance from local administration (54.64%) followed by requirement of large capital (50%), problems in land conversion (45.36%), lack of demand by users (41%), maintenance problem (35%), inadequate technical supervision (33%), non-availability of skilled manpower (32%), high cost of fumigation (25%), lack of awareness(22%) risk of damage (about 20%), high rate of interest, paucity of working capital and deterioration in quality and quantity were the issues as expressed by 10 to 15 per cent of the farmers. From these issues, it is understood that the owners of the godowns require a lot more than the subsidy from the government to manage plenty, and to facilitate farmers to avoid the distress sales.

Table A.24: Constraints expressed by the beneficiaries of the GBY Scheme

Sl. No	Particulars	Percent of Owners
I	Financial constraints	
1	High cost of fumigation	25.00
2	High rate of interest	15.00
3	Paucity of working capital	10.00
4	Requirement of large capital	50.00
II	Technical constraints	
1	Non-availability of skilled manpower	32.00
2	Inadequate technical supervision	33.00
3	Maintenance problem	35.00
III	General constraints	
1	Lack of demand by users	41.00
2	Lack of awareness	22.45
4	Risk of damage	20.25
5	Deterioration in quality and quantity	10.30
	Administration constraints	6.00
IV	Any others (Specify)	
1	Problems in land conversion	45.36
2	Lack of assistance from local administration	54.64

Source: Primary data

A.13.7. Suggestions provided by the beneficiaries of GBY

On the other hand, a few suggestions were reported by the owners of the godowns are presented in **Table A.25**. A highest proportion of farmers (61%) suggested for educating the beneficiaries

on the pledge loan facilities and their easy arrangement from the banks is an immediate requirement, followed by the increment in the volume of loan amount (13.75%), awareness on benefits of scientific godowns among the farming community (11.25%), Procurement of wheat by Government at MSP price (5.50%), and development of proper infrastructure facilities (8.50%) were the suggestions expressed by the beneficiaries in the Madhya Pradesh. These issues seem to be relevant and needs immediate attention of the policy makers and bureaucratic to take away the farmers from distress sale and to double the farmers income in the near future.

Table A.25: Suggestions provided by the beneficiaries of GBY

Sl. No.	Particulars	Percent of Owners
1	Increment in the volume of loan amount	13.75
2	Awareness on benefits of Godowns among farmers	11.25
3	Procurement of wheat by Government on MSP	5.50
4	Development of proper infrastructure facilities	8.50
5	Education on Pledge loan facilities	61

Source: Primary data

A.14. Pros and Cons in Implementation of the RGS/ GBY in Madhya Pradesh

The main objectives of the scheme include creation of scientific storage capacity with allied facilities in the rural areas to meet the requirements of farmers for storing farm produce, processed farm produce, and agricultural inputs. It is clear from the above description that due to various factors; farmers are selling off their produce right after the harvest to the Mandis / open market, a State government procurement agency, and hence they are assured of MSP for their produce. In this context, with the central support the RGS has been introduced in the state. In this section, authors have made an objective-wise critical appreciation of the scheme in the state of Madhya Pradesh as follows:

A.14.1. Extent of coverage and capacity utilization of the godowns

It is noticed that out of the total capacity of storage space created under GBY, Jabalpur, Hoshangabad, Harda, Dewas, Sehore, Vidisha and Indore were the top eight districts, which occupied more than half (45%) of the storage created, mainly due to the cropping pattern, higher productivity, assured irrigation facilities and consequent demand for storage space by various agencies. It was observed that in districts with a paddy, wheat and maize were a major cropping pattern, the demand for storage space was highest, followed by the wheat and tobacco cropping

pattern in the districts, while the demand was lowest in the districts of green pea belt. This might be due to procurement of paddy and wheat for central pool, in contradictory to other crops. Overall, it appears that the projects under GBY were distributed on demand driven basis in the Madhya Pradesh.

With reference to the utilization of the storage capacity created under GBY in the state, the entire storage capacity has been utilized fully round the year (excluding maintenance period for about 30 to 45 days after lifting of produces) by the FCI and its associated agencies for storing agricultural produce, primarily wheat and paddy, which reflected the adequacy of storage space in the state as on date. In spite this Madhya Pradesh being a third a largest producer of paddy and wheat after Punjab and Haryana and with a storage space, none of the farmers have used their godowns for their own usage. With a declining demand for rice and wheat from the Central Pool because of the increasing productivity and self-sufficiency of member States, the shelf-period of rice and wheat is increasing in Madhya Pradesh godowns, thereby leading to shortage of storage space temporarily and increased post-harvest losses.

A.14.2. Constraints in implementation and performance of GBY

Although the implementation of the scheme of RGS/GBY has registered a significant success, it has been observed during the field work that there were some constraints which have negatively influenced the success of the program are the requirement of a high capital investment, and lack of participation of medium and SC/ST farmers.

As revealed by the beneficiaries, a high capital investment is a major constraint for participation in the GBY as the procurement agencies demand for large capacity godowns in the state. Hence, it also is a problem for the SC/ST farmers to participate in the program due to low investment capacity and social obligations. As an alternative measure, instead of providing benefits to the individuals, the government may consider the groups and associations with a higher incentive.

A.14.3. Extent of participation of beneficiaries

As prescribed in the guidelines, all the categories of beneficiaries have found to be participated in the GBY. However, the extent of participation from the individuals and cooperatives together

was much higher (about 90%) than the participation from other sections of the society. Looking into their landholding pattern, it is observed that a majority of them were belonged to the category of large farmers. Although, one of the objectives of the scheme is to preventing the distress sale, due to procurement from the Government at MSPs more than 90 per cent of their produces and rest of produces were sold in open market after at remunerative price. Hence, the question of distress sale was not arisen in the state of Madhya Pradesh. However, the state should explore avenues to encourage farmers to sell their produce at the remunerative price and avoid the depending on MSP in long run.

A.14.4. Overall performance of the scheme

Rural godown scheme plays a vital role in promoting agriculture marketing, rural banking and financing and ensuring food security in the state as well as in the country. It enables the markets to ease the pressure during harvest season and to maintain supply of agricultural commodities during off season. Thereby, it resolves the problems of glut and scarcity, which are the major problems in agricultural marketing. Though warehousing is an independent economic activity, yet is closely linked with production, consumption and trade. In this regard, the implementation of the Rural Godown Scheme by the Government of India was a successful attempt towards helping the farmers to avoid distress sale, and to enhance their income level and livelihood. In this section, we have made an attempt to explain the performance of the scheme is as follows:

- **Promotion of grading, standardization and quality control of agricultural produce to improve their marketability:** Field survey in Madhya Pradesh was conducted in three different districts representing high, medium and low performance of RGS in the state. No grading, standardization and quality control of agricultural produce was observed in the state. Most of the storage space created was rented out or leased out for the central or state procurement agencies.
- **Prevention of distress sale immediately after harvest by providing the facility of pledge financing and marketing credit:** General norm observed during the field survey is that all farmers sell their produce at MSP to the state procurement agencies (MPSW) and hence, no distress sale was noticed during the field survey and farmers are also not expressed the same. However, there were also no instances of pledge loan obtained.
- **Strengthen agricultural marketing infrastructure in the country by paving the way for the introduction of a National System of Warehouse Receipts in respect of agricultural**

commodities stored in such godowns: Madhya Pradesh has a Third-highest storage space created in the country. However, according to Warehouse Development and Regulatory Authority (WDRA), none of the godowns registered with WDRA. The gulf between actual storage capacity created is might be due to limited utility of the provision because of the government procurement.

- **Demand and supply of storage capacity created under GBY:** The total storage capacity created under the GBY along with other agencies were 15098 thousand MT in Madhya Pradesh (covered 53 districts). On an average, each godown capacity works out to be above 2000 MT (**Table A.26**). To cater the state level production of foodgrains at about 33450thousand MT (as per 2018-19 data), the storage space created since inception of the scheme could able to accommodate only about 45 per cent of the total production in Madhya Pradesh. Considering the marketable surplus to an extent of 75 to 90 per cent of the production, the gap about 55 per cent is exposed to post harvest management issues, underlining a significance of creation of suitable storage space in the state.

Table A.26: District-wise Demand and Supply of Storage Capacity in Madhya Pradesh

Total storage Capacity in 000 MT tons	Total Foodgrain Production (000 tons)	Storage Gap for food grain (000 tons)	Demand for storage (%)
15098	33450	18352	54.86

Source: NABARD, FCI and DMI

A.15. Summary and Conclusion

Post-harvest management plays an important role in the production and marketing as the considerable quantity of the valuable produce is lost every-year due to improper post-harvest management. Therefore, crisis in food availability is not only caused by the natural disasters, but also by absolute lack of post-harvest management. With this background the introduction of GBY from the Government of India has a high relevance to the country, but also to the individual farmers. In this context, we have analyzed the significance of GBY in Madhya Pradesh, which supports farmers to protect farm produce from the post-harvest losses and consequently avoids distress sale and increase the food security as well in the country. Since, Madhya Pradesh is top one cereal producing state and providing a huge quantity of wheat and paddy to the PDS.

In the context of inadequate economic viability of farmers to construct own godowns, our study examines the status and performance of GBY in Madhya Pradesh. Based on the analysis of both primary, secondary data and field observation, the following observations were drawn:

- The distribution of godowns across the state reflects the nature of the scheme is demand driven and hence, a majority of the godowns were concentrated in intensive agricultural areas such as Jabalpur, Indore, Hoshangabad and Vidisha.
- The average size of the godowns constructed under the scheme works out to be around 3000 MT reflecting the need at a major procurement state Madhya Pradesh. The godowns were larger in size, availed under PEG scheme with a support of GBY, and were rented out to the government for procurement of food grains up to five years period. The rent of the godowns is revised for every 11 months as per the government order.
- Based upon the interactions, it was noticed that the utilization of the godowns founds to suit the local demands and returns are realized at a normal profit.
- As regard to the participation of the beneficiaries in the program, Individuals participation found to be adequate. However, SC/STs, Women, small and marginal farmers' participation was limited, may be due to a huge mandatory margin money.

To conclude, so far, the scheme has created a storage capacity to an extent of about 45 per cent of the foodgrain production in the Madhya Pradesh and helped to reduce the post-harvest losses. However, in view of increasing population, and also the commitment of the state under National Food Security Act, measures have to be taken to enhance the storage availability. At the same time, through preferential subsidy approach, the participation of SC/STs and farmers associations (like FPO/ FPCs) may also be encouraged.



Rural Godown in Madhya Pradesh



Interacting with beneficiary of GBY in Madhya Pradesh



Field investigator interacting with farmer in Madhya Pradesh



Interacting with beneficiary of GBY in Madhya Pradesh

B. HARYANA

B.1. Overview of Agriculture in Haryana

Haryana State formed in 1966 on 1st November on the political map of India. Geographically, the state is bounded by the Shiwalik hills in the north, the Aravali hills in the south, Yamuna river in the east and the Thar-desert in the west. It has 44.2 lakh hectares of land, which is 1.34 per cent of the total geographical area of the country. The average height ranges from 700 to 950 feet above sea-level. The climate of the State varies from arid, semi-arid and humid with annual average rainfall of 617 mm (<http://www.rainwaterharvesting.org/urban/rainfall.htm>). The State receives a major rainfall during July to September. A comprehensive review of history of the agriculture has been encoded in Haryana State Gazetteer Volume II. Agriculture and animal husbandry are always been the mainstay of its economy through the ages. The State surrounds National Capital from three sides. Over 35 per cent of the State's area falls in National Capital Region. It is located near to International Airport, which is an additional advantage, as it enhances the reach to domestic and global markets.

Haryana is often called as the “**Food Mine**” of the country. About 80 per cent of the population of the state, directly or indirectly is dependent on agriculture. Haryana is self-sufficient in producing food grains and is also a major contributor of foodgrains in meeting the needs of other States of the country. The world-famous Basmati Rice is produced here in abundance. The major cereals produced in the state include wheat, rice, maize and *bajra*. The crop production of Haryana can be broadly divided into *Rabi* and *Kharif*. The main *kharif* crops in the state include sugarcane, groundnut, maize, and paddy etc. The minor *kharif* crops are chillies, bajra, jawar, pulses and vegetables. The north western part of the State is suitable for the cultivation of rice, wheat, vegetables and temperate fruits, and the south-western part is suitable for a high-quality agricultural produce, tropical fruits, exotic vegetables, and herbal and medicinal plants. Based on the ecology and cropping pattern, the state is delineated (**Table B.1**) into the following three zones. These zones have their own strengths and weaknesses. Accordingly, the farming systems and cropping systems have emerged. The major cropping systems followed in the State are rice-wheat, *bajra*-wheat, cotton-wheat, and sugarcane-wheat. The gross cropped area in the state was 65.05 lakh hectares. About 3.069 m ha (84% of the cultivated area) was irrigated and the cropping intensity had been over 184 per cent (**Table B.2**). The State is a second largest contributor to the central foodgrains pool and a largest exporter of *basmati* rice.

Table B.1: Different Agricultural Zones of Haryana

Zone	Districts	Area %	Agricultural production options
I	Panchkula, Ambala, Kurukshetra, Yamunanagar, Karnal, Kaithal, Panipat and Sonapat	32.00	Wheat, rice, sugarcane, maize, cows, buffaloes, and poultry
II	Sirsa, Fatehabad, Hisar, Jind, Rohtak, Faridabad and Palwal	39.00	Wheat, cotton, rice, sugarcane, bajra, buffaloes, cows and poultry
III	Bhiwani, Mahendergarh, Mewat area, Rewari, Jhajjar, Gurgaon and Mewat	29 .00	Pearl millet, is also suitable for agro-forestry, sheep and goat rearing rapeseed & mustard.

Source: agriharyana.nic.in

The agricultural initiatives by the State have brought significant economic benefits to the farmers. They have also helped to bring down rural poverty. Most importantly, the state has played a very significant role and helped the country to achieve self-sufficiency in food production. Green Revolution has helped Haryana to become a role model of success stories in post-independent India. Agriculture plays a vital role in economic development as it still contributes 16.70 per cent to the State GDP and employs 51 per cent of the workforce. Therefore, strengthening agricultural research, education and extension as well as ensuring adequate availability of irrigation water, timely supply of essential inputs and dissemination of improved technologies to the farmers and other stakeholders have always been a major concern of the State. The strenuous pursuits of the Government to support the farmers have resulted in an agricultural revolution in the State.

The farmers have harnessed benefits of advanced technologies in the State. The impact of initiatives of the Government can be viewed in terms of quantum jump in food grains production, which was merely 25.92 lakh tons at the time of inception of the State. It touched 183.42 lakh tons during 2011-12. The average productivity of total foodgrains has reached 35.27 q/ha as against 19.2 q/ha at the country level. This increase in production is mainly due to the contribution of principal crops *viz.*, rice, wheat and *bajra*. The state enjoys a first position in the production of *basmati* rice and also in the productivity of wheat (51.8 q/ha), pearl millet (20.4 q/ha) and rapeseed & mustard (18.8 q/ha). The State has achieved a high productivity/production of fish (5,500kg/ha), mushroom (6.07 kg/tray productivity or 8000 tons production), honey (2500 tons production with 15% growth/annum), fruits (3.5 tons/ha), vegetables (13.42 q/ha), etc. Similarly, livestock productivity has increased several times. Haryana can legitimately claim to be the pioneer in adoption of sprinkler irrigation technology. Area under irrigation is estimated at 84 per cent. Haryana is a second largest contributor of food grains to the Central

Pool. About 60 per cent of the total export of *basmati* rice is contributed by the State alone. The total food grains productivity in the State is 1.8 times a higher than the average at the country level. During 2011-12, the increase in productivity of paddy, wheat, barley, maize, *bajra*, *rabi* oilseeds, gram, cotton, and sugarcane were achieved by 2.6, 3.5, 2.7, 2.6, 4.8, 3.4, 1.8, 2.7, and 21.4 times respectively, over the year 1966-67 (Table B.3).

Table B.2: Haryana Agriculture at Glance

1.	Geographical area ('000' ha.)	4421
2.	Area under forests ('000' ha.)	41
3.	Percent Forest	0.90
4.	Cultivable area ('000' ha.)	3676
5.	Percent Cultivable area (%)	83.10
6.	Net Area Sown ('000' ha.)	3520
7.	Percent Net area sown (%)	95.70
8.	Area sown more than once ('000' ha.)	2982
9.	Gross cropped area ('000' ha.)	6502
10.	Cropping Intensity (%)	184.7
11.	Net area irrigated (Total) ('000' ha.)	2974
12.	a) By canals	1153 (38.8%)
	b) Tube-wells	1821 (61.2%)
	Gross irrigated area ('000' ha.)	5763
13.	Intensity of irrigation (%)	193.8
14.	Percent net irrigated sown area (%)	84.50
15.	Fertilizer consumption (kgs/ha.) (2014-15)	205
16.	Average rainfall (mm.) (2015)	456.3
17.	Range of Rainfall (mm.) 2015	158-869.6
18.	No. of holdings (Total) (in lakh)	16.17
19.	a) Marginal farmers (in lakh) (Up to 1 ha.)	7.78 (48.1%)
	b) Small farmers (in lakh) (1-2 ha.)	3.15 (19.5%)
	c) Others (in lakh) (Above 2 ha.)	5.24 (32.4%)
	Food grains Prod.2016-17 (Lakh Tonnes)(Kharif-54.94+Rabi-125.06)	180.00
20.	Procurement (Lakh Tonnes)(Wheat- 67.54+Paddy-42.59) (2015-16)	110.13
21.	GSVA (Current Prices) Agriculture and allied 2016-	17 4.9% (Tent.)
22.	No. of tube wells (Lakh)	8.12
23.	No. of tractors (Lakh)	2.79
24.	No. of biogas plants	59767
25.	No. of Sprinkler sets	1,167
26.	No. of Soil Testing Laboratories	34+ 3 mobile
27.	No. Soil Sample annual analysis (in lakhs)	4.50
28.	Purchasing Centers in the State	
	i) Principal yards	106
	ii)Sub Yards	178
	iii)Purchase Centers	192

Source: http://agriharyana.gov.in/assets/images/whatsnew/Vital_Of_Statistics_2016-17_dted_7-8-2017.pdf

The rice-wheat rotation, became a most preferred cropping system, which eliminated a many of the cropping patterns, due to its comparative economic advantages, assured marketing and comparatively stable productivity levels. Rice-wheat cropping system continues to occupy more than 58 per cent of the gross area in the State. The Green Revolution was beneficial in the initial years for the State, but it is a labour and input intensive. However, the farmers are hesitant to adopt the diversification in agriculture because of the marketing problems, and therefore, the options are limited to enhance the profitability. The sharp decline in net farm profitability is due to an increase in the cost of cultivation, particularly due to an increased cost of inputs, machines, and shortage of labor. During the last ten years, the cost of production per quintal of major crops has increased by over 2.5 times.

Table B.3: Productivity Status of Major Crops

Crops	Productivity Status (Kg/ha) Increase		%	Fold over
	1966-67	2011-12		
Paddy	1161	3044	262	2.6
Wheat	1459	5182	355	3.5
Barely	1313	3633	276	2.7
Maize	988	2666	269	2.6
<i>Bajra</i> (pearl millet)	418	2040	488	4.8
<i>Rabi</i> oilseeds	404	1396	345	3.4
Gram (chickpea)	500	911	182	1.8
Cotton	268	739	275	2.7
Sugarcane	3408	73253	2149	21.4

Source: [agriharyana.nic.in/Stat Info/Nine%20Patti.doc](http://agriharyana.nic.in/Stat%20Info/Nine%20Patti.doc)

B.2. Status of Agricultural Marketing in Haryana

The Agricultural produce in Haryana is being regulated under the Punjab Agricultural Produce Markets Act, 1961. The primary objective of Haryana Marketing Board and Market Committees is to establish modern Markets for efficient marketing of agricultural produce by providing modern facilities in the mandis and to enforce the provisions of the Act, Rules and Bye-laws framed there under. Board is a body corporate as well as a local authority by the name of the State Agricultural Marketing Board having perpetual succession and a common seal, and shall by the said name sue and be sued, and shall, subject to the provisions of this Act, Whereas Market Committees are to enforce the provisions of this Act and the rules and the bye-laws made there under in the notified market area and, when so required by the Board, to establish a market

therein providing such facilities for persons visiting in connection with the purchase, sale, storage, weighing and processing of Agricultural produce concerned as the Board may from time to time direct to control and regulate the admission to the market, to determine the conditions for the use of the market and to prosecute or confiscate the agricultural produce belonging to person trading without a valid license. The Board may from time to time direct these market committees to control and regulate the admission to the markets Market Committees are service rendering agencies and their main source of income is market fee. There are in total 107 Market Committees all over Haryana, with 107 principal market yards (Mandis) and 174 of sub-yards and 195 purchase centers, 33 fruit & vegetable mandis, 25 Fodder mandis and 107 Grain Markets.

A strong and efficient marketing infrastructure is required to ensure efficient functioning of the modern marketing systems and the state of Haryana has been successful in creation of such infrastructure. Haryana State Co-operative Supply and Marketing Federation Limited (HAFED), and Haryana State Warehousing Corporation are the two major units of the State government which governs the agricultural marketing in the state. The Haryana State Warehousing Corporation has 107 warehouses across the State.

Haryana produces more than 10 million tonnes of food grains with a surplus of both in Wheat and Paddy. In view of surplus production, the Government of Haryana has established the Haryana State Cooperative Supply & Marketing Federation Limited (HAFED), in 1966. HAFED is the largest apex cooperative federation of Haryana and it has been established with the following objectives:

- To ensure that farmers get remunerative prices for their produce and do not have to resort to distress sale,
- To service the TPDS and other welfare schemes of the Government so that subsidized food-grains are supplied to the poor and needy,
- To build up buffer stocks of food-grains to ensure food-grain security.

B.2.1. HAFED

HAFED is a largest Apex Cooperative Federation of Haryana State in India. It came into existence on November 1st 1966 with a formation of Haryana as a separate State. Since then, it is

playing a leading role in serving the farmers of the State as well as customers in India and overseas by providing hygienic and safe quality consumer products. HAFED is one of the State procuring agencies for procurement of foodgrains for Central Pool, with a largest share among all the procuring agencies. Haryana produces more than 10 million tonnes of foodgrains with a surplus both in terms of wheat and paddy. HAFED is involved in procurement of wheat, paddy, mustard seeds, barley, and bajra on MSP. At present there is a network of 367 mandis/ purchase centers in the state. However, as per the need, the new mandi/ purchase centers can be opened in the case of basic amenities are provided by the Haryana State Agricultural Marketing Board and fulfilling the norms prescribed by the Food and Civil Supplies Department.

HAFED Procurement Details

HAFED procures Basmati as well as Non-basmati paddy. It has 11 Rice Mills situated at various places in Haryana. Some of the purchases were made on commercial lines for domestic sale as well as for exports, if any. Most of the paddy is, however, purchased at MSP for Central Pool and delivered as custom milled rice to FCI as per the Government of India scheme. To improve the profitability of Rice Mills, HAFED has been making efforts to run them in association with a private party. However, its Rice Mill at Taraori is being run by the HAFED at its own. The purchases and turnover details of paddy along with wheat during the last five years are given in **Table B.4**.

Table B.4: Procurement Details of Wheat and Paddy by HAFED

Year	Wheat			Paddy		
	Share allotted (%)	Share procured (%)	Qty procured (lakh MT)	Share allotted (%)	Share procured (%)	Qty procured (lakh MT)
2014-15	30.00	39.00	25.18	31.00	33.00	9.85
2015-16	40.00	43.69	29.55	35.00	36.00	15.15
2016-17	33.00	37.35	25.12	33.00	35.00	18.42
2017-18	33.00	36.19	26.84	33.00	33.00	19.38
2018-19	40.00	40.43	35.28	40.00	31.00	18.06
2019-20	40.00	42.00	39.18	-	-	-

Source: HAFED

For Bajra, the Government of India has fixed the Minimum Support Price (MSP) of Fair Average Quality (FAQ) @ Rs. 1950/- per quintal and the details of procurement by HAFED on MSP during the last five years are given in **Table B.5**. It is observed from the table that the HAFED is also the State agency for procurement of Oil Seeds and Pulses such as Mustard and Sunflower Seeds, and Grams, respectively, on behalf of NAFED under Price Support Scheme.

Table B.5: Procurement of Bajra and Oil Seeds by HAFED

Year	Mustard Seed (In LMT)	Sunflower Seed (In MT)	Bajra Qty Procured (In MT)
2014-15	-	3,814	-
2015-16	-	4,162	4,352
2016-17	-	4,785	6,039
2017-18	0.37	8,459	25,114
2018-19	2.35	4,926	95,920
2019-20	5.19	7,106	-

Source: HAFED

B.2.2. Haryana State Warehousing Corporation (HSWC) Procurement details

Haryana State Warehousing Corporation (HSWC) came into existence on 1/11/1967. It was carved out from erstwhile Punjab Warehousing Corporation. It is a statutory body created under an Act of Parliament with twin objective of providing scientific storage facilities for a wide range of agricultural produce and notified commodities to the farmers, Government agencies, Public Enterprises, traders, etc. and to make available credit against goods deposited in the warehouses.

HSWC Procurement details

HSWC Procures wheat, paddy, and bajra for central pool as per the direction issued by the Government of India/ State Government from time to time. It started with procuring only two items i.e. wheat and paddy w.e.f. 1983-84 and 1997-98, respectively (**Table B.6**). The procurement under Price Support is taken up mainly to ensure remunerative prices to the farmers for their produce, which works as an incentive for achieving a better production.

In the recent past, for the purpose of Central Pool, FCI procured about 3,40,963 MT of Rice in Kharif season of 2019-20 and has plans to procure about 93,20,866 MT of wheat in Rabi season of 2019-20 (**Source:** FCI). To procure these huge quantities of food grains, the assistance of various agencies has been engaged by the FCI as listed in **Table B.7**.

Procurement Prices of Food Grains

The State Government has extended price support to wheat, paddy and bajra through the State Procuring Agencies like HAFED and the Food Corporation of India (FCI). All the foodgrains

conforming to the prescribed specifications offered for sale at specified market yards (mandis), and purchase centers are bought by the procurement agencies at the Minimum Support Price (MSP). Food-grains procured by the State Agencies with a commission @ 2.5 per cent of MSP, are ultimately taken over by the FCI for distribution throughout the country. The farmers have the option to sell their produce to State Agencies/ FCI at MSP or in the open market. The wheat procurement is done for the central pool on behalf of the FCI. Procurement during the last few years is given in **Table B.7**. Similarly, for paddy, HAFED procures both specialty rice like basmati as well as Non-basmati varieties at support price for the central pool, and deliver it as Custom Milled Rice (CMR) to FCI as per the Govt. of India scheme. Some of the purchases are made on commercial lines for exports as well. The details of the Minimum Support Prices declared by the Government are given in **Table B.8**.

Table B.6: Procurement by HSWC (in Lakh Metric Tonnes)

Year	Crop	State Procurement	Share allotted to HSWC (%)	No. of HSWC mandis	Procurement by HSWC
2011-12	Wheat	68.85	9.00	61	6.13
	Paddy	29.33	10.00	34	2.31
	Bajra	17.00	10.00	14	3
2012-13	Wheat	86.49	10.00	64	8.24
	Paddy	38.46	10.00	39	3.28
	Bajra	0.00	10.00	13	0
2013-14	Wheat	58.73	10.00	64	5.25
	Paddy	35.75	10.00	40	3.46
	Bajra	0.00	10.00	13	0
2014-15	Wheat	64.97	10.00	66	6.33
	Paddy	29.77	11.00	42	2.45
	Bajra	0.00	11.00	14	0
2015-16	Wheat	67.54	15.00	93	11.07
	Paddy	42.59	11.00	49	3.74
	Bajra	5.05	10.00	7	0.54
2016-17	Wheat	67.30	12.00	106	11.22
	Paddy	53.30	12.00	49	5.7
	Bajra	6.65	--	7	0.33
2017-18	Wheat	74.10	12.00	102	13.49
	Paddy	59.17	12.00	51	6.65
	Bajra	31.39	10.00	7	2.3
2018-19	Wheat	87.26	15.00	110	15.54
	Paddy	58.64	15.00	62	7.96
	Bajra	183.11	--	44	87.19
2019-20	Wheat	93.05	15.00	111	16.53
	Paddy	63.12	18.00	66	9.45
	Bajra	287.10	--	60	117.6

Source: HSWC web page

Table B.7: Agency wise procurement of food grains in Haryana for FCI (in MT) as on 31.11.2019

Sl. No.	Agency	Paddy (KMS 2018-19)	Paddy (KMS 2019-20)	Wheat (RMS 2019-20)
1	FCI	18022	4725	1133971
2	DFSC	3262545	3487146	2767391
3	HAFED	180661	1980794	3906194
5	HSWC	796074	934321	1513310
Total		5883202	6406986	9320866

Note: KMS- Kharif Marketing Scheme, RMS- Rabi Marketing Scheme;
Source: HAFED

Table B.8: MSP of Foodgrains (in Rs.)

Commodity	Common Variety	Grade A
Paddy (KMS 18-19)	1750	1770
Paddy (KMS 19-20)	1815	1835
Wheat (RMS 18-19)	1735	
Wheat (RMS 19-20)	1840	
Coarse Grains	Jowar (Hybrid)	2550
	Jowar (Maldandi)	2570
	Bajra	2000
	Maize	1760
	Ragi	3150
	Barley	1440
	Gram	4620
	Masoor (Lentil)	4475
	Rapseed / Mustard	4200
	Sunflower	4945

Source: HAFED

B.3. Marketed/ Marketable Surplus in Haryana

Keeping in view the above discussion, an effort was made to collect the marketed surplus ratios for the major crops grown in the state of Haryana and presented in **Table B.9**. It is observed that

from Table 11 that the marketed surplus ratio for foodgrains ranges from 70 to 90 percent as per the 2012-13 to 2014-15 figures as per DES, GOI. Whereas, the ratio was ranges from 90 to 98 per cent for oilseeds. The commercial crops like sugarcane the ratio was records a significant swing from 64 per cent to 100 per cent.

Table B.9: Marketed surplus ratios of major crops in Haryana

Details of crops	Marketed surplus ratios		
	2012-13	2013-14	2014-15
Food grains			
Rice	93.47	93.87	98.61
Wheat	83.98	70.14	80.69
Bajra	91.71	86.15	89.89
Oilseeds			
Rapeseed and mustard	93.64	97.52	90.21
Cotton	99.05	98.96	98.36
Sugarcane	100.00	64.00	-

Note: Average MSP is calculated for three years i.e., 2012-13, 2013-14 and 2014-15 for marketed surplus ratio;

Source: Directorate of Economic and Statistics, Department of Agriculture, Cooperation and Farmers Welfare, Government of India.

B.3.1. Post-Harvest Losses

Haryana is one of the leading states in the production of various foodgrains in the country. However, the post-harvest losses at various stages in the state work out to be around three to four per cent of the total food production while the proportion is much more in the case of fruits and vegetables. Most of the produce of the farmers is sold as raw materials due to the non-availability of post-harvest technologies in the state. Since there is no database on the state-wise post-harvest losses are available, the results from the study conducted by the Directorate of Marketing Inspection, GoI are extracted and presented in **Table B.10**. The table reveals that the post-harvest losses are higher (3.92%) in the case of Bengal gram and lowest in respect of black gram (0.91%). On an average the post-harvest loss is to an extent of two to four per cent in foodgrains in the state.

Table B.10: Post-Harvest Losses of Different Crops in Haryana (Triennium ending 1998-99)

Crops	Quantity (in 000'tonnes)	%
Paddy	108.85	2.67
Wheat	215.78	2.77
Jowar	0.45	1.25
Bajra	13.61	2.06
Maize	0.65	1.97
Barley	2.4377	2.57
Red gram	0.83	1.98
Bengal gram	13.64	3.92
Green gram	0.11	1.57
Black gram	0.0066	0.91

Source: dmi.gov.in; Abstract of reports on Marketable Surplus and Post-Harvest Losses of Foodgrains in India.

The primary objective of the Rural Godown Scheme is to minimize the post-harvest losses and following are some of the standardized measures undertaken by the Food Corporation of India.

B.3.2.1. Quality Control and Scientific Preservation

The FCI has evolved an extensive and scientific stock preservation system suitable to different regions of the country. An on-going programme sees that both prophylactic (preventive) and curative treatment is done timely and adequately. The grain in storage is continuously scientifically graded, fumigated and aerated by qualified trained and experienced personnel (outsourced through the tender system). The process of foodgrain preservation starts with the arrival of food grains in the godowns. The bags are kept on wooden crates/poly pallets to avoid moisture on contact with the floor. Depending on the quality status and nature of grains, fumigation is carried out to prevent infestation etc. of stocks is done. Chemicals such as Malathion, Deltamethrin etc., are used. Al. Phosphide is used as a rodenticide. Caretakers have informed that there have been no instances of grain damages due to infestation.

B.3.2.2. Cleanliness

During the fieldwork, it was observed at all godowns that due care has been given to the cleanliness. The godowns should be swept regularly at least twice in a week and kept in a neat tidy and hygienic condition. All webs on the wall roof, alleyway & bags should be removed

regularly and bags should be properly brushed and cleaned. No loose grains should lie on the naked floor.

B.3.2.3 Aeration

Proper ventilation in godowns laden with grains helps in maintaining the quality of grains. It is recommended that doors, windows, and ventilators of the godowns should be kept open on clear/dry/sunny days for aeration. Same has been observed during the fieldwork.

B.3.2.4. Separate Storage

As far as possible, it was observed that each commodity was stored in a separate section of the godown.

B.3.2.5. Cover and Plinth Storage

Though Haryana is second place in the country, in terms of storage capacity, due to its significant share of procurement, there is a shortage of covered storage area in the state. The details of storage capacity with different agencies are given in **Table B.11**. It can be seen from **Table B.11** that about 3.33 LMT under CAP is used for storage of grains. It is also noticed from **Table B.12** that damage to the tune of 543 MT in a months' time with the state agencies as compared to FCI, this appears to be a serious concern. Necessary arrangements need to be initiated to prevent these post-harvest losses with a better management.

Table B.11: Details of Ownership of Storage Capacity Created in Haryana

Owning Agency	Covered	CAP (Uncovered)
FCI Owned	7.68	3.33
State Government	5.97	-
CWC	3.35	-
SWC	5.39	-
PEG	33.35	-
PWS	0.15	-
Hired Silo	1.50	-
Total Hired	48.81	3.33
Total Covered	56.49	-
Grant Total	59.82	-

Source: FCI

Table B.12: Position of Damaged Food Grains (in MT) as on 31.10.2019

Sources	Opening Balance as on 01.10.2019	Accrual during the month	Disposed of during the month	Closing Balance as on 31.10.2019
With FCI	0	0	0	0
With State Agencies	1217	935	393	1759

Source: FCI

B.3.2.6. Adoption of Better Technologies

With reference to the procurement of foodgrains and storing the same, till their disbursement to different parts of the country, three factors appear to influence the situation. Viz., a) increasing productivity per unit area, b) increasing production in other states and hence, delay in unloading the godowns, c) ageing of existing godowns. These factors will increase the demand for creation of new storage space. It has been proven that adoption of verticle silos ensure a better quality of grain at less cost per unit and also demands lower space. Accordingly, the State has envisaged creating 3 LMT Silos under Non-VGF mode during phase I. Capacity of 2 LMT is proposed to be transferred from PEG Scheme to Silos, during Phase II. Unsanctioned capacities under PEG scheme will be merged to construct Silos of 50,000 LMT at the following locations under non-VGF model: In phase III, 4.5 LMT capacity to be created for Wheat Silos (FCI, 2016) (Table B.13).

Table B.13: Proposed Silo construction in Haryana (in MT)

Sl. No.	Phase I		Phase II		Phase III	
	Centre	Capacity in MTs	Centre	Capacity in MTs	Centre	Capacity in MTs
1	Bhattu	50,000	Tohana	50,000	Shahabad	50,000
2	Jind	50,000	Jagadhari	50,000	Ambala	1,00,000
3	Panipat	50,000	Rohtak	50,000	Karnal	1,50,000
4	Palwal	50,000	Narwana	50,000	Panipat	50,000
5	Rohtak	50,000			Bhiwani	50,000
6	Sonepat	50,000			Hansi	50,000
	Total	3,00,000		2,00,000		4,50,000

Source: http://fci.gov.in/app/webroot/upload/Storage/Revised%20Action%20Plan%20dated%2014.01.2016_1.pdf

B.4. Methodology of the Study

The present study is done using both secondary and primary data.

B.4.1. Secondary Data Sources

The secondary sources such as Directorate of Economics and Statistics, Government of India, Directorate of Marketing and Inspection (DMI), Faridabad, and NABARD have been referred to collect the data on area and agricultural production of Haryana, number of godowns sanctioned with their capacity of storage, Rural Godowns beneficiary list, location and their addresses etc. In addition, various journals, reports, and guidelines available with the libraries, websites/ search engines were also been used in finalizing the methodology and writing the report.

B.4.2. Primary data collection

To collect the primary information from the beneficiaries of the scheme, users of the godowns, implementing officers of NABARD, Officials of implementing agencies, and bankers, pre-tested separate set of questionnaires have been designed and used to record their feedback with regard to the sources of information on GBY, profile of the users, cropping pattern & their storage methods, usage pattern of the godowns, costs incurred and benefits obtained, issues in availing the loans, constraints in management of the godown, utilization etc., and to record their suggestions for improvement of the scheme. Further, a Focused Group Discussion (FGD) was carried out to extract reliable information from the group of farmers/ users of the godown. The collected primary data from the questionnaires were tabulated and organized for the analysis of the data and inferences were drawn from the evaluation study leading to recommendations and suggestions. Tabular Analysis, CAGR, Cost-Benefit Analysis have used to derive inferences.

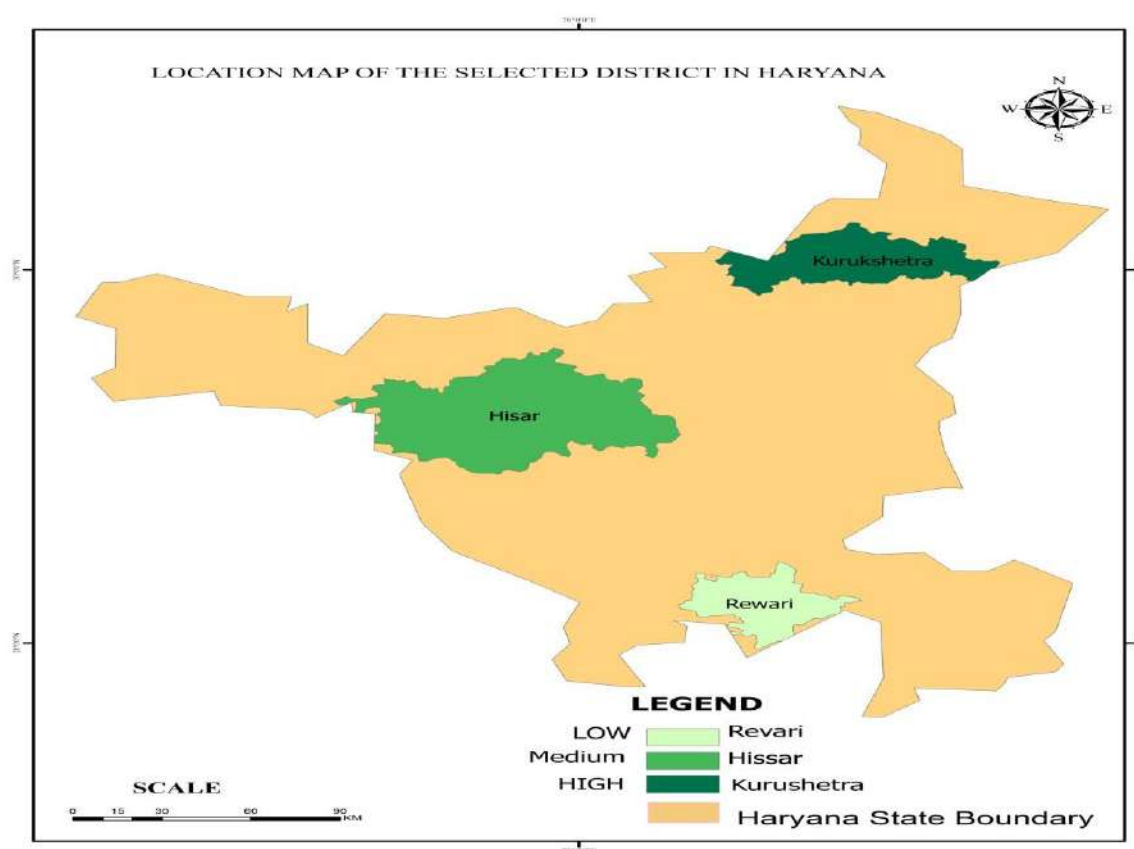
B.4.3. Sampling Method

The district-wise total number of rural godowns sanctioned by the NABARD (till 31st March 2019) in the state of Haryana is a criterion used to select the samples. A list of number of godowns was collected from the State level offices of NABARD with the help of state nodal agency, DMI. The districts are categorized on the basis of number of godowns and their storage capacity in each district. (Due to non-availability of complete data of rural godowns, data pertaining to godowns under control of HAFED were considered). The storage capacity created is used as a yard stick to classify the godowns into three categories such as high performing, medium performing and low performing districts. Within a top five districts in each category, one district was considered as a sample to represent the particular category. Accordingly, the

districts selected for the state of Haryana are Kurukshetra to represent high performing category, followed by Hissar under the medium performing district, and Rewari as a low performing district (**Table B.14**). A brief profile of the sample district is given in the subsequent sections.

Table B.14: Classification of Districts based on the Performances

S.I. No	Particulars	Districts
1	High performing district	Kurukshetra
2	Medium performing	Hissar
3	Low performing	Rewari



B.4.3.1. High Performing District – Kurukshetra

In this category, the number of godowns and their utilization is several times higher as compared to other categories. Farming as the main occupation of the people in the district as 90 per cent of the people are engaged in various agricultural pursuit. Paddy and wheat cycles are predominant cropping pattern in the district. Among commercial crops, sugarcane is an important crop of the district. To supplement the income, dairy farming and cattle rearing is another occupation

adopted by the people which are strengthening economy of the district. Most of the agriculturists are engaged in either dairy farming, poultry farming, pig farming etc., as a side business. The total storage capacity created in the district accounts to 1.33 lakh MT under open system and 1.04 lakh MT under the covered storage, together amounts to a total capacity of 2.36 lakh MT. Tube wells and canal irrigation ensures timely irrigation to the crops and hence, the district is known for its agricultural prosperity.

B.4.3.2. Medium performing District – Hissar

Among the band of districts from the medium performing – Sonapat, Hissar, Jind, and Khaital, Hissar was selected as sampling district. Similar to Kurukshetra, Hissar is also a predominant agricultural district. The district has better irrigation facilities and overall infrastructure. The major crops in the district include wheat, cotton, rice, sugarcane and bajra along with dairy as a subsidiary occupation. The storage capacity created under GBY in the district works out to a total capacity of 2.02 lakh MT with a 1.14 lakh MT capacity under open system and 0.89 lakh MT as a covered.

B.4.3.3. Low performing District – Rewari

Low performing districts of Haryana are Mewat, Ambala, Rewari, Gurugram, Jhajjar, Narnaul, Rohtak, Bhiwani, Yamunanagar, Panipat. Of them, Rewari district was selected as sample district for this category of districts. This district comes under the zone III of the State, wherein the irrigation facilities are poor as compared to the above two districts. The major crops in the district include pearl millet, rapeseed and mustard. The district has about 0.13 lakh MT of storage capacity created under GBY. Of which, a majority (0.10 lakh MT) is under covered capacity.

B.5. Status of GBY in Haryana

A study conducted by the Central Institute for Post-Harvest Management has indicated that about 3.12 per cent of paddy was lost during the post-harvest stage in the trans-genetic plain region (Haryana and Punjab). Similarly, in the case of wheat, the post-harvest losses were reported to be about four per cent. These losses assume significance, as the quantities involved are huge and a country like India cannot afford such a national loss. In this background, the Government of

India has introduced ‘**Gramin Bhandaran Yojana(GBY)**’, a capital investment subsidy scheme for construction/ Renovation/ Expansion of Rural Godowns across the country. The Scheme was introduced in 2001-02 on the recommendations of an Expert Committee constituted by the Department of Agriculture and Cooperation, Ministry of Agriculture, Government of India. The main objectives of the scheme include:

- Creation of scientific storage capacity and thus prevention of distress sale
- Reduction of loss in quantity and quality
- Creation of additional employment opportunities in rural areas
- Assistance in the easy procurement of food grains by FCI and other agencies
- Renovation and up-gradation of existing storage capacity created by co-operatives with the assistance of NCDC
- Encouraging private and co-operative sector investment in the creation of storage infrastructure in the major producing zones and the major consumption zones in the country and
- Reduction in pressure on existing storage facilities with public agencies and co-operatives and reduction in pressure on the transport system in the post-harvest period

B.5.1. Method of Implementation of the Scheme

The scheme was implemented by the Department of Agriculture, Cooperation & Farmers’ Welfare, Government of India in collaboration with the National Bank for Agriculture and Rural Development (NABARD) in the state. The Directorate of Agricultural Marketing and Inspection (DMI), acts as a nodal office for implementing the scheme. The credit linked back-ended subsidy for investment has been followed in the state. The project for the construction of rural godowns under this scheme can be availed by the individuals, farmers, groups of farmers/growers, firms, non-government organizations (NGOs), Self Help Groups (SHGs), companies, corporations, co-operatives, federations and agricultural produce marketing committees in the country. Moreover, the entrepreneur will be free to construct godowns at any place, as per his/her commercial judgment, excepting a condition that it should be under the limits of the Municipal Corporation area. In addition to this scheme, Food Corporation of India has also announced its Private Entrepreneurs Guarantee (PEG) Scheme for creation of storage space in the state by availing subsidy under GBY. Several entrepreneurs have made use of these schemes and have created a

huge storage space in the state. As a result, Haryana is the second position in the country in terms of its storage capacity.

On GoI recommendation, FCI requested the National Institute of Agricultural Extension Management (MANAGE) Hyderabad to assess the storage gaps in the 11th Plan. As per estimates, funds to the tune of about Rs. 4000 crores were required to fulfill the gap as indicated in MANAGE report. Though the FCI owned godowns become valuable assets, as it is easier to make long term strategic planning, affect the changes in this infrastructure with the changing requirements, administrative convenience and flexibility in managing them, and the benefits of value appreciation with a passage of time. But, in view of the inadequate allocation of funds in the 11th plan, it became necessary for FCI to explore the alternative avenues to create such a huge storage capacity. Therefore, the PEG scheme has been formulated to plan for creating additional capacity through private participation and required guidelines were issued for hiring of godowns by FCI in the 11th Plan. This has led to the extensive participation of private sector through amalgamation of PEG and RGS.

(Source: http://fci.gov.in/app2/webroot/upload/Storage/Storage%202008%2024-6-13_eng.pdf).

B.5.2. Creation of Storage Space for Procured Materials

The construction of rural godowns under GBY scheme was used by various categories of beneficiaries such as individuals, farmers, groups of farmers/ growers, firms, non-government organizations (NGOs), Self Help Groups (SHGs), companies, corporations, co-operatives, federations and agricultural produce marketing committees. Moreover, the entrepreneur will be free to construct godown at any place, as per his/her commercial judgment except that it should be outside the limits of the Municipal Corporation area. In addition to this scheme, Food Corporation of India has announced its Private Entrepreneurs Guarantee (PEG) Scheme for creation of storage space in the state. Several entrepreneurs have made use of these schemes and have helped in the creation of huge storage space in the state. As a result, Haryana is the second position in the country in terms of its storage capacity. The information on distribution of district-wise storage capacity created by Open, Covered and Shed storehouse in Haryana is presented in **Table B.15**.

Table B.15: District Wise Capacity Created Since Inception

District	Open Capacity	Covered Capacity	Shed Capacity	Total capacity	% to total Capacity created
Faridabad	1401325	963260	0	2364585	42.72
Sirsa	511350	371393	0	882743	15.95
Karnal	262632	164050	0	426682	7.71
Fatehabad	253473	137317	0	390790	7.06
Kurukshetra	133170	103750	0	236920	4.28
Sonipat	127200	97560	0	224760	4.06
Hissar	113500	89190	0	202690	3.66
Jind	105420	68150		173570	3.14
Kaithal	74400	97700	0	172100	3.11
Panipat	63600	40500	0	104100	1.88
Yamunanagar	51800	42500	1000	95300	1.72
Bhiwani	48680	38940	0	87620	1.58
Rohtak	13600	43000	0	56600	1.02
Narnaul	0	44690	0	44690	0.81
Jhajjar	5000	17020	0	22020	0.40
Gurugram	0	15200	0	15200	0.27
Rewari	3500	10170		13670	0.25
Ambala	1500	9300		10800	0.20
Mewat	0	10236	0	10236	0.18
Total	3170150	2363926	1000	5535076	100.00

Source: NABARD

It is noticed from **Table B.15** that out of the total capacity of storage created under GBY, Faridabad and Sirsa were the top two districts, which occupied more than half (59%) of the storage created. Interestingly, within these two districts, more than 43 per cent of the capacity created found in Faridabad alone, followed by 16 per cent in respect of Sirsa. Excepting Karnal and Fatebad districts, rest of the districts had a less than five per cent of the storage capacity created. Overall, it appears that the projects under GBY were distributed on demand driven basis in the state of Haryana.

Along with the storage space creation, the GBY scheme also attracted about 651 crores of private investment from the public to the agriculture sector, especially in the form of infrastructure creation, related to the post-harvest management, such an extent which has reduced the burden of the Haryana State government (**Table B.16**).

For safekeeping of the procured materials, the State Government has declared HAFED as a Nodal Agency for construction of 39.56 LMT godowns under Private Entrepreneur Godown (PEG) Scheme, 2008, of the Government of India in Public-Private Partnership (PPP) mode through private entrepreneurs, Central Warehousing Corporation (CWC) and State Warehousing

Corporations (SWCs) to overcome storage constraints and ensure safe stocking of food grains across the country. Out of this, a capacity of 34.56 LMTs has been completed, and 0.47 LMTs capacity is under construction. The Food Corporation of India has leased under PEG scheme about 22.53 LMT under 10-year guarantee godowns (Lease only), 5.94 LMT under 10-year guarantee godowns (Lease with Service) and another 5.07 LMT under 9-year guarantee from HAFED (Table B.17).

Table B.16: Private Investment through PEG under GBY

Year	Year-wise Storage Capacity	Cumulative Storage Capacity	Private Investment (Rs in Crores)
2010-11	0.28	0.28	5.30
2011-12	5.31	5.59	99.60
2012-13	8.77	14.36	164.40
2013-14	15.48	29.84	290.30
2014-15	3.98	33.82	74.60
2015-16	0.55	34.37	10.30
2016-17	-	34.37	-
2017-18	-	34.37	-
2018-19	-	34.37	-
2019-20*	0.33	34.70	6.20
Total	34.70	-	650.60

Table B.17: Total Storage Capacity Created in Haryana (in LMT)

As on	Total Storage Capacity with FCI	Storage Capacity with State Agencies (excluding capacity with FCI)	Total Capacity in LMT
01.04.2019	57.15	54.55	111.70
01.04.2018	54.72	49.74	104.46
01.04.2017	52.95	48.00	100.95
01.04.2016	51.91	56.11	108.02
01.04.2015	46.08	63.78	109.86
01.04.2014	40.2	84.63	124.83
01.04.2013	33.42	78.77	112.19
01.04.2012	27.11	70.21	97.32
01.04.2011	26.23	69.31	95.54

Source: NABARD

Procuring such huge quantities of foodgrains warrants the creation of storage space, and HAFED has successfully created storage spaces and warehousing has become a major activity of HAFED. Besides Catering to its Own Storage requirements, warehousing services on Commercial basis are also being provided to external Customers. This has a direct impact on HAFED's other key business activities like Food Grain Procurement, Input Storage & Supply

etc. HAFED has been declared as a Nodal Agency by the State Government for construction of approx. 39.56 Lakh MT godowns in the State of Haryana under Private Entrepreneur Godown (PEG) Scheme, 2008, of the Government of India. Out of this a capacity of 34.56 Lakh MTs has been completed, 0.47 Lakh MTs capacity is under construction (**Table B.18**).

Table B.18: Storage Capacity with HAFED (Lakh MTs)

Capacity Godowns	Capacity Open (in Lakh MTs)
Capacity under covered Godowns	18.03
Capacity under Open Cover	11.02
Under PEG Scheme	
10 years guarantee godowns (lease only)	22.53
10 years guarantee godowns (lease with Services)	5.94
9 years guarantee godowns (HAFED)	5.07

Note: Capacity as on 2018-19; *Source:* HAFED web page.

At the time of its inception, HSWC had only 16 godowns of 7000 MTs total capacity, and has grown manifold with the present number of warehouses rising to 111 with a storage capacity (own) of 15.25 lakhs Metric Tonnes (up to June-2018). HSC has created and operates a network of over 110 warehouses with a capacity of more than 1.7 million tonnes, which showcase its success in reducing storage losses to a negligible level by way of scientific storage (**Table B.19**).

Table B.19: Storage Space Creation and Utilization by HSWC

Particulars	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19
Total average storage capacity (lakh MT's)	16.63	18.88	17.91	16.77	17.23	17.12	16.59	19.70
Average occupancy in Lakh MT's	16.51	19.66	16.03	11.72	11.81	12.61	14.05	19.13
Average occupancy in percentage	99.00	104.00	90.00	70.00	69.00	74.00	85.00	97.00

Source: <http://hwc.org.in/site/page/2>

Assessment of additional storage capacities required under the scheme is based on the overall procurement/ consumption pattern and storage space already available. Under the PEG scheme, no funds were allocated by the Government for construction of godowns and hence, full investment is done by the private parties/CWC/State Agencies by arranging their own funds including the land. After a godown is constructed and taken over, FCI gives a guarantee of rent for 10 years in the case of private investors and for nine years in the case of CWC/SWCs/State Agencies, irrespective of quantum of foodgrains stored. Out of a sanctioned capacity of 149.89

LMT under the PEG scheme, a storage capacity of 143.08 LMT has been completed as on 31.10.2019 (Tables B.20, B.21 and Figure B.1). This scheme has benefitted Haryana significantly.

Table B.20: Creation of Storage Capacity under PEG (as on 31.10.2019) (in MT)

Year	year wise Storage Capacity creation under PEG	Cumulative Storage Capacity	Procurement in LMT
2010-11	0.28	0.28	-
2011-12	5.31	5.59	-
2012-13	8.77	14.36	-
2013-14	15.48	29.84	25.18
2014-15	3.98	33.82	29.55
2015-16	0.55	34.37	25.12
2016-17	-	34.37	26.84
2017-18	-	34.37	35.28
2018-19	-	34.37	39.18
2019-20*	0.33	34.7	

Source: NABARD

Table B.21: Agency Wise Storage Capacity Details (LMT)

Agency	Total capacity allotted/ sanctioned	Work completed	Capacity taken over	Work under construction
Net approved Capacity	35,03,589			
CWC	5,000	5,000	5,000	0
SWC	6,33,956	6,16,656	5,25,576	17,300
Private investors	28,62,633	28,47,633	28,47,633	15,000
Total	35,01,589	34,69,289	33,78,209	32,300

Source: NABARD

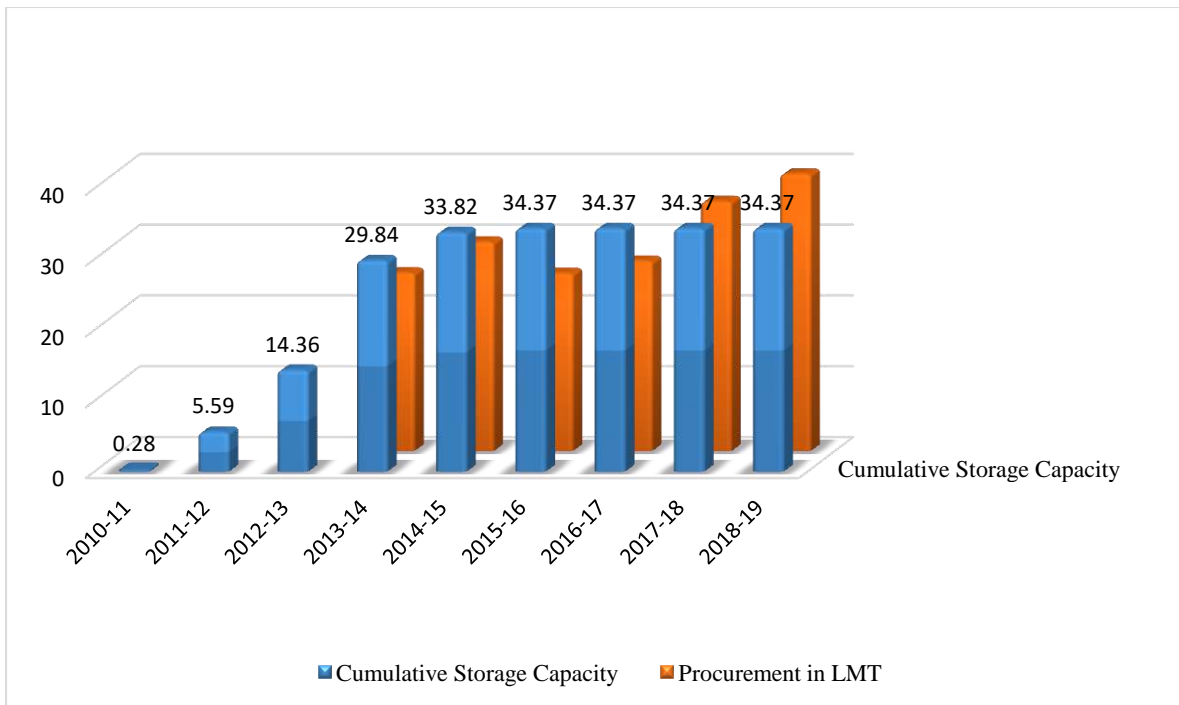


Figure B.1: Year-wise Creation of Storage Space and Procurement (in LMT)

Table B.22 and **Figures B.2 to B.4** explains the monthly pattern of procurement of different crops in the state of Haryana during 2014 to 2018. With regard to paddy, the peak period of storage observed in the months of March and April with a quantity of around 14 lakh MT, however, the season starts from December. As regard to Wheat, the peak period will be in the months of May to August. However, the highest quantity stored was noticed in the month of June with a quantity of 80 lakh MT. In the case of un-milled paddy, the peak months for the storage is recorded during November with a highest quantity of 32 lakh MT. However, the season prevails from October to January. On an average, the monthly procurement in year amounts to 10 lakh MT of rice, 11 lakh MTs of un-milled rice, and 55 lakh MTs of wheat.

Table B.22: Month-wise storage of food grains (in LMT) during 2014 to 2018

Year	Jan	Feb	March	April	May	June	July	Aug	Sep	Oct	Nov	Dec	Month Average
Rice													
2018	16.34	19.98	22.39	21.97	21.21	19.32	17.16	14.7	11.64	8.5	8.93	14.44	16.38
2017	14.27	16.76	18.23	17.37	16.43	14.7	11.86	9.57	8.14	5.42	8.77	12.58	12.71
2016	8.16	10.13	12	10.25	9.62	9.12	7.76	6.32	4.53	2.82	5.24	10.49	8.04
2015	5.9	6.35	5.79	4.49	3.31	3.08	2.19	1.45	1.06	0.56	2.33	5.8	3.53
2014	8.26	10.27	12.69	13.86	12.92	10.75	9.37	5.64	2.48	2.56	1.09	2.75	7.72
Average	9.67	12.70	14.22	13.59	12.70	11.39	9.67	7.54	5.57	3.97	5.27	9.21	9.62
Wheat													
Year	Jan	Feb	March	April	May	June	July	Aug	Sep	Oct	Nov	Dec	
2018	35.61	29.31	23.56	29.86	102.1	99.09	93.24	87.06	78.49	70.31	63.88	55.22	63.98
2017	23.83	18.07	12.37	64.54	73.97	69.62	64.14	59.59	55.15	50.88	46.61	41.47	48.35
2016	30.04	27.21	20.96	70.97	78.62	73.82	66.3	59.61	50.24	42.83	36.4	30.98	49.00
2015	36.6	31.05	25.02	47.18	79.8	79.92	75.35	68.86	63.02	56.86	49.27	41.34	54.52
2014	59.77	49.91	40.3	29.4	57.03	78.94	75.58	70.74	65.88	58.97	52.53	47.71	57.23
Average	37.17	31.11	24.44	48.39	78.30	80.28	74.92	69.17	62.56	55.97	49.74	43.34	54.62
Un-milled Paddy													
Year													
2018	22.45	12.34	3.71	1.88	1.3	0.57	0.45	0.26	0.26	54	54.09	39.67	15.92
2017	21.97	12.38	3.67	2.2	1.23	0.32	0.24	0.18	0.15	0.15	32.57	34.7	9.64
2016	18.11	10.43	3.98	2.44	1.54	0.82	0.63	0.56	0.56	48.59	46.04	33.39	13.92
2015	11.98	6.1	1.25	0.5	0.5	0.49	0.49	0.46	0.42	0.42	0.42	0.42	1.95
2014	29.86	21.65	16.03	8.76	6.1	4.9	2.28	2.55	2.52	0.92	25.66	26.73	12.33
Average	20.87	12.58	6.24	3.16	2.13	1.42	0.82	0.80	0.78	20.82	31.76	26.98	10.70

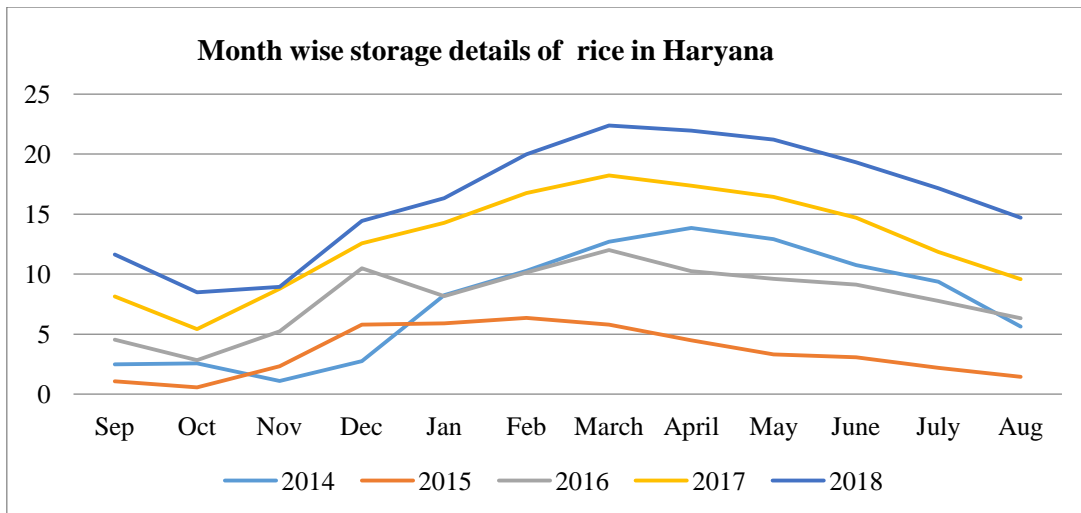


Figure B.2: Month-wise Procurement of Rice in Haryana during 2014 to 2018 (LMT)
Source: NABARD

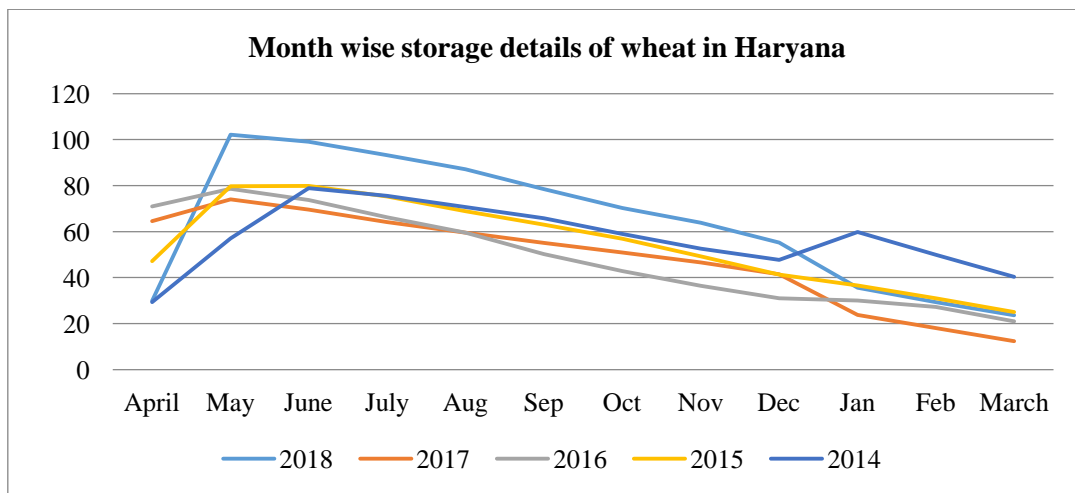


Figure B.3: Month-wise Procurement of Wheat in Haryana during 2014 to 2018 (LMT)

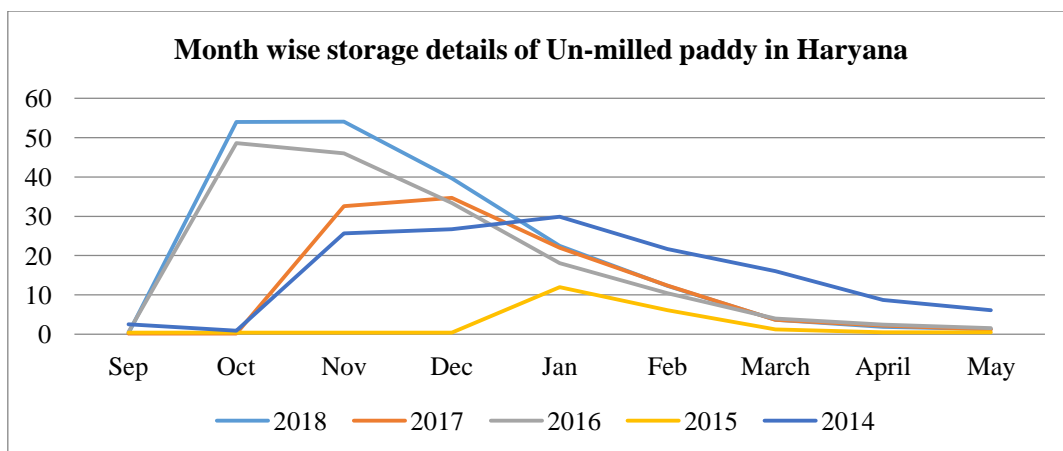


Figure B.4: Month-wise Procurement of Un-Milled Paddy in Haryana during 2014 to 2018 (LMT)

As per the records made available from DMI (**Table B.23**), Haryana has a second-highest storage space created in the country. However, according to Warehouse Development and Regulatory Authority (WDRA), there were only 15 godowns registered with a total storage capacity of 2.09 LMT (as on 16.01.2020). The gulf between actual storage capacity created, but the area available for the National System of Warehouse Receipts indicates that in the state of Haryana, this aspect of Rural Godown Scheme is far from satisfactory.

Table B.23: Storage Space available under the National System of Warehouse Receipts

Sl. No.	District	Warehouse Management	Capacity in MT	WDRA code No	Registration Date	Valid up to
1	Karnal	Central Warehousing Corporation	23000	4070041	2018-07-13	2023-07-12
2	Sonipat	Harshna Ice and Cold Storage Pvt Ltd	6089	3131651	2019-10-31	2024-10-30
3	Hisar	Central Warehousing Corporation	28400	3730042	2018-06-25	2023-06-24
4	Karnal	Central Warehousing Corporation	72100	3710013	2018-06-25	2023-06-24
5	Karnal	Central Warehousing Corporation	12600	4050011	2018-07-11	2023-07-10
6	Karnal	Central Warehousing Corporation	15180	4630033	2018-08-28	2023-08-27
7	Bhiwani	Central Warehousing Corporation	15800	3830011	2018-06-28	2023-06-27
8	Gurgaon	Origo Commodities India P Limited	2652	1009109	2017-08-02	2022-07-01
9	Sonipat	Star Agri Warehousing Collateral Management Limited	2485	3611641	2019-11-18	2024-11-17
10	Sonipat	Central Warehousing Corporation	19280	4090019	2018-07-16	2023-07-15
11	Kaithal	Commodity Management Pvt. Ltd	3174	8191021	2019-08-21	2024-08-20
12	Karnal	Star Agri Warehousing Collateral Management Limited	417	4051658	2019-12-06	2024-12-05
13	Sonipat	LTC Commercial Company Private Limited	3151	6911038	2019-07-09	2024-07-08
14	Kurukshetra	Central Warehousing Corporation	5000	6910010	2019-01-24	2024-01-23
		Total Capacity	209328			

Source: https://wdra.gov.in/documents/32110/38835931/Registered_WH_20200116.pdf%2816-JAN-2020%29.pdf/80b9c39e-f1cd-dfb8-f1b5-4d6464a52861 accessed on 17.01.2020

B.5.3. Profile of the Beneficiaries

Having stated the status of warehouses in Haryana as a whole, it may be useful to present a brief summary of the beneficiaries and this information is presented in **Table B.24. Table B.24** which presents the beneficiaries by category shows that the individuals exceeded (50%) as their eligible subsidy rate is 15 per cent. The women and SC/ST groups taken together accounted for 25 per cent as their rate of subsidy is 33 per cent. Education level shows that all the beneficiaries are literate having more than 10 years of schooling. Moreover, a majority of the beneficiaries are farmer cum traders (62%) followed by 38 per cent businessmen. On an average, the number of family members found to be six in number with a net operated area of 9.35 acres.

Table B.24: General Characteristics of the Sample Owner's in Haryana

Sl. No.	Particulars	Unit
1	Category (Percentage)	
	Individual	50.00
	Women	25.00
	SC/ST	25.00
	Farmers	-
2	Categories of Beneficiaries Occupation	
	Farmer	25
	Farmer/trader	37.5
	Business	37.5
3	Average age of the beneficiary	45.00
4	Education level (Percentage)	
	Illiterate	-
	Primary (1 to 4)	-
	Higher primary (5 to 9)	-
	Matriculation (10)	37.50
	Pre- university (10+2) & above	62.50
5	Average No. of family members	6
6	Average Annual Income (in Rs.)	2,57,142
7	Net operated area	9.35

Source: Primary data

B.5.3.1. Different Categories of Beneficiaries under GBY in Haryana State

As per the guidelines of GBY, the beneficiaries are classified into three broad categories according to their eligible rate of subsidy. **Figure B.5** explains that the beneficiary from general category constitutes about 50 per cent, while women and SC/ ST beneficiaries' shares the rest equally. A majority of general category include farmer, farmer-trader, businessmen

etc. As per their landholdings, it is noticed that most of the beneficiaries belongs to a large farmer's category, and the godowns created under GBY were all leased-out to HAFED. None of them reported for their own usage. Participation of small and marginal farmers was found to be absent.

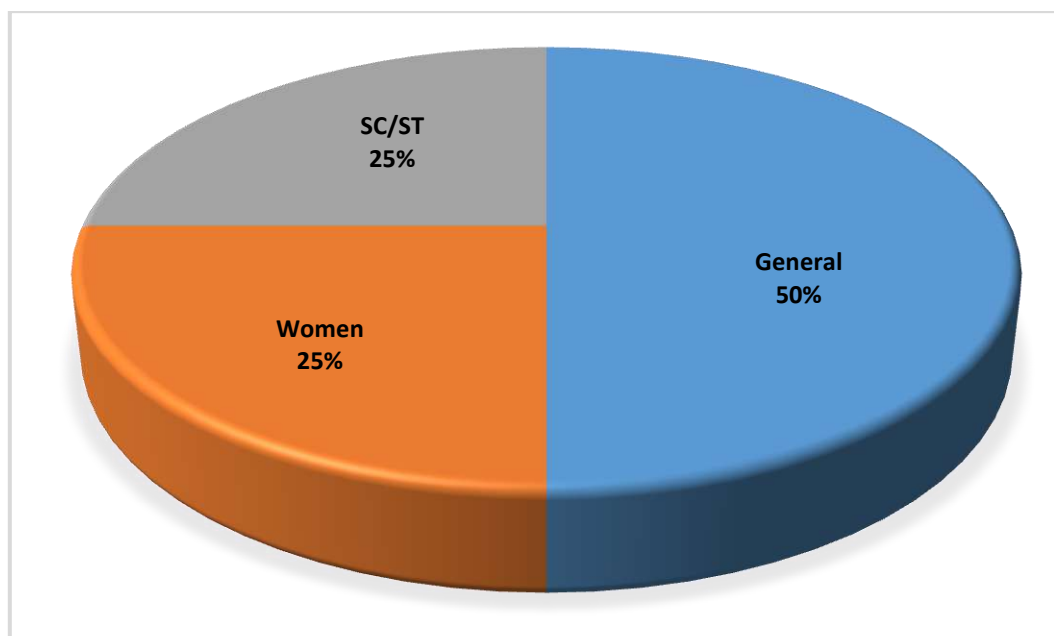


Figure B.5: Participation of Different Groups under GBY (%)

Source: Primary data

B.5.3.2. Source of awareness on GBY

From **Table B.25**, it is understood that most of the beneficiaries have come to aware of the GBY through a News Paper Advertisement (50%) in the media by the Government of Haryana, followed by Bank official (25%), APMC and Other sources (12.50% each). Other sources include friends/ relatives/ co-traders etc.

Table B.25: Sources of Awareness on GBY

S.I. No.	Particulars	Percentage
1	Bank official	25.00
2	Newspapers/ Media	50.00
3	APMC	12.50
4	Panchayath mukhiya	-
5	Others (internet)	12.50

Source: Primary data

B.5.4. Economic Benefits obtained from the Godowns

The State government of Haryana being a pro-farmer and actively ensured MSP for every farmer in respect of all the major crops produced in the State. From the field survey, it found that none of them have sold their produce outside the mandi, other than procurement centers across the state. Since, the MSP is an assured price, farmers never thought of selling their produce outside the government procurement process, since the implementation of Green Revolution in the state of Haryana. Hence, for a farmer, there is no need to consider storing the produce and waiting for better prices. However, the beneficiaries have opined that their participation in GBY has helped to strengthen; a) the state government in flawless procurement of farm produces, and b) reduce the post-harvest losses of foodgrains. With reference to their own economic benefits, it was expressed by them that till the lease period, the rental value of the godown is adequate to cover the EMI towards the loan taken under GBY. However, after the term loan period co-terminates with a lease period, the rental value will be income to the household. In sum total, the beneficiaries have expressed that non-tangible benefits are far more than tangible economic benefits. This might be a reason for the traders and businessmen for their active participation in the state under GBY.

As regard to employment generation in the godowns created under GBY, the management of the godowns rest with the agencies such as FCI, HAFED and HSWC as they owned/ hired it from the owners for a particular period of lease. These agencies in turn hired the required workforce for loading, unloading, security, and quality maintenance of the godowns through outsourcing from third party. It was difficult to estimate the exact man-days required for each godown operations as the period of storage extend beyond 12 months in some cases, for others, it may vacate within a span of a few months depending upon the Central Pool requirements. However, an attempt is made with the available information from the sample beneficiaries and the details are presented in **Table B.26**. As the capacity of the godowns were large, a full-fledged security maintained round the clock, and hence, a minimum of six man-days a day were hired for the said purpose in almost all the godowns. According to the capacity of the godowns, the analysis was made for two groups such as a less than 10000MT and a more than 10000MT. It is noticed that on an average three permanent workers were hired mainly for security and administrative purposes in the case of a smaller godowns whereas, it was five workers in the case of larger godowns. The casual laborers were used for the purpose of loading, unloading, fumigations, and other maintenances. Accordingly, the

employment generated from the creation of rural godowns works out to be 1080 man-days of permanent and 710 man-days of casual workers per annum in respect of smaller godowns. On the other hand, larger godowns have generated 1800 man-days of permanent and 1420 man-days of casual employment per annum. However, due to the distribution of godowns across the state, demand for the workforce is also spread across the state and is also erratic in nature.

Table B.26: Employment Generation

Sl. No.	Details	<10000MT	>10000MT
Permanent Worker			
1	Average No. of workers/ godown	3	5
2	No. of work days	360	360
3	No. of working hours	8	8
	Per Man-days	1080	1800
Casual Worker			
1	Average No. of workers/godown	10	20
2	No. of work days	70	70
3	No. of working hours	8	8
	Per Man-days	710	1420

Source: Primary Survey

B.6. Perception of the Stakeholders

In this section, we have made an attempt to collect the information from the beneficiaries of godowns (i.e., traders, entrepreneurs, owners) on scientific godowns versus traditional godowns. It is evident from **Table B.27** that about 63 per cent of beneficiaries felt that, keeping produces in a scientific godown helps it to retain quality. About 37 per cent of the beneficiaries also opined that the scientific storage ensures safety from pests and rodents in the godowns. We conclude that it is apparent in Haryana, beneficiaries prefer scientific storing facility to retain their agriculture produce against traditional storage.

With regard to utilization of the godowns, none of them have utilized the godowns created under GBY for their own purpose. Almost all of them have constructed these godowns under PEG scheme with a support of GBY and given it on lease basis to the FCI and its associated agencies. Hence, they reported the utilization as 100 per cent (**Table B.28**). FCI has used all these spaces to keep agricultural produces only.

Table B.27: Perception on Scientific Storage Vs Traditional Storage

Sl. No.	Particulars	Percentage
1	Quality retention	62.50
2	Safety of Food grains	37.50

Source: Primary data

Table B.28: Capacity Utilization of the Godown

Sl. No.	Particulars	No. of beneficiaries	Extent of usage
1	Own purpose	-	-
2	Leased-out	11	Full godowns has been used

Source: Primary data

B.7. Pros and Cons in Implementation of the RGS/ GBY in Haryana

The main objectives of the scheme include creation of scientific storage capacity with allied facilities in the rural areas to meet the requirements of farmers for storing farm produce, processed farm produce, and agricultural inputs. It is clear from the above description that due to various factors; farmers are selling off their produce right after the harvest to the HAFED, a State government procurement agency, and hence they are assured of MSP for their produce. In this context, with the central support the RGS has been introduced in the state. In this section, authors have made an objective-wise critical appreciation of the scheme in the state of Haryana as follows:

B.7.1. Extent of coverage and capacity utilization of the godowns

It is noticed that out of the total capacity of storage created under GBY, about 59 per cent of the storage created concentrated in the Faridabad and Sirsa districts, mainly due to the cropping pattern and a higher productivity, and consequent demand for storage space by various agencies. It was observed that in districts with a paddy-wheat cropping pattern, the demand for storage space was highest, followed by the paddy-cotton cropping pattern districts, while the demand was lowest in the districts of mustard belt. This might be due to procurement of paddy and wheat for central pool, in contradictory to other crops. Overall, it appears that the projects under GBY were distributed on demand driven basis in the state of Haryana.

With reference to the utilization of the storage capacity created under GBY in the state, the entire storage capacity has been utilized fully round the year (excluding maintenance period) by the FCI and its associated agencies for storing agricultural produce, primarily wheat and paddy, which indicates the adequacy of storage space in the state as on date. In spite of Haryana being a second a largest producer and with a storage space, none of the farmers have used their godowns for their own usage. With a declining demand for rice and wheat from the Central Pool because of the increasing productivity and self-sufficiency of member States, the shelf-period of rice and wheat is increasing in Haryana godowns, thereby leading to shortage of storage space temporarily and increased post-harvest losses.

B.7.2. Constraints in implementation and performance of GBY

Although the implementation of the scheme of RGS/GBY has registered a significant success, it has been observed during the field work that there were some constraints which have negatively influenced the success of the program are the requirement of a high capital investment, and lack of participation of medium and SC/ST farmers.

As revealed by the beneficiaries, a high capital investment is a major constraint for participation in the GBY as the procurement agencies demand for large capacity godowns in the state. Hence, it also is a problem for the SC/ST farmers to participate in the program. As an alternative measure, instead of providing benefits to the individuals, the government may consider the groups and associations with a higher incentive.

B.7.3. Extent of participation of beneficiaries

As prescribed in the guidelines, all the categories of beneficiaries have found to be participated in the GBY. However, the extent of participation from the farmer-traders and businessmen was much higher (50%) than the participation from other sections of the society. Looking into their landholding pattern, it is observed that a majority of them were belonged to the category of large farmers. Although, one of the objectives of the scheme is to preventing the distress sale, due to procurement from the Government at MSPs, the question of distress sale was not arisen in the case of state of Haryana. However, the state should explore avenues to encourage farmers to sell at the better prices than MSP as a long-term strategy.

B.7.4. Overall performance of the scheme

Rural godown scheme plays a vital role in promoting agriculture marketing, rural banking and financing and ensuring food security in the state as well as in the country. It enables the markets to ease the pressure during harvest season and to maintain supply of agricultural commodities during off season. Thereby, it resolves the problems of glut and scarcity, which are the usual problems in agricultural marketing. Though warehousing is an independent economic activity, yet is closely linked with production, consumption and trade. In this regard, the implementation of the Rural Godown Scheme by the Government of India was a successful attempt towards helping the farmers to avoid distress sale, and to enhance their income level. In this section, we have made an attempt to explain the performance of the scheme is as follows:

- Promotion of grading, standardization and quality control of agricultural produce to improve their marketability: Field work in Haryana was conducted in three different regions representing high, medium and low performance of RGS in the state. No grading, standardization and quality control of agricultural produce was observed in the state. Most of the storage space created was leased out for state procurement agencies.
- Prevention of distress sale immediately after harvest by providing the facility of pledge financing and marketing credit: General norm observed during the field work is that all farmers sell their produce at MSP to the state procurement agencies and hence, no distress sale was observed. However, there were also no instances of pledge loan obtained.
- Strengthen agricultural marketing infrastructure in the country by paving the way for the introduction of a National System of Warehouse Receipts in respect of agricultural commodities stored in such godowns: Haryana has a second-highest storage space created in the country. However, according to Warehouse Development and Regulatory Authority (WDRA), there were only 15 godowns registered with a total storage capacity of 2.09 LMT (as on 16.01.2020). The gulf between actual storage capacities created is might be due to limited utility of the provision because of the government procurement.
- To reverse the declining trend of investment in agriculture sector by the private/cooperative sectors to invest in the creation of storage infrastructure in the country: Capital investment made under RGS in different districts explains the contribution of

RGS in bringing about Rs.650.60 crores of private capital investment into the creation of storage infrastructure in the state.

- Demand and supply of storage capacity created under GBY

B.8. Summary and Conclusion

Post-harvest management plays an important role in the production and marketing as the considerable quantity of the valuable produce is lost every-year due to improper post-harvest management. Therefore, crisis in food availability is not only caused by the natural disasters, but also by absolute lack of post-harvest management. With this background the introduction of GBY from the Government of India has a high relevance to the country, but also to the individual farmers. In this context, we have analyzed the significance of GBY in Haryana, which supports farmers to protect farm produce from the post-harvest losses and consequently avoids distress sale.

In the context of inadequate economic viability of farmers to construct own godowns, two questions are raised in this study. Our study examines the status and performance of GBY in Haryana. Based on the analysis of both primary and secondary data, the following observations were drawn:

- The distribution of godowns across the state reflects the nature of the scheme - demand driven and hence, a majority of the godowns were concentrated in intensive agricultural areas such as Faridabad, Kurushashtra and Hissar.
- The average size of the godowns constructed under the scheme works out to be around 4000MT reflecting the need at a major procurement state - Haryana. The godowns were larger in size, availed under PEG scheme with a support of GBY, and were leased out to procurement agencies up to ten years period.
- Based upon the interactions, it was inferred that the utilization of the godowns founds to suit the local demands.
- As regard to the participation of the beneficiaries in the program, women participation found to be adequate. However, SC/STs and small and marginal farmers participation was limited, may be due to a huge mandatory margin money.
- In terms of overall performance evaluation, the scheme has helped to attract Rs.650 crores of private investment into the agricultural sector, especially in the post-harvest management. This investment has helped to create about 110 lakh MTs of storage

capacity at the rural area and protection of foodgrains from the post-harvest losses and ultimately to enhance income levels of farmers.

To conclude, so far, the scheme has created a storage capacity to an extent of about 110 per cent of the foodgrain production in the state and helped to reduce the post-harvest losses. However, in view of increasing population, and also the commitment of the state under National Food Security Act, measures have to be taken to enhance the storage availability. At the same time, through preferential subsidy approach, the participation of SC/ STs and farmers associations (like FPO/ FPCs) may also be encouraged.



Interacting with officials in Haryana



Interacting with beneficiary of GBY in Haryana



Interacting with beneficiary of GBY in Haryana

4.2. MEDIUM PERFORMANCE STATES

C. GUJARAT

C.1. Overview of Agriculture in Gujarat

Gujarat is one of the fastest developing State of India in general, and particularly in agriculture growth. Gujarat has practiced an innovative pattern of development with a planned growth of key sectors viz., agriculture- allied, energy, industry, tourism, eco-agri tourism and transportation, for which it has achieved a significant double-digit growth since, last decades. The State comprises of about six per cent of the total geographical area and five per cent of the total population of the country of which, 3.47 corers of population living in the rural area, constituting about 57 per cent of its total population (**Census 2011**). A majority of workers in the State are rural based, constituting about 71 per cent of its total population. During year 2015-16, there were about 53 lakhs of farm households in the State, constituting more than 27 per cent of total workers. Among farm households, about 26 per cent (14 lakhs) were farm women, reflecting about 52 per cent of the total agriculture labourers. Thus, it clearly indicates that, a dominance of women in agricultural labourers than cultivators.

Agriculture and allied sector continue to play a vital role in the Gujarat economy and primary occupation of a majority of rural households in the State, still it considered as a backbone of State economy. More than 52 per cent of the working population in the State is still engaged in agriculture and allied activities for their livelihood (**Census 2011**), which contributes about 16 per cent of the State Gross Value Added (current prices 2019). Thus, the agriculture in the State is a major source of livelihood for many households and main sources of labour absorption in the State. Hence, give a more priority to agriculture sector, which will achieve a goal of reducing hunger, poverty, and malnutrition, as well as of inclusive growth. Further, agriculture forms the resource base for a number of populations in agro-based industries and agro-services, it would be more meaningful to view agriculture not as farming alone but as a holistic value chain, as it includes farm production, value addition, storage and warehousing, wholesaling, processing, and retailing. Thus, the prosperity and wellbeing of farmers in Gujarat is closely linked with agriculture and allied activities.

Gujarat State is divided into seven agro-climatic zones based on the characteristics of climatic conditions. It is endowed with an abundant natural resource in terms of varied soil types, climatic conditions and a diversified cropping system adopted for agriculture activities. Farming is characterised by the natural inconsistencies viz, (i) drought prone areas and lowest annual rainfall areas, which received an average annual rainfall of 345 mm at the north west end of the States; and assured the highest annual rainfall amounting to about 2500 mm at the south-east end; (ii) well drained deep fertile soils of central Gujarat and shallow and undulating soils with a poor fertility in hilly rocky areas in the east; (iii) moisture starved degraded areas and low lying waterlogged and saline areas; (iv) areas prone to frequent scarcity and areas prone to frequent cyclone or floods or locusts (**GoG, 2012a**). Thus, output of agriculture sector in the Gujarat has been a largely dependent on south-west monsoon. The State frequently experiences erratic behaviour of the south-west monsoon, which can partly be attributed to the geographic situation. Out of the total geographical area of 18.80 million hectares, about 60 per cent of the area (11.40 million hectare) is cultivated and remaining two-third of the area is under arid and semi-arid tropics, which are largely dependent on rainfall, where the risk and uncertainty in agricultural production and yield remains quite a high. Since the rainfall amount is highly erratic which widely varies across different parts of the State and resulting to clock and steady agricultural growth, Hence, the expansion of irrigation provisions and an efficient water management can further strengthen the agriculture sector in the State.

C.1.1. Performance and Challenges

The agriculture sector has been performing smartly in Gujarat since last two decades; there are many challenges to overcome, so as to perform a sustainable agricultural production in the State. As highlighted by **Pathak and Singh** (2007), a major challenges and tasks for the agriculture sector in Gujarat are: (i) to increase the share of agriculture and allied sectors in the total State income; (ii) to increase the public investment in agriculture; (iii) increasing the irrigated area in rainfed areas through developing micro-level water resources such as check dams, village tanks, farm ponds and recharging of wells under various water conservation programmes; (iv) further to increase in irrigation efficiency through more use of micro irrigation systems such as drip and sprinkler; (v) further development in dairy sector; (vi) marketing reforms with the contract farming alternatives; (vii) revitalizing the agricultural extension system and (viii) further growth in exports of value added agri-products.

Furthermore, the challenges of climate change and global warming, deteriorating soil health including imbalanced use of fertilizers, micronutrient deficiency, lack of organic matter content, low productivity, unfavourable market prices and practically a very little value addition, distress sales, high cost of cultivation, adherence to Sanitation and Phyto-Sanitation (SPS) standards, and measures for minimizing the export rejections are some of the other challenging areas to be addressed by the State government.

The State Government has aggressively pursued an innovative agriculture development programme by liberalizing the markets, eNAM schemes, inviting private capital, reinventing agricultural extension, improving roads, and other infrastructure (Shah et al., 2009; Kumar et al., 2010). The mass-based water harvesting and farm power reforms in dry Saurashtra and Kachchh, and North Gujarat, have helped to energize the State's agriculture. These semi-arid regions have outperformed, the canal irrigated South and Central Gujarat in terms of cultivation of crops.

The Gujarat State is a largest producer of cotton, castor, cumin and isabgul in India and a second largest producer of sesamum and groundnut in the country. The yield of major agricultural crops in the State is highest in India, as well as in the World. The yield of mustard, castor, cotton, onion and potato are highest in the State as compared to other States in the country. Groundnut, bajra and banana productivity is second highest in India. Further, the livestock productivity also has been increasing due to risky rainfall patterns in some part of the agricultural area in the State.

C.1.2. Agriculture Growth Performance in Gujarat

The economy of Gujarat State has undergone a significant change in the recent past. While, the share of service and manufacturing sector are growing positively, whereas the share of agriculture and allied sector in the State NSDP is declining. This reflects a shift in the traditionally agrarian economy to service dominated economy. Most importantly, the decrease in agricultural share to NSDP has not been accompanied by a matching reduction in the share of agriculture in employment.

The growth performance of agriculture in Gujarat State has been varied across the years. The growth performance of gross cropped area, cropping intensity, area, production and yield of

principal crops have been reflecting a wide fluctuation during the study period. In spite of the efforts that has been taken by the State and Central governments to achieve four per cent of agricultural growth in the current period, the growth rate of gross cropped area, and area of principal crops have been decreasing drastically, reflecting a negative growth rate of (-0.45 and -1.39) per cent per annum. However, there has been a significant growth in yield and production, which has increased significantly at the rate of 1.76 and 0.37 per cent per annum (**Table C.1**). It is interesting to note that, in absolute terms, the gross cropped area has increased by 31 per cent in nine-year period (i.e., from 10,489 thousand hectares in 2009-10 to 13,740 thousand hectares in 2018-19). The degree of variation in gross cropped area is also a quite evident in the State as revealed from **Table C.1**. The similar pattern has been reflected in the case of area, production and productivity of principal crops in the State. There are only two possible ways to meet the increasing demand for foods in the State such as increasing the net sown area or by increasing the cropping intensity. Hence, the State has taken steps to increase both of them. On one hand, the net sown area of the State has increased by 30 per cent since many decades and has reached to an end point to make any further increase in the area under cultivation. On the other hand, the cropping intensity has been increased from 119 per cent in 2009 to 143 per cent in 2018-19 by reflecting the area cultivated more than ones in an agriculture year (**Table C.1**).

Table C.1: Gross Cropped Area, Area, Production and Yields of Principal Crops in Gujarat during 2009-10 to 2018-19

Sl. No.	Year	Gross Cropped Area (000ha)	Cropping Intensity (%)	Principal Crops		
				Area (000ha)	Production (000 MT)	Yield (Kg/ha)
1	2009-10	10489	119	8810	16119	4807
2	2010-11	12406	115	10786	25319	6242
3	2011-12	13778	125	11026	24945	5913
4	2012-13	10928	127	8581	15046	5206
5	2013-14	12230	120	10171	27180	6974
6	2014-15	11106	122	9088	21492	6325
7	2015-16	10648	124	8621	17953	5880
8	2016-17	11209	123	9128	17414	6202
9	2017-18	12828	138	9298	24299	6802
10	2018-19	13740	143	9586	17149	5863
11	CGR (%)	-0.45*		-1.39*	0.37**	1.76 **

Source: Ministry of Agriculture & Farmers Welfare, Govt. of India and data analysed by author; *Note:* *, ** and *** indicates 10, 5 and 1 per cent level of significance.

C.1.3. Foodgrain production in Gujarat and India during 2009-2018

Looking into the growth rates of foodgrain production in Gujarat and India, during the last decade (2009-10 to 2018-19), it is observed that the growth rates of foodgrain production in Gujarat was declined to an extent of 0.31 per cent, whereas it has increased significantly at all India level with an 2.24 per cent (**Table C.2** and **Figure C.1**).

The absolute foodgrain production in Gujarat has exhibited a quite fluctuating trend *i.e.*, 5761 thousand tons in 2009-10 to 7701 thousand tons during 2018-19. The growth in production was mainly due to growth in yield associated with increase in crop production technologies. The similar trend was noticed in the case of all India. Considering the share of foodgrain production, it was almost stagnant during period (2009-10 to 2018-19). **Table C.2** reveals that the share of foodgrain production in Gujarat has increased from 2.64 per cent in 2009-10 to 3.64 per cent during 2013-14, thereafter the trend was declined to 2.70 per cent in 2018-19. However, during 2013-14, a significant increase in foodgrain production was recorded at 9180 thousand tons in respect of Gujarat. The share of foodgrain production of the State in terms of total foodgrain production in the country has grown to a highest share of 3.64 per cent, with a few ups and downs in the period.

TableC.2: Foodgrain production in Gujarat and India during 2009-2018 (*000 Tonnes)

Sl. No.	Year	Gujarat	India	Share of Gujarat in total food grain production (%)
1	2009-10	5761	218107	2.64
2	2010-11	8342	244482	3.41
3	2011-12	8874	259286	3.42
4	2012-13	7056	257135	2.74
5	2013-14	9180	265045	3.46
6	2014-15	7109	252023	2.82
7	2015-16	6262	251566	2.49
8	2016-17	7422	275111	2.70
9	2017-18	7665	285014	2.69
10	2018-19	7701	285210	2.70
11	CGR (%)	0.31**	2.24 ****	-1.89

Source: Ministry of Agriculture & Farmers Welfare, Govt. of India and data analysed by author.

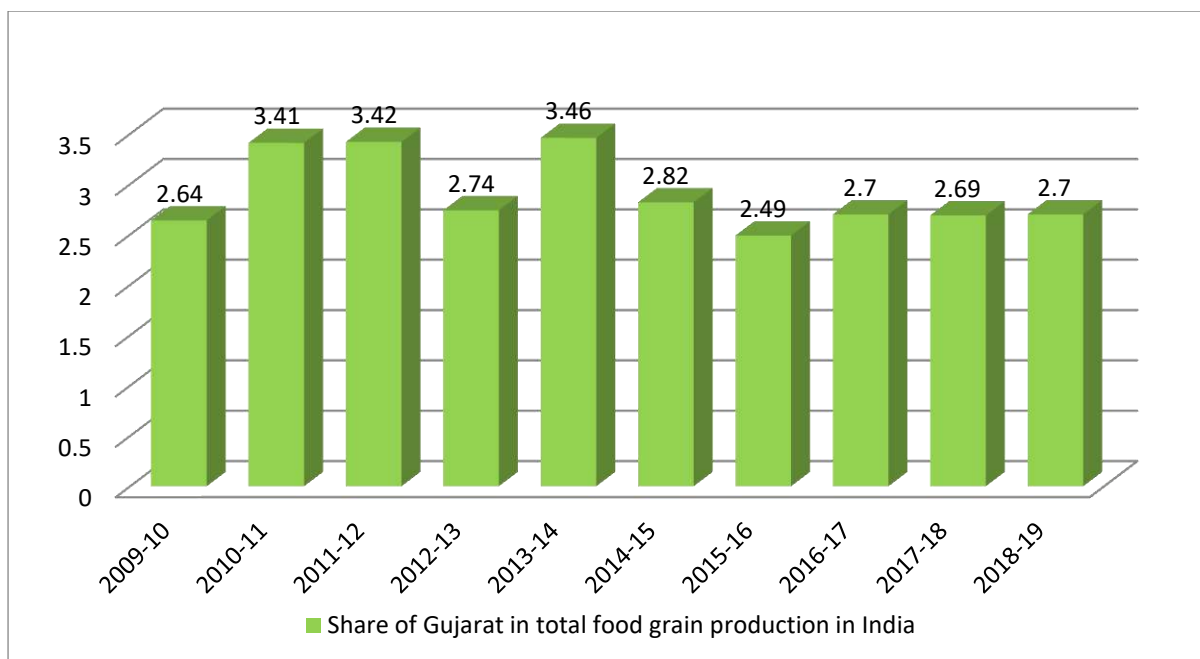


Figure C.1: Share of Gujarat in total foodgrain production in India

C.1.4. Crop specific Growth performance in Gujarat during 2009-2018

The major crops grown in different parts of Gujarat are rice, wheat, bajra, maize, tur, gram, cotton, groundnut, rapeseed, mustard, fodder, and horticultural crops. The growth performances of principal crops in Gujarat are presented in **Table C.3**. Table reveals that except area under tobacco and pulses, none of the crops have shown a positive growth rates during the period. However, the negative growth in other crops varied from 0.71 per cent to 2.14 per cent in terms of area. Among cereals crops, the growth rate of area under rice has increased by 1.24 per cent. While, the growth rate of bajra, jowar, maize, and wheat, have been considerably declined by 6.88, 3.86, 1.73 and 1.60 per cent respectively. As regard to pulses, a significant growth rate was found in the case of grams (2.31%), followed by tur (0.75%); Nevertheless, the growth rate of groundnut reflected a negative to an extent of one per cent. The growth rate of commercial crops such as cotton and tobacco has registered the growth rate of 0.07 and 6.66 per cent, respectively.

Overall, the production growth rates of cereals, pulses, total foodgrain, oilseeds and commercial crops (Cotton and Tobacco) have shown a mixed growth in production (**Table C.3**). A highest positive growth rate was found to be in the commercial crop (tobacco) which was 8.59 per cent, followed by oilseeds (3.09%) and Pulses (2.39%). Whereas, the production

growth rate of cereals, and total foodgrains have declined at the rate of 0.62 and 0.34 per cent, respectively. Although, the total cereals production has shown a declining trend in growth rates during the study period, the growth of rice and maize have increased by 2.89 per cent and 0.94 per cent, respectively. With regard to jowar, bajra, and wheat, the growth rate have been considerably declined by 2.77, 2.54, and 1.87 per cent respectively. The growth rate of tur and gram production has found to be increased significantly with a growth rate of 3.21 and 3.28 per cent, respectively, during the study period. In the case of groundnut, cotton and tobacco, the growth rate has considerably increased at rate of five per cent, one per cent and 8.39 per cent per annum.

In terms of yield cereals, pulses, total foodgrain, oilseed and commercial crops (Cotton and Tobacco) have shown a positive growth during the study period. The highest growth rate was found in the case of oilseed crop (3.78%), followed by pulses (2.27%), cereals (1.53%) and total foodgrains (1.32%). Among cereals, a highest growth rate was noticed in respect of bajra (4.85%) followed by maize (2.68%), rice (1.60%) and jowar crop (1.18%); whereas, in the case of wheat, the growth rate has slightly declined (0.34%). Similarly, the growth rates of tur, gram, and groundnut yields have significantly increased to 2.24, 0.78, and 5.72 per cent, respectively. The remaining crops such as cotton and tobacco have shown a meagre growth during the same period.

TableC.3: Crop specific Growth performance in Gujarat during 2009-2018 (%)

Sl. No.	Particulars	Area	Production	Yield
1	Rice	1.24	2.89 ***	1.60**
2	Wheat	-1.60	-1.87	-0.34
3	Jowar	-3.86*	-2.77*	1.18
4	Bajra	-6.88***	-2.54 *	4.85***
5	Maize	-1.73	0.94 *	2.68*
	Total Cereals	-2.14	-0.62	1.53*
6	Tur	0.75	3.01*	2.24***
7	Gram	2.31*	3.08**	0.78
	Total Pulses	0.11	2.39	2.27***
	Total Food Grains	-1.66	-0.34	1.32*
8	Groundnut	-1.00	4.77*	5.72*
	Total oilseed	-0.71	3.09*	3.78*
9	Cotton	0.07	0.73	0.66
10	Tobacco	6.66***	8.39***	1.72**

Source: Ministry of Agriculture & Farmers Welfare, Govt. of India and data analysed by author.

C.2. Status of Agricultural Marketing in Gujarat

Agriculture marketing plays an important role not only stimulating production and consumption but also in accelerating the pace of economic development. Further, marketing of farm produce is a key economic activity as it required to maintain an equilibrium in demand and supply of food and food products for the consumers and a sustainable farm income to the farm households. On the other hand, an adequate return on farm produces is one of the driving forces for a better agricultural growth, which resulted to a higher marketed surplus in a majority of the crops. Hence, the marketed surplus of the Gujarat farmers ranges from 70 to 90 per cent. Still the returns from the farm produces do not reflecting a more remunerative in the State because of lack of linkages between the production to consumption marketing. On the other hand, influence of international market on domestic prices of farm produce adds to the complexity of the issues. However, food inflation has been a major causing source of anxiety in marketing policies. For that reason, agricultural markets need well-functioning to drive the growth and development of the rural economy. This necessitates understanding the status of agricultural marketing and marketable surplus in Gujarat. It is found to be relevant in discussing the issues related to better marketing channels, warehouse facilities and other essential infrastructure for ensuring adequate returns on agricultural output of farmers.

Gujarat State has made a rapid stride in adoption and implementation of agricultural marketing reforms for supporting and developing agriculture marketing system in the State. Gujarat stands fourth in the country in terms of per capita farm output. The horticulture sector is a supplier for a large quantity to the agro-based industries which has high avenues for generation of skilful employment and self-employment opportunities both in rural and urban areas. Better technology for post-harvest management and market linkages are essential for increase in returns from agro-products.

Gujarat State has their own agricultural marketing arrangement through APMC markets located in every district and sub-markets at every taluka/ block with all infrastructure facilities like yards, godowns and weighment etc. These APMCs facilitates the whole process of marketing of agricultural produces in the State. The State enacted, the Gujarat Agricultural Produce Marketing (Regulation and Development) Act way back in 1939, a regime of former princely State of Baroda. The Baroda State established the regulated markets at Bodeli in the

year 1937-38 and provided for improved regulation in the marketing of agricultural produce, development of an efficient marketing system, promotion of agricultural processing, agricultural export and the establishment, and proper administration of markets for agricultural produce.

The organized marketing of agricultural commodities has been promoted in the country through a network of regulated markets. The basic objective of setting up of network of physical markets has been to ensure reasonable gain to the farmers by creating an environment in markets for fair play of supply and demand forces, regulate market practices, and attain transparency in transactions. To cope with the need to handle increasing agricultural production, the number of regulated markets has been increasing in the country. While by the end of 1970, there were only 101 regulated markets in the State, today the number stands at 734 (as on 31.3.2012). Most of these regulated markets are wholesale markets. The State has a network of 734 markets; out of which 205 wholesale markets, 129 rural primary marketes, 199 principal markets and 201 sub market yards (*Source: Ministry of Agriculture Department of Agriculture and Co-operation Government of India, 2012*).

C.2.1. New initiatives of Gujarat agricultural marketing

The Model Act, 2003 formulated by the Government of India contains many progressive legislations introduced in the State of Gujarat. The Marketing legislation has been amended from time to time to incorporate, the necessities arising in the field of Agricultural Marketing. The development of market yards with all infrastructures required for marketing of notified agricultural produce, benefits and safeguard the farmers in terms of proper weighing, competitive price and free from exploitation, and payment of price on the same day. For this purpose, it has been made mandatory in the Act to the effect that the buying and selling of notified agricultural produce shall take place only in the market yards notified by the Director from time to time.

The present scenario of existing and potential market linkages in the State reveals that there are no food parks in the State, however, two food parks are planned at Hazira and Dahej. There are two Agri-Export Zones (AEZs) in the State, one is for mango and vegetables, and other for onions. The AEZ for mangos and vegetables is in Central and Southern part of the Gujarat, where about half of the total mango production is produced. There are about 25

processing units and 100 cold storages in the region (**GoG, 2018b**). Exports from this region are primarily to Middle East and UK. The AEZ for onions has about 18 units, out of which, about six are HACCP certified. Onions in this zone are primarily exported in the dehydrated form to Europe and USA.

There are about 20 value addition centres (cold, and 70 grading centres in the State. The processing units exist primarily for mango pulp, pickles, tomato ketchup, dehydration of onion and tutti frutti. In addition, there are around total 16,400 food processing units in the State, of which, the total number of registered processing units are 56, with a capacity of 11.78 lakh quintals. Among these processing units, oilseeds processing, milk processing units, fruits and vegetable processing units and fish processing units are the major ones. There are about 185 cold storages in Gujarat, having a total capacity of 8.1 lakh metric tonnes, used primarily for potatoes and vegetables. The key issue with a low level of processing in the State is poor post-harvest infrastructure. It is estimated that Rs. 800 crores per annum are lost due to a lack of post-harvest infrastructure and processing (**GoG, 2018b**). The post-harvest loss for various fruits and vegetables is between 25 per cent and 30 per cent. Thus, it is import to strengthen and expand the existing post-harvest infrastructure and processing units. Further, a setting up of special market and special commodity market through public private partnership in market extension activities of market committee, a single point market levy of market fee, promoting e-trading of agricultural commodities are very much essential to bring efficiency, and transparency in pricing.

In addition, attention is also given to creation of eNAM in April, 2016 to initiate a major reform in agricultural marketing through setting up of electronic platform i.e., electronic National Agriculture Market (eNAM). This (eNAM) facilitates inter State trade, in which farmers of one State are allowed to trade to other State farmers. There is also a provision of e-permit which facilitates the movement of produces such as pulses, oilseeds, copra, cereals across the State (**Financial Express, 2017**).

C.2.2. Marketed Surplus in Gujarat

Looking into the predominant situation of agricultural segment in Gujarat, collection and maintenance of farm marketed surplus of foodgrain assumes a great significance. In any developing economy, the marketed surplus or producer's surplus of farm products plays a

major role, as it is the quantity, which is actually made available to the non-producing population of the country. From the marketing point of view, this surplus is more important than the total production of commodities. The arrangement for marketing and the expansion of markets have to be made only for the surplus quantity available with the farmers, and not for the total production. The rate at which agricultural production expands, determines the pace of agricultural development, while the growth in the marketed surplus determines the pace of economic development in the State and the country as well. An increase in production must be accompanied by an increase in the marketable surplus for the economic development of the nation. Though the marketing system is more concerned with the surplus which enters or is likely to enter the market, the quantum of total production is essential for this surplus.

Agricultural marketing in Gujarat has made notable progress since independence, but many constraints still today remain unresolved. A dynamic and vibrant marketing system with an ample supply chain infrastructure is necessary to keep pace with the changing agricultural production and growing marketable surplus. Moreover, efforts should be made at all legal and policy levels to strengthen the rural economy and create rural employment, which will surely augment production and productivity, leading to storage security, food security, and inclusive agriculture growth of the State. There is also an increasing pressure on the agriculture produce economy to respond to the challenges and opportunities that the global markets pose in the era of globalization and liberalization.

To meet the ever-increasing demand of food grains, State is heavily dependent on the availability of adequate local supplies particularly from the Gujarat State. The main agricultural produce marketed in the APMC market yards of Gujarat are rice, bajra, wheat, maize, jowar, tur, gram, sesamum, groundnut, castor, rapeseed-mustard, cotton, tobacco, horticulture crops, plantation crops, fodder crops and other crops as these are the major crops grown in the Gujarat State. Hence, their share in agriculture GDP is also notable in Gujarat State, mainly due to the implementation of marketing reforms in the State such as setting up of Agricultural Produce Market Committees (APMCs), Marketing Boards, the system of Minimum Support Price, and eNAM etc., have played a significant role in rising the marketed and marketable surplus.

The existing and potential market linkages in the State reveals that there are no food parks in the State but based on the availability and potentiality, the State being a food park hub of the

country. Therefore, most of the horticultural crop like chilli, onion, tomato, garlic and ginger are sold in APMCs only. Some of the APMCs have been dominated by a specific commodity market viz., Vadgam APMC is specialized for red chilli; Ahmedabad, Dahod, Gondal, Mehsana, and Rajpipla for banana; Amirgadh and Amreli for castor; and Anand & Aravalli for onion; Amirgadh and Becharaji for wheat and rice. Looking at the role of Gujarat in the country's food security, it is important to collect the information about the marketed surplus ratios for the major crops grown, and estimate the same in the State of Gujarat. The present study is very much relevant and important in providing the information about marketed surplus as well as post-harvest losses of major foodgrains.

Table C.4 reveals that the growth rate of marketed surplus of major crops in the Gujarat is quite impressive since a decade. It is observed from **Table C.4** that the growth rate of marketed surplus of wheat, bajra and groundnut have shown a significant growth by registering about three, four, and one per cent respectively, whereas, rapeseed & mustard, sesamum, and cotton have reflected a meagre growth rate.

Further, the marketed surplus depends upon the type of crop i.e. foodgrain, other food crop or non-food crop. In the case of foodgrains, and other food crops, the marketed surplus is generally less as most of the small and marginal farmers produce and consume for their own and the leftover is marketed according to the size of holdings and other related factors. But, in the case of non-food crops viz. cotton, sugarcane, soybean etc., which is used as raw material in agro-based industry, almost all the production (98%) is available for sale excepting a small quantity kept for the seed purpose. On the other hand, even food crops with a large marketable surplus (say above 50%) can be regarded as cash or commercial crops.

Among crops, except bajra, marketed surplus of foodgrains ranges from 70 to 97 per cent during the period between 2005-06 to 2014-15, whereas bajra ratio varied between 53 per cent to 87 per cent. In the case of oilseeds, the ratio of marketed surplus was ranged between 88 per cent to 99 per cent. Whereas in respect of cotton the ratio was more than 96 per cent during the decade. Though the growth rates of marketed surplus of cotton, rapeseed and mustard, sesamum has shown a meagre in the growth rate, the share of marketed surplus in absolute term has increased substantially during the last decade may be due to the adoption of improved agriculture technologies in crop production and process of diversification of agriculture towards market orientation.

Table C.4: Marketed Surplus Ratio and Growth Rates of Major Crops in Gujarat (2005-06 to 2014-15)

Crops/ Years	05-06	06-07	07-08	08-09	09-10	10-11	11-12	12-13	13-14	14-15	CAGR (%)
Food grains											
Wheat	78.2	69.7	73.3	82.14	80.12	79.12	80.2	84.24	88.29	97.24	2.59***
Bajra	53.4	58.4	66.89	70.8	75.06	77.46	83.5	86.35	77.39	74.38	4.17***
Oilseeds											
Groundnut	89.15	88	92.78	95.28	98.15	96.34	95.85	99.81	98.45	94.68	1.03**
Rapeseed and mustard	93.32	94.32	97.63	92.85	90.84	91.1	92.18	95.4	99.92	99.84	0.5
Sesamum	98.78	99.7	95.3	92.7	96.87	93.21	95.84	99.04	99.02	99.72	0.17
Commercial crop											
Cotton	91.8	98.6	96.45	97.45	98.89	98.48	99.46	99.68	95.79	98.71	0.4

Source: GOI, (2018), agricultural Statistics at a Glance, various issues.

C.2.3. Post-Harvest Losses in Gujarat

Gujarat agriculture has noticed a demand driven production rather than supply driven. During the post-harvest management, the farm produce produced on the farmers' field have to undergo a series of operations such as harvesting, threshing, winnowing, bagging, transportation, storage, processing and exchange before they reach the consumer, and there are appreciable losses in crop output at all these stages. Due to the glaring gaps in the marketing infrastructure, the existing markets operate inefficiently and the transaction costs are high. Multiple handling by various players in the fragmented supply chain, the lack of warehouse and cold storage also results in a high post-harvest loss. Hence, it is essential to produce and process agriculture commodities keeping in view of the changing consumer pattern of tastes and preferences, and increasing the shelf life of the produce and reduce the post-harvest losses. Estimation of post-harvest losses has been made by different studies in the past. A High-level Expert Committee on the Cold Storage constituted by the Department of Agriculture and Co-operation has estimated that about 25 to 30 per cent of fruits and vegetables, and eight to 10 per cent of foodgrains are wasted annually, due to lack of post-harvest technology, non-existence of integrated transport, storage and marketing facilities, etc. As per the Millennium Study, it was estimated that about seven per cent of foodgrains and 30 per cent of fruit and vegetables are lost due to inadequate handling facilities.

Though increase in agricultural production and productivity is a priority of the agriculture sector today, improved post-harvest handling and processing are essential to ensure high-

quality products and higher value addition. Value of agricultural output can be increased considerably by following improved methods of post-harvest practices. In this connection, it is worth to note here that the average post-harvest losses of food grain production at various stages in the Gujarat State was estimated and presented in **Table C.5** and **Figure C.2**. On an average the post-harvest loss is to the extent of two to three per cent in foodgrains in the State while the proportion is much more in the case of perishable commodities. Although, the Government has taken various measures to curb these post-harvest losses, the proportion of the post-harvest losses remains same due to various issues. Since there is no time series database on the State-wise post-harvest losses, the results from the study conducted by the Directorate of Marketing Inspection, GoI for the year 2005 are extracted and presented in Table 6. Among the different crops, the highest post-harvest losses were found to be in the case of paddy, which is about 4.86 per cent whereas, lowest in the case of wheat to the share of 1.26 per cent (**Table C.5**).

**Table C.5: Post-Harvest Losses of Different Crops in Gujarat
(Triennium ending 1998-99)**

(in '000 tonnes)

Crops	Total quantity of production	Post-Harvest losses quantity	Post-Harvest losses (%)
Paddy	1267.56	61.60	4.86
Wheat	1289.21	16.25	1.26
Jowar	258.07	6.52	2.53
Bajra	1399.99	31.32	2.24
Maize	645.29	19.45	3.01
Ragi	20.79	0.87	4.18
Tur	328.03	7.47	2.28
Bengal Gram	91.67	3.32	3.62
Green Gram	89.74	1.93	2.15
Black Gram	82.2630	2.0406	2.48
Total	5472.613*	150.7706*	2.86#

Source: dmi.gov.in; Abstract of reports on Marketable Surplus and Post-Harvest Losses of Foodgrains in India.
Note: * indicates Total quantity of production and Post-Harvest losses quantity whereas, # indicates average percentage of Post-harvest losses.

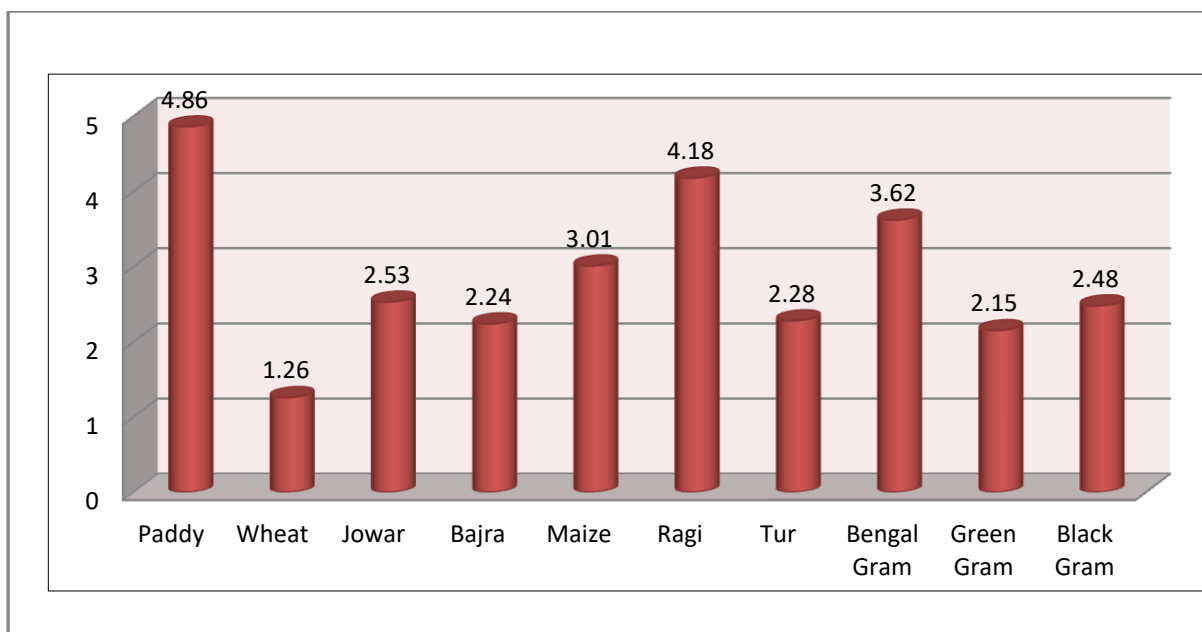


Figure C.2: Post-Harvest Losses of Different Crops in Gujarat

C.3. Government Interventions in Post-Harvest Management of Agricultural and Horticultural Crops

Gujarat stands fourth in the country in terms of per capita agricultural output. The horticulture sector is the supplier for large number of agro based industries which has high avenues for generation of skill full employment and self-employment opportunities both in rural and urban areas of the State. Hence, the Gujarat Government has undertaken various measures to improve the production, marketing and post-harvest management practices through adoption of better technology. Market linkages are essential to increase in revenue from agro-products. Looking into the importance of infrastructure in agricultural and rural development, the State has tried to create more infrastructure related to the post-harvest management both the sectors. In this section, we have made an attempt to bring out some of the Government initiatives schemes which have focused to address the challenges of small & marginal farmers, and to create storage infrastructure capacity for the farming community. In this connection, the Gujarat State Government has created storage infrastructure through various institutions and funding from different government schemes such as;

- i Central Warehouse Corporation
- ii Gujarat State Warehouse Corporation
- iii Private Entrepreneurs Guarantee (PEG) Scheme

- iv National Horticulture Mission (NHM) / Mission on Integrated Development of Horticulture (MIDH)
- v Rastriya Krishi Vikas Yojana (RKVY)
- vi Garmin Bhandaran Yojana (GBY)

The information on district-wise storage capacity created under Central Warehousing Corporation under National System of Warehouse Receipts is presented in **Tables C.6 and C.7**. Tables revealed that the godowns listed under WDRA from all sources of organization/institutions. One of the important provisions of the WDRA registration is that the godowns constructed under the regulation of Negotiability of Warehouse Receipts, ensures the users of the godowns (farmers) to retain their produce till they get better prices in the market and avail the pledge loans from the Nationalized Banks for their immediate requirements. As revealed from the table, most of the registered godowns belong to the APMC (97%) and the rest with other agencies. As per the registration storage capacity, Rajkot tops the list (17.70%), followed by Mehsan (12%), Ahmedabad (9.90%), Baroda (9.17%) Sabarkandha (7.06%), Banaskantha (6.45%), Kutch (5.77%), Patan (5.25%), and the rest fall below five per cent level. It is worth to mention here that a majority of the rural godowns constructed under GBY have not been registered with the WDRA as the technical specifications of the rural godowns are disparate and not able to adhere to the specifications mentioned in the Negotiable Warehouse Receipt System (NWRs). A majority of the farmers also felt that the registration with the WDRA is an also a costly affair and hence they have not registered. Moreover, the bankers are not in favor of the NWRs in respect of rural godowns. Further, issues related to pledge loans are discussed in detail in the subsequent sections.

Table C.6: Agency wise number of Godowns available in Gujarat

SI. No	Agencies	Number of Godowns	Percentage
1	FCI	19	0.27
2	CWC	17	0.24
	SWC	2	0.03
3	Co-operative	1	0.01
4	APMCs	6980	97.50
5	Others	140	1.96
	Total	7159	100.00

Source: GOI, DMI and FCI various reports

Note:1. "OTHERS" includes three PEG godowns comprising storage capacity of 34800 MTs.

2. "OTHERS" includes one godowns from Port Authority comprising storage capacity of 6978 MTs.

3. "OTHERS" includes one godowns from GUJCOMASOL comprising storage capacity of 4920 MTs.

4. "OTHERS" includes one private party's godowns under PWS-2010 scheme comprising storage capacity of 15,000 MTs,

Table C.7: District-wise storage space available with different agencies in Gujarat (Space/Capacity in MT)

NAME OF DISTRICT	FCI		CWC		SWC		CO-OPERATIVE		APMCs		OTHERS		Total		Percentage
	No	Space	No.	Space	No.	Space	No.	Space	No.	Space	No.	Space	No.	Space	
Rajkot	2	90000	3	50860	1	6978	0	0	772	106555.9	27	140250	805	394643.9	17.7
Mehsana	1	11120	0	0	0	0	0	0	24	12420	52	243757	77	267297	11.99
Ahmedabad	3	154260	2	10375	0	0	0	0	266	19425	3	36736	274	220796	9.9
Baroda*	3	103210	2	82668	1	8656	0	0	0	0	1	9800	7	204334	9.17
Saba kantha (Himmatnagar)	0	0	0	0	0	0	0	0	825	157350	0	0	825	157350	7.06
Banaskantha *	1	28520	0	0	0	0	0	0	24	17600	20	97636	45	143756	6.45
Kutch	1	50000	1	23095	0	0	0	0	747	49038	4	6561	753	128694	5.77
Patan	0	0	0	0	0	0	0	0	43	8650	23	108308	66	116958	5.25
Panchmahal	2	78960	0	0	0	0	0	0	344	15895	0	0	346	94855	4.25
Kheda (Nadiad)	0	0	3	28868	0	0	0	0	627	38703	2	13500	632	81071	3.64
Adipur	1	50000	1	23095									2	73095	3.28
Jamnagar	1	30000	1	15000	0	0	0	0	4	2300	0	0	6	47300	2.12
Junagadh	0	0	0	0	0	0	0	0	17	8500	4	36990	21	45490	2.04
Surat*	0	0	1	20500	0	0	0	0	112	19675	0	0	113	40175	1.8
Anand	0	0	2	16800	0	0	0	0	573	9242	2	9620	577	35662	1.6
Bhavnagar	1	20000	1	13500	0	0	0	0	7	300	0	0	9	33800	1.52
Aravali	0	0	0	0	0	0	0	0	526	32617	0	0	526	32617	1.46
Dahod*	0	0	0	0	0	0	0	0	1072	29888	0	0	1072	29888	1.34
Chhota Udaipur	0	0	0	0	0	0	0	0	222	23620	0	0	222	23620	1.06
Surendranagar	1	10000	0	0	0	0	0	0	25	6650	0	0	26	16650	0.75
Bharuch	0	0	0	0	0	0	0	0	204	11498.7	1	4920	205	16418.7	0.74
Mahisagar	0	0	0	0	0	0	0	0	255	14393	0	0	255	14393	0.65
Valsad	1	10000	0	0	0	0	0	0	6	1200	0	0	7	11200	0.5

Table C.7: District-wise storage space available with different agencies in Gujarat (Space/Capacity in MT)

Contd....

NAME OF DISTRICT	FCI		CWC		SWC		CO-OPERATIVE		APMCs		OTHERS		Total		Percentage
	No	Space	No.	Space	No.	Space	No.	Space	No.	Space	No.	Space	No.	Space	
Morbi	1	10000	0	0	0	0	0	0	0	0	0	0	1	10000	0.45
Tapi (Vyara)	0	0	0	0	0	0	0	0	134	9100	0	0	134	9100	0.41
Gir Somnath	0	0	0	0	0	0	0	0	5	1460	1	6978	6	8438	0.38
Botad	0	0	0	0	0	0	0	0	12	5288	0	0	12	5288	0.24
Amreli*	0	0	0	0	0	0	0	0	29	4700	0	0	29	4700	0.21
Gandhinagar	0	0	0	0	0	0	0	0	7	4207	0	0	7	4207	0.19
Narmada (Rajpipla)	0	0	0	0	0	0	0	0	66	3748	0	0	66	3748	0.17
Navsari	0	0	0	0	0	0	1	2925	0	0	0	0	1	2925	0.13
Dang (Ahva)	0	0	0	0	0	0	0	0	32	720	0	0	32	720	0.03
Total	19	646070	17	284761	2	15634	1	2925	6980	614743.6	140	665256	7159	2229390	100

Source: GOI, DMI and FCI, NABARD, various reports

Note: 1. "OTHERS" includes three PEG godowns comprising storage capacity of 34800 MTs.

2. "OTHERS" includes one godowns from Port Authority comprising storage capacity of 6978 MTs.

3. "OTHERS" includes one godowns from GUJCOMASOL comprising storage capacity of 4920 MTs.

4. "OTHERS" includes one private party's godowns under PWS-2010 scheme comprising storage capacity of 15,000 MTs.

C.3.1. Percentage of Storage Space Utilization Status in Gujarat

From **Table C.8 and Figure C.3**, the percentage of utilization of storage capacity under different agencies it is revealed that almost all the agencies have utilized more than 90 per cent of their capacity except SWC PEG. The highest percentage of storage space utilized by SWC covered PEG has reflected (100%) followed by CWC covered (98%), Private (silo) 97 per cent, FCI owned (96%), SWC covered(94%) and 89 per cent of storage space utilized by SWC, PEG, CWC as per the Food Corporation of India (FCI). It is also noticed that the States where the procurement of foodgrain is implemented, the WDRA registered godown utilization found to be better as compared to own usage by the owners or private beneficiaries. A few cases, the godowns constructed under GBY have been registered with the WDRA have been used to store procured foodgrains. For instance, paddy & wheat in Madhya Pradesh and Haryana, wherein the storage capacity was more than 1000 MT.

Table C.8: Percentage of storage space Utilization- Status as of FCI and Private Owned/ Covered as on 31.12.2019

Sl.No.	Agencies/Depot	Storage Space Utilization (%)
1	FCI OWNED	96
2	CWC Covered	98
3	CWC covered PEG	90
4	SWC covered	94
5	SWC covered PEG	100
6	SWC PEG	89
7	Pvt. (Silo)	97
	Average	95

Source: FCI

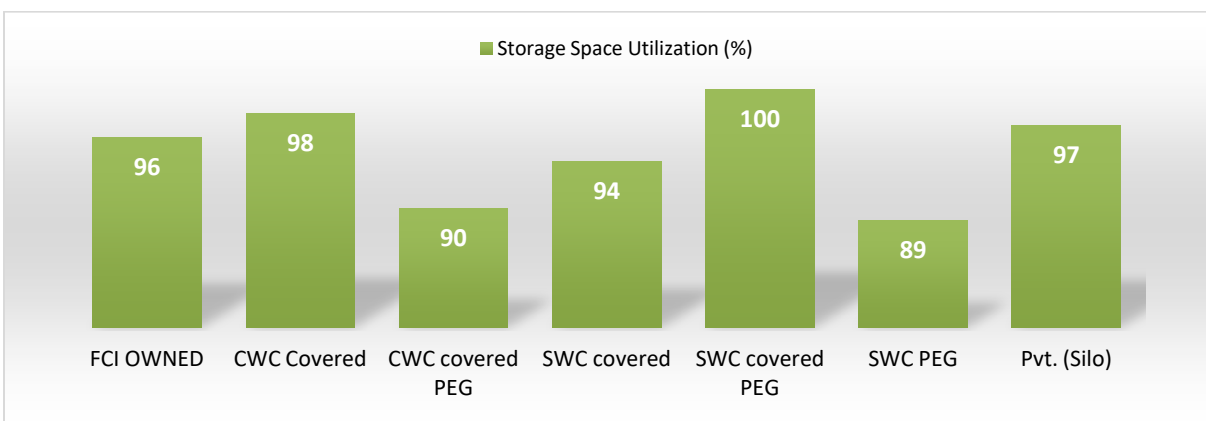
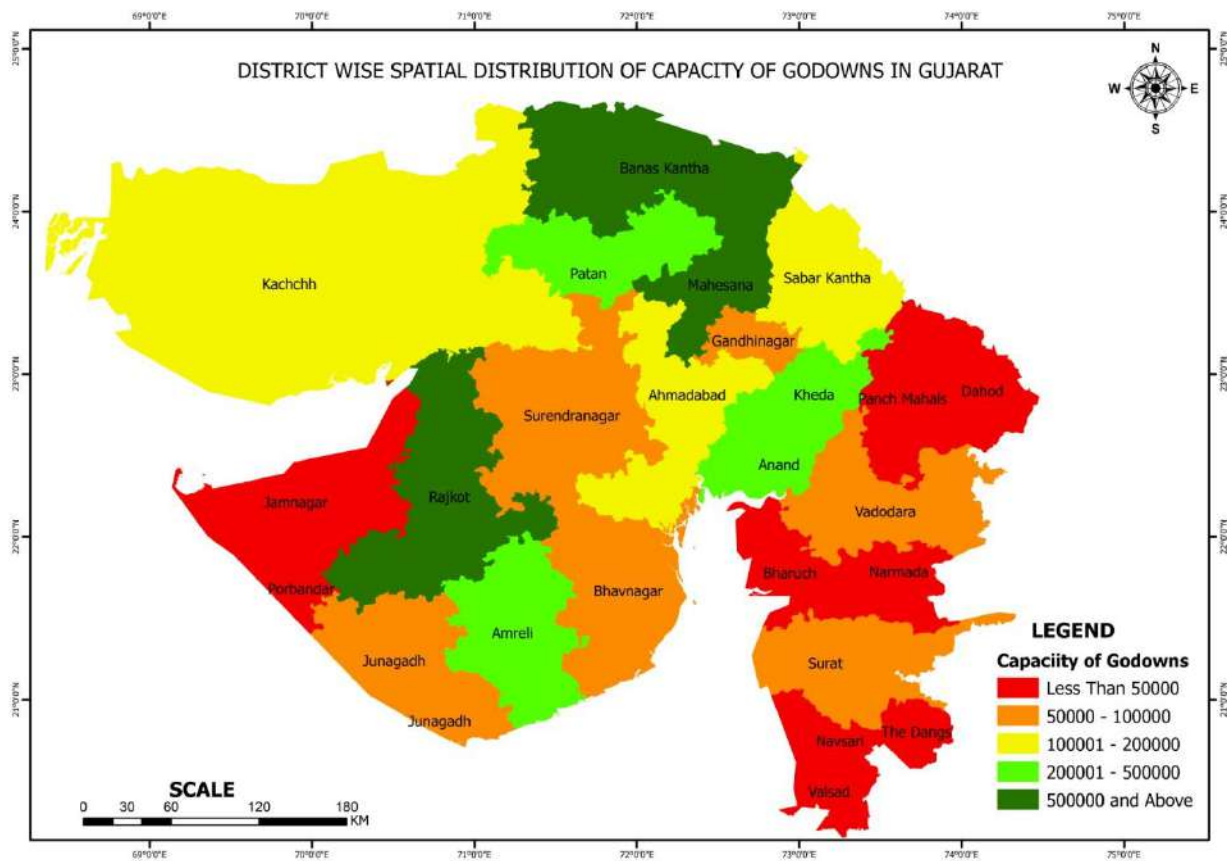


Figure C.3: Percentage of Storage Space Utilization Status



C.4. Status of GBY in Gujarat

It is noticeable that the existing initiatives that have been implemented all over the country were not getting capital subsidy to economically weaker sections to construct their own warehouses to avoid the distress sale. Furthermore, there is also a necessity of the government initiatives to support farming community at a large extent. In the light of this, the Government of India has introduced a Grameen Bhandaran Yojana (GBY) during 2001, and implemented through the Directorate of Marketing and Inspection in collaboration with NABARD, NCDC, and other financial institutions to address the limitations of other government initiatives that have been already implemented all over the country and more so to support those farm communities who are economically weak and non-viable to construct godowns. Garmin Bhandaran Yojana is a Capital Investment Subsidy Scheme for Construction / Renovation / Expansion of Rural Godowns. Since, it is a Central Scheme, the Government of Gujarat also implemented the same on the same period. The guidelines of the scheme have been subsumed with other ongoing

scheme of Development/ Strengthening of Agricultural Marketing Infrastructure, Grading Standardization and Post-harvest management (AMIGS) during 2004 and again into Agricultural Marketing Infrastructure (AMI) sub scheme of Integrated Scheme of Agricultural Marketing (ISAM) w.e.f. 2014.

Rural godown scheme plays a fundamental role in promoting agriculture marketing, rural banking and financing, and ensuring Food Security in the country. It enables the markets to ease the pressure during harvest season and to maintain supply of agricultural commodities during off season. Hence, it solves the problems of miss matching of market demand and supply, glut and scarcity, which are the usual problems in agricultural marketing. Though warehousing is an independent economic activity, yet is closely linked with production, consumption and trade. The main objective of the scheme is to create scientific storage capacity with allied facilities in the rural areas, to meet the requirements of farmers for storing farm produce, processed farm produce and agricultural inputs; promotion of grading, standardization and quality control of agricultural produce to improve shelf life of the produce, marketability; prevention of distress sale immediately after harvest by providing the facility of pledge financing and marketing credit; strengthening of agricultural marketing infrastructure in the country by paving the way for the introduction of a National System Of Warehouse Receipts in respect of agricultural commodities stored in such godowns and to reverse the declining trend of investment in agriculture sector by encouraging private and cooperative sectors to invest in the creation of storage infrastructure in the State.

C.4.1. Method of implementation of the Scheme

In Gujarat State, the GBY scheme was implemented by the Directorate of Agricultural Marketing and Inspection (DMI). It acts as a nodal office for implementing the scheme. DMI has two sub-offices located in Ahmedabad and Rajkot. Along with National Institute of Agricultural Marketing (NIAM), Jaipur and other National/ State level Institutions, DMI officials have organized training to create general awareness on the scheme to farmers and entrepreneurs for construction, maintenance and operations of the rural godowns. The scheme is implemented by the Department of Agriculture, Cooperation & Farmers' Welfare, Government of India in

collaboration with the National Cooperative Development Corporation (NCDC) and National Bank for Agriculture and Rural Development (NABARD). The credit linked back-ended subsidy for investment has been followed in the State. All three categories of beneficiaries such as individual farmers, registered Farmer Producer Organizations, Schedule Caste/ Schedule Tribes/ women have been availed the benefits under this scheme throughout the State. A few of the renovation of the storage projects availed by the cooperatives financed by NCDC.

C.4.2. Methodology of the Study

The present study is based on both secondary and primary data.

C.4.2.1. Secondary Data Sources

The secondary sources such as Directorate of Economics and Statistics, Government of India, Directorate of Marketing and Inspection (DMI), Faridabad, NABARD and NCDC have been referred to collect the data on area and agricultural production of Gujarat, number of godowns sanctioned with their capacity of storage, Rural Godowns beneficiary list, location and their addresses etc. In addition, various journals, reports, and guidelines available with the libraries, websites/ search engines were also been used in finalizing the methodology and writing the report.

C.4.2.2. Primary data collection

To collect the primary information from the beneficiaries of the scheme, users of the godowns, implementing officers of NABARD/ NCDC, Officials of implementing agencies, and bankers, pre-tested separate set of questionnaires have been designed and used to record their feedback with regard to the sources of information on GBY, profile of the users, cropping pattern & their storage methods, usage pattern of the godowns, costs incurred and benefits obtained, issues in availing the loans, constraints in management of the godown, utilization etc., and to record their suggestions for improvement of the scheme. Further, a Focused Group Discussion (FGD) was carried out to extract the reliable information from the group of farmers/ users of the godown.

The collected primary data from the questionnaires were tabulated and organized for the analysis of the data and inferences were drawn from the evaluation study leading to recommendations and suggestions. Descriptive statistics, CAGR, Cost-Benefit Analysis have used to derive inferences.

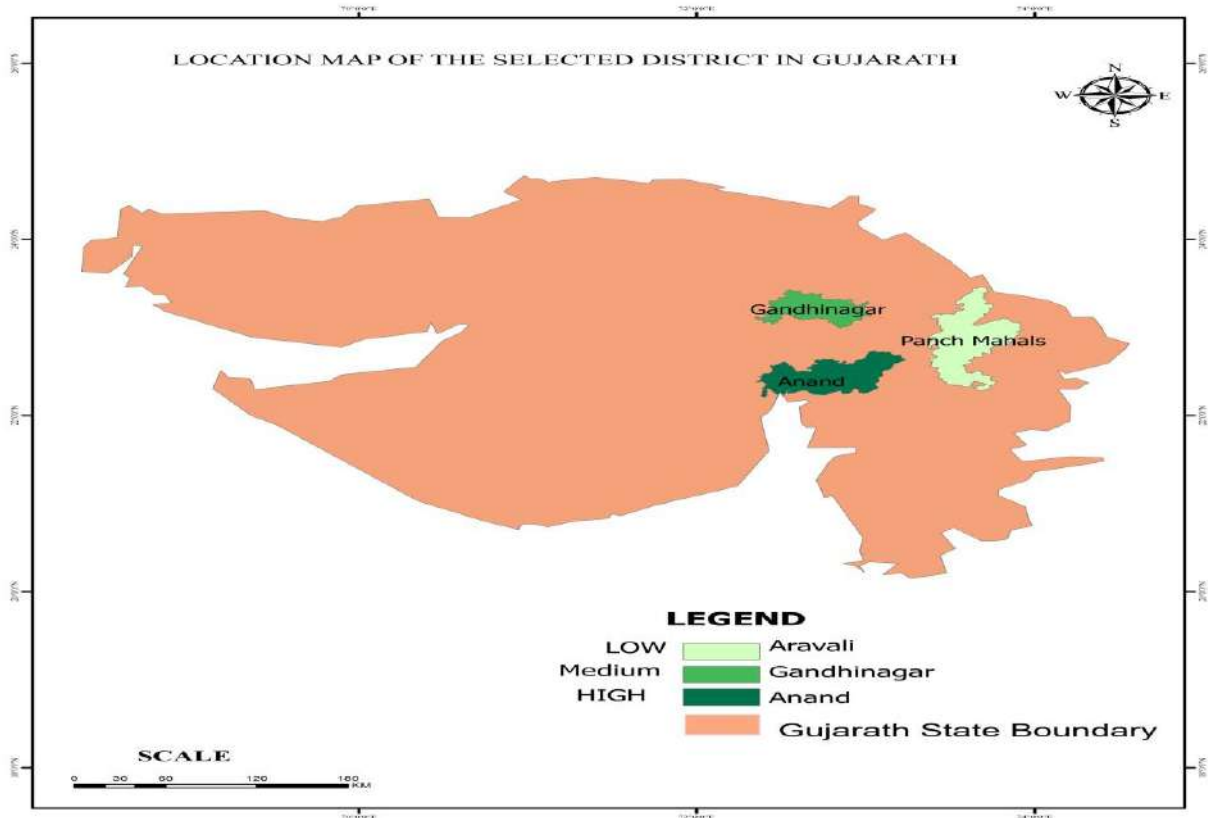
C.4.3. Sampling Method

The district-wise total number of rural godowns sanctioned by the NABARD and NCDC (till 31st March 2019) in the State of Gujarat is a criterion used to select the samples. A detailed list of number of godowns were collected from the State level offices of NABARD and NCDC with the help of State nodal agency, DMI. The districts are categorized on the basis of number of godowns and their storage capacity in each district. The average storage capacity created is used as a yard stick to classify the godowns into three categories such as high performing, medium performing and low performing districts. Within a top five districts in each category, one district was considered as a sample to represent the particular category. Accordingly, the districts selected for the State of Gujarat are Anand district to represent high performing category, followed by Gandhi Nagar under the medium performing district, and Aravalli as a low performing district (**Table C.9**). A brief profile of the sample district is given in the subsequent sections.

Table C.9: Classification of Districts based on the performances

Sl. No	Particulars	Districts
1	High performing district	Anand
2	Medium performing	Gandhi Nagar
3	Low performing	Aravalli

Source: NABARD



C.4.3.1. High Performing District –Anand

In this category, the number of godowns and their utilization seems to be better as compared to other categories. Anand district is situated in the central part of Gujarat. It has common boundaries with four other districts. The geographical area of the Anand district is 2951.10sq.kms, accounts for 1.50 percent of the total geographical area of the State. The district is divided into 8 talukas and has 365 inhabited villages and 12 towns. All the eight talukas of the district are well irrigated because of the availability of canal provision from the Mahi Right Bank Canal Command Area (MRBC) and has an intensive network of canal. The Canal is fed by weir constructed on Mahi River at Waynesboro in Balasinor Taluka of Kheda District. Anand district, the name that has been inscribed in golden letters in the history of modern India because of White Revolution and a largest co-operative sector (AMUL) development, was basically part of the Kheda district. It's only in 1997 when Anand got its existence (**Anand district at a glance 2017-18**).

The district is known as milk bowl of the State as milk production in most of its villages. Apart from this, many agricultural crops such as paddy, wheat, jowar, sunflower, bajra, cotton, tur, etc., and horticultural crops have been grown in the district in a much higher quantity. The district is also well connected with a road and railway transportations. Hence, there is a more demand for the godowns. It is also found that the sizes of the godown in this area are in the range of medium to large size. Moreover, a majority of these godowns were filled up with more of cereals, pulses, oilseeds, tobacco and dry & green fodders of wheat and paddy (**Anand district at a glance 2017-18**).

C.4.3.2. Medium performing District - Gandhi Nagar

The district is found in the northern part of the Gujarat, officially known as Gandhi Nagar district. The District is an administrative division of Gujarat, India, whose headquarters is at Gandhinagar, the State capital. It was organized in 1964. It has an area of 649 km², and a population of 1,334,455, of which, 35 per cent were urban (**Census 2001**) and ranks 20th in terms of its population in the State. The district comprises of four talukas namely, Gandhinagar, Dahegam, Kalol, and Mansa. It has 291 numbers of villages, and nine urban areas. Total area of the district is 2137.62 sq. km. Major portion of the district falls under Sabarmati river basin. The entire district is a part of North Gujarat Alluvial plain with neither hill features nor any prominent natural water bodies. The Sabarmati, the Khari and the Meshwo are important rivers of the district. The crops cultivated in the district are paddy, wheat, jowar, bajra, tur, gram, groundnut, mango, brinjal, sapota (chikku), citrus, banana, chilli, ginger, etc. The district is popular for wheat and groundnut production. Many godowns constructed in the district were used to store wheat and its by-products as noticed during the survey. Overall, it is found that the size of the godowns were neither big nor small and their utilization was to a medium extent and own purposes (**Gandhi Nagar district at a glance 2017-18**).

C.4.3.3. Low performing District - Aravalli

The Aravalli district derives its name from the Sabarmati river that separates Sabarkantha from the neighbouring districts. The district is bounded by the Rajasthan State to the north,

Banaskantha and Mehsana districts to the west, Gandhinagar, Kheda, and Panchmahal districts to the south. The major source of irrigation is Sabarmati, Hathmati, Harnav, Meshvo, Majham, Vatrak and Guhai rivers. Meshvo reservoir is constructed on Meshvo river near village Shamlaji of Bhiloda taluka. The district head quarter at Himmatnagar which is well connected with road and rail transportations. The district consists of 13 talukas namely, Bayad, Bhiloda, Dhansura, Himmatnagar, Idar, Khedbrahma, Malpur, Meghraj, Modasa, Prantij, Talod, Vadali, and Vijaynagar. The major crops in the district are wheat, paddy, groundnut, maize, tur, gram, cotton, castor, mango, coconut, ber, aonla, sapota, etc. The size of the godowns constructed under GBY are of medium to smaller in size in the district, hardly stored agricultural produces and fodder for animal feeding as observed during the survey (**Sabarkantha/Aravali district at a glance 2017-18**).

C.5. Performance of GBY in Gujarat

In Gujarat State, small and marginal farmers constitute a major share of farming community; do not have the storage facilities to retain the farm products with themselves till the market prices are remunerative. It is very much essential to provide facilities for scientific storage so as to avoid produce deterioration and enable them to meet their credit requirement. The Government of India through GBY scheme provided an opportunities to establish rural godowns to enable small and marginal farmers to increase their holding capacity, and make them to sell their produce at remunerative prices by avoiding distress sale.

C.5.1. Distribution of godowns under GBY

The secondary data collected from the head offices of DMI, NABARD and NCDC on the total number of godowns sanctioned since inception are presented in **Table C.10**. As stated earlier, the projects implemented in the State were financed (especially subsidy) either through NABARD or NCDC. The subsidy under this scheme was linked to institutional credit and the finance was made available through Commercial Banks, Regional Rural Banks (RRBs), State Cooperative Banks (SCBs) and Scheduled Primary Cooperative Banks (PCBs) and other institutions eligible for refinance by the NABARD or any other financial institutions such as

State Financial Corporations (SFCs) approved by DAC&FW. The individuals, group of farmers/ growers, registered FPOs, Cooperatives, Partnership/ Proprietary firms/ Companies, APMCs, State Warehousing Corporations (SWCs) have availed the benefits from the GBY scheme.

Table C.10 reveals that out of the total projects sanctioned in the State of Gujarat, a majority (>90%) were sanctioned by the NABARD but a meagre proportion were approved by the NCDC. Due to lack of available data with the NCDC, the details of the godowns sanctioned by them are not presented here. One of the key features of the NABARD distribution of godowns noticed in the case of Gujarat is that the sizes of the godowns were small and mostly used to store main agricultural products, by-products, agricultural inputs such as chemicals, fertilizers, horticultural crops, and commercial crops like tobacco. Across districts, the top five districts in the order of number of godowns sanctioned were Rajkot (3099), Amreli (1774), Mehsana (914), Patan (813) and Ahmedabad (740), whereas, top five districts in terms of storage capacity created were Banaskantha (31.02 lakh MT), Mehsana (7.78 lakh MT), Rajkot (5.94 lakh MT), Patan (3.60 lakh MT), and Anand (3.09 lakh MT), and in the rest of the districts, the godowns area falls below 300 MT.

Looking into the distribution of rural godowns across districts, it is understood that NABARD has sanctioned a greater number of projects in the districts. Though the Gujarat State is one of the pioneers State in recognizing the importance of co-operative marketing reform, a higher number of cooperatives exist in the State and most of them were related to the milk and horticultural produces. It is also true that the cooperatives were more active and successful in respect of dairy products and horticultural produce as compared to foodgrains. As per the available data with the NABARD, the distribution of godowns are presented in **Table C.10**. Looking into the table, it appears that the NABARD has sanctioned the godowns under GBY on the basis of demand irrespective of type of produce.

C.5.2. Profile of the Beneficiaries under GBY

The socio-economic details of the beneficiaries are presented in **Table C.11**. It is observed from the table that a majority of the beneficiaries (44%) who obtained benefits from the GBY are

individuals, followed by SC/ ST/ Women (40%), and farmers (13%). The average age of the beneficiaries was 53 years having better education. Among different levels of education possessed by the beneficiaries, a majority (40%) had possessed a pre-university and above education level, followed by Matriculation (40%) and higher primary education (17%). Average number of family members was seven persons with an average annual income of Rs. 2.90 lakhs. In addition, they had an agricultural Net Operated Land to an extent of 5.44 acres.

C.5.3. Cropping pattern of the Beneficiaries

The previous year cropping pattern of the beneficiaries have been collected and illustrated in **Table C.12**. It is clearly visible from the table that the beneficiaries have undertaken crop cultivation in three seasons in a year. This is mainly due to availability of a large number of water resources such as canals, check dams, and water harvesting structures made available by the Gujarat Government for cultivation of crops throughout the year. The major crops grown by the beneficiaries include cereals such as wheat, maize, bajra, and paddy, commercial crop – tobacco, vegetables, and fruit crops like banana in the sample area.

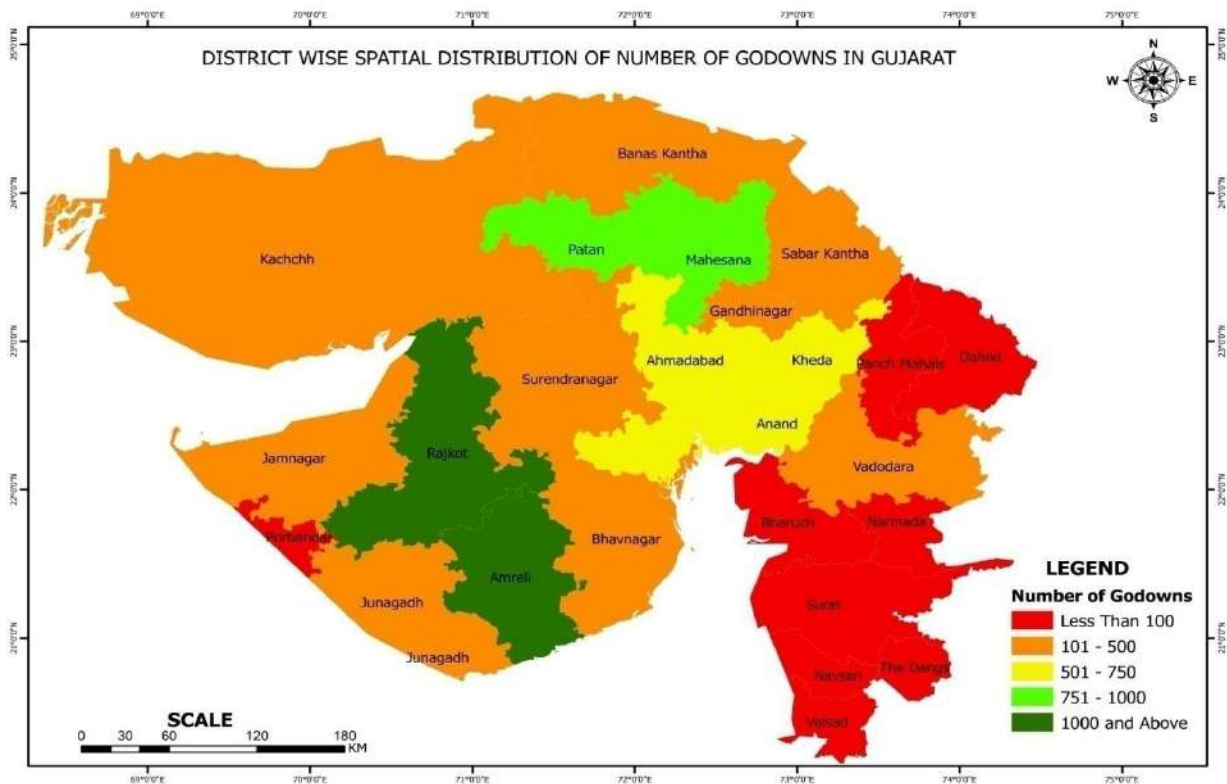


Table C.10: Distribution of godowns by NABARD under GBY since inception (2001-02) till 31st March 2019

District	Number of godowns	Capacity of godowns (MT)
Rajkot	3099	595481
Amreli	1774	230063
Mehsana	914	778471
Patan	813	360038
Ahmedabad	740	171735
Kheda	708	272638
Anand	553	303992
Junagadh	498	118881
Jamnagar	446	48329
Sabarkantha	328	111224
Banaskantha	246	3102279
Bhavnagar	205	59258
Kutch	175	146181
Surendranagar	173	89027
Vadora	136	85152
Gandhinagar	128	65,052
Morbi	74	18205
Panchmahal	60	26160
Surat	58	66483
Gir Somnath	50	10,625
Valsad	46	21931
Porbandar	44	5489
Aravali	36	10836
Navsari	34	37940
Botad	27	4186
Dahod	25	2414
Bharuch	23	7996
Devbhumi Dwarka	17	1967
Mahisagar	17	3793
Tapi	17	27193
Chotaudepur	12	2414
Narmada	10	1198
Himatnagar	9	1547
Dang	3	140
Idar	1	77
Nadiad	1	127

Source: NABARD

Table C.11: Profile of the Beneficiaries of GBY

Sl. No.	Particulars	Unit
1	Category-wise Usage of Godowns	(% of respondents)
	Individuals	46.66
	SC/ST/Women	40.01
	Farmers	13.33
2	Average age of the beneficiary (Years)	53.00
3	Education level (% of respondents)	
	Illiterate	-
	Primary (1 to 4)	3.33
	Higher primary (5 to 9)	16.67
	Matriculation (10)	40.00
	Pre- university (10+2) & above	40.00
4	Average No. of family members (Numbers)	7.00
5	Average Annual Income (Rs.)	2,90,000
6	Net operated area (Acres)	5.44

Source: Primary data

From the above analysis, it is found that the cropping pattern in Gujarat has undergone significant changes over time. Wherever water is not a constraint and assured irrigation is available, beneficiaries were growing paddy and wheat. In other areas, banana, bajra, and tobacco were cultivated both as a solo or mixed cropping. Across sample districts, higher proportion of wheat, paddy, maize, and tobacco were observed in the case of Anand. Wheat, bajra, and chilli were noticed in respect of Gandhi Nagar district, while a mixed cropping pattern was observed in the case of Aravalli. In addition, a higher proportion of mushroom cultivation was also noticed during the survey. Across crops, only Chilli was noticed in all the three seasons. Banana was available throughout the year, while tobacco is an annual harvesting. In terms of area under cultivation, cotton was grown in a higher area (3.42 acres) as compared to all other crops during kharif season only, followed by chilli (almost 2 acres each during kharif and rabi). Tobacco was harvested in one season immediately after Kharif. Whereas, banana was available throughout the year in an average two acre of land. Interestingly, except tobacco, almost all these crops were grown by the beneficiaries and sold in the local market yard as soon as the produce is harvested without storing and waiting for a favorable price in the market. Only in the case of tobacco, the produce was kept in the godowns for three to four months or till they get a reasonable price in the market.

In respect of tobacco and banana, a few were sold to the brokers at the farm gate/ local market yard. There were number of intermediaries involved in the marketing of the agricultural produce, hence, a majority will be selling their produce to these intermediaries at the local market at distress price. On an average, 65 to 75 per cent of the produce grown by the farmers were sold in these markets and the rest was kept for own consumption.

Interestingly, these results are on par with the marketed surplus as indicated in the **Table C.4**. Marketable surplus is the only income for the farmers, their income level depends on the price at which they sell in the market. A majority cases, the producers will be selling as soon as the harvest is over/ peak season due to non-availability of storage spaces with them. It is a general knowledge that during peak season, the demand will be lesser and prices will be at lower levels. Therefore, it is important to store the produce till the remunerative prices in the market. This is where the role of GBY played an important role by creating storage places at the rural areas in general and particularly, at farm houses.

Table C.12: Information on Crop-wise Area, Production and Marketable Surplus

(Qty in Qtl)

SI. No	Crops	Area (Acre)	Production	Consumption	Stored	Sales
Kharif						
1	Paddy	2.27	62.10	8.60	53.50	Local Mkt yard
2	Maize	2.61	67.06	7.29	58.50	Local Mkt yard
3	Bajra	2	30.50	10.00	20.50	Local Mkt yard
4	Chilli	1.75	316.67	15.00	222.50	Local Mkt yard
5	Vegetables	2	500.00		500.00	Local Mkt yard
6	Cotton	3.42	41.63		41.63	Local Mkt yard
Rabi						
1	Wheat	3.37	83.54	11.61	71.93	Local Mkt yard
2	Chilli	2.00	300.00	10.00		Local Mkt yard
3	Banana	1.75	775.00		1300	local trader (broker)
Summer						
1	Tobacco	2.41	248.75	1.00	444.17	local trader (broker)
2	Vegetables	1.25	590		450	Local Mkt yard

Source: Primary data

C.5.4. Sources of information on GBY

In order to understand, how the beneficiaries got information on GBY, the sources of information were collected and displayed in **Table C.13**. It is noticed that a majority have got the information from the Media (60%), followed by Bank officials (23%), Panchayat Mukhiya (13%), who generally interact directly with the Development Officers including the lead banks in their areas very often. About three per cent have also expressed that they got information from the APMCs. The other sources enlisted by the beneficiaries are co-farmers, friends and relatives, etc.

Table C.13: Sources of information on GBY

Sl. No	Particulars	Percentage
1	Bank officials	23.33
2	Media	60.00
3	APMC	3.33
4	Panchayat Mukhiya	13.33
	Total	100.00

Source: Primary data

C.5.5. Distribution of Beneficiaries

To have an idea, the beneficiaries were grouped into the classification as enlisted in the GBY guidelines and the results are shown in **Table C.14**. Table reveals that a majority of the beneficiaries availed benefit from the GBY, in the order of SC/ ST/ women (43%), followed by individuals (30%), and farmers (27%). The individuals are the persons other than farmers category, he might be a businessmen, entrepreneur, farmer, group of farmers, etc., and are eligible for 15 per cent subsidy; farmers are the individuals having agriculture as their main occupation and availed subsidy at the rate of 25 per cent under farmers quota; SCs/STs include the individual men from SC/STs and women from all categories, and are eligible for 33 per cent subsidy.

It is worth to mention here that in the case of Gujarat, a many APMCs, Zilla Panchayats (ZPs), and the Cooperative societies have availed the benefit under Individual categories and constructed godowns in the rural areas, mainly to facilitate storage and to avoid distress sale

from the farmers. A few cases, godowns were handed over to the Gram Panchayats and Trustees by the APMCs, to enhance their capacity utilization. However, in many cases, these godowns space were utilized for agricultural produce storage/ sale of agricultural inputs by the Cooperative societies. But, in a few cases, they have been utilized for public distribution centres (PDS)/ rationing, and to conduct ceremonies etc. Out of the sample, four such projects were visited and found that they have been utilized for such activities mentioned above, in respect of both Aravalli and Gandhi Nagar districts. During the visits, we also found that a majority of the NABARD sanctioned projects were smaller in size (ranged from 100 to 500 MT), and mostly used to store their own agricultural produces, agricultural inputs such as fertilizer and pesticides, and feed and fodder materials.

In order to attract private entrepreneurs, the scheme was made available to the traders as well as businessmen to invest on the godowns. The bankers have classified these entrepreneurs/ traders and associations under Individual category provide subsidy benefits from NABARD. Accordingly, a few have constructed the rural godowns with a larger size. On the other hand, a group of farmers or FPOs also availed the benefit under this scheme to an extent.

Table C.14: Classification of the Sample Beneficiaries as per GBY Guidelines

SI. No.	Beneficiaries	Percentage
1	SC/ST/Women	43.32
2	Individuals	30.00
3	Farmers	26.66
	Total	100.00

Source: Primary data

C.5.6. Godowns Capacity Utilization

It is found that a majority of the rural godowns availed by the beneficiaries were used to store agricultural main products, by-products or horticultural produces only. Since, there were no availability of records on storage details with the beneficiaries, the average utility of the godowns were collected. Accordingly, the utilization of the godowns was classified into three categories in Gujarat such as;

- a) Sub-optimal utilization
- b) Optimum utilization
- c) Own use

a) Sub-optimal utilization - The godowns that are of larger in size (> 500 MT), which have not been utilized properly in the places where the godowns are constructed without a proper business plan. Farmers in Gujarat have no tendency to store their produce and sell may be due to non-availability of the government procurement in the State. Hence, no hiring practices of godowns on rental basis were found in the State of Gujarat. Such types of godowns were found especially in the case of Gandhi Nagar and Aravalli districts. During the interaction with the beneficiaries, it was found that the project plan was prepared by some Consultants and the bank managers concentrated more on repaying capacity of the proponent rather than project report. However, larger godowns were fully utilized in the places where assured irrigation facilities were available. For instance, such godowns are found in Anand and part of Gandhi Nagar districts.

b) Optimum utilization - These godowns are of 200 MT to less than 500 MT, wherein the medium and large farmers availed subsidies under GBY to construct godowns with a primary objective of storing their own/ relatives produce for a temporary period of 3-4 months or till the prices are favour or to wait till the next harvest period. Interestingly, none of them aware of a pledge loan facilities and warehouse receipt systems in the State of Gujarat. This category also includes the godowns constructed with the support of ZPs, APMCs and Cooperative Societies, but were utilized throughout the year for selling agricultural inputs, PDS, farm equipment etc.

c) Own use - These godowns are of smaller size (less than 200MT), usually availed by the medium farmers to store their own produce, inputs and other farm equipment. Some of beneficiaries have converted these godowns into other purposes such as a part of residential house, mushroom cultivation, storage of dry and green fodders, cattle shed, and commercial shops after the repayment of loans to the bank. Most of the time, these godowns will be utilized for more than ten months in a year.

On the basis of duration of the storage, the godowns are classified into three categories and presented in **Table C.15**. It is noticed from the table that, a highest number of users (50%) stored their produce in the godowns for a period up to three to six months, subsequent one to three months (30%) and beyond six months (20%). It is found that dry fodder products were kept for beyond six months had their main subsidiary activity as dairy.

Table C.15: Storage characteristics of the users

Sl. No	Duration (months)	% of users
1	1 to 3	30.00
2	3 to 6	50.00
3	6 to 12	20.00

Source: Primary data

C.5.7. Economic Benefits obtained from the Godowns

C.5.7.1. Sale of Agricultural Produce

An attempt was made to verify whether beneficiaries have realized additional prices benefits by keeping their produce in the godowns in the case of Gujarat and the results are presented in **Table C.16**. The price at which the farmers sold their produce was compared with the prevailing MSP in the year and actual prices received by the farmers in the later stages, to work out the economic benefits, as the farmers were unable to recollect the prices during the harvest period. It is noticed that a maximum benefit obtained (32% hike) was noticed in the case of wheat followed by paddy (25%), maize and cotton (12% each), and bajra (11%). Although, a few were stored for a limited period, they realized better prices than the prices at peak period/ harvest period. This manifestation of positive impact was possible mainly due to the creation of rural godowns under GBY by preventing sales during glut phase of the market. For details of absolute incremental benefits realized by the farmers is presented in **Table C.16**.

Table C.16: Crop-wise Economic Benefits obtained from the Godowns (Rs. /Qtl)

SI No.	Crops	Minimum Support Price (MSP)	Actual Price Received by the Farmer After Storage Period	Incremental Benefits due to GBY	
				Rs/Qtl)	Percentage
1	Paddy	1750	2195	445	25.43
2	Maize	1700	1910	210	12.35
3	Bajra	1950	2175	225	11.54
4	Cotton	5150	5750	600	11.65
5	Wheat	1840	2430	590	32.07

Source: Primary data

C.5.7.2. Employment Generation due to the Rural Godowns

Further, due to the establishment of rural godowns, the beneficiaries have been contributing in the form of employment generation in the form of hiring labour for a security, loading and unloading, management of the godowns etc. The rate of employment generation was worked out based on the size of the godowns and presented in **Table C.17**. It is noticed that on an average, a less than 200MT godowns have generated 95 man-days of permanent and 50 man-days of casual labour; more than 200 to 500MT godowns have generated about 270 man-days of permanent and 250 man-days of casual labours. Similarly, in the case of more than 500MT godowns, the employment generation is about 360 man-days of permanent and 400 man-days of casual labours. It is noticed that higher the capacity of the godowns, better will be the infrastructure and skill level of workforce.

Table C.17: Employment Generation due to the Rural Godowns

SI No.	Details	<200 MT	>200 to 500 MT	>500 MT
Permanent Worker				
1	Average No. of workers/godowns	-	1	1
2	No. of work days	360	360	360
3	No. of working hours	2	6	8
4	No. of Man-days	95	270	360
Casual Worker				
5	No. of Man-days	50	250	400

Source: Primary data

C.6. Perception of the stakeholders

In this section, we have made an attempt to collect the information from the beneficiaries as well as the users of the godowns on different aspects of agricultural produce storage and their benefits as follows:

C.6.1. Reasons for Immediate Sale by the farmers

Table C.18 presents the reasons for immediate sale/ distress sale by the farmers, as it is a common phenomenon noticed across the State. It is found that about 60 per cent of the farmers sold their produce as soon as the harvest to meet the immediate requirements, like to repay the loan, purchase of inputs (seeds, fertilizers, pesticides, equipment), family functions such as festivals, marriages, children education fee etc. In many cases, they will be repaying the amount already spent on the same purposes in the last season or for the next season. Not aware of the pledge loan facility was the next important reason specified by the 20 per cent of the farmers. However, about five per cent expressed that there is no storage facility to store their produce was the reason for immediate sale. More importantly, about 15 per cent farmers also expressed their misconception that the storage reduces the weight in the later stages. They explained that because of the thresher harvest, immediate sale helps to gain advantages of weight because of the higher moisture content; the seller may reduce a meagre value for the same.

Table C.18: Reasons for Immediate Sale by the farmers

Sl. No.	Reasons	Percentage
1	To meet the immediate requirements (purchase of inputs, family expenses, to clear the debts with the formal or informal sources)	60.00
2	No storage facilities	5.00
3	Not aware of pledge loans	20.00
4	Storage reduces the weight	15.00

Source: Primary data

C.6.2. Level of Awareness on the Benefits of Scientific Storage of Agricultural produces

To understand the awareness level of the farmers and beneficiaries on the benefits of scientific storage of agricultural produce, a few questions were posed to the farmers and their responses are displayed in **Table C.19**. It is very clear from the results that a more than 50 per cent of the

farmers were aware that the scientific storage helps to get a better price in the later stages, avoids wastage (30%), and protects the farm produce from pest and diseases attack (20%) scientifically. Although, they knew that immediate sale of produce is a distress sale, farmers are selling immediately to overcome from the immediate financial requirements.

Table C.19: Level of Awareness on the Benefits of Scientific Storage of Agricultural produces

Sl. No.	Benefits	Percentage
1	To avail better price	50.00
2	Protection from pest and rodents attack	30.00
3	To avoid wastages	20.00

Source: Primary data

C.6.3. Types of storage structure used to store the produce

Information on traditional storage methods were also collected from the farmers and beneficiaries to understand the methods of storages in the earlier stage/ practice which they are following in their house and their status as on today. It is seen from **Table C.20** that a more than 50 per cent of the farmers store their produces in Mud structure inside the residential houses. Further, about 26 per cent stored their produce in the Wood/bamboo structures and 17 per cent expressed that they store their produce in metallic/plastic drums, bins, gunny bags, or containers. A majority of the farmers were also expressed that, till today there are using these storage structures to store agricultural produce kept for own consumption. From this we can conclude that a majority farmer household are storing the produce in the traditional structures only due to non-availability of scientific storage structures in the rural areas. Whereas, in recent days a very few farmers started storing their agriculture produce in scientific warehouses.

Table C.20: Information on Types of storage structure used to store the produce

Sl. No.	Storage Structure	Percentage
1	Mud structure	56.67
2	Wood/bamboo	26.67
3	Metallic drums, bins or container	16.67
	Total	100.00

Source: Primary data

C.6.4. Perception of farmers on advantages of Godowns vis-a-vis Traditional storages

Perception on scientific storage versus traditional practices were collected from the farmers and beneficiaries and the results are expressed in **Table C.21**. It is observed that a highest number of farmers (47%) expressed that the scientific storage godowns reduces the losses from the pests/ rodents/ birds/ moisture to an extent of 62 per cent as compared to the traditional storage structures. About 27 per cent of the farmers stated that there will be no wastage in the godowns. About 11 per cent producers also stated that godowns improves quality of the produce to an extent of eight per cent. However, more than seven per cent farmers appreciated the godowns for the reasons of no pilferage and availability of insurance to an extent of more than 85 per cent.

Table C.21: Perception of storage users on advantage of Godowns vis-a-vis Traditional storage practices

Sl. No.	Particulars	Percentage	Increase or Decrease (%)
1	Quality maintained	11.00	8.00
2	Reduced losses from pests/ rodents/ birds/ moisture etc.	46.67	62.00
3	No wastage	26.67	10.00
4	No pilferage (stealing)	6.67	85.00
5	Insurance facility	9.00	90.00

Source: Primary data; *Note:* Multiple responses are provided by the users, hence, total per cent shows more than 100.

C.6.5. Constraints expressed by the beneficiaries of the GBY Scheme

The owners of the godowns were asked to enlist the issues or constraints faced and suggestions for improvement of the GBY scheme as per their opinions. Accordingly, we have categorized and discussed the constraints and suggestions in **Tables C.22**. Table explains the constraints of the owners/beneficiaries of the GBY in obtaining the benefits of the scheme and management of the godowns. It discloses that a lack of demand by users (75%) was a major issue in the construction of the godowns under GBY, followed by a lack of assistance from the local administration (64.64%), requirement of a large capital (60%), non-availability of skilled

manpower (42%), maintenance problem (about 32%), lack of demand by users, lack of awareness, inadequate technical supervision and problems in land conversion were the issues as expressed by 20 to 30 per cent of the farmers. The next line of other issues is risk of damage, paucity of working capital, deterioration in quality and quantity, high rate of interest, and administration constraints issues constitutes about a less than five per cent of the beneficiaries. From these issues, it is understood that the owners of the godowns require a lot more than the subsidy from the government to manage plenty, and to facilitate farmers to avoid the distress sales.

Table C.22: Constraints expressed by the beneficiaries of the GBY Scheme

Sl. No.	Particulars	Percent of Owners
I	Financial constraints	
1	High cost of fumigation	15.50
2	High rate of interest	5.00
3	Paucity of working capital	4.50
4	Requirement of large capital	60.00
II	Technical constraints	
1	Non-availability of skilled manpower	42.00
2	Inadequate technical supervision	22.50
3	Maintenance problem	35.50
III	General constraints	
1	Lack of demand by users	75.00
2	Lack of awareness	23.25
4	Risk of damage	5.25
5	Deterioration in quality and quantity	3.33
	Administration constraints	5.00
IV	Any others (Specify)	
1	Problems in land conversion	25.36
2	Lack of assistance from local administration	64.64

Source: Primary data

C.6.6. Suggestions provided by the beneficiaries of GBY

On the other hand, a few suggestions were reported by the owners of the godowns are presented in **Table C.23**. A highest proportion of farmers (55%) suggested for educating the beneficiaries on the pledge loan facilities and their easy arrangement from the banks is an immediate

requirement, followed by the awareness on benefits of scientific godowns among the farming community (40%), increment in the volume of loan amount (35%), Procurement of wheat by Government at MSP price (21%), and development of proper infrastructure facilities (19%) were the suggestions expressed by the beneficiaries in the Gujarat State. These issues seem to be relevant and needs immediate attention of the policy makers, to take away the farmers from distress sale and to double the farmer’s income in the near future.

Table C.23: Suggestions provided by the beneficiaries of GBY

Sl. No.	Particulars	Percent of Owners
1	Increment in the volume of loan amount	35.00
2	Awareness on benefits of Godowns among farmers	40.00
3	Procurement of wheat by Government on MSP	20.50
4	Development of proper infrastructure facilities	18.50
5	Education on Pledge loan facilities	55.00

Source: Primary data

C.7. Pros and Cons in Implementation of the RGS/ GBY in Karnataka

The main objectives of the scheme include creation of scientific storage capacity along with allied facilities such as weighing machines, training on post-harvest management of food grains etc, in the rural areas to meet the requirements of farmers for storing farm produce, processed farm produce, and agricultural inputs. It is clear from the above description that due to various factors in general, and non-availability of storage space in particular, the farmers are selling off their produce right after the harvest (glut phase in the market), and hence are not getting remunerative prices for their produce. In this context, the RGS has been introduced by the GOI is relevant for the Gujarat State. In this section, authors have made an objective-wise critical appreciation of the scheme in the State of Gujarat as follows:

C.7.1. Extent of coverage and capacity utilization of the godowns

The scheme GBY has been successfully implemented across all districts in the Gujarat State, with a various degree of numbers and storage capacity creation as per the cropping pattern, extent of irrigation facilities, and the demand prevailing in the respective districts. Across

districts, the top five districts in the order of number of godowns sanctioned under GBY are Rajkot (3099), Amreli(1774), Mehsana (914), Patan (813) and Ahmedabad (740). Whereas, the top five districts in terms of storage capacity created are Banaskantha (31.02 lakh MT), Mehsana (7.78 lakh MT), Rajkot (5.94 lakh MT), Patan (3.60 lakh MT), and Anand (3.09 lakh MT), and rest of the districts, godowns area, falls below three lakh MT. The details of the coverage are given in **Table C.10**. Out of the total projects sanctioned in the State of Gujarat, more than 90 per cent were sanctioned by the NABARD, and others such as NCDC, FCI, Private agencies etc., has covered the rest by encouraging the beneficiaries to utilize this scheme. Looking into the distribution of rural godowns across districts, it is understood that the creation of storage capacity is demand driven, irrespective of districts and cropping patterns.

With an exception of State and central warehouse corporations, a most of the rural godowns owners have not maintained basic records on arrivals, quantities, and storage detail records, and infrastructure facilities like weighing machine, moisture meters, rodent & pest control measures, etc. Hence, it was difficult to assess the exact capacity utilization of the godowns created under GBY. However, godowns were classified based on the opinions of the beneficiaries during the field survey. Accordingly, it is noticed that there were three patterns of utilization such as 1) Sub-optimal utilization, 2) optimum utilization, and 3) own utilization of godowns in the State of Gujarat. A majority of the large godowns (>500MT) were fall into the category of sub-optimal utilization in many districts. A few godowns of such size were found to be utilized optimally in a few districts (Anand, and Aravalli) where, the cropping pattern was wheat, maize, paddy and tobacco. Moreover, these districts had a better irrigation facility. During the interaction, it was found that the reasons for sub-optimal utilization were a) lack of demand for storage in the godowns, b) no procurement from the government side at MSP, c) No awareness on pledge loan facilities to retain their produce in the godowns, d) failure of monsoon and consequent crop failures, e) shift in the cropping pattern from field crops to commercial crops etc.

Beneficiaries also expressed that a major reason for sub-optimal utilization/ failure of godowns was mainly due to poor project plan/ inaccurate estimations. One of the key features of the Gujarat is that a majority of the farmers who availed smaller godowns with a capacity less than

200 MTs were utilized efficiently by the beneficiaries for their own purposes in the form of storage of tobacco, feed and fodders, agricultural equipment etc.

On the basis of duration of the storage period (**Table C.15**), a highest number of users (50%) stored their produce in the godowns for a period up to six months, subsequently up to three months (30%) and beyond six months (20%).

C.7.2. Constraints in implementation and performance of GBY

Although the implementation of the scheme of RGS has registered a significant success, it has been observed during the field work that there were some constraints which have negatively influenced the success of the program viz., lack of awareness about the scheme among the farming community; lack of demand for godowns, delay in subsidy; lack of participation of medium and SC/ST farmers due to a high capital investment.

C.7.2.1. Lack of demand

Due to a limited size of land holdings and operation size (less than two hectares), a majority of the farmers in Gujarat fall into the category of small and marginal, their production and income levels will be at subsistence. Moreover, the absence of government intervention in procurement of foodgrains the farmers were not thinking of storage and wait for the remunerative prices in the later stages. Further, there are no significant means of income in across seasons, farmers are forced to take loans for agricultural and non-agricultural purposes. End of the season, they are under pressure to repay the loans as soon as the harvest is done (during glut period). This attitude has resulted in lack of demand for storage space.

C.7.2.2. Lack of information from the local administration

As discussed in the constraints, about 65 per cent of the farmers also expressed that there is a lack of information related to the post-harvest management, storage management, pest-diseases control measures, marketing information, and availability of pledge loan facilities from the local

administration such as Department of Agriculture, Horticulture, FCI, DMI, NABARD, Banks etc., were the major threats of successful of the GBY.

C.7.2.3. Requirement of high capital investment

It is observed during filed survey that a majority of the benefits under GBY were captured by small and marginal farmers. As the Guidelines stipulate that the project component must contribute 20 per cent of the project cost as a margin money and for most of these farmers, as well as SC/ ST farmers, the initial investment and the margin money amounts to prohibitively high and has prevented them from considering the construction of godowns and availing the benefits of GBY. Moreover, bankers give a priority to the repayment capacity of the proponent rather than demand for godowns.

C.7.2.4. Non-availability of skilled manpower and poor management of godowns

The scientific godowns should be managed properly to reduce the post-harvest losses during storage. However, farmers were not educated and there is no either capacity building activities nor skilled manpower for the management of godowns as observed in the State of Gujarat during field survey. Like the high-performing States such as Madhya Pradesh and Haryana, there should be a third-party management arrangement for a better management of the rural godowns.

C.7.2.5. Lack of awareness about the scheme

In the Gujarat State, although the DMI and NABARD, have conducted awareness campaigns and programs for officers of regional financial institutions/ banks, the programme was unable to reach the masses in rural Gujarat. It was found that media was a prime source of information about this scheme. Whereas, in the case of Karnataka, Haryana and Punjab States, the promotion of scheme was intense due to a participation of other agencies such as Panchayat President, FCI and Haryana State Cooperative Supply & Marketing Federation (HAFED), which directly involved in foodgrain procurement and storage.

C.7.2.6. Absence of awareness on Pledge loan

The major constraint observed during the survey that a large share of beneficiaries was not aware of the pledge loan facilities for their produce retained in the godowns.

C.7.3. Extent of participation of the beneficiaries

A majority of the beneficiaries availed benefits from the GBY were in the order of SC/ST/Women (43%), followed by Individuals (30%), and farmers (27%). The SC/STs and women farmers were eligible for 33 per cent of the subsidy to the total project cost. The individuals are the persons other than farmer's category such as a businessman, entrepreneur, farmer, group of farmers, etc., and they were eligible for 15 per cent subsidy; farmers availed subsidy at the rate of 25 per cent under farmers quota. In addition to these beneficiaries, a many APMCs, Zilla Panchayats (ZPs), and the Cooperative societies have availed the benefit under Individual categories and constructed godowns in the rural areas, mainly to facilitate storage and to avoid distress sale from the farmers.

It is found that a majority of the NABARD sanctioned projects were smaller in size (ranged from 100 to 500 MT), and mostly availed by the small and marginal farmers for their own purpose and stored their own agricultural produces, agricultural inputs such as fertilizer and pesticides, and feed and fodder materials. In order to attract private entrepreneurs, the scheme was made available to the traders as well as businessmen to invest on the godowns.

C.7.4. Overall performance of the scheme

Rural godowns scheme plays a vital role in promoting agriculture marketing, rural banking and financing and ensuring food security in the State as well as in the country. It enables the markets to ease the pressure during harvest season and to maintain supply of agricultural commodities during off season. Thereby, it resolves the problems of glut, scarcity and some extent of distressed sales which are the main problems in agricultural marketing. Though warehousing is an independent economic activity, yet it is closely linked with the production, consumption and

trade. In this regard, the implementation of the Rural Godown Scheme by the Government of India was a successful attempt towards helping the farmers to avoid distress sale, and to enhance their income levels. In this section, we have made an attempt to explain the performance of the scheme is as follows:

- Promotion of grading, standardization and quality control of agricultural produce to improve their marketability: Field work in Gujarat was conducted in three different regions representing high, medium and low performance of RGS in the State. With an exception of storing tobacco as it requires curing, no grading, standardization, and quality control of agricultural produce was observed in the State. Most of the storage space created was used to store feed and fodder for dairying. A few farmers used this storage space for temporary storing of perishables produce till it taken to market.
- Prevention of distress sale immediately after harvest by providing the facility of pledge financing and marketing credit: In addition to the beneficiaries of GBY, random personal interviews of about 30 farmers were also carried out to understand the awareness and accessibility of pledge loan benefits. The farmers were enquired about the distress sale of their produce (at a rate lower than MSP declared by the State Government). There have been no instances of such distress sale reported by the farmers, as they have sold their produce slightly lesser than MSP. In addition, farmers were also opined that storing in godowns incurred associated costs such as cleaning, loading & unloading, godown rental, transportation etc., discourage the farmers to store in godowns. Further, a larger proportion of the farmers were not aware of the pledge loan facility from the banks.
- Strengthen agricultural marketing infrastructure in the country by paving the way for the introduction of a National System of Warehouse Receipts in respect of agricultural commodities stored in such godowns: As per the records made available by the Regional Office of NABARD, Ahmadabad, there are a few godowns created under RGS with a limited storage capacity. A major reason for this difference being Godowns are used for storing own (or relatives) produce and were not registered with WDRA. It also indicates that the storage space is not available for farmers in general. The gap between the storage space created under GBY, and the area available/eligible under National System of Warehouse Receipts, indicates a significant scope for improvisation in the operations of the RGS.

- Demand and supply of storage capacity created under GBY along with other agencies: The total number of godowns created under the GBY along with other agencies were accounts to 18514 with a capacity of 4265.94 thousand MT at the overall State of Gujarat (covered 31 districts). On an average, each godown capacity works out to be 200 to 500 MT (**Table C.24**). To cater the State level production of foodgrains at about 7665 thousand MT (as per 2017-18 data), the storage space created since inception of the scheme could able to accommodate only about 56 per cent of the total production in Gujarat. Considering the marketable surplus to an extent of 80 per cent of the production, the gap of 44 per cent is exposed to post harvest management issues, underlining a significance of creation of suitable storage space in the State.

Table C.24: Total Supply (Storage Capacity/Space created) and Demand in Gujarat (2017-18)

Total storage Capacity in 000 tons	Total Foodgrain Production (000 tons)	Storage Gap (000 tons)	Demand for storage (%)
4265.94	7665.00	3399.053	44.35

Source: NABARD

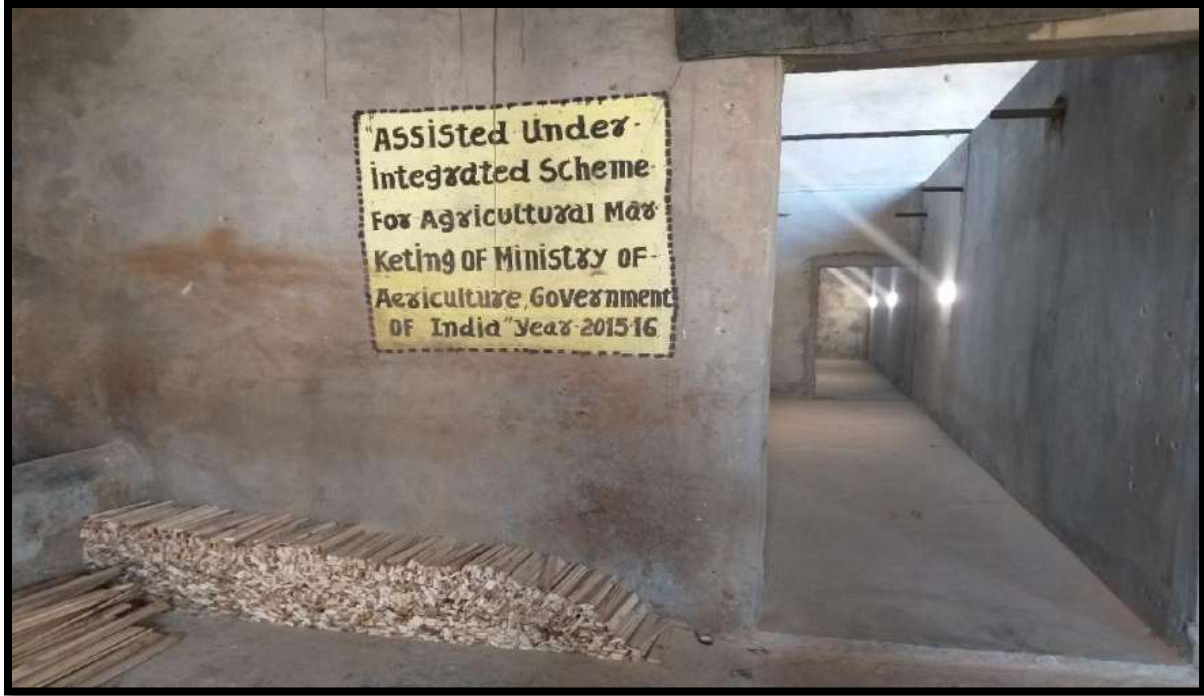
C.8. Summary and Conclusion

Post-harvest management plays an important role in the production and marketing as the considerable quantity of the valuable produce is lost every-year due to an improper post-harvest management. Therefore, crisis in food availability is not only caused by the natural disasters, but also by absolute lack of post-harvest management in India. With this background the introduction of GBY from the Government of India has a high relevance to the country, but also to the individual farmers. In this context, we have analysed the significance of GBY in the State of Gujarat, which supports farmers to protect farm produce from the post-harvest losses and consequently avoids distress sale and increase the food security.

In the context of inadequate economic viability of farmers to construct own godowns, our study examines the status and performance of GBY in Gujarat. Based on the analysis of both primary and secondary data, the following observations were drawn:

- The distribution of godowns across the State reflects that the nature of distribution of godowns was on the basis of demand and hence, a majority of the godowns were located in intensive agricultural areas such as Rajkot, Amreli, Gandhi Nagar, Anand and Mehsana districts.
- The average size of the godowns constructed under the scheme works out to be below 500 MT reflecting a reasonable demand as prescribed in the objectives of the scheme. As the godowns were small to medium size, most of the godowns were managed by the farmers themselves. Hence, there were no adequate documentations on the utilization of the godowns and returns from the godowns.
- Based upon the interactions with the beneficiaries, it was inferred that the utilization of the godowns founds to meet the local demand. For instance, the produce was kept in the godown for six to eight months in the case of tobacco, chilli, wheat and groundnuts, in respect of Gandhi Nagar district; dry fodder were kept for about 10 months in the godowns in the case of Anand district for dairy animals; maize was stored for about four to six months in Anand and Aravalli districts. It is worth to note that, a few godowns were used for cultivation of mushroom production throughout the year in the case of Aravalli district.
- As regard to the participation of the beneficiaries in the program, SC/ ST and women participation found to be adequate however, participation of other small and marginal farmers was negligible, may be due to a mandatory margin money and non-awareness about the scheme.
- However, factors such as lack of awareness about the scheme among the farming community; lack of demand for godowns, delay in subsidy; lack of participation of medium farmers due to a high capital investment were some of the major obstacles to harvest full potential of the scheme.

To conclude, so far, the scheme has created a storage capacity to an extent of about 56 per cent of the foodgrain production in the State and helped to reduce the post-harvest losses. However, in view of increasing population, and also the commitment of the State under National Food Security Act, measures have to be taken to enhance the storage availability. At the same time, through preferential subsidy approach, the participation of small and marginal farmers may also be encouraged.



Rural Godown in Gujarat



Interacting with beneficiary of GBY in Gujarat



Interacting with Women beneficiary of GBY in Gujarat



Quality Control Mechanism adopted by the beneficiary at his own godown in the case of Gujarat State

D. KARNATAKA

D.1. Overview of Agriculture in Karnataka

Although, the share of agriculture in the State domestic product has been decreasing over the years in Karnataka, a majority of the rural population predominantly depends on agriculture. It is the eighth largest State of India in geographical area covering 1.92 lakh sq km and accounting for 6.3 per cent of the geographical area of the country. A total of 123,100 sq km of land is cultivated in Karnataka, constituting 64.60 per cent of the total geographical area of the State. According to the census 2001 and 2011, the total agricultural labour was decreased from 26.46 per cent in 2001 to 25.67 per cent in 2011 indicating the decrease in dependency on agriculture in Karnataka. The State is heavily dependent on the southwest monsoon since the extent of arid land in the State. Only 26.5 per cent of sown area (30,900 km²) is subjected to irrigation. The State has three agricultural seasons – Kharif (April to September), Rabi (October to December) and Summer (January to March). The main crops grown in the State include rice, ragi, jowar (sorghum), maize, and pulses (tur and gram) in addition to oilseeds and a number of other cash crops. Cashews, coconut, arecanut, cardamom, chillies, cotton, sugarcane and tobacco are also produced in the State.

Despite the fact that a vast area in Karnataka is drought prone/ rainfed area, the topography of the State favors the agricultural activities. Karnataka is the largest producer of coarse cereals, coffee, raw silk and tomatoes among the States in India. Horticultural crops are grown in an area of 16,300 km² and the annual production is about 9.58 million tonnes. The income generated from horticulture constitutes over 40 per cent of the income generated from agriculture, which accounts to about 17 per cent of the State's GDP. **Table D.1** represents the cropping pattern and their compound annual growth rates for the period 2008 to 2018 in the State of Karnataka, which has undergone a significant change over time. It is reveals from the table that the major cereal crops grown in the State of Karnataka are paddy, maize, jowar, and ragi; in terms of pulses, tur and gram were the major crops; as regard to oil seeds, groundnut and cotton were the predominant; and in respect of other major crops coconut and arecanut were the major

commercial crops. Besides, the number of commercial crops such as cashews, cardamom, chillies, cotton, sugarcane and tobacco were also grown in the State (**Ramachandra et al., 2013**). **Table D.1** illustrates that although the productivity has increased in the case of total cereals, both the area and production have come down to an extent of two and one per cent, respectively, during a last decade (2008 to 2018). During the same period, the highest reduction found to be happened in all terms of jowar area (-3%), production (-5%), and productivity (-2%) while, maize has gained both area and production to a meager extent (1% each) but productivity remains constant. The last 10 years have shown a comforting prospect for the pulses crops as revealed by the growth rates in terms of area (3%), production (5%), and productivity (2%) during 2008 to 2018. Both tur & gram crops had shown a bumper growth with more than four per cent in terms of area and production, keeping a proactivity stagnant. Similar to total cereals, total oilseeds have shown productivity growth (3%) but significant reduction (6% and 4%) in terms of both area and production, respectively. Among oilseed crops, cotton has indicated a better prospect with a positive growth to an extent of four per cent each in respect of the area and productivity, while, the production had eight per cent growth in the past 10 years period i.e., 2008 to 2018. The commercial crops such as coconut and arecanut had a great growth in terms of production (17% and 10%) with an additional support from increased area (9% and 3%). However, a extreme reduction in productivity was observed in respect of coconut may be due to a continuous drought prevailed in the coconut production areas during the period 2008 to 2018 whereas arecanut has reflected a higher growth rate (6%). The results are also represented in **Figures D.1** and **D.2** in the subsequent sections.

Table D.1: CAGR of area, production, and productivity of major crops in Karnataka during 2008 to 2018 (% growth)

Crops	Area	Production	Yield
Rice	-4.81	-3.82	1.04
Maize	1.37	0.97	-0.40
Jowar	-3.38	-5.25	-1.93
Ragi	-1.69	-2.92	-1.25
Total cereals	-1.65	-1.11	0.56
Tur	4.32	8.58	4.09
Gram	4.73	4.79	0.05
Total pulses	2.92	5.36	2.37
Coconut	9.08	17.08	-17.80
Arecanut	3.82	10.21	6.16
Total oilseeds	-6.15	-3.51	2.82
Groundnut	-4.22	-1.93	2.39
Cotton	3.63	8.06	4.27

Note: Area in thousand hectares; Production in thousand hectares.

Source: (1) Directorate of Economics and Statistics, Government of India;

(2) Horticulture Statistics Division Department of Agriculture, Government of India, 2018

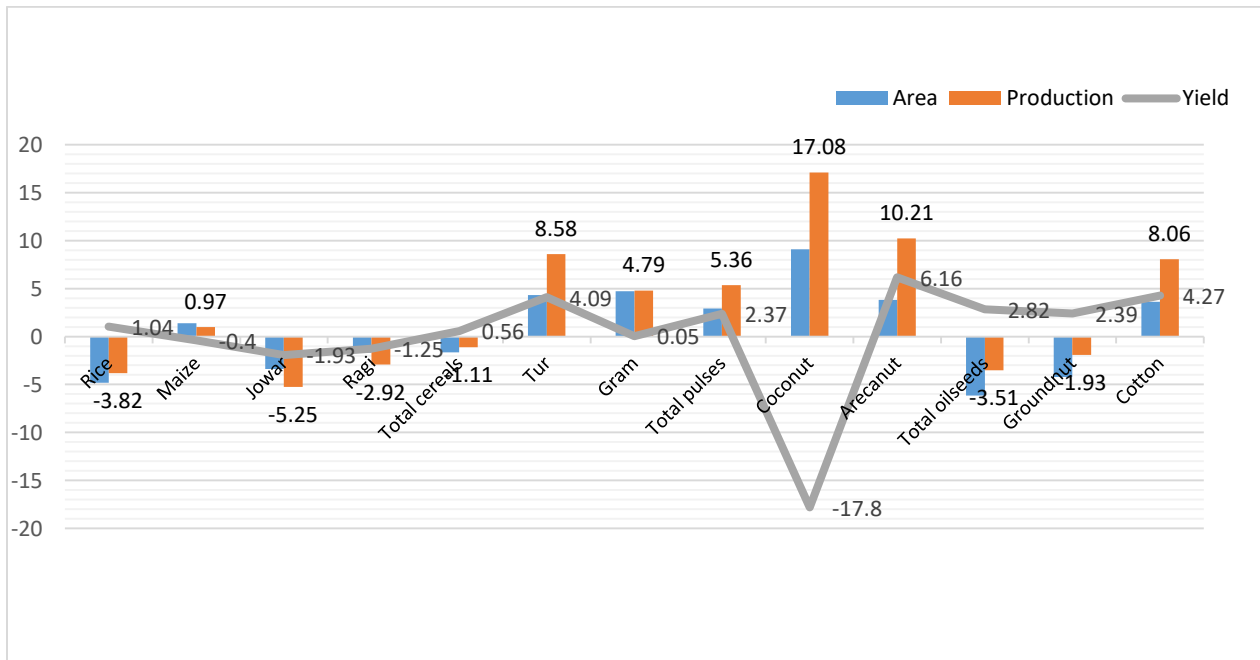


Figure D.1: CAGR of area, production, and productivity of major crops in Karnataka during 2008 to 2018 (% growth)

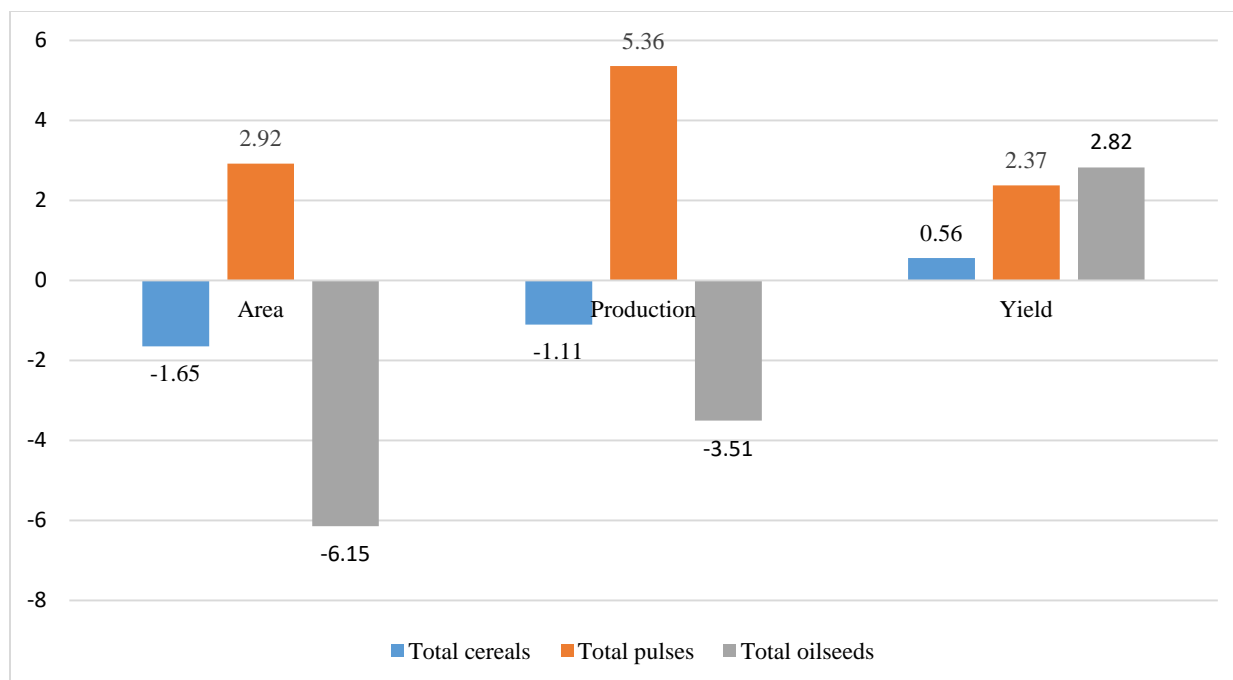


Figure D.2: CAGR of area, production, and productivity of total cereals, pulses and oilseeds crops in Karnataka during 2008 to 2018 (% growth)

D.2. Status of Agricultural Marketing in Karnataka

D.2.1. Current Status of Agricultural Marketing in Karnataka

The agricultural sector in the State has flourished over the years due to the constant thrust of the Government on increasing agricultural production. Still the benefits are not percolating down to the farming community because of the lack of strong linkages between production and marketing. However, the better growth in agricultural production has resulted in higher marketed surplus in case of many crops. Therefore, agricultural sector needs well-functioning markets to drive growth, employment generation and economic prosperity in rural areas. Therefore, in order to understand the status of agricultural marketing and marketed/ marketable surplus in Karnataka found to be relevant in discussing the issues related to storage infrastructure.

Karnataka is one of the pioneer State in recognizing the importance of reforms in agricultural marketing for strengthening and development of agricultural marketing systems in the country. Every district in Karnataka has their own agricultural marketing arrangement mainly through

APMC Markets and sub-markets supported by godowns. These APMCs facilitates the whole process, besides providing the facilities like yards, godowns, weighing etc. The State enacted the Karnataka Agricultural Produce Marketing (Regulation and Development) Act way back in 1966 but came in to effect from May 1, 1968 and provided for improved regulation in the marketing of agricultural produce, development of an efficient marketing system, promotion of agricultural processing, agricultural export and the establishment and proper administration of markets for agricultural produce. Karnataka was the first State to allow the cooperative sector through NDDDB for establishing National Integrated Produce Market namely-SAFAL market. The Model Act, 2003 formulated by the Government of India contains many progressive legislations introduced in the State of Karnataka. The Marketing legislation has been amended from time to time to incorporate the necessities arising in the field of Agricultural Marketing. To take up the development of market yards wherein the infrastructure required for the marketing of notified agricultural produce which benefits and safe guards the farmers in terms of proper weighment, competitive price and free from exploitation and payment of price on the same day. For this purpose, it has been made mandatory in the Act to the effect that the buying and selling of notified agricultural produce shall take place only in the market yards notified by the Director from time to time. To make use of the information technology for the benefit of stake-holders, Krishi marata vahini web-site has been launched during 2001. The prices prevailing in the day and the arrivals of the commodities to the market yards will be reported by all the APMCs online to the web-site.

The Act was further amended on 2007 to allow direct purchase centres, establishment of private markets, farmers-consumers market, contract farming, establishment of spot exchanges, etc. Looking into the changing needs of the markets and to address the small holding and their small marketable surplus, the Government of Karnataka reviewed the existing policies and framed 'Karnataka Agricultural Marketing Policy 2013' during the same year. This policy also seek to increase competition, better price realization to the farmers, to encourage investments in warehousing infrastructure, assaying and grading facilities, cold chains, food processing etc., and to make this sector as an attractive for generating employment in rural areas for equitable growth of the State. Meanwhile, the Government also made attempts to establish 'Farmers Market' or 'Raithara Santhe' in many cities including tier three cities. The first Raithara Santhe was

established in 2002 at Yelahanka, Bangalore (15 Kms from Bangalore Railway Station). Again in 2017, the State Government amended its Agriculture Produce Marketing Regulation Act on the lines suggested in Model Act circulated by the Central Government. The Act also speaks in favour of setting up of special market and special commodity market public private partnership in market extension activities of market committee single point market levy of market fee promoting e-trading of agricultural commodities to bring efficiency and transparency in pricing. The State of Karnataka has a network of 509 wholesale markets and 771 rural primary markets. Out of the wholesale markets, 155 are principal markets and the rest 354 are sub market yards (**Source: KSAMB**).

In addition, attention is also given to creation of eNAM in April, 2016. Karnataka is the first State to initiate major reforms agricultural marketing through setting up of electronic platform i.e., electronic National Agriculture Market (eNAM). This (eNAM) facilitates interstate trade in which farmers of one State are allowed to trade to other State farmers. There is also a provision of e-permit which facilitates the movement of produces such as pulses, oilseeds, copra, cereals across the State (**Financial Express, 2017**).

D.2.2. Marketed/ Marketable Surplus in Karnataka

The major agricultural produce traded in the regulated markets of Karnataka are coconut, paddy, til, maize, jowar, groundnut, eucalyptus, onion, potato, sunflower, cotton, chillies, jaggery, bajra, tamarind, bengal gram, tur, urd, arecanut, cashewnut, black pepper, betel leaves and ginger, as these are the major crops grown in the State. Moreover, the reforms in agricultural marketing system such as setting up of Agricultural Produce Market Committees (APMCs), Marketing Boards, the system of Minimum Support Price and eNAM etc., have played a significant role in rising the market surplus. Karnataka State being a horticulture hub of the country, does not have exclusive markets for horticultural crops. Hence, a major horticultural crop like onion, tomato, garlic and ginger are sold in APMCs only. Some of the APMCs have been dominated by a single crop. For instance, Shimoga APMC is specialized for arecanut, Tiptur for coconuts, Raichur and Ranebennur markets for cotton, and Byadagi for dry chillies. Keeping this in view, an effort was made to collect the marketed surplus ratios for the crops grown in the State of Karnataka and

presented in **Table D.2**. Table illustrates that except ragi crop, the distribution of average marketed surplus is more than 84 per cent in almost all the crops, whereas the ratio was less than 50 per cent in respect of ragi.

Table D.2: Marketed Surplus Ratio of Major crops in Karnataka

Details of Crops	Marketed Surplus ratios		
	2012-13	2013-14	2014-15
Foodgrains: Cereals			
Rice	84.15	87.48	94.40
Maize	96.12	96.67	95.15
Jowar	58.52	73.97	86.17
Ragi	29.53	44.11	48.92
Pulses			
Arhar	96.34	97.81	97.40
Oilseeds			
Groundnut	84.81	93.95	96.34
Safflower	-	-	100.00
Commercial Crops			
Sugarcane	98.80	98.85	85.37
Cotton (Thousand bales of 170 Kgs)	97.74	99.32	99.29
Onion	99.23	99.29	91.29

Note: Average MSP is calculated for three years i.e., 2012-13, 2013-14 and 2014-15 for marketed surplus ratio.

Source: Directorate of Economic and Statistics, Department of Agriculture, Cooperation and Farmers Welfare, Government of India.

D.2.3. Post-Harvest Losses

Karnataka is one of the leading State in the production of various foodgrains in the country. However, the post-harvest loss at various stages in the State works out to be around three to four per cent of the total food production while the proportion is much more in the case of fruits and vegetables. Although, the government has taken various measures to curtail these losses, the proportion remains same due to various issues in the post-harvest management. Since there is no database on the State-wise post-harvest losses are available, the results from the study conducted by the Directorate of Marketing and Inspection, GoI for the year 2005 are extracted and presented in **Table D.3**. The table reveals that the post-harvest losses are higher (3.84%) in the

case of ragi crop and lowest in respect of paddy (2.33%). On an average, the post-harvest loss is to an extent of two to four per cent in foodgrains in the State.

**Table D.3: Post-Harvest Losses of Different Crops in Karnataka
(Triennium ending 1998-99)**

(in '000 tonnes)		
Crops	Quantity	%
Paddy	96.59	2.33
Wheat	5.07	3.87
Jowar	36.50	2.31
Bajra	6.09	3.05
Maize	35.01	2.24
Ragi	50.37	3.83
Red gram	4.40	2.71
Bengal gram	5.45	3.64
Green gram	2.12	2.95
Black gram	0.95	2.74

Source: dmi.gov.in; Abstract of reports on Marketable Surplus and Post-Harvest Losses of Foodgrains in India.

D.3. Government Interventions in Post-Harvest Management of Agricultural and Horticultural Crops

Since agriculture & horticulture are the important sectors in the State of Karnataka, the Government has undertaken various measures to improve the production, marketing & post-harvest management in these sectors. As the State has been performing better over the years, the State has assigned its thrust on post-harvest management activities. Understanding the importance of infrastructure in agricultural and rural development, the State has tried to create more infrastructures related to the post-harvest management in agriculture & horticulture sectors. In this section, we have made an attempt to bring out some of the Government initiatives that have focused to address the challenges of marginal and small farmers (to that of economically non-viable to have storehouse) and to create storage infrastructure capacity for the farm community. In the State of Karnataka, the Government has created storage infrastructure through various institutions and funding from various schemes such as;

- a) Central Warehouse Corporation
- b) Karnataka State Warehouse Corporation
- c) Private Entrepreneurs Guarantee (PEG) Scheme
- d) National Horticulture Mission (NHM) / Mission on Integrated Development of Horticulture (MIDH)
- e) Rastriya Krishi Vikas Yojana (RKVY)
- f) Gramin Bhandaran Yojana (GBY)

The information on district-wise storage capacity created under various institutions and registered National System of Warehouse Receipts is presented in **Table D.4**. It is noticed from **Table D.4** that the godowns listed under WDRA from all sources of organization/ institutions. One of the important provisions of the WDRA registration is that the godowns will be treated under the regulation of negotiability of warehouse receipts which ensures the users of the godowns (farmers) to retain their produce till they get better prices in the market and avail the pledge loans from the banks. As revealed from the table that most of the registered godowns belong to the Central Warehouse Corporation (73%) and the private godowns are limited (22%). Out of 29 districts, only 11 districts godowns have been registered in WDRA. As per the registration storage capacity, Gulbarga district tops the list (16%) followed by Davanagere (15%), Gadag (13%), Chitradurga (12%), and the rest falls below seven per cent. The registration validity is about to expire during 2023.

It is worth to mention here that a majority of the rural godowns constructed under GBY have not been registered with the WDRA as the technical specifications of the rural godowns are disparate and not able to adhere to the specifications mentioned in the Negotiable Warehouse Receipt System (NWRS). A majority of the farmers also felt that registration with the WDRA is an also a costly affair and hence they are not registered. Moreover, the bankers are not in favor of the NWRS in respect of rural godowns. Further, issues related to pledge loans are discussed in detail in the subsequent sections.

As per the available secondary information on percentage of utilization of storage capacity under different agencies it is noticed that almost all the agencies have utilized more than 90 per cent of

their capacity (**Table D.5**). Under agency like SWC covered PEG has shown 100 per cent utilization followed by Private (silo) 98 per cent and CWC covered as per the Food Corporation of India (FCI). It is also noticed that the States where the procurement of foodgrain is implemented, the WDRA registered godown utilization found to be better as compared to own usage by the owners or private parties. A few cases, the godowns constructed under GBY have been registered with the WDRA have been used to store procured foodgrains. For instance, paddy & wheat in Madhya Pradesh and Haryana, wherein the storage capacity was more than 1000 MT.

Table D.4: District-wise storage space available with National System of Warehouse Receipts

Sl No.	District	Name of Godown	Capacity in MT	Registration Number of WDRA	Date of Registration	Valid Up to
1	Gadag,	Central Warehouse	10000	1002617	27-03-2018	26-03-2023
2	Davangere	National Collateral Management Services Limited	13500	1010479	22-09-2017	14-09-2022
3	Belgaum	Central Warehousing Corporation	14450	1970026	14-03-2018	13-03-2023
4	Bidar	Central Warehouse Corporation	20000	1001767	27-03-2018	26-03-2023
5	Tumkur	Central Warehousing Corporation	23065	2090029	20-03-2018	19-03-2023
6	Dharwad	Central Warehousing Corporation	20358	1001825	03-04-2018	02-04-2023
7	Gadag	Central Warehousing Corporation	23500	1001775	03-04-2018	02-04-2023
8	Gulbarga	Central Warehousing Corporation	35000	3090025	14-05-2018	13-05-2023
9	DakshinaKannada	Central Warehousing Corporation	13390	1970087	2018-03-14 2023-03-13	
10	Davangere,	Navjyoti Commodity Management Services Limited	15146	3230024	21-05-2018	20-05-2023
11	Gulbarga	DUSHYANT MALGE	1000	1550018	19-02-2018	18-02-2023
12	Chitradurga	SRI RAGHAVENDRA SWAMY WARE HOUSE,	30000	5690016	2018-11-20 2023-11-19	
13	Gulbarga	DHORAJIWALA WAREHOUSE	1000	3510013	04-06-2018	03-06-2023
14	Dharwad	Central Warehousing Corporation	9311	1002633	27-03-2018	26-03-2023
15	Shimoga	Central Warehousing Corporation	10500	1970012	14-03-2018	13-03-2023
16	Gulbarga	Central Warehousing Corporation	9780	1001783	27-03-2018	26-03-2023
17	Bangalore	Central Warehousing Corporation	25535	2170014	23-03-2018	22-03-2023
18	Gulbarga	Anagha Ware House,	2262	4870013	05-10-2018	04-10-2023
19	Chigradugra	Navjyoti Commodity Management Services Ltd	10637	3791031	2019-04-23 2024-04-22	
20	Davangere	Central Warehousing Corporation	19838	1970049	14-03-2018	13-03-2023
21	Belgaum	Central Warehousing Corporation	9000	3350023	24-05-2018	23-05-2023
22	Gadag	Central Warehousing Corporation	8158	1001791	03-04-2018	02-04-2023
23	Gulbarga	Central Warehousing Corporation	3000	1001809	27-03-2018	26-03-2023
		Registered storage area with private owners	73,545			
		Total Capacity	3,28,430			

Source: https://wdra.gov.in/documents/32110/38835931/Registered_WH_20200117.pdf%2817-JAN-2020%29.pdf/497d21a4-9218-da47-3c4e-5a2d35653b45

Table D.5: Percentage of Utilization- Status as on 31.12.2019

Sl. No.	Agencies/Depot	Percentage Utilization
1	FCI OWNED	93.00
2	CWC Covered	96.00
3	CWC covered PEG	92.00
4	SWC covered	90.00
5	SWC covered PEG	100.00
6	SWC PEG	87.00
7	Pvt. (Silo)	98.00
	Total	92.00

Source: FCI

D.4. Status of GBY in Karnataka

It is apparent that the existing initiatives that have been implemented all over the country are not giving capital subsidy to those who are economically non-viable to construct on their own storehouse to retain agriculture produce. Furthermore, there is also a necessity of government initiative to support farm community at large extent. In the light of this, the Government of India has introduced Grameen Bhandaran Yojana (GBY) to address the limitations of other government initiatives that have been already implemented in all over the country and more so to support those farm communities who are economically non-viable to construct godowns. Gramin Bhandaran Yojana is a Capital Investment Subsidy Scheme for Construction / Renovation / Expansion of Rural Godowns has been introduced by Government of India during 2001-02. Since, it is a Central Scheme; the Government of Karnataka also implemented the same during the same period. The guidelines of the scheme have been subsumed with other ongoing scheme of Development/ Strengthening of Agricultural Marketing Infrastructure, Grading and Standardization (AMIGS) during 2004 and again into Agricultural Marketing Infrastructure (AMI) sub scheme of Integrated Scheme of Agricultural Marketing (ISAM) w.e.f. 2014.

Rural godown scheme plays a vital role in promoting agriculture marketing, rural banking and financing and ensuring Food Security in the country. It enables the markets to ease the pressure during harvest season and to maintain supply of agricultural commodities during off season. Hence, it solves the problems of glut and scarcity, which are the usual problems in agricultural marketing. Though warehousing is an independent economic activity, yet is closely linked with production, consumption and trade. The main objective of the scheme is creation of scientific storage capacity with allied facilities in the rural areas to meet the requirements of farmers for storing farm produce, processed farm produce and agricultural inputs; promotion of grading, standardization and quality control of agricultural produce to improve their marketability; prevention of distress sale immediately after harvest by providing the facility of pledge financing and marketing credit; strengthen agricultural marketing infrastructure in the country by paving the way for the introduction of a national system of warehouse receipts in respect of agricultural commodities stored in such godowns and to reverse the declining trend of investment in agriculture sector by encouraging private and cooperative sectors to invest in the creation of storage infrastructure in the country.

D.4.1. Method of implementation of the Scheme

In the State of Karnataka, the Directorate of Agricultural Marketing and Inspection (DMI), acts as a nodal office for implementing the scheme. DMI has two sub-offices located in Bangalore and Hubli. Along with National Institute of Agricultural Marketing (NIAM), Jaipur and other National/ State level Institutions, DMI officials have organized training to create general awareness on the scheme for farmers and entrepreneurs for construction, maintenance and operations of rural godowns. The scheme is implemented by the Department of Agriculture, Cooperation & Farmers' Welfare, Government of India in collaboration with the National Cooperative Development Corporation (NCDC) and National Bank for Agriculture and Rural Development (NABARD). The credit linked back-ended subsidy for investment has been followed in the State. All three categories of beneficiaries such as individual farmers, registered Farmer Producer Organizations, Schedule Caste/ Schedule Tribes/ women have been availed the benefits under this scheme throughout the State. A few of the renovation of the storage projects availed by the cooperatives financed by NCDC.

D.4.2. Methodology of the Study

The present study is done using both secondary and primary data.

D.4.2.1. Secondary data sources

The secondary sources such as Directorate of Economics and Statistics, Government of India, Directorate of Marketing and Inspection (DMI), Faridabad, NABARD and NCDC have been referred to collect the data on area and agricultural production of Karnataka, number of godowns sanctioned with their capacity of storage, Rural Godowns beneficiary list, location and their addresses etc. In addition, various journals, reports, and guidelines available with the libraries, websites/ search engines were also been used in finalizing the methodology and writing the report.

D.4.2.2. Primary data collection

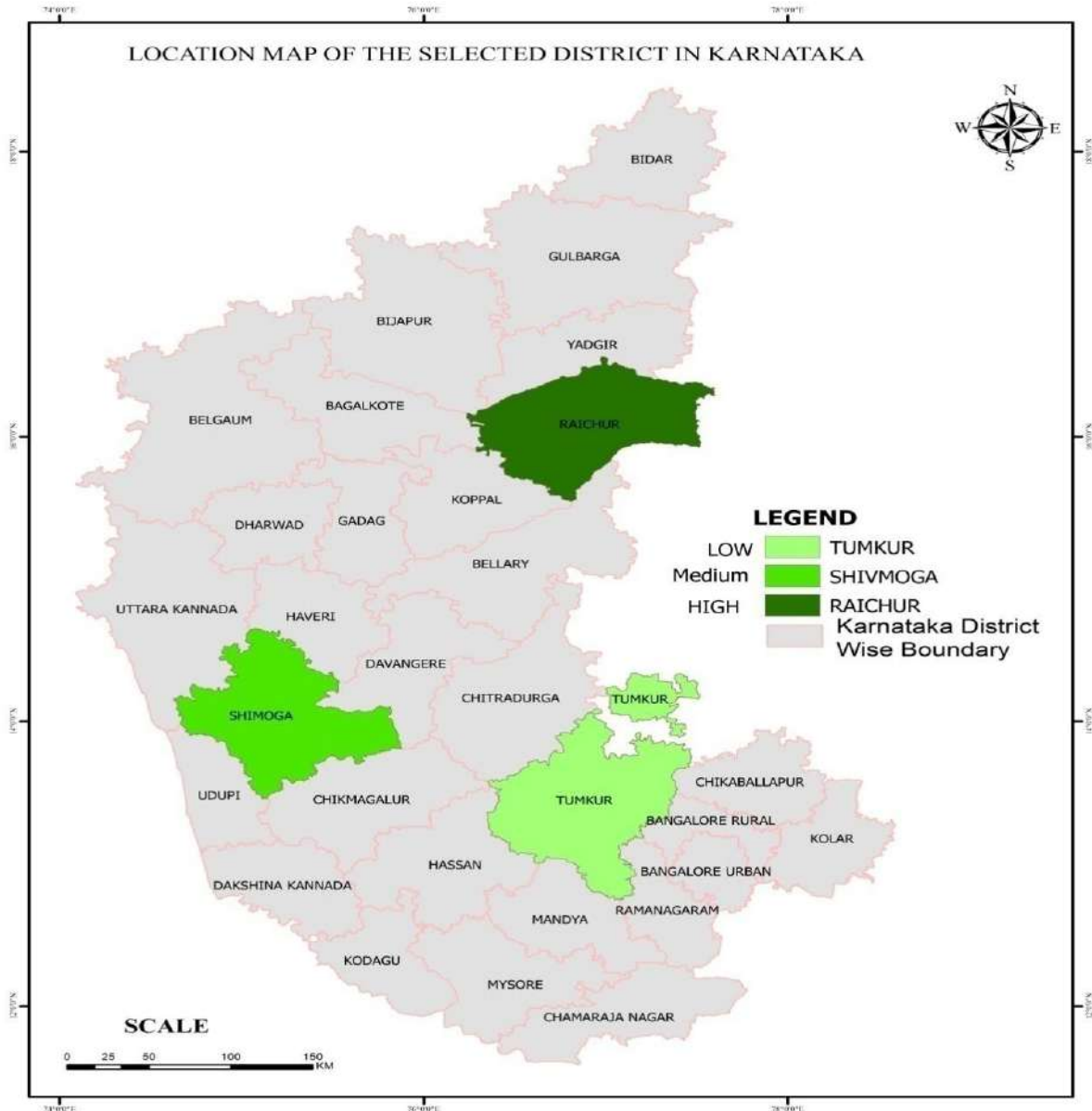
To collect the primary information from the beneficiaries of the scheme, users of the godowns, implementing officers of NABARD/ NCDC, Officials of implementing agencies, and bankers, pre-tested separate set of questionnaires have been designed and used to record their feedback with regard to the sources of information on GBY, profile of the users, cropping pattern & their storage methods, usage pattern of the godowns, costs incurred and benefits obtained, issues in availing the loans, constraints in management of the godown, utilization etc., and to record their suggestions for improvement of the scheme. Further, a Focused Group Discussion (FGD) was carried out to extract the reliable information from the group of farmers/ users of the godown. The collected primary data from the questionnaires were tabulated and organized for the analysis of the data and inferences were drawn from the evaluation study leading to recommendations and suggestions. Tabular Analysis, CAGR, Cost-Benefit Analysis have used to derive inferences.

D.4.3.1. Sampling Method

The district-wise total number of rural godowns sanctioned by the NABARD and NCDC (till 31st March 2019) in the State of Karnataka is a criterion used to select the samples. A detailed list of number of godowns was collected from the State level offices of NABARD and NCDC with the help of State nodal agency, DMI. The districts are categorized on the basis of number of godowns and their storage capacity in each district. The average storage capacity created is used as a yard stick to classify the godowns into three categories such as high performing, medium performing and low performing districts. Within a top five districts in each category, one district was considered as a sample to represent the particular category. Accordingly, the districts selected for the State of Karnataka are Raichur to represent high performing category, followed by Shimoga under the medium performing district, and Tumakuru as a low performing district (**Table D.6**). A brief profile of the sample district is given in the subsequent sections.

Table D.6: Classification of Districts based on the performances

Sl. No.	Particulars	Districts
1	High performing district	Raichur
2	Medium performing	Shimoga
3	Low performing	Tumakuru



D.4.3.2. High Performing District - Raichur

In this category, the number of godowns and their utilization seems to be better as compared to other categories. Raichur is situated in the northern part of the Karnataka, the second largest district in terms of area in the State. All the five talukas of the district are well irrigated because of the availability of canal provision from the Tungabhadra Dam (TB Dam) on the Tungabhadra river and Narayanpura Dam on the Krishna river. The district is known as rice bowl of the State as paddy is grown in most of its irrigated area. Apart from this, many dry land crops such as

sunflower, bajra, cotton, tur, etc., and horticultural crops have been grown in the district in a much higher quantity. The district is also well connected with road and railway transportations. Hence, there is a more demand for the godowns. It is also found that the size of the godowns in this area is in the range of medium to large size. Moreover, a majority of these godowns are filled up with more of cereals and pulses especially, paddy and tur.

D.4.3.3. Medium performing District - Shimoga

The district is found in the middle part of the Karnataka, officially known as Shimoga district. A major part of the district lies in the hills of Western Ghats, having seven Talukas. The district ranks 9th in terms of its area in the State. Although five rivers originated in the district, two major rivers such as Tunga and Bhadra are popular. The district is also known as ‘Gateway to Malnad’ as it connects most of the cities and places in the hilly areas. The crops cultivated in the district are paddy, arecanut, cotton, maize, oil seeds, cashew nuts, pepper, chilli, ginger, ragi, etc. The district is popular for arecanut and many godowns constructed in the district were used to store the arecanut as noticed during the survey. Overall, it is found that the size of the godowns was neither big nor small and their utilization was to a medium extent.

D.4.3.4. Low performing District - Tumakuru

The district is situated in southern part of Karnataka, a neighbor district of Bangalore. It is the second largest district in Karnataka after Belagavi. The major crops in the district is coconut followed by arecanut, hence it is called as ‘Kalpataru Nadu’. These crops are grown as a sole and intercrop in the field of Ragi. The district falls under the dry zone and ragi is a major crop alongside. The other crops grown in the district include green gram, black gram, cow pea, etc. A majority of the storage space created is utilized to store plantation crops such as coconut, arecanut and ragi. The size of the godowns constructed under GBY are of medium to smaller, hardly stored agricultural produces as observed during the survey.

D.5. Performance of GBY in Karnataka

D.5.1. Distribution of godowns under GBY

The secondary data collected from the head offices of DMI, NABARD and NCDC on total number of godowns sanctioned since inception are presented in **Table D.7**. As stated earlier, the projects implemented in the State were financed (especially subsidy) either through NABARD or NCDC. The subsidy under this scheme is linked to institutional credit and the finance was made available through Commercial Banks, Regional Rural Banks (RRBs), State Cooperative Banks (SCBs) and Scheduled Primary Cooperative Banks (PCBs) and other institutions eligible for refinance by the NABARD or any other financial institutions such as State Financial Corporation's (SFCs) approved by DAC&FW. The individuals, group of farmers/ growers, registered FPOs, Cooperatives, Partnership/ Proprietary firms/ Companies, APMCs, State Warehousing Corporations (SWCs) have availed the benefits from the GBY.

Table D.7 reveals that out of the total projects sanctioned in the State of Karnataka, a majority (>94%) were sanctioned by the NABARD alone, and about six per cent were supported by the NCDC. One of the key features of NCDC distribution of godowns noticed in the case of Karnataka is that the size of the godowns was small and mostly used to store agricultural inputs such as chemicals, fertilizers, along with horticultural produces. Across districts, the top five districts in the order of number of godowns are Raichur (1004), Bellary (586), Koppal (559), Shimoga (457) and Davangere (291), whereas, top five districts in terms of storage capacity created are Raichur (7.56 lakh MT), Davangere (3.96 lakh MT), Koppal (2.82 lakh MT), Bellary (2.62 lakh MT), and Kodagu (2.22 lakh MT). As regard to NABARD sanctioned projects, a majority have been sanctioned in the same top five districts in the similar order according to the number of projects/ godowns, while, in terms of storage capacity, the top five rank districts were Raichur (7.51 lakh MT), followed by Davangere (3.8 lakh MT), Bagalkot (2.87 lakh MT), Koppal (2.77 lakh MT), and Bellary (2.58 lakh MT). With regard to NCDC, the pattern of distribution of godowns found to be entirely different from that of NABARD. Wherein the top five rank in terms of number godowns were occupied by Belgaum (41), Bagalkot (32), Chikkamagaluru (29), Kodagu (28), and Dakshina Kannada (18) districts, in the order of merit.

On contrary, the storage capacity created by NCDC was highest in the case of Belgaum (39814 MT), Bijapur (26494 MT), Kodagu (17313 MT), Davangere (15595 MT), and Chikkamagaluru (14845 MT). Looking into the distribution of rural godowns across districts, it is understood that NCDC has sanctioned a greater number of projects in the districts where higher number of cooperatives exists in the State, and production of horticultural produces is high. It is also true that the cooperatives were more active and successful in respect of horticultural produces as compared to foodgrains. This might be one of the reasons the distribution was much higher in these districts. NABARD's distribution of godowns appears to be demand driven, irrespective of places and type of produce.

Table D.8 provides us the district-wide information on the number of godowns created and cost involved in construction of godowns above 1000 metric tonnes. As per the guidelines of Rural Godown Scheme, about 20 percent of cost has to be borne by the individuals as a margin money and the remaining 80 percent (including subsidy) of the cost involved in the construction of godown can be provided under the Rural Godown Scheme. Table reveals that about 711 crores of investment was stimulated by the GBY in the State of Karnataka – a significant contribution to an agrarian economy.

From the secondary data available with the NABARD, out of the total applicants (4414), about four per cent (197) were rejected on the technical grounds. It is found that a majority (62%) of the beneficiaries of GBY belong to the farmers category followed by women (30%), non-farmers (3%). It is very clear that the participation of SC/ ST was negligible (<1%). Although the participation was from all the sections of the society, it needs to be improved over time (**Figure D.3**).

**Table D.7: Distribution of godowns by NABARD & NCDC under GBY since inception
(2001-02) till 31st March 2019**

Districts	NABARD		NCDC		Total	
	No of godowns	Capacity created (MT)	No of godowns*	Capacity created (MT)	No of godowns	Capacity created (MT)
Raichur	1000	751882.69	4	4350	1004	756232.69
Bellary	584	258055.34	2	3500	586	261555.34
Koppal	553	277312.66	6	5158	559	282470.66
Shimoga	450	200460.67	7	8974	457	209434.67
Davanagere	282	380091.42	9	15595	291	395686.42
Bagalkot	78	287502.31	32	12953	110	300455.31
Gulbarga	102	79047.28	2	1550	104	80597.28
Haveri	87	49055.98	9	6778	96	55833.98
Belgaum	54	73418.83	41	39814	95	113232.83
Chitradurga	89	81644.44			89	81644.44
Chikkamagaluru	41	133956.95	29	14845	70	148801.95
Kodagu	34	204425.22	28	17313	62	221738.22
Bengaluru I	52	29388.00	10	5805	62	35193.00
Bidar	57	20905.97	1	2500	58	23405.97
Mandya	31	68030.32	17	7347	48	75377.32
Dakshina (Canara)	28	204425.22	18	8804	46	213229.22
Tumakuru	41	72143.69	4	3390	45	75533.69
Dharwad	40	92290.58	3	8655	43	100945.58
Bijapur	34	10260.98	8	26494	42	36754.98
Bengaluru urban	36	61775.73	4	5805	40	67580.73
Gadag	34	65955.17	4	2450	38	68405.17
Yadgir	34	25242.69	2	3500	36	28742.69
Mysore	27	139371.25	6	1675	33	141046.25
Hassan	11	14276.80	4	4600	15	18876.80
Uttara Kannada	10	11525.90	3	3425	13	14950.90
Udupi	6	7624.00	2	400	8	8024.00
Kolar	3	3625.00	4	3840	7	7465.00
Chamrajnagar	2	12209.19	3	850	5	13059.19
Chickballapur	0	0.00	2	1225	2	1225.00

Note: Includes renovation Projects

Table D.8: District-wise Capital Investment brought into Storage Infrastructure

District	No of RGs	Total Capacity (Tons)	Private Investment (Rs in Crores)
Bagalkote	78	73419	13.86
Bangalore Rural	52	383293	71.97
Bangalore Urban		204425	38.33
Belgaum	54	133957	25.11
Bellary	585	258055	48.45
Bidar	57	81644	15.33
Bijapur	34	92291	17.31
Chamarajanagar	2	12209	2.30
Chikmagalur	41	20906	3.90
Chitradurga	89	79047	14.81
Dakshina Kannada	28	25243	4.73
Davanagere	282	380091	71.37
Dharwad	40	68030	12.86
Gadag	34	72144	13.53
Hassan	11	14277	2.78
Haveri	87	49056	9.20
Kaluburgai	102	287502	53.90
Kodagu	34	10261	1.94
Kolar	3	3625	0.70
Koppal	553	277313	52.00
Mandya	31	65955	12.47
Mysore	27	139371	26.12
Raichur	1649	751883	141.01
Shimoga	450	200461	37.66
Tumkur	41	29388	5.51
Udupi	6	7624	1.43
Uttara Kannada	10	11526	2.26
Yadgir	34	61776	11.66
Total	4414	3794772	711.52

Source: Computed from data provided by NABARD

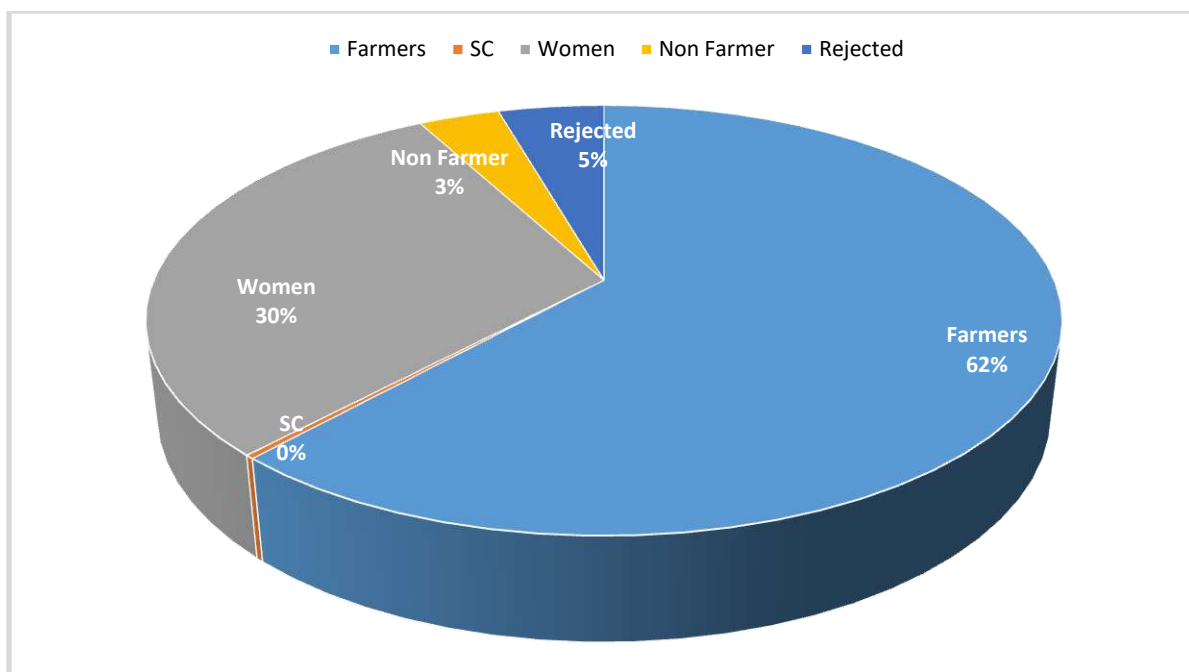


Figure D.3: Participation of Different Groups under GBY (%)

D.5.2. Profile of the Beneficiaries under GBY

The socio-economic details of the beneficiaries are presented in **Table D.9**. It is observed from the table that a majority of the beneficiaries (44.45 %) who obtained benefits from the GBY are belonged to the group of general categories, followed by farmers and entrepreneurs (22% each), and Schedule Caste (11%). The average age of the beneficiaries works out to 52 years. Interestingly, a majority (63%) of the beneficiaries were well educated having a pre-university and above education level followed by Higher primary education (25%), and Matriculation (13%). Average number of family members in the beneficiary's family was six persons with an average annual income of Rs. 5.20 lakhs and above. In addition, they had an agricultural net operated land to an extent of 14 acres.

Table D.9: Profile of the Beneficiaries of GBY

Sl. No.	Particulars	Unit
1	Category (% of respondents)	
	Individuals	44.45
	Entrepreneurs	22.22
	SC/ST	11.11
	Farmers	22.22
2	Average age of the beneficiary (Years)	52.25
3	Education level (% of respondents)	
	Illiterate	-
	Primary (1 to 4)	-
	Higher primary (5 to 9)	25.00
	Matriculation (10)	13.00
	Pre- university (10+2) & above	63.00
4	Average No. of family members (Numbers)	6
5	Average Annual Income (Rs.)	520000
6	Net operated area (Acres)	13.80

Source: Primary data

D.5.3. Cropping pattern of the Beneficiaries

The previous year cropping pattern of the beneficiaries have been collected and illustrated in the **Table D.10**. It is clearly visible from the table that the beneficiaries have undertaken crop cultivation in two seasons in a year. The major crops grown by them includes cereals such as ragi and paddy, important pulses are green gram and black gram, while the plantation crops consist of arecanut and coconut in the sample area. From the above analysis we see that the cropping pattern in Karnataka has undergone significant changes over time. Wherever water is not a constraint and assured irrigation is available, beneficiaries were growing paddy and arecanut and in other areas, coconut, ragi and pulses were cultivated both as a solo or mixed cropping. Across sample districts, higher proportion of paddy and pulses were observed in the case of Raichur. Coconuts, ragi, and pulses were noticed in respect of Tumkur district while mixed cropping pattern was observed in the case of Shimoga in addition to higher proportion of arecanut. Across crops, only ragi was noticed in both the seasons. Coconuts were available throughout the year while arecanut is an annual harvesting. In terms of area under cultivation, paddy was grown in a higher area (18 acres) as compared to all other crops during kharif season only, followed by ragi (10 acres in kharif and 3 acres in rabi). Arecanut was harvested in one season immediately after Kharif whereas coconut was available throughout the year in an average 10 acres land.

Interestingly, almost all these crops grown by the beneficiaries were sold in the local market yard as soon as the produce is harvested without waiting for a favorable price in the market. In respect of paddy, a few were sold to the brokers at the farm gate/ local market yard. There are number of intermediaries involved in the marketing of the agricultural produce, hence, a majority will be selling their produce to these intermediaries at the local market at distress price. More than 80 per cent of the produce grown by the farmers were sold in these markets and the rest was kept for own consumption. These results are on par with the marketed surplus as indicated in the Table 2. Marketable surplus is the only income for the farmer's, their income level depends on the price at which he sells in the market. A majority cases, the producers will be selling as soon as the harvest is over/ peak season due to non-availability of storage spaces with them. It is a general knowledge that during peak season, the demand will be lesser and prices will be at lower levels. Therefore, it is important to store the produce, till the prices favor in the market. This is where the role of GBY played an important role by creating storage places at the rural areas.

Table D.10: Information on Crop-wise Area, Production and Marketable Surplus

(Qty in Qtl)

SI. No	Crops	Area (Acre)	Production	Consumption	Stored	Sales
Kharif						
1	Ragi	10.00	65.00	12.5	52.50	Local Mkt yard
2	Coconut	4.50	18500 (nuts)	0.00	18500 (nuts)	Local Mkt yard
3	Paddy	18.00	400.00	82.00	318.00	Mkt yard/ local trader (broker)
4	Green gram	0.50	1.00	0.20	0.8.00	Local Mkt yard
5	Black gram	0.50	1.00	0.50	0.50	Local Mkt yard
6	Arecanut	10.00	200.00	0.00	200.00	Local Mkt yard
Rabi						
1	Coconut	10.00	45000(nuts)	0.00	45000(nuts)	Local Mkt yard
2	Ragi	3.00	18.00	1.00	17.00	Local Mkt yard

Note: Ragi per acre- 6 quintals; paddy per acre- 20 qtl; arecanut per acre- 20-25 qtl; green gram per acre- 2-3 qtl;

Source: Primary data

D.5.4. Sources of information on GBY

In order to understand, how the beneficiaries got information on GBY before availing the benefits under the scheme, sources of information were collected and displayed in the **Table 11**. It is noticed that a majority have got the information from the panchayat president (70%), who generally interact directly with the Development Officers including the lead banks in their areas a very often. About 17 per cent also expressed that they got information from the APMCs. The other sources enlisted by the beneficiaries are Banks, Print media/ local newspapers, friends and relatives etc.

Table D.11: Sources of information on GBY

Sl. No.	Sources	Percentage
1	Bank	3.33
2	Media	3.33
3	APMC	16.67
4	Panchayat President	70.00
5	Others	6.67

Source: Primary data

D.5.5. Distribution of Beneficiaries

To have an idea, the beneficiaries were grouped into the classification as enlisted in the GBY guidelines and the results are shown in the **Table D.12**. Table reveals that a majority of the beneficiaries availed benefit from the GBY in the form of general category (67%), followed by farmers (22%) and SC/ STs (11%). The general category involves the individuals other than farmers, group of farmers, entrepreneurs etc.; farmers are the individuals having agriculture as their main occupation; SCs/ STs includes the individual men or women from any other categories. The rate of subsidy was depending up on the categories on which they are eligible. Accordingly, the general categories were eligible for 15 per cent of the subsidy; individual farmers are eligible for 25 per cent and; SC/ ST/ Women were eligible for 33 per cent.

Table D.12: Classification of the Sample Beneficiaries as per GBY Guidelines

Sl. No.	Beneficiaries	Percentage
1	General	66.67
2	Farmers	22.22
3	SC/ST/Women	11.11
	Total	100.00

Source: Primary data

It is worth to mention here that in the case of Karnataka, many APMCs, Zilla Panchayats (ZPs), and the Cooperative societies have availed the benefit under general categories and constructed godowns in their rural areas, mainly to facilitate storage and to avoid distress sale from the farmers. A few cases, godowns were handed over to the Gram Panchayats and Trustees by the APMCs, to enhance their capacity utilization. However, many cases, these godowns space were utilized for agricultural produce storage/ sale of agricultural inputs by the Cooperative societies. But, in a few cases, they have been utilized for public distribution centres (PDS)/ rationing, and to conduct ceremonies etc. Out of the sample, four such projects were visited and found that they have been utilized for such activities mentioned above, in respect of both Tumakuru and Shimoga district. During the visits, we found that a majority of the NCDC sanctioned projects were smaller in size (<500MT), and mostly used to distribute agricultural inputs such as fertilizer and pesticides.

In order to attract private entrepreneurs, the scheme was made available to the traders as well as businessmen to invest on the godowns. The bankers have classified under general category to avail the subsidy benefits from NABARD/ NCDC. Accordingly, many have constructed the rural godowns with a larger size. On the other hand, group of farmers or FPOs also availed the benefit under this scheme to an extent.

D.5.6. Godowns Capacity Utilization

It is found that a majority of the rural godowns availed by the beneficiaries were used to store agricultural or horticultural produces only. According to the utilization of the godowns, an attempt was made to classify the beneficiaries into three categories in Karnataka such as;

- a) Sub-optimal utilization
- b) Optimum utilization
- c) Own use

a) Sub-optimal utilization -The godowns that are of larger in size (> 5000 MT), have not been utilized properly in the places where the godowns are constructed without a proper business plan. Such types of godowns were found especially in the case of Tumakuru and Davangere district. During the interaction with the beneficiaries, it was found that the project plan was prepared by some consultants and the bank managers will depend upon the project report prepared by them, in addition to the repaying capacity of the proponent. However, the larger godowns were fully utilized in the places where assured irrigation facilities are available. For instance, such godowns are found in Raichur and Bellary districts.

b) Optimum utilization – These godowns are of less than 2000MT, wherein medium and large farmers availed subsidies under GBY to construct godowns with a primary objective of storing their own/ relatives produce for a temporary period of 3-4 months or till the prices are favor and the next harvest period. They have availed pledge loan in the initial years and the banks stopped pledge loan in the later years may be due to discrepancies and malpractices by a few godown users. It is also found that a few large size godowns (>2000MT) were utilized optimally in the agriculturally prosperous districts like Raichur and Bellary and were also hired on rental basis by the SWC. This category also includes the godowns constructed with the support of ZPs, APMCs and Cooperative Societies, were utilized throughout the year, for selling agricultural inputs, PDS, farm equipment etc.

c) Own use – These godowns are of smaller size of less than 500MT, usually availed by the medium farmers to store their own produces, inputs and other farm equipment. Some beneficiaries have converted these godowns into other purposes such as a part of residential house, cattle shed, commercial shops after the repayment of loans to the bank. Most of the time, these godowns will be utilized for more than ten months in a year.

On the basis of duration of the storage period (**Table D.13**), a highest number of users (59%) stored their produce in the godowns for a period up to three months, subsequent to three to six months (35%) and a few of them (6%) stored beyond six months especially in the horticultural produce such as coconuts and arecanuts.

Table D.13: Storage characteristics of the users

Sl. No.	Duration (months)	% of users
1	1 to 3	58.8
2	3 to 6	35.3
3	6 to 12	5.90

Source: Primary data

D.5.7. Economic Benefits obtained from the Godowns

An attempt was made to verify whether beneficiaries have realized better prices by keeping their produce in the godowns in the case of Karnataka and the results are presented in **Table D.14**. The price at which the farmers sold their produce was compared with the MSP prevailing in the season for the particular crops, to work out the economic benefits as the farmers were unable to recollect the prices during the harvest period. It is noticed that a maximum of benefits (43% hike) were found in the case of paddy followed by coconut (23%), and ragi (4%). This manifestation of positive impact was possible mainly due to the creation of rural godowns under GBY by preventing sales during glut phase of the market. On the contrary, the pulses have shown a negative price difference, may be because of better production in the subsequent season.

Table D.14: Crop-wise Price realized by the users of Rural Godowns (Rs/Qtl)

Sl. No.	Crops	Minimum Support Price (MSP)	Sale Price	Percentage Difference
1	Paddy	1750	2500	42.85
2	Ragi	2897	3000	3.57
3	Green gram	4400	3900	-11.36
4	Black gram	4400	3500	-20.00
5	Coconut	2030	2500	23.15

Source: Primary data; **Note:** In case of coconut, the derived benefit is because of the value addition by means drying rather than selling in the form.

Further, due to the establishment of rural godowns, the beneficiaries have been contributing in the form of employment generation for the purposes like security, loading and unloading,

management of the godowns etc. The rate of employment generation was worked out based on the size of the godowns and presented in **Table D.15**. It is noticed that on an average less than 500MT godowns could able to generate 90 man-days of permanent and 300 man-days of casual labour, more than 500 to 1000MT godowns have generated about 450 man-days of permanent and 500 man-days of casual labours. Similarly, in the case of more than 1000MT godowns, the employment generation is about 1180 man-days of permanent and 900 man-days of casual labours. Higher the capacity of the godowns better will be the infrastructure and skill level of workforce. There will be a separate administrative, security and casual staff for efficient operations.

Table D.15: Employment Generation due to the Rural Godowns

Sl. No.	Details	<500 MT	>500 to 1000 MT	>1001 to 2000 MT
Permanent Worker				
1	Average No. of workers/godowns	-	1	2
2	No. of work days	360	360	360
3	No. of working hours	2	10	8
	No. of Man-days	90	450	1180
Casual Worker				
	No. of Man-days	300	500	900

Source: Primary data

D.6. Perception of the stakeholders

In this section, we have made an attempt to collect the information from the beneficiaries as well as users of the godowns on different aspects of agricultural produce storage and its benefits. **Table D.16** presents the reason for immediate sale/ distress sale by the farmers as it is common phenomenon noticed across the State. It is found that about 60 per cent of the farmers sold their produce as soon as the harvest is done, to meet the immediate requirements, like to repay the loan, purchase of inputs (seeds, fertilizers, pesticides, equipment), family functions such as festivals, marriages, children education fee etc. In many cases, they will be repaying the amount already spent on the same purposes in the last season or for the next season. Not aware of the

pledge loan facility was the next important reason specified by the 25 per cent of the farmers. However, about 10 per cent expressed that there is no storage facility to store their produce, was the reason for immediate sale by the farmers. More importantly, a few farmers (5%) also expressed their misconception that storage reduces the weight in the later stages. They explained that because of the thresher harvest, immediate sale helps to gain advantages of weight because of the higher moisture content; the seller may reduce a meagre value for the same.

Table D.16: Reasons for Immediate Sale by the farmers

Sl. No.	Reasons	Percentage
1	To meet the immediate requirements (purchase of inputs, family expenses, to clear the debts with the formal or informal sources)	60.00
2	No storage facilities	10.00
3	Not aware of pledge loans	25.00
4	Storage reduces the weight	10.00

Source: Primary data

To understand the awareness level of the farmers and beneficiaries on the benefits of scientific storage of agricultural produce, a few questions were posed to the farmers and the responses are displayed in **Table D.17**. It is very clear from the results that more than 50 per cent of the farmers were aware that storage helps to get better prices in the later stages, avoids wastage (30%), and protect the farm produce from pest and disease attack (20%) scientifically. Although they knew that immediate sale of produce is a distress sale, farmers are selling immediately to overcome from the other financial constraints.

Table D.17: Level of Awareness on the Benefits of Scientific Storage of Agricultural produces

Sl. No.	Benefits	Percentage
1	To avail better price	50.00
2	Protection from pest and rodents attack	20.00
3	To avoid wastages	30.00

Source: Primary data

Information on traditional storage methods were also collected from the farmers and beneficiaries to understand the types of storages were available for storing agricultural produce and their status as on today. It is evident from **Table D.18** that a half of (>50%) of the farmers were storing their produce in the wood/ bamboo storage structures inside the residential houses. About 20 per cent expressed that there were a small separate room for storing the agricultural produces whereas, other 20 per cent revealed that there were other storage formats like storage bins, underground bins, gunny bags etc. However, about 10 per cent said that they were using mud structures to store their produces. More than 50 per cent farmers also stated that, the same structures were used till date to store agricultural produces kept for own consumption.

Table D.18: Information on Types of storage structure used to store the produce

Sl. No.	Storage Structure	Percentage
1	Mud structure	10.00
2	Wood/bamboo	50.00
3	Small Rooms	20.00
4	Others	20.00

Source: Primary data

Perceptions on scientific storage versus traditional practices were collected from the farmers and beneficiaries and the results are expressed in **Table D.19**. It is observed that a highest number of farmers (70%) expressed that the scientific storage godowns reduces the losses from the pests/ rodents/ birds/ moisture to an extent of 60 per cent as compared to the traditional godowns structures. About 20 per cent each of the farmers also expressed that the quality will be better (to an extent of 10%), no pilferage, like stealing (to an extent of 80%), and availability of insurance (to an extent of 100%) were the other benefits from the scientific godowns in comparison to traditional godowns. No or less wastage was also an important benefit from the scientific godowns as revealed by the 10 per cent of the users, thereby, it decreases the wastage level to an extent of 10 per cent as compared to traditional storages.

Table D.19: Perception of storage users on advantage of Godowns v/s Traditional storage practices

Sl. No.	Particulars	Percentage	Increase or Decrease (%)
1	Quality maintained	20.00	10.00
2	Reduced losses from pests/ rodents/ birds/ moisture etc.	70.00	60.00
3	No wastage	10.00	15.00
4	No pilferage (stealing)	20.00	80.00
5	Insurance facility	20.00	100.00

Source: Primary data; *Note:* Multiple responses are provided by the users, hence, total per cent shows more than 100.

To gather the information on the additional services provided by the owners of the godowns, a majority of the users of the godowns (60%) revealed that the godowns owners have arranged to provide market price information. Subsequently, about 30 per cent opined that the owners have given services like, loading, unloading, payment relaxation etc., for the users of their godown. A 10 per cent of the users also expressed that the owners have given advisory services on marketing to attract the users to store agricultural produces in their godowns (**Table D.20**).

Table D.20: Additional services provided by the godown owners to the users

Sl. No.	Particulars	Percentage
1	Market price information	60.00
2	Advice on marketing	10.00
3	Good services (loading/unloading/payment relaxation etc.)	30.00
4	Any other (specify)	NA

Source: Primary data

The owners of the godowns were asked to enlist the issues or constraints faced and suggestions for improvement of the GBY scheme as per their opinions. Accordingly, we have categorized and discussed the constraints and suggestions in **Tables D.21 and D.22**. **Table D.20** explains the constraints of the owners/beneficiaries of the GBY in obtaining the benefits of the scheme and management of the godowns. Table discloses that requirement of large capital, maintenance

issues, risk of damages, deterioration in quality and quantity were the major constraints faced by (38 per cent each) of the owners/ beneficiaries, followed by the high rate of interest, paucity of working capital, non-availability of the skilled labour, inadequate technical supervision, lack of awareness on the benefits of godowns among farmers, competition among godown owners were the next line of issues as uttered by 25 per cent each of the owners. A meagre proportion of the owners (13%) also reported that high cost of fumigation & lack of assistance from local administration as the other issues in managing the godowns. From these issues, it is understood that the owners of the godowns require a lot more than the subsidy from the government to manage plenty and to facilitate farmers in avoiding distress sale.

Table D.21: Constraints expressed by the beneficiaries of the GBY Scheme

Sl. No	Particulars	Percent of Owners
I	Financial constraints	
1	High cost of fumigation	12.50
2	High rate of interest	25.00
3	Paucity of working capital	25.00
4	Requirement of large capital	37.50
II	Technical constraints	
1	Non-availability of skilled manpower	25.00
2	Inadequate technical supervision	25.00
3	Maintenance problem	37.50
III	General constraints	
1	Lack of demand by users	37.50
2	Lack of awareness	25.00
3	Competition among Godowns/ Warehouses	25.00
4	Risk of damage	37.50
5	Deterioration in quality and quantity	37.50
	Administration constraints	-
IV	Any others (Specify)	
1	Problems in land conversion	-
2	Lack of assistance from local administration	12.50

Source: Primary data

On the other hand, a few suggestions were reported by the owners of the godowns and are presented in **Table D.21**. A highest proportion of farmers (80%) suggested for making easy access to pledge loan facility to the produce retainers in the godowns, followed by increment in

the volume of loan amount, need for creating awareness on benefits of storage among farmers, and development of proper infrastructure facilities were the major suggestions provided by the 70, 60, and 30 per cent of the owners of the godowns. These suggestions seem to be relevant and needs immediate attention of the policy makers, to take away the farmers from distress sale and to double the farmer's income in the near future.

Table D.22: Suggestions provided by the beneficiaries of GBY

Sl. No.	Particulars	Percent of Owners
1	Increment in the volume of loan amount	70.00
2	Need of creating awareness amongst farmers	60.00
3	Make proper arrangements for easy access of pledge loans to produce retainers in the Godowns	80.00
4	Development of proper infrastructure facilities	30.00

Source: Primary data

D.7. Pros and Cons in Implementation of the RGS/ GBY in Karnataka

The main objectives of the scheme include creation of scientific storage capacity with allied facilities in the rural areas to meet the requirements of farmers for storing farm produce, processed farm produce, and agricultural inputs. It is clear from the above description that due to various factors; farmers are selling off their produce right after the harvest (glut phase in the market), and hence are not getting competitive prices for their produce. In this context, with the central support the RGS has been introduced in the State. In this section, authors have made an objective-wise critical appreciation of the scheme in the State of Karnataka as follows:

D.7.1. Extent of coverage and capacity utilization of the godowns

The scheme GBY has been successfully implemented across all districts in the State with varying degree of number and storage capacity creation as per the cropping pattern and extent of irrigation facilities, and the demand prevailing in the respective districts. Accordingly, the top five districts in the order of number of godowns are Raichur (1004), Bellary (586), Koppal (559), Shimoga (457), and Davangere (291), whereas, top five districts in terms of storage capacity created are Raichur (7.56 lakh MT), Davangere (3.96 lakh MT), Koppal (2.82 lakh MT), Bellary

(2.62 lakh MT), and Kodagu (2.22 lakh MT). The details of the coverage are given in **Table D.6**. Out of the total projects sanctioned in the State of Karnataka, a majority (>94%) were sanctioned by the NABARD alone, and about six per cent were supported by the NCDC.

Looking into the distribution of rural godowns across districts, it is understood that NCDC has focused more on cooperative institutions like PACS, VSNL, and horticultural produces such as arecanut and coconuts. NABARD's distribution of godowns appears to be demand driven, irrespective of districts and cropping pattern.

With an exception of State and Central Warehouse Corporations, most of the rural godown owners have not maintained the records on arrivals, quantities, and storage details. Hence, it was difficult to assess the exact capacity utilization of the godowns created under GBY. However, an attempt was made to classify the capacity utilization based on information provided by the owners during the field work. It is noticed that there were three patterns of utilization such as 1) Sub-optimal utilization, 2) optimum utilization, and 3) own utilization. A majority of the large godowns (> 2000MT) were fall into the category of sub-optimal utilization in many districts excepting Raichur, Gulburga, and Bellary where, the paddy and tur/ red gram were dominant along with better irrigation facilities. During the interaction, it was found that the reasons for sub-optimal utilization were a) high density of godowns in close proximity, b) failure of monsoon and consequent crop failure – as in case of maize in Davangere district, c) creation of storage space on higher side, d) shift in the cropping pattern from field crops to plantation crops – as is the case in Tumakuru district. Procurement of pulses by the State government has an impact on the capacity of utilization of godowns as it was observed in many other States. Karnataka State Warehousing Corporation has engaged godowns preferably more than 2000MT to an extent in few cases for storing government procurement such as tur crop in Gulburga, Bijapur and Raichur districts.

During the interaction with the beneficiaries, it was also found that major reason for sub-optimal utilization of the godowns are due poor project plan/ inaccurate estimations prepared by some Consultants, whereas the bank managers looks for the repaying capacity of the proponent rather than project report.

On the basis of duration of the storage period (**Table D.13**), a highest number of users (59%) stored their produce in the godowns for a period up to three months, subsequent to three to six months (35%) and a few of them (6%) stored beyond six months especially in the horticultural produce such as coconuts and arecanuts.

D.7.2. Constraints in implementation and performance of GBY

Although the implementation of the scheme of RGS has registered significant success, it has been observed during the field work that there were some constraints which have negatively influenced the success of the program *viz.*, lack of awareness about the scheme among the farming community; lack of demand for godowns, frequent transfer of bank/branch managers and delay in subsidy; lack of participation of medium and SC/ ST farmers due to high capital investment.

D.7.2.1.Lack of awareness about the scheme

In the State of Karnataka, though the DMI and NABARD have conducted awareness campaigns and programs for officers of regional financial institutions/ banks, the programme was unable to reach the masses in rural Karnataka. It was found that Panchayat President was the prime sources of information about this scheme. Whereas, in the case of Haryana and Punjab States, the promotion of scheme was intense due to participation of other agencies such as FCI and Haryana State Cooperative Supply & Marketing Federation (HAFED), which directly involved in foodgrain procurement and storage.

D.7.2.2. Lack of demand

Due to the limited size of land holdings and operation size, a majority of the farmers in Karnataka fall into the category of small and medium, with an operational land size below one hectare and hence their income will be subsistence, moreover their sources of income is at the end of a season. Farmer gets his income only after selling his farm produce after the harvest. With no significant means of income in between, farmer is forced to take loans for agricultural

and non-agricultural purposes. End of season, he is under pressure to repay the loans as soon as the harvest is done during glut period. This attitude has resulted in sub-optimal demand for storage space.

D.7.2.3. Frequent transfer of bank/ branch managers and delay in subsidy

As discussed earlier, the Bank/ Branch Manager forms a crucial link between the program and farmers. Submission of project proposal to NABARD for approval and release of first installment of subsidy, submission of Joint Inspection Report and release of second half of subsidy depends on the branch managers. However, due to the time bound transfers of the Bank Managers, the new incumbent manager may not well aware with the projects initiated by the previous managers and it may result in delay in the submission of papers for release of second installment of subsidy etc. Delay in release of second installment has serious implications on quantum of EMI and at times from preventing the project to become Non-Productive Assets (NPA). There cases that the subsidy was adjusted against the pending EMIs and many a case the proponent deprived of assured rate of subsidy.

D.7.2.4. Lack of participation of medium and SC/ST farmers due to high capital investment

It is observed that a majority of the benefits under GBY were captured by non-farmer groups & large farmers only. As the Guidelines stipulate that the project component must contribute 20 per cent of the project cost as a margin money and for most of the small and medium as well as SC/ST farmers, the initial investment and the margin money amounts to prohibitively high and has prevented them from considering the construction of godown and availing the benefits of GBY. Moreover, bankers give priority to the repayment capacity of the proponent.

D.7.3. Extent of participation of beneficiaries

As disused in the previous sections, a highest number of beneficiaries (67%) under the scheme belong to the general category with a 15 per cent of subsidy, followed by Individuals/ farmers (22%) and SC/STs (11%) with a 25 per cent and 33 per cent subsidy, respectively. The general

category involves the individuals other than farmers, group of farmers, entrepreneurs etc. Under the category of individuals, many large farmers having agriculture as their main occupation along with subsidiary activities have made use of the scheme. The SCs/STs includes the individual men or women from any other categories have availed 33 per cent of the subsidies. However, it is noticed that a meagre proportion of women participation under GBY as per the sample but, it is about 30 per cent at the State level. As regard to Cooperative Societies/ FPOs, no participation was observed during the field survey. Nevertheless, during a pilot survey at Gulbarga district, one of the FPOs has hired a godown for storing tur/ red gram and agricultural inputs with an objective of better prices. The Secretary of the particular FPO opined that the margin money can be brought down to 10-12 per cent instead of 20 per cent and the rate of interest should be cut down to six per cent to encourage FPO operations and prosperity to member farmers.

D.7.4. Overall performance of the scheme

Rural godown scheme plays a vital role in promoting agriculture marketing, rural banking and financing and ensuring food security in the State as well as in the Country. It enables the markets to ease the pressure during harvest season and to maintain supply of agricultural commodities during off season. Thereby, it resolves the problems of glut and scarcity, which are the usual problems in agricultural marketing. Though warehousing is an independent economic activity, yet is closely linked with production, consumption and trade. In this regard, the implementation of the Rural Godown Scheme by the Government of India was a successful attempt towards helping the farmers to avoid distress sale, and to enhance their income level. In this section, we have made an attempt to explain the performance of the scheme is as follows:

- **Promotion of grading, standardization and quality control of agricultural produce to improve their marketability:** Field work in Karnataka was conducted in three different regions representing high, medium and low performance of RGS in the State. With the exception of storing coconuts for allowing it to mature into dry copra, no grading, standardization and quality control of agri produce was observed in the State. Most of the storage space created was used to store the produce till they fetch better prices. However, it

was also observed that before stacking the paddy, it was sun-dried near the godowns in paddy growing regions.

- **Prevention of distress sale immediately after harvest by providing the facility of pledge financing and marketing credit:** In addition to the beneficiaries of GBY, random personal interviews of about 30 farmers were also carried out. The farmers were enquired about the distress sale of their produce (at a rate lower than MSP declared by the State Government). There have been no instances of such distress sale reported by the farmers, as they have sold their produce slightly lesser than MSP excepting in the case tur/red gram as the procured tur at the rate of MSP to an extent. In addition, farmers were also opined that storing in godowns incur associated costs such as cleaning, loading & unloading, godown rental, transportation etc., discourage the farmers to store in godowns. Further, pledge loan facility was extended by the banks only to the godowns registered under WDRA, while most of the private godowns built under RGS were not registered and hence, not considered by the banks.
- **Strengthen agricultural marketing infrastructure in the country by paving the way for the introduction of a National System of Warehouse Receipts in respect of agricultural commodities stored in such godowns:** As per the records made available by the Regional Office of NABARD, Bengaluru, there are 4414 godowns created under RGS with a total storage capacity of 37,94,772 MT. However, according to the WDRA records, there are only 23 godowns with a storage capacity of 3,28,430 MT. Of which only 73,545 MT was owned by the private entrepreneurs, and the rest is State owned godowns. A major reason for this difference being Godowns are used for storing own (or relatives) produce and were not registered with WDRA. It also indicates that the storage space is not available for farmers in general. The gap between the storage space created under GBY, and the area available/eligible under National System of Warehouse Receipts, indicates a significant scope for improvisation in the operations of the RGS.
- **To reverse the declining trend of investment in agriculture sector by the private/cooperative sectors to invest in the creation of storage infrastructure in the country:** Capital investment made under RGS in different districts explains the contribution of RGS in bringing about Rs. 711 crores of capital investment into creation of storage infrastructure in the State.

➤ **Demand and supply of storage capacity created under GBY:** The total number of godowns created under the scheme were 4508 with a capacity of 37.88 lakh MT at the overall State of Karnataka (covered 30 districts). On an average, each godown capacity works out to be 840.12 MT (**Table D.23**). To cater the State level production of foodgrains at about 106.27 MT (as per 2017-18 data), the storage space created since inception of the scheme could able to accommodate only 36 per cent of the total production in Karnataka. Considering the marketable surplus to an extent of 85 per cent of the production, the gap of 49 per cent is exposed to post harvest management issues, underlining the significance of creation of suitable storage space in the State.

Table D.23: District-wise Demand and Supply of Storage Capacity in Karnataka

No. of Projects	Total Capacity in '000 tonnes	Average Capacity of the Godowns (MT)	Foodgrain Production (2017-18)	Storage created as a function of Production
4508	3788	840.12	10627	35.65

Source: NABARD

D.8. Summary and Conclusion

Post-harvest management plays an important role in the production and marketing as the considerable quantity of the valuable produce is lost every-year due to improper post-harvest management. Therefore, crisis in food availability is not only caused by the natural disasters, but also by absolute lack of post-harvest management. With this background the introduction of GBY from the Government of India has a high relevance to the country, but also to the individual farmers. In this context, we have analyzed the significance of GBY in Karnataka, which supports farmers to protect farm produce from the post-harvest losses and consequently avoids distress sale.

In the context of inadequate economic viability of farmers to construct own godowns, two questions are raised in this study. Our study examines the status and performance of GBY in Karnataka. Based on the analysis of both primary and secondary data, the following observations were drawn:

- The distribution of godowns across the State reflects the nature of the scheme – demand driven and hence, a majority of the godowns were located in intense agricultural areas such as Raichur and Bellary.
- The average size of the godowns constructed under the scheme works out to be below 1000MT reflecting the reasonable demand as prescribed in the objectives of the scheme. As the godowns were of medium size, most of the godowns were managed by the farmers themselves. Hence, there were no adequate documentations on the utilization of the godowns.
- Based upon the interactions, it was inferred that the utilization of the godowns founds to suit the local demand. For instance, the produce was kept in the godown for 12 months in the case of arecanuts in Shimoga&Chikkamagaluru, coconuts were kept for about 10 months in the godown in the case of Tumkur district, tur/ red gram for eight months in Gulbarga, and paddy for about four to six months in Raichur and Bellary districts.
- As regard to the participation of the beneficiaries in the program, women participation found to be adequate however, SC/ST participation was negligible, may be due to a mandatory margin money.
- In terms of overall performance evaluation, the scheme has helped to attract Rs. 711 crores of private investment into the agricultural sector especially in the post-harvest management. This investment has helped to create about 38 lakh MT of storage capacity at the rural area, which in turn helped the farmers to avoid distress sale, protection of foodgrains from post-harvest losses and ultimately to enhance their income levels.
- However, factors such as lack of awareness about the scheme among the farming community; lack of demand for godowns, frequent transfer of bank/branch managers and delay in subsidy; lack of participation of medium and SC/ ST farmers due to high capital investment were the some of the major obstacles to harvest full potential of the scheme.

To conclude, so far, the scheme has created storage capacity to an extent of about 36 per cent of the foodgrain production in the State and helped to reduce the post-harvest losses. However, in view of increasing population, and also the commitment of the State under National Food

Security Act, measures have to be taken to enhance the storage availability. At the same time, through preferential subsidy approach, the participation of SC/STs may also be encourage.



Research team interacting with the beneficiary of GBY in Davanagere district, Karnataka



Interacting with the beneficiary of GBY in Karnataka



Godown in Rachur District, Karnataka



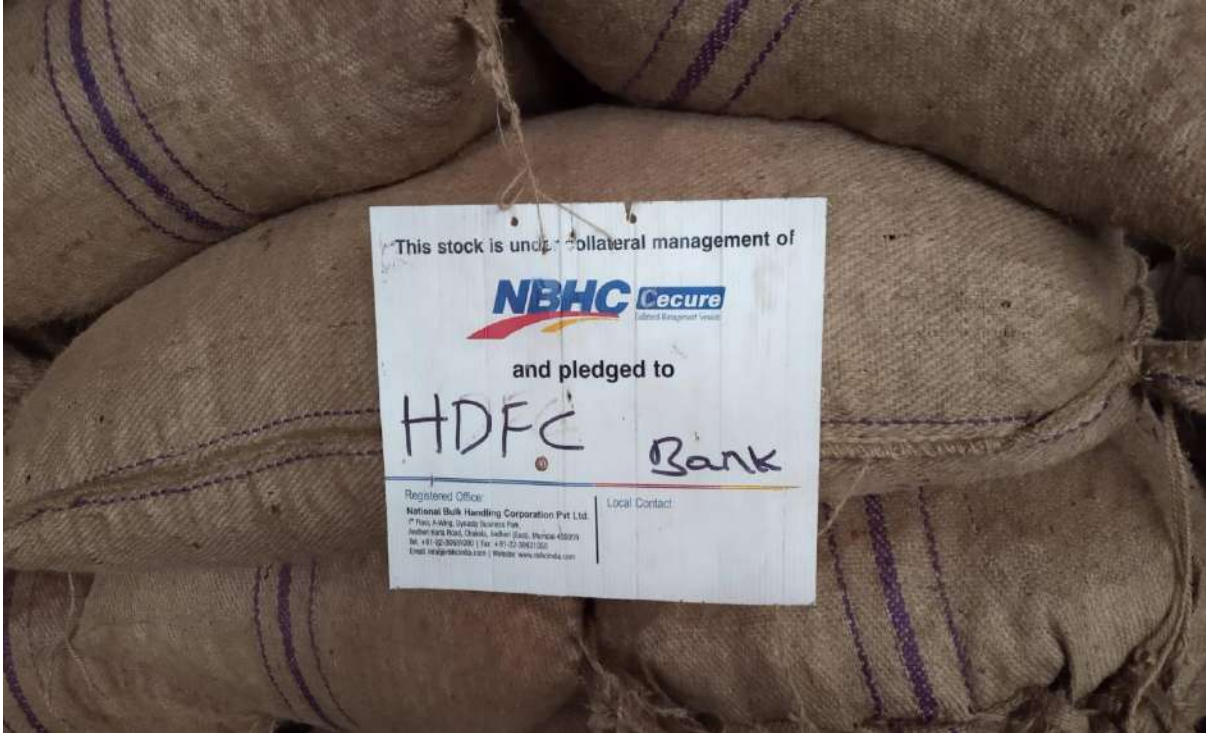
Godown in Raichur district, Karnataka - loan sanctioned by Canara Bank



Label related to the Pledge Loan facility offered by the Karnataka Bank and Quality Control by NCMSL in Karnataka State



No Quality Control by the Individual Farmers in Karnataka



Stock in the godown displaying the Pledge Loan tag in Karnataka



Stock in the godown with a lot tag describing the details of the storage by the users.

4.3. LOW PERFORMANCE STATES

E. MEGHALAYA

E.1. Overview of Agriculture in Meghalaya

A majority of the population (about 70%) depends more on agriculture for their livelihood in Meghalaya and it contributes about 22 per cent of the GSDP. About 62 per cent of total land is used for foodgrains, 25 per cent under cash crops, nine per cent under horticultural crops and the rest of about four per cent is used for other miscellaneous crops in the State. Rice and maize are the major food crops, rice alone occupies about 44 per cent of the total agricultural land. A total area covered under crop cultivation is about eight per cent of the cropped area, and mainly in the plains of *Garo* hills, Mairang, Mawphlang and Laskein block of Jaintia hills. Cotton, jute and mesta are the other important fibre crops grown in the State. The State is also famous for its horticultural crops such as orange, pineapple, lemon, guava, litchi, jackfruit and banana, plum, pear and peach. Besides, Meghalaya is a major producer of Khasi Mandarin, tagged as its most important fruit, both in the northern and southern tilts of the State. Plantation crops such as tea, cashew, coconut, arecanut and other spice crops like, black pepper have been performing well and offer good scope for area expansion. Besides, the major vegetable crops grown in the State are cauliflower, cabbage, knol-khol, peas, beans, tomato, carrot, radish, turnip, beetroot, lettuce, brinjal, lady's finger, cucumber, pumpkin, squash, chow-chow, gourds and a wide range of other leafy vegetables. Bengal ginger (local name - Syingmakhir), roccambole garlic (local name - Rynsunkhasi), winged prickly ash (local name - Jaiur), Indian bay leaf (local name - Sla tyrpad), Indian long pepper (local name - Sohmrithlaw), aromatic ginger (local name - Syingshmoh) are unique to Meghalaya.

Meghalaya agriculture practice has been organic by tradition and the State is slowly transforming towards organic agriculture, through sustainable and chemical free agriculture practices, environment friendly pests and diseases control methods, use of bio fertilisers and organic manure. The State has a very high potential for cultivation of all types of flowers such as orchids, chrysanthemums, gerberas, carnations, lilioms, gladiolus, asters, marigolds, gomphrenas, zinnias,

roses and different kinds of house plants. About 300 orchids world's species are found in rich forestlands, gardens and nurseries. Amongst its rare species are the insect-eating pitcher plants, wild citrus and pygmy lily. The highest number of orchid species is located in Mawsmal and Mawmluh.

E.1.1. Foodgrain Production in Meghalaya

The State is having a shortfall in foodgrain production due to its terrain and landscape, but tremendous potential exists for the promotion of horticulture and plantation crops. As can be seen from **Table E.1** that the growth in terms of agriculture and horticultural crops shows a significant growth in the last decade exhibiting a positive growth in area, production, and productivity. Among all crops, pulses have shown a highest growth (in the range of 6 to 18%) in terms of all parameters considered. The productivity of cereals is less than that of other crops. Among oilseed crops, turmeric has indicated a better prospect with around three per cent productivity, while growth observed in respect of area and production found to be four per cent and seven per cent respectively, in the past decade (2008 to 2018). The results are also represented in **Figures E.1 and E.2** in the subsequent sections.

Table E.1: CAGR of area, production, and productivity of major crops (2008 to 2018)

Crops	Area	Production	Productivity
			(% growth)
1.Rice	0.36	4.01	3.64
2.Maize	0.78	7.24	6.41
Total Cereals	0.48	4.44	3.94
1.Bengal gram	20.27	31.43	9.28
2.Red gram	5.97	14.61	8.16
Total Pulses	9.68	18.05	7.62
1.Soybean	8.30	7.94	16.52
2.Seas mum	5.83	14.61	8.30
3.Mustard	4.87	10.21	5.09
Total Oilseeds	5.14	12.02	6.54
1.Turmeric	4.07	7.03	2.85
2.Ginger	0.83	3.32	2.47
Total spices	1.30	3.59	2.27
1. Areca nut	4.47	6.03	1.49

Note: Area in thousand hectares; Production in thousand hectares; *Source:* (1) Directorate of Economics and Statistics, Government of India; (2) Horticulture Statistics Division Department of Agriculture, Government of India, 2018

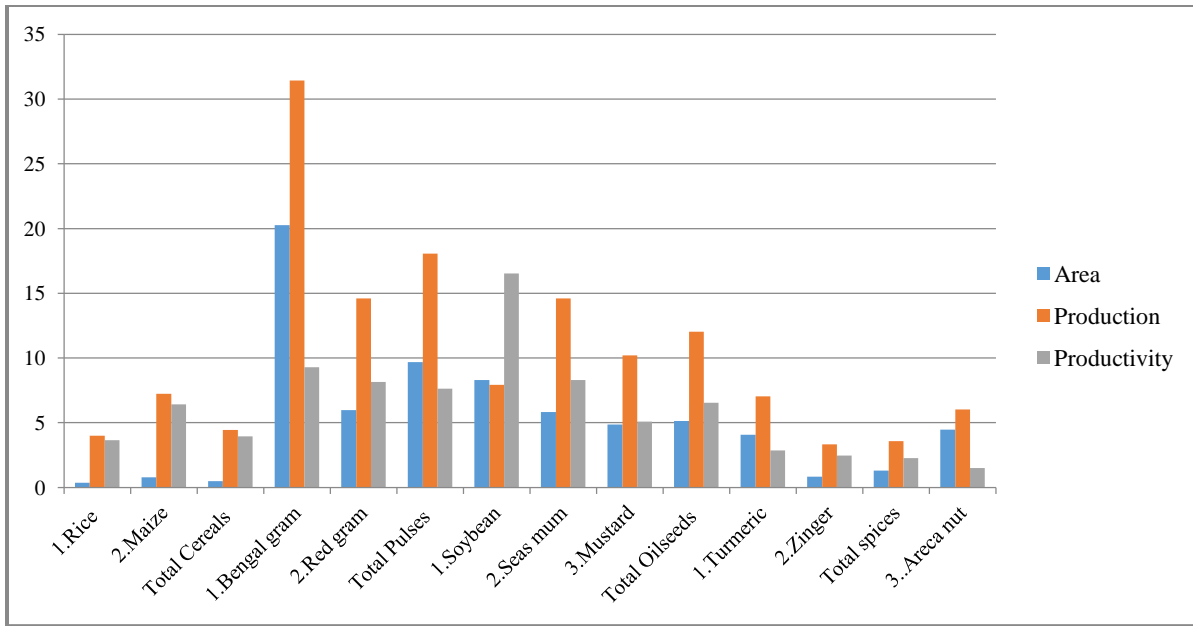


Figure E.1: CAGR of area, production, and productivity of total cereals, pulses, oilseeds spices and plantations crop in Meghalaya during 2008 to 2018 (% growth)

Source: (1) Directorate of Economics and Statistics, Government of India; (2) Horticulture Statistics Division Department of Agriculture, Government of India, 2018

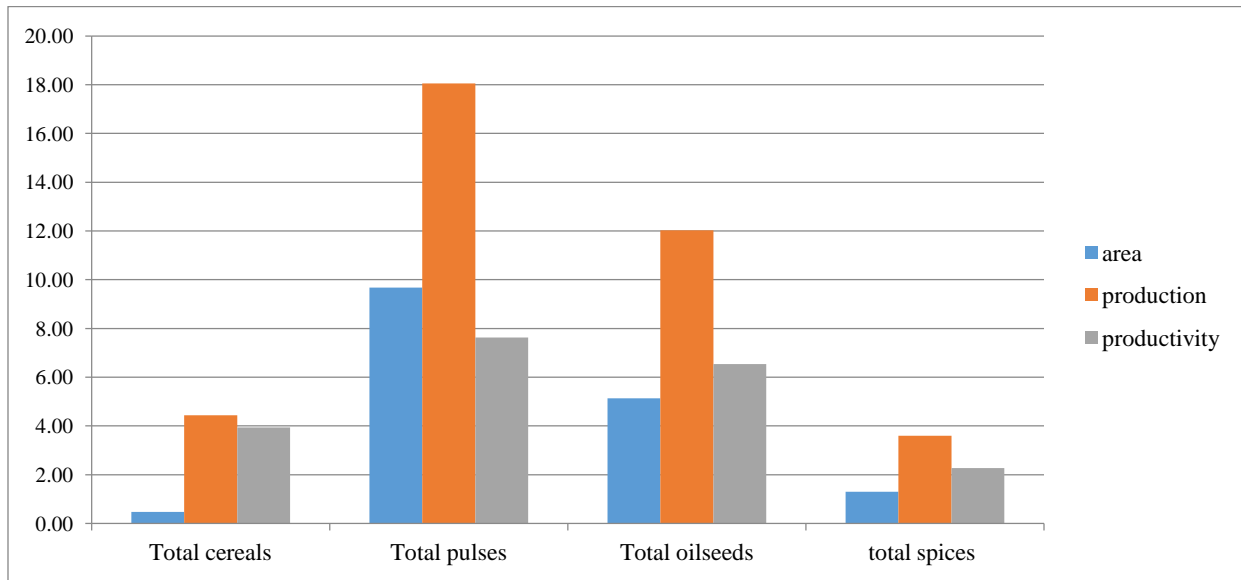


Figure E.2: CAGR of area, production, and productivity of total cereals, pulses and oilseeds crops in Meghalaya during 2008 to 2018 (% growth)

Source: (1) Directorate of Economics and Statistics, Government of India; (2) Horticulture Statistics Division Department of Agriculture, Government of India, 2018

E.2. Status of Agriculture Marketing in Meghalaya

E.2.1. Market Regulation in Meghalaya

The State Agricultural Produce Marketing Act was enacted in the year 1980 and the State Agricultural Marketing Board was set up in 1983, to develop marketing infrastructural facilities and to provide marketing support to the farmers in the State. As a result, the State has two regulated markets and two secondary processing centres for processing of agricultural produce. However, most of the markets dealing with agricultural products are managed and controlled by different agencies like the Autonomous District Councils, Autonomous Committees and private personnel etc. However, Planning Commission (2002), study indicates that the State lacks robust distribution and marketing infrastructure for agricultural and horticultural produce. There is also a dearth of proper storage and processing facilities and organised markets for the disposal of agricultural and horticultural produce (*Government of India, 2002; Meghalaya State Development Report*).

Besides other supporting services and facilities are available for the benefit of the farmers. These are: -

- ✓ Standardized and verified Weight and Measures.
- ✓ No Entry or Toll tax.
- ✓ Free temporary storage of unsold produce in the market yard.
- ✓ Transportation of farmer's produce from villages to the regulated market by the market committee's two nos. of trucks at very reasonable charges.
- ✓ Round the clock security inside the market complex.
- ✓ Provision of rest house for farmers who wish to stay overnight.
- ✓ Clean drinking water supply.
- ✓ Provision of latrines inside the market.
- ✓ Spacious parking yard for vehicles coming from villages/ outside the state.
- ✓ A branch of the Meghalaya Co-operative Bank inside the Market for business transaction of farmers and traders.

E.2.1.1. State Warehousing Corporation

State Warehousing Corporation was established in Meghalaya after being bifurcated from Assam State Warehousing Corporation in the year 1975, under the Warehousing Corporation Act, 1962. The Meghalaya State Warehousing Corporation was established w.e.f. 30th March 1973. Unlike other State Government undertakings, the Meghalaya State Warehousing Corporation has two shareholders viz, Central Warehousing Corporation and the State Government on 50:50 basis. The main source of funding of the Corporation is on share basis of capital contributions from its shareholders. The authorised share capital of the corporation is Rs.5.00 Crores.

E.3. Marketed/Marketable Surplus

As the contribution of the State in terms of agriculture to the country is less than a two per cent and a majority of the farmers undertake agriculture as a subsistence occupation, there is no much agricultural produce for the market. Hence, there is no availability of the data related to the marketable or marketed surplus for the State. On contrary, horticultural produces constitutes a significant portion of the surplus. In addition, a few Non-Timber Forest Products (NTFP) such as Indian Bay leaf and broom grass (*Thysanolaena maxima*) which are widely grown across hills of the east Khasi, which were collected/ harvested by a majority of the tribes and sold to the intermediaries. The beneficiaries of GBY, have stored these NTFP in their godowns.

E.3.1. Post Harvest Loss

The produce obtained after harvest, threshing and winnowing has a long way till it reaches the market and the final consumer (*Parmod et al, 2013*). Post-harvest losses are rampant in northeast States of India because of dearth of resource availability in particular, and cultivate them as a subsistence crop (*Devi and Kanta Singh, 2015*). The study also highlights that, in the absence of proper storage facilities, farmers usually sell their produce in the local markets soon after the harvest. Thus, post harvest management such as storage and keep up of produce forms a most important link in supply chain but, is missing in Meghalaya and also in the north-east region. There is no database on the State-wise post-harvest losses available. Based on a study conducted

by the Directorate of Marketing and Inspection, GoI for the year 2005, the information related to the post-harvest losses in Meghalaya are extracted and presented in **Table E.2**. Table 2 reveals that the post-harvest losses are higher (3.44%) in the case of Maize crop and lowest in respect of paddy (1.99%). On an average the post-harvest loss is to an extent of two to three per cent of foodgrains in the State.

**Table E.2: Post-Harvest Losses of Different Crops in Meghalaya
(Triennium ending 1998-99)**

(in '000 tonnes)

Name of the Crop	Quantity	Percentage
Paddy	4.87	1.99
Maize	0.86	3.44

Source: dmi.gov.in; Abstract of reports on Marketable Surplus and Post-Harvest Losses of Foodgrains in India.

E.4. Status of Gramin Bhandaran Yojana in North Eastern States

The Government of India has introduced Gramin Bhandaran Yojana (GBY) to address the limitations of other Government initiatives that have been already implemented in all over the country and more so to support those farm communities, by providing storage space, pledge loan to avoid distress sale. Gramin Bhandaran Yojana, is a Capital Investment Subsidy Scheme for construction / renovation / expansion of Rural Godowns. It has been introduced by Government of India during 2001-02. Since it is a Central scheme, the Government of Meghalaya also implemented the same during the same period. The guidelines of the scheme have been subsumed with other ongoing schemes of Development/ Strengthening of Agricultural Marketing Infrastructure, Grading and Standardization (AMIGS) during 2004 and again into Agricultural Marketing Infrastructure (AMI) sub scheme of Integrated Scheme of Agricultural Marketing (ISAM) w.e.f. 2014.

Rural godown scheme plays a vital role in promoting agriculture marketing, rural banking and financing and ensuring food security in the country. Though warehousing is an independent economic activity, yet is closely linked with production, consumption and trade. The main objective of the scheme is creation of scientific storage capacity with allied facilities in the rural areas to meet the requirements of farmers for storing farm produce, processed farm produce and

agricultural inputs; promotion of grading, standardization and quality control of agricultural produce to improve their marketability; prevention of distress sale immediately after harvest by providing the facility of pledge financing and marketing credit; strengthen agricultural marketing infrastructure in the country by paving the way for the introduction of a national system of warehouse receipts in respect of agricultural commodities stored in such godowns and to reverse the declining trend of investment in agriculture sector by encouraging private and cooperative sectors to invest in the creation of storage infrastructure in the country.

E.4.1. Method of implementation of the Scheme

In the State of Meghalaya, the scheme was implemented by the Directorate of Marketing and Inspection (DMI). It acts as a nodal office for implementing the scheme. DMI has its own office in Shillong, but the office was closed for a significant period during 1990s for almost a decade. Along with National Institute of Agricultural Marketing (NIAM), Jaipur and other National/ State level Institutions such as NABARD. DMI officials have organized training to create general awareness on the scheme for farmers and entrepreneurs for construction, maintenance and operations of rural godowns. The scheme is promoted by the Department of Agriculture, Cooperation & Farmers' Welfare, GoI. The credit linked back-ended subsidy approach for investment has been followed in the State. All three categories of beneficiaries such as individuals, farmers, and schedule castes/ schedule tribes/ women have been availed the benefits under this scheme throughout the state.

It is important to note that the existing initiatives that have been carried out under GBY in north east region have a distinctive constraints than the rest of India. It is noticed from **Table E.3** that the Assam (more than 94.69%), Meghalaya (2.82 per cent), and Tripura (1.41 per cent) were the top three States in terms of utilization of funds and capacity of storage created under GBY, remaining north eastern States had a less than one per cent of the storage capacity created. There were no godowns created in Manipur state.

E.5. Methodology of the Study

The present study is relied upon both the secondary and primary data.

E.5.1. Secondary data sources

The secondary sources such as Directorate of Economics and Statistics, Government of India, Directorate of Marketing and Inspection (DMI), Faridabad, and NABARD have been referred to collect the data on area and agricultural production of Meghalaya, number of godowns sanctioned with their capacity of storage, Rural Godowns beneficiary list, location and their addresses etc. In addition, various journals, reports, and guidelines available with the libraries, websites/ search engines were also been used in finalizing the methodology and writing the report.

E.5.2. Primary data collection

To collect the primary information from different stakeholders such as the beneficiaries of the scheme, users of the godowns, officers of NABARD, Officials of implementing agencies, and bankers, a pre-tested separate set of questionnaires have been designed and used to record their feedback on various aspects of GBY, such as cropping pattern & their storage methods, usage pattern of the godowns, costs incurred and benefits obtained, issues in availing the loans, constraints in management of the godowns, utilization etc., and to record their suggestions for improvement of the scheme. The collected primary data was to assess and evaluate the programme. Tabular Analysis and CAGR, have been used to derive inferences.

Table E.3: Number of loans sanctioned under GBY+AMIGS+AMI scheme to North East States of India

State	Storage		Non-Storage	
	GBY	AMI	AMIGS	AMI
Assam	268	48	16	09
Arunachal Pradesh	01	-	-	-
Meghalaya	08	-	-	-
Manipur	Nil	-	-	-
Mizoram	01	-	-	-
Nagaland	01	-	-	-
Tripura	04	02	-	-

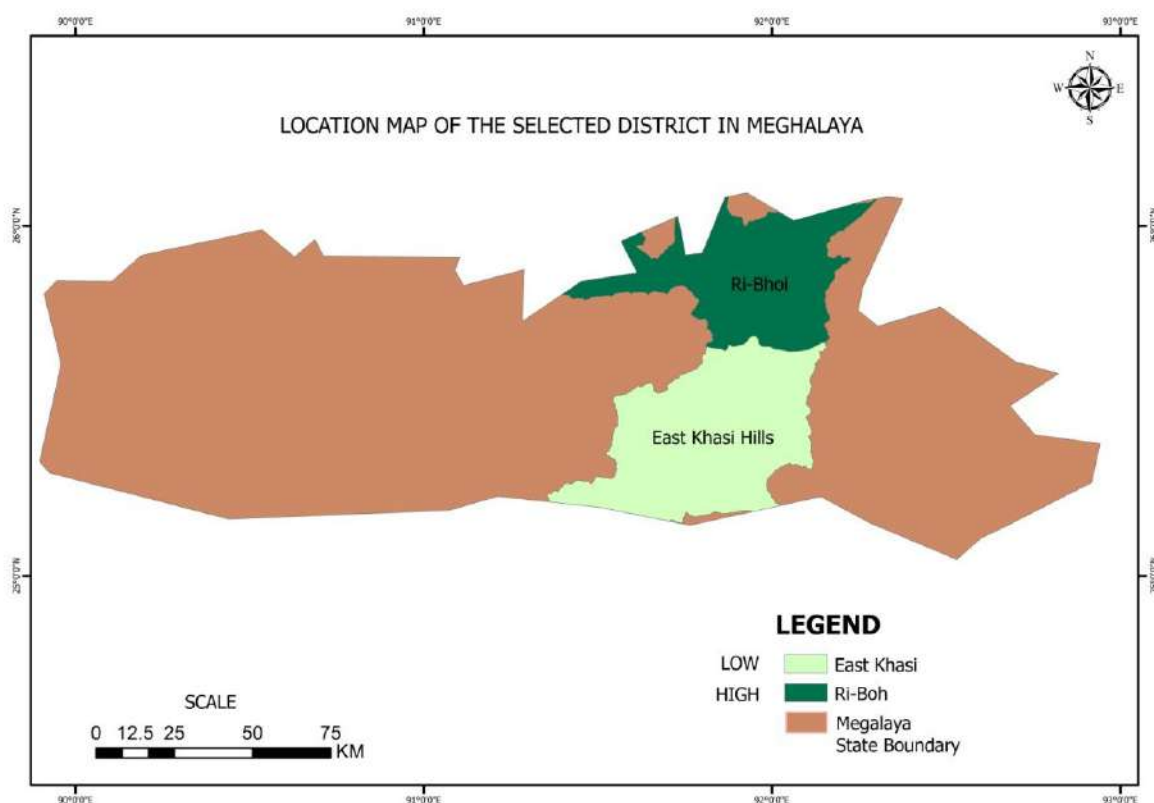
Source: DMI, Meghalaya

E.5.3. Sampling Method

A detailed list of the number of godowns was collected from the state-level offices of nodal agency - DMI and NABARD. The districts are categorized on the basis of their geographical distribution of godowns, as the godowns were distributed only in two districts of the State under GBY during a first decade of the scheme viz., East Khasi Hills and Ri-bhoi. Hence, field visits were made to both of these districts for information collection. In view of a very few godowns were constructed under GBY in Meghalaya, two godowns from each district were considered for the survey. A brief profile of the sample districts is given in the subsequent sections.

East Khasi Hills District forms a central part of Meghalaya and covers a total geographical area of 2,748 Sq. Kms. Shillong is the district headquarter. The northern portion of the district is bounded by the plain of Ri-Bhoi. The district gradually rising to the rolling grasslands of the Shillong plateau interspersed with river valleys, then falls sharply in the Southern portion forming a deep gorges and ravines in Mawsynram and Shella-Bholaganj, community and rural development block, bordering Bangladesh. The district is bounded by the Jaintia Hills to the east and the west Khasi Hills to the west. The climate of the district ranges from temperate in the plateau region to the warmer tropical and sub-tropical pockets on the northern and southern regions. The whole of the district is influenced by the south-west monsoon which begins generally from May and continues till September. The agricultural and other products are transported by trucks, jeeps and tractors.

Ri-Bhoi District: It is bounded on the north by Kamrup district and on the east by Jaintia Hills and Karbi Anglong District of Assam and on the west by Khasi Hills District. Ri Bhoi district covers an area of 2448 km². The headquarter of the district is Nongpoh located at 53 km away from the State capital Shillong and 50 km from Guwahati. This district is characterized by rugged and irregular land surface. It includes a series of hill ranges which gradually sloped towards the north and finally joins the Brahmaputra valley.



E.6. Performance of Gramin Bhandaran Yojana

E.6.1. Distribution of Godowns under GBY in Meghalaya

The secondary data collected from the head offices of DMI and NABARD on the total number of godowns sanctioned since inception are presented in **Table E.4**. As stated earlier, the projects implemented in the State were financed through NABARD only. In total only eight godowns have been created in the State under this scheme, their spread was limited to two districts only.

The total storage capacity of the godowns was 19,625 MT with an average capacity of 4,215 MT. Such a low storage space creation may be due to following reasons, viz., lack of title deeds/ land ownership documents, lack of marketable surplus of agriculture commodities, lack of initiative from financing banks, and high costs of land and construction. The details of each point are explained as follows:

E.6.1.1. Lack of Title Deeds/ Land ownership documents

It is a major issue across all the states in NER. The government administered revenue system operates only in the plains and valleys of Assam, a portion of Tripura and Manipur. On the other hand, village level customary land tenure system operates in hilly States of Arunachal Pradesh, Meghalaya, Mizoram, Nagaland and in hilly Parts of Assam, Manipur and Tripura. In all the six states of NER, there is no patta land, which can serve the purpose of collateral against bank loans. Land ownership documents provided by the local village council are not acceptable to the banks as guarantee.

E.6.1.2. Lack of marketable surplus of agriculture commodities

On account of terrain and landscape, the cultivation of field crops is restricted only to valleys and contour farming. This has resulted in extensive subsistence cultivation and a very limited marketable surplus produced from the field crops in the State.

E.6.1.3. Lack of initiative from financial institutions

Factors such as absence of clear title deeds of land, collateral guarantee etc., have forced the financial institutions to take a guarded approach to GBY and has resulted in a sub-optimal approval of term-loans under GBY.

E.6.1.4. High costs of land and construction

Due to the undulating mountainous landscape, and price of flat land are essential for construction of godowns is very expensive. Further, the cost of construction is also a very high as most of the construction materials have to be transported from far off places. In comparison with plains, the cost of construction is several times higher in the mountain region such as Meghalaya, and due consideration is needed in estimations of the cost of construction schemes like GBY.

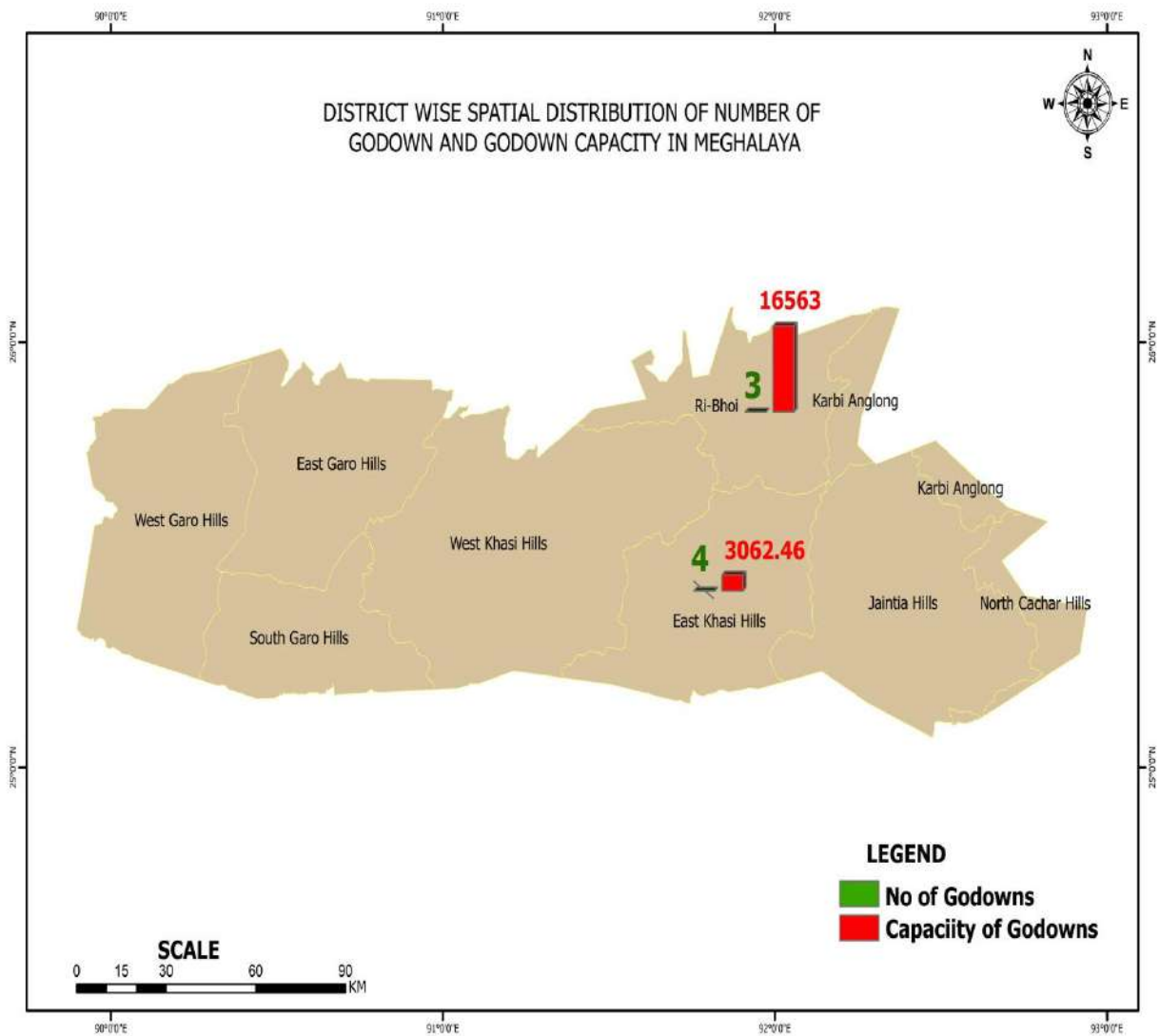


Table E.4: List of Godowns Constructed under Rural Godowns Scheme (Rs in lakhs)

Sl. No.	Name of the Project	Location	Capacity (MT)	Bank & promoter	TFO Sanctioned (in Rs.)	Bank Loan (in Rs.)	Promoter's Equity (in Rs.)	Total Eligible Subsidy (in Rs.)
1.	Laitjem Agricultural Godown (WOMEN/ST)	Village, Upper Shillong, Dt: -East Khasi Hills	155.28	Bank of Baroda, Shillong Branch, Shillong. SmtLaitjem	3,79,000	1,76,500	75,700	1,03,000/-
2.	Country Rural Godown (WOMEN/ST)	3rd Mile, Upper Shillong, Dt: -East Khasi Hills	921.98	Central Bank of India, Police Bazar Branch, Shillong. Smt. PhillieGyndiang	49,97,900	23,32,000	10,00,900	6,14,600/-
3.	Raps Warehouse Pvt. Ltd	Khanapara, Block-Umling Dt: -Ri-Bhoi	7700	Meghalaya Cooperative Apex Bank Ltd, Shillong Branch, Shillong	3,12,05,000	1,24,00,000	1,50,000	38,49,500/-
4.	Shiromani Food Products Pvt. Ltd	Vill- Baridua, Amerigog, Dt: -Ri-Bhoi	731	PNB, Mahabir Market Branch, Guwahati. Shri Binod Agarwal	1,00,98,000	77,24,000	23,74,000	6,09,106/-
5.	Phlangshlain Rural Godown (ST)	Vill: - UrksewWahpathaw, Pynursla, Dt: -East Khasi Hills	676	Meghalaya Cooperative Apex Bank, Pynursla Branch, East Khasi Hills. Shri DonboklangKhongkhlad	18,97,000	14,47,000	4,50,000	5,63,230/-
6.	Nengnong Agricultural Godown (ST)	Kynton-U-Mon (Lad Smit), Smit, Dt: -East Khasi Hills	924.2	Meghalaya Rural Bank, Smit Branch, Dt- East Khasi Hills. Shri LamshaphrangNengnong.	25,00,000	20,00,000	5,00,000	8,09,000/-
7.	Khongnohbeh Agricultural Godown (ST)	Nongiri, Dt: -East Khasi Hills	385	Meghalaya Rural Bank, Shillong Branch. Shri EdingsonKhongnohbeh.	28,75,000	23,00,000	5,75,000	3,19,900/-
8.	Prime Enterprise (GENERAL WOMEN)	Opp: -CRPF Gate No.1, 9th Mile, NH-37, Villa: -Baridua, Dt:-Ri-Bhoi	8132 MT	PNB, Mahabir Market Branch, Guwahati. Smt Pratima Sureka	3,40,39,000	2,60,42,000	79,97,000	1,08,41,582/-

E.6.2. Category wise Information- Profile of the Beneficiaries

The GBY projects were sanctioned around the year 2010 and the term loan repayment was completed couple of years back. Hence, neither the financial institutions (Banks) nor the NABARD have maintained the updated contact details of the beneficiaries. In the absence of updated contact details, it was a problem to locate the beneficiaries. Hence, the number of personal interactions were limited to two beneficiaries, and the telephone interaction was done with other two beneficiaries. In total, four beneficiaries out of eight, were consulted during the survey in the State.

E.7. Perception of the stakeholders

E.7.1. Source of awareness on GBY

In order to understand, the sources of information on GBY were collected and displayed in **Table E.5**. It is noticed that all of them have got the information from the financial institutions/ through Bank Managers only. As many of the beneficiaries were belong to the category of farmer-trader/ businessmen/ entrepreneurs, they will be having a regular contact with the bank officials and hence, they could able to avail the benefits under this scheme.

Table E.5: Sources of information on GBY

SL. No.	Sources	Percentage
1	Bank/Financial Institutions	100.00

Source: Primary data

E.7.2. Distribution of Beneficiaries

To have an idea, the beneficiaries were grouped into the classification as enlisted in the GBY guidelines, and the results are shown in **Table E.6**. **Table E.6** reveals that a half of the beneficiaries availed benefit from the GBY under SC/ STs & Women (50%), followed by the Individuals category (37%) and the rest were belonging to the category of farmers (12%). However, the rate of subsidy was 33 per cent as prescribed under the guidelines of GBY for the

NER/ hilly regions. The highest proportion of SC/ ST and women in the State of Meghalaya might be due to the higher of proportion of Tribes in NER.

Table E.6: Classification of the Sample Beneficiaries as per GBY Guidelines

SI. No.	Beneficiaries	Percentage
1	Individuals	37.00
2	Farmers	12.00
3	SC/ST/Women	50.00
	Total	100.00

Source: Primary data

E.7.3. Godown's Capacity Utilisation and Economic Benefits

It is noticed that in the absence of irrigation system in the State of Meghalaya, only rainfed cultivation is practiced. Paddy and maize were being a major cereal crop and are of primarily the subsistence nature. Although, arecanut, ginger and turmeric were grown as commercial crops, their marketable surplus is limited and sold off immediately after harvesting locally. Thus, the demand for storage space for perishable agricultural produce is a very limited. On the other hand, NTFPs like bay leaf and broom grass forms an important source of income for the villagers. During the pre-monsoon seasons, bay leaf and broom grass were collected and field-dried for couple of days before selling to the trader/ godown owners. It is observed that the beneficiaries of GBY were the traders, used these godowns for storage of NTFPs in East Khasi district and commercial purposes in the Ri-bhoi district. The East Khasi beneficiaries found to had a smaller storage structures of a capacity less than 500 MT in contradiction to bigger size (>2000 MT) of godowns in Ri-Bhoi district.

In the case of smaller godowns in East Khasi district, the godown owners have stored the NTFPs which were purchased from many tribal households in the neighboring areas. Whereas in larger godowns (found in Ri-bhoi district), the owners have hired/ rented-out to the commercial purposes like, rice millers, organized retailers, distributors etc., but their usage found to be limited period in a year. However, on the basis of duration of the storage period (**Table E.7**), the utilization of these godowns is to an extent of three to six months and six to twelve months as

perceived by equal proportion of beneficiaries. As discussed earlier, the smaller godowns constructed at remote towns were reported a higher occupancy rate than a large godowns constructed along Guwahati - Shillong highway.

Table E.7: Storage characteristics of the users

Sl. No.	Duration (months)	% of users
1	1 to 3	-
2	3 to 6	50.00
3	6 to 12	50.00

Source: Primary data

E.7.4. Employment Generation

Further, due to the establishment of these rural godowns, the beneficiaries have been contributing in the form of employment generation by hiring the labourers for the purposes like, security, loading and unloading, management of the godowns etc. The rate of employment generation was worked out based on the size of the godowns and presented in **Table 8**. It is noticed that on an average, the godowns could able to generate 90 man-days of casual labour and 30 man-days for administrative purposes. With reference to the employment of permanent nature, it was opined that due to a social condition, security was not an issue in the cases of smaller godowns. On the other hand, godowns with more than 2000 MT have generated about 395 man-days of permanent (security – 365; man-days and administrative – 30 man-days) and 200 man-days of casual labours for loading and unloading the material to godowns.

Table E.8: Employment Generation due to the Rural Godowns

Sl. No.	Details	<500 MT	> 2000 MT
Permanent Labour			
1	Average No. of workers/godowns	1	1
	No. of man-days	30	395
Casual Labour			
1	No. of man-days	300	200

Source: Primary data

E.8. Pros and Cons in Implementation of the RGS/ GBY in Meghalaya

The main objectives of the scheme include the creation of scientific storage capacity with allied facilities in the rural areas to meet the requirements of farmers for storing farm produce, processed farm produce, and agricultural inputs. It is clear from the above description that due to various factors; foodgrain marketable surplus is very limited and hence, the use of godowns are a very limited in Meghalaya. However, it was observed that in the case of NTF products, such as bay leaf, storage helps in price escalation. However, as described earlier, it is traders-farmer taking the benefit of this profit through the godowns created under GBY. In this section, authors have made an objective-wise critical appreciation of the scheme in the State of Meghalaya as follows:

E.8.1. Extent of coverage and capacity utilization of the godowns

It is noticed that all GBY projects sanctioned in the State of Meghalaya were supported by the NABARD alone. Under GBY, Meghalaya State, the distribution of godowns under GBY limited to eight godowns with a capacity of 19,625 MT in two districts only. Of the districts, East Khasi Hills district has five godowns with a capacity of 3,062 MT, while Ri-boh district had three godowns with a higher capacity of 16,563 MT. The differential spread of storage space is a resultant of the market forces accordingly, the focus of the beneficiaries was on creation of storage space for a bigger operation, whereas in East Khasi hills is for storage of NTF products.

In the case of smaller godowns in East Khasi district, the godown owners have stored the NTFPs which were purchased from many tribal households in the neighbouring areas. Whereas in larger godowns (found in Ri-bhoi district), the owners have hired/ rented-out to the commercial purposes like, rice millers, organized retailers, distributors etc., but their usage found to be limited period in a year. On the basis of duration of the storage period, the utilization of these godowns is to an extent of three to six months and six to twelve months. The smaller godowns constructed at remote towns were reported a higher occupancy rate than a large godowns constructed along Guwahati - Shillong highway.

E.8.2.Constraints in the Implementation and Performance of GBY

During the field work, the interaction with a various stakeholder, it has been observed that the following reasons for such a low performance, *viz.*, land ownership documents, lack of marketable surplus of agriculture commodities, lack of initiative from financing banks, High costs of land and construction.

- **Lack of Title Deeds/ Land ownership documents:** It is a major issue across all the states in NER. The government administered revenue system operates only in the plains and valleys of Assam, a portion of Tripura and Manipur. On the other hand, Village level Customary Land Tenure System operates in hilly states of Arunachal Pradesh, Meghalaya, Mizoram, Nagaland and in hilly Parts of Assam, Manipur and Tripura. In all the six states of NER, there is no patta land, which can serve the purpose of collateral against bank loans. Land ownership documents provided by the local village council are not acceptable to the banks as guarantee.
- **Lack of marketable surplus of agriculture commodities:** On account of terrain and landscape, the cultivation of field crops is restricted only to valleys and contour farming. This has resulted in extensive subsistence cultivation and a very limited marketable surplus produced from the field crops in the State.
- **Lack of initiative from financial institutions:** factors such as absence of clear title deeds of land, collateral guarantee etc., have forced the financial institutions to take a guarded approach to GBY and has resulted in a sub-optimal approval of term-loans under GBY.
- **High costs of land and construction:** Due to the undulating mountainous landscape, and price of flat land are essential for construction of godowns is very expensive. Further, the cost of construction is also a very high as most of the construction materials have to be transported from far off places. In comparison with plains, the cost of construction is several times higher in the mountain region such as Meghalaya, and due consideration is needed in estimations of the cost of construction schemes like GBY.

E.8.3. Extent of participation of beneficiaries

As prescribed in the guidelines, all the categories of beneficiaries have found to participate in the GBY. It is found that half of the beneficiaries availed benefit from the GBY belong to the category of SC/ STs & Women (50%), followed by the Individuals (37%), and the rest were belonging to the category of farmers (12%). However, the rate of subsidy was 33 per cent as prescribed under the guidelines of GBY for the NER/ hilly regions. The highest proportion of SC/ST and women in the State of Meghalaya might be due to the higher of proportion of Tribes in NER.

E.8.4. Overall performance of the scheme

The Rural Godowns Scheme/ GBY plays a vital role in promoting agriculture marketing, rural banking and financing and ensuring economic welfare in the rural areas. It enables the markets to ease the pressure during harvest season and to maintain a supply of agricultural commodities during the offseason. Thereby, it resolves the problems of glut and scarcity, which are the usual problems in agricultural marketing. Though warehousing is an independent economic activity, yet is closely linked with production, consumption and trade. In this regard, the implementation of the Rural Godowns scheme by the Government of India was a successful attempt towards helping the farmers to avoid distress sale, and to enhance their income level. In this section, we have made an attempt to explain the performance of the scheme is as follows:

- **The main objectives of the scheme include the creation of scientific storage capacity with allied facilities in rural areas to meet the requirements of farmers for storing farm produce, processed farm produce and agricultural inputs-** As described in previous sections, marketable surplus of non-perishable farm produce is very low in Meghalaya and this aspect reduces the utility of storage godowns, but they can play a significant role in storing the NTFPs. However, the benefits were captured by the traders only.
- **Promotion of grading, standardization and quality control of agricultural produce to improve their marketability -** During the fieldwork, both the districts have shown no such

instances were found among the beneficiaries of GBY. However, unique ecosystem of Meghalaya offers a huge potential for same.

- **Prevention of distress sale immediately after harvest by providing the facility of pledge financing and marketing credit** – As the State has no much marketable surplus, this aspect of GBY was found to be negligible. Many beneficiaries were not aware of such facilities as well.
- **To reverse the declining trend of investment in the agriculture sector by private/cooperative sectors to invest in the creation of storage infrastructure in the country** - GBY Scheme has led to a creation of storage space to the tune of 19,625 MT in the State of Meghalaya. Going by the total project cost, the total private investment made in the state works out to Rs. 7.59 crores since the inception of the scheme. More importantly, the whole private investment was in the sub-sector of agriculture, i.e., post-harvest management.
- **To develop marketing infrastructure to effectively handle and manage marketable surpluses of agricultural and allied produce including horticulture livestock, poultry, fishery, bamboo, minor forest produce and such like produce supportive to enhance farmers' income** - There is huge potential for making significant increase in the household income levels by harnessing the NRFP through SHG or FPO in Meghalaya state. The revised scheme, as described in above sections, can play very significant role.

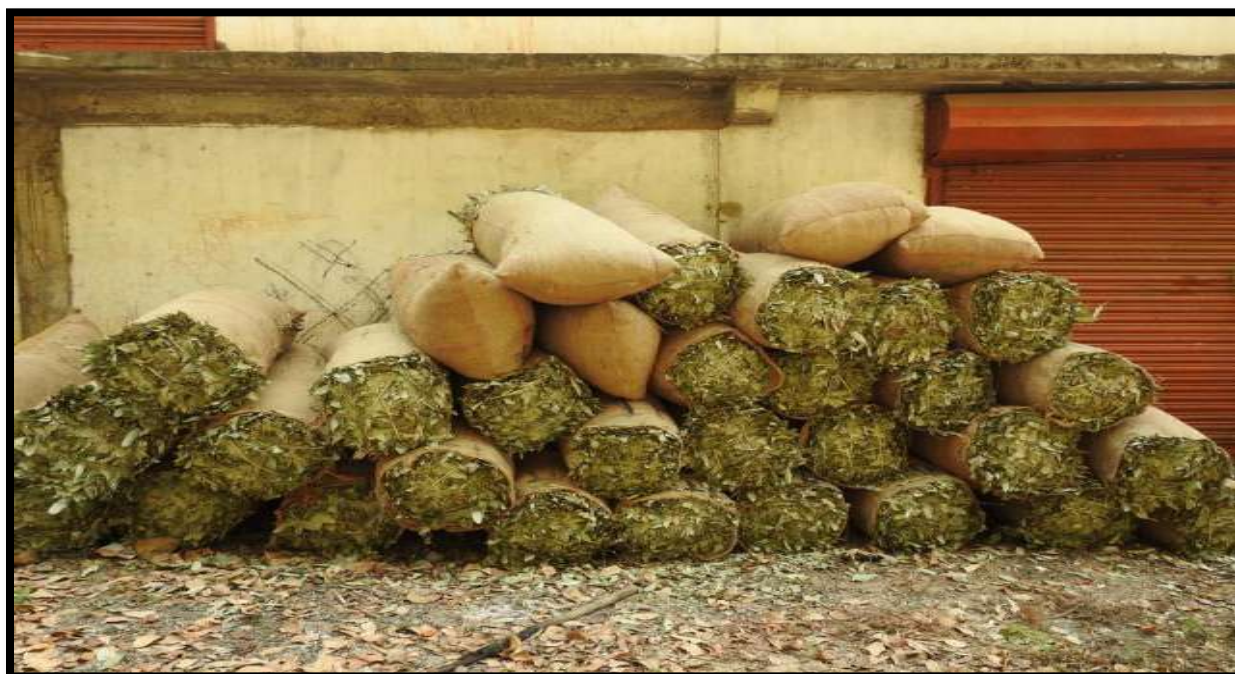
E.9. Summary and Conclusion

Post-harvest management plays an important role in the production and marketing as the considerable quantity of the valuable produce is lost every year due to improper post-harvest management. Therefore, the crisis in food availability is not only caused by natural disasters, but also by the absolute lack of post-harvest management. With this background, the introduction of GBY from the Government of India has high relevance to the country, but also to the individual farmers. In this context, we have analyzed the significance of GBY in Meghalaya, which supports the farmers to protect farm produce from the post-harvest losses and consequently avoids distress sale. Our study examines the status and performance of GBY as against its founding objectives in the context of Meghalaya. Based on the analysis of both the primary and secondary data, the following observations were drawn:

- The distribution of godowns in only two districts reflects the uneven distribution nature of the scheme. Further, a lesser number of godowns indicates, the direct factors such as minimal marketable surplus of farm production in the state and terrain nature of the geography, and high cost of construction etc.
- The average size of a majority of the godowns constructed under the scheme works out to be a less than 1000 MT in the case of East Khasi district, reflects the usage of godowns for NTFP, while the average size of more than 4000 MT, reflects the commercial purposes of the construction of godowns in respect of Ri-bhoi district.
- Based upon the interactions, it was inferred that the utilization of the godowns founds to suit the requirement of businessmen or traders to store either CMR or NTFPs. However, the direct involvement of the farming community is limited. It is found that smaller the size of the godowns, better the utilization in the NER.
- As regard to the participation of the beneficiaries in the program, the participation by SC/ST and women was observed to be higher because of higher population of tribes in Meghalaya as well as NER.
- In terms of overall performance evaluation, the scheme has helped to attract Rs. 7.6 crores of private investment into the post-harvest management. This investment has helped to create about 20,000 MT of storage capacity in the state.
- However, the factors such as lack of demand for godowns, land title deeds, high capital investment, land scape, were some of a major obstacle found during the survey.



Bay leaves stored in Rural Godown in Meghalaya



Bay leaves stored in Rural Godown in Meghalaya



Research team interacting with beneficiary of GBY

F. ODISHA

F.1. Overview of Agriculture in Odisha

In Odisha, agriculture is the mainstay of a majority of the population and thus, holds the key to the socio-economic development of the State. Despite an economic development, it suffers from the frequent natural calamities like cyclones, drought and flash floods. Notwithstanding that the share of agriculture sector in the state's Gross State Domestic Product (GSDP) has been declining over the years, this sector is still providing employment to more than 60 per cent of the population directly or indirectly. Hence, sustainable development in the agriculture sector is vital to set the pace of development in the State. The State has cultivated area of 61.80 lakh hectares, of which 29.14 lakh hectares is a high land, 17.55 lakh hectare is medium land, and 15.11 lakh hectare low land. The area coverage under paddy during kharif season is about 38.80 lakh & during rabi season it is three lakh hectares (Tables F.1 and F.2).

Table F.1: Land Use Pattern in Odisha (Area in lakh hectares)

Sl. No	Items	Area
1	Forest	58.13
2.	Miscellaneous Trees & Groves	3.42
3	Permanent Pasture	4.94
4.	Culturable waste	3.75
5.	Land put to Non-Agriculture use	12.98
6.	Barren & un-culturable land	8.40
7	Current fallow	7.56
8.	Other fallow	2.29
9.	Net Area Sown	54.24
	Total Geographical Area	155.71
	Gross cropped area	90.54
	Cropping Intensity (%)	167

Source: Directorate of Economics and Statistics, Government of India.

Table F.2: Land Profile (Area in lakh hectares)

SL. No	Category	Cultivated Area	Kharif Paddy Area
1.	High	29.14	8.06
2.	Medium	17.55	15.80
3.	Low	15.11	14.94
	Total	61.80	38.80

Source: Directorate of Economics and Statistics, Government of India.

The State is broadly classified into four physiographic zones namely, Coastal Plains, Central Tableland, Northern Plateau and the Eastern Ghats. Furthermore, they are subdivided into ten agro-climatic zones. Soils are mainly acidic with a degree of acidity varying widely. About four lakh hectares is exposed to saline inundation, 3.54 lakh hectares to flooding and 0.75 lakh hectares to water-logging, particularly in the deltaic areas. The per capita availability of cultivated land was 0.39 hectares in 1950-51, which has declined to 0.15 hectares in 2010-11. Information on the farm size or land holding is presented in **Table F.3**. During 2010-11, there were 46.67 lakh operational holdings in the State, out of which, marginal and small holdings accounts for 91.8 per cent, medium eight per cent, and large consists of less than one per cent. The total number of operational holdings registered an increase of 7.14 per cent over 2005-06. The average size of the holding during 1970-71 was 1.89 hectares, which has decreased to 1.04 hectares during 2010-11. The average size of holding in marginal, small, semi-medium, medium, and large categories in 2010-11 was 0.57 hectares, 1.63 hectares, 2.95 hectares, 5.99 hectares and 23.72 hectares, respectively. An operational holding amongst the categories, the total number of SC & ST holdings were 7.02 lakh and 14.26 lakh hectares, respectively. The average area of holdings operated by SC and ST was 0.81 hectares and 1.13 hectares, respectively. About 96.71 per cent of the total individual holdings correspond to a male category, whereas the female category of holdings accounts for 3.29 per cent. The predominance of the small size of operational holdings along with wide spread poverty poses a big problem in the agricultural growth of the State. In the present agricultural scenario, the marginal and small farmers, constituting more than 90 per cent of the total farmers, they will either own or rent a piece of land for cultivation. Because of the economic concerns, they generally cultivate their crops with little inputs and hence crop production is low.

Table F.3: Land Holding Pattern in State

Category of farmers	No of Holdings (Lakh nos.)		Area (in lakh ha.)		Percentage to total Nos.		% to the total area	
	2005-06	2010-11	2005-06	2010-11	2005-06	2010-11	2005-06	2010-11
Marginal (< 1.0 ha.)	25.97	33.68	13.42	19.22	59.62	72.17	26.73	39.61
Small (1 – 2 ha.)	11.56	9.18	15.88	14.98	26.54	19.68	31.63	30.87
Semi-medium (2– 4 ha.)	4.72	3.11	12.50	9.19	10.84	6.67	24.92	18.94
Medium (4 – 10ha.)	1.20	0.64	6.58	3.81	2.70	1.36	13.11	7.86
Large (> 10 ha.)	0.11	0.06	1.81	1.32	0.30	0.12	3.61	2.72
TOTAL	43.56	46.67	50.19	48.52	100.00	100.00	100.00	100.00

Source: Directorate of Economics and Statistics, Government of India.

Rice, maize, ragi are the major crops grown in the State, while other crops such as wheat, jowar, bajra & small millets are grown to a lesser extent (**Table F.4**). If there is a good rainfall during the last part of October, the area coverage under pulses crops is higher. This becomes clear, if, we looked at the compound annual growth rate of pulses in the area and production. The same information is presented in **Table F.5**. However, there were several instances of natural disasters like cyclone, floods and drought, which have been destroying standing crops severely, and have resulted in production deficit.

Table F.4: Crop-wise in Area and Production Details (2015-16)

Name of the Crop	Area (in '000 Ha)	Production (in '000 MT/Bales)
Rice (DE &S)	3941.51	5875.37
(Paddy)	-	8902.07
Wheat	3.61	6.35
Jowar	6.21	3.89
Bajra	2.11	1.29
Maize	239.18	666.40
Ragi	147.29	127.65
Small millets	25.35	12.70
Total Cereals	4365.26	6693.65
Arhar	138.29	122.52
Mung	768.89	361.07
Biri	522.90	234.07
Kulthi	194.96	75.45
Gram	39.18	30.13
Field pea	28.10	20.74
Lentil	7.48	3.90
Cowpea	48.84	35.32
Other pulses	116.02	52.89
Total Pulses	1864.66	936.09
Total Foodgrains	6229.92	7629.74
Total Oilseeds	630.67	564.29
Total Fibers	144.29	426.81
Total Vegetables	650.97	9067.65
Total Spices	161.56	652.25
Sugarcane	28.98	2107.34

Source: Directorate of Agril. & F.P., Odisha

There were a negative growth rate observed in the area under almost all crops between 2008 to 2018 period, except potato and coconuts while the growth in pulses remain a constant (**Table F.5**). In terms of production, rice production remains same whereas pulses have registered a slight increase (1.40%). Along with area, the production of potato has shown a significant

positive growth (7%) during the period. Interestingly, the productivity has shown a growth rate to an extent of two per cent across all crops. These results are shown in **Figures F.1 and F.2**, respectively.

Table F.5: CAGR of area, production, and productivity of major crops (2008 to 2018)

Crops	(% growth)		
	Area	Production	Yield
Rice	-1.55	0.80	2.38
Wheat	-39.48	-38.52	1.65
Jowar	-6.03	-6.00	0.03
Maize	-4.78	-3.14	1.72
Total food grains	-1.44	0.70	2.18
Tur (Arhar)	0.06	0.57	0.51
Gram	-0.95	-0.01	0.96
Total pulses	-0.51	1.40	1.91
Groundnut	-8.55	-8.45	0.11
Total oilseeds	-7.26	-6.40	0.93
Coconut	0.96	-0.17	1.59
Potato	8.60	7.19	-1.30

Source: Directorate of Economics and Statistics, Government of India

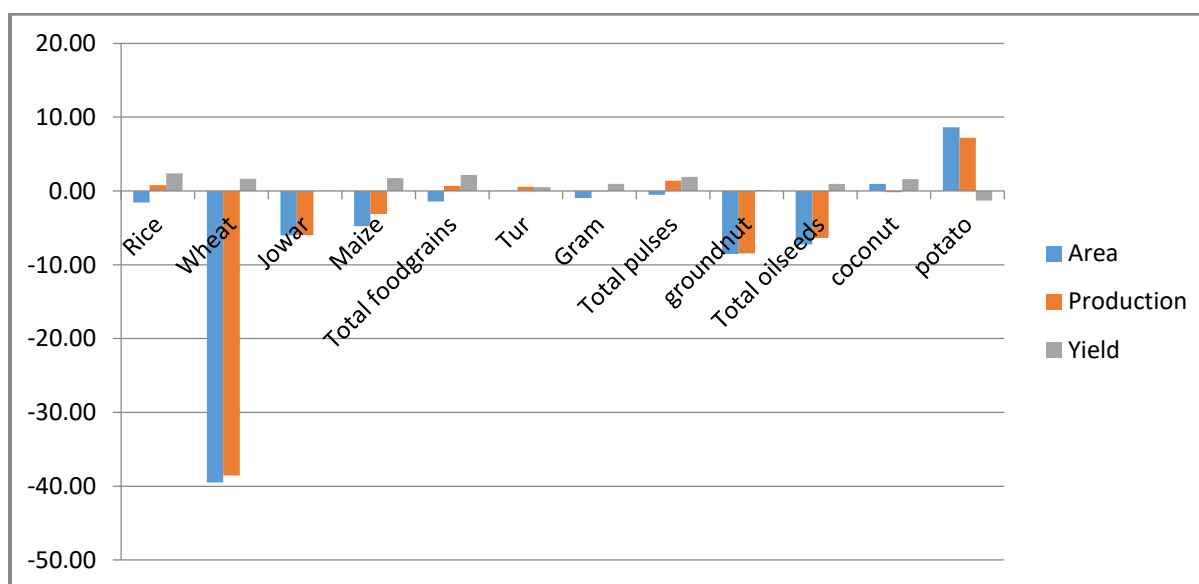


Figure F.1: CAGR of area, production, and productivity of total cereals, pulses, oilseeds and plantation crops in Orissa during 2008 to 2018 (% growth)

Source: Directorate of Economics and Statistics, Government of India

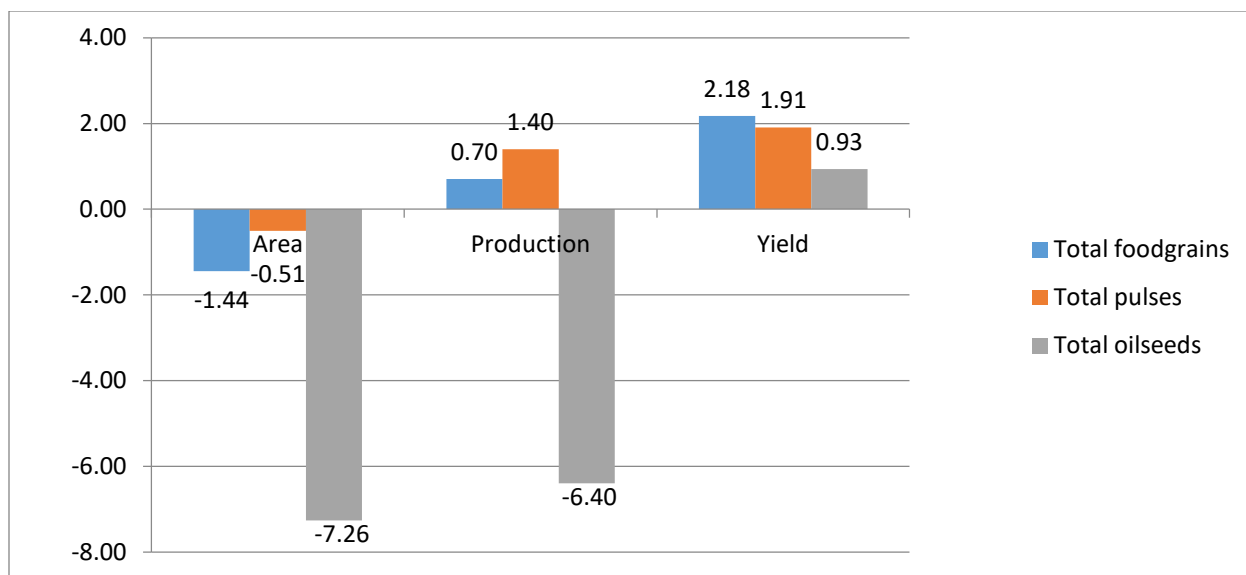


Figure F.2: CAGR of area, production, and productivity of total cereals, pulses, and oilseed crops in Orissa during 2008 to 2018 (% growth)

An attempt is made to compare the State level foodgrain production to a country level in **Table F.6**. It shows the proportion of foodgrain of Odisha to the total foodgrain production of the country. It is found that the contribution has been declining to an extent of two per cent over the period of years from 3.39 per cent in 2008-09 to 2.51 per cent in the year 2017-18.

Table F.6: Proportion of Foodgrain production to total production during 2009-2018

(000' Tonnes)				
Sl. No	Year	Orissa	India	Share of Orissa n in total food grain production (%)
1	2008-09	7399	218107	3.39
2	2009-10	7553	244482	3.09
3	2010-11	7619	259286	2.94
4	2011-12	6412	257135	2.49
5	2012-13	8009	265045	3.02
6	2013-14	8359	252023	3.32
7	2014-15	8980	251566	3.57
8	2015-16	6408	275111	2.33
9	2016-17	9061	285014	3.18
10	2017-18	7151	285210	2.51
CGR (%)		0.70	2.25	-1.51

Source: Ministry of Agriculture & Farmers Welfare, Govt. of India

F.2. Status of Agricultural Marketing in Odisha

According to the Food and Procurement Policy issued by the Government of Odisha for Kharif Marketing Scheme (KMS) 2019-20, the Odisha State Civil Supplies Corporation Ltd. (OSCSC Ltd.) shall purchase paddy, mill into rice for, a) distribution against Government allocations under the food security schemes and other welfare schemes, and b) delivery of surplus rice to FCI, under the Decentralized Procurement Scheme (DCP) of Government of India as per the procurement targets fixed by the State Government from time to time. Paddy conforming to the specifications mentioned in Fair Average Quality (FAQ) to be purchased only at Minimum Support Price (MSP) and incentive bonus, if any. Payment of MSP is applicable only for FAQ standard paddy and sale of non-FAQ paddy below MSP will not amount to distress sale. Paddy MSP for KMS 2019-20 (Rs/ Qtl.) is fixed at Rs.1815/- for Common varieties and Rs.1835/- for Grade and 'A'.

F.2.1. Paddy Procurement System

The process of paddy procurement by the state government on behalf of the Government of India under the Decentralized Procurement Scheme was started in KMS 2003-04. Food and Procurement Policy of Odisha mandates Primary Agriculture Co-operative Societies (PACS), Women Self Help Groups (SHGs) and Pani Panchayat (PP) to procure paddy from the registered farmers. There are about 2634 Primary Agriculture Co-operative Societies (PACS), 143 Women Self Help Groups (SHGs), 2 Pani Panchayats, 1347 millers, 280 transport contractors were involved in the paddy procurement process in the State and about 8.8 lakh tonnes of storage capacity is available for this purpose. Currently, the state stands as 4th largest contributor of paddy to the Central Pool (i.e. 9.8% of the total paddy). Pre-notified quantity of paddy is procured from pre-registered farmers. An authorized miller with required godown capacity is permitted to lift the paddy from procuring agency for preparation of Custom Milled Rice (CMR). It was observed during the field study that the quantum of paddy allocated to a miller is generally dependent on the captive storage capacity that miller has. This condition has led to a massive subscription of rice mill owners to construct the godowns under the GBY scheme. The state has

about 12.35 lakhs of registered farmers and around 65.38 lakh MT of paddy procured by the State in KMS 2018-19 from 10.1 lakh farmers living in about 50,000 villages of the State.

F.2.2. Marketed/ Marketable Surplus in Odisha

The reforms in agricultural marketing system such as setting up of Agricultural Produce Market Committees (APMCs), Marketing Boards, the system of Minimum Support Price and eNAM etc., have been playing a significant role in raising the market surplus. Keeping this in view, the data related to the average marketed surplus of each crop in Odisha were collected and presented in **Table F.7**. Table illustrates that the distribution of average marketed surplus varied from commodity to commodity, in a range of 70 to 77 per cent between the years 2012-13 to 2014-15, except for the oil seeds.

F.3. Post-Harvest Losses of foodgrains

There are different phases of growth of the plants, however, the operations after the harvest fall under the post-harvest management. However, the produce obtained after harvest, threshing and winnowing, still has to go a long way until it reaches the market and the final consumer (**Parmod et al, 2013**). During the process of post-harvest management, a certain amount of loss of produce may occurs. The present analysis focuses on these categories of losses i.e., produce loss during post-harvest.

Table F.7: Average Marketed Surplus Ratio of Major crops in Odisha

Details of Crops	Marketed Surplus ratios		
	2012-13	2013-14	2014-15
Food grains: Cereals			
Rice	73.96	70.37	77.35
Pulses			
Arhar	74.58	73.85	54.37
Urad	70.55	70.06	86.64
Moong	73.88	79.34	75.55
Oilseeds			
Niger seed	97.67	-	-

Note: Average MSP is calculated for three years i.e., 2012-13, 2013-14 and 2014-15 for marketed surplus ratio.

Source: Directorate of Economic and Statistics, Department of Agriculture, Cooperation and Farmers Welfare, Government of India.

As per the Directorate of Marketing and Inspection, GoI report, 2005, post-harvest losses are higher (8.64%) in the case of wheat crop and lowest in respect of jowar (1.87%) **Table F.8**. On an average, the post-harvest loss is to the extent of two to nine per cent in foodgrains in the State, which is high as compared to other States such as Karnataka and Haryana.

Table F.8: Post-Harvest Losses of different crops in Odisha

(in '000 tonnes)

Crops	Quantity	Percentage
Paddy	302.86	3.41
Wheat	0.07	8.64
Jowar	0.12	1.87
Maize	2.46	3.32
Ragi	3.16	5.23
Red gram	1.86	2.73
Bengal gram	0.83	3.45
Green gram	1.31	2.88
Black gram	1.1137	2.74

Source: dmi.gov.in; Abstract of reports on Marketable Surplus and Post-Harvest Losses of Foodgrains in India

Post-harvest losses arise because of several reasons. It occurs due to detrimental loss of produce and wastage from pests and rodents, during threshing and winnowing, varying temperature, excess moisture, lack of transport facility, and traditional storage practices. Nevertheless, some amount of losses cannot be avoided. However, some amount of losses occur due to poor management, which can be minimized. For instance, losses occur because of improper harvesting method, lack of transportation, and storage, which can be minimized by adopting appropriate methods like provision of transport facility and creating scientific storage and so on.

F.4. Methodology of the Study

The present study is done using both secondary and primary data.

F.4.1. Secondary data sources

The secondary sources such as Directorate of Economics and Statistics, Government of India, Directorate of Marketing and Inspection (DMI), Faridabad, NABARD and NCDC have been

referred to collect the data on area and agricultural production of Odisha, number of godowns sanctioned with their capacity of storage, Rural Godowns beneficiary list, location and their addresses etc. In addition, various journals, reports, and guidelines available with the libraries, websites/ search engines were also used in finalizing the methodology and writing the report.

F.4.2. Primary data collection

To collect the primary information from the beneficiaries of the scheme, users of the godowns, implementing officers of NABARD, Officials of implementing agencies, and bankers, pre-tested separate set of questionnaires have been designed and used to record their feedback with regard to the sources of information on GBY, profile of the users, cropping pattern & their storage methods, usage pattern of the godowns, costs incurred and benefits obtained, issues in availing the loans, constraints in management of the godown, utilization etc., and to record their suggestions for improvement of the scheme. Further, a Focused Group Discussion (FGD) was carried out to extract reliable information from the group of farmers/ users of the godown. The collected primary data from the questionnaires were tabulated and organized for the analysis of the data and inferences were drawn from the evaluation study leading to recommendations and suggestions. Tabular Analysis, CAGR, Cost-Benefit Analysis have used to derive inferences.

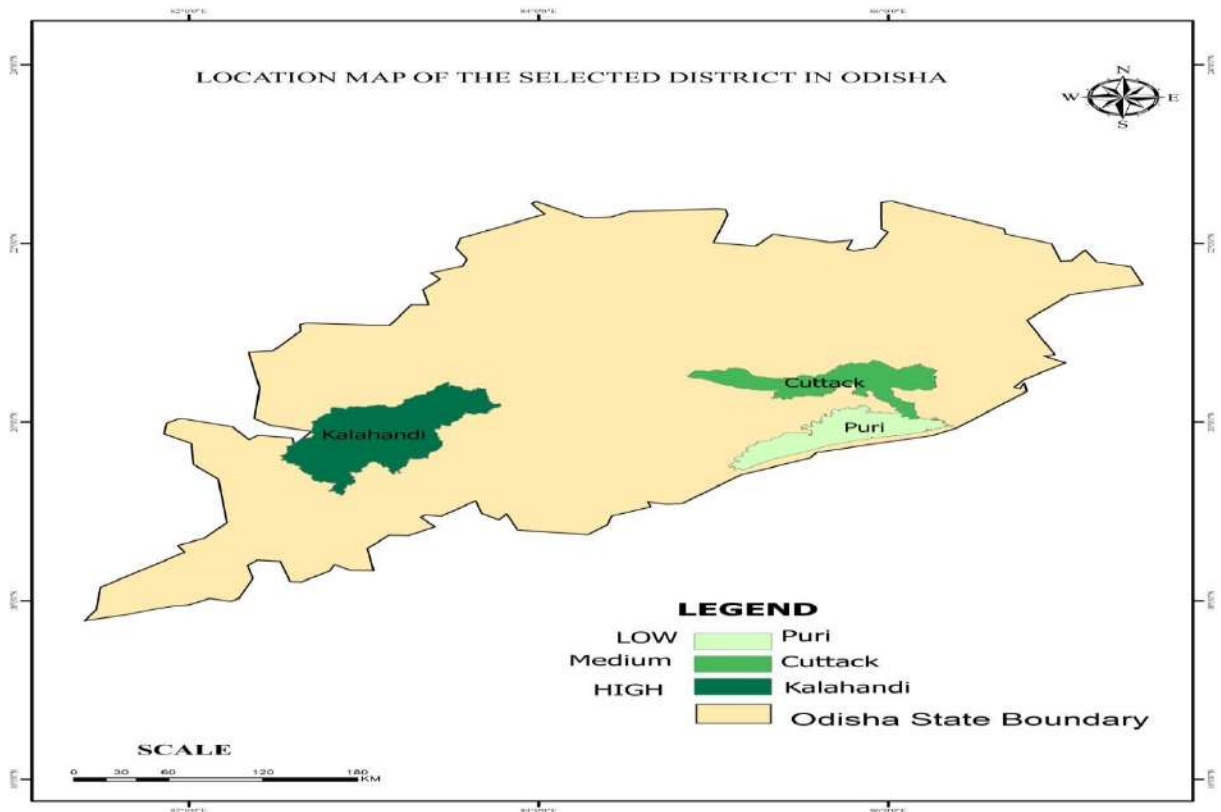
F.4.3. Sampling Method

The district-wise total number of rural godowns sanctioned by the NABARD (till 31st March 2019) in the State of Odisha is a criterion used to select the samples. A detailed list of the number of godowns was collected from the State-level offices of NABARD with the help of State nodal agency, DMI. The districts are categorized on the basis of the number of godowns and their storage capacity in each district. The average storage capacity created is used as a yardstick to classify the godowns into three categories such as high performing, medium performing and low performing districts. Within a top five districts in each category, one district was considered as a sample to represent the particular category. Accordingly, the districts selected for the state of Odisha are Kalahandi to represent a high performing category, followed

by Cuttack under the medium performing district, and Puri as a low performing district (Table F.9). A brief profile of the sample districts selected are given in the subsequent sections.

Table F.9: Classification of Districts based on the performances

S.I. No	Particulars	Districts	Selected District
1	High performing district (more than 30 godowns in the district)	Ganajm, Bargarh, Bolangir, Kalahandi, Jajpur	Kalahandi
2	Medium performing (Between 10 to 30 godowns)	Bhadrak, Balasore, Khurda, Sambalpur, Nayagarh, Mayurbhanj, Cuttack	Cuttack
3	Low performing (less than 10 godowns)	Rayagada, Koraput, Nuapada, Puri, Sonapur, Subarnapur, Balangir, Dhenkanal, Gajapati, Kendrapara, Jagatsinghpur, Kendrapada Keonjhar, Malkangiri, Deogarh, Jharsuguda, Kandhamal, Mayurbhanj to Keonjhar, Nowrangpur, Phulbani, Sundargarh	Puri



F.4.3.1. High Performing District - Kalahandi

The district occupies the south western portion of Odisha, bordered to the north by the Balangir and Nuapada districts, to the south by the Nabarangpur, Koraput and Rayagada districts, and to the East by the Rayagada, Kandhamal and Boudh districts. The climate of the Kalahandi district is an extreme type. It is dry except during monsoon. The maximum temperature of the district is 45+ degree Celsius, whereas, the minimum temperature recorded is four degree Celsius. The District experiences an average annual rainfall as 1378.20 mm. The monsoon starts late in June and generally lasts up to September. Indravati is a largest river system of this area, which supplies water to the most parts of Jaipatna, Junagarh, Koksara, Thuamul Rampur, Dharamgarh and Kalampur blocks for irrigation purpose. Tanks are found in almost every village. Paddy is the principal crop which alone accounts for 60 per cent of the gross cropped area of Kalahandi district. Other major crops are jowar, bajra, maize, ragi, and pulses. The district has more than 35 rural godowns with a storage capacity of 82,521 MT.

F.4.3.2. Medium performing District - Cuttack

The word “Katak” etymologically means army cantonment and also the capital city. Cuttack developed into a city out of five villages’ viz. In the remote past, Cuttack was connected both by land routes and waterways with the renowned medieval ports like Chelitalo, Palur and Tarmalipti. With a limited industrialization, the people of this District depend upon agriculture as their main source of livelihood, with about 76 per cent of the population being dependent on it. Agriculture in this District is sustained by numerous rivers and canals flowing through it. Rice, pulses, oilseeds, jute, sugarcane, coconut and turmeric are the major crops grown here. This district is a major exporter of cash crops, which in turn, contributes immensely towards its economic growth. National Rice Research Institute (NRRI) located at Bidyadharpur village on the Cuttack-Paradeep Road, is one of the premier National Research Institutes under the Indian Council of Agricultural Research. The district has about 13 godowns with a storage capacity of 21,720 MT.

F.4.3.3. Low performing District – Puri

Puri District is a coastal District on the eastern part of Odisha, India. This District needs no introduction, being the abode of Lord Vishnu, most popularly known as Lord Jagannath. This District derives its name from the heritage city of Puri, one of the four pilgrimage centres of India. Covering an area of 3051 sq/ kms, the district may be divided into two dissimilar natural divisions-the Littoral tract and the Level alluvial tract. Paddy, wheat, green gram, horsegram and groundnut are some of the major crops grown in the district. It has seven godowns with a storage capacity of 3,984 MT.

F.4.4. Method of implementation of the Scheme

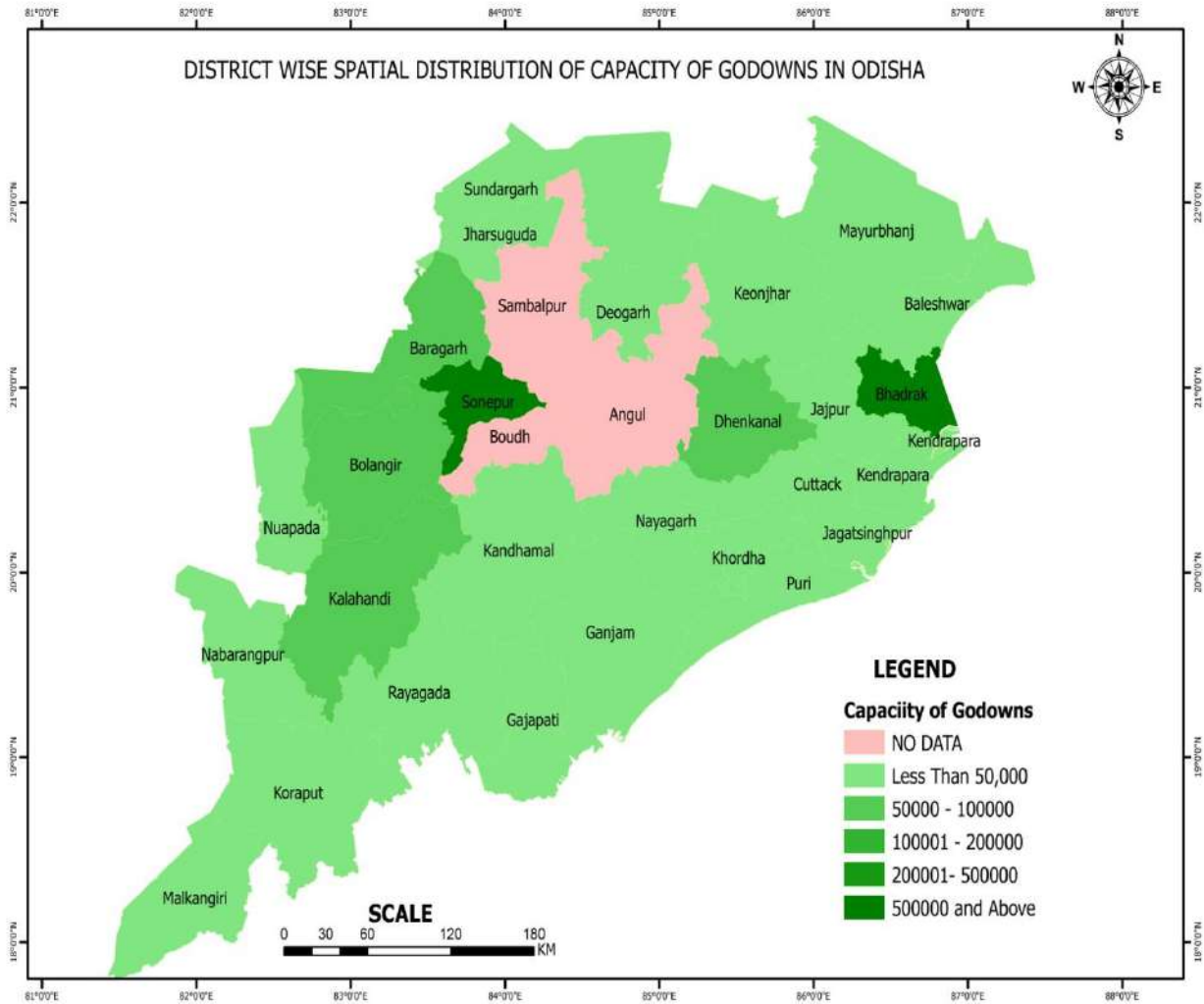
In the state of Odisha, the scheme was implemented by the Directorate of Marketing and Inspection (DMI). It acts as a nodal office for implementing the scheme. DMI has its own office in Bhubaneswar. Along with National Institute of Agricultural Marketing (NIAM), Jaipur and other National/ State level Institutions such as NABARD, DMI officials have organized training to create general awareness on the scheme for farmers and entrepreneurs for construction, maintenance and operations of rural godowns. The scheme is implemented by the Department of Agriculture, Cooperation & Farmers' Welfare, GoI in collaboration with the National Cooperative Development Corporation (NCDC) and National Bank for Agriculture and Rural Development (NABARD). The credit linked back-ended subsidy for investment has been followed in the State. All three categories of beneficiaries such as individual farmers, registered Farmer Producer Organizations, Schedule Caste/ Schedule Tribes/ women have availed the benefits under this scheme throughout the State. **Table F.10** illustrates that the storage capacity created in the various districts along with the godowns under the control of FCI.

As revealed by Table 9, FCI has undertaken the storage capacities created by different agencies in Odisha such as CWC and OSWC, in addition to their own storage space. The total space available with the FCI is 4.67 LMT.

Table F.10: Storage Capacity Created Under the Control of FCI

Owner	Capacity (MT)
FCI Owned	230967
CWC	67773
SWC	168849
PVT	-
Total	467589

Source: FCI webpage



F.5. Status of Gramin Bhandaran Yojana in Odisha

The Government of India has introduced Gramin Bhandaran Yojana (GBY) to address the limitations of other government initiatives that have been already implemented in all over the

country and more so to support those farm communities, by providing storage space, pledge loan to avoid distress sale. Gramin Bhandaran Yojana, is a Capital Investment Subsidy Scheme for Construction/ Renovation/ Expansion of Rural Godowns. It has been introduced by Government of India during 2001-02. Since it is a Central Scheme, the Government of Odisha also implemented the same during the same period. The guidelines of the scheme have been subsumed with other ongoing schemes of Development/ Strengthening of Agricultural Marketing Infrastructure, Grading and Standardization (AMIGS) during 2004 and again into Agricultural Marketing Infrastructure (AMI) sub scheme of Integrated Scheme of Agricultural Marketing (ISAM) w.e.f. 2014.

Rural godown scheme plays a vital role in promoting agriculture marketing, rural banking and financing and ensuring Food Security in the country. It enables the markets to ease the pressure during harvest season and to maintain the supply of agricultural commodities during the offseason. Hence, it solves the problems of glut and scarcity, which are the usual problems in agricultural marketing. Though warehousing is an independent economic activity, yet is closely linked with production, consumption and trade. The main objective of the scheme is creation of scientific storage capacity with allied facilities in the rural areas to meet the requirements of farmers for storing farm produce, processed farm produce and agricultural inputs; promotion of grading, standardization and quality control of agricultural produce to improve their marketability; prevention of distress sale immediately after harvest by providing the facility of pledge financing and marketing credit; strengthen agricultural marketing infrastructure in the country by paving the way for the introduction of a national system of warehouse receipts in respect of agricultural commodities stored in such godowns and to reverse the declining trend of investment in agriculture sector by encouraging private and cooperative sectors to invest in the creation of storage infrastructure in the country.

OSCSC Ltd., is focused on enhancing its scientific storage capacity to provide infrastructure support to its two main schemes, viz., a) Public Distribution System, and b) decentralized paddy procurement. It utilizes 215 godowns as Rice Receiving Centers (RRCs) with a capacity of 4.10 lakh MT. It owns 212 godowns, out of which 63 godowns, with a capacity of 41,267 MT are used as RRCs and is focusing on the construction of scientific godowns that can be used for

long-term storage of foodgrains. To augment storage capacity in the state, CWC and OSWC are constructing three lakh MT of scientific storage space on guaranteed use by OSCSC Ltd.

F.5.1. Distribution of godowns under GBY

The secondary data collected from the head offices of DMI, NABARD and NCDC on the total number of godowns sanctioned since inception are presented in **Table F.11**. As stated earlier, the projects implemented in the state were financed (especially subsidy) through NABARD. The subsidy under this scheme is linked to institutional credit and the finance was made available through Commercial Banks, Regional Rural Banks (RRBs), State Cooperative Banks (SCBs) and Scheduled Primary Cooperative Banks (PCBs) and other institutions eligible for refinancing by the NABARD or any other financial institutions such as State Financial Corporation's (SFCs) approved by DAC&FW. The individuals, group of farmers/ growers, registered FPOs, cooperatives, partnership/ proprietary firms/ companies, APMCs, State Warehousing Corporations (SWCs) have availed the benefits from the GBY.

Table F.11 reveals that out of the total projects sanctioned in the state of Odisha, and all of them were sanctioned by the NABARD alone, in Odisha as per the data available. Under GBY, Odisha state has about 429 godowns with a capacity of 20.83 LMT. Of the districts, Ganjam tops the list with a highest number of godowns (69), followed by Bargarh (43), Bolangir (38), Kalahandi (37) and Jaipur (30). In terms of storage space created, Sonepur tops the list with a capacity of 7.34 LMT, followed by Bhadrak (5.88 LMT), Dhenkanal (0.89 LMT), and Bolangir and Kalahandi (0.88 LMT each). On contrary, Nowrangpur, Gajapati and Kandamal districts created a lower storage capacity in the State with a capacity of less than a thousand MT. The differential spread of storage space is a resultant of the local demand and the cropping pattern.

From the secondary data of the NABARD, out of the total applicants (441), about six per cent (27) were rejected on the technical grounds; the subsidy was recalled from about one per cent (5 cases) of the beneficiaries due to a technical faults and wrong usage of the godowns. About six per cent of the applications for the loan under GBY were rejected by the NABARD because of their ineligibility (**Table F.12**).

Table F.11: District-wise Number of Rural Godowns Capacity Created

District	Number of godowns	Capacity created in MT
Ganjam	69	35943
Bargarh	43	60986
Bolangir	38	88539
Kalahandi	37	82521
Jajpur	30	51311
Bhadrak	27	588167
Balasore	21	31537
Khurda	21	35211
Sambalpur	19	73466
Nayagarh	16	26271
Mayurbhanj	14	15437
Cuttack	13	21720
Rayagada	10	22842
Koraput	8	8736
Nuapada	7	29229
Puri	7	3984
Sonepur	6	734466
Subarnapur	6	8171
Balangir	4	6048
Dhenkanal	4	89316
Gajapati	4	878
Kendrapara	4	3411
Jagatsinghpur	3	3319
Kendrapada	3	1673
Keonjhar	3	3234
Malkangiri	3	7540
Deogarh	2	1790
Jharsuguda	2	4663
Kandhamal	1	1089
Mayurbhanj to Keonjhar		18437
Nowrangpur	1	295
Phulbani	1	5000
Sundargarh	1	17711

Source: (i) NABARD; (ii) basic data extracted from DMI

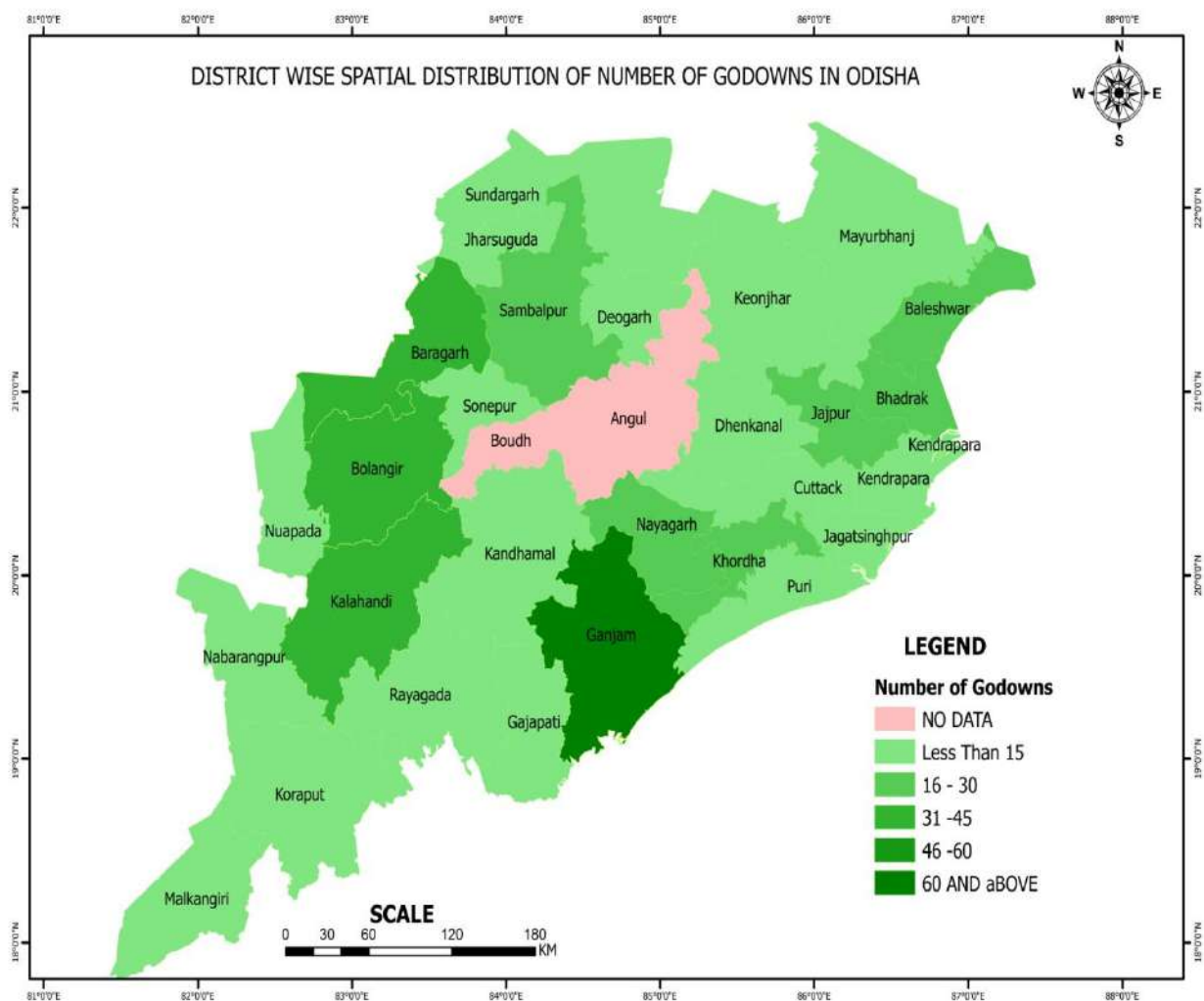


Table F.12: Evaluation of Applications received under GBY

Sl. NO	Status of Application	Number	Per cent
1	Subsidy Recalled	5	1
2	Recall Letter Issued	37	8
3	Rejected Proposal	27	6
4	Completed	290	66
5	Under correspondence	6	1
6	Complicated	10	2
7	Sent to HO for final subsidy Confirmation	13	3
8	Subsidy Refunded	53	12

Source: NABARD Database

F.5.2. Profile of the beneficiaries of GBY

Examination of the beneficiaries of GBY presents the following breakup in terms of participation from different sections of the society. It is very clear from **Table F.13 and Figure F.3** that about 81 per cent of the applicants belonged to others category followed by general (17%), and SC/STs constitutes a less than three per cent.

Table F.13: Composition of Beneficiaries of GBY

Sl. No	Category	Number	Per cent
1	General	33	16.75
2	Others	159	80.71
3	SC	4	2.03
4	ST	1	0.51

Source: NABARD Database

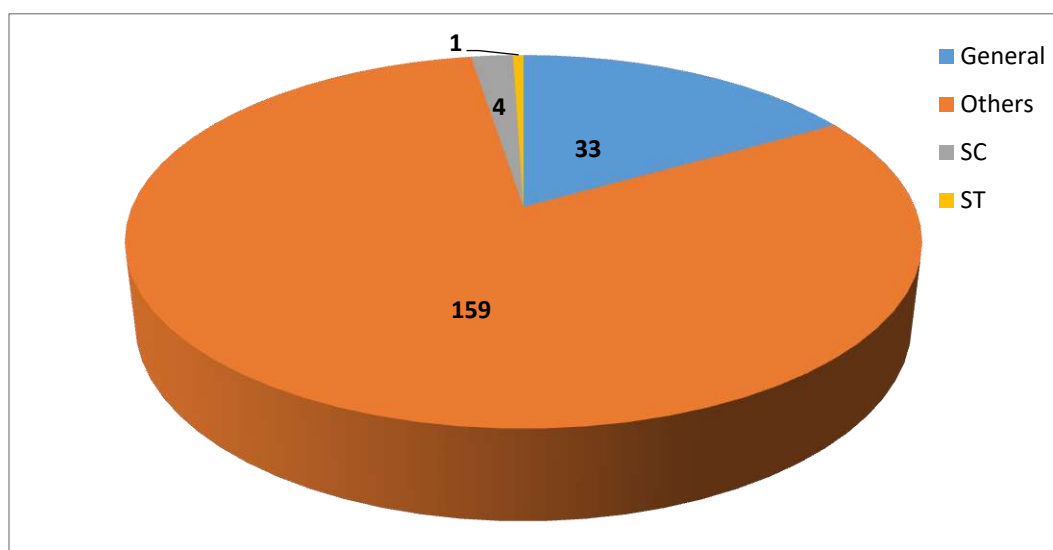


Figure F.3: Composition of Beneficiaries of GBY

Source: NABARD Database

F.5.3. Socio-economic profile of the Beneficiaries of GBY

As described in the previous sections, godowns constructed under GBY were primarily used by the millers and other trades, while the usage of godowns by the farmers is negligible. During the

field work, in-depth interactions were made with the owners of the godowns constructed under GBY and their socio-economic and other information is presented in this section.

Table F.14 presents a brief summary of the beneficiaries. Average age of the sample is about 48 years and about 70 per cent of the beneficiaries belong to the individual's category as per the GBY guidelines and are eligible for 15 per cent subsidy, while about 20 per cent belong to the SC/ ST and women category having eligibility of 33 per cent of subsidy. Only ten per cent of the beneficiaries are farmers by profession with subsidy eligibility of 25 per cent. It reveals that a majority of the beneficiaries are well educated with Pre-University and above education level. With regard to family size, on an average, the number of family members is found to be seven having the net operated area of 13.85 acres with an average annual income of Rs. 1.24 lakhs. Although, the State has a majority small and marginal farmer with a limited household income, the godown business found to be a costly affair and capital intensive for them. On the other hand, GBY offers several added benefit to the millers such as a) creation of additional storage capacity leading to additional sanction of paddy to process it as CMR; b) storage space for value addition during lean season; c) to store larger volume for a longer duration; d) it facilitates their allied businesses.

Table F.14: Demographic Features of Beneficiaries (N=8)

Sl. No.	Particulars	Unit
1	Category (% of respondents)	
	Individuals	70.00
	Cooperative	-
	SC/ST	20.00
	Farmers	10.00
2	Average age of the beneficiary (Years)	48
3	Education level (% of respondents)	
	Illiterate	-
	Primary (1 to 4)	-
	Higher primary (5 to 9)	-
	Matriculation (10)	-
	Pre- university (10+2) & above	100.00
4	Average No. of family members (Numbers)	7
5	Average Annual Income (Rs.)	124400
6	Net operated area (Acres)	13.85

Source: Primary data

F.5.4. Sources of information on GBY

As depicted in **Table F.15**, a majority of the beneficiaries of GBY stated that the primary source of information are the banks (75%), followed by panchayat president and others (friends/relatives) equally. Since, a majority were into farmer-traders and millers, they had a constant interaction with the bankers and also with a fellow entrepreneur, that might have facilitated the information on GBY.

Table F.15: Sources of information on GBY

Sl. No	Particulars	Percentage
1	Bank	75.00
2	Panchayat President	12.50
3	Others (Department)	12.50

Source: Primary data

F.5.5. Cropping pattern of the Beneficiaries

The previous year cropping pattern of the beneficiaries has been collected and the major crop grown by them is paddy. The dominant cropping pattern is paddy-maize cycle. Across sample districts, a higher proportion of paddy cultivation was observed in Puri district. In respect of Kalahandi district, cotton and paddy are found to be the major crops. Interestingly, almost all these crops grown by the beneficiaries were sold in the local market yard as soon as the produce is harvested, excepting paddy, as it is sold under MSP to the State procurement agencies and no exceptions were seen during the fieldwork.

Major crops during Kharif seasons are paddy under irrigated area and cotton under un-irrigated/dryland in Odisha. During the rabi, pulses such as green gram, and black gram are chosen based on the soil moisture content. In places with an assured irrigation, paddy is also grown in rabi season. It can be seen from **Table F.16** that the productivity of paddy is about 20 quintals per acre and about two quintals were retained for domestic consumption and the rest is a marketable surplus. Similarly, some portion of pulses are retained for domestic consumption while, the rest is sold off at the market yard. However, during the field work, no farmer member has reported

any instances of distress sale. In case of damage to paddy due to natural calamities like cyclone and floods, the government agencies relax the FAQ to help the farmers. However, this creates a problem to the millers as RRCs likely to object for his CMR and there are chances of rejection of his lot, on the grounds of quality norms.

Table F.16: Crop-wise Details on Area, Production, and Marketable Surplus

Sl. No	Crops	Area	Production	Consumption	Stored	Sales
Kharif						
1	Paddy	5.78	103.53	4.92	8.16	Market yard
2	Cotton	6.00	42.55		0	Market yard
Rabi						
1	Green gram	3.16	8.36	1.31	0.460	Market yard
2	Black gram	1.41	1.62	0.83		Market yard
3	Paddy	3.00	46	2.5	0	Market yard

Source: Primary data (Qty in Qtl)

F.5.6. Capacity Utilization of the Godowns

The users of the godowns in the state of Orissa are broadly of two types, *viz.*, procurement agencies and the millers. The procurement agencies store the procured commodity for a temporary period (till it is uplifted by the miller) of three to four months in a season and the godown was empty or unutilized for the rest of the year. In the case of Cooperative Societies, the lean period will be utilized for keeping agricultural inputs such as fertilizers and farm machineries. On the other hand, rice millers utilized these godowns for various purposes throughout the year. It is observed during the field survey that the rice millers godowns were found to be filled with either un-milled paddy or value-added products of paddy like rice flakes. However, an attempt was made to describe the godowns based on the number of months the godowns were utilized (**Table F.17**). As the number of beneficiaries were more of rice millers, more than 77 per cent of the beneficiaries stated that the godowns were utilized for more than six months in a year and the rest used for a period of a less than three months (**Table F.17**).

Table F.17: Duration of Storage in Godowns

Sl. No	Duration (months)	% of users
1	1 to 3	23.00
2	3 to 6	-
3	6 to 12	77.00

Source: Primary data

F.5.7. Economic Benefit obtained from the godowns

The Odisha government has implemented the procurement of paddy at MSP in a systematic approach having a high operational efficiency. It has led to a majority of the farmers to prefer to sell paddy through this channel and have not considered to store anticipating higher prices later. The rest of the crops are of minor economic importance, mostly used for subsistence purposes like domestic or seed material. Hence, economic benefits due to storage in godowns was not attempted. On the other hand, there was an instance, wherein the farmer/owner of the godown was unable to pay EMI and the godown was declared as NPA. He resolved the issue by One Time Settlement with a bank and later made available to store non-agricultural products like cement etc., to recover his costs. While attempting to analyze this particular situation, two factors found to be responsible such as a) sudden decline in the demand for storage space on account of railway yard shifting; b) No suitable approach road to the godown.

F.5.8. Employment Generation

Due to various operations such as loading and unloading of paddy and custom milled rice, there is a significant employment generation due to GBY. It was estimated that each godown would generate two kinds of employment, viz, permanent nature like security, administration and casual employment for loading and unloading from/ to godown. According to the capacity of the godowns, the analysis was made for two groups, i.e., a less than 1000 MT, and more than 1000 MT and information on this is presented in **Table F.18**. It is noticed that on an average, two or three permanent workers were hired mainly for the said purposes in the case of a godowns of less than 1000 MT, whereas, it was three to four workers in respect of a larger godowns. The casual laborers were used for the purposes of loading, unloading, fumigations, and other maintenances. Accordingly, the employment generated from the creation of rural godowns works out to be 458

man-days of permanent and 450 man-days of casual workers. On the other hand, a larger godowns have generated 1180 man-days of permanent and 900 man-days of casual employment per annum.

Table F.18: Employment Generation due to the Rural Godowns

Sl. No.	Details	<1000 MT	>1001MT
Permanent Employment			
1	Average No. of workers/godown	2	3- 4
2	No. of work days	360	360
3	No. of working hours	10	8
4	No. of Man-days	458	1180
Casual Employment			
1	No. of Man-days	450	900

Source: Primary data

F.6. Perception of stakeholders

In this section, we have made an attempt to collect information from the farmers and beneficiaries of godowns (i.e., traders, millers, owners). Further, we have also tried to collect their (beneficiaries) opinions on scientific godowns against traditional godowns. The results are presented in **Tables F.19 to F.22** as follows:

Table F.19 reveals that 60 per cent of the farmers prefer to sell their produce to government agencies for the fear of post-procurement depreciation of paddy prices while the rest (40%) were used to sell the produce to meet immediate requirements for the next growing season. The information on advantages of scientific godowns vis-a-vis traditional godowns were collected and presented in **Table F.20**. It could be inferred from the table that a majority (60%) of the beneficiaries felt that, keeping produce in a scientific godowns helps to retain quality and the remaining (40%) expressed that the scientific storage ensures safety of foodgrains from pests and rodents.

Table F.19: Reasons for Immediate Sale by the farmers

SL.NO	Particulars	Percentage
1	To meet the immediate requirements like purchasing of inputs for next crop	40.00
2	Post procurement depreciation	60.00

Source: Primary data

Table F.20: Perceptions on advantage of Godowns v/s Traditional storage practices

S.I No	Particulars	Percentage
1	Quality retention	60.00
2	Safety of Food grains	40.00

Source: Primary data

A few observations from the beneficiaries were collected to understand the constraints and suggestion for successful implementation of the GBY and the results are presented in **Tables F.21 and F.22**. As pointed out in **Table F.21**, some of the major constrains which could exert negative impact on the success of the implementation of scheme in the order of ranking are lack of demand by users (50%), requirement of a high capital investment (38%), competition among godowns (37%), risk of damage and working capital (25% each). A few beneficiaries also expressed that high cost of fumigation, dearth of skilled labour, lack of assistance from local administration, etc., were the other constraints.

To enhance the usage of godowns and for the better implementation of the scheme, a few suggestions were marked by the beneficiaries are listed in **Table F.22**. Among the suggestions, creating an awareness about GBY in farming community (37%), an arrangement to higher subsidy (25%), active participation of the financial institutions in promoting the scheme were the suggestions for the successful implementation of GBY.

Table F.21: Constraints expressed by the beneficiaries of the GBY Scheme

Sl. No	Particulars	Percentage
I	Financial constraints	
1	High cost of fumigation	12.50
2	Paucity of working capital	25.00
3	Requirement of large capital	37.50
II	Technical constraints	
1	Non-availability of skilled manpower	12.50
III	General constraints	
1	Lack of demand by users	50.00
2	Competition among Godowns/ Warehouses	37.00
3	Risk of damage	25.00
IV	Any others (Specify)	
1	Lack of assistance from local administration	12.50

Source: Primary data

Table F.22: Suggestions provided by the beneficiaries of GBY

S.I. No	Particulars	Percentage
1	Higher Subsidy to the owners as investment is high	25
2	Awareness to farmers and farmers groups	37.5
3	Active participation by bank is required	12.5

Source: Primary data

F.7. Pros and Cons in Implementation of the RGS/ GBY in Odisha

The main objectives of the scheme include the creation of scientific storage capacity with allied facilities in the rural areas to meet the requirements of farmers for storing farm produce, processed farm produce, and agricultural inputs. It is clear from the above description that due to various factors; farmers are selling off their produce right after the harvest of the paddy (major crop in the State) to the OSCSC Ltd, a State government procurement agency, and hence they are assured of MSP for their produce. Whereas, the marketable surplus is very low among other crops as compared to other sample States. In this context, with the central support, the RGS has been introduced in the State. In this section, authors have made an objective-wise critical appreciation of the scheme in the state of Odisha as follows:

F.7.1. Extent of coverage and capacity utilization of the godowns

It is noticed that out of the total projects sanctioned in the state of Odisha, all of them were supported by the NABARD alone. Under GBY, Odisha State has about 429 godowns with a capacity of 20.83 LMT. Of the districts, Ganjam tops the list with the highest number of godowns (69), followed by Bargarh (43), Bolangir (38), Kalahandi (37) and Jaipur (30). In terms of storage space created, Sonepur tops the list with a capacity of 7.34 LMT, followed by Bhadrak (5.88 LMT), Dhenkanal (0.89 LMT), and Bolangir and Kalahandi (0.88 LMT each). On contrary, Nowrangpur, Gajapati and Kandamal districts created a lower storage capacity (less than a thousand MT) in the State. The differential spread of storage space is a resultant of the local demand and the prevailing cropping pattern reflecting a demand-driven nature in terms of distribution of godowns under GBY.

With reference to the utilization of the storage capacity created under GBY in the State, the entire storage capacity and users of the godowns in the State of Orissa can broadly be divided into two types, viz., Procurement Agencies and the millers. The procurement agencies have stored the procured produce (paddy) for a temporary period till it is uplifted by the miller within a three to four months in a season and the godowns were kept empty or unutilized for the rest of the year. In the case of Cooperative Societies, the godowns were used for keeping agricultural inputs such as fertilizers and farm machinery in the lean period. On the other hand, rice millers utilized these godowns for various purposes throughout the year. It is observed during the field survey that the rice millers godowns were found to be filled with either un-milled paddy or value-added products of paddy like rice flakes. According to the number of months the godowns were utilized, more than 77 per cent of the beneficiaries stated that the godowns were utilized for more than six months in a year and the rest used for a period of a less than three months.

F.7.2. Constraints in the implementation and performance of GBY

Although the implementation of the scheme of RGS/ GBY has registered a significant success, it has been observed during the fieldwork that there were some constraints which have negatively influenced the success of the program are; a) lack of demand, b) requirement of a high capital

investment, and lack of participation of medium and SC/ ST farmers, c) frequent transfer of managers of financial institutions, and d) lack of in-depth understanding about the program. Brief description of each constraint is explained as follows.

a) Lack of Demand: It became the norm in Odisha that the farmers sell off their paddy produce (major crop) right after the harvest to the OSCSC Ltd, a State Government procurement agency, and hence they are assured of MSP for their produce. In other words, there is no demand from the farming community for storage space. The demand, if at all, is only for a few quintals and for a few months – basically for storing the foodgrains for household consumption including seed materials.

b) High Capital costs and lack of participation from the Medium and SC/ ST farmers: As expressed by the beneficiaries, high capital investment is a major constraint for participation in the GBY as the procurement agencies demand for a larger capacity godowns in the State. High capital cost is a severe problem not only for the SC/ ST farmers, but also to the farming community in general, as landholding size is too small to facilitate such entrepreneurial activities. However, it was suggested that an alternative measure of providing subsidy benefits to the individuals, the Government may consider modifying the guidelines so as to extend the benefits to the groups and associations with a higher incentive.

c) Frequent transfer of managers of the financial institutions: As discussed earlier, the Bank/ Branch Manager forms a crucial link between the program and farmers. Submission of a project proposal to NABARD for approval and release of the first installment of subsidy, submission of Joint Inspection Report and release of the second installment of subsidy depends on the Branch managers. However, due to the time-bound transfers of the Bank Managers, the new incumbent manager may not well aware with the projects initiated by the previous managers and it may result in a delay in the submission of papers for the release of the second installment of the subsidy etc. Delay in the release of the second installment has a serious implication on the quantum of EMI and at times from preventing the project to become Non-Productive Assets (NPA). There are cases that the subsidy was adjusted against the pending EMIs and many a case the proponent deprived of the assured rate of subsidy.

d) Lack of in-depth understanding of the program: Being back-end term loan. GBY has a several conditions to be fulfilled for the release of full subsidy in time. However, during interactions with the beneficiaries, it came to light that the process could have been smoother than what it was. For instance, the rate of subsidy- during the initial discussions, it appears that beneficiaries were told that they were eligible for 25 per cent subsidy, but have received a subsidy of 15 per cent only, and this has led to a cost escalation on their part. Beneficiaries have blamed this reduction on financial institutions. However, the banks have clarified that income tax payee is eligible for 15 per cent and not 25 per cent of subsidy. Thus, more awareness about the program would not give rise to such avoidable misunderstandings between the beneficiaries and the financial institutions.

F.7.3. Extent of participation of beneficiaries

As prescribed in the guidelines, all the categories of the beneficiaries have participated in the GBY in the State. However, the extent of participation from the businessmen was much higher (70%) than the participation from other sections of the society. SC/ STs and women members constituted only twenty per cent, while farmers constituted only ten per cent. Preventing the distress sale is one of the objectives of the scheme by enabling the farmer to store his produce and avail pledge loan. However, due to procurement from the Government at MSPs, registered paddy growing farmers are ensured of MSP and the distress sale was adequately addressed. However, the State should explore avenues to empower farmers to sell at a better price than MSP as a long-term strategy.

F.7.4. Overall performance of the scheme

Rural godown scheme plays a vital role in promoting agricultural marketing, rural banking and financing, and ensuring food security in the State as well as in the country. It enables the markets to ease the pressure during harvest season and to maintain the supply of agricultural commodities during the off-season. Thereby, it resolves the problems of glut and scarcity, which are the usual problems in agricultural marketing. Though warehousing is an independent economic activity, yet is closely linked with production, consumption and trade. In this regard, the implementation

of the Rural Godowns Scheme by the Government of India was a successful attempt towards helping the farmers to avoid distress sale, and to enhance their income level. In this section, we have made an attempt to explain the performance of the scheme as follows:

F.7.5. Overall performance of the scheme

- **The main objectives of the scheme include the creation of scientific storage capacity with allied facilities in the rural areas to meet the requirements of farmers for storing farm produce, processed farm produce and agricultural inputs** - According to the Census 2011, there are 46.67 lakh operational holdings in the State, out of which, the marginal and smallholding accounts for 91.8 per cent, medium eight per cent and large (<1%). The average size of the holding in marginal, small, semi-medium, medium, and large categories in 2010-11 was 0.57 ha, 1.63 ha, 2.95 ha, 5.99 ha and 23.72 ha respectively. The total number of SC & ST holdings were 7.02 lakh and 14.26 lakh, respectively. The average area of holdings operated by SC & ST was 0.81 ha and 1.13 ha, respectively. The predominance of the small size of operational holdings along with a wide spread-poverty poses a big problem in the agricultural growth of the State. Prior two decades, the productivity was lower than the national average, and the State used to import foodgrains from the Central Pool. Hence, traditionally, the demand for commercial storage space was low. However, with an increase in the productivity in the recent past, the demand for storage space is increasing in the State. Field interactions indicate that GBY is helping to fill the demand in the State for storage space. Creation of storage space at village levels is also helping the PACS, SHGs and Pani Panchayat to procure the paddy from the registered farmers efficiently, and thereby, reducing the post-harvest losses as well.
- **Promotion of grading, standardization and quality control of agricultural produce to improve their marketability** – During the fieldwork in three districts representing, the high, medium and low-level performance of creation of storage capacity under the GBY, viz., Kalahandi, Puri and Cuttack, no such instances of the farmers involved in grading, standardization and quality control of agricultural produce were seen.
- **Prevention of distress sale immediately after harvest by providing the facility of pledge financing and marketing credit** - During the fieldwork, random personal interviews of

about 30 farmers were carried out. During the interactions, the farmers were enquired about distress sale of their produce (at a rate lower than MSP declared by the State Government). There have been a few instances of farmers, that they were forced to sell at prices lower than MSP, viz., for a farmer whose paddy quality was lower than Fair Average Quality (FAQ) norms prescribed by the Government and other farmer, whose harvesting operations were delayed and was unable to sell paddy in stipulated dates. Rest all other farmers have sold their produce at MSP to the agencies deputed by the Government for this purpose.

- The common perception in the farming community with a near certainty is that once the Government procurement of paddy is over, the private traders offer a lower price than MSP, and hence, the farmers try to sell their entire marketable surplus to the Government agencies as soon as possible. Hence, the option of opting for a pledge loan, storing produce in the godowns for a better price are not at all considered by the farming community. In addition, the farmers are unaware of the facility of pledge financing for the retained produce at the godowns as well.
- **Strengthen agricultural marketing infrastructure in the country by paving the way for the introduction of a national system of warehouse receipts in respect of agricultural commodities stored in such godowns**
- As per the records made available from the NABARD and DMI, Odisha has about 411 godowns constructed under GBY. It was expected that these godowns would be registered with a Warehouse Development and Regulatory Agency (WDRA) for availing the loans for the produced goods in the godowns under the National System of Warehouse Receipts. However, as per WDRA records, only two godowns were registered and are eligible for National System of Warehouse Receipts with a total storage capacity of about 22,395 MT only.
- **To reverse the declining trend of investment in the agriculture sector by private/cooperative sectors to invest in the creation of storage infrastructure in the country –** The GBY Scheme has led to a creation of storage space to the tune of Rs. 7.75 lakh MT in Odisha State. Going by the norms prescribed by GBY guidelines, per MT unit cost of construction of godowns works out to be at Rs. 1875, accordingly, the total private investment made available for the construction of godowns in the State is about Rs. 145.41 crores, since its inception.

- **To develop marketing infrastructure to effectively handle and manage marketable surpluses of agricultural and allied produce including horticulture livestock, poultry, fishery, bamboo, minor forest produce and such like produce supportive to enhance farmers' income.**
- In the event of natural disasters, undoubtedly, the storage capacity created under GBY is one of the important factors that has enabled the Government to procure huge quantities and delivered for Custom Milled Rice (CMR) units and also store CMR properly for a significant time, thus reducing the post-harvest losses to a minimum.
- **To promote innovative and latest technologies in the post-harvest and agricultural marketing infrastructure** - Due to the vulnerability of Odisha to natural disasters like cyclones, floods, the utmost care has to be taken to ensure the quality of foodgrains stored in the godowns. Quantity of foodgrains lost due to various factors such as damaged roof, and the cyclone were works out to be about 40MT. However, in the absence of godowns, the losses would have been several folds higher.

F.8. Summary and Conclusion

Post-harvest management plays an important role in the production and marketing as the considerable quantity of the valuable produce is lost every year due to improper post-harvest management. Therefore, the crisis in food availability is not only caused by natural disasters, but also by the absolute lack of post-harvest management. With this background, the introduction of GBY from the Government of India has high relevance to the country, but also to the individual farmers. In this context, we have analyzed the significance of GBY in Odisha, which supports farmers to protect farm produce from the post-harvest losses and consequently avoids distress sale. Our study examined the status and performance of GBY as against its founding objectives in Odisha. Based on the analysis of both primary and secondary data, the following observations were drawn:

- The distribution of godowns across the state reflects the nature of the scheme – demand-driven and hence, a majority of the godowns were located in intense agricultural areas such as Indrawathi and Mahanadi Command areas – Ganjam, Kalahandi districts.

- The average size of a majority of the godowns constructed under GBY works out to be between 1000 – 2000 MT reflecting the requirement of millers. Further, the creation of godowns with a smaller than 500 MT at village level especially by the Cooperative Societies indicates that their use limited for a temporary stocking of procured paddy by APMC, SHGs etc.
- As regard to the participation of the beneficiaries in the program, participation by farmers and, SC/ ST was observed to be nominal and the traders and businessmen dominates. This might be due to a mandatory margin money in the initial stages of godowns construction.
- The GBY has helped to attract Rs. 145 crores of private investment into the agricultural sector especially in the post-harvest management sub sector. This investment has helped to create several lakh MT of storage capacity in the close vicinity of rice mills.
- However, factors such as lack of awareness about the scheme among the farming community; lack of demand for godowns, frequent transfer of bank/ branch managers and delay in subsidy; lack of participation of medium and SC/ ST farmers due to a high capital investment were the some of the major obstacles to harvest full potential of the scheme.

To conclude, so far, the scheme has created storage capacity to an extent of about 13 per cent of the foodgrain production in the State and is helping to reduce the post-harvest losses. However, in view of increasing population, and also the commitment of the State under the National Food Security Act, measures have to be taken to enhance the storage availability. At the same time, through preferential subsidy approach, the participation of SC/ STs may also be encouraged.



Rural Godown in Odisha



Paddy stored in Rural godown in Odisha



Interacting with the Stakeholders in Odisha

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COMMENTS AND ACTION TAKEN REPORT

1. Abbreviations (Separate Page)

Included in the beginning of the Report.

2. Logo of NIAM

Logo updated on the front page of the report.

3. Specific recommendation for medium and low performing states as well.

Updated in the report.

4. Recommendation should be there separately ideally before summary and conclusion and should incorporate all the points mentioned in the Minutes of Meetings shared (not limited to) and it should also include at least half page note on role of FPO.

Incorporated all the points mentioned in the Minutes of the Meetings held on 13th March 2020.

5. May include some photographs taken during the field visits as annexure or at relevant sections in the report

Updated in the report.

6. Marketed Surplus ratio clarification, Onion storage, if specify more will give for significance to report.

Marketed Surplus in each state for different crops as available were updated in all the State/ Case reports. Onion storage structures are not covered under the RGS.

7. Collaborative comparison of marketed surplus and post-harvest losses.

Since, there are no authenticated studied related to the marketed surplus and post-harvest losses year-to-year basis for the recent period. The available information from various reports were compared and presented in the report. However, with the storage space created under RGS (since inception) as a function to the India's foodgrain production capacity of the country are compared with the average marketable surplus (72.58%) and reduction in post-harvest-losses (@2.43%) and the foodgrain savings were worked out and presented in the Chapter 3 of the report.

8. Few lines - approach why still private sector is playing a major role in storage (Table 1.6: Storage Capacity of Warehouses with various Institutions in India)?

Updated in the report.

9. Logistic/storage scenario figures and facts (Grameen Bhandaran Yojana (GBY) implemented since 01.04.2001) if added will give proper picture.

Updated in the report.

10. In some of the States like Haryana, the PEG is merged with GBY for the sake of subsidy. (Any facts and figures will give more clarification to report).

Updated in the report.

11. Few lines approach how FPO will play a crucial role in reinventing and encouraging storage utility for small and marginal farmers.

Updated in the report.

12. Few line approaches how Agricultural Produce and Livestock Marketing promote storage utility and efficiency focusing our report.

Updated in the report.

13. Few line approaches on Contract Farming Facilitation Group (CFFG) for promoting contract farming and services at village/Panchayat level.

Updated in the report.

14. In order to discourage distress sale and to encourage them to store their produce in warehouses, from the year 2010-11(Some facts and figures which will highlight the importance of storage to overcome distress sale) (Interest Subvention Scheme (ISS) on Crop Loans extended to Post Harvest).

Issues in the ISS implementations were expressed and recommended accordingly.

15. Few lines approach on (the benefit of interest subvention has been made available to small and marginal farmers having Kisan Credit Card) latest amendments made considering loan amount, duration, crop, type of farmers and storage utility point of view.

Issues in the ISS implementations were expressed and recommended accordingly.

16. eNWRs at the same rate as available on crop loan and farmers (Some facts and figures will unique the report standards).

Need to address the issues in successful implementation pledge loans, accordingly, recommendation was given in the report.

17. Pledge / hypothecation of agricultural produce can be granted against warehouse receipts.(Some facts and figures focusing how much pledge loan given/sanctioned against warehouse receipts will enhance the project time line)

Updated in the report.

18. Rural godown scheme plays a vital role in promoting agriculture marketing, rural banking and financing and ensuring Food Security in the country (Some facts and figures for highlighted parts).

Updated in the report.

19. The DMI acts as a nodal office for implementing GBY scheme by opening at least one sub-offices in every state (Please figure out the existing number of offices and sub-offices all over India.)

Updated in the report.

20. The beneficiaries of GBY scheme all over India include: individual farmers; registered Farmer Producer Organizations; Schedule Caste, Schedule Tribes and women, subsidies given A few cooperatives have availed finance through NCDC for renovation of storage projects as well.(Please incorporate facts and figures which will enrich the project views)

Participation of beneficiaries was highlighted throughout the report and recommendation was given accordingly.

21. Because of the high cost of construction of the godowns, a majority of the small and marginal farmers and the SC/STs participation seems to be negligible in these states. (Can we incorporate a rough economics for construction of a godown to clarify it).

For the country as a whole, the subsidy of 25% per one MT is Rs 1166.55, and the cost of one MT is about Rs. 5,000. The cost of a godown with a 500MT capacity will be about Twenty five lakhs (Rs. 25,00,000) only. Moreover, to get a term loan from financial institutions, the proponent has to show collateral guarantee, which is an another obstacle for SC/ST and marginal farmers. Similar results were illustrated in Chapter I and the cost is highlighted in the Recommendations.

22. As the preference of the procurement agencies is towards the larger size godowns, there is no demand for a smaller godowns (How we can suggest the government to utilize the small godowns, if so how FPO can play a role in it.)

The larger size godowns were in demand only in the MSP dominated/ higher government intervention in procurement states. The preference of procurement agencies in surplus states is, naturally for bigger ones, and certainly the utility of smaller godowns is limited with procurement agencies. However, creation of smaller godowns would certainly help farmers to store their produce (other than paddy and wheat). FPOs can play a role in construction of small size godowns in High Performing States.

23. Can we compare farmers (marginal, small and large) population wise data, number of godowns constructed through GBY/RGS and actual capital utilization of it.

As our sample size is limited, it is not advisable to work out participation of beneficiaries based on the landholding classification, and address their godown utilization.

24. As focused irrigated areas have more rural godowns, can we come up with some strategies how we can increase unirrigated area under rural godown scheme. Like , wise we have State Industrial Corporation we can come up with State Rural Godown Corporations in this areas (along with storage) we will have all facilities of grading, standardization, processing and value addition.

Being a demand driven scheme, so far, the construction of godowns was focused more on irrigated areas or agriculturally prosperous areas, on the other hand, not so well endowed regions were deprived of adequate storage capacity. This has further escalated the distress sale. If suitable modifications made to the guidelines of RGS, the creation of storage space can be promoted in regions with an inadequate storage spaces in each state. Along with, intensive awareness programs by CCS NIAM in these regions, could result in ushering a new practice of avoiding sale during glut phase/ immediately after harvest. Further, the DMI may evolve suitable guidelines to facilitate grading, standardization, processing and value addition.

25. Moderate demand for godowns (Gujarat and Karnataka), (More interestingly, the number of godowns appears to be more in these states, but the size of the godowns were small at the aggregate (<1000 MT).(Can we clarify the cropping pattern, value chain, market linkages, marketing channels, types of farmers involved in this scenario).

As explained in previous sections, in respect of HPS, the RGS was converged to suit the requirement of FCI and accordingly, the size of godown were stipulated to be on higher side, i.e., to procure the foodgrains and store for the Central Pool from surplus states. On the other

hand, in the case of MPS, viz, Gujarat and Karnataka, the decision about the size of godowns were made by the beneficiaries themselves, in the absence of any demand for FCI or any State Agency based on their own purpose and hence, the size of godowns were smaller in these states.

- 26. Adherence to Quality Control Measures in Godowns, (Moreover, the average duration of the storage was less than six months, it was observed that the quality adherence was relaxed and norms prescribed by the FCI or other agencies were not followed by these private owners.) (if it is less than six months, whether there are in mandatory form to carry out quality measures) any supporting document will clarify it.**

Updated in the report with photos.

- 27. Low Performance States (LPS), as we see in case of Meghalaya (has significant forestry industry, but the important crops being potatoes, rice, maize, pineapples, bananas, papayas and spices.) can we know the other storage utilities i.e, any cold storage facility if so.**

The agricultural production is limited to the sustenance in these States and the Marketable surplus is very negligible. In fact, they import foodgrains and fruits and vegetables. Moreover, we have not come across any cold storages during the visit to these states.

- 28. Few lines approach (How we can collaborate Primary Agricultural Cooperative Societies (PACS) with Rural Godown Scheme.)**

PACS have been availed godown facility under GBY through NCDC in the Gujarat, Karnataka and Madhya Pradesh States. A majority of them have used these godowns for multipurpose such as distribution of agricultural inputs such as fertilizers, implements, pesticides etc., PDS distribution, and storage of agricultural produce.

- 29. Madhya Pradesh and Haryana (Extent of participation of beneficiaries), report says no subsidy beneficiaries. (How to clarify it, either more private investment and or....)**

Mistakes found and rectified in the report.

- 30. Only in the case of Karnataka, coconut was stored for a value addition purpose (to extract dry copra, coconut oils etc.) (Can we come up with value addition enclosed warehouses). Please add some few lines of approach.**

Coconut is a major crop in the Tumkur and Mandya districts in Karnataka. Tumkur is known for high quality copra while Mandya is known for its tender coconuts. For quality copra,

matured coconuts have left undisturbed for six to nine months. One tender coconut fetches about Rs 15 at farm gate, while copra (one nut) fetches about Rs 22. Because of the higher production, farmers in Tumkur district were not sold as tender coconuts, instead, the godowns constructed under the RGS have helped the farmers to store their coconuts undisturbed for required time and thus have helped in the process of value addition. On the Contrary, fresh nuts from Mandya district were delivered to biggest tender markets in Asia at Maddur from where the tender coconuts are distributed across the country. The value addition is by default in the case of Tumkur.

31. The scheme has brought about Rs. 11831 crores private investment into the sub sector of agriculture - post-harvest management, which needs to be continued to reduce the post-harvest losses in the Indian agriculture. (Please justify it)

Through the RGS, the government could able to contribute only 25% of the cost of construction of godowns across the country as a subsidy to the private sector, the rest 75% (Rs. 11831 crores) is contributed by the Private. As mentioned in the previous sections, the scientific storage prevents post harvest losses and also helps the farmers to realize a better price for their produce by avoiding sale during glut phase. The storage space created under the scheme since inception could able to cover only forty per cent of the foodgrain production produced annually. There is a need to achieve still more area to match the production and hence, it is one of the most deserving strategies of enhancing farmers income. Therefore, it is suggested the government to continue the same trend in the future to reduce post-harvest losses in the country.