AERC REPORT 177

Electronic National Agricultural Market (eNAM) in Gujarat: Review of Performance and Prospects

S. S. Kalamkar, Kinjal Ahir and S.R. Bhaiya

All India Study Coordinated by

Agro-Economic Research Unit
Institute of Economic Growth, University of Delhi, Delhi

Report submitted to the

Directorate of Economics & Statistics
Department of Agriculture, Cooperation & Farmers Welfare
Ministry of Agriculture & Farmers Welfare,
Government of India, New Delhi

Agro-Economic Research Centre
For the states of Gujarat and Rajasthan
(Ministry of Agriculture & Farmers Welfare, Govt. of India)
Sardar Patel University
Vallabh Vidyanagar 388120, Anand, Gujarat

March 2019

AERC Report No. 177

Prepared by

Dr. S. S. Kalamkar, Director and Professor, AERC
Dr. Kinjal Ahir, Deputy Director (Hon), AERC
Dr. S. R. Bhaiya, Field Officer, CCS, AERC

Research Team

Ms. Kalpana Kapadia, *Research Associate*
Shri Manish Makwana, *Research Associate*
Shri T. B. Parihar, *Research Associate*
Shri M. Ojha, *Research Associate,*

Published by

The Director
Agro-Economic Research Centre
(Ministry of Agriculture & Farmers Welfare, Govt. of India)
Sardar Patel University, Vallabh Vidyanagar, Anand, Gujarat.
Ph. No. +91-2692-230106
Fax- +91-2692-233106
Email: director.aerc@gmail.com; directoraercgujarat@gmail.com

Printing and Circulation In-charge:

Shri Deep K. Patel

Draft Report submitted in February 2019

Final Report submitted in March 2019

Citation: Kalamkar, S.S.; Kinjal Ahir and S.R. Bhaiya (2019), "Electronic National Agricultural Market (eNAM) in Gujarat: Review of Performance and Prospects", AERC Report No. 177, Agro-Economic Research Centre, Sardar Patel University, Vallabh Vidyanagar, Anand, Gujarat.

Foreword

Marketing of agricultural commodities in India is carried out through the state enacted Agricultural Produce Marketing Regulation Acts (APMRA). Under this system, a vast network of regulated markets has been established. However, over time, these markets have become restrictive and monopolistic and have failed in not only achieving their basic objectives owing to restrictive provisions of Acts, but also prevented a seamless integration of farmers and buyers and evolution of an efficient supply chain. Realizing the urgent need to address the challenges of the existing agricultural marketing system, the Union Government has introduced a Central Sector Scheme for Promotion of National Agriculture Market through a common electronic market platform, called the electronic National Agricultural Market or e-NAM.

The e-NAM aims to integrate all the agricultural markets of the country and envisages a common national market for agricultural commodities with seamless movement across state boundaries. This is envisioned as a solution to marketing issues of all stake holders - farmers, traders, retailers, consumers and logistic providers. The common e-market platform envisaged networking of selected 585 wholesale markets in desirous states/UTs by March 2018. It was recorded on eNAM portal that till July 31, 2017, out of 585 targeted markets, 455 markets across 13 states were live on e-NAM. Accordingly, a need was felt to assess the status of the extent of implementation of eNAM and the expected benefits derived therefrom. In view of same, the Ministry of Agriculture and Farmers Welfare, Government of India entrusted this study for the state of Gujarat to AERC Centre, Sardar Patel University, Vallabh Vidyanagar (Gujarat). The Agro-Economic Research Unit, Institute of Economic Growth (IEG), Delhi acted as a coordinator of this empirical study and provided sampling framework and table format. The study is based on both primary and secondary level data. The study proposes important and apposite policy implications which would facilitate suitable interventions to spread the benefits of electronic market to farmers in the country and also doubling the income of the farmers.

I am thankful to authors and the research team for putting in a lot of efforts to complete this excellent piece of work. I also thank the Directorate of Economics and

Statistics, Ministry of Agriculture and Farmers Welfare, Government of India for the unstinted cooperation and support. I hope this report will be useful for policy makers and researchers.

Agro-Economic Research Centre
For the states of Gujarat and Rajasthan
(Ministry of Agriculture and Farmers Welfare, Govt. of India)
Sardar Patel University,
Vallabh Vidyanagar 388120

(Dr. S.S. Kalamkar)
Director & Professor

Acknowledgements

The study on "Electronic National Agricultural Market (eNAM) in Gujarat: Review of Performance and Prospects" has been carried out at the Agro-Economic Research Centre, Sardar Patel University, Vallabh Vidyanagar, Anand, Gujarat, as entrusted by the Ministry of Agriculture and Farmers Welfare, Government of India, New Delhi.

We have benefited immensely from various scholars and officials from different government departments while carrying out this study. At the outset, we would like to thank **Prof. Shirish Kulkarni**, Vice Chancellor of our University and Chairman, AERC Advisory/ Governing Body as well as **Dr. Mahesh Pathak**, Honorary Advisor of our Centre for their constant encouragement and support for undertaking such research activity at the Centre. We are grateful to the coordinators of the study, **Prof. C.S.C. Sekhar**, Head, AERU, Institute of Economic Growth and (Former) Honorary Director, Agricultural Economics Research Centre, University of Delhi, Delhi, for providing required support, study framework and necessary inputs in completing the study.

We thank **Shri B. M. Modi**, present Director of Agriculture, Department of Agriculture and Cooperation, Govt. of Gujarat, Krishi Bhawan, Gandhinagar (Gujarat) and District Agriculture Officers for providing the secondary level information.

The study would not have reached to this stage without the active co-operation of the respondents from selected APMCs and villages in Gujarat who provided all the required data for the study without any hesitation and expectation. We thank each one of them for their invaluable support.

We also thank Prof. C.S.C.Sekhar, Head, AERU, Institute of Economic Growth, Delhi for support and advice during data collection for Phase I study.

We have also received support and encouragement from our colleagues in the Centre while carrying out the study. We would like to thank Dr. Hemant Sharma, Assistant Professor, AERC for his support. Specifically, thanks to all the fieldsmen who have provided support in getting APMC data and for their support during field work of the study. We are thankful to all our Research Associates (Ms. Kalpana Kapadia, Shri Manish Makwana, Shri T. B. Parihar, and Shri M. Ojha) for collecting data from the APMC representatives and tabulation of data. We also thank all staff of Accounts and PA to director for providing necessary support.

Thank to Shri Deep Patel (Research and Reference Assistant-Lib) for designing the cover page of report and making necessary arrangements for printing and circulation of the report.

Lastly but not least, we thank all the other AERC staff for their direct and indirect support.

Agro-Economic Research Centre
For the states of Gujarat and Rajasthan
(Ministry of Agriculture, Govt. of India)
Sardar Patel University,
Vallabh Vidyanagar 388120, Anand, Gujarat.

S. S. Kalamkar
Team Leader

Contents

List of Tables

List of Figures

List of Map

List of Abbreviations

APC	-	Agricultural Prices Commission
APMC	-	Agricultural Produce Marketing Committee
Av.	-	Average
CA	-	Commission Agent
C.I.	-	Cropping Intensity
CACP	-	Commission for Agricultural Costs and Prices
CAGR	-	Compound Annual Growth Rate
CMS	-	Cooperative Marketing Society
CoC	-	Cost of Cultivation
DES	-	Directorate of Economics and Statistics
Dist.	-	District
DM	-	Dry Matter
DOC	-	Division of Cooperation
FAO	-	Food and Agriculture Organization
FAQ	-	Fair Average Quality
FASR	-	Food & Agribusiness Strategic Advisory &Research
FCI	-	Food Corporation of India
GCA	-	Gross Cropped Area
GDP	-	Gross Domestic Product
GIA	-	Gross Irrigated Area
GOG	-	Government of Gujarat
GOI	-	Government of India
GSDP	-	Gross State Domestic Product
GVA	-	Gross Value of Agriculture
GVO	-	Gross Value of Output
ha	-	Hectare
HH/hh	-	Household
HYV	-	High Yielding Variety Seeds
I.I.	-	Irrigation Intensity
IGFRI	-	Indian Council of Agricultural Research
JCI	-	Jute Corporation of India
KCC	-	Kisan Credit Card
kg	-	kilograms
mha	-	Million hectares
MIP	-	Market Intervention Price
MIS	-	Market Intervention Scheme
MOA	-	Ministry of Agriculture
MSP	-	Minimum Support Price
mt	-	Metric Tonnes
NAFED	-	National Agricultural Cooperative Marketing Federation of India Ltd.
NATP	-	National Agricultural Technology Programme
NBHC	-	National Bulk Handling Corporation
NCA	-	Net Cropped Area
NCAER	-	National Council of Applied Economic Research

NCDFI	-	National Cooperative Dairy Federation of India
NCMSL	-	National Collateral Management Services Limited
NDDB	-	National Dairy Development Board
NIA	-	Net Irrigated Area
NITI	-	National Institution for Transformation India
Nos	-	Numbers
NSA	-	Net Sown Area
NSDP	-	Net State Domestic Product
NSSO	-	National Sample Survey Organization
PDS	-	Targeted Public Distribution System
PSS	-	Price Support Scheme
Rs.	-	Rupees
SAU	-	State Agricultural Universities
SC	-	Scheduled Caste
ST	-	Scheduled Tribe
TE	-	Triennium Endings

Executive Summary

Electronic National Agricultural Market (eNAM) in Gujarat: Review of Performance and Prospects

S. S. Kalamkar, Kinjal Ahir and S.R. Bhaiya[1]

1 Introduction:

Marketing of agricultural commodities in India is carried out through the state enacted Agricultural Produce Marketing Regulation Acts (APMRA). Under this system, a vast network of regulated markets had been established. However, over time, these markets have become restrictive and monopolistic and have, therefore, failed to achieve their basic objectives owing to restrictive provisions of Acts. It also prevented a seamless integration of farmers and buyers and evolution of an efficient supply chain. Realizing the urgent need to address the challenges of the existing agricultural marketing system, the Union Government introduced a Central Sector Scheme for Promotion of National Agriculture Market through a common electronic market platform, called the electronic National Agricultural Market or e-NAM on 1 July 2015. The e-NAM aims to integrate all the agricultural markets of the country and envisages a common national market for agricultural commodities with seamless movement across state boundaries. This is envisioned as a solution to marketing issues of all stake holders - farmers, traders, retailers, consumers and logistic providers. The common e-market platform envisaged networking of selected 585 wholesale markets in desirous states/UTs by March 2018. It was recorded on eNAM portal that till January 24, 2018, out of 585 targeted markets, 471 markets across 15 states were live on e-NAM.

The eNAM portal provides a single window service for all APMC related information and services, including commodity arrivals, prices, bids and offers. Some of the expected benefits from e-NAM include accessibility of farmers to a common agriculture market; real time price discovery; transparency in the agriculture marketing system; reduce the transaction costs of buyers and sellers; real time information on prices, market arrivals; bidding on quality parameters of commodities; online bidding for more transparency; online payment system to reduce the payment risk and ensure timely payments to farmers, cleaning, sorting, grading and weighing facilities and additional services such as soil testing laboratories at the e-NAM. Small Farmers' Agribusiness Consortium (SFAC) is designated as Lead Agency to roll out the eNAM in partnership with a strategic partner, which will be responsible for developing, running and maintaining the proposed e-marketing platform. To facilitate assaying of commodities for trading on NAM, common tradable parameters have been developed for 90 commodities. eNAM is a virtual market but it has a physical market at the back end. While one time registration of farmers / sellers, lot details at the entry gate, weighment, quality assaying, auctions / trade transactions, payment by buyers to sellers and other agencies involved in the chain of transaction will take place online on e-NAM, actual material flow will happen physically through the market. Entire arrivals of agricultural commodities selected for trading on e-NAM will be traded on-line itself. In order to facilitate both - unification of market and online trading, it is necessary for each State to undertake reforms prior to seeking assistance under the scheme in respect of (i) a single license to be valid across the State, (ii) single point levy of market fee and (iii) provision for electronic auction as a mode for price discovery. Only those States/UTs that have completed these three pre-requisites are eligible for assistance under the scheme. The States must ensure that the reforms are carried out both in letter and spirit through appropriate and unambiguous provisions in the APMC Acts and rules. Besides, the State Marketing Boards/APMCs must enable the promotion of the e-auction platform.

[1]Agro-Economic Research Centre, Sardar Patel University, Vallabh Vidyanagar, Anand, Gujarat

2. Progress of e-NAM in India

The electronic trading portal for national agricultural market is an attempt to use modern technology for transforming the system of agricultural marketing. Thus, eNAM is an online inter-connectivity of e-mandis, aimed at ushering in much needed agriculture marketing reforms to enable farmers to get better price. The common e-market platform envisaged networking of selected 585 wholesale markets in desirous states/UTs to be deployed in three phase, viz. 200 wholesale markets by September 2016, another 200 markets by March 2017 and remaining 185 markets by March 2018 (Shalendra and Jairath, 2016).The electronic trading platform for National agriculture market was launched on April 16, 2016 in 21 Mandis across 8 States with pilot trading of 24 commodities namely Apples, Potato Onion, Green Peas, Mahua Flower, Arhar whole (Red Gram), Moong Whole (green gram), Masoor whole (lentil), Urad whole (black gram), Wheat, Maize, Chana whole, Bajra, Barley, Jowar, Paddy, Castor Seed, Mustard Seed, Soya bean, Ground nut, Cotton, Cumin, Red Chillies and Turmeric.As of October 31, 2017, it was reported/ uploaded on the website of eNAM that, out of 585 targeted markets, 470 regulated markets from 14 states were live on e-NAM. The target of bringing 455 mandis online by May 2017 was achieved and it was reported that total 5076501 farmers and 96118 buyers were registered on e-NAM portal with a turnover of Rs. 31424.04 crore from the trading of 11371.72 tonne produce covering about 90 commodities including vegetables. The state-wise coverage of markets after phase II indicate that the highest number of selected markets that are live on eNAM portal are from the state of Uttar Pradesh (100) followed by Madhya Pradesh (58), Haryana (54), Maharashtra (45), Telangana (44), Gujarat (40), Rajasthan (25), Andhra Pradesh (22), Himachal Pradesh (19), Jharkhand (19), Chhattisgarh (14), Odisha (10) and Uttarakhand (5).

The growth in number of stakeholders of e-NAM in India by July 2017 indicated that progress is very slow and number is disappointing given the fact that there are more than 13.8 crore farmers with approximately 20 lakh commission agents and traders in more than 7320 markets across India. The six major states with the most mandis under eNAM are Uttar Pradesh, Madhya Pradesh, Haryana, Maharashtra, Telangana and Gujarat. These states collectively accounted for three fourth of targets achieved. However, in these states too, the market remains isolated, with traders from outside the APMC not being able to buy farmers' produce from the mandi and buyers having to physically inspect quality of produce due to absence of required infrastructure. While studying the impact of e-markets in Karnataka, Reddy (2016) made a mention about some teething problems in its implementation.

3. Need of the Study:

Some of the expected benefits from e-NAM include accessibility of farmers to a common agriculture market; real time price discovery; transparency in the agriculture marketing system; reduce the transaction costs of buyers and sellers; real time information on prices, market arrivals; bidding on quality parameters of commodities; online bidding for more transparency; online payment system to reduce the payment risk and ensure timely payments to farmers, cleaning, sorting, grading and weighing facilities and additional services such as soil testing laboratories at the e-NAM. It was felt important to assess the implementation and benefits derived from eNAM in the state of Gujarat. Therefore, AERC, SPU, Vallabh Vldyanagar centre was entrusted by the Ministry of Agriculture and Farmers Welfare, GOI to conduct this survey in Gujarat.

4. Data and Methodology:

The study is based on both primary and secondary level data. The secondary data on market, marketed surplus, eNAM coverage and activities and related information were collected from the government publications, research papers/reports and various relevant websites. Primary data was collected by using a pilot-tested structured interview schedule

canvassed in 2017 over sample farmers, commission agents and APMCs' office bearers during Phase I of this study in two selected APMCs of Gujarat, viz. Petlad (Anand) and Ahmedabad. The Phase II of the study, the current research, is confined to the State of Gujarat and covers 31 APMCs from 31 districts of the state (23 eNAM and 8 APMCs not under eNAM) covering the agriculture year 2018-19. Out of the total 40 APMCs covered under the eNAM, total 23 APMCs from 23 districts of the State of Gujarat were selected for the study. As some of the districts had two APMCs under eNAM, in such cases, randomly one APMC was selected. Besides, 08 APMCs were selected from remaining eight districts that were not covered under eNAM to know about the awareness and related parameters of the eNAM. From every district, minimum five farmers and five Commission Agents and selected APMC office bearers were contacted. Accordingly, the information related to eNAM implementation and its implications were collected in pre-tested schedules from 155 farmers and 155 commission agents and 31 APMC officers.

5. Status of e-NAM in Gujarat:

Gujarat government has aggressively pursued an innovative agriculture development programme by liberalizing markets, inviting private capital, reinventing agricultural extension, improving roads and other infrastructure. The state government has a comprehensive Agri-Business Policy to facilitate projects of value addition in value chain from farm to market, develop agri-infrastructure, encourage research and development, promote food safety management system at the farm level and processing units. A total of 400 regulated markets exist in the State serving on an average 45 villages per market and about 491 sq km area. On 14th of April 2016, eNAM scheme had been launched on a pilot basis in three selected APMCs of Gujarat, viz. Patan, Botad and Himmatnagar with specified commodities such as castor seed, chana (black gram) and wheat respectively. Out of total 585 mandis selected at national level, total 40 APMCs area from 24 districts of Gujarat were selected for eNAM. It was reported that by the completion of second phase (May 2017), all targeted 40 mandis were live on e-NAM. About 308346 farmers and 7399 buyers were registered on e-NAM portal. Theturnover of Rs. 3693.164 crore from the trading of 907.05 tonne produce covering agriculture commodities like Castor Seed, Cotton, Wheat, Sesame Seed, Groundnut was observed. Though the state of Gujarat has made provisions for three identified reform measures and have basic infrastructure facilities like auction platform, information dissemination mechanism, banks, etc. as compared to other states of India (IFPRI, 2016; Shalendra and Jairath, 2016), APMCs are facing problems in implementation of this scheme.

6. Findings from Field Based Survey:

Farmers Households

- *The profile of selected farmer households indicated that more than 98 per cent of the respondents were male under eNAM category while all respondents were male in Non eNAM APMC category. Average age of the respondents was around 45-46 years having average education of 9-10 years with average farming experience of 22 years in both categories. Average household size was 6-7 persons. The share of family members working in farming and dairy was relatively higher in Non eNAM APMC category than eNAM category.*
- *The socio economic characteristics of selected farmers indicate that majority of respondent were Hindus. More than half of the selected farmers belonged to 'open category' followed by Other Backward Classes and Scheduled Caste category. More than 79 per cent of farmers from both category belonged to 'above poverty line 'group and thus possibly for the same reason more than 89 per cent of farmers from eNAM group and 80 per cent from Non eNAM APMC group had pucca or semi pacca house.*
- *Crop cultivation was the main occupation of the selected farmers from both groups and animal husbandry was the secondary source of income for these households. Around 40*

per cent farmers' households maintained the farm records and more than 60 per cent of households have Kissan Credit Card with them.

- *Average operational land holdings with eNAM group farmers was 3.86 ha of which 82 per cent land was irrigated, while corresponding figure for Non eNAM APMC group was 3.5 ha with 93 per cent having irrigation facility. The average rental value of irrigated land was obviously higher than the unirrigated land and ranged between Rs. 25000-30000/- per hectare for a year's period. The major source of irrigation with selected farmers was groundwater (tube well and open well) along with minor share of canal water.*
- *More than 83 per cent of farmers have sold their produce in APMC through commission agents (through action method of sale) followed by sale to village traders while some of them sold at both places. None of eNAM group farmer had sold their produce through eNAM procedure of sale being implemented in selected APMCs of the Gujarat.*
- *Hardly one third of selected famers from eNAM group were aware about eNAM, despite of the fact that these selected APMCs are provided with grant-in-aid and infrastructure for implementation of eNAM which also includes creating awareness among the farmers and other stakeholders. Those who were aware about eNAM, for them the main source of information was APMC. Thus, there is a need of mega awareness campaign inside APMC as well as villages around particular APMCs. None of the crop was marketed through eNAM (intrastate or interstate biding and sale as per the guidelines of eNAM).*
- *There are many uses of eNAM as one can check prices of commodities in various markets on different dates, sale of commodity, online payment, etc. Though no sale of commodity was reported under eNAM, attempt was made to check whether farmers make use of this electronic platform and website for any other purpose. But it was observed that none of the farmers have reported any use of the same for any such purpose.*
- *The implementation of eNAM market necessitates infrastructural facilities in selected APMCs covered under eNAM such as assaying (quality testing), e-auction, weighing, etc. All the mandis have weighing facility besides other facilities like grain storage, soil testing and bid management. In terms of the quality parameters across all services, weighing facility was assessed with 'good' to 'satisfactory level'.*
- *As no sale was undertaken under electronic market, none of the samples of agricultural produce was tested and uploaded on the eNAM platform. Thus, none of the farmer have responded on quality testing and related parameters at APMC. The other facilities available at the market premises of APMC were bank, agriculture input shops, telephone, storage, internet, canteen, and guest house.*
- *Certain problems were reported by sample farmers about eNAM (these may be perceptions of the farmers as no one has transacted through electronic process). The major five perceptions reported as problem about electronic marketing include online transaction process is difficult; sale process is complicated than before; delay in receiving online payment, discovering prices is cumbersome, and sorting facilities are not adequate.*
- *The selected farmers perceived that marketing through eNAM would be transparent, would involve convenient transfer of money and cost of marketing will be lower. The rating for eNAM given by famers indicate that a lot of things need to be done to prepare farmers to transact with electronic market.*
- *The selected farmers have suggested all the necessary requirement for better implementation of eNAM.*

Commission Agents (CA):

- *All the commission agents were male in eNAM category while 2.5 per cent were female respondents in Non eNAM APMC group. The average age of the respondent commission agent was around 46-47 years with 13 years of education.*
- *Almost 96 per cent of CA in eNAM mandi were aware about the electronic market while corresponding figure for Non eNAM APMC group was 62.5 per cent. The main source of the information about electronic market was APMC itself and media coverage. The CA*

were registered under eNAM in 2016 and reported transactions by six CA which were within APMC sale entry made in eNAM software.

- *As none of the farmer had sold their output under electronic market platform, while entry of transaction in APMC was made under eNAM software and shown as sale under this form of marketing. The commodities which were transacted were bajara, mustard, gran, wheat and maize only in four eNAM mandis, viz. Dahod, Deesa, Jamnagar and Patan. The quantity reported transacted under eNAM was very small, while rate per quintal of commodities was same as reported under auction method of sale. Thus, there is no difference in price rate realised under new method of marketing.*
- *The use of eNAM was reported to be very rare by the selected commission agents in the mandis covered under eNAM while none of the commission agents in APMC group even know about the use of same.*
- *All the mandis have weighing facility, grain storage, soil testing and bid management. In terms of the quality parameters of all services, weighing facility was responded with 'good' to 'satisfactory' level.*
- *Though some quantity of sale was reported under eNAM by few commission agent, but no sale was undertaken under electronic market, thus no sample of commodity was tested and uploaded on the eNAM platform. Thus, no CA have responded on quality testing and related parameters at APMC. While required supporting facilities like Bank, Agriculture Input Shop, Telephone, Storage, Internet, Canteen, and Guest house are available in APMC premises.*
- *Problems reported by CA about eNAM (most of them may have given their perceptions as no one has transacted through electronic process) are, discovering prices is cumbersome, sale process is complicated than before, delay in receiving online payment, online transaction process is difficult, and sorting facilities are not adequate.*
- *Few CAs have opined that marketing through eNAM would give better access to national markets, low cost of marketing and better price realisation for farmers. The rating for eNAM indicatesthat a lot of things need to be done to prepare CAs to transact with electronic market.*

Selected APMCs

- *On an average, every eNAM mandi covers 90 villages while corresponding figure for APMC group was 151 villages. The average number of commission agents registered were 123.79 per eNAM mandi which indicates successful implementation of first step of registration of CA under new marketing system. Large number of famers are also registered at each eNAM mandi, while none of the market mandi has recorded sale transaction or inter markets sale under eNAM.*
- *It was strange to note that about 17 per cent of APMC respondents were not aware about the reforms in agricultural marketing such as specific provision for electronic trading, single trading licenses valid for trading in all mandis of the state, and single-point levy of transaction fee.*
- *As per the guidelines of the Enam, Central Government provides the software free of cost to the all the states along with Rs. 30 lakh per selected mandi for setting up the hardware and related equipment/infrastructure, which was later increased to Rs.75 lakh per mandi. Out of total 23 eNAM mandissurveyed, 48 per cent mandis have received the grant-in-aid or financial support from the Government of India for different purposes, while only 22 per cent of the selected mandis have received the infrastructure support.*
- *About 90,000 farmers had visited the mandi for selling the produce during the last month,and of them about 6,000 famers have registered in eNAM software and arrival details of about 10 per cent of registered farmers are made in eNAM software. Although,no sale was conducted under eNAM.*
- *As mentioned earlier, all the mandis have only weighing facility and lack assaying (quality testing), E-auction facilities, while other facilities available are grain storage, soil testing and bid management. In terms of the quality parameters of all services, weighing facility was ranked with 'good' to 'satisfactory' level by APMC representatives.*

- *As no sale was undertaken under electronic market, nosample of any commodity was tested and uploaded on the eNAM platform. Thus, no APMC hasresponded on quality testing and related parameters at APMC.*
- *Major constrains in implementation of electronic marketing are,farmers are not interested, commission agents are not willing to do transactions, assaying laboratorynot yet established, long time required for e-transactions, farmer need quick settlement and cash in hand, sale process is complicated, online payment process is difficult and delay in online payment. Therefore, it is very important and urgent to educate and convince the famers and commission agents as well as other authorities of the APMC to adopt the electronic trading system may be gradually to gain confidence of the famers and commission agents. Few successful cases of transparent speedy transaction need to be recorded and disseminated through social media.*
- *The selected APMC authorities have mentioned that marketing through eNAM will cost lower, satisfaction of being part of the national market, itwould be transparent, better price realisation, online payment is more convenient, convenient transfer of money. It was a surprise to note that 26 per cent of CAs have reported use of eNAM app to APMC, while corresponding figure reported by famers to APMC was 4.35 per cent only. The rating for eNAM given by APMC authorities indicates that a lot of things need to be done to prepare farmers and CAs to transact with electronic market. Average score regarding the superiority of electronic market over APMC was between 'worse' to 'no change'. Open auction method of sale is used for transaction of commodities in market.*
- *The selected APMC respondents have suggested all the necessary requirement for better implementation of eNAM.*

7. Conclusions:

From the field visits and survey, it was observed that though (visited) APMCs are linked and now live on eNAM portal, but so far nowhere actual e-trading has been recorded or taken place. Whatever business has been reported on eNAM portal is the entry of agricultural produce in market as uploaded in eNAM software; however, produce is auctioned and sold through regular process adopted in the market premises. At few places, local commission agent/trader attempted to trade through new system, but they faced some problems. In true sense, stakeholders are not yet ready to go with e-trading due to following reasons.

- *Most of the farmers do not have complete knowledge about eNAM due to which they are hesitant to share their bank details and adhaar card number required for registration with system. They have certain apprehensions about eNAM and subsequent use of their income details for income tax purpose. Some APMCs organized meetings with farmers and traders as well as distributed printed leaflet for creating awareness about eNAM, but could not succeed in their goal. Thus there is an urgent need to have clear time bound strategy to educate stakeholder on various aspects of eNAM concept. Also there is need to build trust among farmers and traders over new technology based system.*
- *Generally, in APMC market, one physical auction gets completed within a duration of as small as a minute. Therefore, farmers and traders' perceive that eNAM process would take a lot of time to complete one auction and they may face difficultly in settling payment within same day.*
- *The APMC management have also raised their concern about completion of auction of all produce that arrives in APMC premises for sales during glut or harvest seasons. Besides, apathy of commission agents for online payment is another concern.*
- *Farmers have mentioned that they always stay connected with local commission agents/traders and sometimes they take advance money to meet the expenditure on crop cultivation and domestic needs with an agreement that produce after harvest would be sold through same commission agent or to same trader. In such cases, selling produce under eNAM to desired trader would not be possible, and therefore farmers fear that traditionally existing business relations/ associations over generations may get spoiled.*
- *Most of the farmers mentioned that they sell their produce when they require some money for procurement of agriculture inputs or for domestic requirements. Thus they sell*

their produce in market as and when required. In present system, they are able to sell produce and procure inputs on same day, which may not be possible under new system.

- *As per the present practice of auction, traders first physically check the quality of grains and then bids for the produce in presence of other bidders, famers and APMC inspector and then, highest quoted receipt is given to farmers by APMC inspector/officer for weighing and billing process, followed by payments either by cheque or cash. The traders are opposing this scheme because they are not ready to purchase agricultural commodities without physical verification, whereas electronic assaying is an important component of this scheme (providing online information on type/variety of commodities, quality specifications, moisture content, etc). Thus there are hesitations towards e-auctions and e-testing / assaying quality of the produce. Besides ambiguity related to whether the sample was same as the original produce or not, remains.*
- *Some of the traders have mentioned that they are aware about the soil quality and production practices followed in particular crop production by the particular farmer or by farmers of particular village/area and therefore they prefer to quote higher price for agricultural produce that comes from those villages/areas. Such confidence and empirical assessment would not be possible in eNAM by the traders, while they would not know that they are bidding for which farmer's produce if they rely only on electronic market.*
- *Most of the farmers are marginal with small land holdings and they prefer to sell their produce in small quantity. It is not exactly clear how their produce would be sold through the process specified in eNAM and how bargaining power of these farmers will be protected. Whereas in the current system even the smallest of the lot (as low as about 25 kgs) of agricultural produce, involves bidding by traders in the presence of APMC officials.*
- *APMC officials and Traders have mentioned that trading of agricultural produce is not assigned HSSN code due to which they face difficulty in uploading the trade details for tax purpose, especially in the post GST regime.*
- *In order to participate in e-trading, commodities are required to be converted from physical form to electronic form, which requires assaying labs and skilled manpower. At present, the availability of such labs as well as skilled personnel is meagre. Though few staff of all APMCs are provided training on quality parameters by AGMARK, but follow-up training with hardware support needs to be undertaken at each mandi. Besides, there is a lack of infrastructure required for eNAM such as scientific sorting/grading facilities, speedy internet connection, etc. Thus even the trained personnel do not get to test their skills in the real market, since the infrastructure is itself not yet developed.*
- *There is a need to set up e-auction hall equipped with computers for uploading of buy quotes / bids by traders and large monitor / projector with speedy internet access. Broadband penetration and digital infrastructure in rural areas is very poor. Internet-literacy is minimal among farmers which may lead to a new kind of exploitation by middlemen who are more tech savvy.*
- *Some of the mandis have come up with mobile application to keep farmers informed about the prices on daily basis which would certainly help farmers to decide about time of sale of their produce. If similarly, farmer has an access to price information in all nearby APMC mandis, it will facilitate his decision making and reduce reliance on middlemen or atleast have a better bargaining power in negotiation with middlemen.*
- *There is no proper channelling laid down for sale of produce to outside buyer and then settlement of accounts and transfer of material, which has created confusion and negative thinking about eNAM.*

8. Policy Implications:

The setting up of eNAM aims to integrate all the agricultural markets of the country and is thus a landmark initiative. It envisages a common national market for agricultural commodities with seamless movement across state boundaries. But, it will happen when e-NAM becomes fully operational throughout the country and when the eventual goal of 'One Nation One Market' for agricultural produce will become a reality. At present, APMCs are

facing some teething problems in its implementation and no selected markets in Gujarat have actually participated in e-trading. Accurate information, institutions and infrastructure are the basic pre-requisites for successful implementation of any government programme/scheme. The infrastructural impediments include poor back-end infrastructure like inadequate scientific storage and warehousing, assaying and grading facilities in some markets only, limited number of cold storage, lacking refrigerated vans, low market density, limited capacity of these equipment to deal with high volume of agricultural commodities in the peak season, different standards for agricultural commodities, fragmented APMCs, lack of synergy between marketing organizations and service providers, involvement of traders in the marketing of agricultural produce, poor internet connection, inadequate number of computers, servers and kiosks in the market, interrupted power supply, poor quality of rural road, etc. Institutional impediments can be further subdivided into two- a) legal and b) human resource impediments.

- *There is an immediate need to enhance the clarity amongst different stakeholders about eNAM concept and processes, stakeholders' role and responsibility through well-developed time bound strategy covering publicity, awareness campaign and capacity building of different stakeholder with a focussed approach for producer grower to avoid exclusion of farmers from the system.*
- *It is very important and urgent to educate and convince the famers and commission agents as well as other authorities of the APMC to adopt the electronic trading system, may be gradually, to gain confidence of the famers and commission agents. Few successful cases of transparent speedy transaction need to be recorded and disseminated through social media. Inadequate skilled manpower in the APMCs, limited number of trained traders to trade in the electronic platform and low literacy level of farmers are among the important human resource bottlenecks.*
- *There is urgent need to build trust among farmers and traders over new technology based system. Besides requisite infrastructure such as assaying facilities with skilled manpower and high speed internet connectivity to all selected markets for un-interrupted trading processes need to be provided without further delay.*
- *Suitable dispute resolution mechanisms need to be constituted in respect of assaying, weighment and e-payment related matters with respect to trades on e-NAM at APMC level.*
- *Though this system may take few years to become fully functional, it is an important reform in agricultural marketing system for which immediate appropriate steps need to be taken for its proper implementation and adoption.*

Informational impediments need to be removed, like lack of awareness of the farmers about the e-NAM, limited knowledge of e-tendering process, lack of awareness about the benefits of e-NAM and farmers' apprehension about getting less price for their produce associated with their fears that their produce may be found to be of sub-standard quality on assaying,fragmented agricultural markets make a perfect case for a unified platform like National Agricultural Market (NAM). Although facing initial hiccups for successful implementation and lesser density of e-NAM across the existing wholesale regulated markets, there is tremendous scope for its further expansion and modernization. The common agricultural platform integrated with modem technologies will be an important catalyst to ensure best price to the producers for their produce and will also ensure the variety of quality products to the consumers. The expansion in the volume of trade in e-NAM platform will follow the strengthened back-end infrastructure for complete value chain of produce. Therefore, efforts must also be channelized towards development and up gradation of scientific warehouses, cold storage, refrigerated vans for perishables, awareness and training to the participants in the marketing process, high speed internet connectivity to the markets and among different components of the market. The benefits of e- NAM would be visible once it is implemented fully in the true sense as it has been conceptualized.

Chapter I
Introduction

1.1 Introduction:

India is still an agricultural economy where more than half of the population is dependent on agriculture. Though the share of agriculture in national income has been decreasing continuously, agriculture continues to be the largest source of employment and livelihood(55.3 per cent of the households in India are dependent on livelihood as per the 68th round of NSSO 2014 data). According to the Census 2011, it provides employment to 54.9 per cent of total workforce in the country(GOI, 2018), raw material for a large number of industries, and contributes 12.55 per cent in national exports (2015-16). Besides it is a significant, if not the sole, source of livelihood for the small land holders (<2 ha) who comprise about 85 per cent of the total number of farm holders during 2010-11 (GOI, 2018). Therefore, prosperity of the rural economy is closely linked to growth of agriculture and allied activities (Kalamkar, 2011, 2011a; 2011b). The agricultural development is important not only because of its highpotential to raise the income and employment to rural masses but also due to its capacity to provide food, raw material and ever expanding market for industrial goods for speedy development of overall economy (Kalamkar 2003, 2011a). Growth of agriculture has a significant bearing on food and overall inflation, macroeconomic stability, trade and commerce, and industrial activity (Chand and Parappurathu, 2012). Besides, agricultural growth is also found to be more pro-poor (Xavier et al. 2001; Christiensen et al. 2006; Douglas 2009; Cerventes and Dewbre 2010; Dewbre et al. 2011; Sharma and Kumar 2011; Grewal et al. 2012) and therefore it helps to eradicate rural poverty (Ravallion and Datt 1996; Datt and Ravallion 1998; Virmani 2008) as envisaged in the Sustainable Development Goals (Bisen and Kumar, 2018). While the future of India's food security rests on small farms, the land-based livelihoods are becoming untenable for the majority of smallholders not only because of their limited scale but also due to a number of constraints. Such constraints include, poor access to markets, inputs, technologies, information and services, among others in their endeavour to enhance farm incomes. Therefore, decent agricultural growth is a pre-requisite for providing food and nutrition security to burgeoning population of more than 1.3 billion in the country as well as to reduce poverty and hunger.

Food and nutrition security has remained one of the top priorities of policy planners in post-Independence India. In the 1960s, food shortages and foreign-exchange shortages led to major political challenges after the United States decided to use food exports as an instrument of foreign policy (Birner *et al.,* 2011). As a consequence, the Government of India (GOI) adopted policies that aimed at making the country self sufficient in food grains production (Subramaniam, 1995). Since independence, major strides have been made in production of food grains, not only due to increase in area but also due to technological development in agriculture. As a result, the food grains production increased from 50.82 million tonnes in 1950-51 to 257.44 million tonnes in 2011-12 (GOI, 2018). It has set new milestones in its progress. India made significant advances towards achieving its goals of rapid agricultural growth, improving food security, and reducing rural poverty during the last six decades. After self sufficiency in food grains was met, the policy makers realized the need for diversification of agriculture to achieve higher growth rates. It also wanted to address the changing consumption pattern of the population which was experiencing urbanization and rising per capita incomes. Thus dairy, horticulture, poultry and other allied sectors were given impetus and were being promoted through various policy measures. Policy support, production strategies, public investment in infrastructure, research and extension for crops, livestock and fisheries have significantly helped in increasing the agricultural productivity (Kumar and Mittal, 2006) and improvement in performance of agriculture (Chand and Srivastva, 2016).These policies were immensely successful and by the mid-seventies, India had become virtually self-sufficient in production of food grains along-with impressive gains in the production of milk and sugar. India now ranks first in the world in production of pulses and milk, second in wheat, rice, groundnut, sugarcane, cotton, fruits and vegetables and third in production of total cereals, rapeseed, tea and eggs (GOI, 2018). This increased production has brought in its wake new challenges to handle in terms of huge marketable surplus. However, agricultural marketing did not receive the required and adequate attention during these years. The National Farmers Commission 2004(http://pib.nic.in) recommended that a regulated market should be available to farmers within a radius of 5 Km (corresponding market area of about 80 square km.). However, presently all-India average area served by a regulated market is 487.40 square km. The number of commodity specific markets with requisite infrastructure is also limited. The post-harvest management and development of

efficient markets and supply chains have largely been neglected in policymaking. Besides, existing agricultural marketing system suffers from inefficiency, disconnect between prices received by producers and the prices paid by consumers, fragmented marketing channels, poor infrastructure & policy distortions (Chand, 2012).

Marketing of agricultural produce serves as a link between the farm sector on one hand and other sectors on the other hand. An efficient marketing system helps in the optimization of resource use, output management, increase in farm incomes, widening of markets, growth of agro-based industry and addition to national income through value addition and employment creation (Acharya & Agrawal, 2004; Acharya, 2006). The current agricultural marketing system in the country is the outcome of several years of Government intervention. The system has undergone several changes during the last 60 years owing to the increased marketed surplus; increase in urbanization and income levels. Consequent changes in the pattern of demand for marketing services, increase in linkages with distant and overseas markets; and changes in the form and degree of government intervention is witnessed (details in Chapter II).

NABARD (2018) findings reflect that for all rural households combined, the average monthly income stood at Rs. 8059/- only, with that being higher for agricultural households (Rs. 8931) as compared to non-agricultural ones (Rs. 7269). Itindicates alarmingly low income levels. Agriculture needs to be made more profitable, attractive and enterprising so that the rural to urban migration is reduced and farmers take pride in their profession. Recent efforts to improve farmers' income have been focused on raising Minimum Support Prices (MSPs). Historical evidence shows that MSP does not directly translate into higher income for farmers due to a deficient and ineffective implementation framework. Additionally, high MSPs result in market distortions and render Indian exports uncompetitive in world markets. Realising the need to pay special attention to the plight of the farmers, Union Government changed the name of Ministry of Agriculture to Ministry of Agriculture and Farmers' Welfare in 2015. Further, goal was set to double farmers' income by 2022-23 to promote farmers' welfare, reduce agrarian distress and bring parity between income of farmers and those working in non-agricultural professions (Chand, 2017). One of the important ways to achieve the GOI's goal of doubling the farmers' income by the year 2022 is through better price realisation for their harvest. This can be achieved through upgrading traditional agricultural produce market to electronic

markets (Chand, 2016; Acharya, et al., 2012; Athawale, 2014; Reddy, 2016). The current policy focus on doubling farmers' income can also achieve its desired objectives only by improving and vastly redesigning the existing marketing system in the country (Sekhar, 2017).

1.2 Importance of and Problems in Marketing of Agricultural Produce:

The issue of ensuring food and nutritional security for the masses has occupied a central place in recent policy debates in India. Rural poverty and food insecurity at household level remain pronounced, despite pervasive government interventions in agricultural markets. Apart from these internal challenges, farmers face the challenges from the rapid changes in the international trade and economic environment. Economies are now more interdependent, and a recession or boom in one country can affect others, sometimes profoundly (Kalamkar, 2009, 2011, 2011b). Some of the studies contested the role of regulation in agricultural marketing in the economic development (Pal et al. 1993; GOI 2001; Gujral et al. 2011; Minten et al. 2012). However, Purohit et al. (2017) found positive effect of market regulations on agricultural growth, technology adoption, area expansion, fertilizer use and irrigated area. Thus, assured and remunerative marketing opportunities hold the key to continued progress in agriculture and enhancing farm productivity and profitability. Several significant market reforms have already been initiated by the Central and the State governments (discussed in Chapter III). These reforms provide more options to farmers for selling their produce, allowing the private sector, including cooperatives, to develop markets, promote direct sales to consumers, processors and retail chain suppliers / exporters and restrict corruption and harassment. However, still the markets are not that efficient as should have been.

Agricultural marketing in India suffers from inefficiency, a disconnect between the prices received by producers and the prices paid by consumers, fragmented marketing channels, poor infrastructure and policy distortions (Chand, 2012). The spread and success of the green revolution during the 1970s and 1980s led to an increase in the political power of the farming class and their clout in policy making. This was reflected in the creation and strengthening of farmer-friendly institutions and a policy environment favorable to farmers. Marketing institutions like market committees, state level marketing boards and many others in the public and cooperative sectors served the interests of the farming community. However, over the period of time after achieving self sufficiency in food grains, public policy began losing

its focus and targets. The marketing system and marketing institutions were plagued by inefficiencies, bureaucratic control, and politicization.

Noticeably, a significant increase in total number of regulated markets in India was observed (i.e. 3528 in 1976 to 7246 in 2011).The growth of market facilities did not keep pace with the growth in market arrivals, forcing producers to seek help from middlemen (Chand, 2012).There were in all 7246 regulated markets in the country (as on 30.06.2011) and 21238 rural periodic markets, about 20 percent of which, function under the ambit of regulations (Table 1.1). Actual buying and selling of commodities mainly take place in market yards, sub-yards and rural periodic markets. Though there is significant expansion in the number of regulated markets, the area served per market yard is quite high. The farmers are, therefore, required to travel long distances to reach a market place. Between 1976 to 1991, the total number of regulated markets in the country increased from 3528 to 6217, a 76 percent increase over 15 years, while agricultural production increased by 74 percent. However, after 1991, the number of regulated markets grew only 22 percent in 17 years till 2008, while volume of production increased by 70 percent. Thus marketing infrastructure did not grow with the same pace as the output, which resulted in crowdedness, putting sellers in a disadvantaged position and providing advantages to middlemen. Moreover, with small surplus to sell, most of the farmers try to evade these markets (Chand, 2012).Also, there are several regulatory measures that hamper efficient functioning of the domestic market for agricultural commodities and adversely affect both the growers and the consumers (Acharya, 1998). These include levy on rice millers; statutory rationing of rice and wheat in Calcutta; monopoly procurement of raw cotton in Maharashtra; levy on sugar mills, and system of state advised prices of sugarcane prevalent in some states.

The supply chain of agriculture produce also remains very fragmented with a large number of intermediaries. Despite significant increase in quantity of marketed surplus and increase in market income through market fee charged, there has been huge gap in marketing infrastructure. Due to the glaring gaps in marketing infrastructure, existing markets operate very inefficiently and the transaction costs are high. It is reported that one third of regulated markets in the country do not have a common auction platform. The infrastructure for marketing perishables like fruits and vegetables which require special facilities for storage and processing are very inadequate (Planning Commission, 2007). Multiple handling by various players in the

fragmented supply chain and the lack of warehouse and cold storage facilities also result in high post-harvest losses. Rural periodic markets which are basically primary assembly markets such as *Haat, Bazzar* are most neglected. There is wide variation in their governance. Most of them do not have even basic amenities. Also marketing system suffers from multiple tax regimes and multiple licensing systems.

Table 1.1: Number of Wholesale, Rural Primary and Regulated Markets in India (as on 31.03.2011)

State/ U.TS	Number of Markets			Regulated Markets			Area covered - sq. kms/market	Require-ment of Markets	Population Served by each Market
	Whole - Sale	Rural Primary	Total	Principal	Submarket Yards	Total			
Andhra Pradesh	329	576	905	329	576	905	303.92	3501	84210
Arunachal Pradesh	6	63	69	16	113	129	1213.67	1066	8511
Assam	405	735	1140	20	206	226	347.07	998	117945
Bihar *	325	1469	1794	* APMR Act Repealed			0	1198	
Jharkhand	205	603	808	28	173	201	396.59	1015	134059
Goa	4	24	28	1	7	8	462.75	47	168459
Gujarat	207	129	336	196	218	414	473.49	2495	122394
Haryana	284	189	473	106	178	284	155.68	563	74453
Himachal	42	35	77	10	38	48	1184.53	709	126623
J & K	26	8	34	APMR Act not implemented			0	2829	
Karnataka	504	730	1234	152	352	504	382.82	2441	104862
Kerala	348	1014	1362	APMR Act not implemented			0	495	
Madhya Pradesh	241	1321	1562	241	276	517	601.06	3924	116799
Chhattisgarh	2	1132	1134	73	112	185	734.24	1721	112615
Maharashtra	880	3500	4380	299	581	880	349.65	3916	110089
Manipur	20	98	118	APMR Act not implemented			0	284	
Meghalaya	35	84	119	2	-	2	11214.5	285	1159411
Mizoram	10	105	115	APMR Act not implemented			0	268	
Nagaland	19	174	193	18	Nil	------	0	211	
Orissa	398	1150	1548	45	269	314	495.88	1982	117212
Punjab	488	115	603	139	349	488	103.2	641	49916
Rajasthan	**431**	**312**	**743**	**129**	**302**	**431**	**795.9**	**4356**	**131107**
Sikkim	7	12	19	1	-	1	7096	90	56473122
Tamil Nadu	300	677	977	277	15	292	445.4	1655	213718
Tripura	84	554	638	21	-	21	499.33	133	152343
Uttar Pradesh	584	3464	4048	249	356	605	394.32	3036	274707
Uttarakhand	36	30	66	25	33	58	962.84	711	146368
West Bengal	279	2925	3204	43	641	684	129.19	1130	117282
A & N Island	0	0	0	APMR Act not implemented			0	105	
Chandigarh	1	0	1	1	-	1	114	1	900914
D & N Haveli	0	8	8	APMR Act not implemented			0	6	
Daman & Diu	0	2	2	Reported Nil		0	0	1	
Delhi	30	0	30	8	13	21	70.62	19	659548
Lakshadweep	0	0	0	APMR Act not implemented			0	0	
Puducherry	9	0	9	4	5	9	54.67	6	108261
Total	**6539**	**21238**	**27777**	**2433**	**4813**	**7246**	**28982.67**	**41838**	**149717**

Notes: - * Bihar Agril. Produce Marketing (Regulation) Act Repealed from 1st September, 2006. In West Bengal sub yards include cold storages and hence figures of total regulated markets and wholesale markets are not comparable. All principal regulated markets are wholesale markets, whereas sub market yards may / may not be a wholesale market as it also includes some of Rural Primary Markets notified for regulation.
Source: http://agmarknet.nic.in

The Working Group on Agricultural Marketing for the XII FYP noted that there has been virtually no progress in setting wholesale markets (except Kerala) and highlighted the gaps in the marketing infrastructure (Planning Commission, 2011). . Like, out of 7246 regulated markets in India, grading units are found in less than 20 percent of the market yards/sub-yards; only around 7 percent of the total quantity

sold by farmers is graded before sale;the scientific storage capacity is only 30 percent of what is required; and cold storage facilities are available for only 10 percent of fruits and vegetables.

1.3 Penetration of the Market (Marketed Surplus):

Indian agriculture has become increasingly market-oriented and commercialized. During the last six decades of planned development in India, there has been continuous increase in Marketed Surplus Ratio (MSR) for all important non-cash crops like rice, wheat and maize, and cash crops like sugarcane, cotton and jute (see, Table 1.2). Particularly, the ratio of marketed surplus in case of rice and wheat have gone up from 30 percent each in 1950-51 to 81.51 and 77.49 percent in 2012-13, respectively. The increase was more significant in maize (from 24 per cent to 84.32 percent) followed by jowar (24 per cent to 64.14 percent) during corresponding period. In the early 1950s, about 30-35% of food grains output was marketed, which increased to more than 70% in recent years (Sharma and Wardhan, 2015). While MSR was much lower for wheat and coarse cereals in Gujarat as compared to national average in 2012-13.

Table 1.2: Growth in Marketed Surplus Ratio of Important Agricultural Commodities in India

Crop Group /Crops	MSR (% to total production)- All India							
	1950-51	2005-06	2006-07	2007-08	2008-09	2010-11	2011-12	2012-13
1. Rice	30.0	71.25	79.17	78.61	75.55	80.65	77.20	81.51
2. Wheat	30.0	54.90	66.09	61.87	70.87	73.20	70.00	77.49
3. Maize	24.0	80.01	78.56	82.87	85.52	86.00	83.32	84.32
4.Jowar	24.0	46.25	61.02	61.47	54.60	62.03	53.46	64.14
5. Bajra	27.0	61.44	72.21	61.78	57.78	67.38	67.48	76.77
6. Barley	n.a.	11.72	58.85	71.91	53.12	73.81	59.78	67.39
7. Ragi	n.a.	n.a.	27.58	22.17	20.11	25.73	53.25	29.63
8. Arhar	50.0	73.29	83.61	79.15	75.40	73.82	81.45	84.33
9. Gram	35.0	74.06	76.81	90.81	74.15	86.58	85.25	83.67
10. Urad	n.a.	75.55	78.40	80.06	60.78	63.61	70.04	77.76
11. Moong	n.a.	77.69	80.26	84.37	82.48	81.54	87.32	85.55
12. Lentil	55.0	68.73	79.03	85.66	73.38	77.91	88.14	88.75
13. Groundnut	68.3	85.88	91.60	88.61	91.76	93.36	90.78	93.54
14. R & Mustard	84.3	80.20	87.72	95.44	89.37	82.14	82.08	90.41
15. Soyabean	n.a.	93.89	95.79	96.35	77.26	95.69	94.41	95.32
16. Sunflower	n.a.	76.86	97.18	96.44	65.18	99.58	65.62	99.18
17. Sesamum	n.a.	87.48	91.28	85.98	83.66	83.18	92.79	89.00
18. Safflower	n.a.	98.22	46.67	100.0	72.65	55.12	-	-
19. Nigerseed	n.a.	92.52	73.58	97.13	94.51	83.66	94.67	97.67
20. Sugarcane	100.0	99.85	100.00	100.0	100.0	78.92	78.02	77.84
21. Cotton	100.0	96.91	96.23	96.15	97.72	99.79	98.36	99.41
22. Jute	100.0	76.80	97.35	83.01	85.72	99.43	83.50	100.00
23. Onion	n.a.	99.46	99.62	99.46	98.17	97.25	75.36	99.23
24. Potato	n.a.	82.52	80.19	63.98	81.60	81.04	77.40	86.17

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

As volume of marketed surplus affects the supplies of food for the non-farm population, increasing trend in marketed surplus lowers the pressure related to basic

food items. Thus massive increase in the marketed surplus ratio for key crops indicates an increasing penetration of the market over the last six decades. While, most of the marketed surplus is accounted by the large landholders, in relative terms even the smallest landholders sell a non-negligible share of their output (Basole and Basu, 2011). Thus almost half of the produce is being retained by the landless and marginal farmers for their family consumption and they sell the other half. At the same time, there are huge post-harvest losses (10-25% for perishables like milk, meat, fish and eggs). The estimated losses in fruits and vegetables are even higher (30-40%). These adversely affect the Indian economy (Hegazy 2013). Another estimate indicates an annual loss of Rs. 92,651 crores (Jha et al. 2015). The loss is almost three times as high as the budget for agriculture sector in 2016-17 (Molony, 2016).

In view of the existing conditions as mentioned above, vital steps need to be taken to ensure that the farmers get higher realization without putting additional burden on consumers. Agricultural marketing is a state subject.However, many states are either slow or reluctant to implement various reforms and legislations related to marketing, even though they are considered necessary for developing the market, trade and for improving the welfare of producers and consumers. Some experts suggest moving agricultural marketing to the concurrent list, so that the required changes can be implemented quickly & smoothly (Chand, 2012).

1.4Recent Agricultural Marketing Reforms in India[1] (eNAM)

Agricultural marketing is governed by the Agricultural Produce Marketing (Regulation) Act (APMRA), which are administered by respective State Governments. Under this system, a vast network of regulated markets have been established. The central government has intervened in the agricultural marketing from time to time to strengthen the system in the country. Over time, these markets have become restrictive and monopolistic. They have failed not only to achieve their basic objectives owing to restrictive provisions of Acts but have also prevented a seamless integration of farmers and buyers through an efficient supply chain. Some of the major problems with the current system include,insufficient number of APMC markets and their inadequate infrastructure, limited access to market for (small) farmers, less remuneration to the farmers and high intermediation cost, lack of market information /information asymmetry, need to physically bring the produce to mandi, high

[1] for details, see Chapter III.

incidence of market fee/ charges, fragmentation of markets, requirement of multiple licenses for trading, multiple point levy of market fee, existence of opaque/ semi-transparent processes of bidding and lack of emergence of alternative channels of marketing. Some state governments have evolved various reforms in their marketing sector to meet the challenges. In order to keep pace with the changing production pattern and growing marketable surplus, the Government advocates development of adequate number of markets equipped with modern infrastructure, with increased private sector participation and development of other marketing channels like direct marketing, contract farming, etc. The Government is actively pursuing states to amend their marketing laws to provide suitable legal framework and policy atmosphere to facilitate such developments. The reform[2] agenda of the Government focuses on seven vital areas for reforms (Table 1.3).

Table 1.3: Status of Marketing Reforms with reference to seven key areas vis-a-vis Model APMC Act as updated on 25/02/2016.

Sl	Area of Reforms	States that adopted the suggested area of marketing reforms
1.	Establishment of private market yards/ private markets managed by a person other than a market committee.	Andhra Pradesh, Arunachal Pradesh, Assam, Chhattisgarh, Gujarat, Goa, Himachal Pradesh, Karnataka, Maharashtra, Mizoram, Nagaland, Orissa (excluding for paddy / rice), Rajasthan, Sikkim, Telangana, Tripura, Punjab, UT of Chandigarh, Jharkhand, Uttarakhand, West Bengal
2.	Establishment of direct purchase of agricultural produce from agriculturist (Direct Purchasing from producer)	Andhra Pradesh, Arunachal Pradesh, Assam, Chhattisgarh, Gujarat, Goa, Haryana (for specified crop through establishment of Collection Centres) Himachal Pradesh, Karnataka, Madhya Pradesh, Maharashtra, Mizoram, Nagaland, Rajasthan, Sikkim, Telangana, Tripura, Punjab (only in Rule), UT of Chandigarh (only in Rule),Jharkhand, Uttarakhand and West Bengal U.P. (Only for bulk purchase under executive order issued time to time)
3.	To promote and permit e-trading,	Andhra Pradesh, Chhattisgarh, Gujarat, Jharkhand, Haryana, H.P., Karnataka, Rajasthan, Sikkim, Goa, Madhya Pradesh, Maharashtra (has granted license to Commodity Exchanges registered under FMC), Mizoram, Telangana, Uttarakhnad .
4.	Establishment of farmers/ consumers market managed by a person other than a market committee (Direct sale by the producer)	Arunachal Pradesh, Assam, Chhattisgarh, Gujarat, Goa, Himachal Pradesh, Karnataka, Maharashtra, Mizoram, Nagaland, Rajasthan, Sikkim, Tripura, Jharkhand, Uttarakhand and West Bengal.
5.	Contract Farming Sponsor shall register himself with the Marketing Committee or with a prescribed officer in such a manner as may be prescribed.	Andhra Pradesh, Arunachal Pradesh, Assam, Chhattisgarh, Goa, Gujarat, Haryana Himachal Pradesh, Jharkhand, Karnataka, Maharashtra, Madhya Pradesh, Mizoram, Nagaland, Orissa, Punjab (separate Act), Rajasthan, Sikkim, Telangana, Tripura, Uttarakhand.
6.	Single point levy of market fee	Andhra Pradesh, Rajasthan, Gujarat (for processor, grader, packer, value addition and exporter), Goa, Himachal Pradesh, Chhattisgarh, Karnataka, Madhya Pradesh, Nagaland, Jharkhand, Sikkim, UT of Chandigarh, Punjab, Mizoram, Telangana, Uttar Pradesh and Uttarakhand.
7	Single registration/ license for trade/ transaction in more than one market	Andhra Pradesh, Goa, Gujarat, Haryana, Himachal Pradesh, Karnataka (in Rules only), Rajasthan, Chhattisgarh Madhya Pradesh, Maharashtra, Mizoram Nagaland, Telangana (in Rules only), Sikkim .

Source: http://pib.nic.in/newsite/PrintRelease.aspx?relid=137359

[2] In 2003, the Department of Agriculture, Cooperation & Farmers' Welfare (DAC&FW) formulated a Model Agricultural Produce Marketing (Development and Regulation) Act, followed by Model Rules 2007 for the States/UTs to adopt. The unified National Agricultural Market and the model APLM Act, 2017 are the precursors to further reforms in the agricultural marketing system.

However, many states carried out partial reforms only, on a pick-and-choose basis, thereby defeating the objective of creating a uniform trade environment across the country. However, in some states some alternative marketing systems (direct marketing, contract farming, private market, organised retail, producers' organisation, cooperatives in marketing, food processing, etc) have developed. Further, as a part of reforms and realizing the urgent need to address the challenges of the existing agricultural marketing system, the Union Government introduced a 'Central Sector Scheme for Promotion of National Agriculture Market' through Agritech Infrastructure Fund. It had a budget allocation of Rs. 200 crore on 1 July 2015. It provided a common electronic market platform, called the electronic National Agricultural Market or e-NAM. The scheme entails setting up a common e-platform in 585 selected wholesale regulated markets across the country by March 2018. The central government provides the software free of cost to the states along with Rs. 30 lakh per selected mandi for setting up the hardware and related equipment/infrastructure. The e-NAM aims to integrate all the agricultural markets of the country and envisages a common national market for agricultural commodities with seamless movement across state boundaries. This is envisioned as a solution to marketing issues of all stake holders - farmers, traders, retailers, consumers and logistic providers. The e-NAM Portal provides a single window service for all APMC related information and services, including commodity arrivals, prices, bids and offers. Some of the expected benefits from e-NAM include accessibility of farmers to a common agriculture market; real time price discovery; transparency in the agriculture marketing system; reduces the transaction costs of buyers and sellers; real time information on prices, market arrivals etc; bidding on quality parameters of commodities; online bidding for more transparency; online payment system to reduce the payment risk and ensure timely payments to farmers, cleaning, sorting, grading and weighing facilities and additional services such as soil testing laboratories at the e-NAM. Small Farmers' Agribusiness Consortium (SFAC) is designated as Lead Agency, to roll out the e-NAM in partnership with a Strategic Partner (SP), which will be responsible for developing, running and maintaining the proposed e-marketing platform. The features of eNAM are as mentioned below:

a) A National e-market platform for transparent sale transactions and price discovery in regulated markets, kisan mandis, warehouses and private markets. Willing states to accordingly enact provision for e-trading in their APMC Act.

b) Liberal Licensing of traders / buyers and commission agents by state authorities without any pre-condition of physical presence or possession of shop / premises in the market yard.
c) One license for a trader valid across all markets in the state.
d) Harmonization of quality standards of agricultural produce and provisions of assaying (quality testing) infrastructure in every market to enable informed bidding by buyers.
e) Restriction of APMC jurisdiction upto the APMC market yard / sub yard instead of a geographical area (the market area) at present.
f) Single point levy of market fees i.e. on the first wholesale purchase from the farmer.

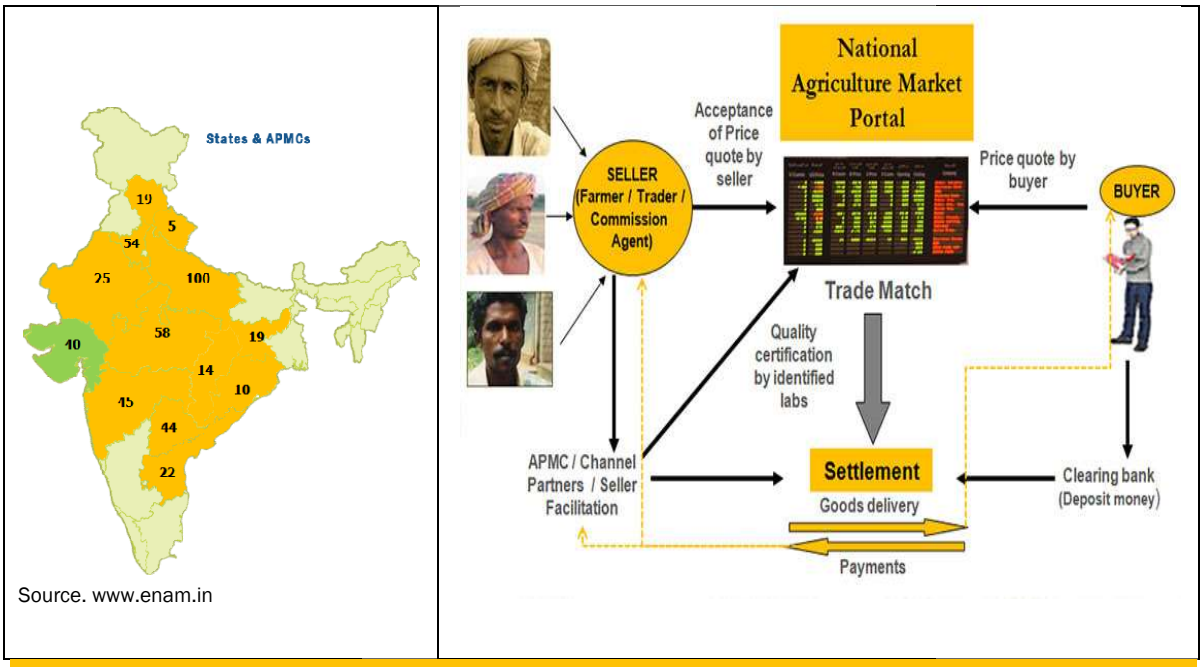
In order to facilitate both - unification of market and online trading, it is necessary for the states to undertake reforms prior to seeking assistance under the scheme in respect of (i) a single license to be valid across the State, (ii) single point levy of market fee and (iii) provision for electronic auction as a mode for price discovery. Only those States/UTs that have completed these three pre-requisites are eligible for assistance under the scheme. The States must ensure that the reforms are carried out both in letter and spirit through appropriate and unambiguous provisions in the APMC Acts and rules. Besides the State Marketing Boards/APMCs must enable the promotion of the e-auction platform. The States will need to ensure that the mandis that are integrated with NAM make provision for requisite online connectivity, hardware and assaying equipments.

1.5 Progress of e-NAM in India

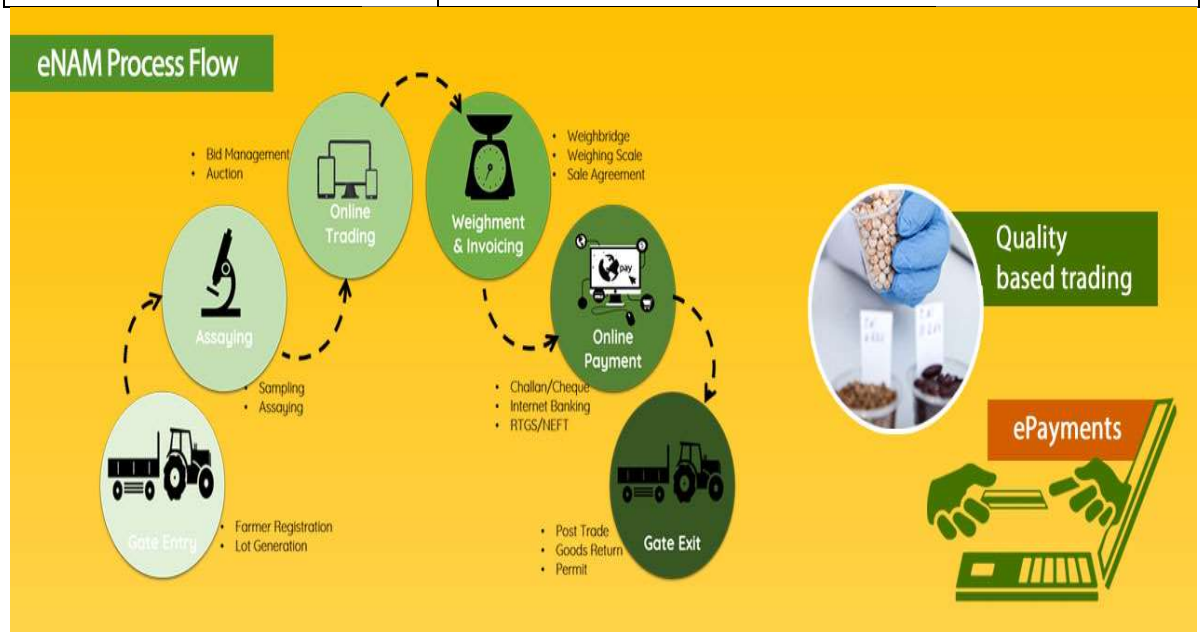
It was reported/ uploaded on the website of eNAM that as of October 31, 2017, out of 585 targeted markets, 470 regulated markets from 14 states were live on e-NAM. The target of bringing 455 mandis online by May 2017 was achieved and it was reported that total 5076501 farmers and 96118 buyers were registered on e-NAM portal with a turnover of Rs. 31424.04 crore from the trading of 11371.72 tonne produce covering about 90 commodities including vegetables. The state-wise coverage of markets under eNAM completed as per phase II indicate that highest number of markets selected are in the state of Uttar Pradesh (100) followed by Madhya Pradesh (58), Haryana (54), Maharashtra (45), Telangana (44), Gujarat (40), Rajasthan (25), Andhra Pradesh (22), Himachal Pradesh (19), Jharkhand (19),

Chhattisgarh (14), Odisha (10) and Uttarakhand (5).The coverage and pictorial depiction of process of eNAM is presented in Fig. 1.1.

Fig. 1.1: Coverage and process of eNAM Portal



Source. www.enam.in



Source. www.enam.in

The number of stakeholders in e-NAM in India as on July 2017 is presented in Table 1.4. However, this number is unsatisfactory, given that there are more than 13.8 crore farmers in India. There are about 2477 principal regulated markets based on geography (the APMCs) and 4843 sub-market yards regulated by the respective APMCs in India. The six major states with the most mandis under eNAM are Uttar Pradesh, Madhya Pradesh, Haryana, Maharashtra, Telangana and Gujarat. They

collectively accounted for three fourth of target achieved.Even in these states, the markets remain isolated, with traders from outside the APMC not being able to buy farmers' produce from the mandi and buyers having to physically inspect quality of produce due to absence of required infrastructure.

Table 1.4: Number of Stakeholders of e-NAM in India as on July 2017

Sl.	States	Buyers	Commission Agent	Service providers	Sellers
1	Andhra Pradesh	2360	2209	0	174395
2	Chhattisgarh	2735	213	0	55047
3	Gujarat	7530	5229	0	371851
4	Haryana	7941	18773	0	1669691
5	Himachal Pradesh	1852	1083	0	48213
6	Jharkhand	1151	1	0	5466
7	Madhya Pradesh	18686	0	1	236734
8	Maharashtra	7415	6861	0	158016
9	Odisha	656	0	0	29245
10	Rajasthan	11389	4920	0	294426
11	Tamilnadu	767	0	0	4080
12	Telangana	5107	3854	0	758863
13	Uttar Pradesh	30538	8266	2	2497010
14	Uttarakhand	1623	1343	0	6465
	Total	99,750	52,752	3	63,09,502

Source. www.enam.in

1.6 Brief Review of Literature:

The brief review of literature is presented here in order to get an overview about the views and observations along with the suggestions of the researchers on theimplementation of eNAM policy of the Government of India.

There are a good number of studies evaluating the implementation of e-NAM as well as e-tendering of agricultural commodities, mode of operation and benefits to various stakeholders in the marketing of agricultural produce (Dey 2015; Chand 2016; Dey 2016; Sharma 2017; Mustaqquim 2017; NIAM 2017; Nirmal 2017; Mishra & Mishra2017; Roy et al. 2017; Narayanmoorthy & Palli, 2018). Some of the studies have focused on constraints faced in implementation of e-NAM across various states (Chengappa et al. 2012; Sharma, 2016; Agarwal et al. 2016 &2017; NIAM 2017; Roy et al. 2017, Kalamkar, 2017). Table 1.5presents above-mentioned studies in brief along withtheir perception about e-NAM (Bisen & Kumar, 2018).

Table 1.5: List of Studies on e-auctioning/e-tendering/e-NAM

Sr No	Attributes which e-auctioning/ e-tendering/ e-NAM will advocate	Author(s)
1	Increased marketing efficiency.	Chengappa et al. 2012
2	Increased competitiveness	Chengappa et al. 2012; NIAM 2015; Mustaqquim 2107; Mishra & Mishra2017; Pavithra et al. 2018
3	Improved transparency in marketing system	Chengappa et al. 2012; NIAM 2015; Mustaqquim 2107; Nirmal 2017; Pavithra etal.2018
4	Increased financial literacy of farmers	Dey2015
5	Reduced transaction cost	Dey 2015; SFAC 2015; Mustaqquim 2017
6	Increased market integration	NIAM 2015; SFAC 2015; Mustaqquim2017; Krishna 2017
7	Increased net returns to farmers	NIAM 2015; Mustaqquim 2017; Roy et al. 2017
8	Infrastructural, social and technological improvisation of markets	NIAM; Dey 2016; Nirmal 2017
9	Reduced wastage and final consumers price	SFAC 2015
10	Reduced market imperfection	Chand2016
11	Increased market driven diversification	Chand 2016
12	Reduced dependency of farmers on MSP and public procurement	Chand 2016
13	Real time and broad-based price dissemination	Dey 2016; Chand 2016 ,
14	Single licensing	Dey 2016; Chand 2016
15	Single point levy	Dey 2016; Chand 2016
16	Reduced market intermediaries	Sharma 2016
17	IT based/digital upgrading of markets	Sharma 2016
18	Reduced monopoly of traders	Mishra & Mishra 2017
19	Increased trade expansion	Roy et al. 2017
20	Reduced transaction time and increased market revenue	Pavithra et al. 2018
21	Infrastructure Institution and Awareness constraints	Kalamkar 2017, Kumar et al (2018)
22	Suggested Smart Micro-Mandi	Kumar et al (2018)

Source: Bisen and Kumar (2018).

In a study(Chand and Singh 2016), NITI Ayog has highlighted the preparedness of states on three pre-requisites for e-NAM viz. single point levy in the market, single trading licence and provision of e-trading by the legal means i.e. either by provision of these in their acts or by notifying these pre-requisites. The results indicated that Andhra Pradesh, Goa, Gujarat, Haryana, Himachal Pradesh, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan and Tamil Nadu have completely adopted these; while Chhattisgarh, Jharkhand, Mizoram, Punjab and Chandigarh have partially adopted, and other states have not adopted these. However, states and union territories, for example Bihar, Kerala, Andaman and Nicobar, Dadra and Nagar Haveli, Daman and Diu and Lakshadweep do not have APMC Act while Sikkim, Arunachal Pradesh and Mizoram have non-functional APMCs.

Kumar et al *(2017)* examined the readiness of the APMC Mandis for implementation of e-NAM, awareness of different stakeholders about e-NAM, level of farmers' participation and estimated the benefits from this structural change in selected markets of Telangana and Madhya Pradesh. Authors noted that in Telangana, less than 50% farmers are aware about e-NAM in all the selected markets, while none of the farmers in the selected markets of MP were aware about e-NAM. The assaying and SMS services are not implemented in any of the selected markets, creating major hurdles in implementation of e-NAM. The farmers were sceptical regarding the process under electronic platform as bidding does not take place in front of them and farmers still prefer to sell through the middleman in the market as they get many services from them viz. input credit, financial contingencies, lodging and boarding facility in the *mandi* during sale of produce.

Bisen and Kumar (2018) attempted to systematically review different studies regarding the important marketing reforms in the country and the benefits and challenges of e-tendering/e-auctioning in agriculture. He further suggested solutions to strengthen e-NAM for dissemination of its anticipated benefits in inclusive manner and efficiently. The study is primarily based on qualitative systematic review of literature regarding agricultural marketing developments in India and how these developments are significant to address the challenges of poverty reduction. Authors noted that fragmented agricultural markets make a perfect case for a unified platform like National Agricultural Market (NAM). Although facing initial hiccups for successful implementation and lesser density of e-NAM across the existing wholesale regulated markets, there is tremendous scope for its further expansion and modernization. The common agricultural platform integrated with modem technologies will be an important catalyst to ensure best prices for their produce to the producers and will also ensure a variety of quality products to the consumers. The expansion in the volume of trade in e-NAM platform will follow the strengthened back-end infrastructure for complete value chain of produce. Therefore, efforts must also be channelized towards development and up gradation of scientific warehouses, cold storage, refrigerated vans for perishables, awareness and training to the participants in the marketing process, high speed internet connectivity to the markets and among different components of the market. The benefits of e- NAM would be visible once it is implemented fully in letter and spirit, and as it has been conceptualized.

Kumar et al (2018) proposed new conceptual framework for the new market model i.e. Smart Micro-Mandi (SMM), which envisages combination of E-NAM platform, strength of JAM (Jan Dhan account, Aadhar & Mobile) and application of modern technology like, sophisticated camera & sensors, artificial intelligence (AI) and Internet of Things (IoT). Authors argue that such mandi would be agnostic to land-size. It has capability to offer multiple benefits to the farmers by compressing the value chain, minimizing role of middlemen, efficient price discovery, and most importantly reversing the market risks for the smallholders.

NCDFI (2018) has started such initiative known as NCDFI eMarket since June 10, 2015 which combines the trust and patronage of dairy cooperatives throughout the country with state-of-the-art technology and efficient business development practices to offer an efficient marketplace for bulk trading. At present, NCDFI eMarket has a membership of 703 out of which 39 are cooperatives. Cooperatives and producer companies are allowed to buy and sell through the portal whereas private parties are only allowed to buy but not sell their products. The sellers (Cooperatives) & Bidders (Cooperatives & Private) get registered with NCDFI before participating in the auctions at e-market portal.

1.7 Need of the Study:

Some of the expected benefits from e-NAM include National common agriculture market accessibility by farmers; real time price discovery; transparency in the agriculture marketing system; reduction in the transaction costs for buyers and sellers; real time information on prices, market arrivals; bidding on quality parameters of commodities; online bidding for more transparency; online payment system to reduce the payment risk, ensure timely payments to farmers, cleaning, sorting, grading and weighing facilities, besides additional services such as soil testing laboratories at e-NAM. It was felt important to assess the extent of implementation and benefits derived from eNAM in the state of Gujarat. Therefore, our centre was entrusted to conduct the current study by the Ministry of Agriculture and Farmers Welfare, GOI.

1.8 Objectives of the Study:

The specific objectives of the study are:

1) To study the extent of operation, adoption and functioning of e-NAM in some of the major markets of the state of Gujarat
2) To analyze the improvements in price-discovery, quantity traded and marketing cost, among other things due to e-NAM
3) To assess the functioning of the assaying laboratories at the e-NAMs and acceptability of quality parameters to various stakeholders
4) To analyze the infrastructure facilities at the e-NAMs for cleaning, sorting, grading and weighing of commodities
5) To assess the overall impact on the ease of doing business

1.9 Data and Methodology:

1.9.1 Data Sources

The study is based on both primary and secondary level data. The secondary data on market, marketed surplus, eNAM coverage and activities and related information were collected from the government publications, research papers/reports and various websites. Primary data was collected by using a pilot-tested structured interview schedule canvassed in 2017over a sample farmers, commission agents and APMCs' office bearers during Phase I of this study in selected two APMCs of Gujarat, viz. Petlad (Anand) and Ahmedabad. In Phase II the study was extended further to include larger number of APMCs in various districts of Gujarat.

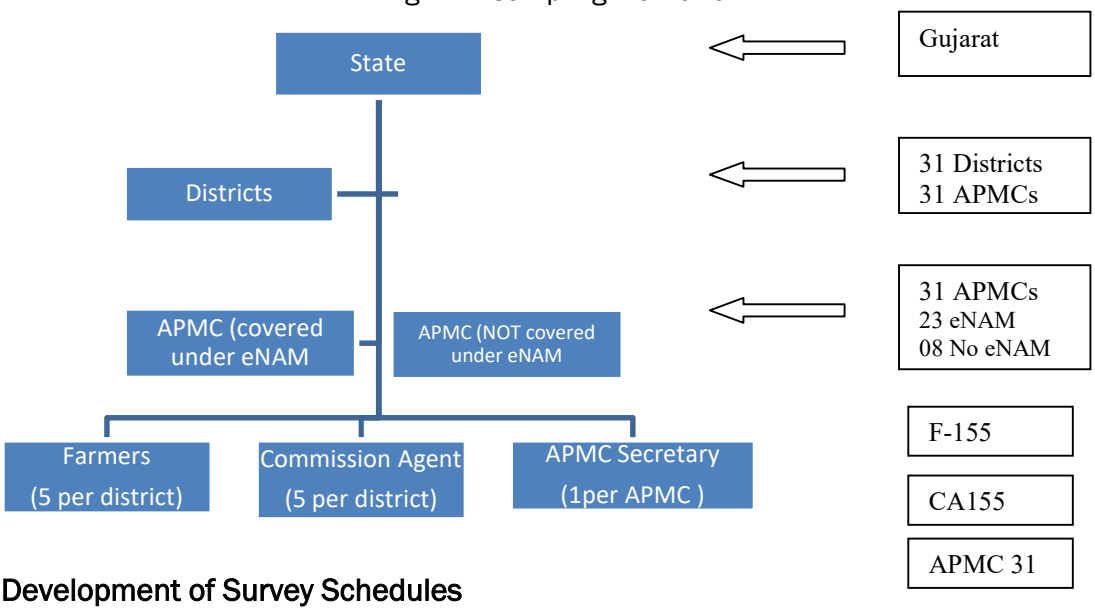
1.9.2 Study Area and Time period

The study is confined to the State of Gujarat and covers 31 APMCs from 31 districts of the state. The study was conducted in Gujarat state in two Phases.

- Phase I: As per the study proposed by the Coordinator (AERU, IGE, Delhi), study was conducted in only two APMCs each at Petlad (Anand) and Ahmedabad (Phase I) during 2017-18 covering the agriculture year 2017-18.
- Phase II: While Centre voluntarily conducted Phase II of the survey covering 31 APMCs (23 APMCs with eNAM and 8 APMCs not under eNAM) during 2018-19 covering the agriculture year 2018-19.
    - The data was collected from 31 APMCs, 155 farmers, and 155 Commission Agents as per the following sampling framework.

1.9.3 Sampling Framework

Fig. 1.2: Sampling Framework



1.9.4 Development of Survey Schedules

The survey schedules were developed for the collection of primary data. Three types of survey schedules were developed and canvassed in the study area:

- **Farmers 1.0:** for collecting detailed information about awareness regarding eNAM sale of commodities at APMCs, crop marketed through eNAM, use of eNAM, infrastructure available at APMC, problems faced and advantages of eNAM, other features and suggestions to improve eNAM.
- **Commission Agents/Traders 2.0:** for collecting detailed information about registration in market and in eNAM, use of eNAM, infrastructure available at APMC, problems faced and advantages of eNAM, other features and suggestions to improve eNAM.
- **APMC Office Bearers 3.0:** semi-structured schedule to discuss the overall implementation of eNAM, training details, infrastructure available at mandi, method of sale of agricultural commodities in market under eNAM, problems faced and advantages of eNAM, other features and suggestions to improve implementation of eNAM.

1.9.4.1 Pilot Testing and Finalization of Schedules

All schedules were pre-tested in selected APMC markets viz. Petlad (Anand) and Ahmedabad during Phase I of the study. Before starting the field work, training was provided to research staff explaining them about the purpose of the study, about schedules, sample selection and data collection.

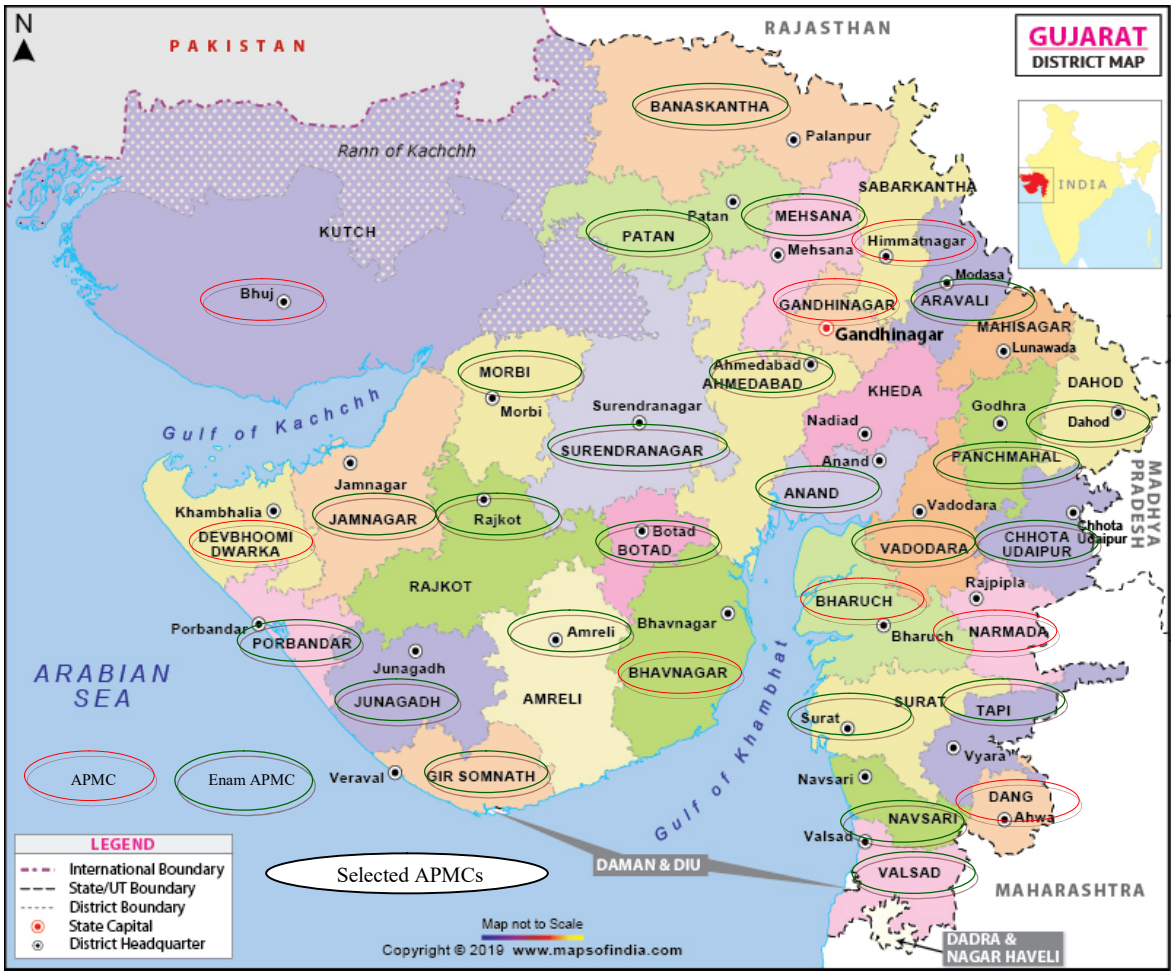
1.9.5 Selection of Districts/Input Market

Out of the total 40 APMCs covered under eNAM, a total of 23 APMCs from 23districts of the State of Gujarat were selected for the study. As some of the districts had two APMCs under eNAM, in such cases, randomly one APMC was selected. Besides, 08 APMCs were selected from remaining eight districts to know about the awareness and related parameters of the eNAM where eNAM was yet not introduced. From every district, minimum five farmers and five Commission Agents and APMC office bearers were contacted. The information related to eNAM and its implications was collected in pre-tested schedules from 155 farmers and 155commission agents and 31 APMC officers.

Table 1.6: Details on Sample Respondents of Gujarat

Sr. No.	Respondents	Sampling Framework		
		eNAM APMCs	Non eNAM APMCs	Total
1	Farmers	115	40	155
2	Commission Agent	115	40	155
3	APMC Officer	23	08	31

Map 1.1: Location Map of the Study Area in Gujarat



Tabular analytical tools were used for appropriate interpretation of data. The average score of the rating scale was used to get intensity of the parameter as

- Use the App? :1-Once a day; 2-Once in 3 days; 3-Once in a week; 4-once in a month; 5- Never 6-Some time;
- Rating of e-NAM :1-very poor 2- poor 3-satisfactory 4- good 5-very good;
- e-NAM better than manual mandi: 1-worse 2- no change 3-better 4- much better

1.10 Limitations of the Study:

The main limitation of the study was that most of the parameters related to sale of agricultural produce under eNAM, quality parameters,were not answered since the implementation is still in nascent stage. The data related to the arrival of commodity in the market was imputed in computer provided under eNAM at entry gate and same has been reported, while no actual inter APMC trade was reported. Thus, it was not possible to get more insights on the aspects related to actual implementation of the study.

1.11 Organization of the Study:

The current report is divided into six chapters. Chapter 1 is the introductory chapter, followed by Chapter 2 which presents government interventions in agricultural marketing. In Chapter 3, agricultural marketing reforms are discussed. The status of agricultural marketing in Gujarat is presented in Chapter 4, while Chapter 5 presents the findings from field survey data.The broad conclusions and policy implications are discussed in the last chapter.

The next chapter presents the government interventions in agricultural marketing.

Chapter II

Government Interventions in Agricultural Marketing

2.1 Introduction:

Agricultural markets in India have traditionally been marked by heavy government interventions since independence due to the fact that our demand had often exceeded supplies to start with. Government intervention in India had the twin objective of price support and buffer stocks. Further, with not so open borders in the case of globally traded commodities, there were always inconsistencies towards governments' policy on international trade in many of the primary commodities and more specifically in the agricultural commodities. It often leads to artificial (policy created) price fluctuation (Shanmugam,2009). The problems being faced by the farmers received the attention of the government, which took several measures including (a) regulation of marketing practices, (b) creation of infrastructure, (c) provision of price support, (d) promotion of farmers' cooperative organizations, and (e) provision of technology transfer and input supply support systems including credit delivery to the farmers (Acharya, 2004). Due to the efforts put by various organizations, intervention by the government, as well as the creation of awareness among the farmers towards marketing of farm produces, significant changes in the farmers marketing practices and agricultural marketing system were introduced (Kalamkar et al, 2015).

2.2 Need and Different forms of Government Interventions in Marketing:

Before 1960, the major preoccupation of agricultural price policy used to be with the problem of high prices in periods of shortage. Associated with that was the problem of ensuring the availability of agricultural products, especially food grains, to the consumer at fair prices. Since the adoption of a package approach to bring about improvements in agricultural productivity, the question of protecting the agricultural producer against an undue fall in prices came to the fore. In fact, the provision of guaranteed floor prices form part of the package (Narain, 1973). Currently, the food security system and price policy basically consist of three instruments: procurement prices/Minimum Support Prices (MSPs), buffer stocks and Public Distribution Systems (PDS). In fact, agricultural price policy is one of the important instruments in achieving food security by improving production, employment and incomes of the farmers.

Therefore, there is a need to provide remunerative prices to farmers in order to maintain food security and increase the income of farmers. There has been a debate on price versus non-price factors in the literature. However, literature shows that they are complements rather than substitutes (Dev and Ranade 1998; Rao 2004, 2006; Schiff and Montenegro 1997; Kalamkar, et al., 2013 & 2014; Kalamkar 2015[1]).

2.3 Grain Marketing Parastatals around the Globe: Focus on Asia[2]:

Governments have played an important role in influencing policies in the agricultural sector all over the world (Bathla, 2004). In developing countries, agriculture accounts for a substantial share of all productive activity and food is a dominant share of total consumption. In this situation, price interventions in food markets can have far reaching consequences. Furthermore, since cultivators derive a major proportion of their incomes from food production, fluctuations in food prices lead to large scale fluctuations in the income of a large proportion of agricultural producers. Agricultural prices in a developing economy are highly influenced by the interaction between producer, consumer and groups of trader and their relative effectiveness in influencing government decisions-making (Bhatia, 1994). One of the major objectives of price policy in developing countries is therefore to impart stability to prices of important agricultural commodities like food grains. Other objectives include price assurance to farmers through a system of minimum support prices to increase their production and to keep prices low for consumers for food security reasons simultaneously (Bhalla, 2007).

In the neo-liberal framework of economic development, 'free market' is important; but there have been instances of market failure. These instances are frequent for agricultural commodities in developing countries. Consequences of market failure for either producer or consumer of agricultural commodities are enormous. Government therefore intervenes in agriculture market. It goes without saying that in a country where agriculture dominates; market failure and equity act as underlyingfactors behind government mediation. The initial economic conditions and the rationale for public intervention in food grains markets were remarkably similar in those Asian countries where governments intervened in their food grains markets. Agriculture was largely weather dependent, production variability was high, domestic

[1] For details, see Kalamkar, et al, 2013 & 2014 and Kalamkar 2015.
[2] For more details, please see, Rashiid, *et al,* 2008.

markets were poorly integrated, international markets were highly volatile, and the countries had severe liquidity constraints owing to buying from the international markets at times of scarcity. These countries were vulnerable to crop failures, their foreign exchange reserves were meagre, and their national food security depended, apart from 'mother nature' on the goodwill of and relationship with donor countries. These relationship, however, were not always smooth because of sharp differences in political ideology. Therefore, policy rationale of these countries attempted to attain self-sufficiency, improve food distribution, and manage food security threats arising from weather-related production shocks. This rationale coincided with advent of Green Revolution, giving the governments another justification for intervention, i.e. mitigating risks and uncertainties of the new technology (Rashid, et al, 2008).

Historically, a range of government regulations have supported parastatals or other government agencies involved in food intervention programs. Agricultural parastatals are quasi-government agencies charged with carrying out public marketing activities. In Asia, these agencies have been linked with food policies that the countries in the region have practiced for decades. Although operational approaches vary, the central policy objective has been similar, i.e. to stabilize prices of basic agricultural commodities by ensuring a floor price for farmers and a ceiling price for consumers. In implementing these policies, the parastatals have been mandated to carry out a range of marketing activities under a variety of legal and regulatory supports, including monopoly control over export and import of food, movement restrictions for private trade, subsidized storage facilities, and preferential access to credit and transportations (Rashid, et al., 2008). Monopoly controls in international trade, restrictions on movements of food grains by the private sector, cheap credit and preferential access to transportation for the parastatals, and limits on private storage have been extensively used in all such countries. Summary is presented in Table 2.1.

Asian food markets are undergoing a profound and extremely rapid transformation, with implications for employment in value added and primary production for small scale processors, intermediaries, farmers and landless labourers (Gulati and Reardon, 2008). In the developing countries, these policies are found to act as tax on agriculture and subsidy on food consumption, an opposite policy is observed in the developed countries where urban population is taxed to support farm production and incomes (Hoekman and Kostecki, 2004; Acharya and Agarwal, 1999; Pursell and Gulati, 1993; Gulati and Sharma, 1991; and Goldin and Knudsen, 1990).

Nonetheless, the broad common objectives of the policies everywhere was to increase agriculture production and productivity, achieve stability in farm prices, transfer of resources to non-agricultural sector, reduce dependence on importsand attain minimum nutritional standards (Bathla, 2004).

Table 2.1: Regulatory Framework to Facilitate Parastatal Operations in Asian Countries

Regulations/ Restrictions	India	Indonesia	Philippines	Bangladesh	Pakistan	Vietnam
Monopoly on export						
Year introduced	1965	Never had large surplus	Never had large surplus	Never had large surplus	1974	1989
Still enforced	No, but quota on export	n.a.	n.a.	n.a.	Private sector export allowed since 1987	Yes
Monopoly on Import						
Year introduced	1965	1967	1972	1972	1948	1975
Still enforced	Yes	Officially withdrew in 1998, but reinstituted	Yes	No, lifted in 1992-93	Private import freed in 1987,but quickly reversed	Yes
Movement restrictions						
Year introduced	1941 (during British rule)	1967	n.a.	1941 (during British rule)	1941 (during British rule)	1975
Still enforced	Yes, partially	Yes, partially	No	No, lifted in 1989	Lifted in 2001, but enforced in2004	
Credit Concession						
Year introduced	1973-74	1979	1972	1948 (during East Pakistan era)	1948	1989
Still enforced	Yes, although interest rate revised in 1994	No, reformed in 1998, but has credit guarantee from central bank	Yes, occasionally	No, reformed in 1992	Yes	Yes
Preferential access						
Year introduced	1965	n.a.	n.a.	Preferential access to rail & waterways	No	n.a.
Still enforced	Yes	n.a.	n.a.	Reformed in 1997	n.a.	n.a.

Source: Adopted from Rashid et al., 2008.

2.4 Food Policy and Parastatals in India:

Among the different agricultural economic policies pursued by the government of India, the agricultural price policy has been playing a significant role in bringing about noticeable changes in production and productivity of the agricultural sector. It also plays an important role in achieving growth and equity in the Indian economy in general, and the agriculture sector in particular. The major underlying objective of the Indian governments' price policy is to protect both producers and consumers (Dev and Rao, 2010).

Policy interventions in agricultural markets in India have a long history. Till the mid 1960s, it was expected to facilitate the smooth functioning of markets and to keep a check on activities that were considered inimical for producers and/or consumers primarily. Subsequently, the country opted for a package of direct and indirect interventions in agricultural markets and prices, initially targeted at procuring and distributing wheat and paddy. This gradually expanded to cover several other crops/products and aspects of domestic trade in agriculture (Chand, 2012). In India, government interventions in agriculture markets take different forms, Price Support Scheme (PSS) and Market Intervention Scheme (MIS) are some of them.

The emergence of agricultural policy in the Indian context can be traced back to the official documents beginning from Food grains Policy Committee of 1943 (Gregory, 1943). The Great Bengal famine of 1943, widely cited as a classic example of market failure, provided the momentum of public interventions in Indian food grains markets (Rashid, *et al.,* 2008). The Famine Enquiry Committee Report, as well as subsequent studies, concluded that the root cause of famine was the failure of markets in responding to supply shortages in Bengal (that is, lack of spatial integration), rather than the availability of food grains in India as a whole, in those particular years.[3] Thus, the central premise for heavy public involvement was to address the perceived inability of private traders to ensure efficient allocation of essential commodities across space and time. Government actions focused on ensuring a steady flow of supplies at 'reasonable' prices to consumers through domestic production supplemented by imports whenever production suffered a setback. Until about 1965, consumers were generally assured of a minimum supply, but a guaranteed income to the producers remained an elusive promise[4].

Two major events coincided to prompt a change in policy. First, in 1965-66 and 1966-67, the country experienced two consecutive droughts with unprecedented severity that reduced food grains production by almost 20 per cent below their previous best levels. India was in crisis. It was bailed out by a large volume of U.S. food aid that severely strained the country's pride. Second, in 1963, the new High Yielding Varieties (HYVs) of wheat were first grown experimentally in India, and by 1966 prospects of the Green Revolution appeared promising. The New Strategy of

[3] Sen's (1981) interpretation of famine, the entitlement failure, differs from this view. Although Sen's works have been extremely influential, many have disagreed with his view. See, Devereux (2001), as quoted in Rashid, et al (2008).

[4] This concern was based, in part, on the assumption that production responds slowly to price, but price responds swiftly and demand or to fluctuations in supplies (Rashid, *et al,* 2008).

Agricultural Development, articulated in IVth FYP marked a bold step beyond previous policies (Rashid et al, 2008). Thus, an integrated food and agricultural policy emerged.

After Independence, India continued with tight war time controls on prices and movements of most of the essential commodities. In case of agricultural commodities, the controls consisted of movement of crops from open markets, purchases and rationing in almost all the states. The Food-grains Price Committee of 1947 recommended progressive decontrol of food grains trade and as a result there was some relaxation subsequently. But the controls resurfaced during bad crop years. For example, food production was low in 1948 and prices started rising sharply with the result that the controls were re-imposed. It was only in 1953-54, consequent to a good crop, the prices started declining and controls were completely abolished. But prices started rising again from 1955 onwards with the result that partial controls were again introduced. The regime of controls continued till the late 1950's. The Food grains Enquiry Committee of 1957 recommended social control over the wholesale trade in food grains. Consequently, in 1959 an attempt was made to introduce state trading in wheat and rice. But the scheme failed because the administered prices were fixed at too low a level.Despite good crop, very little surpluses came into the market and very little procurement took place (Bhalla, 2007).

Nevertheless, administered price system continued and the prices of food grains were kept low. Large imports also depressed prices. Hence, there was very little price incentive for the farmers to undertake investment for increasing their production. The imposition of heavy compulsory levy on the wholesale traders also did not yield much return. In order to implement the system, the government introduced food zones. Eight zones were created for wheat and some zones were created for rice in South India. Whereas food grains could move within a zone, inter-zonal movement of food grains was banned. This scheme was also barely successful and consequently, each state was declared a zone. The government took upon itself the responsibility of moving food grains from the surplus to the deficit states. Despite all these steps, the food management continued to be in serious crisis.

It was in the context of acute food scarcity during the sixties and the failure of various schemes for food management that the Indian Government appointed the Food grains Prices Committee in 1964 under the chairmanship of Jha (Jha Committee, GOI, 1965) to look at the entire question of food management in India.

One of the major contributions of the Jha Committee was the introduction of a positive price policy. While recognizing the need for protecting the interests of the consumers, the Committee underlined the role of appropriate prices as an instrument for augmenting production. One of its major recommendations was the suggestion for the creation of the Food Corporation of India and the Agricultural Prices Commission.

An elaborate system of food management consisting of procurement, storage and public distribution of food grains was instituted subsequent to the Committee's proposals. The main objective of the food management system was to give price insurance to famers to encourage them to increase food production and to provide food to consumers at reasonable prices. The Food Corporation of India (FCI) and the Agricultural Prices Commission (APC) was set up in 1965 to help administer food security in the country. Today, the FCI is the agency to purchase food grains at the Minimum Support Prices (MSP) or the procurement price, and to stock and distribute these to the consumers through the public distribution system (PDS) which consists of as many as 4.99 lakh fair price shops spread all over India in rural and urban areas. The food grains are stocked and then distributed through fair price shops. The FCI also undertakes open market operations with a view to stabilize prices.

The main function of the Agricultural Prices Commission which was renamed as Commission for Agricultural Cost and Prices in 1983, is to advise the Government on price policy for agricultural commodities. It is also enshrined to evolve a balanced and integrated price structure in the perspective of the overall needs of the producers and the consumers. While making its recommendations, the commission is, *inter-alia*, to keep in view the need to provide incentives to producers for adopting technology for enhanced production, to ensure rational utilisation of land and other productive resources; to take account of the likely effect of the prices on the rest of the economy, broadly on the cost of living, level of wages, industrial cost etc., and to also keep in view the terms of trade between the agricultural sector and the non-agricultural sector. The cost of cultivation (C2) covers not only paid out costs (out-of-pocket expenses - A2) but also imputed value of owned assets including rental value of owned land, family labour and interest on owned fixed capital for which the farmers do not incur cash expenses[5].

[5]In India, the DES in the Ministry of Agriculture and Farmers Welfare is the main organization responsible for collection of data on cost of production of crops. DES operates a scheme entitled "Comprehensive Scheme for Studying Cost of Cultivation / Production of Principal Crops in India". The scheme was launched in the year 1970-71. It was meant to collect representative data on inputs and output in physical and monetary terms which could then be used for estimation of cost of cultivation per hectare and cost of production per quintal of principal crops. The data under this scheme is collected on a continuous basis in

2.5Price Policy and Support for Farmers

Price support for farmers has been an important instrument of agricultural development and food policy since the mid-1960s. The main objectives of price policy are: (a) to provide incentives to farmers for adopting new technology and maximizing production, (b) to safeguard the interests of consumers or users of farm products by maintaining market prices at reasonable levels, and (c) to keep the fluctuations in prices within certain limits. The main instruments of price policy, *inter alia* are minimum support prices, creating buffer stocks, and operation of a public distribution system of cereals. The main challenge of the policy has always been to reconcile the conflicting price interests of farmers and consumers. It is partly achieved through the provision of food subsidy and supply of essential farm inputs (fertilizers, electricity and canal water) to farmers at reasonable prices or user charges.

Currently, MSPs are announced for 25 farm products, that include cereals, pulses, oilseeds, raw cotton, raw jute, sugarcane and copra (dried coconut) (Table 2.2). Buffer stocks and public distribution systems are operational for rice, wheat and to some extent for sugar. Commission for Agricultural Costs and Prices (CACP) is the advisory body of Government of India for all matters related to agricultural price policy. The quantities that the government agencies need to purchase at support prices depend on the behaviour of market prices and private trade, and fluctuate from year to year. For example, price support purchases of rice and wheat accounted for 15.8 per cent of the production during TE 1992-93, 24.6 per cent during TE 2002-03 and 22.7 per cent during TE 2006-07. In terms of absolute quantities, these varied between 20 metric tones (mt) and 39 mt at these points of time. About 25 per cent is retained by the producer farmers for self-consumption and rest, i.e. more than half of the production is handled by private trade (Acharya, 2009).

Several committees in recent years have reviewed the current price policy regime. These include Long-Term Grain Policy Committee (Abhijit Sen); Repositioning of CACP Committee (Y.K. Alagh); Planning Commission's Working Group for XI Five-Year Plan (S.S. Acharya); Foodgrain Policy Review Committee (Ramesh Chand); and National Commission for Farmers (M.S.Swaminathan). Going by the recommendations of the various Committees, the government is continuing the policy of minimum support prices, maintaining buffer stock of cereals, and distribution of subsidized food

the form of a detailed survey in respect of principal crops. The estimates of Cost of Cultivation of principal crops are used by the Commission for Agricultural Costs and Prices for recommending Minimum Support Prices of 25 crops.

grains. In addition, FCI is continuing to perform its critical role of food management on behalf of the government. Implicitly, the need for maintaining a high degree of self sufficiency in cereals is also recognized. The suggestion to fix MSPs at levels 50 per cent higher than the cost of production has not been accepted by the government rightly because there are several issues involved in this suggestion. As regards other suggestions, there is perhaps no firm decision on either side (Acharya, 2009).

Table 2.2: Changes in MSPs for Selected Crops (according to Crop year)

Sl. No	Commodity	Variety	MSP (*Rs per quintal*)							
			1965-66	1970-71	1980-81	1990-91	2000-01	2010-11	2014-15	2015-16
	Kharif Crops									
1	Paddy	Common	40	53	105	205	510	1000	1360	1410
		Grade 'A'	-	-	-	-	540	1030	1400	1450
2	Jowar	Hybrid	-	-	105	180	445	880	1530	1570
		Maldandi	36-40	45	-	-	-	900	1550	1590
3	Bajra		36-40	45	105	180	445	880	1250	1275
4	Maize		36-41	45	105	180	445	880	1310	1325
5	Ragi		36-42	45	105	180	445	965	1150	1650
6	Arhar(Tur)		-	-	190	480	1200	3000*	4350	4625
7	Moong		-	-	200	480	1200	3170*	4600	4850
8	Urad		-	-	200	480	1200	2900*	4350	4625
9	Cotton	F-414/H-777/J34	247+	299+	304	620	1625	2500a	3750	3800
		H-4	-	-	-	750	1825	3000aa	4050	4100
10	Groundnut In Shell		-	-	206	580	1220	2300	4000	4030
11	Sunflower Seed		-	-	183			2350	3700	3800
12	Soyabeen	Black	-	-	183	600	1170	1400	2500	-
		Yellow	-	-	190	400	865	1440	2560	-
13	Sesamum		-	-	-	-	1300	2900	4600	-
14	Nigerseed		-	-	-	-	1025	2450	3600	-
	Rabi Crops	_								
15	Wheat		59	76	130	225	580	1120$	1450	-
16	Barley		-	-	105	200	430	780	1150	-
17	Gram		40	-	145	450	1100	2100	3175	-
18	Masur (Lentil)		-	-	-			2250	3075	-
19	Rapeseed/Mustard		-	-	-	600	1100	1850	3100	-
20	Safflower		-	-	-	575	1100	1800	3050	-
21	Toria		-	-	-	570	1065	1780	-	-
	Other Crops	_								
22	Copra	Miling	-	-	-	1600	3250	4450	5550	-
	(Calender Year)	Ball	-	-	-	-	3500	4700	5830	-
23	De-Husked Coconut		-	-	-	-	-	1200	-	-
24	Jute		-	-	160	320	785	1575	2700 (TDS)	-
25	Sugarcane@		-	7.37	13.00	23.00	59.50	139.12	230.0	0

Notes: * Additional incentives @ of Rs. 500/- per quintal of tur, mung and urad sold to procurement agencies payable during the harvest/arrival period of two months; # An additional incentive bonus of Rs. 50 per quintal is payable over the MSP; @ Fair and Remunerative Price; a- Staple length (mm) of 24.5-25.5 and Micronaire value of 4.3-5.1; aa- Staple length (mm) of 29.5-30.5 and Micronaire value of 4.5-4.3.

Source: GOI (2018, various issues), http://agricoop.nic.in; http://cacp.dacnet.nic.in/

The next chapter presents the reforms in agricultural marketing in India.

Chapter III

Agricultural Marketing Reforms in India

3.1 Introduction:

Efficient marketing is a pre-requisite in the development process of any economy as it ensues remunerative process to the production and a reduction in marketing costs and margins, to provide commodities to consumers at reasonable prices and promote the movement of surpluses for economic development (Acharya and Agrawal, 1999). Agricultural marketing in India is handled both by private trade as well as government intervention though major part of the agricultural produce is handled by private traders. The objectives and forms of government interventions however changed over time with the intention of protecting the interest of producers and consumers. A number of government organizations such as Food Corporation of India (FCI) are involved in agricultural marketing mainly to procure food grains at minimum support prices from producers and maintain a public distribution system. Similarly government corporations also exist for other crops such as cotton and jute. There are also specialized marketing boards for rubber, coffee, tea, tobacco, etc. and a network of cooperatives at the local, state and national level. The National Agriculture Cooperative Marketing Federation (NAFED) of India handles domestic as well as export marketing for its member organizations. The Directorate of Marketing and Inspection (DMI) under Ministry of Agriculture, Government of India, is responsible for administering federal statutes concerned with marketing of agricultural produce. In order to improve the marketing system of farm products, wholesale agricultural produce markets began to be regulated in the 1950s and 1960s, when each state began implementing its Agricultural Produce Marketing Committee (APMC) Act. The APMCs were established in each state by the respective state governments with a view to regulate the marketing of agricultural produce in market areas. The regulation of markets had several positive features such as sale through auction method, reliable weighing, standardized market charges, payment of cash to farmers without undue deductions, dispute settlement mechanism, reduction in physical losses of produce and availability of several amenities in market yards.

3.2 Agricultural Marketing Reforms in India[1]

Agricultural market regulation in India has come a long way since its humble beginnings in 1886 when the British rulers set up first regulated market at Karanjia under the then Hyderabad residency order (Paty and Gummagolmath, 2015).The Berar Cotton and Grain Market Law of 1897 was the first legislation on market regulation for agricultural commodities. However, the legislation was highly biased towards the commercialization of cotton in India to ensure the stable supply of cotton as a raw material to the textile mills at Manchester at below world price (Rajagopal 1993). By its genuine intent, the aforesaid marketing legislation was purely regressive in the sense that the farmer's economic aspirations and development of marketing infrastructure were brutally defied. Therefore, this marketing board was an inefficient marketing arrangement (Knight 1954; Lele 1971; Bhattacharya 1992). The then Bombay Government was first to enact the Cotton Market Act in 1927. This was the first law in the country that attempted to regulate market with a view to evolve fair marketing practices. Thereafter, Agricultural Produce Marketing (Commission) Act was enacted in 1938 by the Ministry of Food and Agriculture, Government of India and subsequently the state level agricultural market regulations were enacted. But the spread of regulated markets were highly biased towards the cotton growing states and not much progress was made until independence of the country in 1947. Till the mid 1960s, market regulations were primarily meant to facilitate smooth functioning of markets and to keep a check on activities that were considered inimical to producers and/or consumers. Subsequently, the country opted for a set of direct and indirect interventions in agricultural markets and prices, initially targeted at procurement and distribution of wheat and paddy. This gradually expanded to cover several other crops/ products and aspects of domestic trade in agriculture.

The literature on regulation of agricultural markets and the actual regulatory policies put forward two ideologies of agricultural marketing among the policymakers. The first reflects that the agricultural markets in India are ill-functioning and thus requires state intervention to stabilize prices. Contrast to it, the second ideology reflects that these markets are so competitive that new kind of institutions are required to meet emerging challenges. Not only are these two approaches to regulation in constant tension, one may be subordinated to the other, and both to yet

[1] heavily based on Bisen and Kumar (2018)

other interventions (Harriss, 1984). With the onset of liberalization, the latter concept has become increasingly ascendant, with market intervention now seen as the main impediment to development, shifting the debate from the older question about the type of intervention to be adopted to one about a simple binary of “more” vs “less” intervention, with the latter as the ultimate goal (Bernstein 2010).

Moreover, most of the states enacted Agricultural Produce Markets Regulation Acts (APMRA) during the sixties and seventies and put these in operation. All primary wholesale assembling markets were brought under the ambit of these Acts. Well-laid out market yards and sub-yards were constructed and for each market area, an Agricultural Produce Market Committee (APMC) was constituted to frame the rules and enforce them. Thus, the organized agricultural marketing came into existence through regulated markets. The APMRA brought radical changes and significant improvement in almost all aspects of marketing of farm produce (Acharya, 2004) and covered 7,161 markets, which includes more than 98 per cent of the identified wholesale markets in the country (Acharya, 2006 as cited in Shaiendra, 2013). The policy emphasis in the 1960s and 1970s on government intervention to resolve market failures gave way in the 1980s to market-oriented liberalization to ‘get prices right’ and more recently, to a focus on ‘getting institutions right’ (Barrett andEmelly, 2005). However, many gains brought by APMRA to improve competitiveness of agricultural markets got diffused over time and market infrastructure did not keep pace with volume of market arrivals. The facilities provided in markets remained not only inadequate, but also deteriorated in many cases. The regulations had lost the relevance with change in economy and agriculture in terms of production and diversification (NIAM, 2015). Excessive intermediation worked to the disadvantage of producers and consumers and favored only middlemen (Chand, 2016).

Trade liberalization as a consequence of economic reforms of 1991 and need to adjust to WTO (1995) agreements had serious repercussions on Indian agriculture. The economic reforms have divulged Indian agricultural markets to cut throat international competition which necessitated domestic trade liberalization to improve domestic competitiveness. Subtle changes in non-agricultural sector due to the economic reforms at the same time sheared the necessity of reforms in agricultural trade too. Thereafter, series of trade restrictions have been eased for smooth conduct of trade in agricultural commodities all across the country. But, these were

not agricultural marketing reforms in true sense in that the farm-level transactions were not part of any of them.

In view of the uneven development of regulated markets, the inability to fight the vested interests of traders, the persistence of traces of collusion amongst traders even in regulated markets deprived the farmer of his due share in the final consumer's rupee, besides facing other hardships during sale of his produce (Shroff et al, 2014; 2014). Therefore, due to these bottlenecks in the APMC Act and also new challenges and opportunities associated with agricultural marketing, across all states, the Government of India felt it was necessary to undertake market reforms through a change in market legislation. This matter has been under continuous scrutiny as agricultural marketing and exports of agricultural commodities were assuming increasing importance due to liberalization of trade, need for better supply management and need to improve infrastructure and market information. An Expert Committee on "*Strengthening and developing Agricultural Marketing*" under the chairmanship of Shri Shaknerlal Guru was appointed by government in December 2000. This committee (Guru Committee) reviewed the entire system of marketing of agricultural commodities and submitted its recommendations to the government in June 2001. It recommended requirement of a vibrant and dynamic marketing structure and system to meet the challenges emerging out of globalization in the post WTO period. An Inter-Ministerial Committee (with Shri R.C.A. Jain, Additional Secretary, Ministry of Agriculture as the Chairman) was set up to examine the report and the legislative changes required for the implementation of this report. The Inter-Ministerial Task force recommended the formulation of a Model APMC Act which would improve the efficiency of the marketing system and encourage private sector investment in agricultural marketing (GOI, 2001). The amended Act aimed at complete transformation of agricultural marketing in India to make it more market and growth oriented. The Expert Committee in its report (in 2002) noticed that the regulated markets have helped in mitigating market handicaps of producers/sellers at wholesale assembling level but the monopolistic practices and modalities of regulated markets have prevented the development of free and competitive trade in agricultural markets. The Committee recommended various reforms in State Agricultural Produce Marketing Regulation Act and the Essential Commodities Act to root out the restrictive provisions coming in the way of efficient and competitive trade. After deliberate discussion on these recommendations, a Standing Committee of

state ministers was constituted for the purpose under the chairmanship of Hukmdev Narayan Yadav, the then Union Minister of State for Agriculture, on 29 January 2003. Thereafter, Model Law on Agricultural Marketing was framed with consultation of states under the chairmanship of Shri K.M. Sahni.

The Model Agricultural Marketing (Development and Regulation) Act (2003) was circulated among states to implement and to incentivize states to amend their APMC Acts on the lines of the Model Act. Some investment subsidy on market infrastructure development projects was also provided under central assistance. These economic incentives were thought of providing thrust to adjust to the provisions of model law (Chand, 2016). However, after a decade, there existed variation in adoption of the contents and coverage of reforms under the APMC Acts/Rules across the states (Subramanian, 2014). Contrary to these, Sharma (2017) reported that, entry of private players in agricultural marketing benefitted farmers by increasing competition.

The status of implementation of model law was slow and uneven due to reluctance on part of state governments to amend their respective APMC legislations. APMC Acts were passed by the states during socialist past (Patnaik 2014) and restricted the choice of farmers to sell their produce in terms of place as well as person by creating regulated barriers. Some states have created entry barriers for private players to establish the markets by prescribing either prohibitive license fees for setting up such markets, or the minimum distance between private markets and APMC markets. The transaction of trade at private market was less than 10 per cent. The Model Act prohibits commissions in any transaction of agricultural produce from the farmers; however in practice, these range from 1 to 2.5 per cent for food grains and 4 to 8 per cent for fruits and vegetables. There are also wide variations in market fees, from 0.5 to 2.0 per cent of the sales. The market fee and commissions add 15-20 per cent to the farm gate price. In addition, there are 5-6 intermediaries between the primary producer and the consumer. The total mark up in the chain adds 60-75 per cent (Patnaik 2011). These result into higher transaction costs and lower price realization by farmers.

It is evident that these legal provisions have created a fragmented and monopolistic agricultural market with high entry barriers. The basic objectives for setting up a network of physical markets, namely, ensuring reasonable gain to the farmers by creating an environment of fair play of supply and demand forces,

regulating market practices and achieving transparency in transactions, have not been achieved. In some cases, new conditions have been attached to reforms which defeated the very purpose of the reforms. Later, some of the legislative reforms prior to Model Act were repealed by central government rules like licensing requirements, stock limits and movement restrictions in respect of purchase, sale, supply, distribution or storage for sale of agricultural commodities, which were removed in 2002. Subsequently, the changes in rules of game have given opportunities to unorganized market functionaries like commission agents and traders to organize themselves forcing the changes in process guidelines ultimately favored themselves.

Year 2007 witnessed circulation of model APMC rules across the states for implementation but there was wide variation in adoption of content and coverage of reforms. Later, Ministry of Agriculture, Government of India set up an Empowered Committee of State Ministers in-charge of Agricultural Marketing on 2nd March, 2010 to persuade various states to implement the reforms in agriculture marketing through adoption of Model APMC Act. The Model Act suggests reforms necessary to provide a barrier free national market for the benefit of farmers and consumers. It also suggests measures to effectively disseminate market information and to promote grading, standardization, packaging, and quality certification of agricultural produce. The Committee in its report (in 2011) recommended for

1. coherence of state APMC Acts and rules in line with Model Act and rule;
2. provision of multiple and competitive marketing channels to farmers;
3. integration of mandis with electronic spot exchange;
4. private investment in agricultural markets;
5. infrastructure project status for agricultural markets;
6. waiving off marketing fee on perishables like fruits and vegetables;
7. promotion of direct marketing as well as contract farming, etc.

3.3 Karnataka Model for Agricultural Marketing

The state of Karnataka is pioneer in adopting these amendments and innovated its tendering process to bring transparency, competitiveness and efficiency in the regulated markets. The Karnataka state with the assistance of National Commodity and Derivative Spot Exchange (NCDEX) has replaced its manual tender system by electronic tender system for price bidding in selected regulated markets in the state. The plan aimed at vertical as well as horizontal integration of all regulated

agricultural markets (APMCs) with supporting infrastructure for seamless flow of produce, finance and information across different stakeholders in the trading environment.

The model was actualized through a joint venture of state government and NCDEX i.e. Rashtriya e-Market Services (ReMS) Private Limited Company. ReMS provides the package of services which include auction as well as post-auction facilities (weighing, invoicing, market fee collection, accounting); assaying facilities; warehouse-based sale of produce; commodity funding and price dissemination (Sinha & Kumar 2010). The e-tender system was first introduced in 2006-07 on pilot basis for paddy in the Mysore regulated market, which was further extended to 11 commodities in 2010 (Chengappa et al. 2012). However, the unified online agricultural market initiative was launched in Karnataka on 22 February 2014. A total of 105 markets spread across 27 districts have been brought under the Unified Market Platform (UMP) as of March 2016 (Chand, 2016).

This initiative provides a unique identification number to every lot brought by the farmers to the APMC market. The farmer can use the option of using either common platform or the platform of commission agent to auction his produce. The lots ready for auction are assayed for their quality and the information about quality and quantity is put on the portal of ReMS. The registered buyers or traders on ReMS who are interested in purchase of produce are required to get the unified market license. Any prospective buyer can bid for the produce online from anywhere using her/ his credentials with ReMS. A trader can revise the bid upward any number of times before closure of the bidding time. After closure of auction period, the bids are flashed on television screen put up in the mandis and on the portal of ReMS. Thereafter, the producer/ seller are required to give his acceptance for the bid. A seller has the autonomy to reject the bid, in which case a second round of bidding takes place on the same day and in the same way. A bidder is required to keep a pre-bid margin of 5% of value of the lot marked for sale with ReMS before opening of the tender. ReMS charges 0.2% of the value of the transacted produce for providing various online services. The important feature of the model is that the participation in UMP is not restricted to Karnataka. Traders from other states and bulk institutional buyers (Cargill, ITC, Reliance, Metro Cash &Cany) are also registered with ReMS. The UMP received overwhelming response from farmers in the state and it showed impressive results in a short period. Auction and sale of farm produce is not restricted

to traders within the market. Thus, the possibility of tacit understanding to suppress prices received by farmers or cartelization has been eliminated.

3.4 e-NAM: replication and extension of Karnataka model

Though agricultural marketing has made significant progress since independence, plenty of challenges still remain. A dynamic and vibrant marketing system with adequate supply chain infrastructure has been felt necessary to keep pace with the changing agricultural production and growing marketable surplus. The basic objective of setting up of network of physical markets has been to ensure reasonable gain to the farmers by creating environment in markets for fair play of supply and demand forces, regulate market practices and attain transparency in transactions (GOI, 2016). The befitting achievements of Karnataka model received countrywide attention and allured some other states to imitate it. Andhra Pradesh, Gujarat, Maharashtra and Telangana were among the early adopters. With the overwhelming response of farmers to the new marketing method in Karnataka, the Union Government took initiative to encourage other states to replicate similar model for trade in agriculture. The Cabinet Committee on Economic Affairs approved the central sector scheme for promotion on the national agriculture market through Agritech Infrastructure Fund with a budget allocation of Rs. 200 crores on July 1st, 2015. The scheme aimed at setting up of a common e-platform in 585 selected wholesale regulated markets across the country. It envisages expanding Karnataka's UMP model at the national level in a bid to cover the entire country. The Prime Minister of India has given a real push to the effort by launching the electronic trading platform for National Agriculture Market (e-NAM) on April 14,2016.

Haque&Jairath (2014) had argued for institutional innovation in agricultural marketing by way of redefining the roles of different stakeholders, use of information technologies, dismantling the trade-off and expanding the approach of APMCs to make it economically viable to the farmers. A common market for agricultural produce is an attempt in the aforesaid direction. A common market means a market within which there are no institutional or legal barriers to the free circulation of products, so that the producer or the traders can sell them with the same freedom across the state borders as they can within their own states (Roy et al. 2017). National Agriculture Market (NAM) is a similar pan-India electronic trading platform which networks the existing APMCs to create a unified national market for agricultural

commodities. In reality, the common agricultural market like NAM can benefit different stakeholders engaged in value chain of agricultural commodities. The farmers can have benefits of wider choice of buyers for their produce which would positively influence their net income; consumers can also have more alternative for same product with varying prices and qualities; bulk buyers and exporters can reduce their intermediation cost by directly participating in trade without being physically present in the market and direct interface of bulk buyers with the sellers without any intermediation. Therefore, the efficiency of agricultural marketing system is expected to be increased with the NAM platform.

Technically, NAM envisages spatial market integration, reduction in transaction costs and has direct implications on price signals and price discovery, farmer's income and market liberalization as well. Spatial integration of APMCs and uniformity in price (excluding of transportation cost) across the markets will reduce the scope of arbitration by the traders which will create win-win situation for both the farmers and consumers.

3.5 Supportive Schemes by Central Government and other Models:

The Government of India has been playing an important role in developing agriculture marketing system in the country. The marketing division of the Department of Agriculture, Cooperation & Farmers' Welfare is entrusted with the implementation of policy and programme related to agricultural marketing. The agriculture sector needs competitive and well-functioning market for farmers to sell their produce. In order to remove restrictive and monopolistic practices of present marketing system, to reduce the intermediaries in supply chain, to reduce wastage by way of promoting integrated supply and value chain and to benefit farmers through access to global markets, reforms in agricultural markets have to be an ongoing process.

Integrated Scheme for Agricultural Marketing (ISAM):

- In the Ministry of Agriculture and Farmers Welfare, Marketing Division is also implementing ongoing Central Sector Schemes from XII plan, which have been integrated into a new scheme viz. the Integrated Scheme for Agricultural Marketing. ISAM has six sub-schemes namely:
- Agricultural Marketing Infrastructure (AMI)
- Marketing Research and Information Network (MRIN)

- Strengthening of Agmark Grading Facility (SAGF)
- Training, Research and Consultancy through Choudhary Charan Singh National Institute of Agricultural Marketing (NIAM)
- Agri-business Development through Venture Capital Assistance (VCA) and Project Development Facility

Farmers market known as *Rythu Bazar* (RB) in Telangana and Andhra Pradesh (AP) is a novel and direct marketing model, designed to sell on a daily basis, fresh fruits and vegetables to the urban consumers, exclusively by the small and marginal farmers (SMF) coming from the hinterland villages. The model was initiated by the Punjab State Marketing Board (PSMB), in 1987 where SMF were growing vegetables close to Chandigarh city and sold their produce directly to the consumers in different residential locations (sectors) of the city. This model was adopted by the Haryana state in 1999, by opening a farmers' market in Panchkula. As is well known, these markets are devoid of middlemen and other marketing costs where the sellers do the loading and unloading of vegetables themselves and directly sell the vegetables to the consumers.

Price Deficiency Payment Scheme (PDPS) Under Price Deficiency Payment Scheme (PDPS) of PM-AASHA, direct payment of the difference between the MSP and the selling/modal price will be made to pre-registered farmers selling their produce in the notified market yard through a transparent auction process. The scheme does not involve any physical procurement of crops. A similar scheme Bhavantar Bhugtan Yojana was launched on pilot basis by Government of Madhya Pradesh in kharif 2017 season under which when prices fell below the MSP, government paid the remuneration as the difference between the MSP and the model price computed by taking average of selling price in mandis in three major producing states over a fixed period.

Besides, as per the report of 'Doubling of Farmer's Income (DFI)' which has recommended formation of 7,000 FPOs by 2022 towards convergence of efforts for doubling the farmers' income, in the Union Budget 2019-20, Government has announced creation of 10,000 new Farmer Producer Organizations (FPOs)' to ensure economies of scale for farmers over the next five years, for which a dedicated supporting and holistic scheme as Central Sector Scheme is proposed for targeted development of FPOs and its sustainability.

Chapter IV

Agricultural Marketing in Gujarat

4.1 Introduction:

Gujarat has historically been known for business acumen of its people. Gujarat state has made rapid strides in its agriculture sector including the agribusiness sub sector during recent past. The spectacular agricultural growth in Gujarat in recent times has been a result of a well thought out strategy, meticulously planned and coordinated scheme of action, sheer hard-work, sincere implementation of programme, political will to take bold decisions and commitments to economic policy reforms by the state government. Agriculture in Gujarat has been transforming over time from traditional to high value added commercial crops which can be seen from a shift in its cropping pattern from food grains crops to high value cash crops. While Gujarat's dairy success is well known, which is growing at 6-7 per cent per annum on sustainable basis, the recent phenomenon of high growth comes from fruits and vegetables (dominated by banana, mango, potato and onions). Gujarat is the India's largest producer of cotton, castor, cumin and isabgul. The state is the second largest producer of sesame and groundnut in the country. The agricultural productivity of some crops in the state is highest in India as well as in the World. The productivity of mustard, castor, cotton, onion and potato is highest in the state compared to other states in India. The productivity of groundnut, bajra and banana is the second highest in India.The trend in shifting of cropping pattern paved ways for many ancillary industries in the areas of processing, packing, storage, transformation, etc. Agricultural growth in the state is favored by the prevailing eight agro-climatic zones, enterprenurial farming community, policy support from the government, wealth of livestock population, extended coast line and contribution by the agricultural scientist and dedicated NGOs (Swain et al, 2012; Kalamkar, 2014; Parihar et al, 2014).

The Gujarat government has aggressively pursued an innovative agriculture development programme by liberalizing markets, inviting private capital, reinventing agricultural extension (Krishi Motsav, ikisan portal), improving roads and other infrastructure (Jyotigram Scheme) (Gulati et al, 2009; Shah et al., 2009; Kumar et al., 2010, Dholakia, 2010). The mass-based water harvesting and farm power reforms in dry Saurashtra and Kachchh, and North Gujarat have helped energise Gujarat's

agriculture (Shah et al., 2009). These semi-arid regions have outperformed the canal irrigated South and Central Gujarat. The shift in agriculture to 8 per cent growth rate during last decade was mainly responsible for the shift of the overall state economy to higher growth path with 10.6 per cent annual growth rate (Dholakia, 2010). For ensuring systematic and coordinated approach to all-round development of its agriculture sector, the Government of Gujarat had prepared in the year 2000 a ten-year plan called 'Gujarat Agro-vision 2010'. A comprehensive New Agro-industrial Policy was also announced in 2000. In the new industrial policy, the state identified agro-industries as the major thrust area. The policy aims to spur investment in agro-processing, agro-infrastructure and hi-tech agriculture by monetary incentives (Kalamkar et al, 2014).

4.2The Gujarat Agricultural Produce Market Act 1963[1]

The Act for regulation of market was first enacted in the year 1939 during the regime of former princely State of Baroda. The then Baroda State established regulated markets at Bodeli in the year 1937-38. In Saurashtra Region the regulation was introduced after formation of Saurashtra union and the Legislation in the matter was enacted in the year 1954-55. It resulted in the bifurcation of bigger bilingual Bombay State and the formation of Gujarat State, and different laws have been unified. The Gujarat Agricultural Produce Markets Act has been introduced since 1963. The Gujarat Agricultural Produce Market Act 1963 is implemented in Gujarat for regulation of marketing of agricultural produce for development of existing markets and for establishment of new market yards.

The market area in Gujarat generally comprises of a taluka, while the market comprises of village located within 5 to 10 kms of the market yard. In market all notified commodities are legally required to be brought to the market yard and could be sold there only. License fees for traders, commission agents, and other market functionaries such as brokers, carting agents, weighmen, hamals, etc. are determined by the market committees under the bye-laws subject to the minimum and maximum prescribed limit under the Gujarat Agricultural Produce Market Rules 1965. The market committees collect fees on agricultural produce brought or sold in the market area on value, subject at Rs.0.30 ps. and maximum Rs.2.00 per value of Rs.100.00 as provided in the Gujarat Agricultural Produce Market rules 1965. In case of cattle,

[1]https://gsamb.gujarat.gov.in/mission-vision.htm

minimum and maximum market rates fixed are 0.25 ps to Rs.4.00 per animal. The main source of income of market committees are license fees and market fees. The market committee is constituted of eight representatives of the agriculturists, four representatives of the trader holding general license, two representatives of the Cooperative marketing Societies holding general license situated in the market area, one nominee of local authority and two nominees of the State Government who are officials. The duty of the market committee is to manage and maintain market to prevent adulteration, to promote grading and standardization and to enforce in the market area the provision of the Act. The market committee has the status of local authority within the meaning of Bombay General Clauses Act 1904 and is given power to sanction the budget, appoint its staff, except the Secretary, issue of license to the traders and other functionaries, levy and collect market fees within prescribed limits etc.

In Gujarat there are 225 talukas with about Mandi Bazars where agricultural produce is brought for sale. Under the provision of the Gujarat Agricultural produce Markets Act 1963, 213 Market Committees have been established in Gujarat till now (Table 4.1). Out of which 42 market committees are in the backward tribal areas of the State. No district in the State of Gujarat is left without regulation. Under these market committees 213 principal market yards and 187 sub market yards contribute their share in upliftment of the farmers by selling agricultural produce through open auction, standard weight and cash payment. The market committees of Gujarat are steadily developing and getting their financial position strengthened.

Under the market Act, 101 commodities of agricultural, horticultural produce etc. have been covered under market regulation. The food grains in 146 market committees, pulses in 136, cotton in 126, oilseeds in 131, fruits in 7, vegetables in 76, cattle sheep/goats in 54, and condiments in 77 market committees are brought under regulation.In Gujarat the regulated market yards have made satisfactory progress. Some of the market Committees like Unjha, Ahmedabad, Rajkot,Gondal, Dahod, Baroda, Surat, have become inter State Market Committees where Agricultural Produce from other distant districts of neighbouring States is also brought for sale.

At present, the markets are set up at the initiative of State Government alone. These reforms provide for the provision that in a market, more than one market can be established by private persons, farmers and consumers. Existing provisions will have to be replaced by providing an omnibus provision that anybody can set up a

market, provided minimum standards, specifications, formalities and procedures which may be laid down by the Government are complied with.

Table 4.1: Districtwise Number of Regulated Markets in Gujarat

Sr. No.	District	Number of Market Committees	Number of Main Yards	Number of Sub-Market Yards
1	Ahmedabad	8	8	11
2	Amreli	11	11	2
3	Anand	8	8	9
4	Arvalli	6	6	7
5	Banaskantha	13	13	9
6	Bharuch	7	7	12
7	Bhavnagar	9	9	1
8	Botad	2	2	3
9	Chhota-Udepur	5	5	10
10	Devbhumidwarka	3	3	0
11	Dohad	7	7	9
12	Gandhinagar	4	4	7
13	Gir-Somnath	5	5	0
14	Jamnagar	6	6	0
15	Junagadh	9	9	1
16	Kheda	8	8	12
17	Kutch	8	8	2
18	Mehsana	10	10	8
19	Mahisagar	5	5	6
20	Morbi	3	3	2
21	Narmada	4	4	3
22	Navsari	4	4	7
23	Panchmahals	7	7	11
24	Patan	8	8	1
25	Porbandar	2	2	0
26	Rajkot	9	9	2
27	Sabarkantha	7	7	7
28	Surat	8	8	14
29	Surendranagar	8	8	1
30	Tapi	5	5	11
31	The Dangs	1	1	0
32	Vadodara	8	8	7
33	Valsad	5	5	12
	Total	213	213	187

Note: 1. Excluding Uninhabited villages.2. Districtwise no.of villages & area not available for 33 districts.
Source: GOG (2016), Statistical Abstract of Gujarat State-2016,Directorate of Economics & Statistics, Govt of Gujarat.

In Model Act provision has been suggested for promotion of direct marketing as one of the alternative marketing structure that sustains incentives for quality and enhanced productivity, reduce distribution losses, improve farmer income with improved technology support and methods. The market will operate outside the purview of the Agricultural Produce Marketing Act and will be owned by professional agencies in private sector, wholesalers, trade associations and other investors. The Government's role should be that of a facilitator rather than that of having control over

the management of the markets. Considering the vastness of the country, more and more such markets need to come up in the organized sector with private investment so that they can be developed in tune with the market requirements with backward and forward linkages. A common code of conduct and modalities with regard to ownership, operation and need based infrastructure will have to be prepared and circulated to spread the concept of direct marketing by the farmers.

To establish the projects of fruits and vegetables on the line of NDDB, Government of Gujarat has set up a committee under the chairmanship of Hon'ble Minister of Agriculture and Cooperation vide Govt. Resolution No.BGT/102003/2043/K/8 dated 28.11.2003.Separate provision is made for notification of "special commodities markets" in any market area for specified agricultural commodities to be operated in addition to existing markets.

4.3 Gujarat State Agricultural Marketing Board (GSAMB):

The Gujarat State Agricultural Marketing Board was established in 1985 under the provisions contained in section 34 and 34 A (1) of the Gujarat Agricultural Produce Market Act, 1963.The major activities of the boards include:

- Organized state level discussion on impact of implementation of Model Act.
- Improvement of existing yards for trade of cotton having open sheds for cotton auction, proper parking area, grading laboratory and equipments, Farmers Information Center, and other facilities.
- Computer network connection to APMCs under "Agmarknet" scheme of Directorate of Marketing and Inspection, Government of India. At present 280 main yards and sub yards are equipped with computer & Internet facilities and are sending daily prices of arrivals to the Agmarknet site.
- One of the seven promoters in establishing on-line commodity exchange Board of India. Other participants are NAFED, Central Warehousing Corporation, Gujarat Agro Industries Corporation and National Institute of Agricultural Marketing (NIAM).
- Promoting contract farming in the State by printing, publishing and distributing brochures in English and Gujarati
- Acts as an "Arbitrator" during the disputes between any parties regarding any matter pertaining to contract farming agreement.
- Translation, printing and distributing the booklets of various schemes / projects of Government of India in Gujarati language.

- Preparation of commodity profile of post harvest management of Major commodities of Gujarat viz. potato, cotton, cumin, sesame, mango, onion, etc.

4.4 Programmes and Scheme for support in Marketing:

4.4.1 Contract Farming

Gujarat is making rapid progress in developing infrastructure, irrigation, electricity, and productivity in agriculture sector. Gujarat is rich in resources. State has varied soil composition ranging from arid desert of Kutch to highly fertile land of South Gujarat with good water facility suitable for growing many crops.In order to facilitate industries to procure specific quality of agro-commodity directly from the farmers the state govt, keeping in tune with the reforms of Model Act 2003, has adopted " Contract Farming " scheme from dt. 31/3/2005. While adopting contract farming, the prime focus of the Gujarat government is two prong, firstly farmers of Gujarat can get benefit of latest farming technology, improve quality and quantity of commodity, get price security and an opportunity to diversify in other crops. On the other hand, processors can get quality and variety of commodity as per their market requirement at specific stable price.

Gujarat has some good success story and prospective agreements of Contract farming. At present among successful contract farming practices undertaken in Gujarat, following are noticeable:

- **Agrocell Corporation Ltd.** is doing contract farming of organic cotton and seasame seeds covering about 5000 acres in Kutch and Surendranagar district of Gujarat since last 8 years. The farmers get 7-8 % more price than ordinary cotton in current market and concession in certain services from the company.
- **Atreyas Agro Organic Pvt. Ltd.** Plans to grow Jetrophs Curcas by contract farming. They have target of covering more than 50,000 acres of irrigated & non-irrigated land of Gujarat.
- **Godrej Agrovat Ltd.** is also planning to grow high quality palm oil under contract farming in South Gujarat region by providing imported tissue culture plants and farming technology to the contract farmers.
- **Pepsi India, Arvind mills, Jojoba Oil Industries Ltd.**, are some companies who have approached the govt. and shown keen interest in doing research and contract farming in Agro-products in Gujarat under their backward integration projects.

4.4.2 Gujarat New Organic Policy 2015

Gujarat is divided into eight agro-climatic zones with most of zones falling into arid (32%) or semi arid zones (46%)[2]. This makes Gujarat to be a state which is highly prone to droughts. According to the official statistics of Government of Gujarat, of the total cultivated area in Gujarat only 43.24% is irrigated. 68.43% of land in Gujarat is under desertification. The Dangs region of Gujarat ranks the lowest in terms of gross irrigated area and fertilizer consumption, only 0.53% area is irrigated and the per ha consumption of fertilizers is 1.20 kg. In Kutch region 80% of the agriculture is still rainfed[3]. Many studies have confirmed that organic farming is better suited for regions which are more drought prone and untouched by chemical fertilizers thus making Gujarat a very suitable state to implement organic farming. According to the Organic Policy of Gujarat, it is possible to grow a wide range of cereals (sorghum, nagli, ragi, pearl millet, wheat), pulses, groundnut, horticulture (mango, custard apple, banana, papaya, pomegranate, vegetables, chillies, garlic) spices (cumin, coriander) and cotton in Gujarat. Gujarat stands fifth as far as areas under organic certification are concerned. Government of Gujarat is also taking important steps in this direction by releasing its organic farming policy and setting up State Certification Agency - Gujarat Organic Produce Certification Agency(GOPCA), wherein subsidy is also provided to the farmers for organic certification. Most importantly farmers in Gujarat are very enterprising, quite responsive to price realization as they have shown a shift towards cash crops, fruits, vegetable and oil seeds, for better price realization. Gujarat has the potential to be a prominent state in India in the area of organic cultivation, due to the prominence of arid and semi arid zones, agro climatic condition suited to produce a wide range of crops organically, especially cotton and horticulture and its enterprising and progressive producers who are responsive to better price realization and markets.

Gujarat government had launched its organic policy on April 10, 2015 and has become the ninth state to do so. The government will set up a cell to implement its new organic farming policy with a view to promote non-conventional method of farming over the use of chemical fertilizers. The government is committed to promote organic farming and had allocated Rs.10 crore in the budget for this purpose. The policy initially focused on tribal areas and helped farmers' groups for production of organic inputs including seeds as well as processing and marketing. The new policy

[2] http://www.nih.ernet.in/rbis/india_information/draught.htm
[3]http://www.ceeindia.org/cee/pdf_files/Dangs_Perspective.pdf

also highlights research and development of organic produce, setting of syllabus and conduct of training courses. The policy stated that agriculture produce marketing committees, non-governmental organization, municipal corporations and self-help groups would be given incentives for marketing organic produce. The government in its policy also stated that there would be concessions in certification cost to benefit even small and marginal farmers. The government has also decided to have special names for the organic products from Gujarat under the brand name Gujarat Organic, Garvi Gujarat-Organic Gujarat. The tribal areas and areas with low agro-chemical usage would benefitwith this policy.

4.5 Status of implementation of eNAM in Gujarat

As was expected, on 14th of April 2016, eNAM scheme had been launched on a pilot basis in three selected APMCs of Gujarat, viz. Patan, Botad and Himmatnagar with a specific commodity such as castor seed, chana (black gram) and wheat respectively. It was reported that all 40 mandis are online with eNAM. A total of 40 APMCs area were selected from 23 districts of Gujarat and now connected to eNAM portal (Table 4.2 & 4.3).

Table 4.2: Selected districts and Number of APMCs connected with eNAM in Gujarat

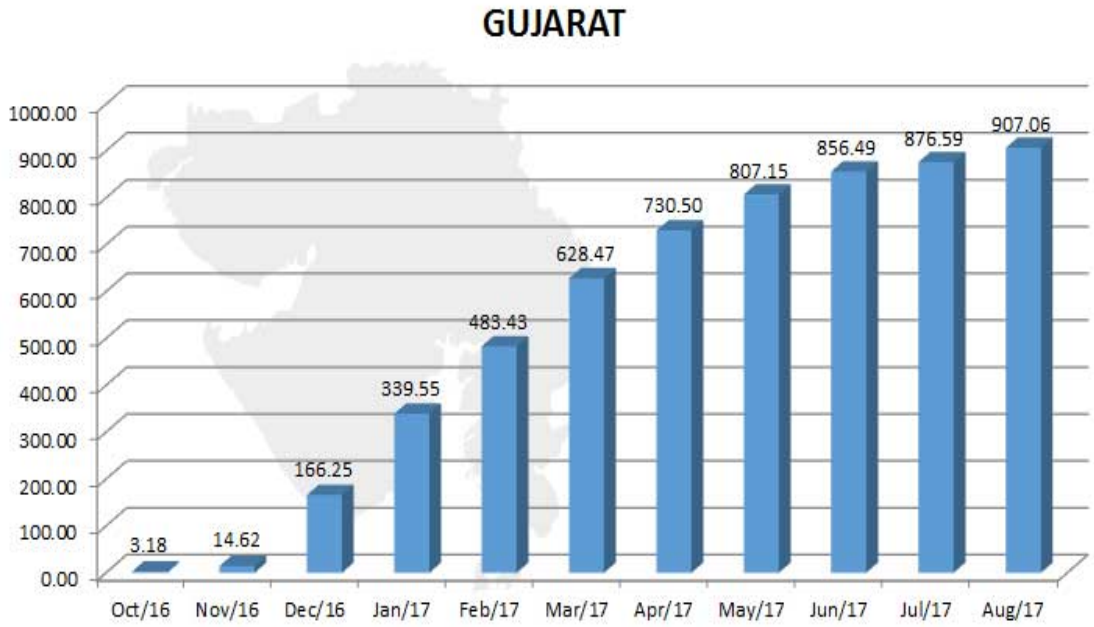
SL.	Selected Districts and APMCs in Gujarat for eNAM						
	District	No.	APMC	SL.	District Name	No.	APMC
1	Ahmedabad	3	Ahmedabad, Dholka, Sanand	14	Navsari	1	Bilmora
2	Amreli	1	Bhiloda	15	Panchamahal	1	Godhra
3	Anand	1	Petlad	16	Patan	1	Patan
4	Arvalli	1	Bhiloda	17	Porbandar	1	Porbander
5	Banaskantha	5	Bhabhar, Deesa, Dhanera, Thara, Tharad	18	Rajkot	2	Jasdan, Rajkot
6	Botad	1	Botad	19	Sabarkantha	2	Himmatnagar, Talod
7	Chhota Udepur	1	Pavi-Jetpur	20	Surat	1	Mahuva
8	Dahod	2	Dahod, Jhalod	21	Surendranagar	1	Wadhwan
9	Gir Somnath	1	Kodinar	22	Tapi	1	Nizar
10	Jamnagar	4	Dharol, Jamjodhpur, Jamkhambhaliya, Jamnagar	23	Vadodara	2	Vadodara, Savli
11	Junagadh	3	Junagadh, Visavadar, Bhesan				
12	Mehsana	2	Vijpur, Visnagar	24	Valsad	1	Valsad
13	Morbi	1	Halvad		Grand Total	40	

Source: www.enam.gov.in

Table 4.3: Details on APMCs connected with eNAM in Gujarat

SL	District	Town/Place	APMC details
1	Ahmedabad	Ahmedabad	Pandit Dindayal Grain Market Yard, Jetalpur, Ahmedabad
2	Ahmedabad	Dhoalka	Grain Market Yard Kheda-Bagodara Highway
3	Ahmedabad	Sanand	Agricultural Produce Market Committee, Sanand Rly. Station Road, Sanand, Dist. Ahmedabad Pin. 382110
4	Amreli	Savarkundla	Secretary, Agricultural Market Committee, Savarkundla, Distt. Amreli
5	Anand	Petalad	First Floor, Shree Morarji Bhavan Shopping Center,College Crossing,Ta:Petalad-388 450,Dist:Anand
6	Arvalli	Bhiloda	Agricultural Produce Market Committee, Market Yard, Bhiloda, Distt.Arvalli
7	Banaskanth	Bhabhar	The Agricultural Produce Market Committee, Bhabhar, Distt. Banaskantha
8	Banaskanth	Deesa	S.S Shah Main Market Yard,Deesa Patan HighwaY, Deesa-385535 Dist-Banaskantha
9	Banaskantha	Dhanera	APMC Dhanera AT & Post.Ta.Dhanera Dist. Banaskantha
10	Banaskantha	Thara	Agricultural Produce Market Committee, Market Yard, Sardar Krushi Ganj Thara Thara, Distt. Banaskantha,
11	Banaskantha	Tharad	Agricultural Produce Market Committee, Market Yard, Tharad, Distt. Banaskantha Gujarat- 385565
12	Botad	Botad	Marketyard,Paliyad Road,Botad-364710
13	Chhota Udepur	Pavi-Jetpur	Agricultural Produce Market Committee Pavi-Jetpur High way road, At.po.tal. Pavi Jetpur,Dist Chhota Udepur,
14	Dahod	Dahod	The Agricultural Produce Market Committee, Dahod Bharpura road Dahod Dist. Dahod
15	Dahod	Jhalod	Agricultural Produce market Committee Market Yard Bansiwada road, NH-113,Jhalod
16	Gir Somnath	Kodinar	Secretary, Agricultural Market Committee, Kodinar, Distt, Junagadh,Near Railway station, Ta: Kodinar, Dist- Gir Somnath
17	Jamnagar	Dhrol	Agricultural Produce Market Committee, Dhrol, Jamnagar- Rajkot Highway, Dist. Jamnagar
18	Jamnagar	Jamjodhpur	Secretary, Agricultural Market Committee, Jamjodhpur, Distt. Jamnagar
19	Jamnagar	Jamkhambhaliya	Secretary, Agricultural Market Committee, Jam Khamblia, Distt. Jamnagar,Jamnagar-Okha,Highway,Jamkhambhalia
20	Jamnagar	Jamnagar	The Agricultural Produce Market Committee, Market Yard Hapa,Jamnagar Ta & Dist Jamnagar361120
21	Junagadh	Junagadh	At. Dolatpara (Junagadh) Gujarat,Sardar Patel Marketing yard,Dolatpara,Junagadh
22	Junagadh	Visavadar	Agricultural Produce Market Committee, Keshubhai Patel Market Yard, Visavadar, Distt. Junagadh
23	Junagarh	Bhesan	Agricultural Produce Market Committee, Parab road, Besan, Dist. Junagarh,OPP- Mamalatadar office at & Po Bhesan
24	Mehsana	Vijapur	At.Po.Vijapur,Khatrikuva, Dist.mehsana Gujarat(N.G)
25	Mehsana	Visnagar	Market Yard, At & Ta - Visnagar Di -Mehsana North Gujarat - 384315
26	Morbi	Halvad	Agricultural Produce market Committee Halvad Dist Morbi,Nr GIDC.
27	Navsari	Bilimora	AT-PO-Devsar,Nursary Road,Amalsad Subyard Tal-Gandevi,Dist Navsari. 396380,
28	Panchamahal	Godhra	Opp. New Bus stand Near Rana Society, Godhra-389001 Panchmahal.
29	Patan	Patan	New Saradar Gunj Bazar,Marketing yard,Patan
30	Porbandar	Porabadar	Agricultural Produce Market Committee, Market Yard, Porbandar, Distt. Porbandar
31	Rajkot	Jasdan	Agricultural Produce Market Committee,Darbar saheb shree shivaraskumar Khachar Market Yard,bypass road Jasdan.dist.rajkot
32	Rajkot	Rajkot	SVP Marketing Yard, Rajkot-Morbi Highway,Bedi, Rajkot
33	Sabarkantha	Himatnagar	APMC Himmatnagar Khed Tasiya road 383001
34	Sabarkantha	Talod	A.P.M.C. Towerchok Bazar,Talod, At:PO:Ta:Talod, Dist:Sabarkantha-383215,
35	Surat	Mahuva	Agricultural Produce Market Committee, Market Yard, Station road, Mahuva, Distt. Surat,
36	Surendranagar	Wadhwan	APMC, Sardar Patel market,Wadhwan, GIDC Area, Wadhwan Pin - 363035,
37	Tapi	Nizar	Agricultural Produce Market Committee, GJ SH 80,Vallabhnagar Nizar, Dist.Tapi,
38	Vadodara	Vadodara	Sayajipura Market yard,NH No 8,Vadodara
39	Vadodra	Savli	Agricultural Produce Market Committee, Market Yard, Savli, At & Po.Savli.Dist.Vadodra 391770
40	Valsad	Valsad	Dashera Tekari, Bechar Road, Valsad-396001

Fig. 4.1: Status of Trading of Produce under eNAM in Gujarat in tonnes (as reported)



Source: http://www.enam.gov.in/NAM/home/multi_dashboard.html

It was reported that by the completion of second phase (May 2017), all targeted 40 mandis were live on e-NAM. About 308346 farmers and 7399 buyers were registered on e-NAM portal with a turnover of Rs. 3693.164 crore from the trading of 907.05 tonne produce covering agricultural commodities like Castor Seed, Cotton, Wheat, Sesame Seed, Groundnut (Fig. 4.1). Though the state of Gujarat has made provisions for three identified reform measures, basic infrastructure facilities like auction platform, information dissemination mechanism, banks, etc are not available in some markets (IFPRI, 2016; Shailendra and Jairath, 2016).

The next chapter presents the findings from field survey data.

Chapter V

Findings from Field Based Survey in Gujarat

5.1 Introduction:

As mentioned in introductory chapter, a survey was undertaken in selected 31 APMCs (covering 23 eNAM APMCs and 8 non eNAM APMCs), covering 155 Commission Agents, 155 farmers and representatives of APMCs to know about the implementation of eNAM, performance and prospects of eNAM in Gujarat. The findings from the sameis presented and discussed in this chapter.

5.2 Farmers' Households:

5.2.1 Profile of Farmers' Households:

The profile of selected farmer households is presented in Table 5.1. It can be seen from the table that more than 98 per cent of the respondents were male under eNAM category while all respondents were male in Non eNAM APMC category. Average age of the respondents was around 45-46 years having average education of 9-10 years. The average farming experience was of 22 years in both categories. Average household size was 6-7 persons per household. The share of family members working in farming and dairy was relatively higher in Non eNAM APMC category than eNAM category.

Table 5.1: Family Profile of Selected Farmers' household

Sr. No	Particulars	Family Profile of Selected Farmers' household							
		eNAM (N=115)				Non eNAM APMC (N=40)			
		Small (up to 2 ha)	Medium (2-4 ha)	Large (4 ha above	Av.	Small (up to 2 ha)	Medium (2-4 ha)	Large (4 ha & above	Av.
	n=	45	31	39	115	17	11	12	40
1	Gender of respondent (%)								
	Male	96.83	100	98.04	98.71	100	100	100	100
	Female	3.17	0.00	1.96	1.29	0.00	0.00	0.00	0.00
2	Age of respondent (years)								
	Male	45.41	49.39	45.11	46.40	43.12	44.91	48.17	45.13
	Female	52.00	0.00	65.00	58.50	0.00	0.00	0.00	0.00
3	Education of respondent (years)	10.56	9.32	10.92	10.11	7.53	8.18	10.92	8.73
4	Farming Experience (Average years)	18.11	26.19	23.51	22.12	20.88	24.45	22.25	22.28
5	Av. Household Size (Nos.)	5.69	7.13	5.82	6.12	6.88	6.36	6.50	6.63
6	Family members working in agriculture (Nos)	2.67	3.42	2.92	2.96	3.41	3.91	3.58	3.60
7	Family members working in Dairy (Nos)	1.87	2.23	1.97	2.00	2.53	3.73	3.08	3.03

Note: Respondent may be head of Household.
Source: Field survey data

5.2.2 Socio Economic Characteristics of Selected Farmers Households:

The socio economic characteristics of selected farmers are presented in table 5.2. It can be seen from the table that majority of the respondents were Hindus. On an average, more than half of the selected farmers belonged to 'open category' followed by Other Backward Classes and Scheduled Caste category. More than 79 per cent of farmers from both category were from 'above poverty line' group and thus possibly because of same more than 89 per cent of farmers from eNAM group and 80 per cent from APMC group have pucca or semi-pucca house.

Table 5.2: Socio-Economic Characteristics of Selected Farmers

Sr. No	Particulars	Socio-Economic Characteristics of Selected Farmers							
		eNAM				Non eNAM APMC			
		Small	Medium	Large	Total	Small	Medium	Large	Total
1	Religion (%)								
	Hindu	100.0	100.0	97.4	99.1	100.0	90.9	100.0	97.5
	Muslim	0.0	0.0	2.6	0.9	0.0	9.1	0.0	2.5
	Christian	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Sikh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Others	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	Social Group (%)								
	Scheduled Tribe	8.9	9.7	7.7	8.7	17.6	9.1	8.3	12.5
	Scheduled Caste	4.4	3.2	0.0	2.6	0.0	0.0	0.0	0.0
	Other Backward Class	42.2	38.7	20.5	33.9	52.9	36.4	8.3	35.0
	General/Open	44.4	48.4	71.8	54.8	29.4	54.5	83.3	52.5
3	Income Group (%)								
	BPL	33.3	16.1	10.3	20.9	23.5	0.0	8.3	12.5
	APL	66.7	83.9	89.7	79.1	76.5	100.0	91.7	87.5
	AAY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	Household structure (%)								
	Pucca	62.2	71.0	79.5	70.4	23.5	72.7	66.7	50.0
	Semi pucca	24.4	19.4	12.8	19.1	35.3	18.2	33.3	30.0
	Kuchcha	13.3	9.7	7.7	10.4	41.2	9.1	0.0	20.0

Source: Field survey data

Table 5.3 presents the details regarding occupation and KCC holding of selected farmers. It can be seen from the table that crop cultivation was the main occupation of the selected farmers belonging to both groups and animal husbandry was the secondary source of income for these households. Around 40 per cent farmer households maintain the farm records and more than 60 per cent of households have Kisan Credit Card with them.

Table 5.3: Details on Occupation and KCC holding of Selected Farmers

Sr. No	Particulars	Occupation and KCC holding of Selected Farmers							
		eNAM				Non eNAM APMC			
		Small	Medium	Large	Total	Small	Medium	Large	Total
1	Occupation (%)								
	Principal								
	Cultivator	95.6	100.0	94.9	96.5	100.0	90.9	100.0	97.5
	AH & Dairying	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Agri. Labour	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Nonfarm Labour	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Own Non-Farm Establishment	0.0	0.0	2.6	0.9	0.0	9.1	0.0	2.5
	Trade	0.0	0.0	2.6	0.9	0.0	0.0	0.0	0.0
	Employee in Service	4.4	0.0	0.0	1.7	0.0	0.0	0.0	0.0
	others	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	*Subsidiary*								
	Cultivator	4.4	0.0	5.1	3.5	0.0	9.1	0.0	2.5
	AH & Dairying	33.3	54.8	46.2	43.5	70.6	72.7	75.0	72.5
	Agri. Labour	2.2	0.0	0.0	0.9	5.9	0.0	0.0	2.5
	Nonfarm Labour	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Own Non-Farm Establishment	11.1	0.0	10.3	7.8	5.9	9.1	0.0	5.0
	Trade	2.2	6.5	0.0	2.6	0.0	0.0	0.0	0.0
	Employee in Service	8.9	6.5	5.1	7.0	5.9	9.1	8.3	7.5
	others	2.2	0.0	0.0	0.9	0.0	0.0	8.3	2.5
3	Do you maintain farm financial record (Yes)	24.4	54.8	43.6	39.1	29.4	54.5	41.7	40.0
5	Possess Kisan Credit card Yes (%)	53.3	71.0	66.7	62.6	58.8	81.8	75.0	70.0

Source: Field survey data

5.2.3. Land Holdings and Sources of Irrigation with Farmers' Households:

The details regarding the land holding size for selected farmers, presented in Table 5.4, indicates that the average operational land holdings with eNAM group of farmers was 3.86 ha of which 82 per cent land was irrigated, while corresponding figure for Non eNAM APMC group was 3.5 ha with 93 per cent having irrigation facility. The average rental value of irrigated land was obviously higher than the unirrigated land and ranged between Rs. 25000-30000/- per hectare for a period of a year. The major source of irrigation with selected farmers was groundwater (tube well and open well) along with minor share of canal water (table 5.5).

Table 5.4: Detailson Land Holding Size of Selected Farmers

Sr. No	Particulars	Land Holdings Size Selected FarmersHousehold (ha)							
		eNAM				Non eNAM APMC			
		Small	Medium	Large	Av	Small	Medium	Large	Av
1	Owned Land (ha)								
	Irrigated	0.95	2.19	5.32	2.77	0.84	2.04	6.61	2.90
	Unirrigated	0.13	0.54	1.25	0.62	0.09	0.52	0.17	0.23
	Total	1.08	2.73	6.57	3.39	0.94	2.56	6.78	3.14
2	Leased in Land								
	Irrigated	0.04	0.11	1.13	0.43	0.12	0.22	0.73	0.33
	Unirrigated	0.00	0.00	0.18	0.06	0.00	0.00	0.00	0.00
	Total	0.04	0.11	1.31	0.49	0.12	0.22	0.73	0.33
3	Leased -out Land								
	Irrigated	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Unirrigated	0.03	0.00	0.00	0.01	0.00	0.00	0.00	0.00
	Total	0.04	0.00	0.00	0.01	0.00	0.00	0.00	0.00
4	Fallow land								
	Irrigated	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Unirrigated	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	Total Operational Land								
	Irrigated	0.98	2.30	6.45	3.19	0.96	2.26	7.34	3.23
	Unirrigated	0.11	0.54	1.43	0.67	0.09	0.52	0.17	0.23
	Total	1.09	2.84	7.88	3.86	1.05	2.78	7.51	3.47
6	Rental Value (rs/ha/year)								
	Irrigated	36140	33072	23312	24469	27500	25020	31257	29554
	Unirrigated	0	0	0	0	0	0	2206	2206

Source: Field survey data

Table 5.5: Sources of Irrigation available with Selected Farmers

Sr. No	Particulars	Sources of Irrigation with Selected Farmers							
		eNAM				Non eNAM APMC			
		Small	Medium	Large	Total	Small	Medium	Large	Total
A	Irrigated Owned land Sample HHs (Nos)	41	30	37	108	17	11	12	40
B	**Owned Land (%)**								
1	Open well	10.8	21.8	6.6	10.4	35.7	27.8	19.7	23.5
2	Tube well	69.2	60.5	78.0	73.2	54.2	60.9	80.3	72.6
3	Canal	6.3	2.8	4.9	4.7	0.0	0.0	0.0	0.0
4	No irrigation	13.7	14.9	10.4	11.8	10.1	11.3	0.0	3.8
5	Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
C	**Leased in Land (%)**								
1	Open well	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	Tube well	3.1	2.1	2.9	2.8	7.5	8.5	10.8	9.9
3	Canal	0.0	0.0	2.1	1.4	0.0	0.0	0.0	0.0
4	Two sources	0.5	2.0	11.6	8.1	5.0	0.0	0.0	0.6
5	Total	3.6	4.1	19.3	14.1	12.6	8.5	10.8	10.5

Source: Field survey data

5.2.4Awareness about eNAM:

Table 5.6 present the details regarding awareness about eNAM and mode of sale of commodity by selected farmers. It can be seen from the table that more than 83 per cent of farmers have sold their produce in APMC through commission agent (regular mode of sale transaction in market through action method of sale) followed by sale to village traders while some of them sold at both places. None of theeNAM group farmer had sold their produce through eNAM procedure of sale, implemented in selected APMCs of Gujarat. Hardly one third of selected famers from eNAM group were aware about eNAM despite of the fact that these selected APMCs are provided with grant-in-aid and infrastructure for implementation of eNAM which also includes amount devoted for creating awareness among the famers and other stakeholders. Those who were aware about eNAM, main source of information was APMC. Thus, there is a need of mega awareness campaign inside APMC as well as villages aroundparticular APMC. None of the crop was marketed through eNAM (intrastate or interstate bidding and sale as per the guidelines of eNAM)

Table 5.6: Awareness about eNAM and Sale of Commodity by Selected Farmers

Sr. No	Particulars	Awareness about eNAM and Sale of Commodity APMC by Selected Farmers							
		eNAM				Non eNAM APMC			
		Small	Medium	Large	Total	Small	Medium	Large	Total
1	Place of Sale of Agri Produce (%) multiple								
	Through eNAM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Commission Agent/APMC	77.8	83.9	89.7	83.5	94.1	81.8	83.3	87.5
	Village Trader	24.4	16.1	15.4	19.1	23.5	18.2	25.0	22.5
2	Awareness of eNAM (%)								
	YES	31.1	35.5	35.9	33.9	5.9	18.2	25.0	15.0
	NO	68.9	64.5	64.1	66.1	94.1	81.8	75.0	85.0
	If yes, source/s of information (%)								
	APMC	100.0	81.8	92.9	92.3	100.0	100.0	100.0	100.0
	Dept of AG/Gram sevak	0.0	0.0	7.1	2.6	0.0	0.0	0.0	0.0
	Fellow Farmers	0.0	9.1	0.0	2.6	0.0	0.0	0.0	0.0
	Electronic and Print Media	0.0	9.1	0.0	2.6	0.0	0.0	0.0	0.0
3	Crop marketed through eNAM (%)								
	YES	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	NO	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	If yes, details on crop sale								
	Crop Name	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Production (qt)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Quantity retained	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Quantity sold at village	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Quantity sold through CA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Quantity sold through eNAM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: Field survey data

5.2.5 Use of eNAM:

There are many uses of eNAM as one can check prices of commodities in various markets on different dates, sale of commodity, online payment, etc. Though no sale of commodity was reported under eNAM, attempt was made to check whether farmers make use of this electronic platform and website for any other purpose. But it was observed that none of the farmers have reported any use of the same for any such purpose (Table 5.7)

Table 5.7: Details on Use of eNAM by Selected Farmers

Particulars	Use	use of eNAM by Selected Households (% to total sample)							
		eNAM				Non eNAM APMC			
		Small	Medium	Large	Total	Small	Medium	Large	Total
For what purpose did you use the e-NAM?	Only checking prices	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Price checking and sale only	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Price checking, sale and online payment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Any other	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Checking prices on e-NAM	Very easy	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Easy	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Not so easy	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Difficult	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Very difficult	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sale on e-NAM	Very easy	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Easy	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Not so easy	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Difficult	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Very difficult	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Payments on e-NAM (receipt by farmers)	Very easy	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Easy	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Not so easy	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Difficult	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Very difficult	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Days taken to receive online payments	Within 2 days	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	3-5 days	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	5-10 days	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	10-20 days	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	More than 20 days	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: Field survey data

5.2.6Facilities Available at APMC reported by Farmers:

Implementation of eNAM market has certain pre-requisites requirement of infrastructure in selected APMC covered under eNAM such as assaying (quality testing), e-auction, weighing, etc. It can be seen from Table 5.8 that all the mandis have weighing facility besides other facilities like grain storage, soil testing and bid management (Table 5.8). In terms of the quality parameters, among all services, weighing facility was ranked with 'good' to 'satisfactory' level.

Table 5.8: Facilities Available and Quality rankat APMC reported by Selected Farmers

Sr. No	Particulars	Facilities Available and quality rank at APMC by Selected Farmer							
		eNAM				Non eNAM APMC			
		Small	Medium	Large	Total	Small	Medium	Large	Total
A	**Facilities (Yes %)**								
1	Cleaning	2.2	12.9	5.1	6.1	0.0	0.0	0.0	0.0
2	Sorting	0.0	0.0	2.6	0.9	0.0	0.0	0.0	0.0
3	Dying	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	Grading	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	Weighing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
6	Assaying (quality testing)	4.4	3.2	0.0	2.6	0.0	0.0	0.0	0.0
7	Bid management	40.0	51.6	53.8	47.8	17.6	36.4	66.7	37.5
8	E-auction	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	Grain storage	44.4	61.3	38.5	47.0	64.7	45.5	8.3	42.5
10	Soil testing	75.6	93.5	87.2	84.3	41.2	54.5	58.3	50.0
11	Any other (specify)	11.1	9.7	2.6	7.8	0.0	0.0	0.0	0.0
B	**Quality (Av. score)**								
1	Cleaning	1.0	1.0	1.5	1.1	0.0	0.0	0.0	0.0
2	Sorting	0.0	0.0	1.0	1.0	0.0	0.0	0.0	0.0
3	Dying	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	Grading	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	Weighing	2.7	2.3	2.4	2.5	3.0	2.8	3.0	3.0
6	Assaying (quality testing)	3.0	3.0	0.0	3.0	0.0	0.0	0.0	0.0
7	Bid management	2.2	2.2	2.2	2.2	3.0	3.0	3.0	3.0
8	E-auction	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	Grain storage	1.9	1.8	1.6	1.8	2.9	2.2	2.0	2.7
10	Soil testing	2.3	2.2	2.4	2.3	2.0	2.2	2.7	2.3
11	Any other (specify)	2.6	3.0	3.0	2.8	0.0	0.0	0.0	0.0

Note:Quality of Facilities (1-very good, 2-good, 3-satisfactory, 4-poor 5-very poor)
Source: Field survey data

As no sale was undertaken under electronic market, sample of noagricultural produce was tested and uploaded on the eNAM platform. Thus, none of the farmers have responded on quality testing and related parameters at APMC (Table 5.9). The other facilities available at the market premises of APMC were bank, agriculture input shops, telephone, storage, internet, canteen, and guest house (Table 5.10).

Table 5.9: Quality Testing and related Parameters at APMC reported by Sample Farmers

Sr. No	Particulars	Quality Testing and related Parameters at APMC reported by Sample Farmers							
		eNAM				Non eNAM APMC			
		Small	Medium	Large	Total	Small	Medium	Large	Total
A	Testing of quality parameters (%)	NR	NR	NR	NR	NR	NR	NR	NR
	Transparent	NR	NR	NR	NR	NR	NR	NR	NR
	Not Transparent	NR	NR	NR	NR	NR	NR	NR	NR
B	Have you ever received a report on testing of quality (%)	NR	NR	NR	NR	NR	NR	NR	NR
	Yes	NR	NR	NR	NR	NR	NR	NR	NR
	No	NR	NR	NR	NR	NR	NR	NR	NR
C	How do you rate testing of quality parameters (%)	NR	NR	NR	NR	NR	NR	NR	NR
	very stringent	NR	NR	NR	NR	NR	NR	NR	NR
	stringent	NR	NR	NR	NR	NR	NR	NR	NR
	alright,	NR	NR	NR	NR	NR	NR	NR	NR
	liberal	NR	NR	NR	NR	NR	NR	NR	NR
	very liberal	NR	NR	NR	NR	NR	NR	NR	NR
D	Av. Rating to following specific parameters (%)	NR	NR	NR	NR	NR	NR	NR	NR
	Moisture (% by wt)	NR	NR	NR	NR	NR	NR	NR	NR
	Foreign matter (% by wt)	NR	NR	NR	NR	NR	NR	NR	NR
	Other edible grains (% by wt)	NR	NR	NR	NR	NR	NR	NR	NR
	Damaged grains (% by wt)	NR	NR	NR	NR	NR	NR	NR	NR
	Weevilled grains (% by count)	NR	NR	NR	NR	NR	NR	NR	NR
	Immature and Shrivelled grains/seeds (% by count)	NR	NR	NR	NR	NR	NR	NR	NR
	Uniformity	NR	NR	NR	NR	NR	NR	NR	NR
	Lusture	NR	NR	NR	NR	NR	NR	NR	NR
	Oil content (% by wt)	NR	NR	NR	NR	NR	NR	NR	NR
	Colour of Extracted oil	NR	NR	NR	NR	NR	NR	NR	NR
	Any other (specify)	NR	NR	NR	NR	NR	NR	NR	NR

Note: NR: Not Responded
Source: Field survey data

Table 5.10: Other facilities available at the Market premises of APMCas reported by Sample Farmers

Sr. No	Particulars	Other facilities available at the Market premises of APMC							
		eNAM				Non eNAM APMC			
		Small	Medium	Large	Total	Small	Medium	Large	Total
1	Canteen	68.9	74.2	79.5	73.9	47.1	72.7	75.0	62.5
2	Guest house	53.3	51.6	69.2	58.3	47.1	45.5	75.0	55.0
3	Bank	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
4	Storage	48.9	38.7	41.0	43.5	58.8	27.3	25.0	40.0
5	Internet	77.8	74.2	69.2	73.9	82.4	63.6	33.3	62.5
6	Telephone	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
7	Agriculture Input Shop	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
8	any other (specify)								

Source: Field survey data

5.2.7 Problems reported by Farmers about eNAM (perceptions):

Table 5.11 presents the problems reported by sample farmersabout eNAM (these may be perceptions of the farmers as no one has transacted through electronic process). It can be seen from the table that the five perceptions reported as major problems about electronic marketing include: online transaction process is difficult; sale process is complicated than before; delay in receiving online payment; discovering prices is cumbersome;and sorting facilities are not adequate.

Table 5.11: Problems reported about eNAM by Sample Farmers

Sr. No	Particulars	Problems faced at the eNAMreported by Sample Farmers							
		eNAM				Non eNAM APMC			
		Small	Medium	Large	Total	Small	Medium	Large	Total
1	No guidance or help desk	62.2	30.6	17.1	29.9	64.7	27.3	25.0	34.7
2	Higher mandi fees than before	2.2	0.0	2.6	1.8	17.6	0.0	5.6	6.7
3	Electronic system does not work/works occasionally	60.0	24.2	16.2	27.2	47.1	13.6	11.1	20.0
4	Discovering prices is cumbersome	75.6	29.0	25.6	36.6	70.6	18.2	27.8	34.7
5	Sale process is complicated than before	82.2	37.1	26.5	40.6	70.6	27.3	33.3	40.0
6	Lower price than pre e-NAM	15.6	14.5	11.1	12.9	11.8	9.1	13.9	12.0
7	Higher cost than pre e-NAM	48.9	25.8	19.7	27.2	17.6	13.6	19.4	17.3
8	Online transaction process is difficult	82.2	37.1	26.5	40.6	58.8	22.7	25.0	32.0
9	Delay in receiving online payment	84.4	37.1	24.8	40.2	70.6	31.8	30.6	40.0
10	Poor net connectivity	48.9	17.7	11.1	20.5	47.1	9.1	8.3	17.3
11	Not enough computers	60.0	22.6	15.4	26.3	41.2	9.1	11.1	17.3
12	Frequent power failure	35.6	6.5	11.1	14.7	41.2	9.1	5.6	14.7
13	No trained manpower to help with eNAM	51.1	21.0	11.1	21.9	35.3	9.1	8.3	14.7
14	Poor road network for transportation	53.3	24.2	13.7	24.6	41.2	9.1	11.1	17.3
15	Cleaning facilities are not adequate	77.8	37.1	23.9	38.4	70.6	31.8	27.8	38.7
16	Sorting facilities are not adequate	77.8	37.1	24.8	38.8	58.8	27.3	30.6	36.0
17	Grading facilities are not adequate	77.8	37.1	23.9	38.4	52.9	27.3	30.6	34.7
18	Weighing facilities are not adequate	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
19	Quality parameters are stringent	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20	No soil testing laboratory	55.6	24.2	15.4	25.9	47.1	9.1	8.3	17.3
21	No refrigeration facilities	53.3	22.6	13.7	24.1	47.1	9.1	5.6	16.0
22	Labour problem for loading / unloading	13.3	0.0	3.4	4.5	5.9	4.5	2.8	4.0
23	Traders Collusion /trade malpractices	44.4	19.4	12.0	20.5	0.0	0.0	0.0	0.0
24	Market is far away	2.2	0.0	1.7	1.3	0.0	0.0	0.0	0.0
25	Any other (specify)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: Field survey data

5.2.8 Advantages of eNAM by Farmers (perceptions):

The selected farmers perceive that marketing through eNAM would be transparent, will result in convenient transfer of money and cost of marketing will be lower (Table 5.12).The rating for eNAM given by famers indicates a lot of efforts are further required to prepare farmers to transact with electronic market. The average score regarding the superiority of electronic market over non eNAM APMC was between 1-2 (worse to no change) (Table 5.13)..

Table 5.12: Advantages of e-NAMreported by SelectedFarmers

Sr. No	Particulars	Advantages of e-NAM -Farmers							
		eNAM				Non eNAM APMC			
		Small	Medium	Large	Total	Small	Medium	Large	Total
1	Higher price realization	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	Lower cost of marketing	2.2	3.2	12.8	6.1	0.0	0.0	8.3	2.5
3	Higher traded volume	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	Transparent procedures	15.6	9.7	20.5	15.7	52.9	27.3	33.3	40.0
5	Sale process is less complicated	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	Online payment is more convenient	15.6	6.5	17.9	13.9	41.2	9.1	0.0	20.0
7	Better facilities for quality product	2.2	0.0	7.7	3.5	0.0	0.0	0.0	0.0
8	Additional facilities like soil testing	4.4	0.0	10.3	5.2	0.0	0.0	0.0	0.0
9	Satisfaction of being part of the national market	2.2	0.0	7.7	3.5	0.0	0.0	0.0	0.0
10	Can locate buyers beyond same mandi area	0.0	0.0	5.1	1.7	0.0	0.0	0.0	0.0
11	Any other (specify)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: Field survey data

Table 5.13: Other features of e-NAMreported by Sample Farmers

Sr. No	Particulars	Other features of e-NAMreported by Sample Farmers							
		eNAM				Non eNAM APMC			
		Small	Medium	Large	Total	Small	Medium	Large	Total
1	Have used the eNAM mobile app (Yes-%)	4.4	3.2	5.1	4.3	5.9	9.1	8.3	7.5
2	If yes, for what purpose, did you use app (price of commodity, %)	4.4	3.2	5.1	4.3	5.9	9.1	8.3	7.5
3	How often you use the App? (Av Score)	5.00	4.97	5.05	5.01	5.06	4.91	4.92	4.98
4	Is the App convenient to use? (Av. score)	4.80	4.97	4.77	4.83	4.82	4.73	4.75	4.78
5	Do you get the SMS alert after the online payment (Yes- %)	42.2	41.9	30.8	38.3	17.6	45.5	66.7	40.0
6	How do you rate the e-NAM overall (Av. score)	1.67	1.58	1.74	1.67	1.29	1.55	2.25	1.65
7	Is e-NAM better than manual mandi before?	1.56	1.42	1.56	1.52	1.29	1.55	1.83	1.53

Notes; Use the App? (1-Once a day; 2-Once in 3 days; 3-Once in a week; 4-once in a month; 5- Never 6-Some time); Rating to e-NAM (1-very poor 2- poor 3-satisfactory 4- good 5-very good,); e-NAM better than manual mandi (1-worse 2- no change 3-better 4- much better)
Source: Field survey data

5.2.9 Suggestions to Improve eNAM by Farmers:

The selected farmers have suggested all the necessary requirement for better implementation of eNAM. It includesguidance / help at the mandi should be provided,sale process through e-NAM should be easy and improved, delay in online transactions should be reduced, sorting & grading infrastructure should be created/improved, weighing facilities should be created/improved, refrigeration facilities should be created / improved, facilities for manual sale should also be provided and single license for the entire country should be ensured (Table 5.14).

Table 5.14: Suggestions to improve e-NAMby SelectedFarmers

Sr. No	Particulars	Suggestions to improve e-NAMby Sample Farmers(% to total responses)							
		eNAM				Non eNAM APMC			
		Small	Medium	Large	Total	Small	Medium	Large	Total
1	Guidance / help at the mandi should be provided	100	100	100	100	100	100	100	100
2	Sale process through e-NAM should be easy and improved	100	100	100	100	100	100	100	100
3	Delay in online transactions should be reduced	100	100	100	100	100	100	100	100
4	Sorting & grading infrastructure should be created/improved	100	100	100	100	100	100	100	100
5	Weighing facilities should be created/improved	100	100	100	100	100	100	100	100
6	Refrigeration facilities Creating / Improved	100	100	100	100	100	100	100	100
9	Facilities for manual sale should also be provided	100	100	100	100	100	100	100	100
10	Single license for the entire country should be insured	100	100	100	100	100	100	100	100
11	Any other (specify)	0	0	0	0	0	0	0	0

Source: Field survey data

5.3 Commission Agents:

5.3.1 Profile of Commission Agents:

The profile of Commission Agents (CA) are presented in Table 5.15. It can be seen from the table that all the commission agents were male in eNAM category while 2.5 per cent respondents were femalesin Non eNAM APMC group. The average age of

the respondent commission agent was around 46-47 years with 13 years of education. Thus most of them were young and educated up to higher secondary level.

Table 5.15: General Information of Commission Agents

Sr. No	Particulars		General Information of Commission Agent	
			eNAM (N=115)	Non eNAM APMC (N=40)
1	Gender of CA %)			
		Male	100	97.5
		Female	0	2.5
2	Age of respondent CA (year)	Av.	46.52	47.68
		Male	46.52	47.92
		Female	0	38.00
3	Education of respondent CA (years)		12.66	12.70

Source: Field survey data

5.3.2 Awareness about and registration in eNAM:

Table 5.16 presents awareness about and registration in eNAM by commission agents and shows that almost 96 per cent of CA in eNAM mandi were aware about the electronic market while corresponding figure for Non eNAM APMC group was 62.5 per cent. The main source of the information about electronic market was APMC itself andmedia coverage. Selected CA were registered under eNAM in 2016. Six CAs reported transactions through eNAM, However these sales were actually physically done in APMC as done traditionally and later the sale entry was made in eNAM software. Thus it was not actually sales using eNAM platform.

Table 5.16: Awareness about and Registration in eNAM by Commission Agents

Sr. No	Particulars	Awareness about and Registration in eNAM by Commission Agents	
		eNAM (N=115)	Non eNAM APMC (N=40U)
1	Awareness of eNAM		
	Yes	95.7	62.5
	No	4.3	37.5
2	Information sources for eNAM		
	APMC	93.6	100.0
	Media	6.4	0.0
3	Registered year for eNAM transactions	2016	-
4	Commodities Sold by eNAM		
	Yes	5.2	0.0
	No	94.8	100.0

Source: Field survey data

5.3.3 Crops Marketed through eNAM as reported:

As it was observed in previous section of this chapter, none of the farmers had sold their output under electronic market platform, while entry of transaction in APMC was made under eNAM software and shown as salesthrough this form of marketing. The commodities which were transacted includebajara, mustard, gram, wheat and maize.Such transaction were reported only in four eNAM mandis, viz. Dahod, Deesa,Jamnagar and Patan (Table 5.17). The quantity transacted under eNAM as reported was very small, while rate per quintal of commodities was same as reported under auction method of sale. Thus, there is no difference in price rate realised under new method of marketing.

Table 5.17: Details regarding Crops marketed through eNAM by Commission Agents

Sr. No	Particulars		Crops marketed through eNAM by Commission Agents					
			Bajra	Mustard	Gram	Wheat	Maize	Total
A	**Total Transacted quantity**							
1	Dahod	Qty in Qtl	0	0	0	0	600	600
		Avg. Price/Qtl	0	0	0	0	1200	1200
2	Deesa	Qty in Qtl	4500	0	0	5000	0	9500
		Avg. Price/Qtl	1200	0	0	1600	0	1400
3	Jamnagar	Qty in Qtl	0	0	40	40	0	80
		Avg. Price/Qtl	0	0	4200	1400	0	2800
4	Patan	Qty in Qtl	0	4250	0	0	0	4250
		Avg. Price/Qtl	0	3500	0	0	0	3500
5	Total	Qty in Qtl	4500	4250	40	5040	600	14430
		Avg. Price/Qtl	1200	3500	4200	1500	1200	2320
B	**eNAM sale**							
1	Dahod	Qty in Qtl	0	0	0	0	600	600
		Avg. Price/Qtl	0	0	0	0	1200	1200
2	Deesa	Qty in Qtl	4.95	0	0	9.9	0	14.85
		Avg. Price/Qtl	1200	0	0	1600	0	1400
3	Jamnagar	Qty in Qtl	0	0	40	40	0	80
		Avg. Price/Qtl	0	0	4200	1400	0	2800
4	Patan	Qty in Qtl	0	15	0	0	0	15
		Avg. Price/Qtl	0	3500	0	0	0	3500
5	Total	Qty in Qtl	4.95	15	40	49.9	600	709.85
		Avg. Price/Qtl	1200	3500	4200	1500	1200	2320

Source: Field survey data

5.3.4Use of eNAM reported by Commission Agents:

The use of eNAM was reported to be very rare by the selected commission agents in the mandis covered under eNAM. As against this none of the commission agents in Non eNAM APMC group were even aware about the use of eNAM (Table 5.18).

Table 5.18: Use of eNAM reportedby Commission Agents

Use	Particulars	Use of eNAM (%)	
		eNAM	Non eNAM APMC
For what purpose did you use the e-NAM?	Only checking prices	0.87	0.00
	Price checking and sale only	0.00	0.00
	Price checking, sale and online payment	4.35	0.00
	Any other	0.00	0.00
Checking prices on e-NAM	Very easy	0.00	0.00
	Easy	0.87	0.00
	Not so easy	0.00	0.00
	Difficult	0.87	0.00
	Very difficult	3.48	0.00
Sale on e-NAM	Very easy	0.00	0.00
	Easy	0.87	0.00
	Not so easy	0.00	0.00
	Difficult	0.00	0.00
	Very difficult	4.35	0.00
Payments on e-NAM	Very easy	0.00	0.00
	Easy	3.48	0.00
	Not so easy	1.74	0.00
	Difficult	0.00	0.00
	Very difficult	0.00	0.00
Days taken to receive online payments (from outside Mandi buyer)	Within 2 days	0.87	0.00
	3-5 days	0.87	0.00
	5-10 days	1.74	0.00
	10-20 days	0.00	0.00
	More than 20 days	1.74	0.00

Source: Field survey data

5.3.5 Facilities Available and its quality at APMC:

As mentioned earlier, the implementation of eNAM market necessitates the requirement of infrastructure in selected APMC covered under eNAM such as assaying (quality testing), e-auction, weighing, etc. It can be seen from the Table 5.19 that all the mandis have weighing facility, besides other facilities available like grain storage, soil testing and bid management. In terms of the quality parameters of all services, weighing facility was ranked with ‘good’ to ‘satisfactory’ level.

Though some sale quantity was reported under eNAM by few commission agents, but no sale was undertaken under electronic market, thus no sample of any agricultural produce was tested and uploaded on the eNAM platform. Accordingly, none of the CAshave responded on quality testing and related parameters at APMC (Table 5.20). Various supporting ancillary facilities like bank, agriculture input shops, telephone, storage, internet, canteen, and guest houses are available in APMC premises.

Table 5.19: Facilities Available and its quality at APMC reported by Commission Agents

Sr. No	Particulars	Facilities Available and its quality at APMC (CA)	
		eNAM	Non eNAM APMC
A	**Facilities (Yes %)**		
1	Cleaning	50.43	45.00
2	Sorting	20.87	15.00
3	Dying	6.09	12.50
4	Grading	22.61	12.50
5	Weighing	100.00	100.00
6	Assaying (quality testing)	7.83	0.00
7	Bid management	57.39	50.00
8	E-auction	37.39	0.00
9	Grain storage	66.96	55.00
10	Soil testing	72.17	47.50
11	Any other (specify)	19.13	0.00
B	**Quality (Av. score)**		
1	Cleaning	2.91	3.78
2	Sorting	2.84	3.33
3	Dying	3.29	3.00
4	Grading	2.69	3.00
5	Weighing	2.37	3.00
6	Assaying (quality testing)	3.00	0.00
7	Bid management	2.11	2.75
8	E-auction	1.70	0.00
9	Grain storage	2.12	2.77
10	Soil testing	2.34	2.25
11	Any other (specify)	2.84	4.20

Source: Field survey data

Table 5.20: Quality Testing and related Parameters at APMC reported by Commission Agents

Sr. No	Particulars	Quality Testing and related Parameters at APMC CA	
		eNAM	Non eNAM APMC
A	Testing of quality parameters		
	Transparent	NA	NA
	Not Transparent	NA	NA
B	Have you ever received a report on testing of quality		
	Yes	NA	NA
	No	NA	NA
C	How do you rate testing of quality parameters		
	very stringent	NA	NA
	stringent	NA	NA
	alright,	NA	NA
	liberal	NA	NA
	very liberal	NA	NA
D	Av. Rating to following specific parameters		
	Moisture (% by wt)	NA	NA
	Foreign matter (% by wt)	NA	NA
	Other edible grains (% by wt)	NA	NA
	Damaged grains (% by wt)	NA	NA
	Weevilled grains (% by count)	NA	NA
	Immature and Shrivelled grains/seeds (% by count)	NA	NA
	Uniformity	NA	NA
	Lusture	NA	NA
	Oil content (% by wt)	NA	NA
	Colour of Extracted oil	NA	NA
	Any other (specify)	NA	NA

Source: Field survey data

5.3.6 Problems reported by CA about eNAM:

Table 5.21 presents the problems reported by respondent CAs about eNAM (most of them may have given their perceptions as no one has transacted through electronic process). It can be seen from the table that the five major perceived problems about electronic marketing include:discovering prices is cumbersome, sale process is complicated than before,delay in receiving online payment,online transaction process is difficult, and sorting facilities are not adequate.

Table 5.21: Problems faced in adoption of eNAM reported by Commission Agents

Sr. No	Particulars	Problems faced in adoption of eNAM (CA)	
		eNAM	Non eNAM APMC
1	No guidance or help desk	13.04	35.00
2	Higher mandi fees than before	13.04	37.50
3	Electronic system does not work/works occasionally	40.87	50.00
4	Price discovery is cumbersome	100.00	100.00
5	Sale process is complicated	100.00	100.00
6	Lower price received than before e-NAM	17.39	27.50
7	Higher cost than pre e-NAM	25.22	50.00
8	Online payment process is difficult	97.39	100.00
9	Delay in online payment	100.00	100.00
10	Having to pay market fee at different mandis	9.57	10.00
11	Difficulty in getting single license	22.61	10.00
12	Corruption of officials	15.65	7.50
13	Getting licenses is several states is difficult	0.00	0.00
14	Poor net connectivity	45.22	52.50
15	Not enough computers	30.43	45.00
16	Frequent power failures	21.74	45.00
17	No trained manpower to help with eNAM	27.83	47.50
18	Poor road network for transportation	30.43	52.50
19	Cleaning facilities are not adequate	75.65	100.00
20	Sorting facilities are not adequate	80.87	97.50
21	Grading facilities are not adequate	79.13	97.50
22	Weighing facilities are not adequate	40.87	65.00
23	Quality parameters are stringent	51.30	57.50
24	Absence of refrigeration facilities	27.83	32.50
25	Labour problem for loading / unloading	24.35	35.00
26	Collusion among some participants	19.13	15.00
27	Any other (specify)	0.00	0.00

Source: Field survey data

5.3.7 Advantages of eNAM by CA (perceptions):

The selected CAs have opined theirperceptions that marketing through eNAM would give better access to national markets, low cost of marketing and better price realisation for famers (Table 5.22). It was a surprise to note that some CAs have reported the use of eNAM app though very rarely to check price of the commodity and rated app with high satisfaction level (Table 5.23). The rating for eNAM indicates that

a lot of things need to done to prepare CAs to transact with electronic market. Also on an average superiority of electronic market over APMC was ranked between 'worse' to 'no change'.

Table 5.22: Advantages of e-NAMreported by Commission Agents

Sr. No	Particulars	Advantages of e-NAM CA	
		eNAM (N=115)	Non eNAM APMC (N=40U)
1	Better access to national markets	100.00	100.00
2	Better price realization	37.39	22.50
3	Lower cost of marketing	46.96	27.50
4	Higher traded volume	15.65	5.00
5	Transparent procedures	33.04	20.00
6	Sale process is less complicated	16.52	2.50
7	Online payment is more convenient	26.96	15.00
8	Better facilities for knowing quality of product	34.78	15.00
9	Satisfaction of being part of the national market	26.09	15.00
10	Any other (specify)	0.00	0.00

Source: Field survey data

Table 5.23: Other features of e-NAMreported by Commission Agents

Sr. No	Particulars	Other features of e-NAM- CA	
		eNAM	Non eNAM APMC
1	Have used the eNAM mobile app (Yes-%)	11.30	5.00
2	If yes, what purpose, you use app (price of commodity, %)	11.30	5.00
3	How often you use the App? (Av Score)	4.90	4.98
4	Is the App convenient to use? (Av. score)	4.74	4.93
5	Do you get the SMS alert after the online payment (Yes- %)	50.43	32.50
6	How do you rate the e-NAM overall (Av. score)	1.89	1.40
7	Is e-NAM better than manual mandi before?	1.63	1.38

Source: Field survey data

5.3.8 Suggestions to Improve eNAM byCAs:

The selected CAs have suggested all the necessary requirement for better implementation of eNAM. It includesguidance / help at the mandi should be provided, sale process through e-NAM should be easy and improved, delay in online transactions should be reduced, sorting & grading infrastructure should be created/improved, weighing facilities should be created/improved, refrigeration facilities should be created / improved, facilities for manual sale should also be provided and single license for the entire country should be ensured (Table 5.24).

Table 5.24: Suggestions to improve e-NAMmade by Commission Agents

Sr. No	Particulars	Suggestions to improve e-NAM (% to total responses) CA	
		eNAM	Non eNAM APMC
1	Guidance / help at the mandi should be provided	100	100
2	Sale process through e-NAM should be easy and improved	100	100
3	Delay in online transactions should be reduced	100	100
4	Sorting & grading infrastructure should be created/improved	100	100
5	Weighing facilities should be created/improved	100	100
6	Refrigeration facilities Creating / Improved	100	100
7	Facilities for manual sale should also be provided	100	100
8	Single license for the entire country should be insured	100	100
9	Any other (specify)	0	0

Notes; Use the App? (1-Once a day; 2-Once in 3 days; 3-Once in a week; 4-once in a month; 5- Never 6-Some time); Rating to e-NAM (1-very poor 2- poor 3-satisfactory 4- good 5-very good,); e-NAM better than manual mandi (1-worse 2- no change 3-better 4- much better)

5.4 Selected APMCs

5.4.1. Profile of Selected APMCs and Implementation of eNAM

The profile of selected APMCs and implementation of eNAM is presented in Table 5.25. It can be seen from the table that on an average, every eNAM mandi covers 90 villages while corresponding figure for Non eNAM APMC group was 151 villages. The average number of commission agents registered were 123.79 per eNAM mandi which indicates successful implementation of first step of registration of CA under new marketing system. Large number of famers are also registered at each eNAM mandi, while none of the market mandi has recorded sales transaction or inter markets sale under eNAM.

Table 5.25: Information about Selected APMCs and Implementation of eNAM

Sr. No	Particulars	General Information about Selected APMCs	
		eNAM (N=23)	Non eNAM APMC (N=8)
1	Average No. of villages covered	89.91	150.75
2	Commission agents registered for eNAM transactions	2984	-
3	Farmers registered for eNAM transactions	210678	-
4	Av. No. of agricultural commodities registered for eNAM transactions	7.91	9.75
5	Recording of sale transactions under eNAM software (No of APMCs)		
	2016-17	Nil	Nil
	2017-18	Nil	Nil
6	Inter-market sale/on line transactions/ auction under eNAM		
	2016-17	Nil	Nil
	2017-18	Nil	Nil

Source: Field survey data

5.4.2 Awareness about eNAM

It was strange to note that about 17 per cent of APMC respondents were not aware about the reforms in agricultural marketing such as specific provision for electronic trading, single trading licenses valid for trading in all mandis of the state, and single point levy of transaction fee (Table 5.26).

Table 5.26: Awareness about Reforms in APMR Act

Sr. No	Particulars	Awareness about Reforms in APMR Act	
		eNAM (N=23)	Non eNAM APMC (N=8)
1	Awareness of reformed APMC act for eNAM (YES %)	82.61	62.50
2	Specific provision for electronic trading (YES %)	82.61	62.50
3	Single trading licenses valid for trading in all Mandis of the State (YES %)	82.61	62.50
4	Single Point levy of transaction fee (YES %)	82.61	62.50

Source: Field survey data

5.4.3Support received from Government:

As per the guidelines of eNAM, Central Government provides the software free of cost to all the states along with Rs. 30 lakh per selected mandi for setting up the hardware and related equipment/infrastructure, which was later increased to 75 lakh per mandi. Out of total 23 eNAM surveyed mandis, 48 per cent mandis had already received the grant-in-aid or financial support from the Government of India for different purpose (Table 5.27), while only 22 per cent selected mandis had received the infrastructure support yet.

Table 5.27: Grant-in-aid or financial support received from GOI for different purpose

Sr. No	Particulars	Awareness about Reforms in APMR Act	
		eNAM	Non eNAM APMC
1	No. of APMCs received grants-in-aid	11	02
2	Grant-in-aid or financial support received for		
	a) Customised software	590000	510000
	b) Maintenance cost	443000	0
	c) Training to the Staff	952000	0
	d) Laboratory establishment	461000	0
	e) Development fund	5900000	0
3	No. of APMCs received Equipments	5	0

Source: Field survey data

5.4.4 Participation in Trading:

About 90,000 farmers had visited the mandi for selling the produce during the last month and of them about 6,000 famers have registered in eNAM software.Arrival details of about 10 per cent of registered farmers are made in eNAM software (Table 5.28) but no trading under eNAM. That is probably the reason why no details are provided by selected mandis on commodities traded last month (Table 5.29).

Table 5.28: Participation in Trading during last one month

Sr. No	Particulars	Participation in Trading	
		eNAM	Non eNAM APMC
1	No. of Farmers who visited the Mandi for selling the produce during the month	89252	8698
2	Number of farmers registered on e-NAM out of total Farmers visited the mandi during the month	5934	1513
3	Number of Farmers traded on e-NAM out of total Farmers visited the mandi during the month	656	0

Source: Field survey data

Table 5.29: Commodity Trading Details for Last one month

Sr. No	Particulars	Commodity Trading Details	
		eNAM	Non eNAM APMC
1	Commodity Arrivals (Quintal)	NA	NA
2	Commodity Traded (in Quintal)	NA	NA
3	Commodity Traded on e-NAM/ e-trading	NA	NA
4	Last Traded Price-APMC(Rs. per Quintal)	NA	NA
5	Last Traded Price –ENAM (Rs. per Quintal)	NA	NA

Source: Field survey data

5.4.5. Facilities available and its quality at APMC premises:

As mentioned earlier, the implementation of eNAM market requires certain specific infrastructural facilities in selected APMC covered under eNAM such as assaying (quality testing), e-auction, weighing, etc. It can be seen from the Table 5.30 that all the mandis have weighing facility besides ancillary facilities that are available like grain storage, soil testing and bid management. In terms of the quality parameters of all services, weighing facility was ranked with ‘good’ to ‘satisfactory’ level by APMC representatives.

As no sale was undertaken under electronic market, thus nosample of agricultural produce was tested and uploaded on the eNAM platform. Thus, none of the APMCresponded on quality testing and related parameters at APMC (Table 5.31).

Table 5.30: Facilities available and its quality at APMC premises

Sr. No	Particulars	Facilities Available and its quality at APMC	
		eNAM (N=23)	Non eNAM APMC (N=8)
A	**Facilities (Yes %)**		
1	Cleaning	56.5	37.5
2	Sorting	34.8	12.5
3	Dying	13.0	12.5
4	Grading	34.8	25.0
5	Weighing	100.0	100.0
6	Assaying (quality testing)	8.7	0.0
7	Bid management	65.2	37.5
8	E-auction	47.8	0.0
9	Grain storage	78.3	50.0
10	Soil testing	73.9	37.5
11	Any other (specify)	56.5	37.5
B	**Quality (Av. score)**		
1	Cleaning	2.15	3.67
2	Sorting	2.00	3.00
3	Dying	2.33	3.00
4	Grading	2.00	3.50
5	Weighing	1.91	2.63
6	Assaying (quality testing)	2.50	0
7	Bid management	2.00	3.00
8	E-auction	1.64	0
9	Grain storage	1.83	2.25
10	Soil testing	1.82	1.67
11	Any other (specify)	1.67	0

Source: Field survey data

Table 5.31: Quality Testing and related Parameters at APMC premises

Sr. No	Particulars	Quality Testing and related Parameters at APMC	
		eNAM	Non eNAM APMC
A	Testing of quality parameters		
	Transparent	NA	NA
	Not Transparent	NA	NA
B	Have you ever received a report on testing of quality		
	Yes	NA	NA
	No	NA	NA
C	How do you rate testing of quality parameters		
	very stringent	NA	NA
	stringent	NA	NA
	alright,	NA	NA
	liberal	NA	NA
	very liberal	NA	NA
D	Av. Rating to following specific parameters		
	Moisture (% by wt)	NA	NA
	Foreign matter (% by wt)	NA	NA
	Other edible grains (% by wt)	NA	NA
	Damaged grains (% by wt)	NA	NA
	Weevilled grains (% by count)	NA	NA
	Immature and Shrivelled grains/seeds (% by count)	NA	NA
	Uniformity	NA	NA
	Lusture	NA	NA
	Oil content (% by wt)	NA	NA
	Colour of Extracted oil	NA	NA
	Any other (specify)	NA	NA

Source: Field survey data

5.4.6 Problems reported by APMC in Implementation of eNAM:

Table 5.32 presents the problems reported by sample respondent APMCs about implementation of eNAM. It can be seen from the table that the major constrains in implementation of electronic marketing include that thefarmers are not interested, commission agents are not willing to do transactions, assaying laboratories arenot yet established, long time required for e-transactions, farmers need quick settlement and cash in hand, sale process is complicated, online payment process is difficult and delay in online payment. Therefore, it is very important and urgent to educate and convince the famers and commission agents as well as other authorities of APMC to adopt the electronic trading system may be gradually to gain confidence of the famers and commission agents. Few successful cases of transparent speedy transaction need to be recorded & disseminated through social media.

Table 5.32: Problems faced in adoption of eNAM by APMC

Sr. No	Particulars	Problems faced in adoption of eNAM by APMC	
		eNAM	Non eNAM APMC
1	Internet speed is very low /Poor net connectivity	65.22	62.50
2	Farmers are not interested	100.00	100.00
3	Commission agents are not willing to do transactions	100.00	100.00
4	No trained manpower with us	34.78	62.50
5	Not yet established assaying laboratory	100.00	100.00
6	Long time required for e-transactions	100.00	100.00
7	APMC administration is not yet ready to adopt	34.78	87.50
8	Farmer need quick settlement and cash in hand	100.00	100.00
9	Need registration and uploading of information of famers	47.83	75.00
10	No guidance or help desk regarding eNAM queries	30.43	62.50
11	Higher mandi fees than before	0.00	0.00
12	Electronic system does not work/ works occasionally	56.52	62.50
13	Price discovery is cumbersome	95.65	100.00
14	Sale process is complicated	100.00	100.00
15	Lower price received than before e-NAM	21.74	25.00
16	Higher cost than pre e-NAM for Mandi	26.09	25.00
17	Online payment process is difficult	100.00	100.00
18	Delay in online payment	100.00	100.00
19	Not enough Computers	26.09	62.50
20	Frequent power failures	8.70	25.00
21	Cleaning facilities are not adequate	65.22	100.00
22	Sorting facilities are not adequate	82.61	100.00
23	Grading facilities are not adequate	78.26	100.00
24	Weighing facilities are not adequate	21.74	37.50
25	Quality parameters are stringent	60.87	87.50
26	Absence of storage/refrigeration facilities	52.17	75.00
27	Labour problem for loading / unloading	30.43	50.00
28	Collusion among some participants	17.39	25.00
29	Farmers and Traders impatient due to delay in process	82.61	100.00
30	Delay in establishment in assaying lab	86.96	100.00

Source: Field survey data

5.4.7 Advantages of e-NAM as per APMC respondent:

The selected APMC authorities have mentioned that marketing through eNAM will cost lower, satisfaction of being part of the national market,would be transparent, better price realisation, online payment is more convenient, convenient transfer of money (Table 5.33). It was surprising to note that 26 per cent of CAshave reported use of eNAM app to APMC, while corresponding figure reported from famers by APMC was 4.35 per cent only (Table 5.34). The rating for eNAM given by APMC authoritiesindicates that a lot of things need to be done to prepare farmers and CA to transact with electronic market. Also average score on betterment of electronic market over APMC was between 'worse' to 'no-change'. Open auction method of sale is used for transaction of commodities in market.

Table 5.33: Advantages of e-NAM as per APMC respondent

Sr. No	Particulars	Advantages of e-NAM APMC	
		eNAM	Non eNAM APMC
1	Better price realization	52.17	12.50
2	Lower cost of marketing	69.57	25.00
3	Higher traded volume	26.09	25.00
4	Transparent procedures	65.22	50.00
5	Sale process is less complicated	39.13	12.50
6	Online payment is more convenient	52.17	0.00
7	Better facilities for knowing quality of product	52.17	25.00
8	Satisfaction of being part of the national market	60.87	37.50

Source: Field survey data

Table 5.34: Other features of e-NAM perceived by APMC

Sr. No	Particulars	Other features of e-NAM perceived by APMC	
		eNAM	Non eNAM APMC
1	Has any CA reported use of the eNAM mobile app (Yes-%)	26.09	12.50
2	Has any farmer reported use of the eNAM mobile app (Yes-%)	4.35	12.50
3	How often you use the App? (Av Score)	4.74	5.00
4	Is the App convenient to use? (Av. score)	3.87	4.00
5	Do you get the SMS alert after the online payment (Yes- %)	47.83	37.50
6	How do you rate the e-NAM overall (Av. score)	2.52	1.75
7	Is e-NAM better than manual mandi before?	1.83	1.25
8	Method of sale		
	a. Tenders	0	0
	b. Open Auctions	100.0	100.0
	c. Negotiations	0	0
	d. E-trading /ENAM	0	0
	e. Others	0	0

Notes; Use the App? (1-Once a day; 2-Once in 3 days; 3-Once in a week; 4-once in a month; 5- Never 6-Some time); Rating to e-NAM (1-very poor 2- poor 3-satisfactory 4- good 5-very good,); e-NAM better than manual mandi (1-worse 2- no change 3-better 4- much better)
Source: Field survey data

5.4.8 Suggestions by APMC to Improve eNAM adoption:

The selected APMC respondents have suggested all the necessary requirement for better implementation of eNAM are as: guidance / help at the mandi should be provided, sale process through eNAM should be easy and improved, delay in online transactions should be reduced, sorting & grading infrastructure should be created/improved, weighing facilities should be created/improved, refrigeration facilities creating / improved, facilities for manual sale should also be provided and single license for the entire country should be ensured (Table 5.35).

Table 5.35: Suggestions by APMC to improve e-NAM

Sr. No	Particulars	Suggestions to improve e-NAM (% to total responses)	
		eNAM (N=115)	Non eNAM APMC (N=40U)
1	Guidance / help at the mandi should be provided	100	100
2	Sale process through e-NAM should be easy and improved	100	100
3	Delay in online transactions should be reduced	100	100
4	Sorting & grading infrastructure should be created/improved	100	100
5	Weighing facilities should be created/improved	100	100
6	Refrigeration facilities Creating / Improved	100	100
7	Facilities for manual sale should also be provided	100	100
8	Single license for the entire country should be insured	100	100
9	Any other (specify)	0	0

Source: Field survey data

The next chapter presents conclusions and policy implications.

Chapter VI

Summary and Conclusions

6.1 Introduction:

Marketing of agricultural commodities in India is carried out through the state enacted Agricultural Produce Marketing Regulation Acts (APMRA). Under this system, a vast network of regulated markets had been established. However, over time, these markets have become restrictive and monopolistic and have, therefore, failed to achieve their basic objectives owing to restrictive provisions of Acts.It also prevented a seamless integration of farmers and buyers and evolution of an efficient supply chain. Realizing the urgent need to address the challenges of the existing agricultural marketing system, the Union Government introduced a Central Sector Scheme for Promotion of National Agriculture Market through a common electronic market platform, called the electronic National Agricultural Market or e-NAMon 1 July 2015. The e-NAM aims to integrate all the agricultural markets of the country and envisages a common national market for agricultural commodities with seamless movement across state boundaries. This is envisioned as a solution to marketing issues of all stake holders - farmers, traders, retailers, consumers and logistic providers. The common e-market platform envisaged networking of selected 585 wholesale markets in desirous states/UTs by March 2018. It was recorded on eNAM portal that till January 24, 2018, out of 585 targeted markets, 471 markets across 15 states were live on e-NAM.

The eNAM portal provides a single window service for all APMC related information and services, including commodity arrivals, prices, bids and offers. Some of the expected benefits from e-NAM include accessibility of farmers to a common agriculture market; real time price discovery; transparency in the agriculture marketing system; reduce the transaction costs of buyers and sellers; real time information on prices, market arrivals; bidding on quality parameters of commodities; online bidding for more transparency; online payment system to reduce the payment risk and ensure timely payments to farmers, cleaning, sorting, grading and weighing facilities and additional services such as soil testing laboratories at the e-NAM.Small Farmers' Agribusiness Consortium (SFAC) is designated as Lead Agency to roll out the eNAM in partnership with a strategic partner, which will be responsible for developing,

running and maintaining the proposed e-marketing platform. To facilitate assaying of commodities for trading on NAM, common tradable parameters have been developed for 90 commodities. eNAM is a virtual market but it has a physical market at the back end. While one time registration of farmers / sellers, lot details at the entry gate, weighment, quality assaying, auctions / trade transactions, payment by buyers to sellers and other agencies involved in the chain of transaction will take place online on e-NAM, actual material flow will happen physically through the market. Entire arrivals of agricultural commodities selected for trading on e-NAM will be traded on-line only. The features of eNAM are as mentioned below:

a) A National e-market platform for transparent sale transactions and price discovery in regulated markets, kisanmandis, warehouses and private markets. Willing states to accordingly enact provision for e-trading in their APMC Act.
b) Liberal Licensing of traders / buyers and commission agents by state authorities without any pre-condition of physical presence or possession of shop / premises in the market yard.
c) One license for a trader valid across all markets in the State.
d) Harmonization of quality standards of agricultural produce and provisions of assaying (quality testing) infrastructure in every market to enable informed bidding by buyers.
e) Restriction of APMC jurisdiction to within the APMC market yard / sub yard instead of a geographical area (the market area) at present.
f) Single point levy of market fees i.e. on the first wholesale purchase from the farmer.

In order to facilitate both - unification of market and online trading, it is necessary for each State to undertake reforms in their APMC Act prior to seeking assistance under the scheme in respect of (i) a single license to be valid across the State, (ii) single point levy of market fee and (iii) provision for electronic auction as a mode for price discovery. Only those States/UTs that have completed these three pre-requisites are eligible for assistance under the scheme. The States must ensure that the reforms are carried out both in letter and spirit through appropriate and unambiguous provisions in the APMC Acts and rules. Besides, the State Marketing Boards/APMCs must enable the promotion of the e-auction platform. The States need to ensure that the mandis that are integrated with NAM make provision for requisite online connectivity, hardware and assaying equipments.

6.2 Progress of e-NAM inIndia

The electronic trading portal for national agricultural market is an attempt to use modern technology for transforming the system of agricultural marketing. Thus, eNAM is an online inter-connectivity of e-mandis, aimed at ushering in much needed agriculture marketing reforms to enable farmers to get better price. The common e-market platform envisaged networking of selected 585 wholesale markets in desirous states/UTs to be deployed in three phases, viz. 200 wholesale markets by September 2016, another 200 markets by March 2017 and remaining 185 markets by March 2018 (Shalendra and Jairath, 2016).The electronic trading platform for National agriculture market was launched on April 16, 2016 in 21 Mandis across 8 States pilot trading of 24 commodities namely Apples, Potato Onion, Green Peas, Mahua Flower, Arhar whole (Red Gram), Moong Whole (green gram), Masoor whole (lentil), Urad whole (black gram), Wheat, Maize, Chana whole, Bajra, Barley, Jowar, Paddy, Castor Seed, Mustard Seed, Soya bean, Ground nut, Cotton, Cumin, Red Chillies and Turmeric.As of October 31, 2017, it was reported/ uploaded on the website[1] of eNAM that, out of 585 targeted markets, 470 regulated markets from 14 states were live on e-NAM. The target of bringing 455 mandis online by May 2017 was achieved and it was reported that total 5076501 farmers and 96118 buyers were registered on e-NAM portal with a turnover of Rs. 31424.04 crore from the trading of 11371.72 tonne produce covering about 90 commodities including vegetables. The state-wise coverage of markets after phase II indicate that the highest number of selected markets that are live on eNAM portal are from the state of Uttar Pradesh (100) followed by Madhya Pradesh (58), Haryana (54), Maharashtra (45), Telangana (44), Gujarat (40), Rajasthan (25), Andhra Pradesh (22), Himachal Pradesh (19), Jharkhand (19), Chhattisgarh (14), Odisha (10) and Uttarakhand (5).

The growth in number of stakeholders of e-NAM in India by July 2017 indicated that progress is very slow and number is disappointing given the fact that there are more than 13.8 crore farmers with approximately 20 lakh commission agents and traders in more than 7320 markets across India. The six major states with the most mandis under eNAM are Uttar Pradesh, Madhya Pradesh, Haryana, Maharashtra, Telangana and Gujarat. These states collectively accounted for three fourth of target achieved. However in these states too, the market remains isolated, with traders from outside the APMC not being able to buy farmers' produce from the mandi and buyers

[1] http://www.enam.gov.in/NAM/home/implemented_progress.html#

having to physically inspect quality of produce due to absence of required infrastructure. While studying the impact of e-markets in Karnataka, Reddy (2016) made a mention about some teething problems in its implementation.

Table 1: Growth of Stakeholders of e-NAM in India by July 2017

Sl.	States	Buyers	Commission Agent	Sellers
1	Andhra Pradesh	2360	2209	174395
2	Chhattisgarh	2735	213	55047
3	Gujarat	7530	5229	371851
4	Haryana	7941	18773	1669691
5	Himachal Pradesh	1852	1083	48213
6	Jharkhand	1151	1	5466
7	Madhya Pradesh	18686	0	236734
8	Maharashtra	7415	6861	158016
9	Odisha	656	0	29245
10	Rajasthan	11389	4920	294426
11	Tamilnadu	767	0	4080
12	Telangana	5107	3854	758863
13	Uttar Pradesh	30538	8266	2497010
14	Uttarakhand	1623	1343	6465
	Total	99,750	52,752	6309502

6.3 Need of the Study:

As discussed earlier, there are a lot of benefits of eNAM. Accordingly, a need was felt to assess the implementation and benefits derived from eNAM in the state of Gujarat. Therefore, AERC, SPU, Vallabh VIdyanagar centre was entrusted by the Ministry of Agriculture and Farmers Welfare, GOI to conduct this survey with a main objective to review the performance and prospectsof electronic National Agricultural Market (eNAM) in Gujarat.

6.4 Data and Methodology:

The study is based on both primary and secondary level data. The secondary data on market, marketed surplus, eNAM coverage and activities and related information were collected from the government publications, research papers/reportsand various relevant websites. Primary data was collected by using a pilot-tested structured interview schedule canvassed in 2017 over sample farmers, commission agents and APMCs' office bearers during Phase I of this study in two selected APMCs of Gujarat, viz. Petlad (Anand) and Ahmedabad. The Phase II of the study, the current research,is confined to the State of Gujarat and covers 31 APMCs from 31 districts of the state (23 eNAM and 8 APMCs not under eNAM) covering the agriculture year 2018-19.Out of the total 40 APMCs covered under the eNAM, total 23

APMCs from 23 districts of the State of Gujarat were selected for the study. As some of the districts had two APMCs under eNAM, in such cases, randomly one APMC was selected. Besides, 08 APMCs were selected from remaining eight districtsthat were not covered under eNAM to know about the awareness and related parameters of the eNAM. From every district, minimum five farmers and five Commission Agents and selected APMC office bearers were contacted. Accordingly, the information related to eNAM implementation and its implications were collected in pre-tested schedules from 155 farmers and 155 commission agents and 31 APMC officers.

6.5Status of e-NAM in Gujarat:

Gujarat state has made rapid strides in its agriculture sector including the agribusiness sub sector during the recent past. The spectacular agricultural growth in Gujarat in recent times has been a result of a well thought out strategy, meticulously planned and coordinated scheme of action, sheer hard-work and sincere implementation of programme, political will to take bold decisions and commitments to economic policy reforms by the state government. Agriculture in Gujarat has been transforming over time from traditional to high value added commercial crops which can be seen from a shift in its cropping pattern from food grains crops to high value cash crops. Gujarat is the largest producer of cotton, castor, cumin and isabgul& the second largest producer of sesame and groundnut in the country.

Gujarat government has aggressively pursued an innovative agriculture development programme by liberalizing markets, inviting private capital, reinventing agricultural extension, improving roads and other infrastructure. The state government has a comprehensive Agri-Business Policy to facilitate projects of value addition in center value chain from farm to market, developed agri-infrastructure, encourage research and development, promote food safety management system at the farm level and processing units. A total of 400 regulated markets exist in the State serving on an average 45 villages per market and about 491 sq km area. On 14th of April 2016, eNAM scheme had been launched on a pilot basis in three selected APMCs of Gujarat, viz. Patan, Botad and Himmatnagar with specified commodities such as castor seed, chana (black gram) and wheat respectively. Out of total 585 mandis selected at national level, total 40 APMCs area from 24 districts of Gujarat are selected for eNAM (Table 2).

Table 2: Selected districts and Number of APMCs connected with eNAM in Gujarat

SL.	Selected Districts and No. of APMCs in Gujarat selected for eNAM (Total 40)						
	District	No.	APMC	SL.	District Name	No.	APMC
1	Ahmedabad	3	Ahmedabad, Dholka, Sanand	13	Morbi	1	Halvad
2	Amreli	1	Bhiloda	14	Navsari	1	Bilmora
3	Anand	1	Petlad	15	Panchamahal	1	Godhra
4	Arvalli	1	Bhiloda	16	Patan	1	Patan
5	Banaskantha	5	Bhabhar, Deesa, Dhanera, Thara, Tharad	17	Porbandar	1	Porbander
6	Botad	1	Botad	18	Rajkot	2	Jasdan, Rajkot
7	ChhotaUdepur	1	Pavi-Jetpur	19	Sabarkantha	2	Himmatnagar, Talod
8	Dahod	2	Dahod, Jhalod	20	Surat	1	Mahuva
9	GirSomnath	1	Kodinar	21	Surendranagar	1	Wadhwan
10	Jamnagar	4	Dharol, Jamjodhpur, Jamkhambhaliya, Jamnagar	22	Tapi	1	Nizar
11	Junagadh	3	Junagadh, Visavadar, Bhesan	23	Vadodara	2	Vadodara, Savli
12	Mehsana	2	Vijpur, Visnagar	24	Valsad	1	Valsad

Source: www.enam.gov.in

It was reported that by the completion of second phase (May 2017), all targeted 40 mandis were live on e-NAM. About 308346 farmers and 7399 buyers were registered on e-NAM portal. Theturnover of Rs. 3693.164 crore from the trading of 907.05 tonne produce covering agriculture commodities like Castor Seed, Cotton, Wheat, Sesame Seed, Groundnut was observed. Though the state of Gujarat has made provisions for three identified reform measures and have basic infrastructure facilities like auction platform, information dissemination mechanism, banks, etc. as compared to other states of India (IFPRI, 2016; Shalendra and Jairath, 2016), APMCs are facing problems in implementation of this scheme.

6.6 Findings from Field Based Survey:

6.6.1 Farmers Households

- The profile of selected farmer households indicated that more than 98 per cent of the respondents were male under eNAM category while all respondents were male in Non eNAM APMC category. Average age of the respondents was around 45-46 years having average education of 9-10 years with average farming experience of 22 years in both categories. Average household size was 6-7 persons per household. The share of family members working in farming and dairy was relatively higher in Non eNAM APMC category than eNAM category.

- The socio economic characteristics of selected farmers indicate that majority of the respondent were Hindus. On an average, more than half of the selected farmers belonged to 'open category' followed by Other Backward Classes and Scheduled Caste category. More than 79 per cent of farmers from both category belonged to'above poverty line' category and thus possibly for the same reason more than 89 per cent of farmers from eNAM group and 80 per cent from Non eNAM APMC group hadpucca or semi pacca house.
- Crop cultivation was the main occupation of the selected farmers from both groups and animal husbandry was the secondary source of income for these households. Around 40 per cent farmers' households maintain the farm records and more than 60 per cent of households have Kissan Credit Card with them.
- Average operational land holdings with eNAM group farmers was 3.86 ha of which 82 per cent land was irrigated, while corresponding figure for Non eNAM APMC group was 3.5 ha with 93 per cent having irrigation facility. The average rental value of irrigated land was obviously higher than the unirrigated land and ranged between Rs. 25000-30000/- per hectare for a year's period. The major source of irrigation with selected farmers was groundwater (tube well and open well) along with minor share of canal water.
- More than 83 per cent of farmers have sold their produce in APMC through commission agents (regular mode of sale transaction in market through action method of sale) followed by sale to village traders while some of them sold at both places. None of eNAM group farmer had sold their produce through eNAM procedure of sale being implemented in selected APMCs of the Gujarat.
- Hardly one third of selected famers from eNAM group were aware about eNAM, despite of the fact that these selected APMCs are provided with grant-in-aid and infrastructure for implementation of eNAM which also includes creating awareness among the famers and other stakeholders. Those who were aware about eNAM, for them the main source of information was APMC. Thus, there is a need of mega awareness campaign inside APMC as well as villages around particular APMCs. None of the crop was marketed through eNAM (intrastate or interstate biding and sale as per the guidelines of eNAM).
- There are many uses of eNAM as one can check prices of commodities in various markets on different dates, sale of commodity, online payment, etc. Though no sale of commodity was reported under eNAM, attempt was made to check whether

farmers make use of this electronic platform and website for any other purpose. But it was observed that none of the farmers have reported any use of the same for any such purpose.

- The implementation of eNAM market necessitates infrastructural facilities in selected APMCs covered under eNAM such as assaying (quality testing), e-auction, weighing, etc. All the mandis have weighing facility besides other facilities like grain storage, soil testing and bid management. In terms of the quality parameters across all services, weighing facility was assessed with 'good' to 'satisfactory level'.
- As no sale was undertaken under electronic market, none of the samples of agricultural produce was tested and uploaded on the eNAM platform. Thus, none of the farmer have responded on quality testing and related parameters at APMC. The other facilities available at the market premises of APMC were bank, agriculture input shops, telephone, storage, internet, canteen, and guest house.
- Certain problems were reported by sample farmersabout eNAM (these may be perceptions of the farmers as no one has transacted through electronic process). The major five perceptions as problem about electronic marketing include: online transaction process is difficult; sale process is complicated than before; delay in receiving online payment, discovering prices is cumbersome, and sorting facilities are not adequate.
- The selected farmers perceived that marketing through eNAM would be transparent, would involve convenient transfer of money and cost of marketing will be lower. The rating for eNAM given by famers indicate that a lot of things need to be done to prepare farmers to transact with electronic market. Average score regarding the superiority of electronic market over APMC was between 'worse' to 'no change'.
- Selected farmers have suggested all the necessary requirement for better implementation of eNAM. It includesguidance / help at the mandi should be provided, sale process through e-NAM should be easy and improved, delay in online transactions should be reduced, sorting & grading infrastructure should be created/improved, weighing facilities should be created/improved, refrigeration facilities should be created / improved, facilities for manual sale should also be provided and single license for the entire country should be ensured.

6.6.2 Commission Agents:

- All the commission agents were male in eNAM category while 2.5 per cent were female respondents in Non eNAM APMC group. The average age of the respondent commission agent was around 46-47 years with 13 years of education.
- Almost 96 per cent of CA in eNAM mandi were aware about the electronic market while corresponding figure for Non eNAM APMC group was 62.5 per cent. The main source of the information about electronic market was APMC itself and media coverage. The CA were registered under eNAM in 2016 and reported transactions by six CA which were within APMC sale entry made in eNAM software.
- As none of the farmer had sold their output under electronic market platform, while entry of transaction in APMC was made under eNAM software and shown as sale under this form of marketing. The commodities which were transacted were bajara, mustard, gran, wheat and maize only in four eNAM mandis, viz. Dahod, Deesa,Jamnagar and Patan. The quantity reported transacted under eNAM was very small, while rate per quintal of commodities was same as reported under auction method of sale. Thus, there is no difference in price rate realised under new method of marketing.
- The use of eNAM was reported to be very rare by the selected commission agents in the mandis covered under eNAM while none of the commission agent in APMC group even know about use of same.
- All the mandis have weighing facility besides other facilities like grain storage, soil testing and bid management. In terms of the quality parameters of all services, weighing facility was responded with 'good' to 'satisfactory'level.
- Though some sale quantity was reported under eNAM by few commission agent, but no sale was undertaken under electronic market, thus none of sample of commodity was tested and uploaded on the eNAM platform. Thus, no CAs have responded on quality testing and related parameters at APMC. While required supporting facilities like Bank, Agriculture Input Shop, Telephone, Storage, Internet, Canteen, and Guest houses are available in APMC premises.
- Problems reported by CA about eNAM (most of them may have given their perceptions as no one has transacted through electronic process)are, that discovering prices is cumbersome, sale process is complicated than before, delay

in receiving online payment, online transaction process is difficult, and sorting facilities are not adequate.

- The selected CAs have opined that marketing through eNAM would give better access to national markets, low cost of marketing and better price realisation for famers. It was a surprise to note that some CAs have reported use of eNAM app, though very rarely, to check prices of the commodities and rated app with high satisfaction level. The rating for eNAM indicates that a lot of things need to done to prepare CA to transact with electronic market. Average score regarding the superiority of electronic market over APMC was between 'worse' to 'no change'.
- The selected CAs have suggested all the necessary requirement for better implementation of eNAM. It includes guidance / help at the mandi should be provided, sale process through e-NAM should be easy and improved, delay in online transactions should be reduced, sorting & grading infrastructure should be created/improved, weighing facilities should be created/improved, refrigeration facilities should be created / improved, facilities for manual sale should also be provided and single license for the entire country should be ensured.

6.6.3 Selected APMCs

- On an average, every eNAM mandi covers 90 villages while corresponding figure for APMC group was 151 villages. The average number of commission agent registered were 123.79 per eNAM mandi which indicates successful implementation of first step of registration of CAs under new marketing system. Large number of famers are also registered at each eNAM mandi, while none of the market mandi has recorded sale transactions or inter marketsale under eNAM.
- It was strange to note that about 17 per cent of APMC respondents were not aware about the reforms in agricultural marketing such as specific provision for electronic trading, single trading licenses valid for trading in all mandis of the state, and single point levy of transaction fee.
- As per the guidelines of the eNAM, Central Government provides the software free of cost to the all the states along with Rs. 30 lakh per selected mandi for setting up the hardware and related equipment/infrastructure, which was later increased to 75 lakh per mandi. Out of total 23 eNAM surveyed mandis, 48 per cent mandis have received the grant-in-aid or financial support from the Government of India for different purpose (Table 5.27), while only 22 per cent selected mandis have received the infrastructure support..

- About 90000 farmers had visited the mandi for selling the produce during the last month and of them about 6,000 famers have registered in eNAM software and arrival details of about 10 per cent of registered farmers are made in eNAM software. Accordingly hence, no details are provided by selected mandis on commodities traded last month.
- As mentioned earlier, all the mandis have only weighing facility and lack assaying (quality testing), E-auction facilities, while other facilities available are grain storage, soil testing and bid management. In terms of the quality parameters of all services, weighing facility was responded with 'good' to 'satisfactory' level by APMC representatives.
- As no sale was undertaken under electronic market, thus none of sample of commodity was tested and uploaded on the eNAM platform. Thus, none of the APMCsresponded on quality testing and related parameters at APMC.
- Major constrains in implementation of electronic marketing are farmers are, not interested, commission agents are not willing to do transactions, not yet established assaying laboratory, long time required for e-transactions, farmer need quick settlement and cash in hand, sale process is complicated, online payment process is difficult and delay in online payment. Therefore, it is very important and urgent to educate and convince the famers and commission agents as well as other authorities of the APMC to adopt the electronic trading system may be in slower manner to gain confidence of the famers and commission agents. Few successful cases of transparent speedy transaction need to be recorded and disseminated through social media.
- The selected APMC authorities have mentioned that marketing through eNAM will cost lower, satisfaction of being part of the national market, itwould be transparent, better price realisation, online payment is more convenient, convenient transfer of money. It was surprising to note that 26 per cent of CAs have reported use of eNAM app to APMC, while corresponding figure reported by famers to APMC was 4.35 per cent only. The rating for eNAM given by APMC authorities indicates that a lot of things need to done to prepare farmers and CAs to transact with electronic market. Average score regarding the superiority of electronic market over APMC was between 'worse' to 'no change'. Open auction method of sale is used for transaction of commodities in market.

- The selected APMC respondents have suggested all the necessary requirement for better implementation of eNAM. It includesguidance / help at the mandi should be provided, sale process through e-NAM should be easy and improved, delay in online transactions should be reduced, sorting & grading infrastructure should be created/improved, weighing facilities should be created/improved, refrigeration facilities should be created / improved, facilities for manual sale should also be provided and single license for the entire country should be ensured

6.7 Conclusions:

From the field visits and survey, it was observed that though (visited) APMCs are linked and now live on eNAM portal, but so far nowhere actual e-trading has been recorded or taken place. Whatever business has been reported on eNAM portal is the entry of agricultural produce in market as uploaded in eNAM software; however, produce is auctioned and sold through regular process adopted in the market premises. At few places, local commission agent/trader tried to trade through new system, but they faced some problems. In true sense, stakeholders are not yet ready to go with e-trading due to following reasons.

- Most of the farmers do not have complete knowledge about eNAM due to which they are hesitant to share their bank details and *adhaar* card number required for registration with system. Theyhave certain apprehensions about eNAM and subsequent use of their income details for income tax purpose. Some APMCs did organize meeting with farmers and traders as well as distributed printed leaflet for creating awareness about eNAM, but could not succeed in their goal. Thus there is an urgent need to have clear time bound strategy to educate stakeholder on various aspects of eNAM concept. Also there is need to build trust among farmers and traders over new technology based system.
- Generally, in APMC market, one auction gets completed within a duration as small as a minute. Therefore, farmers and traders' perceive that eNAM process would take a lot of time to complete one auction as well as they may face difficultly in settling the payment within same day.
- The APMC management have also raised their concern about completion of auction of all produce that arrives in APMC premises for sales during glut or harvest seasons. Besides, apathy of commission agents for online payment is another concern.

- Farmers have mentioned that they are always stay connected with local commission agents/traders and sometimes they take advance money to meet the expenditure on crop cultivation and domestic needs with an agreement that produce after harvest would be sold through same commission agent or to same trader. In such cases, selling produce under eNAM to desired trader would not be possible, and therefore farmers fear that traditionally existing business relations/ associations over generations may get spoiled.
- Most of the farmers mentioned that they sell their produce when they require some money for procurement of agriculture inputs or for other domestic requirements. Thus they sell their produce in market as and when required. In present system, they are able to sell produce and procure inputs on same day, which may not be possible under new system.
- As per the present practice of auction, traders first physically check the quality of grains and then bids for the produce in presence of other bidders, famers and APMC inspector and then, highest quoted receipt is given to farmers by APMC inspector/officer for weighing and billing process, followed by payments either by cheque or cash. The traders are opposing this scheme because they are not ready to purchase agricultural commodities without physical verification, whereas electronic assaying is an important component of this scheme (providing online information on type/variety of commodities, quality specifications, moisture content, etc). Thus there are hesitations towards e-auctions and e-testing / assaying quality of the produce. Besides ambiguity related to whether the sample was same as the original produce or not, remains.
- Some of the traders have mentioned that they are aware about the soil quality and production practices followed in particular crop production by the particular farmer or by farmers of particular village/area and therefore they prefer to quote higher price for agricultural produce that comes from those villages/areas. Such confidence and empirical assessment would not be possible in eNAM by the traders, while they would not know that they are bidding for which farmer's produce if they rely only on electronic market.
- Most of the farmers are marginal with small land holdings and they prefer to sell their produce in small quantity. It is not exactly clear how their produce would be sold through the process specified in eNAM and how bargaining power of these farmers will be protected. Whereas in the current system even the smallest of the

lot (as low as about 25 kgs) of agricultural produce, involves bidding by traders in the presence of APMC officials.

- APMC officials and Trader have mentioned that trading of agricultural produce is not assigned HSSN code due to which they face difficulty in uploading the trade details for tax purpose, especially in the post GST regime.
- In order to participate in e-trading, commodities are required to be converted from physical form to electronic form, which requires assaying labs and skilled manpower. At present, the availability of such labs as well as skilled personnel is meagre. Though few staff of all APMCs are provided training on quality parameters by AGMARK, but follow-up training with hardware support needs to be undertaken at each mandi. Besides, there is a lack of infrastructure required for eNAM such as scientific sorting/grading facilities, speedy internet connection, etc. Thus even the trained personnel do not get to test their skills in the real market, since the infrastructure is itself not yet developed.
- There is a need to set up e-auction hall equipped with computers for uploading of buy quotes / bids by traders and large monitor / projector with speedy internet access. Broadband penetration and digital infrastructure in rural areas is very poor. Internet-literacy is minimal among farmers which may lead to a new kind of exploitation by middlemen who are more tech savvy.
- Some of the mandis have come up with mobile application to keep farmers informed about the prices on daily basis which would certainly help farmers to decide about time of sale of their produce. If similarly, farmer has an access to price information in all nearby APMC mandis, it will facilitate his decision making and reduce reliance on middlemen to sale his produce, or atleast have a better bargaining power in negotiation with middlemen.
- There is no proper channelling laid down for sale of produce to outside buyer and then settlement of accounts and transfer of material, which has created confusion and negative thinking about eNAM.

6.8 Policy Implications:

The setting up of eNAM aims to integrate all the agricultural markets of the country and is thus a landmark initiative. It envisages a common national market for agricultural commodities with seamless movement across state boundaries.But, it will happen when e-NAM becomes fully operational throughout the country and when the

eventual goal of 'One Nation One Market' for agricultural produce will become a reality. At present, APMCs are facing some teething problems in its implementation and no selected markets in Gujarat have actually participated in e-trading. Accurate information, institutions and infrastructure are the basic pre-requisites for successful implementation of any government programme/scheme. The infrastructural impediments include poor back-end infrastructure like inadequate scientific storage and warehousing, assaying and grading facilities in some markets only, limited number of cold storage, lacking refrigerated vans, low market density, limited capacity of these equipment to deal with high volume of agricultural commodities in the peak season, different standards for agricultural commodities, fragmented APMCs, lack of synergy between marketing organizations and service providers, involvement of traders in the marketing of agricultural produce, poor internet connection, inadequate number of computers, servers and kiosks in the market, interrupted power supply, poor quality of rural road, etc. Institutional impediments can be further subdivided into two- a) legal and b) human resource impediments.

- There is an immediate need to enhance the clarity amongst different stakeholders about eNAM concept and processes, stakeholders' role and responsibility through well-developed time bound strategy covering publicity, awareness campaign and capacity building of different stakeholder with a focussed approach for producer grower to avoid any exclusion of farmers from the system.
- It is very important and urgent to educate and convince the famers and commission agents as well as other authorities of the APMC to adopt the electronic trading system may be gradually, to gain confidence of the famers and commission agents. Few successful cases of transparent speedy transaction need to be recorded and disseminated through social media.Inadequate skilled manpower in the APMCs, limited number of trained traders to trade in the electronic platform and low literacy level of farmers are among the important human resource bottlenecks.
- There is urgent need to build trust among farmers and traders over new technology based system. Besides requisite infrastructure such as assaying facilities with skilled manpower and high speed internet connectivity to all selected markets for un-interrupted trading processes need to be provided without further delay.

- Suitable dispute resolution mechanisms need to be constituted in respect of assaying, weighment and e-payment related matters with respect to trades on e-NAM at APMC level.
- Though this system may take few years to become fully functional, it is an important reform in agricultural marketing system for which immediate appropriate steps need to be taken for its proper implementation and adoption.

Informational impediments need to be removed, like lack of awareness of the farmers about the e-NAM, limited knowledge of e-tendering process, lack of awareness about the benefits of e-NAM and farmers' apprehension about getting less price for their produce associated with their fears that their produce may be found to be of sub-standard quality on assaying fragmented agricultural markets make a perfect case for a unified platform like National Agricultural Market (NAM). Although facing initial hiccups for successful implementation and lesser density of e-NAM across the existing wholesale regulated markets, there is tremendous scope for its further expansion and modernization. The common agricultural platform integrated with modem technologies will be an important catalyst to ensure best price to the producers for their produce and will also ensure the variety of quality products to the consumers. The expansion in the volume of trade in eNAM platform will follow the strengthened back-end infrastructure for complete value chain of produce. Therefore, efforts must also be channelized towards development and up gradation of scientific warehouses, cold storage, refrigerated vans for perishables, awareness and training to the participants in the marketing process, high speed internet connectivity to the markets and among different components of the market. The benefits of eNAM would be visible once it is implemented fully in the true sense as it has been conceptualized.

References

.Aggarwal, N., Jain, S. and Narayanan, S. (2017). The long road to transformation of agricultural markets in India: lessons from Karnataka. Economic & Political Weekly, 52 (41), 47-55.

Acharya, S. S. and Agarwal N. (1999, 2004). Agricultural Marketing in India. Oxford and IBH Publication, New Delhi.

Acharya, S. S.; Chand P.R.; Birthal S.K. and Negi D.S. (2012). Market integration and price transmission in india- a case of rice and wheat with special reference to the world food crisis of 2007-08: Rome, Food and Agriculture Organisation.

Acharya, S.S. (2006). Agricultural marketing and rural credit for strengthening Indian agriculture. INRM Policy Brief No 3, Asian Development Bank, New Delhi.

Acharya, S.S. (1998). Indian Agriculture: Policy Issues and Priorities. Agricultural Situation in India, August, pp. 273-277.

Acharya, S.S. (2004). State of the Indian Farmer: A Millennium Study, Agricultural Marketing, Vol. 17, Department of Agriculture and Cooperation, Ministry of Agriculture, Government of India and Academic Foundation, New Delhi.

Acharya, S.S. (2009) Food Security and India Agriculture: Policies, Production Performance and Marketing environment, Agricultural Economics Research Review, Vol. 22 January- June 2009, pp. 1-19.

Aggarwal, N., Jain, S. and Narayanan, S. (2016). The long road to transformation of agricultural markets in India: lessons from Karnataka. Working Paper no. 2016-026, Indira Gandhi Institute for Developmental Research, Mumbai.

Athawale, S. G. (2014).APMC and E-Trading for Financial Inclusiveness in Karnataka. IBMRD's Journal of Management and Research, Vol. 3, No. 2, pp,. 84-98.

Barrett, B. C. and Emelly, M. (2005). Agricultural markets in developing countries. In: The new Palgrave dictionary of economics (Lawrence E. B. & Steven N. D. eds.). Palgrave Macmillan, London.

Basole, Amit and Deepankar Basu (2011). Relations of production and modes of surplus extraction in India: Part I- Agriculture. Economic and Political Weekly, April 2, pp.41-60.

Bathla, Seema (2004). Agriculture market intervention policies: trends and implication in a new regime. Occasional Paper 34, National Bank for Agriculture and Rural Development, Mumbai.

Bernstein, H. (2010). Class dynamics of agrarian change. Femwood Publishing, Halifax.

Bhalla, G.S. (2007). Indian Agriculture since Independence, National Book Trust, New Delhi, pp. 195-221.

Bhatia M.S. (1994). Agricultural Pricing, Marketing and International Trade under New Economic Environment. Indian Journal of Agricultural Economics, 49(3), July-Sept,, 403-416.

Bhattacharya, N. (1992). Colonial state and agrarian society. In: The making of agrarian policy in British India, 1770-1900 (B. Stein, eds.). Oxford University Press, New Delhi.

Birner, Regina, Surupa Gupta and Neetu Sharma (2011). The Political economy of agricultural policy reform in India, Research Monograph, International Food Policy Research Institute, Washington

Bisen, Jaiprakash and Kumar, Ranjit (2018). Agricultural marketing reforms and e-national agricultural market (e-NAM) in India: a review. Agricultural Economics Research Review. 31. 167-176. 10.5958/0974-0279.2018.00032.0.

Cervantes, G D. and Dewbre, J. (2010). Economic importance of agriculture for poverty reduction. Food, agriculture and fisheries working papers no. 23, Organization for Economic Co-operation and Development, France.

Chand, R. (2016). e-Platform for national agricultural market. Economic and Political Weekly, 51(28), IS-IS.

Chand, R. and Singh, J. (2016). Agricultural marketing and farmer friendly reforms across Indian states and UTs National Institute for Transforming India, NITI Aayog, New Delhi.

Chand, Ramesh (2012). Development Policies and Agricultural Markets. Economic and Political Weekly, Vol. XLVII, No. 52, December 29, 53-63.

Chand, Ramesh (2017). Doubling Farmers Income: Rationale, Strategy, Prospects and Action Plan. NITI Policy Paper 01/2017, National Institution for Transforming India, Government of India, New Delhi, March.

Chand, Ramesh and Shinoj Parappurathu (2012). Temporal and spatial variations in agricultural growth and its determinants. Economic and Political Weekly, Vol. XLVII, Nos. 26 and 27, pp.55-64.

Chengappa, P.G; Arun, M.; Yadava C.G. and Prasanna Kumar, H.M. (2012). IT application in agricultural marketing service delivery - electronic tender system in regulated markets. Agricultural Economics Research Review, 25, 359-372.

Christiaensen, L., Demery, L. and Kuhl, J. (2006).The role of agriculture in poverty reduction - an empirical perspective. Working paper no. WPS4013. The World Bank Group. Available at: https://doi.org/10.1787/18156797

Datt, Gaurav and Martin Ravallion (1998). Farm productivity and rural poverty in India. Journal of Development Studies, 34 (1).

Dev, S. Mahendra and N Chandrashekhara Rao (2010), "Agricultural Price Policy, Farm Profitability and Food Security", Economic and Political Weekly. Vol. XLV, Nos 26 and 27, pp. 174-182.

Dev, S. Mahendra and Ranade Ajit (1998). Rising food prices and rural poverty: going beyond correlations. Economic & Political Weekly, 33 (39),2529-36.

Devereux, S. (2001). Sen's Entitlement Approach: Critiques and Counter-critiques. Oxford Development Studies, 29 (3), 245-263.

Dewbre, J., Cervantes, G. D. and Sorescu S. (2011). Agricultural progress and poverty reduction: synthesis report. Food, agriculture and fisheries working papers no. 49. Organization for Economic Co-operation and Development, France. Available at: http://dx.doi.org/10.1787/5kg6vlvk8zr2-en

Dey, K. (2015). Why electronic spot market is a better bet? Business line, February, 3,2015. Available at: https://www.thehmdubusinessline.com/ markets/ commodities/why-electronic-spot-market-is-a-better-bet/article6853254.ece

Dey, K. (2016). National agricultural market-rationale, roll-out and ramifications. Economic & Political Weekly.51(19), 35-39.

Dholakia, R.H. (2010). Has agriculture in Gujarat shifted to high growth path? in Dholakia, R.H. and S.K. Dutta (eds), 'High Growth Trajectory and Structural Changes in Gujarat Agriculture', Centre for Management in Agriculture, IIM Ahmedabad, pp.1-19

Douglas, G (2009). Agriculture as an engine of growth and poverty reduction: what we know and what we need to know. Available at; https://www.africaportal.org/. i ;, documents/5672/DpuglasAgriculture.pdf

GOG (2016). Statistical Abstract of Gujarat State 2016. Gujarat State. Directorate of Economics and Statistics. Govt of Gujarat. Gandhinagar.

GOI (1965). Report of the Jha Committee on Food grain Prices for 1964-65, Department of Agriculture Government of India.

GOI (2016). National Agriculture Market: Initiatives and Challenges, Reference Note No.21/RN/Ref./July/2016, Lok Sabha Secretariat, New Delhi

GOI (2018). Agricultural Statistics at a Glance 2017. Directorate of Economics & Statistics. Ministry of Agriculture. Govt. of India.

GOI (2001). Report of task force on agricultural marketing reforms. Government of India, Available at: https://dini.gov.in/Documents/ReportTaskForceAMR.pdf

Goldin, Ian and Odin Knudsen (ed.) (1990), Agricultural Trade Liberalization: Implications for Developing Countries, OECD, Paris.

Gregory, Sir Theodore (1943). Report of the Food Grains Policy Committee, Govt of India, New Delhi

Grewal, B., Grunfeld, H. and Sheehan, P. (2012). The contribution of agricultural growth to poverty reduction. ACIAR impact assessment series report no. 76. Australian Centre for International Agricultural Research, Canberra.

Gujral, J., Joshi, P. and Anuradha, R.V. (2011). Facilitating legislative and administrative reforms in agriculture marketing by leveraging the Competition Commission of India. Available at: http://www.ncaer.org/popuppages/EventDetails/E 16Feb2011/Jyoti-GujrajPiyush-anuradha.pdf.

Gulati, Ashok and Pradeep K. Sharma (1991). Government Intervention in Agricultural Markets: Nature, Impact and Implications. Journal of Indian School of Political Economy, Jan.-March.

Gulati, Ashok and Thomas Reardon (2008). Reducing Poverty and Hunger in Asia, Brief 7 of 15, International Food Policy Research Institute, Washington, DC, USA, March.

Gulati, Ashok; Tushaar Shah and Ganga Shreedhar (2009). Agriculture Performance in Gujarat since 2000: Can It be a Divadandi (Lighthouse) for other States?", International Water Management Institute and International Food Policy Research Institute, May.

Haniss, W. B. (1984). Agricultural maricets and inter-sectoral resource transfers: cases from the semi-arid tropics of southeast India. Available at: https://core.ac.uk/download/pdf/12102869.pdf#page=272

Haque, E. & Jairath, A. P. (2014). Why Vadodara APMC is a hit among farmers? Business line, October, 13, 2014. Available at: https://www.thehindubusmessline.coni/markets/commodities/Why-Vadodara-APMC-is-a-hit-among-farmers/articie20885834.ece

Hegazy, R. (2013). Post-harvest situation and losses in India. Available at: htts://www.researchgate.net/ publication/301770292_Post-harv6st_Situation _and_Losses_in_India

Hoekman, Mernard M. and Michel M. Kostecki (2001). The Political Economy of the World Trading System: The WTO and Beyond, Second Edition, Oxford University Press, New York.

IFPRI (2016). Are we Ready for a National Agricultural Market?. International Food Policy Research Institute Food Security Portal India, accessed from http://india.foodsecurityportal.org/ content/are-we-readynational-agriculture-market.

Jha, S.N., Mshwakarma, R.K., Ahmad, T, Rai, A. & Dixit, A.K. (2015). Report on assessment of quantitative harvest and post-harvest losses for major crops and commodities in India. ICAR-All India Coordinated Research Project on Post-Harvest Technology, CIPHET, Ludhiana.

Kalamkar, S. S.; Ojha M. R. and Parihar T. B. (2014). Evaluation of price support and market intervention scheme in rajasthan. Indian Journal of Agricultural Marketing, 28(2), May August, 81-94.

Kalamkar, S.S. (2003). Agricultural development and sources of output growth in Maharashtra State. Artha Vijnana, Vol. XLV, Nos. 3 and 4, September-December, pp. 297-324.

Kalamkar, S.S. (2009). Globalisation, Food Security and Sustainable Agriculture in India. The Indian Economic Journal, 92nd IEA Conference Volume, Special Issue, Part II, December 2009, pp. 90-113.

Kalamkar, S.S. (2011). Food Security in South Asia with Special reference to India. Millennium Asia -An International Journal of Asia Studies, Vol. 2, No. 1, January-June 2011, pp. 93-121.

Kalamkar, S.S. (2011a). Patterns and Determinants of Agricultural Growth in Maharashtra. Artha Vijnana, Vol. LIII, No. 2, June 2011, pp. 156-181.

Kalamkar, S.S. (2011b). Agricultural Marketing and Food Security in India. Indian Journal of Agricultural Marketing, 25(3), September December, 128-149.

Kalamkar, S.S. (2013). Food and Nutrition Security in India. Indian Journal of Management Review, Special Issue, August 2013, 246-253.

Kalamkar, S.S. (2014). Water Harvesting and Groundwater Recharge in Gujarat. SPET Research Journal of Social Sciences. 2 (2), August, 3-29.

Kalamkar, S.S. (2015). Government Interventions in the Marketing of Selected Agricultural Commodities in India. Indian Journal of Agricultural Marketing, 29(2), May Aug, 50-76.

Kalamkar, S.S. (2017). Performance and Prospects of eNAM in Gujarat. Indian Journal of Agricultural Marketing, 31(3), December, 61-72,

Kalamkar, S.S.; Ojha M. R. and Parihar T. B. (2013). Evaluation of Price Support and Market Intervention Scheme in Rajasthan. AERC Research Report No. 149, April, Agro-Economic Research Centre, Sardar Patel University, Vallabh Vidyanagar, Anand, Gujarat

Knight, S.H. (1954). Food administration in India, 1939-47. Stanford University Press, Stanford, California.

Krishna, P. (2017). Major agricultural marketing reforms - the way forward. Business word, August 21st Available at: http://businessworld.in/article/-major-agricultural-marketing-reforms-the-way-forward/21-08-2017-124398/

Kumar Ranjit; PC Meena and Sanjiv Kumar (2017). National Agricultural Market: Experiences from Telangana and Madhya Pradesh states, Draft report, Agribusiness Management Division, ICAR-NAARM, Hyderabad

Kumar, Dinesh M., Narayanamoorthy A., Singh O.P., Sivamohan M.V.K, Sharma Manoj and Bassi Nitin (2010), Gujarat's Agricultural Growth Story: Exploding Some Myths, Occasional Paper No. 2-0410, Institute for Resource Analysis and Policy, Hyderabad.

Kumar, Praduman and Surabhi Mittal (2006). Agricultural Productivity Trends in India: Sustainability Issues. Agricultural Economic Research Review, 19 (Conference No.), 71-88.

Kumar, R., Kumar, S. & Meena, PC. (2018). Smart micro- mandi: for better price realization and reduced market risks for the smallholders. Policy brief, April 2018, no. 1. ICAR-National Academy of Agricultural Research Management Hyderabad. DOI 10.13140/RG. 2.2.32106.00969.

Lele U.J. (1971). Food grain marketing in India. Private performance and public policy. Cornell University Press, London.

Minten, B., Vandeplas, A. and Swinnen, J. (2012). Regulations, brokers, and inter-linkages: the institutional organization of wholesale markets in India, Journal of Development Studies, 48(7), 864-886,

Mishra, R. & Mishra, S.N. (2017). Reforms in agricultural marketing, policy issues and sustainable market development in Odisha. Indian Journal of Agricultural Marketing, 31(3), 103-117.

Moloney, C. (2016). India's agriculture produce losses Rs 92,000 Cr, 3 times more than agriculture budget. India Spend, August 11, 2016. Available at: http:// archive.indiaspend.com/making-sense-of-breaking-news/indias-agriculture-produce-losses-rs-92000-cr-3-times-more-than-agriculture-budget-71003

Mustaquim, M. (2017). Agriculture marketing reforms: benefiting farmers? Available at: https://www.ruralmarketing.in/industry/agriculture/agriculture- marketing -reforms-benefiting-farmers

NABARD (2018). All India rural financial inclusion survey 2016-17. National Bank for Agriculture and Rural Development, Mumbai.

Narain, Dharam (1973), "Agricultural Price Policy", presented at the 'National Symposium on Agricultural Research and Development since Independence', Indian Council of Agricultural Research, as quoted in Raj, K.N.; Amartya Sen and C.H. Hanumantha Rao (Eds) Studies on Indian Agriculture, Oxford University Press, Delhi.

Narayanamoorthy, A. & Alii, P. (2018). Agriculture market reforms are a must. Business line, January 1, 2018. Available at: ht^s://www.thehindubusinessline.com/opinion/agriculture-market-reforms-are-a-must/articlel 0007561 .ece

NCDFI (2018), NCDFI eMarket -- a ray of Hope, National Cooperative Dairy Federation of India, Anand (by K. C. Supekar, MD, NCDFI).

NIAM (2017). Odisha* linkmg farmers to electronic maricets (e-NAM): current scenario and a way forward. Available at: ht^://www.ccsniam.gov.in/iinage5/pdfs/Odislia_Report_Final.pdf

NIAM, (2015). Unified Common Market: A Concept Note. CCS, National Institute of Agricultural Marketing, Jaipur, Available at: http://www.ccsniam.gov.in/images/pdfs/nam/A_Concept_Note_on_Common_Market.pdf

Nirmal, R (2017). E-NAM: Why inter-state trade is still a non-starter? Indian Journal of Agricultural Marketing, 31(3) (conference special.), 73-81.

NSSO (2014), Employment and Unemployment Situation in India, NSS 68th ROUND, National Sample Survey Office Ministry of Statistics & Programme Implementation 12th Prof. G. Parthasarathy Memorial Lecture, delivered at 28th National Conference of the Indian Society of Agricultural Marketing, held at Agro-Economic Government of India 24 January 2014

Pal, S., Bahl, D. & Mruthyunjaya (1993), Government interventions in food grain maricets: the case of India. Food Policy, 18(5), 414-427.

Parihar T. B.; S. S. Kalamkar and M. Swain (2014), "Agribusiness Initiatives in Gujarat", Indian Journal of Agricultural Marketing, Vol.28, No. 2, September- December 2014, pp. 111-129.

Patnaik,G (2011). Status ofagriculturalmariceting reforms. In: Workshop on policy options and investment priorities for accelerating agricultural productivity and development in India. Indira Gandhi Institute of Development Research, Mumbai & Institute for Human Development, New Delhi. 10-11 November.

Paty, B.K. & Gummagolmath, K.C. (2015). A handbook on agricultural marketing extension for extension functionaries. National Institute of Agricultural Extension Management, Hyderabad, India.

Pavithra, S., Gracy, C P., Saxena R & Patil, G G (2018). Innovations in agricultural marketing: a case study of e-tendering system in Karnataka, India. Agricultural Economics Research Review, 31 (1), 53-64.

Planning Commission (2007), Report of the Working Group on Agricultural Marketing Infrastructure and Policy required for Internal and External Trade for the XI Five Year Plan 2007-2012, Agriculture Division, Planning Commission, New Delhi.

Planning Commission (2011), Report of the Working Group on Agricultural Marketing Infrastructure, Secondary Agriculture and Policy required for Internal and External Trade for the XII Five Year Plan 2012-2017, Agriculture Division, Planning Commission, New Delhi.

Purohit, R, Imai, K.S. & Sen, K. (2017). Do agricultural marketing laws matter for rural growth? evidences fix)m Indian states. Discussion paper no. DP2017-17. Research Institute for Economic and Business Administration, Kobe University, Kobe, Japan

Pursell, G. and Ashok Gulati (1993), "Liberalizing Indian Agriculture - An Agenda for Reforms", Working Paper, Policy Research Department, The World Bank, September.

Rajagopal (1993). Indian rural marketing. Rawat publication, Jaipur, India.

Rao, N. Chandrasekhara (2006), "Agrarian Crisis in Andhra Pradesh",Journal of Indian School of Political Economy, Vol. 18, No. 1&2, pp. 35-75.

Rao, N. Chandrasekhara (2004), "Aggregate Agricultural Supply Response in Andhra Pradesh", Indian Journal of Agricultural Economics, Vol. 59, No. 1, pp. 91-104.

Rashid Shahidur, Gulati Ashok and S. Mahendra Dev (2008), "Parastatals and Food Policies: the Indian Case" in Rashid Shahidur, Gulati Ashok,and Ralph Cumming Jr (Ed) book "From Parastatals to Private Trade: Lesson From the Asian Agriculture, Oxforf University Press, New Delhi.

Ravallion, Martin and Gaurav Datt (1996): "How Important to India's Poor Is the Sectoral Composition of Economic Growth?", World Bank Economic Review, Vol. 10, No. 1, pp 1-25.

Reddy, M.Srinivasa, T.Satyanarayana and M.K.Singh (2014), Rythu Bazars (Farmers' Markets) — an Innovative Direct Marketing Model to Benefit Small and Marginal Farmers. Agricultural Situation In India November, 2014 VOL. LXXI November, 2014 No. 8.

Reddy, A. Amarender (2016), "Impact of E-markets in Karnataka, India", Indian Journal of Agricultural Marketing, Vol. 30, No. 2, May August, pp.31-44.

Roy, D., Joshi, P.K & Chandra R (2017). Elements of a national agricultural market in India. In: Financing agriculture value chains in India (Mani G, Joshi R, Ashok M. eds.). Springer, Singapore.

Sekhar, C.S.C. (2017), Electronic National Agricultural Market (eNAM), A Review of Performance and Prospects, Institute of Economic Growth, Delhi.

Sen, A.K. (1981), Poverty and Famines: An Essay on Entitlement and Deprivation. Oxford: Clarendon.

SFAC (2015). National agriculture market scheme. Available at: http://s&cindia.com/Nam.a8px /

Shah, Tushar, Ashok Gulati, Hemant P, Ganga Shreedhar, R C Jain (2009), 'Secret of Gujarat's Agrarian Miracle after 2000, Economic and Political Weekly, Vol.46, No.52, pp- 45-55

Shailendra (2013). Impact assessment of e- tendering of agricultural commodities in Karnataka. Research Report, CCS NIAM, Jaipur.

Shalendra and M. S. Jairath (2013), "National Agricultural Markets: Present Status, Challenges and Way Forward", Indian Journal of Agricultural Economics, Vol. 71, No. 3. pp. 252-263.

Shanmugam, V. (2009), "Price Risk in Agriculture: Functioning of Markets and Hedging", CAB Calling, October-December 2009,Vol.33, No.4, pp. 114-118.

Sharma , V.P. and Wardhan, H. (2015). Assessment of marketed and marketable surplus of major foodgrains of India. Final Report, Centre for Management in Agriculture (CMA) Indian Institute of Management (IIM), Ahmedabad.

Sharma, A.N. & Kumar, A. (2011). The role of agriculture in poverty reduction: the Indian experience. Available at:https://www.vu.edu.au/sites/default/files/SHARMA_KUMAR_201 l_Role_Agric_in_ Poverty-Reduction_India.pdf

Sharma, K. (2016). Modi's national agricultural market brings more suffering to farmers. Available at: https:// www.dailyo.in/politics/apmc-act-national-agriculture-mission-farmer-crisis-rural-markets-adani-reliance-food/stoiy/1/10302.html

Sharma, P. (2017). Agricultural market reforms: back to the future in the mandi again. Available at: http:// indianexpress.com/article/india/agricultural-market-reforms-back-to-the-future-in-the-mandi-again-4650332/

Sharma, V.P. & Wardhan, H. (2015). Assessment of marketed and marketable surplus of major foodgrains of India. Final Report, Centre for Management in Agriculture(CMA) Indian Institute of Management (IIM) Ahmedabad

Shroff, S.; Kalamkar S. S. and Kajale J. (2014), Emerging Retail sector in Agricultural Marketing. Productivity, 54 (4), January-March 2014, 415-420.

Shroff, S.; Kalamkar S. S. and Kajale J. (2012). Emerging Agricultural Marketing Systems in India: A Case of Onion Marketing in Maharashtra", Indian Journal of Agricultural Marketing, 26 (2), May August 2012, 87-101.

Subramanian, A. (2014). Crossing the rubicon towards a pareto efficient Indian agricultural maricet - with specific focus on rice and wheat markets. Working Paper No. 04/2014-DEA. Ministry of Finance, GOI.

Swain, M., S .S. Kalamkar and Kalpana Kapadia (2012), State of Gujarat Agriculture 2011-12. AERC Report No. 146, Agro-Economic Research Centre, S. P. University Vallabh Vidyanagar.

Virmani, Arvind (2008). Growth and Poverty: Policy Implications for Lagging States. Economic & Political Weekly, 43 (2), 54-62.

Xavier I., Lin, L., Colin, T. & Steve, W. (2001). Agricultural productivity growth and poverty allviation.Development Policy Review, 19 (4) 449-466.