Chapter III

REVIEW OF LITERATURE

3.1 INTRODUCTION

A review of the previous studies on agriculture marketing, various national and international IT initiatives for rural marketing was essential for present research. Literatures reviewed for study are books, international journals, magazines, websites and portals related to research topic. Important international and national IT initiatives are reviewed thoroughly. It is also supported by opinions of experts and authorities in agriculture marketing as well as IT. The literature is reviewed from the following aspects:

- Information Technology in Agriculture
- Agriculture Marketing and IT
- Whole Sales Markets
- IT Enabled Agriculture
- IT Diffusion in Developing Countries
- Direct Marketing
- Government’s Digital Initiatives
- Agriculture Market Efficiency
- Provisions of agriculture marketing development in Model Act

3.2 INFORMATION TECHNOLOGY IN AGRICULTURE

S.C. Mittal¹, in his research highlights the importance of IT in Indian agriculture. According to him Indian farmer and those who are working for their welfare need to be e-powered to face the emerging scenario. The
quality of rural life can also be improved by quality information inputs which provide better decision making abilities. IT can play a major role in facilitating the process of transformation of rural India to meet the challenges and to remove the fast growing digital-divide. The rapid changes in the field of information technology make it possible to develop and disseminate required electronic services to rural India.

As per his opinion, a national strategy needs to be drawn for spearheading IT penetration to rural India. A national coordinating agency with an advisory role can act as a catalyst in the process. No single institution or organization alone can succeed in the task of e-powering. The success of any IT based service to rural India hinges on evolving a proper revenue model for the dissemination points. According to him the ‘clicks & mortar’ rural kiosks should be integrated with the ‘bricks & mortar’ industry to make them sustainable ventures by making them a business gateway to rural India. The information kiosks can draw revenue from the industry by providing and disseminating required services. Once these dissemination points prove to be economically viable, the IT revolution in rural India will require no crusaders.

3.3 AGRICULTURE MARKETING AND IT

J.P. Signh in his research paper identified the problems of agriculture marketing in India as follows:

- Fluctuations in agriculture prices and supplies (surpluses/scarcities)
- Conflicting interests of farmers, middlemen and consumers.
- Under utilization of resources such as rural godowns, market yards.
- Inadequate transportation, communication and information network.
• Imbalance in the spread of internal marketing network.
• Factors such as distribution, seasonability, perishability, and enormity of production, storage, lack of processing.
• Glut in the market and ultimately fall in price.
• Problem of scanty due to inadequate production, crop failure may finally result in rise in prices.

According him, communication plays a vital role in determining the success or failure of commercialization/marketing of the agricultural produce in rural India. He has stressed on the importance of information services for agriculture marketing, to overcome these problems. He has also suggested solutions such as audit of local resources and facilities, determining what the market wants in terms of product now and in future.

S. S. Acharya’s research evaluated the present status of agriculture marketing i.e. marketing institutions, marketing infrastructure, contract farming. He has stated importance of market information and use of IT in agriculture marketing. According to him the development in information technology has great potential for integration of agriculture markets. The information technology revolution, aided by revolution in telecommunication has the potential to help not only market information system but also change the nature of market functioning together by making several intermediaries redundant, reducing the cost of information, lowering the transaction cost and increase of competition.

According to him in the emerging environment, Indian agriculture needs more changes for making agriculture sector vibrant and responsive to the aspirations of the rural masses. The suggested agenda for reforms includes
• Revision in state Agriculture Produce Markets Regulation Acts.
• Redefining the role of state marketing boards and market committees.
• Repeal of ECA (Essential Commodities Act) except under emergencies.
• Putting in place a unified food law.
• Introduction of new instruments like contract farming and warehouse receipt system and assurance to investors that regulations will not be re-imposed.
• The policy of price support needs to be rationalized and decentralized.
• Commission for Agriculture Costs and Prices (CACP) and support price should be given statutory status.
• Complementary public investment in marketing infrastructure should be made.
• The system of training of farmers by strengthening marketing extension education network needs to be put in place.
• Instruments for insurance of farmers against production and price risk should be made essential component of development strategy.

D. Dr. A. G. Matani in his research paper highlights the importance of IT in improving marketing activities of retail business in agricultural area in Indian economy. According to him Information Technology should be used for
• Maintaining an updated and enriched database of region specific agricultural information.
• Timely dissemination of the information pertaining to soil enrichment, seed selection, actions relating to arrival of monsoon etc. to the farmers.
• Information regarding agricultural products, demand-supply status in respect of different products and the current price should be made available on-line to the farmers for taking timely decisions on crop product diversification strategies and positioning of the same in right
market to get optimum revenue.

- The educational and professional institutions should take for guiding the latest information using IT as a tool and make it available to the farmers. The need of the day is to harness the vast potential of agriculture in Indian economy.

### 3.4 WHOLE SALE MARKETS

Edward Seidler⁵, believes that in those countries where the farm structure and the marketing system remain fragmented and co-operatives and farmer groupings are largely underdeveloped (as is the case in most developing countries) wholesale markets are still needed. It provides farmers with effective and profitable marketing outlets for their produce. In addition to facilitating farmers’ access to the marketing system, wholesale markets, if adequately located, sized and managed, are basic instruments for promoting competition and improving public health and food quality control. This thereby lowers and stabilizes consumer prices and reduces post harvest losses as well as urban congestion and pollution.

The study also identifies that wholesale market development lagged behind the needs of most of the countries. *Dedicated wholesale markets are only found in the capital cities and these often serve a combination of wholesale and retail marketing functions with the concomitant problems of heavy congestion, waste, pollution and generally inadequate facilities*. In many cases the wholesale markets were erected during colonial times, when the cities were much smaller and the traded volumes were much lower, with the result that today the markets are too small and spill over into adjacent, unplanned and generally unsuitable areas.
3.4.1 Whole sale markets in India

According to above study, significant development has taken place in wholesale markets in most Asian countries. In the 1970s, the Indian Government realized the importance of wholesale market development and introduced the concept of ‘markets of national importance’ in which it promoted the development of wholesale markets in each of the States and encouraged States to formulate Market Master Plans to promote the development of regulated wholesale and assembly markets. From the 286 regulated markets in 1950, India now has 7161 regulated markets (March 2001). The predominance of New Delhi as the main wholesale market of the country and its role both as a Terminal market and a Transit market is a matter of concern in India. It is estimated that over 30 per cent of the produce going through New Delhi’s Azadpur wholesale market is in fact produce originating from a different State and going to another by transiting through Delhi due to its transport links and the belief that Azadpur is the market that truly reflects market prices. One can imagine the savings that might accrue to farmers and consumers if produce was directly transported from the producing State's market to those in the consuming States.

3.4.2 FAO Guides

To support improvements in wholesale and retail market planning, design, management and operations, which could not be done through the format of individual country projects, FAO has produced a number of Guides or Manuals. These are:

- Wholesale Markets - Planning and Design Manual
- Retail Markets Planning Guide,
• Wholesale Market Management
• Market Infrastructure Planning- a guide for decision makers

These guides are all available in English and some also in French, Spanish and Arabic.

3.5 IT ENABLED AGRICULTURE

3.5.1 Govi Gnana Service [GGS]

In his studies Harsha de Silva states that vast majority of country’s poor lives in rural areas and depend on agriculture for their livelihood. Because of the asymmetry of information between farmers and buyers, where farmers are unaware of what, when and how much to produce as a primary reason for this situation. The researcher identified the farmer’s problems as:

• Unlike most businessmen, farmers do not have an adequate knowledge of market demand, they do not have overdraft facilities or credit limits and they do not have insurance.

• The returns from the crop are not certain and the farmer has no collateral, banks are reluctant to lend him the necessary funds.

• If the price the farmer receives is inadequate to pay off his loans, he falls in to trouble, and gets in to even more debt. He is then unable to afford the right quantities of fertilizer and pesticide in the next season which results in lower yields and poor quality produce, leading to lower income.

This research presents a possible solution to the problem in the form of a widely available, accurate, timely and credible information system and
discusses early findings from a pilot implementation of the system. The **Govi Gnana Service** (GGS) means farmer’s knowledge service in Sinhala and Tamil languages. It is therefore a mechanism that provides such information, *not only to the farmer, but also from the farmer: in the truest sense an agriculture marketing info-structure*. Author believes that, once implemented the GGS would be able to create stability in farmer income by bringing in a calculated certainty into the now unpredictable and volatile produce prices. If successful, GGS will become **a reliable weapon against farmer poverty**. It will help farmers to plant crops according to contracts to sell at future dates and help them raise crop loans using this guaranteed future revenue as collateral. Thereafter it will allow them to sell their produce *at guaranteed prices, not arbitrarily set by a state agency*, but done so in the market, by both state and private agents.

### 3.5.2 aAQUA

aAQUA\(^7\) is an online multilingual, multimedia Agricultural portal for disseminating information from and to the grassroots of the Indian agricultural community. It answers farmers queries based on the location, season, crop and other information provided by farmers. aAQUA, Bhav Puchiye and a digital library of Agricultural Bhav Puchiye (meaning, "ask for the price", in Hindi) is a web-based application for viewing the price and price history information of agrarian products at the nearby wholesale markets called mandis.

A tool provides a simple, yet rich interface suitable for new internet users. A web-based keyboard is also available to assist users. Some agricultural and veterinary problems are better addressed by photographs or audio and video files which provide details to the expert.
3.5.3. Disk and Dairy Portal

Prof. T.P. Rama Rao, presented a concept application using Information and Communication Technology (ICT) in the dairy sector, developed by the Centre for Electronics Governance at the Indian Institute of Management, Ahmedabad (CEG-IIMA). The application aims at helping the dairy farmers with timely messages and educating them on the care for their milch cattle and enhances the production of quality milk. It also aims at assisting the dairy unions in effectively scheduling and organizing the veterinary, artificial insemination, cattle feed and other related services.

The ICT applications described above have received encouraging responses from the dairy sector. In these challenging times, such applications are a useful tool at the grass-root level, to reap quantifiable benefits and help reinforce the foundations of the immensely successful and proven milk cooperative movement, of Management, Ahmedabad.

3.5.4 Market Information Services

According to Andrew Shepherd, Market Information Services can have the following impact on the agricultural marketing activities:

- Efficient allocation of productive resources.
- Improved bargaining position of farmers with traders.
- Information reduces transaction costs by reducing risks.
- Farmers with timely and reliable information and the ability to interpret it can decide to which market they should send their produce to maximize returns or, indeed, whether to send their produce to market at all.
Surya B. Binayee, Program Manager and International Marketing Expert in his report looks into the agriculture marketing information systems in Nepal, India, Pakistan, and Bangladesh, and tries to generate ideas and insights for developing and strengthening agriculture marketing information systems in the similar conditions. This study has been undertaken to identify different marketing information system models prevalent in agriculture sector, and offer a broader perspective on marketing information services. It shows that marketing information systems help increase awareness and capacity of farmer communities in agriculture production, harvesting and marketing. Marketing information systems have been found effective to increase the bargaining capacity of the locals by letting them know the alternative markets and price differences. Thus, they have contributed to the profit margins of the farmers as well.

The information needs are the basis of marketing information design in every case. As its key objective is to assist the target users to make appropriate marketing decisions and facilitate the marketing activities, the marketing information needs range from regular price and demand information to new markets and product development opportunities. Though most of marketing information systems monitor and disseminate market prices for target products, the roles of other information, such as post harvest and processing technologies, new markets and buyers, requirements of the buyers and quality control, best practices in production, and policy issues, are found immense in contributing to the enterprise development and improved marketing of agriculture products.

The key components of marketing information system include information collection, analysis, and dissemination. The most of marketing information
systems have used multiple sources of information, range of analysis, and various media to disseminate information. Information is found collected directly or indirectly from the value chain participants as well as from internal records of various organizations and published documents. Most of the marketing information systems have established linkages with other organizations and have subscribed journal, newspapers, website, etc. to collect information. Most of the systems have developed database to be able to systematically store and analyze the data to generate required marketing information. Most of them have prepared tables (for price and quantity in terms of minimum, maximum, mode, average, etc.), charts (histogram, pie, trend line, etc.) directory (profile of buyers and products), cases (best practices and lesson learned), brochure (technology, farming and post harvest techniques), and other statistics to present the information to the users.

The study shows that when it is a part of their business strategies, private companies can also run marketing information system benefiting poor farmers, which can have high chance of becoming successful and sustainable. If the information to the poor is considered a public good, then government funds to the marketing information system no matter who runs can be an appropriate way to sustain the marketing information system which services the poor farmers. However, the information quality and usefulness to the user’s needs to be continuously assessed and improved with the changing market conditions.

3.5.5 AgriInfo: An Agricultural Information System Based on a Call Centre In China

Agriinfo11 was piloted in the north of China, which attempt to develop and test an agriculture information system based on a call centre. It
demonstrates the possibility and potential benefits of using a call centre to strengthen agricultural information management and service. To test its usefulness, the system had been piloted in the north of China after the prototype was completed. Compared with the simplex internet technique, the call centre has characteristics as follows:

- It has *more potential customers* because the telephone network is more available than the internet, especially in the more *remote rural areas* giving it huge market potential.
- It is less demanding on the user. To access the internet-enabled information system requires that the user be familiar with computers and have professional operation ability. The call centre enabled information system requires only that the user is able to hear and speak regardless of age to get useful information from either the agent or by voice navigation.

**Important Findings of Agriinfo:**

- Agriinfo can provide both on-line communications (synchronous) and an off-line (asynchronous) service.
- It is a good complementary system to overcome the limitations of the traditional information system in also being able to deal with exceptional and difficult situations.
- End users welcome the system’s synchronous and asynchronous functions.
- The integration of basic and expert-level knowledge based with Agriinfo proves to be effective and useful.
- It enables Agriinfo to meet different user requirements in different situations.
- The tele-consultation system acts a good tool to collect agricultural expertise, agricultural cases, and user feedback, extend agricultural
knowledge and techniques, and

- It can solve the problem of shortage of expertise in some regions. Agriinfo offers different paths for delivering agricultural information and knowledge to the user.

After operating for a period of time, many useful suggestions have been received from various avenues.

- The call centre acts as a useful tool to help integrate agricultural information systems with communication tools, such as telephone and mobile phone.

- It can provide a series of advantages such as efficiency, a high degree of flexibility and responsiveness, cost saving to meet user needs in different situations, and to save user time.

- It is a cost-effective way to develop the agricultural information system.

3.5.6 South Korea’s Agricultural Information Service – A National Agricultural Research Systems (NARS) Initiative

Dr. Sahdev Singh\(^2\) in his reviews diverse applications of new ICT in rural farming areas of selected Asia-Pacific countries and identifies different models of such applications by analyzing the context of local situations. One of the success stories is of “South Korea’s Agricultural Information Service”

As per his review Rural Development Administration (RDA) take a significant role in the successful industrialization and modernization of the Korean economy through the effective development and transfer of agricultural technologies. RDA now serves as the National Agricultural Research Systems (NARS) of South Korea and is an active Asia-Pacific Association of Agricultural Research Institutions (APAARI member). For the past three decades, RDA has disseminated high-yielding cultivators and
cropping technologies to attain self-sufficiency in rice and some other important food crops. It has also contributed greatly in vegetable production by introducing technologies that enable farmers to produce crops year-round. Furthermore, RDA has also improved rural environment and fostered young farmers to enhance the competitiveness of Korean agricultural products. Continuous and sizable investment in agricultural research by the Korean government highlights the importance of technology development in advancing the agricultural industry.

### 3.5.7 Agriculture MIS of Agro Enterprise Center

Agro Enterprise Center (AEC) is a technical wing of the Federation of the Nepalese Chambers of Commerce and Industries (FNCCI), an apex body of private sector in Nepal to provide agricultural information and technical supports to its members. With a United States Agency for International Development (USAID) funded project’s support, AEC initiated agricultural marketing information services in Nepal from 1998. AEC’s MIS has following objectives

- Establish a nationwide wholesale market network.
- Generate database on the performance of the national and International wholesale market
- Provide wholesale market information to different users and stakeholders.
- Impart marketing concepts to farmers and local traders and make available the prices of wholesale markets for analyzing the price trend and developing strategies for production and marketing of agricultural products
The main target users of the marketing information system are the private sector members i.e. district chambers, agri-entrepreneurs, wholesalers, retailers, and producers. The information is also provided to development organizations and government agencies to support them in development and implementation of agricultural programs and policies.

Starting with price information of fruits and vegetables for 4 markets, the AEC’s market price information bulletin now covers 18 major markets of Nepal. The information bulletin includes the price information for the following commodities:

- Fruits (domestic and border markets): 22 items
- Herbs (Dharan, Nepalgunj, and Delhi markets): 94 items
- Vegetables (domestic and border markets): 46 items
- Spices (domestic and border markets): 14 items
- Others (domestic markets): cocoon- 9 different grades; coffee- dry and roasted; dairy- 4 items; oilseed- 6 items; pulses- 3 items; oilseed- 6 items;
  radish seed- Minu early and 40 days; and tea: orthodox and CTC

a. Information collection

For the practical purpose, AEC mainly collects and compiles wholesale market prices from major market centers. In this system, wholesale market prices as well as retail market prices of Kalimati market come to AEC through email and/or other channel on a daily basis. Information is collected for morning transactions, and it includes minimum and maximum prices of commodities as well as the sources from where the commodities come into the markets. AEC receives the daily market price information from its designated persons.
AEC has also established international networking with chambers and private sector entrepreneurs, and it collects prices from Delhi and border markets of Barailley, Pilvit, and Khatima in India. In addition, information on prices of herbs, mustard, rice, sunflower, tea, and coffee from major markets in India is collected and maintained periodically. Occasionally, international market price and information is collected and shared with the target users. The international market information is shared with traders, planners, and development organizations to help promote the international trade on the products.

b. MIS Center Management

Two full time staffs compile the information, and analyze the information in the following forms. The information is available both in Nepali and English languages.

- Daily wholesale market price bulletin (marketwise)
- weekly price bulletin (marketwise detail bulletin)
- monthly and yearly market price bulletin (commodity and market wise)
- price trends, etc. (commodity and market wise)

c. Information dissemination

In addition to those members visiting the AEC office and library for the detailed and descriptive information, AEC disseminates the information through emails, websites (www.agripricenepal.com and www.b2b.com.np), fax, and bulletin boards. Emails are sent to the affiliated organizations, members, and the district chambers. The information is also faxed to district chambers. Bulletin boards are put at district chambers and municipality complexes.

AEC has categorized the information into
a) Free information and
b) Fee based information. Fee based information is provided only to the members who pay Rs. 3000 per year as membership fee. These members can access all the information at the AEC website (www.agripricenepal.com).

d. Results and lessons

The marketing information has been useful to producers and traders located nearby city centers for their marketing decisions making. The examples of floriculture and hybrid tomatoes are quoted as success cases of the MIS intervention, especially paring price information with other pertinent information to the target groups. From the experience of the MIS, AEC believes that the farmers and traders can generate more benefits if the market price information is provided together with a package of information that empowers them for improving their farming and marketing practices.

3.5.8 e-Choupal

The case of Indian Tobacco Company (ITC) shows the corporate sectors marketing information system can equally benefit the farmers. Indian Tobacco Company’s e-Choupal\(^\text{14}\) system aims to streamline the supply chain of the cereal crops the company deals in. It has helped the farmers in many ways, such as developing of local leadership, shared ownership of the assets created in this initiative, access to the latest knowledge for the agro-sector, sustainable income levels and skill development for productivity improvement. It is built on information and communication technologies, and provides online information to villagers through kiosks, which are managed by commission based managers to support information access and
direct market linkages of farmers to India Tobacco Company. As being a part of the business strategies of the company and being able to match the farmers’ needs, it is making a good success and has reached to over 24,000 villages with 42,000 kiosks.

The project was initiated with the objective of achieving a win-win situation for both farmers and the company. So on the one hand more profits and larger share of commodity exports were ensured for the company and on the other hand farmers realized better prices for their produce and improved the productivity of their farms.

3.6 IT DIFFUSION IN DEVELOPING COUNTRIES

According to Eric, Kenneth & Jason¹⁶ a significant digital divide exist between richer and poorer countries though international agencies and development specialist has a belief that IT has a potential value to support economic and human development. Some of reasons identified are lack of infrastructure, poverty and inadequate education. Bell and Pavitt states that growth in developing countries comes from technological accumulation, which is “... an evolutionary process of continuous innovation and imitation.” But from the historical data of IT spending it is found that most developing countries have not reached a level of accumulated investment needed to achieve measurable productivity gains.

Researcher opines that developing countries lag behind in IT investment in infrastructure because of which they are not getting significant advantage of IT. The economic major should be taken with the help of financial institution, equity markets to increase investment in IT. There is also a need to increase skilled human capital to get true benefit of IT.
3.7 DIRECT MARKETING

According to the US Census of Agriculture, Ohio ranks in the top ten states for direct farm sales. In addition to Census data, other signs of growth include an increasing number of farm markets, farmers markets, wineries linked to tourism, community supported agriculture programs, produce auctions, chef-grower networks, and farm-based garden centers. According to the North American Farmers’ Direct Marketing Association, direct marketing, as it relates to agriculture, is “selling direct to consumers - individuals, families, restaurants, tour groups, big companies and others.”

Electronic markets and technology have the potential to reduce marketing and transactions costs and otherwise level the playing field for these enterprises. An electronic infrastructure, such as MarketMaker, that successfully connects food producers to its best suited market, has the capacity to significantly impact rural economies as well as better serve a dynamic market place.

3.7.1 Marketing Tactics

This study investigated direct marketing tactics, planned tactics and the level of interest in learning more about specific topics. Respondents indicated that their top eight planned tactics were road signs and billboards(54.29%), business website (51.23%), listings in printed or web directories(45.09%), community or media relationship (42.02%), paid newspaper advertising (41.72%), E-mail (36.20%), samples or demonstrations (35.28%), host or participate in special events (30.67%).
Producers are shifting their tactics, with increased emphasis on new media such as websites, social media and E-mail and reduced emphasis on traditional media such as radio, television and newspaper advertising.

Three of the top five topics that producers were interested in learning were technology-related:

- Website for Business
- Social Media
- Email

Internet technologies were reported as one of the most effective strategies seen by respondents.

3.8 GOVERNMENT’S DIGITAL INITIATIVES

According to Madaswamy Moni\textsuperscript{22} multifunctional agriculture is the bottom line for integrated rural development. Agricultural development, along with village and cottage industries, tiny and micro enterprises, are the cornerstone for promoting sustainable rural livelihoods. In his paper he deals with the government’s digital initiatives and agenda as a step towards “reaching” agricultural knowledge and technology to the resource poor farmers of the country. Vision of our government is vision to realize an economically and socially vibrant agricultural industry i.e. to accelerate commercialization of innovative, alternative and value-added agricultural and farm related enterprises, in rural areas. This development strategy, inter alia, facilitates skill improvement, providing employment in rural areas, transfer of technology, rural industrialization and promoting self-reliance among the people and to build up a strong rural community base.
Among number of digital initiatives the AGMARKNET has already emerged website for farmers to bargain better prices for their produce and an e-Commerce and e-Business portal in India. The Vision 2020 document of the central Department of Agriculture and Cooperation (DAC) envisages that “the tools of IT will provide networking of Agriculture Sector not only in the country but also globally and the Centre and State Government Departments will have reservoir of databases”; and also will bring farmers, researchers, scientists and administrators together by establishing “Agriculture Online” through exchange of ideas and information.

According to the National IT Task Force (1999) recommendation (No.79), “the Government shall take all necessary steps to boost IT for agriculture and integrated rural development”. The Ministry of Agriculture and National Informatics Centre (NIC) also emphasized informatics for Agricultural development in the national conference on “Informatics for Sustainable Agricultural Development (ISDA-95). Many follow up actions (ICT projects: AGMARKNET, DACNET, etc) were taken up, to provide relevant agricultural information in rural areas, helping farmers to improve their labor productivity, increase their yields, and realize a better price for their produce. These projects are

• **AGRISNET**: An infrastructure network upto block level agricultural offices facilitating agricultural extension services and agribusiness activities to usher in rural prosperity

• **AGMARKNET**: With a road map to network 7000 Agricultural produce wholesale markets and 32000 rural markets

• **ARISNET**: Agricultural Research Information System Network

• **SeedNET**: Seed Informatics Network
• **CoopNet:** To network 93000 Agricultural Primary Credit Societies (PACS) and Agricultural Cooperative Marketing Societies to usher in ICT enabled services and rural transformation

• **HORTNET:** Horticultural Informatics Network

• **FERTNET:** Fertilisers (Chemical, Bio and Organic Manure) Informatics Network facilitating “Integrating Nutrient Management” at farm level

• **VISTARNET:** Agricultural Extension Information System Network

• **PPIN:** Plant Protection Informatics Network

• **APHNET:** Animal production and Health Informatics Network networking about 42000 Animal Primary Health Centres

• **FISHNET:** Fisheries Informatics Network

• **LISNET:** Land Information System network linking all institutions involved in land and water management for agricultural productivity and production systems, which has now evolved as “Agricultural Resources Information System” project during the Tenth Plan being implemented through NIC.

• **AFPINET:** Agricultural and Food Processing Industries Informatics Network

• **ARINET:** Agricultural and Rural Industries Information System Network to strengthen Small and Micro Enterprises (SMEs)

• **NDMNET:** Natural Disaster Management Knowledge Network

• **Weather NET:** Weather Resource System of India

According his India is expected to become a “Knowledge Society” very soon and by which time, any farmer in a remote village can demand and get the following information:
• Land use planning for cropping strategy for farmers fields based on integrated information on soil, water, weather, fertiliser and pest management models;

• How and where to get seeds or good quality nursery plants;

• Prevailing prices of farm equipments, agricultural produce, products and series of such set of information, which can lead to high productivity and optimum cost benefit to the farmers.

To achieve “knowledge society” in agriculture, the following things should happen:

• An agriculture information centre in each village;

• Interactive exchange of information for planning and day-today operations by farmers;

• Availability of all the extension and advisory services on demand.

3.9 AGRICULTURE MARKET EFFICIENCY

Manoj Kumar\textsuperscript{23} (2008) in his study tried to establish relationship between market infrastructures and market efficiency i.e. how market infrastructure improves market efficiency. According to him, the main objectives of an efficient marketing system are

1. To enable the primary producers to get the best possible returns

2. To provide facilities for lifting all surplus produce, the farmers are willing to sell at an incentive price,

3. To reduce the price difference between the primary producer (farmer) and ultimate consumer (retail customer)
4. To make available all products of farm origin to consumers at reasonable price without impairing on the quality of the produce.

In this paper five major cotton growing states i.e., Maharashtra, A.P, Punjab, Haryana and Gujarat are taken for the analysis. In the way of showing the effects of market infrastructures on the efficiency of the market, study takes into account three infrastructural amenities viz., fertilizer market, transportation facilities and warehousing facilities. Out of the three variables number of warehouses is most significant in terms of its effect on efficiency According to study, to gain market efficiency there should have been very strong coordination between different markets including both farm and non-farm sector. Because when the markets are efficient and are fully coordinated, the productive resources such as land, labour and capital will be allocated efficiently alternative and competitive uses, which results in specialization of factors and hence lead to higher.

3.10 MODEL ACT 2003: PROVISIONS FOR AGRICULTURE MARKETING DEVELOPMENT

MODEL ACT, The State Agricultural Produce Marketing (Development & Regulation Act, 2003), The Title of the Act is changed to highlight the objective of development of agricultural marketing in addition to its regulation under the Act. Accordingly the Preamble of the Act is redrafted to provide for development of efficient marketing system, promotion of agri-processing and agricultural exports and to lay down procedures and systems for putting in place an effective infrastructure for the marketing of agricultural produce. (Section-1)

- Section-59-18. Market Committees permitted to use its funds among others to create facilities like grading, standardization and quality
certification; to create infrastructure on its own or through public private partnership for post harvest handling of agricultural produce and development of modern marketing system.

- Section-79- Development of quality testing and communication infrastructure.
- Development of media, cyber and long distance infrastructure relevant to marketing of agricultural and allied commodities.
- Section 59- Loans and advance to the employment of the Market Committee, the payment of interest on the loans that may be raised for the purpose of
  - Section 59 (viii) The collection and dissemination of information relating to crop statistics and marketing of agricultural produce
  - Section 59 (xii) Contribution to any scheme for development of agricultural marketing including transport;
  - Section 59 (xiii) To provide facilities like grading, standardization and quality certification services and communication to agriculturist in the market area.
  - Section 59 (xiv) To provide for development of agricultural produce in the market area;
- Section73. (i) Coordination of the working of the Market Committees and other affairs thereof including programs undertaken by such Market Committees for the development of markets and market areas; (ii) Undertake the State level planning of the development of Agricultural Produce Markets; (iii) Administer the State Market Development Fund;
- Section 75. All money received by or on behalf of the Board shall be credited to a fund called Marketing Development Fund. Utilization of Marketing Development fund.
(iv) Granting aid to financially weak Market Committees in the form of loan or grant for development purposes;
(viii) Organizing and arranging workshops, seminars, exhibitions etc., on development of marketing;
(xvi) Development of Haat Bazars for marketing of agricultural production in the market areas;
(xvii) Development of quality testing and communication infrastructure relevant to agriculture and allied sectors
(xviii) Development of media, cyber and long distance infrastructure relevant to marketing of agricultural and allied commodities.

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