

Market Led Agricultural Extension - Challenges and Opportunities

1.1 Links between agriculture and the food industry

The link between agriculture and food continually evolves. In primitive societies, the farmer and consumer were either the same family or close neighbors who bartered their products and services, but as societies develop other linkages are added. Commodity traders, processors, manufacturers who convert produce into food items and retailers, among others, are interposed between the producer and consumer. A more recently introduced link into the chain is the scientist. As the link between food and agriculture continues to evolve, we see emergence of an agribusiness i.e. where agriculture and food become a continuum. Multinational companies are vertically integrated organization with links all the way through from agricultural production to etailing. There is a line of argument, which says that it makes sense that those who are closest should the consumer, should assess his /her needs and interprets them back to the primary producer.

As disposable incomes increase, the food industry will increase the quality and diversity of the products it produces. Food manufactures will have particular expectations of agriculture as a supplier of their raw materials, including:

To build a profitable business, food manufactures seek to establish a preference for their products by differentiating those products in some way which is meaningful to consumers. Then, in order to enable consumers to recognise the differentiated product, manufacturers brand that product. Manufacturers can then work on building consumer loyalty to these brands. Brand loyalty is normally only established by delivering high quality consistently. As disposable incomes rise, the market tends to develop more sophisticated needs and the quality of the raw material becomes even more critical. Where agriculture is seeking to serve a food industry, that itself is seeking to meet these more sophisticated needs and wants, it can expect to face increasing emphasis on quality. Equally well, agriculture can expect to share in the better return for innovative improvements in quality.

Next to quality will come cost. With an increased capability to search the world for raw materials, the food industry is able to find the lowest cost source for any given level of quality. For the food manufacturer, the country in which he/she manufactures, or markets, need no longer be the source of agricultural produce. Improved transportation and communications mean that the world is becoming his/her source of supply. This is a significant change in the competitive environment of agriculture, which the farming

community has to realise, because they have, hitherto, been largely cocooned in their respective domestic markets.

Agricultural products were traditionally seasonal in their production and supply. Modern technology and cultural practices mean that food manufacturers need not have their production schedules dictated by the seasons. Indeed the capital-intensive food industry cannot afford to incur the high costs of under utilising its capacity. This means that farmers will have to compete in terms of reducing seasonality or fitting into a pattern of social competitiveness.

A manufacturer who has invested heavily in building up his brand will be very keen to get reliable supplies in terms of quality, timing and cost. Producers of agricultural produce will be increasingly judged on their reliability in all of these respects.

Ease of processing will become an increasingly important expectation of the food industry. Like all industries, reductions in the costs of capital equipment, wages and inventories are important objectives. For example, farmers who can deliver on the 'just-in-time' principle will contribute towards reducing a manufacturer's working capital and space requirements. Farmers who can do part of the secondary processing and /or performing functions such as the post harvest treatment of the crop or transporting will be adding another advantage. Crops that are specially bred or designed to facilitate processing are another type of advantage that the food industry could expect from agriculture. In short, the competitive advantage will rest with those able to add most value and can differentiate what they are offering from that of other suppliers.

In competitive brand marketing, the food industry has to innovate continuously to create new products that are different from and superior to existing ones of their own or competitors. The scope of innovation has traditionally been at the processing stage. Whilst this will continue to be an important area for innovation, manufacturers will increasingly tend to look for innovative changes in the agricultural produce itself. This may be in terms of novel tastes, improved texture, more attractive shapes, etc.

In the more sophisticated food markets, healthy eating can become a priority among consumers. Therefore, farmers will have to consider the health connotations of what they choose to grow. There are two aspects of health to be taken into account. First, consumers may be interested in the food itself i.e. low/no sugar or low/no salt. Nutrition is important in all segments of the market. Thus farmers have to be concerned about the nutritional value of the produce they grow. Second, the consumer may be more, or equally, concerned about the food production methods i.e. the avoidance of chemicals like herbicides, pesticides etc.

This may mean a change to the farmer's cultivation practices with implications for the costs of production. The consumer and the food industry will expect the farmer to produce without potentially dangerous chemicals, but at no extra cost to them. This will be another challenge for agriculture.

1.2 Challenges in agricultural marketing system

- Market size is large and continuously expanding, but marketing system not kept pace
- Private trade is 80% marketed surplus
- Direct marketing "farmer - consumer " is negligible
- 85% of the 27,294 rural periodic market, facilities for efficient trade is still almost absent
- 7161 market yards/sub yards is inadequate, ill equipped and mismanaged
- Due to lack of proper handling at farm gate lead to 30 % F&V, 7% grains, 10% spices loss before reaching market
- Rs 50,000 crores /year lost due to poor marketing chain
- Risk bearing: In both the production and marketing of produce the possibility of incurring losses is always present. Market risks are those of adverse change in the value of the produce between the processes of production and consumption.
- Storage of farm produce: Whether storage takes place on the farm or in silos off the farm, increases in the value of products due to their time utility must be sufficient to compensate for costs at this stage, or else storage will not be profitable. These costs will include heating, lighting, chemical treatments, store management and labour, capital investment in storage and handling equipment, interest charges and opportunity costs relating to the capital tied up in stocks. Among the less tangible costs is the risks attached to storage. These include shrinkage due to piferage, pests, fungal growths and loss of quality due to ageing. Another risk is that demand could fall with adverse effects on prices.
- Grading : It is important to have a grading system, which accurately describes products in a uniform and meaningful manner. Grades and standards contribute to operational and pricing efficiency by providing buyers and sellers with a system of communicating price and product information. By definition, commodities are indistinguishable from one another. However, there are differences between grades and this has to be communicated to the market. By the same measure, buyers require a mechanism to signal which grades they are willing to purchase and at what

premium or discount. Prices vary among the grades depending upon the relative supply of and demand for each grade. Since the value of a commodity is directly by its grade, disputes can and do arise.

- The absence of grades and standards restricts the development of effective and efficient marketing systems.
- **Standardization:** is concerned with the establishment and maintenance of uniform measurements of produce quality and /or quantity. This function simplifies buying and selling as well as reducing marketing costs by enabling buyers to specify precisely what they want and suppliers to communicate what they are able and willing to supply with respect to both quantity and quality of product. In the absence of standard weights and measures trade either becomes more expensive to conduct or impossible altogether
- **Processing:** Most agriculture produce is not in a form suitable for direct delivery to the consumer when it is first harvested. Rather it needs to be changed in some way before it can be used. Of course, processing is not the only way of adding value to a product. Storing products until such time as they are needed adds utility and therefore adds value. Similarly, transporting commodities to purchasing points convenient to the consumer adds value. In short, any action, which increases the utility of the good or service to prospective buyers, also adds value to that product or service.
- **Quality differences in agricultural products** arise for several reasons. Quality differences may be due to production methods and /or because of the quality of inputs used. Technological innovation can also give rise to quality differences. In addition, a buyer's assessment of a product's quality is often an expression of personal preference. Thus, for example, in some markets a small banana is judged to be in some sense 'better' than a large banana; white sugar is considered 'superior' to yellow sugar; long stemmed carnations are of 'higher quality' than short stemmed carnations. It matters not whether the criteria used in making such assessments are objective or subjective since they have the same effect in the marketplace. What does matter in marketing is to understand how the buyer assesses 'quality'.
- Sporadic success stories of using information technology by farmers are publicized. Internet technology has percolated down up to taluq level and in some states up to village level. Search engines and the present websites furnish general information presently. Agricultural Market related information on the internet is inadequate.

Hence, a whole network of skilled personnel need to be engaged in collection of current information and creation of relevant websites pertaining to / serving specific needs of farmers. Creation of websites should be mandatory in different languages to equip the farmers with information. These websites should contain information like market networks, likely price trends, current prices, demand status options for sale, storage facilities etc.

- Information technology should be able to provide answers to questions like what and how much to produce, when to produce, in what form to sell, at what price to sell, when to sell and where to sell. This kind of information to the farmers with 'press a button' on the computer on a continuous updated basis. Then and only then, the much talked about IT revolution would be beneficial to farmers.
- Market intelligence: As far as is possible marketing decisions should be based on sound information. The process of collecting, interpreting, and disseminating information relevant to marketing decisions is known as market intelligence. The role of market intelligence is to reduce the level of risk in decision-making. Through market intelligence the seller finds out what the customer needs and wants. The alternative is to find out through sales, or the lack of them. Marketing research helps establish what products are right for the market, which channels of distribution are most appropriate, how best promote products and what process are acceptable to the market.
- Generation of data on the market intelligence would be a huge task by itself. Departments of market already possess much of the data. Hence, establishment of linkages between agriculture line departments and Departments of Market strengthens the market-led extension.
- Financing: In almost any production system there are inevitable lags between investing in the necessary raw materials (e.g. machinery, seeds, fertilizers, packaging, flavorings, stocks etc.) and receiving payment for the sale of produce. During these lag periods some individual or institution must finance the investment. The question of where the funding of the investment is to come from, at all points between production and consumption, is one that marketing must address.
- Facilitating Functions: it includes product standardization, financing, risk bearing and market intelligence. Facilitating functions are those activities which enable the exchange process to take place.

- The gigantic size / mechanism of the public extension system in the country is heavily burdened with performance of multi-farious activities in the field. Extension system acts as liaison between the researcher and farmer. They are endowed with the responsibility of conveying research findings from the scientists to the farmers and feeding back the impressions of the farmers to the scientists. The new dimension of 'marketing' may overburden and become an agenda beyond their comprehension and capability.
- The public extension system is already under severe criticism for its inability to deliver the services. In the light of this, the challenge remains to motivate the extension personnel to learn the new knowledge and skills of marketing before assigning them marketing extension jobs to establish their credibility and facilitate significant profits for the farming community.
- Extension cadre development poses a new challenge to the newly designed role. The present extension system suffers from several limitations of stationery, mobility, travel allowances, personnel development, etc. There is a dire need to upgrade these basic facilities and free the extension cadres from the shackles of the hygiene factors and enthuse them to look forward for the motivating factors like achievement, job satisfaction, recognition etc

1.3 Enhanced roles of Agricultural Extension personnel in light of Market-led Extension

- * SWOT analysis of the market: Strengths (demand, high marketability, good price etc.), Weaknesses (the reverse of the above), Opportunities (export to other places, appropriate time of selling etc.) and Threats (imports and perishability of the products etc.) need to be analyzed about the markets. Accordingly, the farmers need to be made aware of this analysis for planning production and marketing.
- * Organization of Farmers' Interest Groups (FIGs) on commodity basis and building their capabilities with regard to management of their farm enterprise.
- * Supporting and enhancing the capacities of locally established groups under various schemes / programmers like watershed committees, users groups, SHGs, water users' associations, thrift and credit groups. These groups need to be educated on the importance, utility and benefit of self-help action.
- * Enhancing the interactive and communication skills of the farmers to exchange their views with customers and other market forces (middlemen) for getting feedback and gain the bargaining during direct marketing ex. Rythu Bazars, Agri-mandi and Uzavar Santhaigal etc.

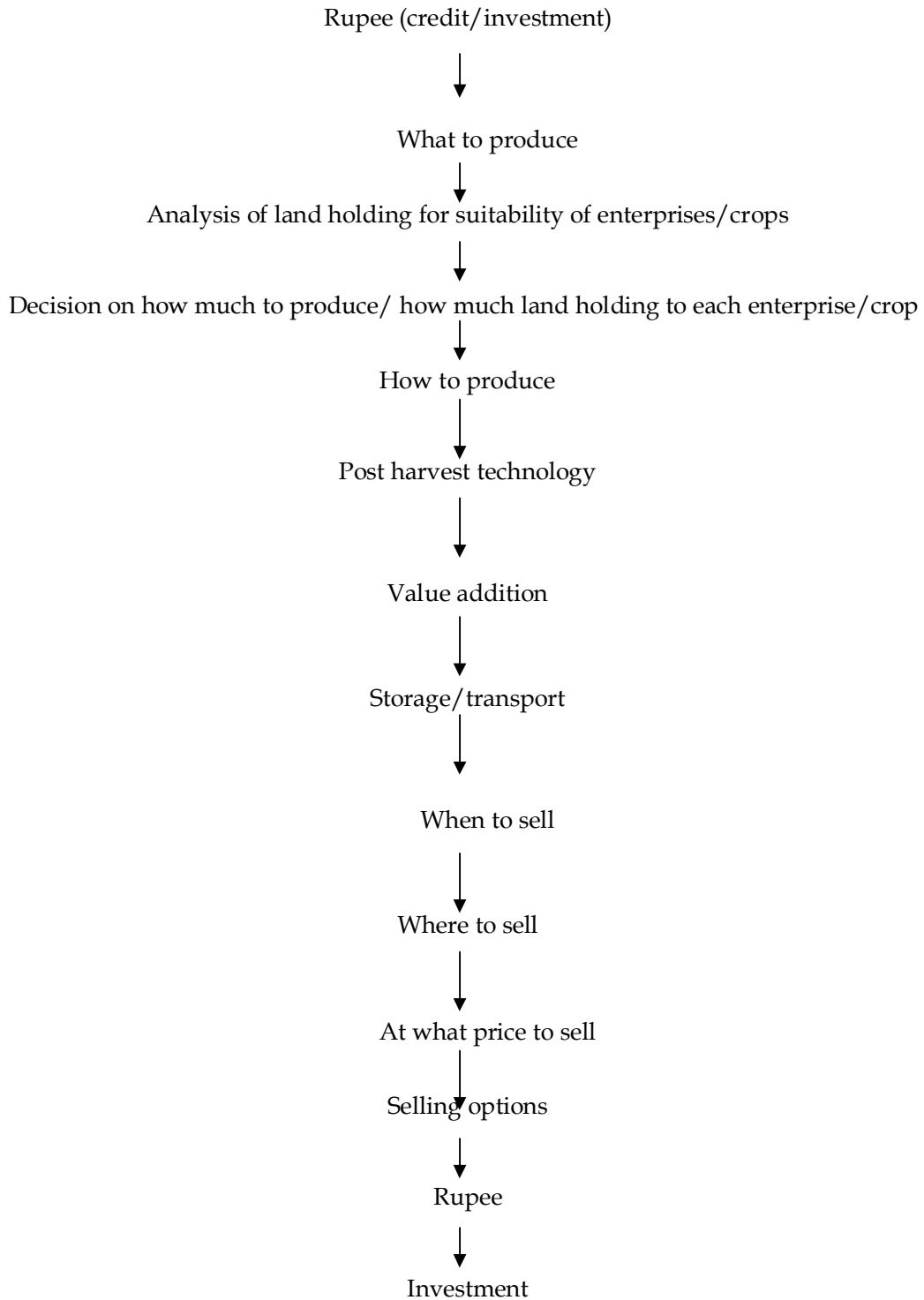
- * Establishing marketing and agro-processing linkages between farmers' groups, markets and private processors
- * Advice on product planning: selection of crops to be grown and varieties suiting the land holding and marketability of produce will be the starting point of agri-enterprise. Extension system plays an important role in providing information in this regard
- * Educating the farming community: to treat agriculture as an entrepreneurial activity and accordingly plan various phases of crop production and marketing
- * Direct marketing: farmers need to be informed about the benefits of direct marketing. In some of the states, Rytu Bazars in AP, Apni Mandis in Punjab and Haryan and Uzavar Santhaigal in Tamilnadu have shown success
- * Capacity building of FIGs in terms of improved production, post harvest operations, storage and transport and marketing
- * Acquiring complete market intelligence regularly on various aspects of markets
- * Regular usage of internet facility through computers to get updated on market intelligence
- * Publication of agricultural market information in news papers, radio and Television besides internet
- * Organization of study tours of FIGs: to the successful farmers/ FIGs for various operations with similar socio-economic and farming systems as the farmers learn more from each other
- * Production of video films of success stories of commodity specific farmers
- * Creation of websites of successful FIGs in the field of agribusiness management with all the information to help other FIGs achieve success

Required information to extension system and farmers

- Present agricultural scenario and land use pattern
- Suitability of land holding to various crops/enterprises
- Crops in demand in near future
- Market prices of crops
- Availability of inputs
- Usage of inputs
- Credit facilities
- Desired qualities of the products by consumers
- Market network of the local area and the price differences in various markets
- Network of storage and warehouse facilities available
- Transport facilities
- Regular updating of market intelligence

- Production technologies like improved varieties, organic farming, usage of bio-fertilizers and bio-pesticides, IPM, INM, and right methods of harvesting etc.
- Post-harvest management like processing, grading, standardization of produce, value addition, packaging, storage, certification, etc. with reference to food grains, fruits and vegetables, eggs, poultry, fish, etc.
- Contract farming
- Private modern terminal markets
- Food retail chains
- Food safety and quality standard
- Certification
- WTO regulations

Flow chart of agriculture as an enterprise



1.4 Paradigm shift from Production-led Extension to Market-led Extension

Aspects	Production-led extension	Market-led extension
Purpose/objective	Transfer of production technologies	Enabling farmers to get optimum returns out of the enterprise
Expected end results	Delivery of messages Adoption of package of practices by most of the farmers	High returns
Farmers seen as	Progressive farmer High producer	Farmer as an entrepreneur "Agripreneur"
Focus	Production / yields "Seed to seed"	Whole process as an enterprise / High returns "Rupee to Rupee"
Technology	Fixed package recommended for an agro-climatic zone covering very huge area irrespective of different farming situations	Diverse baskets of package of practices suitable to local situations/ farming systems
Extensionists' interactions	Messages Training Motivating Recommendations	Joint analysis of the issues Varied choices for adoption Consultancy
Linkages/ liaison	Research-Extension-Farmer	Research-Extension-Farmer extended by market linkages
Extensionists' role	Limited to delivery mode and feedback to research system	Enriched with market intelligence besides the TOT function Establishment of marketing and agro-processing linkages between farmer groups, markets and processors
Contact with farmers	Individual	Farmers' Interest Groups Commodity Interest Groups /SHG's
Maintenance of Records	Not much importance as the focus was on production	Very important as agriculture viewed as an enterprise to understand the cost benefit ratio and the profits generated
Information Technology support	Emphasis on production technologies	Market intelligence including likely price trends, demand position, current prices, market practices, communication net work, etc besides production technologies

Market Intelligence - Meaning, Importance and Development of Market Intelligence for Agricultural Commodities

2.1 Introduction

There is a Chinese saying:

Know thy-self, know thy competition, and get it right almost every time.

Know thy-self, not know thy competition, and get it right about half the time.

Not know thy-self, not know thy competition, and get it wrong almost every time.

We now live in a world driven by hyper-competition. Hyper-competition is where too many businesses are pursuing too little business; i.e., there is not enough demand to go around for all providers of goods and services. The knowledge base for managing in this hyper-competitive environment is called Market Intelligence . Market Intelligence is a process of giving you insights into what might happen in the near future. This process requires that we go from data to information to intelligence. Here is a basic example

- Data - Prices for our products have dropped by 5 percent.
- Information - New offshore facilities have lower labour costs.
- Intelligence - Our key competitor is about to acquire a facility in India that will.

The differences between data, information, and intelligence can be subtle, but very real.

- Data- Unconnected pieces of information.
- Information - Increased knowledge derived by understanding the relationships of data.
- Intelligence- Organizing the information to fully appreciate the implications and impact on the organization.

Intelligence differs from data and information since it requires some form of analysis. The purpose of this analysis is to derive some meaning from the piles of data and information. By going through analysis and filtering, we can refine it enough so that someone can act on it and understand their options, giving them an opportunity to make forward-looking decisions. When we present “intelligence” to people, they can draw a conclusion and make an important decision quickly. Therefore, competitive intelligence should put conclusions and recommendations upfront with the supporting research behind the analysis. Market Intelligence should not simply present the facts, declaring what we found; but instead make a statement, saying this is what we believe is about to happen.

Market Intelligence pulls together data and information from a very large and strategic view, allowing you to predict or forecast what is going to happen. This in turn allows you to

effectively strategize in relation to your competitive environment. Therefore, Market Intelligence allows you to remain competitive by improving your strategic decisions and this leads to better performance against your competitors. Market Intelligence does not attempt to collect and analyze all information for an exact picture, but attempts to get enough information so that we can tell what's going on. It's like a picture that is out-of-focus. We need to analyze enough details so we can discern the big picture and report it to management. Therefore, Market Intelligence does not chase down all the facts, but gets enough information to draw a reasonable conclusion for immediate action.

2.2 Importance of Market Intelligence

No organization can sit still and expect things to be the same month after month, year after year. At some point, something will happen to change your assumptions. And almost every decision (especially a strategic decision) is based on certain assumptions. Over time, these assumptions fall apart and if you fail to adjust with a continuous flow of new intelligence, then you will be forced to react in a way that makes it difficult to compete. Therefore, Market Intelligence can help test and validate your assumptions. Competitive intelligence also fills in gaps, covering areas that you failed to consider in your assumptions. And ofcourse, competitive intelligence can yield some basic benefits:

- Source for best practices – the only real way to isolate and find “best practices” is to engage in some form of Market Intelligence ; otherwise you end up relying on crude and generic type benchmarking data.
- Helps formulate strategy through an understanding of your industry, yourself, and your competitors. Market Intelligence is the essence of strategic business analysis.
- Helps identify areas for improvement as well as risks and opportunities.
- Isolates performance gaps in relation to the competition.

2.3 Process of Market Intelligence

Market Intelligence follows a two-phase process when it comes to collecting information:

- Phase I: Secondary Research (80% volume / 20% time)
- Phase II: Primary Research (20% volume / 80% time)

Phase I (Secondary Research) leads to Phase II (Primary Research). Secondary research consists of press releases, analyst reports, trade journals, regulatory filings, transcripts of speeches, and other published sources of information. The bulk of the information (let's say 80% of it) that we collect comes through secondary research. Once we shift through this information overload, we can move to Phase II where the Market Intelligence resides. Phase II-Primary Research is more hands-on and direct, interviewing sources of published information, meeting face-to-face with key decision makers and flushing out the critical

unknowns not found in secondary research. It is here, primary research, where we should spend most of our time (80%) on the pertinent information (20%) derived from secondary research. Therefore, we should recognize the 80 / 20 rule of competitive intelligence: Spend less of your time gathering the information and spend more of your time analyzing and refining it through primary research.

For example, market research journal has just released a very upbeat report (secondary research) about your main competitor. The report is not very specific, but the analyst has issued a very strong buy recommendation to investors. In an effort to better understand what is driving this recommendation, you contact the analyst directly as part of primary research. This leads to a detailed understanding of how the competitor plans to acquire a warehouse for selling fruits and vegetables in India. This is expected to take place in six months. Based on this intelligence, your company goes into action, partnering with a nationwide super market chain and within three months you have out maneuvered the competition to solidify your market share.

Secondary research tends to be easier than primary research since secondary sources of information are public knowledge. Primary research is more difficult because you are on a detective hunt, trying to track down loose ends. Primary research is often done through a interview, such as contacting suppliers, customers, business writers, and Government agencies. Surveys are sometimes used where several sources are involved.

There are several fine points to both secondary and primary research. Here are some basic guidelines:

- Among the secondary sources of information; local sources are more revealing than national or global. For example, suppose we are analyzing Hudson Agro (ARUN ICE CREAM) and Hudson Agro is headquartered in Chennai, the local newspaper in Chennai will most likely carry more stories about Hudson Agro since it is a major employer in town. On the other hand, a nationwide publication like Business Week will rarely carry stories about Hudson Agro. Market Intelligence is the savvy art of knowing where to get the information.
- Secondary sources should be varied so that you collect different viewpoints. This helps reduce bias in your research.
- Internet related sources of information are often opinionated. Opinion related information is usually subjective and unreliable. Try to find sources of information that are based on solid investigative research as opposed to someone giving an opinion that turns out to be wrong.
- Your competitor's will release an abundance of information - regulatory filings, credit reports, company newsletters, press releases, executive speeches, and other sources of information.

- Secondary research consists mainly of printed type sources of information. The most valuable sources of information are not published at all; but reside in those people who created the published materials.

You should also consider the 80 / 20 rule in relation to internal vs. external sources of information. For example, most of what you need to know about your competition can be found somewhere within your own organization. Sales people mingle with other sales people within the industry. Many employees have experience from competing companies. Procurement personnel will have a complete listing of suppliers for your industry. Senior managers, research personnel, and others may have published reports, given speeches pertinent to developments in your industry. Call center personnel are always engaged in listening to customer complaints and suggestions. Legal personnel can help define regulatory risks unique to your industry. All of these internal sources can represent great sources of intelligence. The external sources represent the general body of information at large, easy to obtain, and widely distributed. Also, by spending more time upfront on internal sources, you are led to the appropriate external sources (both published and human).

2.4 Steps in Market Intelligence

Market Intelligence is a logical approach to resolving critical marketing issues. A typical Market Intelligence project gets organized around certain steps which are as follows.

1. What critical question(s) must get answered?
2. What is the time frame for meeting the competitive intelligence objective?
3. Define the Market Intelligence Project, allocate resources, establish a scope, and issue a quick plan for execution.
4. Launch secondary research – collect and organize data.
5. Analyze appropriate information, conduct primary research, and enlist others in developing the deliverable.
6. Draft findings and recommendations; circulate for review.
7. Approve and distribute final report.

2.5 Analytical Models used in Market Intelligence

Craig Fuller and Bensoussan have Described in detail numerous analytical models and how they should be applied. The authors referred as FAROUT (Forward Oriented, Accurate, Resource Efficient, Objective, Useful, and Timely), for determining the overall effectiveness of an analytical models.

Analytical Method	Future-orientation	Accuracy	Resource-efficiency	Objectivity	Usefulness	Time-liness
Stakeholder Analysis	Present to short-term	Medium	Medium	Medium	Medium	Medium to high
Business Screening Matrix	Present to short-term	Low to medium	Medium	Low	Medium	Medium
SWOT	Present to short-term	Medium	Medium	Medium	Medium to high	Medium to high
Industry Analysis	Present	Medium	Medium to high	Medium	Medium to high	Medium
Scenario Analysis	Long term	Medium to high	Low to medium	Medium	Medium to high	Low to medium

2.6 Best practices

There are several finer points that we need to consider throughout the Market Intelligence process. This following heading will highlight some of the underlying “best practices” behind Market Intelligence.

2.6.1 Time is critical

Slowness is the enemy of competitive intelligence. Having knowledge about something three weeks after you need to act is of little value. Two critical questions you must address are: where do we go to get the information and how long will it take? This requires a very deliberate and strong Market Intelligence effort. Without a serious commitment to Market Intelligence, time will erase whatever hope you have for effective decision-making.

2.6.2 Remain Neutral

Although it's not easy, it is critical that Market Intelligence remains free of bias, providing neutral type results. Market Intelligence is not intended to support an existing management decision. Good Market Intelligence should speak the truth and let management decide how it wants to proceed. One way to ensure Market Intelligence is neutral is to make it independent, similar to other independent functions such as internal auditing.

2.6.3 Go where the information is

Sometimes competitive intelligence can be highly effective through casual and obvious sources of information. One of the more time consuming activities within competitive intelligence can be collecting and categorizing information. So knowing where to look can be half the battle. The useful sources for Market Intelligence include commercial databases, trade publications, research reports from analyst, and regulatory reports.

2.6.4 Challenge conventional thinking

Great Market Intelligence will challenge management to think in new ways. There are too many changes taking place in the World today. There is no way management should be comfortable with the status quo. Therefore, Market Intelligence should deliberately test and validate critical management decisions. Likewise, management should welcome and encourage Market Intelligence to challenge both tactical and strategic decision-making.

2.6.5 Act ethically

Market Intelligence should not engage in illegal acts. Additionally, Market Intelligence should not jeopardize the reputation of a company.

2.7 Agricultural Market Intelligence System in India

Rural Markets (about 21731) are the first contact points of farmers with the market economy, both for selling and buying. As there have been high price differentials many times between the Wholesale Markets and the Rural Markets, there is room for arbitrage which is being exploited by the traders to their advantage. Therefore, it is imperative to make the Wholesale Markets as the price discovery point and the Rural Markets as the price takers with due consideration for transport and other costs. As the Rural Markets have few traders, the tendency to collude among them is high. In the Wholesale Markets, as traders are many, one can expect a fair price. In a country like India with 70 per cent of its population living in about 6.25 lakh villages and depending on agriculture as their main occupation, accurate and timely Market Intelligence about the market prices of the agricultural commodities is of extreme significance.

Market information and intelligence are crucial to enable farmers and traders to make informed decisions about what to grow, when to harvest, to which markets produce should be sent, and whether to store it or not. The most important marketing intelligence need of the farmer is price intelligence. Agricultural price data are based on thousands or millions of transactions, many of them on a small scale, that are taking place every day all over the country. Collecting an adequate sample and making sure that these are representative enough to be useful is not an easy task. As farmers become more market oriented, extension workers need to be in a position to advise them not only on how to grow crops but also on how to market them. Knowledge of produce handling, storage and packaging is also essential. An understanding of costs and margins is essential for all those involved with agricultural marketing. Before any agro-processing venture is started, or before an existing venture decides to expand its product line, an understanding of the market for the planned

products is essential. Market research can never guarantee success but it can certainly increase the likelihood that the new business will turn out to be profitable. It can identify at an early stage those processing ideas that are unlikely to lead to profitable operations.

The Central Government and its agencies, the State Governments and their agencies and the private sector have undertaken some path-breaking initiatives (e.g. AGMARKNET - www.agmarket.nic.in) by the Union Ministry of Agriculture, the e-Vipnan initiative by the Madhya Pradesh State Government, ITC's e-CHOUPAL, DCM SHRIRAM's Hariyali Kisan Bazar, etc) besides strengthening traditional information sources such as individual State Agricultural Marketing Boards, Commodity Boards, and Commodity Exchanges.

AGMARKNET is, the NICNET based Agricultural Marketing Information System Network in the country, under its Central Sector Scheme titled "Marketing Research and Information Network" (MRIN). This AGMARKNET project networked 735 Agricultural Produces Wholesale Markets (APWMs), during 2000-02 and embarked upon additional 2,000 markets during the Tenth Plan Period (2002-2007). With about 2700 markets already covered under the project, AGMARKNET is well on its way to exceed the target of 2810 networked nodes to be established during the Tenth Plan Period. The Government initiative of the networking of agricultural produce markets (AGMARKNET) and the AGMARKNET portal would facilitate the development of B2B and B2C e-Commerce Model in the country. This project has the potential of expansion to about 7557 Wholesale Markets located throughout the country and further to about 22,000 markets in India. This ICT Project is a 'farmer-centric' project to put the farmers on "global free trade zone on Internet".

The AGMARKNET project has led to a nation-wide information network for speedy collection and diffusion of market information, computerization of market related information such as market fees, and market charges, ensuring regularity and reliability of data and increasing the efficiency in agricultural markets. AGMARKNET project has also been designated as one of the Mission Mode Projects of the Department of Information Technology (DIT), Government of India, and has won recognition nationally and internationally, for effectively fulfilling the objective of speedy collection and dissemination of agricultural marketing information for better market access and price realization by the farming community. The AGMARKNET portal has, among the others, details on:

- Commodities and varieties for 300+ commodities and 2,000+ varieties
- Daily mandi-wise/commodity-wise prices and arrivals
- e-Directory of markets of over 7,000 APMCs, 48 Marketing Boards

The advantages of this database accrue to the farmers, as they are not forced to sell their produce in the nearest market at uneconomical prices. The challenge, if the full

potential of such ventures have utilized, is to take IT to rural India in a big way. Constraints/Challenges are (a) connectivity in rural areas, (b) training of the stakeholders and (c) ensuring data updation in real time frame.

2.8 Domestic and Export Market Intelligence Cell (DEMIC)

Market information is an important aspect of agricultural production and marketing. The importance of sound agricultural marketing policies for ensuring fair returns to the farmers cannot be overemphasized. There are wide differences between the prices realized by the farmers and the prices paid by the consumers for most of the crops. Almost all States and Union Territories are providing market information in one form or the other for the benefits of market users like producers, traders, and consumers. However, the information is collected and disseminated by use of conventional methods causing inordinate delay in communicating to different groups and this, in turn, adversely affects the farmers in taking proper marketing decisions i.e, whether to sell immediately or store the produce, whether to market the produce inland or overseas, where to sell in domestic markets, during which part of the year he can get remunerative prices etc. Globalization of agriculture has also opened up opportunities for export of agricultural commodities for which demand by importing countries and their quality specification and standards should be made available to domestic exporters to pave for export led growth. The farmers should also be made aware of the consequences of imports on domestic prices. All the above emphasized the need for establishing the Domestic and Export Market Intelligence Cell (DEMIC).

2.8.1 Objectives

The main objective of DEMIC is to disseminate timely, comprehensive, current and future price intelligence on agricultural commodities for better scientific decision-making by farming community, traders, firms and researchers. More specifically,

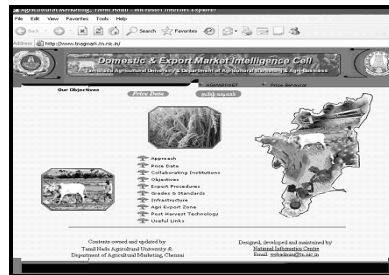
- to forecast the supply and demand of important agricultural commodities in Tamil Nadu;
- to forecast future prices of major agricultural commodities;
- to study the State and National market situation related to important commodities;
- to disseminate the market and price information to the farmers for planning, production and holding stocks; and
- to suggest policy measures to the Government of Tamil Nadu.

2.8.2 Activities

The major activities of the cell is to collect real time data on arrivals, prices and transaction of important agricultural commodities from Regulated Markets in Tamil Nadu,

conducting market surveys, compiling commodity reports and assessing export opportunities of agricultural commodities. Using these data, the cell forecasts the prices of different commodities on a regular basis and the same is transmitted to the farmers through Radio, Television and Newspapers and web developed for this purpose. (www.tnagmark.tn.nic.in). Now all the stakeholders can access the real time price of agricultural commodities variety wise, grade wise from all the major market centres of India in English and Tamil covering more than 500 markets. Apart from price information, other useful information available in the website are export procedures, export standards for various agricultural commodities, infrastructure facilities (ports, air cargo, railways, rural godowns, etc.), agri-export zones, food processing, post - harvest technology and other useful links to various related websites.

An e-mail newsletter focussing on technical and market related information at domestic and international levels has been developed by DEMIC in the banner of “DEMIC Info Series” to sensitize the stakeholders and scientists.



2.8.3 Commodities and forecast schedule

- Turmeric - June 1st week
- Cotton - June 2nd week
- Onion - July 1st or 2nd week
- Maize - August, September
- Banana - August, September
- Chillies - August
- Groundnut - September
- Gingelly - October
- Tapioca - October, November
- Potato - December
- Black gram - May
- Green gram - May

Price forecasts are done with the help of various statistical methods by utilizing historical data and market surveys. Validation is important for measuring goodness of any

forecast. The forecast validation percentage of DEMIC scheduled crops was above 90 per cent. This shows the core strength of DEMIC.

2.8.4 Collaborating institutes

The collaborating institutes are Centre for Agricultural and Rural Development Studies in Tamil Nadu Agricultural University, Department of Agricultural Marketing and Agri-business, Government of Tamil Nadu and National Informatics Centre (NIC), Government of India, Chennai Office.

2.9 Case studies

2.9.1 Price forecastcotton

Market Intelligence is a logical approach to resolving critical marketing issues. The first Market intelligence report of DEMIC : Cotton gets organized around following steps

S.No	Steps	Action
1	What critical question(s) must get answered?	During 2004-05, the arrivals have doubled in these markets. With the reports of bumper crop in 2004-05, domestic cotton prices have moved downward in the current period. This is in stark difference with the conditions seen during last year, when the cotton prices in Tirupur remained high and promised good returns to the local cotton farmers as there was a global deficit. This price drop created havoc among the cotton growers in Tamil Nadu. Hence they put forward queries on whether the current crop will get remunerative price or not. To answer these queries the Domestic and Export Market Intelligence Cell of Tamil Nadu Agricultural University has analyzed the past 15 years weekly prices of Cotton (Jan1990-March 2005) from Tirupur Regulated market
2	What is the time frame for meeting the competitive intelligence objective?	One month
3	Launch secondary research – collect and organize data	Domestic and Export Market Intelligence Cell (DEMIC) of Tamil Nadu Agricultural University conducted market surveys and collected 15 years weekly prices of Cotton (Jan1990-March 2005) from Tirupur regulated market which is one of the major cotton markets of Tamil Nadu.

4	Analyze appropriate information, conduct primary research, and enlist others in developing the deliverable	Analysed historical price data with help of different forecasting models like econometrics, ARIMA, GARCH, ARCH and found that ARIMA 111 has lowest MSE and AIC and SBC criteria's. ARIMA 111 model results and current scenario of cotton crop, price stabilization measures taken by Government (i.e., Agriculture Ministry has directed the CCI to intervene and perform price support actions by purchasing cotton in all the major cotton growing States so far Maharastra Cotton Federation procured 42 lakh bales and CCI has purchased 24 lakh bales), Government permission to export the commodity upto 20 lakh bales in the cotton season (2004-05) and expectation of China enterin the international market as the importer of cotton
5	Draft findings and recommendations; circulate for review	The kapas price will remain to be Rs.1,900 per quintal in the rest of the cotton season (upto September 2005) depending on the variety. Given the above situation, the farmers are advised to reduce the cost of cultivation by adopting Integrated Pest Management and Integrated Nutrient Management.
6	Approve and distribute final report.	Approved by the Committee headed by Vice-Chancellor, Tamil Nadu Agricultural University, Coimbatore and distributed to all the stake holders.

Cotton prices will remain firm for the remaining season in Tamil Nadu

Cotton "The White Gold" is grown throughout India, encompassing a wide range of agro- climatic regions. The major cotton growing areas are Northern-zone comprising of Punjab, Haryana, and Rajasthan; the Central zone consisting of parts of Gujarat, Madhya Pradesh, and Maharastra; and the Southern-zone consisting of Andhra Pradesh, Karnataka, and Tamil Nadu. Shankar, Bengal Deshi, V-797, Jayadhar, J-34/ Bikaneri Narmasg, Y-1, NHH-44, LRA-5166, H-4/MECH-1, S-6/4, MCU-5, DCH-32, are the major varieties/hybrids of cotton cultivated across the country.

Current level of production

With the revival of the monsoon in August, 2004, the predominantly rainfed States of Central and Southern India resumed cotton cultivation energetically. The ability of the crop to withstand late sowing conditions as compared to competing crops led to larger area than anticipated planting in the States of Gujarat, Maharastra, and Andhra Pradesh. The

provisional planting estimates for 2004-05 and field sources confirmed that area under cotton was 8.97 million hectares (accounting 20 percent of World area), a 12 per cent increase over last year. Market reports also confirmed the increase in planting of the new improved hybrids and Bt cotton varieties. According to trade sources, about 40 per cent of the farmers cultivated Bt cotton. Adoption of Bt cotton, also improved the yield prospectus for the 2004-05 cotton crop.

Cotton production is estimated to be 240-245 lakh bales each bale-170 kg in the cotton season from October 2004 – September 2005 which is record cotton crop in India (previous record was 17.8 million bales in 1996/97). Total inflows have already touched 195 lakh bales.

International scenario

According to the recent forecast made by the International Cotton Advisory Committee (ICAC), global cotton production is expected to reach 25.43 million tons in 2004-2005 from 20.66 million tons in 2003-2004. Cotton consumption in the World is likely to remain lower at around 22.85 million tons. An unprecedented 16 per cent expansion in global cotton output forecast for 2004-05 combined with a modest rise of 2.5 per cent in World cotton consumption is set to play havoc in the market. The excess production would contribute to further increase of stock. The international demand estimates suggests that Cotlook A index will average 47 cents per pound this season, 21 cents (31 per cent) below the six year high in 2003-04. Thus world cotton prices are going to rule rather weak over the next several months.

Cotton Import and Export during 2004-05

Increased domestic production in India has however, lowered the estimate for the 2004-05 imports to 0.7 million bales as against 0.8 million bales during the last year. Most imports are likely to be linked to extra long staple and specific purpose cotton. Although import volumes depend on the relative prices of Indian versus International cotton , anticipated lower prices and the improved quality of local cotton are expected to limit cotton imports during the forthcoming season. So far in the last six seasons, India has been a net importer of cotton, but exports has picked up in the last year to recent months to neighbouring countries like Pakistan, Bangladesh and Far East countries. Considering the higher domestic output, Indian cotton would wield the advantage of being the cheapest fibre in the international market and export subsidy would further facilitate it's price advantage. Trade sources confirmed that the countries that would evince interest on importing cotton are Korea, Taiwan and Indonesia, besides some international shippers. The cotton varieties that will get importers' enquiries are Shankar-6, Bunny, Brahma, Mech-1 and

MCU-5. With cotton price fall continuing in tandem with the international cotton futures, a price offer of 44-45 cents per lb (on f.o.b.) for domestic cotton by the Indian exporters is possible this time and invited appreciable trade enquiries from international shippers. Government to give shape to its offer of an export subsidy for raw cotton may force some international cotton shippers and specific cotton consuming countries in the Far-East to seriously consider sourcing Indian cotton. The Cotton Corporation of India (CCI) has estimated trade volume committed for export range up to four lakh bales.

Cotton Crop in Tamil Nadu

In Tamil Nadu, cotton is one of the important cash crops and the area started declining from 2.39 lakh hectares in 90s to 0.75 lakh hectares in 2002-03. The major markets for cotton are Tirupur, Villupuram and Theni. Regulated Markets and Co-operative Marketing Societies act as facilitative organizations for cotton marketing in Tamil Nadu. This year the arrivals have doubled in these markets. With the reports of bumper crop in 2004-05, domestic cotton prices have moved downward in the current period. This is in stark difference with the conditions seen during last year, when the cotton prices in Tirupur remained high and promised good returns to the local cotton farmers as there was a global deficit.

This price drop created havoc among the cotton growers in Tamil Nadu. Domestic and Export Market Intelligence Cell (DEMIC) of Tamil Nadu Agricultural University conducted market surveys and collected 15 years weekly prices of Cotton (Jan1990-Marh 2005) from Tirupur regulated market which is one of the major cotton markets of Tamil Nadu. Analysed historical price data with help of different forecasting models like econometrics, ARIMA, GARCH, ARCH and found that ARIMA 111 has lowest MSE and AIC and SBC criteria's. ARIMA 111 model results and current scenario of cotton crop, price stabilization measures taken by Government (i.e., Agriculture Ministry has directed the CCI to intervene and perform price support actions by purchasing cotton in all the major cotton growing States so far Maharastra Cotton Federation procured 42 lakh bales and CCI has purchased 24 lakh bales), Government permission to export the commodity up to 20 lakh bales in the cotton season (2004-05) and expectation of China entering the international market as the importer of cotton leads to the conclusion that the kapas price will remain to be Rs.1900 per quintal in the rest of the cotton season (upto September 2005) depending on the variety. Given the above situation, the farmers are advised to reduce the cost of cultivation by adopting Integrated Pest Management and Integrated Nutrient Management.

Validation of Price Forecast

- Month of forecast-May2005
- Variety -LRA5166, Tirupur Market.
- Cotton prices will remain firm for the remaining season in Tamil Nadu”
- Upto September 2005-Price of Cotton remained at Rs.1,900 per quintal.

Actual Prices which Prevailed in Tirupur Market were as follows:

Month	Price (Rs/ qtl)
June	1813
July	1750
August	1846
September	1850

2.9.2 Threat of New Competition

J & J Candy Company is a well-established maker of high volume, low cost candies in India. Some of J & J's products include chocolate covered peanuts, bubble gum, and hard candies (mints, lolly-pops, etc.). J & J has strong market presence through wide wholesale and retail distribution. At a recent luncheon, the Marketing Manager discovered that XYZ has plans to introduce its candy products in India. The Marketing Manager is not familiar with XYZ. However, in the interest of making sure nothing happens, he informed the Market Intelligence (MI) Analyst about what he learned, asking him to get back with management on the possible threat.

1. How should the Market Intelligence Analyst treat this information?
2. What analytical tools should the MI Analyst consider using?

Possible Solutions to Case

1. Confirm and verify the information directly to the source that informed the Marketing Manager. Find out who has this knowledge and where did he obtain it. The Marketing Manager can provide the name and perhaps the phone number for primary research. The MI Analyst can continue to confirm back to other sources, picking up more bits of insight into the intentions of XYZ. If the information is well collaborated and confirmed, then further MI should be conducted. For example, MI should find out more about the products XYZ will sell, when will XYZ move into the market space, and other information that puts J & J into action mode. MI continues to push until there is a clear threat and action must be taken. For example, suppose XYZ will market high premium candies that do not compete with J & J. The impact is now substantially less and warrants monitoring, but perhaps not immediate action. MI is the fine art of getting “enough” hard evidence to paint a clear picture of what will happen and how and when it will impact your company.
2. If the threat is confirmed as real, the MI Analyst needs to conduct competitive analysis directly against XYZ. Find out who buys their products, what products are they likely to introduce, where will they sell them, etc. The MI Analyst needs to issue a MI Alert, providing insights and possible action on how J & J can counter XYZ. For example, maybe J & J should launch similar products ahead of time in the same outlets where XYZ sells its candies. MI should help you out guess the moves of XYZ, minimizing the impact of the new competitor.

Market Information Services

3.1 Introduction

Market information is crucial to effective marketing management. Often, marketing excellence of an organization has a relationship with the way in which information is managed. Marketing excellence is the result of correct marketing decisions. Validity of the decisions depends on the information available to a manager. The way a business firm handles marketing information causes the difference between winning and losing the business game.

3.2 Market Information Services

Market Information Service (MIS) is a means of increasing the efficiency of marketing systems and promoting improved price formation. Improved information enables farmers to plan their production more in line with market demand, schedule their harvests at the most profitable times, decide to which markets they should send their produce and negotiate on a more even footing with traders.

Other benefits have been seen for traders. Improved information should enable traders to move produce profitably from a surplus to a deficit market and to make decisions about the viability of storage of produce during peak season.

A large percentage of MIS are primarily data-gathering exercises, and even this is done inadequately. MIS suffer of lack a commercial approach and significant resource constraints.

In designing a service, sustainability and commercial utility should be the prime considerations. This implies detailed research into the needs of those involved in the marketing system. It also implies tailoring the service to meet the resources available and only expanding operations when additional funds can be obtained on a long-term basis.

3.3 Defining Market Information Service

Market Information Service may operationally be defined as a service, usually operated by the public sector, which involves the collection on a regular basis of information on prices and, in some cases, quantities of widely traded agricultural products from rural assembly markets, wholesale and retail markets, as appropriate, and dissemination of this information on a timely and regular basis through various media to farmers, traders, government officials, policymakers and others, including consumers.

3.4 Significance of Market Information Services

A Market Information Service is seen as providing “transparency,” i.e. a full awareness of all parties of prevailing market prices and other relevant information. This, in turn, can contribute to “arbitrage,” i.e. the act of buying at a lower price and selling at a higher price. In theory, when a marketing system functions efficiently prices at different markets are influenced by arbitrage activities of traders, i.e. “spatial arbitrage.” takes place. Traders take advantage of price differences until these differences decrease to the level of transaction costs. “Temporal arbitrage” is the storing of products in order to take advantage of expected higher prices later in the season or, in some cases, in subsequent years.

3.5. Impact of Market Information Services

1. They can facilitate efficient allocation of productive resources
2. The bargaining position of farmers with traders can be improved
3. Information reduces transaction costs (i.e. the costs of selling the produce) 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
4. Lack of information is an entry barrier to both production and trade. Where farmers have had access to information, shifts in cropping patterns to higher value produce have been noted. In the area of trade, individuals find it difficult to begin trading without information, so reducing competition within markets
5. Market information can be particularly valuable where countries are changing over from a state-controlled marketing system to one of private enterprise, in that farmers and small traders are made more aware of market opportunities
6. By contributing to more efficient marketing, particularly improved spatial distribution, market information should be beneficial for consumers as well as farmers and traders. Information on retail prices may also, under certain circumstances, assist consumers to bargain
7. The essence of a good Market Information Service is that it should provide commercially useful information on a timely basis. Information is also useful to policy makers. This improves policy formulation as the functioning of markets comes to be better understood
8. Market information is also an important component of Early Warning systems for food security as it can assist in identifying areas of possible shortages and can highlight whether prices are above or below normal seasonal trends

3.6 MIS Scenario

The Governments of several developing countries undertook the organization of national development but without promoting decisive actions to foster, at the same time, an adequate level of awareness about the use and value of information.

A problem with many MIS is that they become obsessed with processing and analyzing the data and tend to ignore the end use of gathering it in the first place, i.e. to provide speedy and useful information to farmers and traders. This is often a reflection of the lack of a commercial orientation among Ministry officials, particularly those from formerly centrally planned economies, who see data primarily in terms of its use for planning and control purposes.

3.7 Agmarknet

The Indian government's agriculture marketing system, AGMARKNET, heavily uses information and communication technologies (ICT). It links wholesales markets, states, national marketing information center through ICT based network. The information collected from wholesale markets is consolidated, analyzed and disseminated to various agriculture offices and organizations to support their agriculture commodities planning and extension work. The fertilizer MIS of Ministry of Agriculture, Bangladesh monitors demand, supply, and distribution system of select fertilizers. The information comes from farmers, traders, importers, dealers, and big users. The analytical reports are prepared daily, monthly and yearly, and disseminated to the government policy makers, companies, and other organizations.

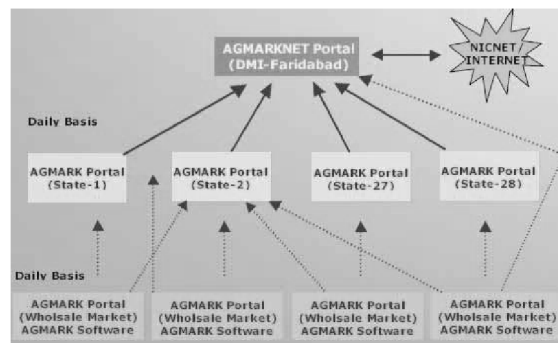
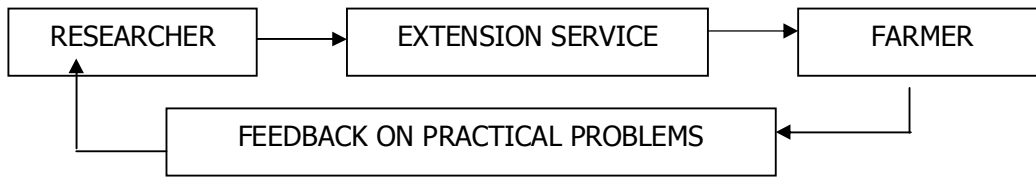


Fig 3. Marketing information flows and information portals on AGMARKNET network (sourced from <http://www.agmarknet.nic.in>)

3.8 Agricultural Extension Services

Quick dissemination of technological information from the Agricultural Research System to the farmers in the field and reporting of farmers' feedback to the research system is one of the critical inputs in transfer of agricultural technology. The extension personnel of the Department of Agriculture disseminate the technological messages to the farmers orally. Through this approach information has not been able to reach majority of the farmers who are spread across the whole country. This gap remains a challenge for the Extension system even today. Farmers' needs are much more diversified and the knowledge required to address them is beyond the capacity of the grass root level extension functionaries.

Agricultural extension literally means to extend the innovations in the field of agriculture to the farmers. Extension workers, thus, act as catalytic agents in adoption of new technology. Extension also highlights the problems of farmers to the research workers.



3.9 Essentials of MIS

- The Institutional Structure
- Ensuring Sustainability
- Analyzing the Marketing System and its Information Needs
- Focus on Products and Market Needs
- Market Information for Consumers
- Frequency of Collection of Information

Effectiveness of Existing Marketing Channels and Networking

4.1 Agriculture Marketing

Agri - Marketing in India refers to the mechanism and infrastructure prevalent to ensure that the produce grown by farmers is efficiently and effectively supplied to end customers, while in the process ensuring that farmers get a fair deal out of their sale, and that customers obtain the necessary produce at fair prices.

Unlike in other countries, the organized marketing of agricultural commodities in India has been promoted through a network of market yards regulated by a marketing board.

A marketing board is an organization created by many producers to try to market their product and increase consumption and thus prices. They most commonly exist to help sell farm products and are funded by the farmers of those crops. Marketing boards often also receive funding from Governments as an agricultural subsidy.

Marketing boards also sometimes Act as a pool, controlling the price of farm products by forming a legal cartel. They also fund other ventures beneficial to their members such a research. Most State Governments and UT administrations have enacted legislations to provide for the regulation of agricultural produce markets.

While by the end of 1950, there were 286 regulated markets in the country, their number as on 31st March 2006 stood at 7,566. In addition, India has 21780 rural periodical markets, about 15 per cent of which function under the ambit of regulation. The advent of regulated markets has helped in mitigating the market handicaps of producers / sellers at the wholesale assembling level. But the rural periodic markets in general and the tribal markets in particular, remained out of its developmental ambit.ⁱ

4.2 Analysis of Agri Marketing

4.2.1 Existing Agri-Marketing Channels

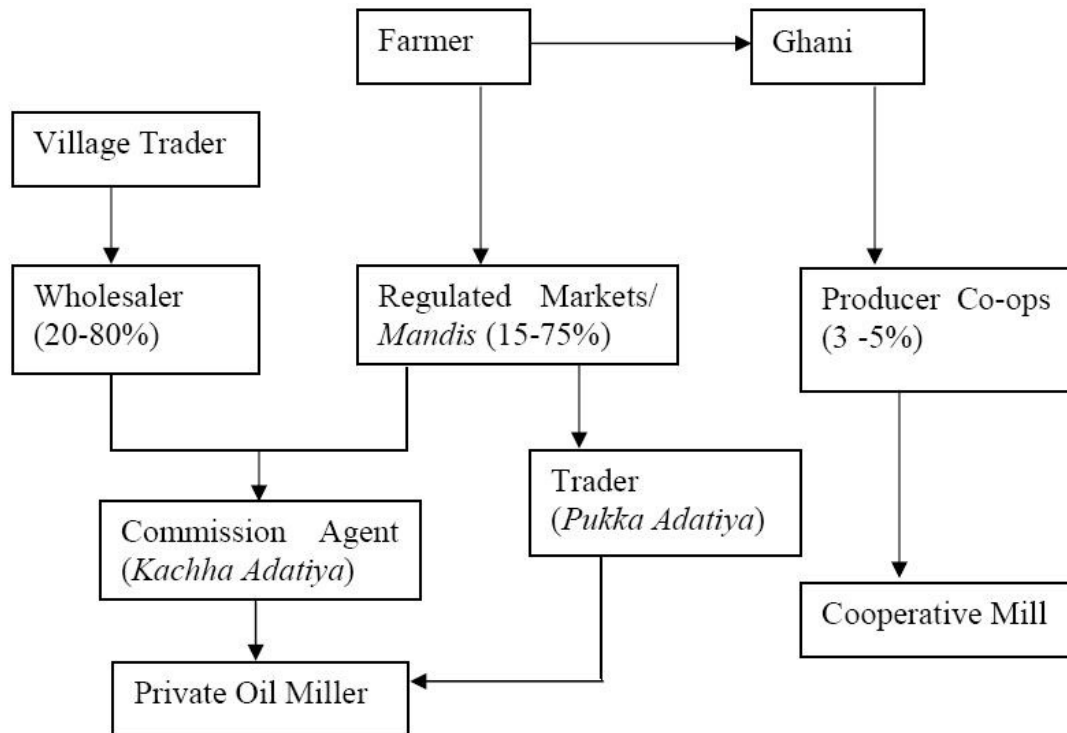
4.2.1.1 Mandis or Market Yards

State Agriculture Marketing Boards are the sole agencies allowed to set up market yards or mandis in a particular geographical location. Though mandis were established initially only at the district level, more recently they have been rapidly increasing to allow trading at a micro level. Right now, there are 750 mandis all across India trading in about

140 crops and their different variants. Since most mandis end up trading a similar set of crops in a district, it creates fragmented markets for produce.

Every mandi comprises of a set of yards set up where licensed traders can buy produce from farmers, and sell it to wholesale dealers down the line.

4.2.1.1.1 Market Operation of Mandi



Every mandi trades in at least one primary commodity, one which is typically grown in the region. The seller brings the produce to the market, where it is weighed, with the grading being performed by a certified mandi inspector. The seller's produce is certified, and upon collection of a mandi fee, he is allowed to put up his produce for sale.

The decision for a farmer to select a particular mandi for selling his produce is largely a function of the costs of transportation involved, given the poor State of infrastructure facilities in India. Added to that, the lack of good packaging and storage during transportation also play a role.

In addition to the buyers and sellers, the market consists of traders or intermediaries between the two parties, the farmers and the wholesale dealers. Traders are licensed, and have to pay two different types of mandi fees to operate viz.

- A transaction fee which is a percentage value of the trader's daily volumes. This fee is levied by the market yard

- Taxes and levies, which are also typically a percentage of the daily volume traded. These taxes are collected by the State, and can vary widely across different States.

The taxes and levies are usually passed on by the traders to the farmers themselves. Currently, the fees and taxes to be paid by mandi traders have been fixed at 4% cumulatively.

Within the mandi, two types of trading are prevalent. One is the open outcry method, where the commodity is sold using the auction process and the other where sellers approach traders for a price quote, and search for a favourable one. The auction process is more popular and is run sequentially, going from one lot of the commodity to another.

As and when each lot is auctioned, a new price is set. There is a limited mechanism for central dissemination of prices.

Disputes with regard to the quality of produce, between the farmer and the trader are resolved by the mandi inspector who is empowered to certify the produce.

At the close of the day, traders report their prices and volumes to the mandi authorities. Since taxes have to be paid on the reported trade value, there is incentive for the traders to under report volumes, and consequently prices as well. This has undesirable consequences for the farmers within the mandi.

Mandis are monitored by the mandi board, a committee with representation from the farmers, the traders and the Government. Operations are conducted by staff hired by the mandi board, with atleast one qualified inspector present to certify produce quality.

How effective is the channel?

On analyzing the points in the procurement chain of any agricultural produce, we see that most wastage occurs while the crop is being put for sale in a market yard. Inefficient facilities for packaging and transport of the produce en route to the market yard create the first significant amount of wastage.

Subsequently during the sale process itself, the lack of adequate cold storage facilities at many of the market yards cause further wastage to the crop. All these losses add up to an amount significant enough to prevent a farmer from a fair return on his investment, lest alone cover his costs. Upon analyzing mandis, the most common mechanism for agriculture marketing in India, we see that in reality, most of them are really highly inefficient markets.

The idea for a market is essentially for the buyers and sellers to involve in price discovery, the Activity of finding the right price at which the market clears, or demand and supply for a particular product balances out with a minimal amount of wastage.

The mandi however is influenced by the interests of not only the buyers and the sellers, but also of the traders and the commission agents. Chiefly involved in finding arbitrage opportunities, middlemen ideally are involved in information dissemination, providing vital linkage between the buyer and seller in a market with limited information

On observation, we see that almost every market yard in the country possesses a strong cartel of traders and commission agents, with the sole aim of benefitting from the sale.

In order to gain, these agents resort to Activities which may be detrimental to either the farmer or the buyer or both. An example in this regard would be how price discovery is manipulated by agents, by either suppressing or inflating the demand for a particular produce.

In many village markets, many a times, there is no open auction. The price is fixed by the commission agent and the retailers (purchaser) under the cover of cloth by making signs on the palm (hatta system). Thus, even though the farmer is present there, he cannot know the real price at which his produce is sold. The commission agents exploit the farmers by using many fraudulent means. They charge heavy commission, use faulty weights and measures and have number of deductions. The following narrative gives a good example of how commission agents bring inefficiency into the system:

“Basavaraju of Jakkur, who had come to the Yeshwantpur market yard to sell his cabbage had no option but to sell it at Rs.2 per kg. Within a few hours, his produce fetched prices varying from Rs.4 to 6, thanks to the "efforts" made by retailers and commission agents, except that only he had no share of this increased price.”

The inefficiency is created for the sole fact that the commission agent causes an increase in the price of the good without actually adding any value to it. The level of manipulation, when multiplied over a number of transactions occurring in the market yard severely affect the market’s ability to accurately discover the right price for the produce, thus affecting the prospects of both the farmers and the buyers.

The APMC Acts place certain restrictions on where agricultural produce can be sold. For instance, the earlier version of the Act restricts movement of produce across State boundaries under any possible circumstances.

Farmers are compelled to bring their produce to specific market yards, places where the demand for the produce may not be high. This compulsion also arises due to the lack of proper transport infrastructure which could enable farmers to transport their produce to the market yard having demand for it and thereby, ensure a fair return.

Thus, we see that a vacuum between the supply and demand for an agricultural produce is created, due to the following factors:

- Limited connectivity among market yards and thus, preventing efficient interaction between buyers and sellers
- Lack of adequate infrastructure to enable farmers to transport produce from one market yard to another
- Inadequate gauging of demand due to the limitation of forward markets or future markets, which may be either too high or too low, and thus result in either gluts or shortages in agriculture produce.

4.2.1.2 Direct procurement

The direct procurement model refers to the practice of institutions establishing their procurement centers and allowing farmers to sell their farmers directly, eliminating the middleman or agent. The institution here can be the Government, an agro-processing firm or a big retail chain.

Considered to be one of the most beneficial of all agrimarketing models, direct procurement eliminates the middle man between the buyer and the seller, thereby allowing the farmer to get a fair worth for his produce. In this case, the institutions enjoy benefits by eliminating trader margins. Direct procurement models run in direct opposition to the traditional mandis, and provide to the farmer a much needed alternative when it comes to a marketplace.

Some of the benefits that direct purchase models accrue are as follows:

- These models bring the buyer closer to the farmer. This would help the farmer in accurately identifying the need of his buyer, changing his farming behaviour accordingly and enable him to reap a profit
- Most direct procurement models peg their procurement prices competitively to major markets of the same produce all over India, and in some cases, to major World markets as well. Information disseminated to the farmers and price discovery is fair
- Since the purchase requirements of the buyer are known before hand by the farmer, a call can be taken as to which produce would have to be sold at which point, either at the mandi or at the institutional buyer. This eliminates wastage of produce
- The absence of any kind of middleman allows the buyer to transfer a portion of the margins saved to the farmers themselves

- Any mechanism of price manipulation, done by agents and traders at mandis is completely eliminated.

Some of the criticisms of the direct procurement model voiced by its opponents are as follows

- A heavy dependence on institutional buyers for marketing of produce may inadvertently result in the creation of a buyer's monopoly.
- The specific focus displayed by institutional buyers in procurement could prompt farmers to ignore the sowing of traditional crop patterns and create a monoculture, with crop sowing patterns being dictated by the buyers.
- A direct impact of the creation of a monoculture of crop sowing patterns would be the loss in the bio-diversity of a particular region, and in the loss of indigenous farming methods and local dietary habits

4.2.1.3 Contract Farming

Contract farming is a forward agreement between farmers and wholesalers/retailers for the production and supply of agricultural commodities and the agreement is generally made at predetermined prices. Through the agreement, the buyers can also provide technical and production support to the grower. The farmers, through the agreement, commit themselves to produce a specific commodity at the buyer-desire quality.

4.2.1.3.1 Need for Contract Farming

Since the Government is a major stakeholder in the contract farming (since most of the produce today is procured by the Government, it is equivalent to farmers producing only for the Government, a variation of contract farming), it is essential to reduce the load on the central and State level procurement system. Contract farming also paves way for private investment which has the potential to boost the entire sector. Contract farming also brings about a market focus in terms of the selection of crops so that farmers could grow that crop and benefit from it immensely. Farmers get a stable, consistent income through contract farming and this Acts as an incentive for the farmer to produce quality produce and also add value to it (like removing the husk and selling only the pulse inside). Contract farming also generates employment in the sense that for an landless agricultural farmers, contract farming might prove to be a source of sustenance. Contract farming also promotes rural self-reliance by utilizing the local resources to meet the challenges.

4.2.1.3.2 Challenges of Contract Farming in India

- Outdated laws and regulations
- Vote bank politics
- Strong attachment to the existing system

- Conflicting Central and State policies
- Lack of cross sectoral interactions
- Government crowding out the fields

The contractual agreement encompasses three areas viz., market (grower and buyer agree for future sale and purchase), resource (buyer agrees to supply inputs and technical advice) and management specifications (grower agrees to follow the recommended practices for the crop cultivation).

One of the reasons for contract farming coming into existence in India was the Land Ceilings Act which stipulated that “agribusiness firms cannot own and cultivate land for their raw materials requirements, to overcome the difficulties encountered in procuring from the open market, especially in perishables”. Therefore, the only option for agribusiness firms was to go in for contract farming to safeguard their interests.

4.3 The Legal Framework for Agri Marketing

4.3.1 APMC Act - Analysis

The Agricultural Produce Marketing Committee Act is a State specific Act of law promulgated by the respective State Governments to regulate the marketing of agriculture produce. The Act chiefly imposes restrictions on who can buy produce from farmers, and where farmers can sell their produce as well. Conceived in an age when marketing of agriproducts was haphazard, the APMC Acts regulated the establishment of independent market yards in specific geographic areas. The intention of State regulation of agricultural markets was to protect farmers from the exploitation of intermediaries and traders and also to ensure better prices and timely payment for their produce.

Exporters, processors and retail chain operators cannot procure directly from the farmers as the produce is required to be channelized through regulated markets and licensed traders. There is, in the process, an enormous increase in the cost of marketing and farmers end up getting a low price for their produce.

Enacted in almost all the States by the end of the 60s, the APMC Act was primarily enacted at a time when agricultural marketing was in the initial stages of being formalized and standardized. The existing market yards were largely unregulated, independent entities with only a local presence. These pre APMC yards were dominated by trader cartels, which manipulated price discovery and prevented the farmer from obtaining the right price for his produce.

The APMC Act prohibited cartelization, initiated the creation of market boards with representation from all the stakeholders, the farmers, traders and the buyers. With Government oversight in the form of constant monitoring and financial support, an attempt was made to make the market yards fairer and transparent.

From the farmer's side as well, the APMC Act placed restrictions on how the farmer could sell his produce. Direct selling to either traders or private institutional buyers was prohibited, except on special approval from the Government. Produce could be sold only at a market yard in the geographical area where the produce was grown. Special approval was required for transporting produce across different market yards in different States as well.

Over a period of time, the APMC Act proved to be both a blessing and a curse. Market yards, in a way were forced to isolate themselves, and due to the woeful infrastructure present, farmers were forced to stick to one single market yard and to a single set of traders and buyers, something which **prevented efficient price discovery**.

The isolation among market yards also lead to **demand supply inefficiencies**, wherein one market yard could be having a huge unsatisfied demand for a particular crop, while another could be looking at a glut of the same product. Prices would vary wildly, and traders pounced upon arbitrage opportunities prevalent.

Crop productivity and wastage was another issue. Farmers began to sow only those crops which they could get a fair price for at their nearest market yard. With all the farmers in the region under the market yard following the same practice, **crop diversity was severely affected**. The **mismatch between demand and supply** lead to farmers getting lower prices for their produce, and resulting in huge wastages to the order of 5 to 7 % for food grains and 25 to 30% for fruits and vegetables.

In the new, transformed economy, private institutions have stepped up their linkages with agriculture, a major source of production inputs for many firms. Significant investments have been made by private entities into establishing efficient supply linkages, warehousing, post harvest and cold chain infrastructure as close as possible to the farmers' fields themselves.

The APMC Act, however severely constrained private participation in agrimarketing and was being looked upon by most of the stakeholders to be regressive in nature.

4.3.2 Model Act – Amendments to The Existing APMC Act

In recent times, it has been clearly observed that agriculture, an important economic sector having vital socioeconomic implications has been lagging behind in growth when

compared to the other sectors. Given the dependence of almost 60% of the population's workforce on this single Activity, it was decided by the Government to improve agricultural growth on a war footing.

Upon close analysis, it was observed that the lack of efficient private participation and the presence of inefficient markets for agricultural produce were the hurdles preventing growth in agriculture, apart from input resource constraints like limited irrigation, soil inefficiency and improper crop usage.

Accordingly, the State Governments were requested to suitably amend their respective APMC Acts for deregulation of the marketing system in India, to promote investment in marketing infrastructure, thereby motivating the corporate sector to undertake direct marketing and to facilitate a national integrated market.

The Department of Agriculture and Co-operation also formulated a model law on agricultural marketing for guidance and adoption by the State Governments. The model legislation provides for the establishment of private markets/yards, direct purchase centers, consumer/farmers' markets for direct sale and promotion of Public-Private Partnership (PPP) in the management and development of agricultural markets in India. Provision has also been made in the Act for constitution of State Agricultural Produce Marketing Standards Bureau for the promotion of grading, standardization and quality certification of agricultural produce. This would facilitate pledge financing, direct purchasing, forward/future trading and exports.

4.3.3 Features of the Model Act

- Establishment of private markets, market yards, direct purchase centers, consumer/farmer markets for direct sale to private institutions
- Promotion of public/private partnership in management and development of agricultural markets
- Setting up of special markets for commodities like fruits, vegetables and flowers
- Regulation of contract farming and promotion of alternative marketing systems
- Provides for prohibition of a commission agency in any transAction of agricultural commodities with the producers
- Empowering State Agricultural Marketing Boards to promote standardization, grading, quality certification, market led extension and training of farmers and market functionaries
- Constitution of State Agricultural Produce Marketing Standards Bureau
- Enable pledge financing, e-trading, direct purchasing, export, forward/futures trading
- Introduction of negotiable warehousing receipt system with respect to agricultural commodities

4.4 Retail Industry in India

4.4.1 What comes under the ambit of Modern Retail?

The private investment in the agricultural sector in the recent years got a boost from the Government by opening up the sector for private investment. This enables large business conglomerates to enter the sector and the investment in this sector is believed to have a cascading effect across the food and agriculture space.ⁱⁱ

Much has been spoken about the retail industry in India. But the categories of retail which directly affect the farmers are only the following

- Food Companies like PepsiCo, McDonald's and ITC which compete to procure the best quality produce from the farmers. For e.g., McDonald's "Cold Chain" concept in India has benefited the farmers and other business people immensely.ⁱⁱⁱ
- The fresh retail outlets like ITC Choupal Fresh and Reliance Fresh which directly procure the vegetables and grains from the farmers and sell them in their outlets.

The entry of big retailers has led to an increased demand for quality produce and this necessitates an increased supply chain by the private players. This could ultimately lead to reduction in marketing costs which could be passed on to the consumers and higher realization for farmers.

4.4.2 Analysis of major players

4.4.2.1 Reliance

With a targeted sales of Rs 90,000 crore by 2010 and with a planned investment of Rs 30,000 crore over the next five years, Reliance retail entered into the retail space by opening up retail outlets in multiple formats with world-class shopping environment, State of the art technology and a seamless supply chain infrastructure. Reliance retail plans to expand its business to around 800 cities and towns in India within a record time. It is only because of Reliance retail that so many other players developed the interest of looking up to retail and consider Greenfield investments in retail ventures.

The integral feature of Reliance's retail venture is to ensure better returns to farmers and greater value for the consumer. By opening up stores in multiple formats, Reliance is aiming to cater to people of all strata of the society.^{iv} With reliance entry, the till-then lukewarm approach to the retail industry by big corporate including Tata and ITC got completely changed. Reliance Industries by starting up Reliance retail has clearly positioned itself in to the role of redefining the entire landscape of Indian retail.^v

Going by its forecasts, Reliance would be making around Rs.3 crores/store which translates to revenue per sq. ft. of around Rs.12,500. So Reliance retail could easily rake in about Rs.9000 crores if everything goes by its plan to open up 3000 outlets.

The risk taking nature of Reliance is also revealed in its retail entry. The format of Reliance Fresh is untested and is quite different from what other retailers in India have offered so far. Reliance retail, unlike other retailers who operate on volumes and thin-margins is trying for a fairly high-margin business mode. Reliance retail has stopped short of being a full-fledged supermarket which is a tried and tested model in India.

Reliance Fresh, unlike other retailers like Big Bazaar and Nilgiris, only stocks plenty of fruits and vegetables, juice bar, and even a large counter for *puja* flowers. But the drawback of this is that consumers might to shop everything under one roof and Reliance retail in that case would miss on that opportunity.

Reliance retail procures the fruits and vegetables directly from the farmers and it has its own supply chain. With an efficient supply chain, margins can be increased and the savings could be shared with customers. There are very few external brands in Reliance retail's shelves and the store is stocked completely with its private labels, the reason being that private labels offer better profit margin than external brands.

Reliance's stores are also smaller compared to other retailers as it brings down the cost of real estate. It is also much easier to find a tiny plot of land in the neighbourhood area as against the supermarkets which could only be located in commercial areas. By being smaller, Reliance could literally flood the cities by locating its stores in several areas where it can be easily accessed by the consumers.

Having smaller stores also has high inventory turnover since consumers visit the store more often as they are easily accessible.

4.4.2.2 ITC

ITC, the country's largest tobacco company, made an entry into retail with the main objectives of increasing its non-tobacco revenues. It has opened fruit and vegetable outlets under the brand name "Choupal Fresh" and hypermarket chain under the name "Choupal Sagar". Choupal Fresh store stocks fresh fruit and vegetable procured directly from the farmers. It has around 18 Choupal Sagar outlets and is mainly targeted at rural people whose income levels are lower. Apart from the retail customers, even kiranas and other small retailers could source from Choupal Sagar. To enable this, Choupal Sagar follows a different pricing model for retail customers and bulk purchasers. Choupal Sagar also provides various services such as soil testing, banking, insurance and medical facilities to the farmers in rural areas.^{vi}

The company is also looking at an increase in the number of e-Choupals from the current 6,400 in 130 districts, to 20,000 across 350 districts, in the next 5-6 years. ITC is also focussing on strengthening health services in rural India. ITC which is 32 per cent owned by British American Tobacco has also entered the retail clothing business under the "Will Lifestyle" brand and its hospitality business under the "ITC Sheraton brand" is also thriving.^{vii}

ITC is also planning to start Choupal Carts after Choupal Sagar and Choupal Fresh. ITC will provide the vegetable vendors with an ITC branded push cart and will follow the pricing and service levels set by ITC.

Choupal Fresh currently follows a two-way model with presence in both front end as well as in back end. ITC along with its logistics partners plans to invest about Rs 800 crore in cold chain and logistical supply.^{viii}

Interestingly, Kirana stores and other small retailers from the small towns will also be able to purchase goods from these outlets. Choupal Sagar will provide different prices to retailers and ordinary consumers.

4.4.2.3 Pepsico

PepsiCo entered India in 1989 by setting up its beverages and foods division on the pre-condition from the Government of India that it should invest in horticulture processing plant in Punjab. To make the business viable, PepsiCo then identified processing of tomatoes in Punjab as a suitable option. It imported Rs 22-crore tomato processing plant from Italy and to pursue this, PepsiCo introduced the concept of Contract farming to India. But

unfortunately, PepsiCo had to close down its tomato production and recently it has revived its plan of growing tomatoes again.

PepsiCo recently offered its services to procure wheat for National Agricultural Marketing Federation (NAFED) and it also has a program are running for procurement of rice and barley.

PepsiCo pays the barley farmers an assured payment of Rs 675 per quintal when the price of barley in the market was Rs 600 and PepsiCo's minimum support price for wheat was Rs 650. PepsiCo also offers it's technical assistance to farmers. PepsiCo is also planning to introduce contract farming in pulses for it's Frito Lay brand and Kerala's ginger. The productivity of Ginger has been decreasing rapidly in Kerala owing to obsolete techniques and poor inputs and PepsiCo wants to capitalize on this.

The model to be followed by PepsiCo in ginger contract farming is that the company will tie up with a bank which bankrolls all the input costs, and the farmers supply their produce to the company at pre-fixed prices. All aspects of crop growing are closely monitored and controlled by the company's experts.^{ix}

Pepsi is also looking at possibilities where it can get the State Government to help evolve a system of territorial exclusivity which could pre-empt future competition in the ginger contract farming. This kind of system is already in existence in sugarcane sector where the Government demarcates captive farming areas for each company to source on an exclusive basis.

4.5 Safal - A Government led initiative in Agri Marketing

4.5.1 Need for Safal

For any agricultural supply chain to be very efficient, it needs to build long term relations with the retailers and also with the farmers for procurement of their produce. On its part, the State Government should also upgrade the infrastructure in these markets by providing cold chains, distribution centres and good road for quicker transport of the produce. This would reduce wastages to a very great extent.

There have been several attempts in the past to help the farmers realize the fullest gain out of his produce. Co-operatives, contract framing and growers association, all aimed to provide farmer's access to markets and minimize transaction costs. Private sector's involvement in this has been promoted aggressively because of the benefits they bring in viz-a-viz technology transfer, capital inflow and assured market for crop production. Private sector's involvement would help the farmers through the backward linkages which is

explained in detail below. Since the Government's ability in these issues is severely constrained by resources, private sectors should be encouraged to invest heavily in the agricultural sector. This would incentivize farmers to produce quality output as they would face lower market risk, get better prices and hence stable income, get technical and technological knowledge from the private players etc. It also has a multiplier effect through increased output, income and hence higher employment.

SAFAL was first started as fruit and vegetable unit in Delhi by National Dairy Development Board (NDDB) and Mother Dairy Foods Processing Ltd. SAFAL Mumbai is a 100 percent export oriented unit and these provide direct link between the vegetable growers and consumers. SAFAL Bangalore follows a complete different model as it is a wholesale market compared to Delhi's retail model. The APMC Act has been amended according to enable SAFAL Bangalore market to operate outside the purview of the Act.

4.5.2 Safal Bangalore

SAFAL Bangalore was set up by Mother Dairy Foods Processing Ltd in order to overcome the infrastructural inefficiencies in the traditional Indian market. The traditional Indian markets do not have any infrastructure for packaging, grading and sorting and cold storages. Apart from addressing the infrastructural issues, SAFAL also aims to eliminate the role of commission agents and traders who set the prices which most of the time are not beneficial to the farmers. This incentivizes the farmers to produce a quality product. SAFAL aims to eliminate these issues by having an efficient supply chain with strong backward linkages with the farmers and forward linkages with the wholesale purchasers. SAFAL also aims to prevent the huge amount of wastages that is infecting the Indian agricultural industry since ages. SAFAL procures fruit and vegetables through a reverse Dutch auction at an electronic auction centre located inside the market. SAFAL also boasts of a huge humidity and temperature controlled storage and ripening chamber and the forklifts used inside the market are all battery operated.

Around 10% of non-perishable items and 30% of perishable items produced in India gets wasted and hence there is an urgent need to invest in processes such as post-harvest management, efficient post-harvest handling and warehouses to prevent the wastages.

So, apart from procuring the produces from the farmers, SAFAL also offers post-harvest services to the farmers which results in getting a higher quality produce, reduce wastages all of which ultimately results in quality product for the consumers at a lower price.

The Karnataka Government has setup a SAFAL market in Bangalore and it has amended the APMC Act accordingly so that farmers could reap the benefits of selling their produce through SAFAL. The amendments made in the APMC Act ensures the smooth movement, storage and marketing of agricultural produce and also enables setting up of commodity exchanges for futures trading.

SAFAL Bangalore in collaboration with Multi-commodity Exchange of India (MCX) has started a SAFAL National Exchange and has promoted spot trading and futures trading of horticultural products in a big way. This would lead to an efficient price discovery by the farmers for their produce and hence result in higher profits for them. Bangalore, because of its growth due to the IT boom, has seen a number of retail players entering the market in recent years. But SAFAL stands apart from them as a terminal wholesale market and the impact of it on farmers and retailers is slowly beginning to be seen.

The following section highlights the structure and functioning, backward and forward linkages of SAFAL Bangalore.

4.5.2.1 Structure and functioning

SAFAL Bangalore has an electronic auction system through reverse Dutch auction, backward linkage through grower association and forward linkages through cash and carry wholesale and retail stores. SAFAL Bangalore has the capability of handling around 1600 tons/day which translates to almost 30% of Bangalore's fruit and vegetable demand. SAFAL Bangalore also boasts of cold storage, grading and sorting and distribution and all the processes here are transparent and competitive. This resulted in wholesalers taking more time to get associated to SAFAL for a long time whereas the farmers associated themselves very quickly. The demand of the produce is informed to the farmers before hand by SAFAL and this ensures consistent supply of the produce in line with the market's quantity and quality specifications.

4.5.2.2 Backward linkages

SAFAL Bangalore is supported by more than 250 farmers' associations with more than 20,000 members. These associations are directly connected to the 40 collection centers and are required to meet the requirements of buyers, in terms of quality, packing and weight. Small farmers are trained in quality management aspects, pre- and post-harvest management. The support for logistics, for transporting the produce from the farm to the market is also provided by SAFAL on a pre-fixed charge.

The wholesale purchasers and farmers before buying/selling the produce through SAFAL have to register themselves as a member for a nominal fee and this enables SAFAL to predict the future demand and supply fairly accurately. SAFAL reduces farmers cost by almost 5% (in traditional system, farmers used to pay 8-10% as commission to agents whereas in SAFAL, they only pay 4.5% as transaction cost). The payment to farmers is based on credit basis where in a weekly account payee cheques are issued to them. The profits gained by the farmers by selling their produce through SAFAL are as high as 10-15% as compared with traditional channels. This is achieved by proper weighing of the produce, lower transaction cost, less waste, accurate price and efficient transportation of the produce. All these enabled farmers to have a strong loyal association towards SAFAL.

4.5.2.3 Forward linkages

The wholesaler procures the fruits and vegetable from the SAFAL through an auction system. The auction system is completely electronic wherein the bid can be put even through a remote electronic system. SAFAL is forward linked to the retailers and wholesale purchasers through 10-12 cash and carry stores which are owned by the auction market. These stores are located strategically throughout the city in order to cater to local buyers. SAFAL also provides cold storage facilities to the retailers and wholesalers on a payment basis. SAFAL grades and packs the fruits and vegetable for easy handling and transport and thus the wholesalers are ensured a quality produced. SAFAL also disseminates online prices information of all the items so that the farmers and wholesalers can make their own decisions regarding when to buy/sell their produce.

4.5.2.4 Constraints

There are still some hurdles that SAFAL has to cross in order to make it's supply chain more efficient. The backward integrating though received appreciation from the farmer's community is still facing stiff resistance by the wholesale traders. In order to combat this problem, SAFAL has established SAFAL National Exchange (SNX), the country's first spot exchange for trading perishable commodities. SNX enables farmers to trade their produce online to buyers from across the country.

4.5.2.5 Challenges

- Currently SAFAL procures only the produce which meets certain grades and the farmers are still dependent on traders and commission agents to buy the left-overs. So, if SAFAL procures even the low quality produce from the farmers, it would not only prove beneficial to the farmers but also improve their loyalty towards SAFAL.

- Farmers are still doubtful about the SAFAL model and as a safe option, they still maintain relationship with the traders and commission agents in case the SAFAL model doesn't click.
- Traders buy only perishable produce from the SAFAL (since SAFAL has cold storage facilities) but for non-perishable commodities, they still go the regulated market.
- Location disadvantages, inconvenient auction timings and more grading procedures prevent traders from enthusiastically approach the SAFAL.
- SAFAL's biggest challenge is to breaking the strong link of commission agents as this system affects their income considerably. Hence it is very difficult to completely eliminate the agents from the supply chain.

4.5.2.6 Scope for improvement

To operate at maximum capacity, SAFAL needs to approach the canteens in IT companies, educational institutions, and hotel chains and persuade them to make their purchase through SAFAL. Brand building will give SAFAL a huge push in this regard. SAFAL has been very successful in integrating growers with wholesalers and retailers within a short amount of time though the above mentioned challenges could be tackled to make it even more successful.

Contract Farming

5.1 Introduction

Contract farming is a means of encouraging production of agricultural commodities used as inputs to processing, such as sugarcane, milk, oilseeds, fruits and vegetables and plantation crops. The processing facility is fed by a large number of outlying suppliers who are independent producers under contract to the processor. The quantum of production, its quality and purchase price as well as timing, are all governed by a mutually agreed contract. Ideally such an arrangement should benefit both the producer and the processor. The former is assured of raw materials of stipulated quality and quantity at fixed prices, so as to permit effective and economic processing. The latter is assured of fixed prices and does not have to depend upon the vagaries of market. Often he is also provided basic inputs such as planting material, fertilizers and pesticides as also advance against the crop he has contracted to deliver. Thus, contract farming reduces the risk factor substantially since the off take of the produce is assured and prices are known to the farmers.

5.2 Concept and definition

5.2.1 Concept

In India, where land laws do not permit private ownership of agriculture land by a company, contract farming provides an acceptable via media for corporate ownership – a boon to processing industry, exporters and organized retailers.

This concept and method is applicable not only to processing of food but also to exports and organized retailing of fresh fruits and vegetables.

In international markets, often importing companies are particular about the quality of imported products. For example, countries of European Union have very strict standards / quality parameters such as pesticide residues or permitted colors etc. When such problems arise the exporting company loses heavily. Contract farming ensures traceability and tractability of a particular lot/source for processing/marketing when marketed product is found substandard by the importer.

5.2.2 Definition

A contract is an agreement between two parties. It could be oral or written on ordinary or legal (stamp) paper. A farming contract generally spells out in detail the responsibilities and obligations of the buyer of farm produce and of the producer farmer.

Roy (1963) defines contract farming as those contractual agreements between farmers and companies whether oral or written specifying one or more conditions of production and/ or marketing of an agricultural product.

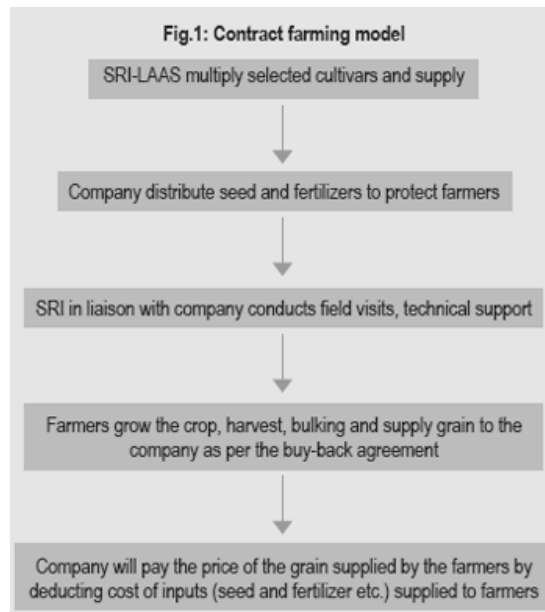
According to Davis (1979), contract farming entails relations between growers and private or state enterprises that substitute for open market exchange by linking normally independent family farmers of widely variant assets with a central processing, export or purchasing unit that regulates in advance price, production practices, product quality and credit.

Gurdev singh (2005) provides a more universal definition of contract farming. "Contract farming is a form of vertical coordination between the producers (farmers) and the contractor (processor or marketing firm or a third party such as input manufacturer or service provider) where the latter directly influences the production decisions and exercises some control at the production point under the obligation of purchasing certain quantity of produce at specific price from the producer. The quantity and price relate to delivery of specific quality produce at designated location and for a period of time."

According to him, "Contract farming is an intermediate institutional arrangement that allows firms to participate in production and exert control over the production process without owning or operating the farms. Contract farming is a system in which agricultural commodities are produced and supplied to particular buyers, mostly processors under pre-negotiated arrangements about price, quality and quantity. It brings producers and processors closer on mutually beneficial terms. The firm is assured of steady supply of quality and material at a stable price. The producer gets a ready market and remunerative price under the arrangement."

In respect of contract farming. There are two schools of thought: One school views it as a dynamic partnership between agri-business firms and small farmers that benefits both without sacrificing the rights of either. The other considers it as a tool for agri-business firms to exploit an unequal power relationship with the small growers, "a form of disguised proletarianisation" as it secures the farmers' land and labor while leaving him with the formal title for both. The company exercises direct effective control on farmers "production efforts while farmer's control is legal but 'illusory' making him propertied laborer".

Under vigilant government and public opinion exploitative arrangements can not last long. Successful contract farming requires a mutually profitable, long term commitment from both parties, i.e. firm and farmer. (Key and Rusten, 1999, Clap, 1994)



5.3 Its Application in India

5.3.1 Brief History

Contract farming is not new to India. It can be traced back to the colonial period when commodities / cash crops such as cotton, indigo, tea, rubber, poppy etc. were produced by Indian farmers for the British companies.

Often such arrangements exploited small peasantry and resulted in indenture and alienation in some instances.

Imperial Tobacco Company (now known as Indian Tobacco Company ITC) introduced cultivation of Virginia tobacco in coastal Andhra Pradesh in the 1920s incorporating most elements of a fair contract system and met with good farmer response. This was replaced by auctions by Tobacco Board in 1984.

Organized public and private seed companies, which emerged in 1960s, had to adopt contract farming from the start since these did not own any land for multiplication of seeds. The seed business could only survive on explicit and formal contracts with farmers covering all relevant factors. Earlier, contracts were with individual farmers. Now contracts are with groups of farmers. This not only ensured supplies, but also helped in meeting quality standards and avoiding disputes.

In 1970s, WIMCO, a Swedish multinational company involved in mechanized match manufacturing, initiated contract farming for Poplar, an exotic plant variety in Punjab, Haryana and Uttar Pradesh. It received good farmer response. (For details, see WIMCO case).

In 1990s, Pepsico set up a tomato processing plant as joint venture with Haryana Agro Industries Corporation. It needed about 40,000 MT of tomato per season. It introduced tomato on a large scale in a non-traditional area, Punjab and Haryana with purchase contracts backed by research and extension support. The scheme met with enthusiastic farmer response and Punjab is now a major tomato growing area.

In 1950, enlightened farmer leaders in Maharashtra integrated cane growing and processing through establishment of sugar cooperatives. These societies provide inputs, extension, advances and supervise/manage harvesting as well as cane delivery to society's factory. These also undertake development work such as link roads, lift irrigation, cane research etc., as well as contribute to social development through establishment of schools, colleges, hospitals etc. Farmers believe their prices to be remunerative and bonus and other social services offered by the society as added incentives for their loyalty to the society.

Many large and more concerned private companies elsewhere in the country, especially in Tamil Nadu and Uttar Pradesh, have taken the cooperative as models and now offer similar, though not all, services to their growers.

The New Agricultural Policy of 2000 of the Govt. of India promoted private sector participation in agribusiness through contract farming. Several agricultural and horticultural crops such as tomatoes, potatoes, chilies, gherkins, cotton, wheat, basmati paddy, flowers, and medicinal plants are being produced under some form of contractual arrangements. Big corporate houses such as Hindustan Lever, Pepsi food, A.V. Thomas, Dabur, Thapers, Marico, Godrej, Mahindras, Wimco etc adopted contract farming on pilot basis. Broiler production in Tamil Nadu was entirely under contract arrangement. Godrej also entered in the boiler business on contract basis.

Niggar in Punjab and Bhilai Engineering in Madhya Pradesh (now in Chattisgarh State) also took up tomato contract cultivation programs shortly after Pepsico.

In recent years, Punjab Govt. promoted contract farming for bulk production of subsistence crops such as paddy-rice, maize and wheat. Punjab government has actively encouraged it as a means of crop diversification. Most such contracts now have specialized contract agencies as interface between farmers and input suppliers/crop purchasers.

“Commodity cooperatives (dairies in Gujarat, sugarcane in Maharashtra) which emerged in 1950s provided most services envisaged under ideal contract farming to their members and bought back the supplies offered at contracted price, although these were not strictly contract arrangements. They succeeded enormously, leading to their replication and compelling private companies also to adopt similar approaches. Contract farming is now

considered to be a corrective to market imperfections and serving a useful purpose in India in its own limited sphere.”

In some pockets, especially non-food crops in Punjab and floriculture in the South and West, farmers have already shown considerable adaptability in accepting new crops and methods of cultivation. While formal contract farming prevails in only some of these instances, many of its desirable features, such as appropriate market intelligence and quality considerations are provided by various agencies, including the intended buyers themselves. Some notable instances are:

- Seed multiplication in Marathawada and Andhra Pradesh.
- Tea and coffee in Karnataka, Kerala and Tamil Nadu.
- Rubber and Pepper in Kerala.
- Poplars in Uttar Pradesh, Haryana and Punjab.
- Medicinal plants in Uttar Pradesh.
- Castor, Isabgol, cumin and aniseed in North Gujarat.
- Jute in West Bengal.
- Tomato and chilies in Punjab, Andhra Pradesh and Karnataka.
- Mangoes in Andhra Pradesh, Tamil Nadu and Maharashtra.

Professor Mathur found that in five samples states, crops covered under contract farming varied from fruits and vegetables, medicinal and aromatic plants to cereals. Different companies initiated contract farming in various states. Mathur’s findings are summarized below:

States		
karnataka	Maharashtra	Madhya Pradesh
-Ashwagandha	-Soybean	-Wheat, maize,
-Dhavana	-Several fruits and	-Soybean
-Marigold	-vegetables, cereals,	-Several fruits and
-Capsica Chilly	-spices and pulses	-vegetables, cereals,
-Coleus		-spices and pulses
-Gherkins		
Punjab	Tamil Nadu	
-Tomato, chilly	-Cotton	
-Barley	-Maize	
-Basmati Rice	-Paddy	
-Maize		
-Groundnut		
-Potato		

You will thus see that contract farming has been tried in various states and covered a variety of crops. Different agro-climate zones produce different specialized crops. For example, tea in North Bengal, and Nilgiri in South, coffee in South, apples in Kashmir and Himachal Pradesh, grapes in Nasik and around Hyderabad.

Main features of the scheme were

- (a) Wimco would establish nurseries, undertake R&D, organize extension service and give adequate publicity to the scheme;
- (b) Wimco nurseries would produce entire transplants (ETPs) and sell them to the farmers;
- (c) Contract farmers would be identified by Wimco and the respective banks;
- (d) At the end of 8 years of growing period, Wimco will buy the trees at a guarantee price or the prevailing market price, whichever is higher;
- (e) The scheme was restricted to Tarai region of Uttar Pradesh and some districts of Punjab and Haryana which showed favorable condition to grow poplars; and
- (f) The scheme would be implemented in two phases, first between 1984 and 1988, and second between 1988 and 1992.

This program had several strong features

- a) A thorough research based approach and excellent extension approach;
- b) Involvement of NABARD to provide refinance for farmer loans from lead banks, and risk cover;
- c) Clearly stated prices and purchase procedures;
- d) Specially recruited and trained extension staff;
- e) Solid backing from not just Indian sponsors, but also its foreign parent.

It was spread over two phases, between 1984 and 1995. It succeeded in meeting or exceeding targets and creating great enthusiasm not only among contract farmers but also among other farmers leading to high supply situation in the region. There was also increasing demand from other users such as plywood manufacturers. So from third phase 1995 onwards Wimco started purchasing the material in competitive open markets.

Thus, we see that company's success in introducing a new product (poplar) through contract farming which resulted in high production in the region led to competitive market replacing contract purchase.

Elements of Contract Farming

There are 17 elements of contract farming:

1. Purpose / Reason

- (a) Quantity of material needed by the company not available in open market.
- (b) Required quality not available in open market.
- (c) Need for bulk and cost-effective procurement.
- (d) Easy market access to farmers.

2. **Time of Contract**
 - (a) Pre-harvest
 - (b) Post-harvest
3. **Minimum Size of Contractual Acreage**

(May vary from commodity to commodity. The unit of measurement may vary from area/acreage for crops to quantity say number of animals in case of dairy).
4. **Registration Process**
 - (a) Registration fees
 - (b) Signing a simple document
5. **Partners in the Consortium**
 - (a) State government / board (in case of plantation crops such as spices board, tea board etc.
 - (b) Financial Institutes
 - NABARD
 - Banks
 - (c) Input providers
 - (d) Service providers
 - (e) Insurance providers
6. **Insurance supplied**
 - (a) Life insurance
 - (b) Crop insurance
7. **Inputs Provided**
 - (a) Fertilizers
 - (b) Seeds
 - (c) Pesticides
8. **Services Provided**
 - (a) Extension services
 - (b) Monitoring quality
9. **Quantity Specifications**
 - (a) Main products
 - (b) By products
10. **Harvesting Time**
 - (a) Decided by corporate
 - (b) Decided by producer
11. **Price Fixation Criteria**
 - (a) Prefixed (including or excluding cost of handling, packaging, transport, taxes and octroi).
 - (b) Market base
 - (c) Pre-fixed with market link component

12. Procurement Strategy

- (a) Delivery taken at farm gate
- (b) Delivery taken at factory/god own gate
- (c) Delivery at designated mandis

13. Packaging

- (a) Provided by the buyer at his cost
- (b) Provided by the producer at his cost

14. Handling

- (a) Cost borne by the producer
- (b) Cost borne by the buyer

15. Transport

- (a) Arranged and paid by the producer up to delivery point
- (b) Arranged and paid by the buyer up to delivery point
- (c) Arranged by producer but paid by the buyer at delivery point
- (d) Transport subsidy paid by company / government / board

16. Mode of Payment

- (a) Cash
- (b) Cheque

17. Time of Payment

- (a) Part or full payment immediately
- (b) Remaining part or full payment in a given time period (week, fortnight, month)
- (c) As per specified payment schedule

5.4 Effectiveness of Contract Farming

5.4.1 Prerequisites for Contract Farming

From the history of contract farming we learn that acceptance or rejection of contract farming methods depend upon several agricultural and socio-economic factors such as:

- Resource endowment of the region.
- Resource base of the farmer, including alternative or additional sources of income.
- Physical and marketing risks involved in the production and disposal of the crops in question, and their perception by growers.
- Extent of infrastructure facilities required for efficient and effective disposal of crops and their actual availability.
- Market structures and their efficiency.
- Farmers' awareness of the ultimate form and use of the commodity and value addition.
- Nature of contact and assurances, finance and facilities provided and penalties stipulated.

- Track record of contract buyer.
- Length of relationship under contract.
- Farmers' previous experience of contracts.

A company intending to follow contract farming system should, at the stage of planning itself, critically examine the above factors.

5.4.2 When Does Contract Farming Work Well?

Contract Farming Generally Works Quite Well When

- (a) The contracted commodity does not have significant direct consumption market, as in case of plantation crops (tea, coffee etc.), sugarcane or seeds.
- (b) Company offers fair price and adequate risk cover;
- (c) Company ensures timely payment since "farmers are loyal to money".
- (d) The produce is new, exclusive, unique, not normally cultivated in the region (for example poplar in case of WIMCO; Gharkin production).
- (e) Company provides needed planting materials and inputs;
- (f) Both parties believe in mutually beneficial relations.
- (g) Trust relationship is built up over a long period of time.
- (h) There is a strong self regulatory social systems (social control) among the growers.
- (i) Contract is properly designed, clearly understood by grower farmers and sincerely implemented.

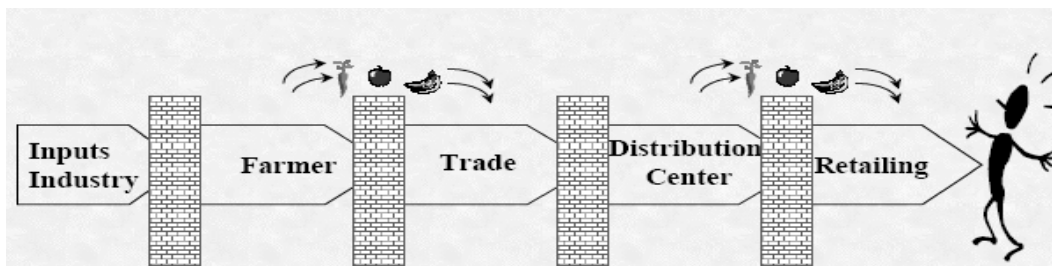
Supply Chain Management - Resource Material

6.1 Introduction

Supply chain management (SCM) represents the management of the entire set of production, manufacturing/transformations, distribution and marketing activities by which a consumer is supplied with a desired product. The practice of SCM encompasses the disciplines of economics; marketing, logistics and organizational behaviour to study how supply chains are organized and how institutional arrangements influence industry efficiency, competitions and profitability.

6.2 Supply Chain Management - An overview

SCM provides a means to conceptualize management of the changes required in the system to efficiently respond to consumer needs, based on integration and co-ordination of the efforts of all the business units involved in the production and delivery processes.



Managing supply chains requires an integral approach in which chain partners jointly plan and control the flow of goods, information, technology and capital from 'farm to fork', meaning from the suppliers of raw materials to the final consumers and *vice versa*.

Supply chain management results in lower transaction costs and increased margins. Because of the many activities and aspects involved it demands a multidisciplinary approach and sustainable trade relations. Supply chain partnerships are based on interdependence, trust, open communication and mutual benefits.

Interest in supply-chain management (SCM) in the agribusiness sector emerged as recently in the 1990s, but has grown rapidly as a result of a number of internal and external pressures, and is now a key area of research and commercial activity in the sector. The advantages of the supply chain management approach are numerous. Some important advantages are:

- Reduction of product losses in transportation and storage.
- Dissemination of technology, advanced techniques,
- Capital and knowledge among the chain partners.

Better information about the flow of products, markets and technologies.
 Transparency, Tracking & tracing to the source.
 Better control of product safety and quality.
 Large investments and risks are shared among partners in the chain.

6.2.1 Stages of Supply chain

In general, supply chain may involve a variety of stages. The supply chain stages include;

- Customers
- Retailers
- Wholesalers/Distributors
- Manufacturers
- Component / Raw material suppliers

Fig 1.1 Stages of a Detergent Supply Chain

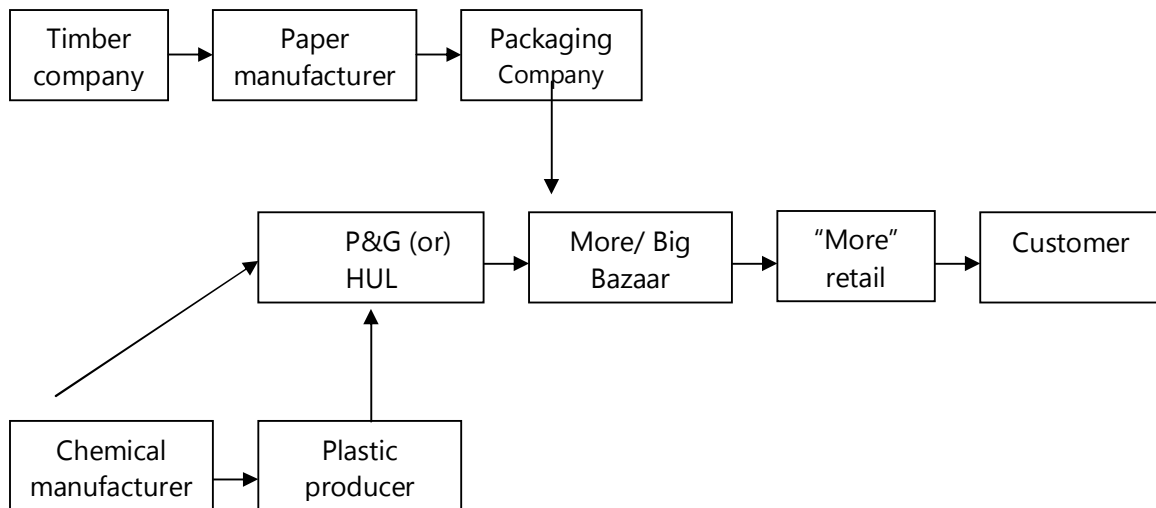


Figure 1.1 represents the detergent supply chain starting from Raw materials (timber company, paper manufacturer, Packaging company, Chemical supplier, plastic producer), Manufacturer (P&G, HUL), Whole saler (More/ Big bazaaar), Retailer(Kannan departmental store/ More) and finally customer

6.2.2 Process view of a supply chain

A supply chain is a sequence of processes and flows that take place within and between different stages and combine to fill a customer need for a product. There are two different ways to view the processes performed in a supply chain.

1. Cycle view : The processes in a supply chain are divided into a series of cycles, each performed at the interface between two successive stages of a supply chain.
2. Push/pull view : The processes in a supply chain are divided into two categories depending on whether they are executed in response to a customer order or in anticipation of customer orders. Pull processes are initiated by a customer order whereas push processes are initiated and performed in anticipation of customer orders.

Cycle view of supply chain processes

All supply chain processes can be broken down into the following four process cycles.

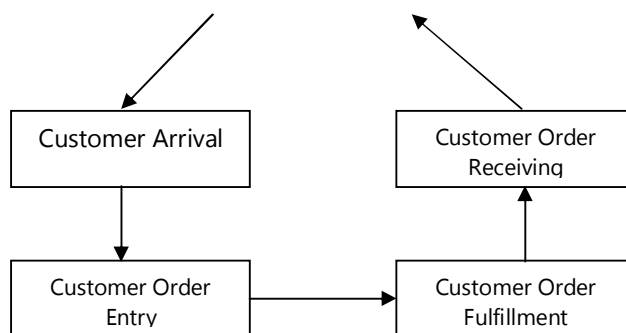
- Customer order cycle
- Replenishment cycle
- Manufacturing cycle
- Procurement cycle

Customer Order Cycle

The customer order cycle occurs at the customer / retailer interface and includes all processes directly involved in receiving and filling the customer's order. Typically, the customer initiates this cycle at a retailer site and the cycle primarily involves filling customer demand. The retailer's interaction with the customer starts when the customer arrives or contact is initiated and ends when the customer receive the order.

- Customer arrival
- Customer order entry
- Customer order fulfillment
- Customer order receiving

Fig 1.2 Customer order cycle

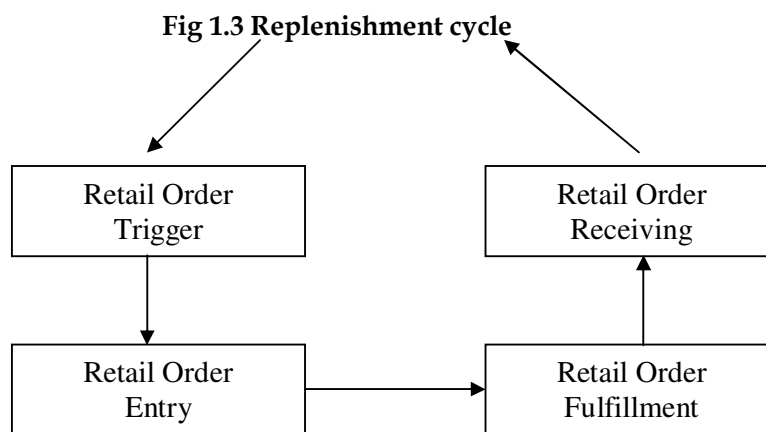


Replenishment Cycle

The Replenishment cycle occurs at the retailer/distributor interface and includes all processes involved in replenishing retailer inventory. It is initiated when a retailer places an order to replenish inventories to meet future demand. A replenishment cycle may be triggered at a supermarket that is running out of stock of detergent or at a mail order firm that is low on stock of a particular shirt.

The replenishment cycle is similar to the customer order cycle except that the retailer is now the customer. The objective of the replenishment cycle is to replenish inventories at the retailer at minimum cost while providing high product availability. The processes involved in the replenishment cycle are shown in the figure 1.3 and include;

- Retail order trigger
- Retail order entry
- Retail order fulfillment
- Retail order receiving

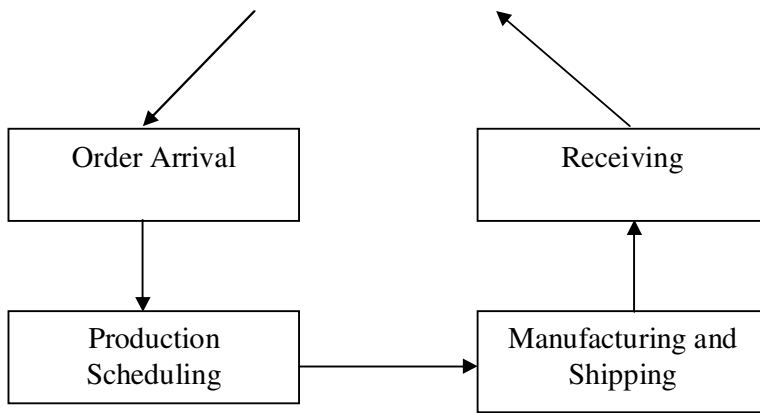


Manufacturing Cycle

The manufacturing cycle typically occurs at the distributor/manufacturer (or retailer/manufacturer) interface and includes all processes involved in replenishing distributor (or retailer) inventory. In this case the manufacturing cycle is anticipating customer demand (referred to as a push process). The processes involved in the manufacturing cycle include the following.

- Order arrival from the finished-goods warehouse, distributor, retailer, or customer
- Production scheduling
- Manufacturing and shipping
- Receiving at the distributor, retailer, or customer

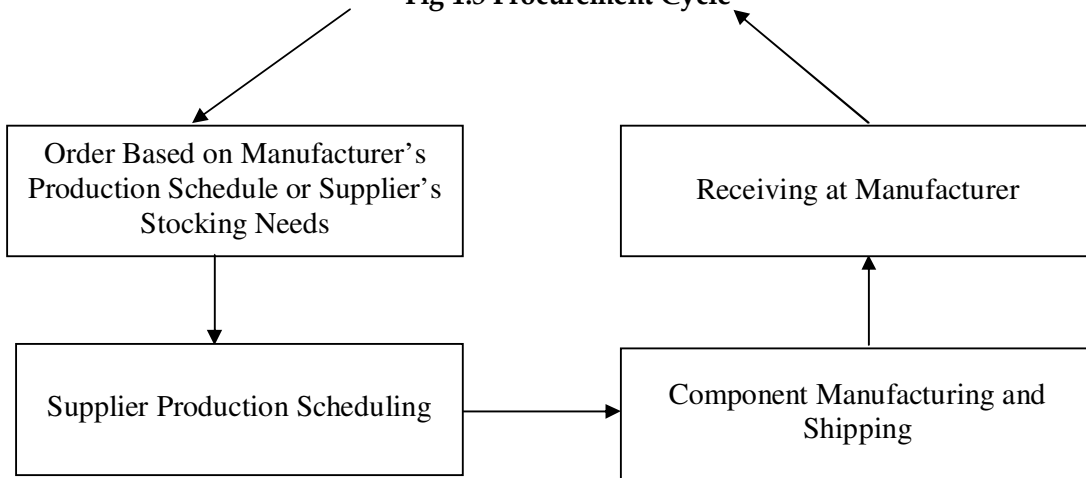
Fig 1.4 Manufacturing Cycle



Procurement Cycle

The procurement cycle occurs at the manufacturer/supplier interface and includes all processes necessary to ensure that materials are available for manufacturing to occur according to schedule. During the procurement cycle, the manufacturer order components from suppliers that replenish the component inventories.

Fig 1.5 Procurement Cycle



Push / Pull View of Supply Chain Processes

Pull processes, execution is initiated in response to a customer order. With push processes, execution is initiated in anticipation of customer orders. Therefore, at the time of execution of a pull process, customer demand is known with certainty whereas at the time of execution of a push process, demand is not known and must be forecast. Pull processes may also be referred to as reactive processes because they react to customer demand. Push processes may also be referred to as speculative processes because they respond to speculated (or forecasted) rather than actual demand.

For example in Dell (build-to-order computer manufacturer), the beginning of PC assembly represents the push/pull boundary. All processes before PC assembly are push processes and all processes after and including assembly are initiated in response to a customer order and are thus pull processes. Whereas, in L.L.Bean, a mail order company that receives customer orders through its telemarketing center or Website. It executes all processes in the customer order cycle after the customer arrives. All processes that are part of the customer order cycle are thus pull processes.

One clear distinction between the two supply chains discussed earlier is that the Dell supply chain has fewer stages and more pull processes than the L.L.Bean supply chain.

6.2.3 Drivers of Supply Chain Performance

Four key drivers of supply chain performance are facilities, inventory, transportation and information. These drivers not only determine the supply chain's performance in terms of responsiveness and efficiency, but also determine whether strategic fit is achieved across the supply chain.

Inventory

Inventory is nothing but raw materials, work in process and finished goods within a supply chain. Inventory is an important supply chain driver and it is one of the factors that decide the supply chain's efficiency and responsiveness.

Transportation

Transportation entails moving inventory from one point to another point in the supply chain. Transportation choices have a large impact on supply chain responsiveness and efficiency.

Facility

These are locations where raw materials, finished goods are stored or fabricated and distributed. The two major types of facilities are production sites and storage sites. Whatever the function of the facility, decisions regarding location, capacity and flexibility of facilities have a significant impact on the supply chain's performance.

Information

Information consists of data and analysis concerning facilities, inventory, transportation, and customers throughout the supply chain. Information is potentially the

biggest driver of performance in the supply chain as it directly affects each of the other drivers.

6.2.4 Distribution in the supply chain Management

Distribution refers to the steps taken to move and store a product from the supplier stage to the customer stage in the supply chain. Distribution occurs between every pair of stages in the supply chain. Distribution is a key driver of the overall profitability of a firm because it directly impacts both the supply chain cost and the customer experience.

Distribution related costs form about 10.5 percent of the U.S. economy and about 20 percent of the cost of manufacturing. For commodity products, distribution forms an even higher fraction of the product cost. In India, the outbound distribution cost of cement is about 30 percent of the cost of production and selling cement.

Wal-Mart and 7-Eleven Japan, have built the success of their entire business around outstanding distribution design and operation. In the case of Wal-Mart, distribution allows them to provide good availability or relatively common products at very low cost. In the case of 7-Eleven distribution allows them to provide a very high level of customer responsiveness at a reasonable cost.

Factors influencing distribution network design

- Customer needs
- Cost of meeting customer needs
- Response time: It is the time between when a customer places an order and receives delivery.
- Product variety: It is the number of different products/configurations that a customer desires from the distribution network.
- Product availability: Availability is the probability of having a product in stock when a customer order arrives
- Customer experience: It is purely experiential aspects like customer satisfaction and customer delight.
- Order visibility: It is the ability of the customer to track their order from placement to delivery
- Return ability: It is the ease with which a customer can return unsatisfactory merchandise and the ability of the network to handle such returns.

Case 1 Consumer Goods distribution in India

In India, consumer goods are sold through tens of million of small retail outlets. Most Indian distributors are one-stop shops stocking everything from cooking oil to soaps and detergents made by a variety of manufacturers. Besides, the convenience provided by one-

stop shopping, distributors are also able to reduce transportation costs for outbound delivery to the retailer by aggregating products across multiple manufacturers during the delivery runs. Distributors are able to replenish retailers with a much shorter response time than a manufacturer would be able to provide.

The presence of distributors thus improves performance of the consumer goods supply chain in India by lowering transportation cost and improving replenishment response time. The major services provided by them are the ability to take in shipments, break bulk, store inventory, and provide outbound delivery to retailers.

6.3 Forecasting in Supply Chain

The forecast of demand forms the basis for all strategic and planning decisions in a supply chain. Throughout the supply chain, all push processes are performed in anticipation of customer demand whereas all pull processes are performed in response to customer demand. For push processes, a manager must plan the level of production. For pull processes, a manager must plan the level of available capacity and inventory. In both instances, the first step a manager must take is to forecast what customer demand will be.

Following are the forecasting of critical factors to be considered for Different departments in the company

Production : Scheduling, inventory control, aggregate planning, purchasing, Quality
Marketing : Sales-force allocation Test market, Target market, market segmenting
Finance : Plant/machinery investment, budgetary planning,
Personnel : Workforce planning, hiring, layoffs. Retrenchment, Redeployment

- Mature products with stable demand are usually easiest to forecast. Eg, milk or paper.
- Forecasting is difficult during either supply of raw materials or the demand for the finished product is highly variable. Eg: fashion goods and many high-tech products.

Good forecasting is very important in these cases because the time window for sales is narrow and if a firm has over or under produced, it has little chance to recover. For a product with a long life cycle, in contrast, the impact of a forecasting error is less significant.

6.3.1 Characteristics of Forecasting

Companies and supply chain managers should be aware of the following characteristics of forecasts:

1. Forecasts are always wrong and should thus include both the expected value of the forecast and a measure of forecast error. To understand the importance of forecast

error, consider two car dealers. One of them expects sales to range between 100 and 1900 whereas the other expects sales to range between 900 and 1,100. Even though both dealers anticipate average sales of 1,000 the sourcing policies for each dealer should be very different given the difference in forecast accuracy.

2. Long-term forecasts are usually less accurate than short-term forecasts; that is long-term forecasts have a larger standard deviation of error relative to the mean than short-term forecasts. For example, if a store manager places an order by 10 AM., the order is delivered by 7 PM on the same day. The manager thus has to forecast what will sell that night less than twelve hours before the actual sale. The forecast in this case is likely to be more accurate than if the store manager had to forecast demand one week in advance.
3. Aggregate forecasts are usually more accurate than disaggregate forecasts as they tend to have a smaller standard deviation of error relative to the mean. For example, it is easy to forecast the Gross Domestic Product (GDP) of the United States for a given year with less than a 2 percent error. However, it is much more difficult to forecast yearly revenue for a company with less than a 2 percent error, and it is even harder to forecast revenue for a given product with the same degree of accuracy.

The key difference between the three forecasts is the degree of aggregation. The GDP is an aggregation across many companies and the earnings of a company are an aggregation across several product lines. The greater the degree of aggregation, the more accurate the forecast.

6.3.2 Forecasting Methods

Forecasting methods are classified according to the following four types

Qualitative : Qualitative forecasting methods are primarily subjective and rely on human judgement. They are most appropriate when there is little historical data available or when experts have market intelligence that is critical in making the forecast.

Time Series: Time series forecasting methods use historical demand to make a forecast. They are based on the assumption that past demand history is a good indicator of future demand.

Casual : Casual forecasting methods assume that the demand forecast is highly correlated with certain factor in the environment (e.g., the state of the economy, interest rates, etc.). For example, product pricing is strongly correlated with demand.

Simulation : Simulation forecasting methods imitate the consumer choices that give rise to demand to arrive at a forecast.

A company must be knowledgeable about numerous factors that are be related to the demand forecast.

- Past demand
- Lead time of product

- Planned advertising or marketing efforts
- Economic factors
- Price discounts
- Competitors

6.3.3 Basic approach to demand forecasting

The following basic, six-step approach helps an organization perform effective forecasting:

1. Understand the objective of forecasting
2. Integrate demand planning and forecasting throughout the supply chain
3. Understand and identify customer segments
4. Identify the major factors that influence the demand forecast
5. Determine the appropriate forecasting techniques
6. Establish performance and error measures for the forecast.

Understand the objective of Forecasting

The objective of every forecast is to support decisions that are based on the forecast, so an important first step is to clearly identify these decisions. Examples of such decisions include how much of a particular product to make, how much to inventory, and how much to order. All parties affected by a supply chain decision should be aware of the link between the decision and the forecast.

Integrate Demand Planning and Forecasting throughout the Supply Chain

A company should link its forecast to all planning activities throughout the supply chain. These include capacity planning, production, promotion planning, and purchasing, among others. This link should exist at both the information system and the human resource management level.

Understand and Identify Customer Segments

Customers may be grouped by similarities in service requirements, demand volumes, order frequency, demand volatility, seasonality and so forth. In general, companies may use different forecasting methods for different segments. A clear understanding of the customer segments facilitates an accurate and simplified approach to forecasting.

Identify the Major Factors that influence the Demand Forecast

A firm must identify major factors that influence the demand forecast. A proper analysis of these factors is central to developing an appropriate forecasting technique. The main factors influencing forecasts are demand, supply, and product related phenomena. These estimates must be based on demand – not sales data.

Determine the appropriate Forecasting Techniques

In selecting an appropriate forecasting technique, a company should first understand the dimensions that will be relevant to the forecast. These dimensions include geographical area, product groups and customer groups. A firm would be wise to have different forecasts and techniques for each dimension.

Establish Performance and error measures for the Forecast

Companies should establish clear performance measure to evaluate the accuracy and timeliness of the forecast. These measures should correlate with the objectives of the business decisions based on these forecasts.

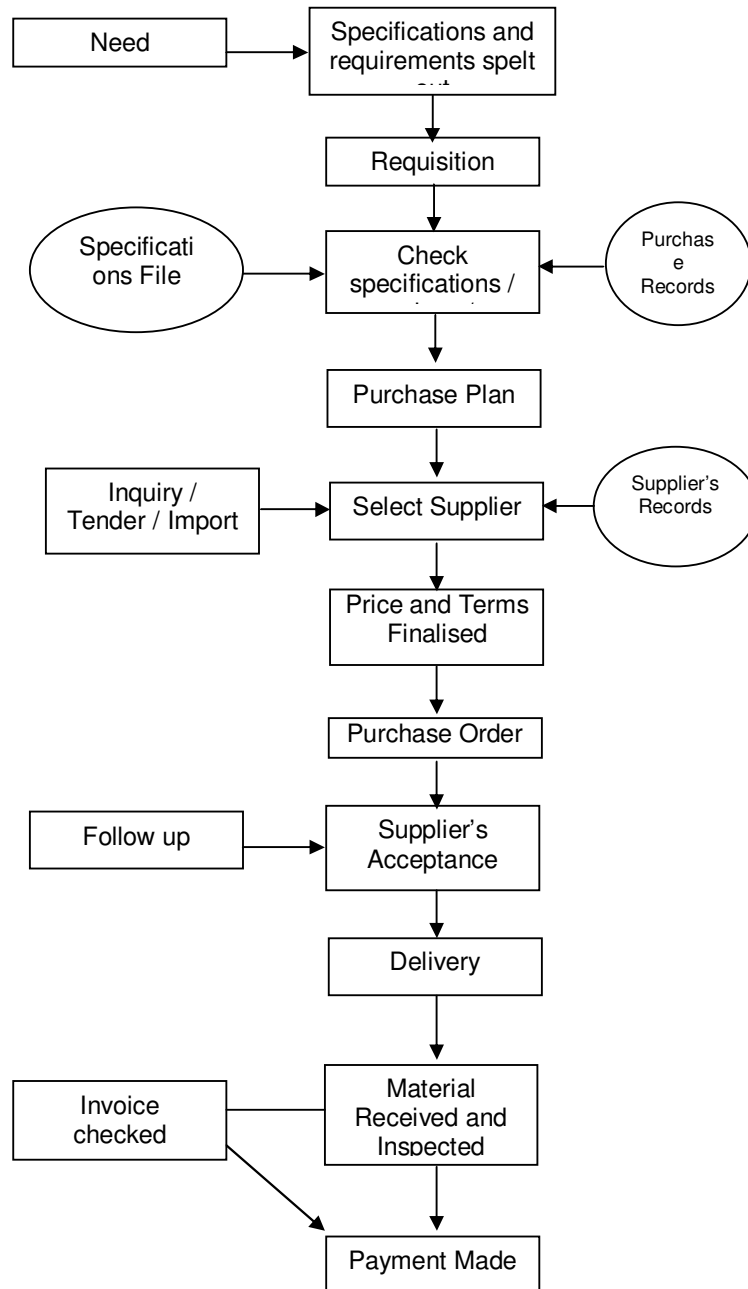
6.4 Purchasing & Inventory Management

Purchasing is also known as procurement, is the process by which companies acquire raw materials, components, products, services and other resources from suppliers to execute their operations. According to Alford and Beary "Purchasing is the procuring of materials, supplies, machine tools and services required for the equipment, maintenance and operation of a manufacturing plant". Sourcing is the entire set of business processes required to purchase goods and services. Sourcing processes include the selection of suppliers, design of supplier contracts, product design collaboration, procurement of material, and evaluation of supplier performance.

6.4.1 Objectives of purchasing

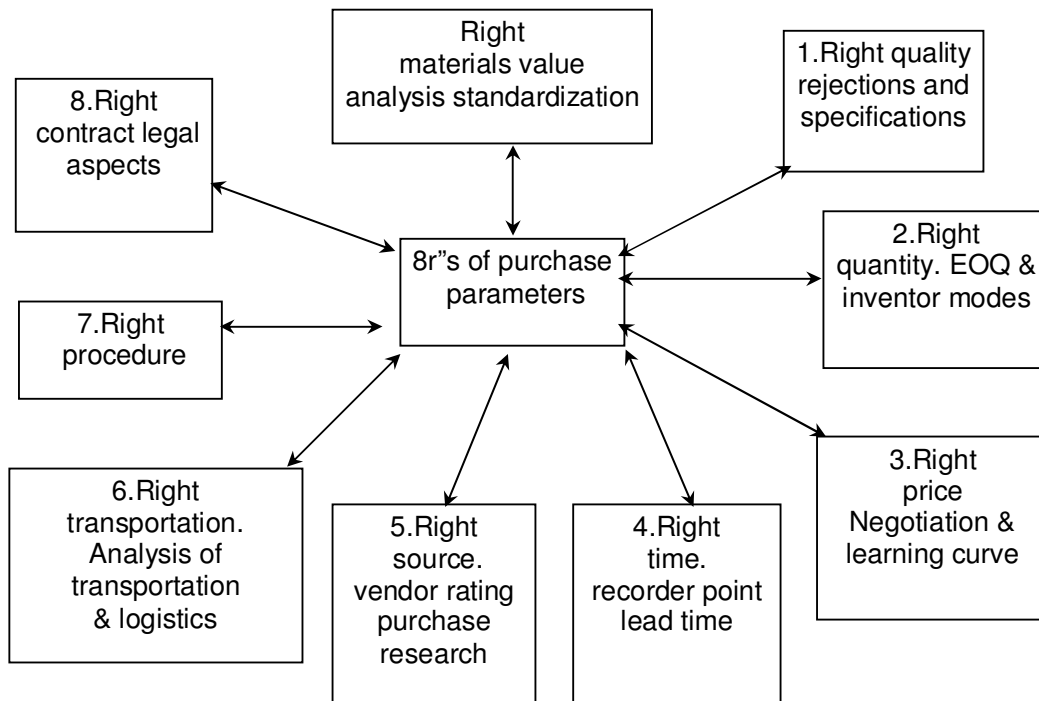
- To procure needed material at a competitive price of the right quality, quantity and at right time.
- Regular and continuous supply
- To suggest better substitute
- To assist in fixing probable price and delivery
- Create goodwill-dealing with supplier
- To render assistance in standardization, make or buy decisions

Purchasing cycle



6.4.2 Purchase Parameters

Eight Rights (8R's) of purchasing



1. Right quality

Methods of providing specification are -brand or trade name, commercial standard, performance standard, blue print, samples etc.

2. Right quantity

It is influenced by replenishment methods and buying methods.

Buying methods

- Hand to mouth
- Scheduled buying
- Forward buying
- Contract buying

3. Right price

- It minimize the overall cost
- To arrive at the right price the following techniques are employed :
Negotiation is used
Tender system
Learning curve

4. Right time

Right time implies that time at which the goods requested should be received while lead time refers to the time between the communication of the need for an item to be purchased by the indenter till the item is actually received and is made available for consumption.

5. Right source

Right source aspect involves decision as to:

- The kind of items to be purchased directly from the manufacturers
- From which dealers
- From which open market
- Also requires the analysis of transportation costs and distance incurred

6. Right place of delivery

- Items have to be supplied directly to the consuming units, which may be located at far distance from the headquarters.
- The place of delivery should be clearly mentioned in the supply order.

7. Right procedure

- Right procedure to be adopted and developed for the pre-purchase, ordering and post purchase systems.

8. Right contract

- It is legal document that binds the selling company with the buying company.
- Various terms and conditions about insurance, sales tax, excise, customs, breach of contract, settlement of dispute etc.

6.4.3 Types of purchasing

I) Contract purchasing

All purchases are made under contracts, usually formal of needed material, frequently spread over a period of time. Ex: Purchasing clocks, air conditioner, and computer.

Characteristics

- Contract for future requirement
- Cycle time may be a week, fortnight, or a month
- The buying department usually takes sufficient time to secure competitive bids and negotiation on other term of contract

Kardex system

This system is widely used by the purchase officers and following information can be obtained from it.

- What should be purchased?
- From whom purchase should be made?
- At what rate?
- When the material to be delivered?
- Has it been delivered?
- Whether payment has been made?

For each item of purchase, a separate card is maintained to keep record of a purchase order till receipt of material. When requisitioner sends an indent it is entered in the card along with the details of enquiry and quotations and last date of receipt, etc.

When the order is placed, then details of the purchase order are recorded in another card, such as:

- a. Order Number
- b. Date
- c. Quantity
- d. Rate accepted
- e. Delivery period
- f. The name of the supplier

This above information is very useful, if a repeat order is required to be placed.

II) Blanket orders

It refers to the purchase of variety of items from a single source, usually a middle man.
Ex; Hard ware, electrical supplies, stationery, small cutting tools etc.

III) Tender purchasing

Types of tender

- a. Single tender
- b. Closed tender
- c. Open tender
- d. Global tender

IV) Seasonal purchasing

Buying of the annual requirements of an item during its season

Ex : Fruits like orange, apple, and mango

V) **Sub-contracting**

It is the work placed with outside supplier to manufacturer a particular item as per the specification of the main contractor for economic reasons or to augment the existing manufacturing facilities. Sub contracting will play major role during

- Big order time
- Company concentrates on certain items and buys the rest from out side
- Get certain operations like electro plating, heat treatment, rough blanking etc.

VI) **Group purchasing**

This refers to buying of items of trial value in a single purchase order

- Minimum & maximum levels are fixed for each item
- Stocks will be reviewed periodically
- Items are classified into few basic groups and these groups are dependent on the source of purchase.

VII) **Purchasing by Requirements**

Purchases are made whenever a need arises and that too only the quantity required is purchased. This method is suitable for made to order jobs goods used infrequently, etc.

VIII) **E-Purchasing**

The Internet is a valuable tool for marketing and selling to customers across town or around the world. It also provides an abundance of buying and cost saving opportunities.

According to a recent survey of professional purchasers by Purchasing Online magazine, the web offers a wide range of significant purchasing benefits.

Auction Hubs

Different types of auctions are

- Commodity auctions (oil, natural gas, electricity),
- Independent auctions (first-run and surplus manufacturing goods), and
- Private auctions (geared toward re-sellers and dealers, rather than end users).

Examples E-Bay at www.ebay.com, www.freemarkets.com

Advantages

- Achieve a dramatically higher level of procurement efficiency and cost savings
- Shift employees' focus from paperwork to productivity
- Realize your goal of a completely paperless purchasing environment

- Use information more efficiently by integrating enhanced transaction data with our existing system
- Mitigate risk by setting detailed purchasing parameters for individual buyers
- Maximize vendor contracts and gain from economies of scale
- Achieve faster cycle times throughout the organization

6.4.4 Inventory Management

A lot or batch size is the quantity that a stage of the supply chain either produces or purchases at a given time. Consider, for example, a computer store that sells an average of four printers a day. The store manager, however, orders 80 printers from the manufacturer each time he places an order. The lot or batch size in this case is 80 printers. Given daily sales of four printers, it takes an average of twenty days before the store sells the entire lot and purchases a replenishment lot. The computer store holds an inventory of printers because the manager purchased a lot size larger than the store's daily sales. Cycle inventory is the average inventory in the supply chain due to either production or purchases in lot size that are larger than those demanded by the customer.

Cycle inventory is primarily held to take advantage of economies of scale and reduce cost within the supply chain. Increasing the lot size or cycle inventory often decreases the cost incurred by different stages of a supply chain. To understand how the supply chain achieves these economies of scale, we must first identify supply chain costs that are influenced by the lot size.

Supplier scoring and assessment

When comparing suppliers, many firms make the fundamental mistake of focusing only on the quoted price, ignoring the fact that suppliers may differ on other important dimensions that impact the total cost of using a supplier. The following factors other than quoted price considered are:

- Replenishment lead time
- On-time performance
- Supply flexibility
- Delivery frequency / minimum lot size
- Supply quality
- Inbound transportation cost
- Pricing terms
- Design collaboration capability
- Exchange rates, taxes and duties
- Supplier viability

Supplier selection and contracts

Supplier selection should be based on total cost of using a supplier and not just the purchase price. Before selecting suppliers, a firm must decide whether it will use single sourcing or will have multiple suppliers from which to source the product.

Single sourcing is used to guarantee the supplier sufficient business when the supplier has to make a significant buyer-specific investment. The buyer-specific investment can take the form of plant and equipment designed to produce a part that is specific to the buyer or could take the form of expertise that needs to be developed. Single sourcing is also used in the automotive industry for parts such as seats that must arrive in the sequence of production. Coordinating such sequencing would be impossible with multiple sources.

6.4.5 Contracts for Product Availability and Supply Chain Profits

Many shortcomings in supply chain performance occur because the buyer and supplier are two different entities, each trying to optimize their own profits. Actions taken by the two parties in the supply chain thus result in profits that are lower than what could be achieved if the supply chain were to coordinate its actions with a common objective of maximizing supply chain profits.

Three contracts that increase overall profits by making the supplier share some of the buyer's demand uncertainty are as follows:

1. Buyback or return contracts
2. Revenue-sharing contracts
3. Quantity flexibility contracts

Buyback Contracts

A buyback or return clause in a contract allows a retailer to return unsold inventory up to a specified amount, at an agreed upon price. For example, the supplier to the music store may agree to buy back discs that have not sold at \$3 per disc. This lowers the loss to the retailer for each unsold disc from \$5 to \$2. The supplier absorbs the \$3 per unsold disc as a reduction in margin. The presence of the buyback clause makes it optimal for the retailer to order more discs, resulting in higher product availability and higher profit for both the retailer and the supplier. Buyback contracts are most effective for products with a low variable cost.

Examples: music, software, books, magazine and newspapers.

Revenue Sharing Contracts

In a revenue sharing contract, the buyer pays a minimal amount for each unit purchased from the supplier but shares a fraction of the revenue for each unit sold. For

example, the supplier agrees to sell each disc to the music store at \$1 but the music store agrees to share 50 percent of the revenue from each disc sold.

One advantage of revenue sharing contracts over buyback contracts is that no product needs to be returned, thus eliminating the cost of returns. Revenue-sharing contracts are best suited for products with low variable cost and a high cost of return.

Example: Block buster video rentals and movie studios.

Quantity Flexibility Contracts

A quantity flexibility clause allows the buyer to modify the order (within limits agreed to by the supplier) as demand visibility increases closer to the point of sale. For example, the music store would place an initial order for, say, 1,000 discs. Closer to the release date, as the store got a better idea of actual demand; they would be allowed to modify their order to any number between 950 and 1,050. In this contract, the retailer modifies his order as he gains better market intelligence over time. The supplier in turn only sends the modified order quantity. The amount ordered by the retailer will be more in line with actual demand resulting in higher profits for the supply chain.

Purchasing is a function of procuring goods and services from sources external to the organization. According to Alford and Beary "Purchasing is the procuring of materials, supplies, machine tools and services required for the equipment, maintenance and operation of a manufacturing plant".

6.5 Warehouse Management

6.5.1 Storage

Storage is an important marketing function, involves holding & preserving goods from the time they are produced until they are needed for consumption. Therefore, storage add the time utility to products.

Traditional storage methods

- Kothi or Mud pots – Unburnt clay mixture with straw and cowdung
- Kuthla – Mud brick, straw and cowdung
- Thekka – Rectangular made up of gunny or cotton wound around wooden support
- Metal drums – Iron sheets
- Gunny bags

6.5.2 Warehouse

A warehouse is a commercial building or premises designed and built for the purpose of bulk storage of raw materials or finished or partly finished goods which can be used in future. First commercial warehouse was started in Venice, USA in 1928. In India, first warehouse was setup in the year 1956 at Bihar

Warehousing Infrastructure Empowering the Agriculture Sector

Warehouses must be designed to accommodate the loads of the materials to be stored, the associated handling equipment, the receiving and shipping operations and associated trucking, and the needs of the operating personnel.

India is witnessing a spurt in warehousing infrastructure with the archaic supply chain management facilities going for a makeover and capacity addition. There is an element of dynamism and the online commodity futures market is hastening the change.

Need of Warehousing Infrastructure

- Storage of food grains, fresh vegetables and fruits, meat, seafood and other food stuffs from the farmers to the retailers.
- Moving forward to the macro level, better storage will provide more food security by meeting the unseasonal demand, avoiding the import of food grains and other items.
- To preserve, to store and to protect the commodities
- Avoid pests and dusts
- By producing Warehouse receipts loans can be taken

6.5.3 Types of Warehousing

Different types of agricultural commodities need different storage facilities. While some need to maintain an optimum temperature and moisture, others may need to be kept free from insect and pest attacks and so on.

The types of warehousing are as follows (Archarya and Agarwal, 2001)

Based on ownership

- **Private** : Owned by private parties
- **Public**: Owned by the government, eg. CWC and SWC
- **Bonded**: Licensed by the government and is constructed nearby airports/seaports. It accepts imported goods till the payment/custom clearance is done by the importer

Based on the type of commodities stored

- **General** : It is an ordinary warehouse to store general items, e.g. food grains

- **Special commodities warehousing:** It is made to store specific commodities, e.g., Tobacco, Cotton, Wool, etc.
- **Refrigerators:** It stores perishable commodities, where the temperature is maintained between 30-50 degrees or even less.
- **Cold Storage**

“Cold storage warehouse” shall mean any place artificially cooled to or below a temperature above zero of 45 degrees Fahrenheit in which articles of food are placed and held for thirty days or more

- First cold storage warehouse established in New York in 1865 for fish
- In India cold storage order was passed in 1964. In India the first cold storage was established in 1892 at Calcutta

Criteria for Good Warehousing

Following are the different criteria for good warehousing:

- Maximum utilization of space
- Freeze and chilled environment (Preferably)
- Sophisticated handling equipment
- Light-colored roofs and energy-efficient operational equipments
- Wide distribution network and access to nearby roads, ports and railways.
- Safety measures for hazardous material.

6.5.4 Agencies Involved

In India, the Central Warehousing Corporations (CWC), State Warehousing Corporations (SWC) and Food Corporation of India (FCI) are involved in storing the major agri-commodities (Table 1). The private parties like ITC, Cash and Carry are coming up in this sector. The government is also encouraging the private parties to participate in this process.

6.6 Transportation

Transportation refers to the movement of product from one location to another as it makes its way from the beginning of a supply chain to the customer’s hands. Transportation plays a key role in every supply chain because products are rarely produced and consumed in the same location.

With the growth in e-commerce and the associated home delivery of products, transportation costs have become even more significant in retailing

6.6.1 Factors affecting transportation decisions

There are two key players in any transportation that takes place within a supply chain.

- The shipper is the party that requires the movement of the product between two points in the supply chain.
- The carrier is the party that moves or transports the product.

For example, when Maruti car(MUL) uses ABT parcel service to ship its cars from the factory to the customer, Maruti car (MUL) is the shipper and ABT parcel service is the carrier.

Factors affecting carrier decisions

1. Vehicle related cost
2. Fixed operating cost
3. Trip-related cost
4. Quantity-related cost
5. Overhead cost

Factors affecting shippers' decisions

1. Transportation cost
2. Inventory cost
3. Facility cost
4. Processing cost
5. Service level cost

6.6.2 Modes of transportation and their performance characteristics

Supply chains use a combination of the following modes of transportation :

- Air
- Package carriers
- Truck
- Rail
- Water
- Pipeline
- Intermodal

Design options for a transportation network

Direct Shipping Network

With this option, the retail chain structures, its transportation network to have all shipments come directly from suppliers to retail stores. With a direct shipment network,

the routing of each shipment is specified and the supply chain manager only needs to decide on the quantity to ship and the mode of transportation to use.

The major advantage of a direct shipment transportation network is the elimination of intermediate warehouses and its simplicity of operation and coordination.

Direct Shipping with Milk Runs

A milk run is a route in which a truck either delivers product from a single supplier to multiple retailers or goes from multiple suppliers to a single retailers.

Direct shipping provides the benefit of eliminating intermediate warehouses, whereas milk runs lower transportation cost by consolidating shipments to multiple stores on a single truck.

For example, Toyota uses milk runs from suppliers to support its just in time manufacturing system in both Japan and the United States. In Japan, Toyota has many assembly plants located close together and thus uses milk runs from a single supplier to many plants. In the United States, however, Toyota uses milk runs from many suppliers to its assembly plants.

6.6.3 Bullwhip effect

Supply chain coordination improves if all stages of the chain take actions that together increase total supply chain profits. Supply chain coordination requires each stage of the supply chain to take into account the impact its actions have on other stages.

A lack of coordination occurs either because different stages of the supply chain have objectives that conflict or because information moving between stages gets delayed and distorted. Different stages of a supply chain may have objectives that conflict if each stage has a different owner.

Many firms have observed the bullwhip effect in which fluctuations in orders increase as they move up the supply chain from retailers to wholesalers to manufacturers to suppliers. The bullwhip effect distorts demand information within the supply chain, with different stages having a very different estimate of what demand looks like. The result is a loss of supply chain coordination.

Procter & Gamble (P&G) has observed the bullwhip effect in the supply chain for Pampers diapers. The company found that raw material orders from P&G to its suppliers fluctuated significantly over time. Further down the chain, when sales at retail stores were studied, it was found that the fluctuations, while present, were small. It is reasonable to

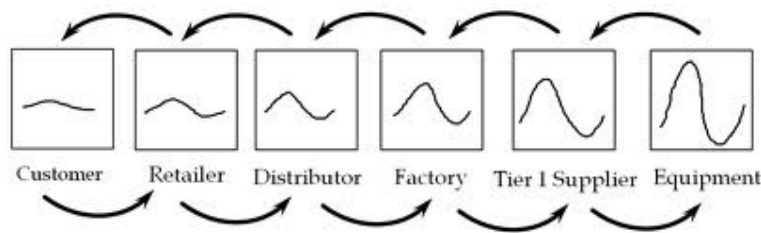
assume that the consumers of diapers (babies) at the last stage of the supply chain used them at a steady rate. Although consumption of the end product was stable, orders for raw material were highly variable, increasing costs and making it difficult for supply to match demand.

The bullwhip effect reduces the profitability of a supply chain by making it more expensive to provide a given level of product availability.

Impact of Bullwhip Effect on Supply Chain Performance

Performance Measure	Impact of Bullwhip Effect
Manufacturing cost	Increases
Inventory cost	Increases
Replenishment lead time	Increases
Transportation cost	Increases
Shipping and receiving cost	Increases
Level of product availability	Decreases
Profitability	Decreases

The phenomenon where the fluctuation in orders increases as one moves up the supply chain from retailers to wholesalers to manufacturers to suppliers is referred to as the bullwhip effect. The bullwhip effect results in an increase in all costs in the supply chain and a decrease in customer service levels. The bullwhip effect moves all parties in the supply chain away from the efficient frontier and results in a decrease of both customer satisfaction and profitability within the supply chain.



BULL WHIP EFFECT IN SUPPLY CHAIN -ILLUSTRATED

6.7 E- Supply Chain Management

All processes within its supply chain can be categorized into three main areas: processes focused downstream, processes focused internally and processes focused upstream. We use this classification to define the three macro supply chain processes as follows:

1. Customer Relationship Management (CRM): Processes that focus on downstream interactions between the enterprise and its customers.
2. Internal Supply Chain Management (ISCM): Processes that focus on internal operations within the enterprise. Note that the software industry commonly calls this “supply chain management” (without the word “internal”) even though the focus is

entirely within the enterprise. In our definition, supply chain management includes all three macro processes CRM, ISCM and SRM.

3. Supplier Relationship Management (SRM): Processes that focus on upstream interactions between the enterprise and its suppliers.

We must also note that there is a fourth important software building block that provides the foundation upon which the macro processes rest. We call this category the transaction management foundation (TMF), which includes basic ERP systems (and its components such as financials and human resources), infrastructure software, and integration software. TMF software is necessary for the three-macro processes to function and to communicate with each other.

6.7.1 Customer Relationship Management

The CRM macro process consists of processes that take place between an enterprise and its customers downstream in the supply chain. The goal of the CRM macro process is to generate customer demand and facilitate transmission and tracking of orders.

Marketing: Marketing processes involve decisions regarding

- Which customers to target,
- How to target customers,
- What products to offer,
- How to price products, and
- How to manage the actual campaigns targeting customers.

Successful software vendors in the marketing area within CRM provide analytics that improve the marketing decisions on pricing, product profitability and customer profitability, among other functions.

Sell: The sell process focuses on making an actual sale to a customer (compared to marketing where processes are more focused on planning who to sell to and what to sell).

The sell process includes providing the sales force the information they need to make a sale and then executing the actual sale. Executing the sale may require the sales person (or the customer) to build and configure orders by choosing among a variety of options and features.

Order Management : The process of managing customer orders as they flow through an enterprise is important for the customer to track his order and for the enterprise to plan and execute order fulfillment.

Call / Service center : A call / service center is often the primary point of contact between a company and its customers. A call / service center helps customers place orders, suggests products, solves problems, and provides information on order status.

CRM software has been the fastest growing, and is now the largest, category of the three macro processes. Software providers in the CRM space have focused on improving CRM processes themselves, but have more work to do to improve integration between CRM and internal operational processes.

ERP players, such as SAP, Oracle and Peoplesoft, who provide a powerful integration story and strong ecosystems.

6.8 Agri supply Chain Management

India stands second in Fruit production after Brazil and also second in vegetables production after China. With increase in per capita income and changing food habits the demand for fruits and vegetables will increase in the future. Tamil Nadu with its varied agro climatic regions produces different kinds of fruits and vegetables in large quantities. Around 4.6 million tonnes of fruits and 4.8 million tonnes of vegetables are produced in Tamil Nadu.

Post harvest losses and volatile prices

The post harvest loss in fruits and vegetables is estimated to be around 35-40 per cent of the production. Infrastructure facilities for post harvest handling like pre-cooling, refrigerated transport, grading, packing, cold storage etc. are not adequate and results in considerable post harvest losses in horticultural produces. Tamil Nadu Horticulture Development Mission set up in 2003 aims at providing adequate infrastructure for post-harvest management and marketing. Due to inadequate linkages with markets and lack of processing facilities, farmers do not get good price for fruits and vegetables. Presence of large number of intermediaries and absence of linkages lead to loss of value both for farmers and consumers. The farmer's share in consumer rupee varies from 40-60 per cent in the case of vegetables. Further the degree of perishability, variety and quality, and various market imperfections, market infrastructure etc also influence the marketing costs and price levels of fruits and vegetables. This indicates the need for effective and efficient supply chain management arrangement. Price volatility is a major cause for concern for the farmers. Cold storage facilities were created as a means to overcome some of these problems encountered by the farmers.

Traceability in Food and Agribusiness

The term 'traceability' has become so widely used in recent times in various industries that it is timely to examine the concept, particularly in relation to agriculture and food. Agricultural traceability simply refers to the collection, documentation, maintenance, and application of information related to all processes in the supply chain in a manner that provides guarantee to the consumer and other stakeholders on the origin, location and life history of a product as well as assisting in crises management in the event of a safety and quality breach.

With respect to a food product, traceability represents the ability to identify the farm where it was grown and sources of input materials, as well as the ability to conduct full backward and forward tracking to determine the specific location and life history in the supply chain by means of records. It contributes to the demonstration of the transparency of the supply chain through the use of verifiable records and labeling. Traceability adds value to the overall quality management system by providing the communication linkage for identifying, verifying and isolating sources of non-compliance to agreed standards and customer expectations.

Issues in supply chain management

The first issue in supply chain management is the relationship between members of the chain. This issue is informed by a substantial business and management literature on strategic alliances, but by relatively little literature on the process in relation to agriculture and agribusiness. Relationship issues to be considered include:

- Sharing long term development goals and seasonal business planning,
- the relationships between operational staff within the businesses on issues such as timing , amount, ripeness and temperature of deliveries,
- the development of shared quality and safety standards and how they will be measured and monitored;
- the information systems to track product and standards. The relationship may include shared access to inventory control systems and to sales performance data.

At the farmer level a key preliminary step is often the development of relationships between individual farmers to create a trading entity with capacity to supply sufficient quantity and continuity to be a credible supply chain member. This may be championed by a farmer, by another member of the chain, or by an external facilitator or manager. Hence the technical and professional issues in supporting the operation of supply chains may include facilitating:

- the development of relationships between farmers to allow their participation
- the development of relationships between members of the supply chain
- information flows between members of the supply chain
- establishing common standards between members of the supply chain
- optimising performance within each level of the supply chain and in the linkage processes.

Promotion activities needed in Agri-Chain Development

- Public private partnership is needed.
- Investing in transportation, communication and electricity.
- Subsidies or co-financing supply for high -risk investments.
- Ensure the availability of (production, price, industry) information and statistics to facilitate market activity and to monitor market progress.

6.9 Case Studies

Case study I Supply Chain Management in Walmart

Wal-Mart emphasizes greater coordination with suppliers and one of its turn-key supply chain management practices, new to the world of fresh produce, is automatic inventory replenishment. The performance of suppliers is graded and to be retained they must meet numerous standards, including a very low stock-out rate.

Suppliers provide services specific to Wal Mart, such as packing in returnable plastic containers (RPCs) and category management, utilizing the electronically exchanged sales data shared by Wal-Mart. This vertically streamlined system better coordinates supply and demand and enables both parties to lower costs. Wal-Mart can offer lower prices to consumers, often without reducing prices paid to shippers.

Many shippers report that Wal-Mart is one of their most profitable accounts and that one of the most important things about becoming a Wal-Mart supplier is the lessons learned on driving out non-value-adding costs, which they can then leverage to other key accounts. In the US retail industry, Wal-Mart's willingness to share information with its suppliers is clearly recognized as distinct from the traditional relationship with suppliers employed by the majority of conventional retail chains.

Most conventional retailers have not adopted automatic inventory replenishment, in part due to their lack of investment in the type of technology systems Wal-Mart developed years ago for real-time electronic information exchange.

As conventional and upscale specialty retailers differentiate themselves from value retailers, identifying high quality and exotic fresh produce offerings as their competitive edge, growers and shippers seeking to add value, including by selling unique, ethnic, organic, or other specialty produce, may find them to be willing partners.

Case 2, Supply Chain Management in McDonalds in India

All suppliers adhere to Indian government regulations on food, health and hygiene while continuously maintaining McDonald's recognised standards. As the ingredients move from farms to processing plants to the restaurant, McDonald's Quality Inspection Programme (QIP) carries out quality checks at over 20 different points in the Cold Chain

system. Setting up of the Cold Chain has also enabled us to cut down on operational wastage.

Hazard Analysis Critical Control Point (HACCP) is a systematic approach to food safety that emphasizes prevention within our suppliers' facility and restaurants rather than detection through inspection of illness or presence of microbiological data. Based on HACCP guidelines, control points and critical control points for all McDonald's major food processing plants and restaurants in India have been identified. The limits have been established for those followed by monitoring, recording and correcting any deviations. The HACCP verification is done at least twice in a year and certified.

The relationship between McDonald's and its Indian suppliers is mutually beneficial. As McDonald's expands in India, the supplier gets the opportunity to expand his business, have access to the latest in food technology, exposure to advanced agricultural practices and the ability to grow or to export. There are many cases of local suppliers operating out of small towns who have benefited from their association with McDonald's India.

Trikaya Agriculture -Supplier of Iceberg Lettuce

Implementation of Good agricultural practices has enabled Trikaya to successfully grow specialty crops like iceberg lettuce, special herbs and many oriental vegetables. Vegetables are kept in pre-cooling room and transported by refrigerated truck Vista Processed Foods Pvt. Ltd. Supplier of Chicken and Vegetable range of products (including Fruit Pies)

A joint venture with OSI Industries Inc., USA, McDonald's India Pvt. Ltd. and Vista Processed Foods Pvt. Ltd., produces a range of frozen chicken and vegetable foods. A world class infrastructure at their plant at Talaja, Maharashtra, has separate processing lines for chicken and vegetable foods, and they are following International standards, procedures and support services for their customers.

Radhakrishna Foodland

Distribution Centres for Delhi and Mumbai

An integral part of the Radhakrishna Group, Foodland specialises in handling large volumes, providing the entire range of services including procurement, quality inspection, storage, inventory management, deliveries, data collection, recording and reporting. Salient strengths are: Annexure I

- A one-stop shop for all distribution management services.
- Dry and cold storage facility to store and transport perishable products at temperatures up to -22 Degree Cel

**Model Act on Agricultural Marketing
The State Agricultural Produce Marketing
(Development & Regulation Act, 2003)**

7.1 Introduction

Agricultural Markets in most parts of India are established and regulated under the State APMC Acts. Agricultural marketing is witnessing major changes worldwide due to liberalization of trade in agricultural commodities and the agricultural marketing system in the country needs to be integrated and strengthened to enable the farming community benefit from new global market access opportunities.

A number of recommendations were made by an Inter-Ministerial Task Force on Agricultural Marketing Reforms to make the agricultural marketing system more vibrant and competitive. Major recommendations related to amendment to the State APMC Act for promotion of direct marketing and contract farming, development of agricultural markets in private and cooperative sectors, stepping up pledge financing, expansion of future trading to cover all agricultural markets, introduction of negotiable warehouse receipt system and use of information technology to provide market led extension services to the farmers.

As a follow-up measure, the Central Government drafted a Model Act on Agricultural Marketing and circulated to all state governments for adopting necessary changes as Agricultural Marketing is a state subject. The State Agricultural Produce Marketing (Development and Regulation) Act, 2003, is an Act to provide for improved regulation in marketing of agricultural produce, development of efficient marketing system, promotion of agri-processing and agricultural export and the establishment and proper administration of markets for agricultural produce. The different state governments have adopted the provisions from the model APMC act from different states.

The Act provides for establishment of private markets/ yards, direct purchase centre, consumer/farmers markets for direct sale, systems for putting in place an effective infrastructure for the marketing of agricultural produce, transparency in the pricing system, and payment to farmers on the same day, promotion of Public Private Partnership in the management and development of agricultural markets in the country. Provision is also made for Special Markets for commodities like Onions, Fruits, Vegetables, Flowers etc.. The role of the present Agricultural Produce Market Committee is redefined, to promote alternative marketing system, contract farming, directs marketing and farmers/consumers markets. It also redefines the role of State Agricultural Marketing Boards to promote standardization, grading, quality certification, market led extension and training of farmers

and market functionaries in marketing related areas. Provision has also been made in the Act for constitution of State Agricultural Produce Marketing Standards Bureau for promotion of Grading, Standardization and Quality Certification of Agricultural Produce. This is expected to facilitate pledge financing, E-trading, direct purchasing, export, forward/future trading and introduction of negotiable warehousing receipt system in respect of agricultural commodities.

An efficient marketing system, promotion of agri-processing and agricultural exports and establishment and administration of markets for agricultural produce,. (Section-1)

7.2 Definitions

“Agricultural Produce” means all produce and commodities, whether processed or unprocessed, of agriculture, horticulture, apiculture, sericulture, livestock and products of livestock, fleece and skin of animals, forest produce etc. as are specified in the schedule or declared by the Government by notification from time to time and also includes a mixture of two or more than two such products. **"Bill"** means bill issued by the traders as prescribed **“Board”** means the State Agricultural Marketing Board,

“Market Committee” means the agricultural produce Market Committee established under this Act **“Market Functionary”** means a trader, a commission agent, buyer, Hamal, Processor, a stockiest, a trader and such other person as may be declared under the rules or bye-laws to be a market functionary.

The Model Act: Salient Features

7.3 Establishment of Markets

The Model Act on Agricultural Marketing provides for improved regulation in marketing of agricultural produce, development of an efficient marketing system, promotion of agri-processing and agricultural exports and establishment and administration of markets for agricultural produce, procedures and systems for putting in place an effective infrastructure for the marketing of agricultural produce. (Section-1)

As per section 3 of the Act, legal persons, growers and local authorities are permitted to apply for the establishment of new markets for agricultural produce in any area. Under the existing law markets are setup at the initiative of State Governments alone. Private persons, farmers and consumers, can establish more than one market, in a market area.

In every market area, there may be: - market yard and sub market yards managed by the Market Committee, private markets and farmers/ consumer markets managed by a person other than the Market Committee.

7.4 Constitution of Market Committee

A Market Committee shall be constituted for every market area. Members would consist of ten agriculturists possessing qualifications as prescribed to be elected by the Managing Committee members of the primary agricultural cooperative societies functioning in the market area and by the Sarapanch & members of the village Panchayats. Seven of them are to be elected from amongst the committee members of Primary Agricultural Societies. Of the 10 representatives of agriculturist at least one should be from scheduled Caste/Tribe; one from other Backward Class and one-woman member,

As per section 14 of the Act, there is no compulsion on the growers to sell their produce through existing markets administered by the Agricultural Produce Market Committee (APMC). However, an agriculturist who does not bring his produce to the market area for sale will not be eligible for election to the APMC.

Every Market Committee shall have a Chairman and a Vice-Chairman, elected from amongst representatives of agriculturists.

7.5 Classification of Market and Special Market

As per section 20 of the Act, separate provision is made for notification of 'Special Markets' or 'Special Commodities Markets' in a market area for specified agricultural commodities to be operated in addition to existing markets.

The State Government may declare any market area to be operated, in addition to the existing market, as 'Special Market' or 'Special Commodity Market' keeping in view aspects such as turnover, area served and special infrastructure requirements of a particular commodity, Members of the Market Committee for special market shall consist of: agriculturists, traders, Municipal Commissioner or his nominee of the area where the Special Market is located, the Collector or his nominee of the District in which Special Market is located, Chief Town Planner , representative of the Registrar of Cooperative Societies,. Director of marketing of the State or nominee, Chief Executive Officer of the State Agricultural Marketing Board (ex-officio Member), representative of other States from where arrivals are received by the special market (to be nominated by the respective State Government) executive member to be appointed by state government, and Agricultural

Marketing Advisor or nominee the. Market Committee shall meet at least once in six months.

7.6 Conduct of Business and Powers and Duties of Market Committee

The Market Committee is responsible for implementing the provisions of this Act, in the market area; providing facilities for marketing of agricultural produce superintendence, direction and control of market or for regulating marketing of agricultural produce in any place in the market area.

As per sections 26 and 27 of the Act the APMC have been made responsible for: ensuring complete transparency in pricing system and transactions taking place in market area; providing market-led extension services to farmers; ensuring payment for agricultural produce sold by farmers on the same day; promoting agricultural processing including activities for value addition in agricultural produce; publicizing data on arrivals and rates of agricultural produce brought into the market area for sale and promoting public private partnership in the management of agricultural markets.

The Market Committee may register market functionaries, regulate/ supervise the auction of notified agricultural produce, agreements of sales, weighment, delivery, payment etc, provide for the settlement of disputes arising out on any transaction connected with the marketing of notified agricultural produce; take steps to prevent adulteration of notified agricultural produce;. Promote public-private partnership for carrying out extension activities in its area viz., collection, maintenance and dissemination of information in respect of production, sale storage, processing, prices and movement of notified agricultural produce; take measures for the prevention of purchases and sales below the minimum support prices as fixed by the Government from time to time; levy rates, charges, fees; regulate the entry of traffic into the market yard; prosecute persons for violating the provisions of this Act, impose penalties for contravening the provisions of the Act.

The committee may inspect and verify scales, weights and measures in use in a market area and also the books of accounts and other documents maintained by the market functionaries; publicize about the benefits of regulation, the system of transaction, facilities provided in the market yard etc. through poster, pamphlets, hoardings, cinema slides, film shows, group meetings, electronic media etc.

In order to maintain stability in the market, Market Committee can take suitable measures to ensure that traders do not buy agricultural produce beyond their capacity and avoid risk to the sellers in disposing of the produce; and grant licences only after obtaining necessary security according to the capacity of the buyers;

The Market Committee may undertake construction of roads, god owns and other infrastructure in the market area to facilitate marketing of agricultural produce; maintain stocks of fertilizer, pesticides, improved seeds, agricultural equipments, inputs for sale; to provide on rent storage facilities for stocking of agricultural produce to agriculturists. To promote and encourage e trading, market committee may establish regulatory system, create infrastructure and undertake other activities and steps needed.

As per section 36 of the Act, provision is made for the appointment of Chief Executive Officer of the Market Committee. The Chief Executive officer shall be the chief executive of the market and the custodian of all the records and properties of the market.

7.7 Contract Farming

A Chapter on 'Contract Farming' (Chapter-VII) is added to provide for compulsory registration of all contract farming sponsors, recording of contract farming agreements, resolution of disputes, if any, arising out of such agreement, exemption from levy of market fee on produce covered by contract farming agreements and to provide for indemnity to producers' title/ possession over his land from any claim arising out of the agreement.

The Model specification of contract farming agreements is provided in the Addendum to the model Act.

Provision is made for direct sale of farm produce to contract farming sponsor from farmers' field without the necessity of routing it through notified markets.

7.8 Regulation of Trading

As per section 39, except in accordance with the provisions of this Act, no person shall use any place in the market area for the marketing of notified agricultural produce or operate in the market area as a market functionary.

All notified agricultural produce shall ordinarily be sold in the market yards/ sub market yards or in the private yards of the license holder. The price of the notified agricultural produce brought in the market yard shall be paid on the same day to the seller in market yard.

Provision is made for imposition of single point levy of market fee on the sale of notified agricultural commodities in any market area and discretion provided to the State Government to fix graded levy of market fee on different types of sales. (Section 42)

As per section 44, licensing of market functionaries is dispensed with and a time bound procedure for registration is laid down for market functionaries to operate in one or more than one market areas.

Every person who, in respect of notified agricultural produce, desires to operate in the market area as trader, commission agent, Weigh men, hamal, surveyor, warehouseman, contract farming buyer, owner or occupier of processing factory or such other market functionary, shall apply to the Market Committee for registration/ renewal of registration.

As per section 44(6) of the Act, Commission agency in any transaction relating to notified agricultural produce involving an agriculturist is prohibited and there will be no deduction towards commission from the sale precedes payable to the agriculturist seller.

Provision is made for the purchase of agricultural produce through private yards or directly from agriculturists in one or more than one market area. (Section-45)

The Director/Managing Director/ Prescribed authority may grant licence to purchase agricultural produce by establishing private yard or direct from agriculturist for process, trade, export of notified agricultural produce; grading, packing and transaction by value addition of notified agricultural produce.

As per section 46 of the Act, provision is made for the establishment of consumers'/ farmers' market to facilitate direct sale of agricultural produce to consumers. (Section-46)

License for establishment of consumer/farmer market shall be granted by the State Govt./ Director/Managing Director.

As per section 50 of the Act, provision is made for resolving of disputes, if any, arising between private market/ consumer market and Market Committee.

No trade allowance or deduction, other than prescribed by or under this Act , shall be made or received by any person in any market area in any transaction in respect of the notified agricultural produce.

The Chief Executive Officer of the Market Committee or any officer of the State Government or the Board, may require any person carrying on business in notified agricultural produce to produce the accounts and other documents and furnish any information relating to stocks of such agricultural produce or purchase, sale, processing, value addition and delivery of such agricultural produce by such person and also to furnish any other information relating to payment of market fees by such person.

The State Governments is conferred power to exempt any agricultural produce brought for sale in the market area, from payment of market fee. (Section-56)

7.9 Market Committee Fund

Money received by a Market Committee shall be paid into a Market Committee Fund" and all expenditure incurred by the Market Committee defrayed out of the fund. Any money received by the Market Committee by way of arbitration fee or as security for costs in arbitration proceedings relating to disputes or received by way of security deposit, contribution to provident fund or for payment in respect of any notified agricultural produce, or charges payable to Wight man and other functionaries shall not form part of Market Committee fund,.

Market Committee may use its funds 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-59)

7.10 State Agricultural Marketing Board: Functions and Powers

In order to coordinate market activities and for development, promotion and regulation of agricultural marketing the State Government may, establish and constitute a State Agricultural Marketing Board.

The State Agricultural Marketing Board would be responsible for: setting up of a separate marketing extension cell in the Board to provide market-led extension services to farmers; (ii) promoting grading, standardization and quality certification of notified agricultural produce and to set up a separate Agricultural Produce Marketing Standards Bureau. (Section-73).

The Board would be responsible for Coordination of the working of the Market Committees; planning of the development of Agricultural Produce Markets; administer the State Market Development Fund; give direction and guide the Market Committees.

Money received by or on behalf of the Board shall be credited to a Marketing Development fund, which could be utilized for: market survey, research, grading, standardization, quality certification, etc.; development of quality testing and communication infrastructure. Development of media, cyber and long distance infrastructure relevant to marketing of agricultural and allied commodities. (Section-79)

7.11 Penalty

Penalty is imposed for contravention of any provision of this Act, with simple imprisonment which may extend to six months or with fine which may extend to one thousand rupees or with both.

Whenever any person is convicted of any offence punishable under this Act, the Magistrate shall in addition to any fine which may be imposed, recover and pay over to the Market Committee the amount of fees or any other amount due from him under this Act and may, also recover and pay over to the Market Committee costs of the prosecution.

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