

## *Chapter 2- Review of Literature*

### **2.1 CATEGORIES OF LITERATURE**

A review of literature related to onion has been undertaken to have a complete and broad understanding of the related aspects of onion prices and production. The observations and the policy implications of the onion related literature have helped in framing the objectives of the present thesis. The selected research studies incorporated in the study are classified as:

- 2.1.1 Studies on fruits and vegetables price instability – include studies on price instability, production risks, floor price scheme and precision farming technology in vegetables and fruits to improve the yield levels.
- 2.1.2 Studies on onion crop- these studies include various aspects of the onion crop like the factors influencing the onion prices, price variability in onions, the status of research on low productivity, constraints in storages, demand and supply analysis of onions, the price spread and market efficiency, constraints in marketing of onions, major problems faced by onion growing farmers etc.
- 2.1.3 Studies on storages of the onion- includes present storage scenario, problems in storages, scientific research on onion storages etc.
- 2.1.4 The history of price stabilization fund- The international history of price fund provides details on varied angles like development, objectives, successes, limitations of the Fund operations world over.
- 2.1.5 Price stabilization fund in India- details highlight the methodology of the working of fund.
- 2.1.6 State government price stabilization schemes.

#### **2.1.1 STUDIES ON FRUITS AND VEGETABLES PRICE INSTABILITY**

Studies on fruits and vegetables dealing with price instability, production risks, floor price scheme and precision farming technology in vegetables have been examined in detail.

Sekhar (2004) has compared the price instability of some important crops in major domestic markets and international markets and looks at the implications for Indian

producers and consumers. The broad policy implication of the paper is that, that international trade can act as a short – term price stabilization policy.

Rajkumar, Mahajanashetti, (2008) undertook the research on 'Farmers Coverage under Market Intervention Scheme in Karnataka'. Karnataka has evolved a Market Intervention Scheme (MIS) called the Floor Price Scheme (FPS) for agricultural and horticultural commodities with a revolving fund of Rs 100 crores, which aims at procuring farm produce during the times of price crash. In addition to the procuring of commodities not covered under MSP of Government of India, the state government also uses this fund for making timely payments to the farmers under MSP. In the year 2004- 05 commodities like onion worth Rs. 6.58 crores and maize worth Rs. 48 crores were procured in the state under FPS. The authors conducted a study to ascertain its impact. In respect of both onion and maize crops, a large number of farmers reported that their top-most problem was of procedural complexities involved in selling their produce under MIS, followed by delayed payments and stipulations of fair average quality (FAQ) produce. About 40 percent of the onion growers expressed lack of storage facility for this perishable crop is the biggest problem among other problems. The lack of transportation facilities, long distance to procurement centers and high cost of marketing under MIS were the other problems reported by the growers.

The perceptions of farmers about risks in production of fruits and vegetables have been analyzed using structured survey method by Ali and Kapoor (2008) in six districts of Uttar Pradesh. It is found that in general, the price and production risks have been perceived as the most important sources of risk in production of fruits and vegetables in the area. The study has argued that public intervention can facilitate better risk management through improved information system, development of financial markets and promotion of market-based price and yield insurance scheme, thus ensuring that the marginal farmers are able to benefit from these interventions as well as participate in the emerging systems.

A study on precision farming technology, adoption decisions and productivity of vegetables in resource poor environments was undertaken by Maheswari, Ashok and Prahadeeswaran (2008) in Tamil Nadu. The study has revealed that adoption of precision farming has led to 80 per cent increase in yield in tomato and 34 per cent in brinjal

production. As the possibility of adoption increases by 10 percent, net return increases by 39 per cent and 28 per cent in tomato and brinjal cultivation. Lack of finance and credit facilities have been identified as the major constraints in non adoption of precision farming.

### **2.1.2 STUDIES ON ONION CROP**

Studies related to onion price behavior point out the fact that onion prices are influenced by factors, such as production, export quantity, export prices, supply of all other states at all India level and also supply conditions in the international markets. It is a complex phenomenon to analyze. Some important research studies that have focused on the onion price behavior analysis have been selected and presented in this study.

Kulkarni and Basargekar (1997) have made a comprehensive study on the factors influencing onion prices in India. The study records a good deal of seasonality in onion prices, which is larger in prices prevailing in producing markets than in overall all India prices. The acreage under onion is influenced by prices prevailing in the previous two years, while the export quantity of onion is influenced by domestic prices and domestic production. The onion prices are influenced by production in the previous year, exported quantity in the previous year and export price in the current year. These factors explain 78 percent of variation in onion prices. The per capita production of onion does not show any increasing or decreasing trend.

Mehta and Kamra, (1999), in their study of onion price variability have stressed the need of a system of price variation alert. The paper studies the seasonality in onion price behavior. They have found out that the pattern of harvesting and market arrivals have direct bearing on price behavior and its movements. For deriving the price alert limit, the approach adopted is of statistical quality control, where the abnormal phenomenon is reflected in the value of a variable beyond certain control limits determined on the basis of normal pattern of price variation. The price is considered as a barometer of the system providing equilibrium of supply and demand. When this process is in normal course, the prices also follow a determined trend. But, when this process is gets out of control due to abnormalities, the immediate reflection is on the price. Taking this analogy, the limits of price variation can be set on the basis of its variability in normal conditions. The study suggests evolvement of a procedure for scrutinizing the price variation and to give alert signals for timely policy intervention.

A study undertaken by Alemayehu and Atteri (2000) indicated that lagged price of onion had a positive and significant correlation with their respective current prices but current prices had a negative correlation with the current arrivals. Trend and seasonality components were significant in the time series analysis of prices of onions. However trend was not significant in case of arrival of onion. Arrival fluctuations played an important role causing high fluctuations in prices. It is suggested in the study that efforts should be made to reduce fluctuations in arrivals by orderly marketing efforts.

A Study by Murthy and Subrahmanyam (2003) examine the gap in the demand and supply of onion during different situations as normal, adverse and bumper production scenarios. The results revealed that production is just sufficient to meet the demand requirements in future under normal production periods. Any increase or decrease in onion production due to bumper or adverse conditions will have significant impact on the prices especially at the higher levels of deficits and excess supply. The study is summarized as follows; the export of onion is growing at a faster rate than production and hence there is a need to develop high yield varieties having long shelf life to increase the existing low per capita availability as well as to meet growing export demand. Necessary steps should be taken to procure the surplus onion through minimum support price, restrictions of exports and imports should be in a proper way at right times to reduce domestic price shocks. Scope exists for diversifying the fresh onion to dry and processed forms of onions as evident from higher growth in these areas. More storage facilities should be created, onion processing units should be promoted to minimize post harvest losses.

Lawande (2004) has focused on the issues of low productivity of onions in India as compared to China, U.S.A. and Netherland. The low production is mainly due to poor yielding genotypes, non availability of quality seeds and F1 Hybrids, shortages of irrigation water at critical stage of growth and large fluctuation in market prices. Further it is stated that the present production is not sufficient to meet the requirements of even the 50 percent of the population. The post harvest handling and storage losses are estimated at 20 to 50 percent which is a very high percentage of wastage. However storage losses could be reduced to 20 to 30 percent with proper scientific methods. The paper suggests maintenance of sufficient buffer stock, fixing of procurement prices and development of a strong infrastructure to manage gluts and shortages in the markets.

Shroff (2004) has analyzed the price spread of onion in Lasalgaon and Pune. The study has revealed that farmers received less than half the retailer price (45.33%), the balance being accounted by marketing costs (40.67%) and marketing margins (14.00%). The paper strongly suggests that storage should be undertaken by planting the seeds of high shelf life crop and processing into dehydrated flakes and exports.

Verma Rajput and Patidar (2004) have analyzed the price spread and market efficiency. They have identified following issues that require attention for improving production and marketing: a) Bank credit and financial assistance should be made available to individual farmers for development of production technology and marketing infrastructure. b) Training of farmers in the areas of production technique, grading, standardization and quality control and modern methods of marketing is required.

A similar study on marketing of onion in Dindigul district of Tamil Nadu by Pushpa and Velan (2004) also reveals the marketing constraints on onions. Distress sale due to the need of immediate cash is identified as the main reason for not opting for storage of Rabbi crop.

Agricultural Economic Research Centre, Gokhale Institute of Politics and Economics published a study (2004), 'Building up of An Efficient Marketing System to Obviate the Need for Large State Intervention in Maharashtra' with case studies of cotton, sugar cane and onion. The study has a detailed account of the marketing channels and costs for these crops. The marketing costs and margins as a percentage of retail prices for onion was 40.67% and 14% respectively in Lasalgaon, while the corresponding figure for Pune was 42.42% and 15.17%. The overall conclusions reveal that the share of the farmer in retail price was less than half the retail prices, the balance being accounted by marketing costs and margins.

Problems of onion growing farmers as identified in the study include:

- Poor storage capacity, leading to qualitative and quantitative losses and price fluctuations.
- Storage losses comprise of loss due to moisture, shrinkage, decay and sprouting.
- In case of glut in the market and with improper storage facilities, prices crash and sometimes the farmers are forced to destroy their crops.

Therefore increasing the shelf life of onions assumes great importance. The important suggestions of the study include:

- Radiation to reduce storage losses.
- Onion dehydration to reduce gluts.
- Attempts to improve the share of farmers in terminal price and also to reduce the length of marketing channels should be undertaken.
- Co operative marketing and direct marketing to final consumers by the farmers should be promoted.
- Pledge financing should be made popular.

Raveendaran and Selvam et. al (2007) studied the impact of agricultural policy on integration of markets of onion. They have stated that the major share of the marketing expenses is the commission charges of the commission agents forming 10% of value of auction. The farmer receives the 'Patti' i.e. total bill only after deduction of commission charges. The paper suggests that arrangement of transport facility, storage facility and pledge loan facility should be made available at the regulated markets.

A study on 'Price Trend and Integration of Wholesale markets for Onion in Metro Cities of India' by 'Reddy and others, (2012) reveal high variability in the arrivals of onions in month of March and April. While discussing the arrival and price relationship in the selected markets, it is stated that an increase in market arrivals by one metric ton (M.T.) in a month led to an increase in prices by Rs. 6/MT and Rs. 4/MT in Bangalore and Delhi respectively. But prices decreased in Ahmednagar (Rs. 6/MT), Mumbai (Rs.10/MT), Kolkata (Rs.2/MT) markets with an increase in arrival by one M.T. in a month. Market integration is found to be significant.

A report by SFAC (2012), analyses price and arrival trends from 2006-07 till to 2011-12 of major markets of Maharashtra and Gujarat and Karnataka. The report identifies unseasonal and irregular rains as the main cause for arrival disturbance and the sky high prices were due to temporary shortages across the country. It is further stated that from export point of view, India has a natural advantage in production and exports need to be strategically improved. It is commonly believed that increase in exports lead to increase in domestic onion prices. But the report highlights the fact that export volumes have a little correlation to domestic prices (as the quality and variety of exported produce is different

than domestic variety), nevertheless when domestic prices are higher, exports do fetch a higher unit value realization.

A project by NCAER and others (2012) on 'Price and Competition Issues in the Indian Markets for Onions' discusses in detail the causes and consequences of price volatility in onion markets with specific focus on supply chain issues.

A report prepared for Competition Commission of India (2012), Government of India by Chengappa, Manjunath and others on 'Competitive Assessment of Onion Markets in India' discusses the arrival and price seasonality, the arrival price relationship, onion market structure etc. It is also pointed out in the study that the speculative traders are making supernormal profits in onions. In Delhi, the mark up price for retailers is 135 percent higher than the wholesale price. It is pointed out that retailers and traders exploit the situation of yield loss and make large profits.

All the studies on different aspects of onion price fluctuations, right from onion production until marketing costs are purposely included in present study to have a firm grasp of the issues related to onion price behavior. The studies bring out factors that have a bearing on onion prices either directly or indirectly. Without identifying these factors, the price behavior analysis may remain incomplete.

### **2.1.3 STUDIES ON ONION STORAGES.**

Singh (2004) in his research notes has remarked that lack of proper storages and price fluctuations were found to be the most severe constraints in onion and cauliflower cultivation. During the survey the farmers responded that along with other factors crop insurance is a prime requirement to improve the productivity in vegetable cultivation.

Research on improving the storage life of Rabbi onions, right from the type of seeds, the plantation methods, post harvest practices, storage structures etc. by eminent professors, research associates of the agricultural colleges in Maharashtra has benefited in improving the yield and storage life of the crop. In the opinion of experts (Dr. K. Lawande: Director, National Centre for Onion and Garlic Research, Rajgurunagar, Pune, Prof. P.B. Hille, Mahatma Phule Krishi Vidyapeeth, Rahuri, Prof. Desale, College of Agricultur, Dhule), it is possible to improve the price and income stability, through adoption of proper storage policy<sup>1</sup>.

Nearly 80% of the farmers are dependent upon primitive and old storage Chawls where the losses are heavy. The bottom ventilation storage structures designed by M.P.K.V<sup>2</sup>., Rahuri, and NHRDF, Nashik and further improved by NRCOG, Rajgurunagar<sup>3</sup>, have demonstrated that storage losses could be reduced by 20 to 30 percent. Improved storage structures are not adopted by majority of farmers due to high cost of construction which is the main hurdle in creating the impact. Proper scientifically built storing needs investment. The small and the marginal farmers cannot afford this investment. As a result they either don't store at all or store in old bamboo structures where the losses are heavy.

NRCOG, Rajgurunagar, Pune: The centre states that cold storage of onion and garlic minimizes the storage losses up to 5 to 10 percent. The post cold storage sprouting can be checked by gamma irradiation treatment. The use of gamma irradiation treatment and cold storage may be helpful in reduction of colossal storage losses and regulating price fluctuation. The cold storage chain may be profitable near metropolitan markets and non-onion growing areas.

#### **2.1.4 THE INTERNATIONAL HISTORY OF PRICE STABILIZATION FUND**

The literature on commodity stabilization programs or agreements can be grouped into three categories viz. first, the international commodity agreements which were developed by International Monetary Fund (IMF) and by United Nations Conference on Trade and Development (UNCTAD) to improve the terms of trade position of developing countries, exporting mainly primary products: secondly the different models developed by different states in India for price stabilization of agricultural products and thirdly the schemes implemented by the Central Government of India at the centre and at state level in India.

Commodity market stabilization agreements have been a major policy issue since the mid 1970's, both because commodity prices are so volatile and because exports of primary commodities are vitally important for generating foreign exchange, development funds and employment in the less developed countries (LDCs). On the other hand, much of the trade and processing of commodities lies in the hands of the developed economies. The LDCs have therefore sought stabilization agreements in which *inter alia*, prices would be higher on average, or more stable, and would redistribute from the consumers in the 'North' to producers in the 'South'. A major difficulty with these proposals has been



confusion over what the proper objective of such a stabilization agreement should be. The producers and the international agencies tend to argue that the sheer volatility of prices is the main problem (UNCTAD, 1976). Alternative, but necessarily incompatible, objectives that have been put forward include stabilizing producers' revenues, raising average prices, and improving the functioning of the market, or securing greater certainty of supply. This ambiguity over objectives is evident from the claim, made by the influential Brandt Commission that commodity prices should be stabilized at a remunerative level to become less vulnerable to market fluctuations. In a similar vein, the main UNCTAD proposal (the Integrated Programme for Commodities; UNCTAD, 1976) did not make it clear whether stabilized prices, stabilized incomes, or improved terms of trade were to be the objectives of policy. The effects of two possible stabilization measures – price stabilization and production controls can be identified with the construction of the theory. Of the two, price stabilization appears to be more powerful however, the main result is that any of these stabilization measures will generate conflicts in so far as greater earning stability has to be 'bought' with lower average earnings. Thus, the simple aims expressed by the Brandt Commission cannot be met unless both instruments are used together in certain combinations.

Jere and Behrman (1977) have discussed the numerous attempts that have been made to control international commodity market throughout the twentieth century. The goals of these attempts have included price stabilization to offset the impact of wide fluctuations in commodity prices. Early in the century, conferences of coffee and sugar producers were held in 1902, and the Brazil coffee "valorization scheme" was instituted in 1907. Before the World War 1, however, such schemes generally were considered uneconomical and impractical. Price stabilization attempts in copper, tin, rubber, and coffee in the early postwar years were followed by a number of other efforts for wheat, beef, wool, tea, timber, and camphor. Generalizations about these efforts are almost impossible, except to note that there was no coordination among them and that all were dominated by producers. Discussions on a broader multi-commodity basis occurred at League of Nations conferences on problems of raw materials (primary commodities) in 1921, 1927, and 1937 and at the London Monetary and Economic Conference in 1935. The United Nations Conference on Food and Agriculture in 1943 began an extensive examination of

international commodity problems. As a result international trade organization at the Havana Conference in 1947 was established.

After the Second World War period, study groups were established for cotton in 1945, wool in 1946, tin, sugar, and rubber in 1947. The tea agreements were again put into force. In the late 1940's, threats of emerging surpluses appeared and study-group effort intensified due to strong producer interests. In 1949, the International Wheat Agreement was signed. Another sharp shift occurred in the early 1950s with the Korean War boom. In 1951, prices hit peak levels for a number of commodities. The major importers started pressurizing for controls to assure price stability and proposed study groups for a large number of commodities. Wheat and tea agreements remained in force, a sugar agreement was initiated in 1953, and a tea agreement in 1956. These agreements laid the foundations for the International Coffee Agreement of 1963. At about the same time, political problems among the United States, Cuba, and the Soviet Union led to the demise of the sugar agreement. The first session of UNCTAD in Geneva in 1964 places considerable emphasis on comprehensive commodity agreements (i.e. including provisions not only for prices and quantities, but also for coordination of markets and for limiting the expansion of competitors). Four years later at UNCTAD 2, in New Delhi, priority was given to generalized trading preferences. Since its establishment in 1964, UNCTAD has taken a major role in promoting study groups for international commodity agreements.

In addition to such international commodity agreements, international producer cartels also have been formed in recent years. The most well known of these is OPEC, which succeeded in increasing oil prices by over 500 percent in 1973-74, Bergsten (1976), Café Mondial, the Intergovernmental Council of Copper Exporting Countries (CIPEC), the Association of Natural Rubber producing Countries, the Union of Banana Exporting Countries(UBEC), and the Association of Iron Ore Exporting Countries.

Some working papers on the common fund scheme like 'Modalities and Operational Elements of the Common Fund,' by Saxena (1977) 'How to Analyze Commodity Price Stabilization' by Kanbur (1977), 'The Common Fund: Prolegomena to Cost Benefit Estimation' by Green (1977), 'Capital Structure and Financing of the Common Fund for 'Financing Commodity Stocks' by Khouja (1977), discuss the various elements of the

common fund scheme. The elements like advantages of the common financing facility, the size, and measures of the programs, structure of resource allocation etc. are explained by Saxena.

Commodities in Crisis' by Maizels (1990) give a very lucid explanation of the commodity crisis faced by the developing countries, it's impact on the developing countries and how the need for stabilization policy was felt to reduce the export instability of these developing countries. The export instability problem came under intensive discussion at the United Nations, which established an Expert Group on the issue. Both these experts groups recommended the establishment of a compensatory financing scheme in the form of countercyclical lending by the IMF designed to offset pressures on the balance of payments of member countries resulting from fluctuations in the import demand of other members. The need for more adequate compensatory financing was discussed in greater depth at the 1983 UNCTAD sixth session. The Expert Group proposed the establishment of a new facility, complementary to IMF, CFF and STABEX (CFF- Compensatory Financing Facility). The supply stabilization measured by developing countries is an innovation to offset, to a greater or lesser extent, the effects of instability.

#### **2.1.5 PRICE STABILIZATION FUND IN INDIA.**

The price stabilization fund (P.S.F.) scheme was launched by Government of India in April 2003<sup>4</sup> against the backdrop of decline in international and domestic prices of Tea, Coffee, Rubber and Tobacco causing distress to primary growers. The growers of these commodities were affected due to substantial reduction in unit value realization for these crops, at times falling below their cost of production.

The objective of the scheme is to safeguard the interests of growers of these commodities and provide financial relief when prices fall a specified level without resorting to the practice of procurement operations by the Government agencies.

#### **OPERATIONAL MODALITIES OF THE P.S.F. TRUST**

P.S.F. trust has announced price spectrum bands. The base for price bands is the 7 years moving average of the international prices of these products. The years are categorized as either a boom year or a normal year or a distress year, on the basis of relationship of domestic prices to P.S.F.

A boom year is defined as when the domestic price is higher than upper band. Normal year is when the domestic price is within the lower band and upper band. Distress year is when domestic price is lower than the lower band.

### **FUNDING OF THE CORPUS**

The fund is established with a corpus of Rs. 500 crores, which shall include Rs. 482.88 crores as a onetime contribution by the central government and Rs. 17.12 crores as non refundable initial contribution by the participating growers at Rs. 500 per grower.

### **COVERAGE OF THE SCHEME**

Initially, the scheme will cover a total of about 3.42 lakh needy growers of tea, coffee, natural rubber and tobacco, the neediest amongst these are those having operational holdings of up to 4 hectares.

### **ADOPTION OF PRICE BAND**

A uniform band of 40 percent for all the four commodities will be adopted with a price spectrum band of (+/-) 20% from seven years moving average of international prices. Lower band would be (-) 20% and upper band would be (+) 20% of the seven years average of international price.

### **MODALITIES OF DEPOSIT IN P.S.F., SAVING BANK ACCOUNT**

In distress year, the government deposits Rs. 1000 per grower. Grower is permitted to withdraw up to Rs. 1000. In normal year, government deposits Rs. 500 per grower, and each grower deposits Rs. 500. No withdrawal is permitted. In boom year, the grower deposits Rs. 1000. No withdrawal is permitted.

Thus the P.S.F. tries to protect the interests of the growers by stabilizing their incomes.

### **2.1.6 STATE GOVERNMENT PRICE STABILIZATION SCHEMES IN INDIA**

Recently in December 2010, the Tamil Nadu Government<sup>5</sup> has decided to constitute a price stabilization fund with the corpus of Rs. 50 crores, contributed by the state government to extend interest free financial support to the cooperative societies. The primary cooperative societies are expected to intervene effectively in the market by procuring select commodities (including vegetables that are prone to abnormal price

fluctuations from season to season. The societies will undertake selling activities through cooperative outlets at cost price to the public.

In Karnataka the government runs the Floor Price Scheme under market intervention scheme. Under the scheme, vegetables including onion are procured at the government fixed floor price to assure remunerative returns to the farmers.

In Gujarat, the state government is planning to build cold storages structures for onions storage.

## **2.2 SUMMARY OF IMPORTANT FINDINGS OF RESEARCH PROJECTS ON ONION**

The review of the literature indicates that onion price and arrival fluctuations are the most important sources of income fluctuations of farmers. At the same time, the December 2010 experience of price crisis point out towards the rise of speculative activities of traders in creating price uncertainties.

- Onion prices have high price seasonality within months. The price growth rate has remained very low over the years.
- Onion prices are determined by factors like present year production, last years' production, and export quantity and export prices.
- Onion prices have positive and significant correlation with lagged prices and negative correlation with current arrivals.
- Onion production is marked with low productivity in India.
- Onion production at present is just sufficient to meet the demand requirement in the future under normal production periods. But any abnormal situation of crop loss or excess crop will have significant impact on the prices. Therefore some buffer stock planning is required.
- Farmer's training in areas of production techniques, standardization and quality control is required to help them increase productivity, storage life of the crop and earn remunerative prices.
- Onion exports are growing at a faster rate than production. Hence there is need to develop high yield varieties as well as need for increasing the storage capacity.
- Onion processing units should be promoted to minimize post harvest losses and stabilize farmer's income.

- Poor storages made by the farmers lead to qualitative and quantitative losses and price fluctuations.
- Farmers don't undertake storages for the main reason that the cost of building proper storage structures is beyond the reach of many small and medium farmers and the urgent need of money of farmers force them to undertake distress sale. Therefore financial support is needed to encourage them to undertake storages.
- Storages and transport facilities are urgently required to help farmers stabilize their incomes.
- Farmers receive very low share in retail prices. It is estimated in one of the studies that the marketing costs and margins in Lasalgaon are 40 and 14 percent respectively. Farmers receive less than 50 percent share of the consumer price. Another study by the Times of India (2010) brings out the fact that speculative traders are making super normal profits in all the major metropolitan markets, this percentage is more than 100 percent in times of arrival shortages (in Delhi 135% in 2010). Traders and retailers exploit the situation of arrival shortage to the maximum extent for their benefit. Therefore the number of supply chain intermediaries should be reduced.
- A more transparent and efficient system of auctions is required. So that aspects like quality, minimum reserve price of the produce may be given due weight age at the time of auctions. This will help in stabilizing farmer's income.

### **2.3 POLICY IMPLICATIONS**

The results and observations of the different research projects themselves speak for required measures that can be undertaken to gain stability in income of onion growing farmers. Broadly such measures can be classified into following four:

- ❖ Planning for the production to cope up with the extreme situations of overproduction and underproduction.
- ❖ Adoption of onion storages by the farmers themselves will increase the volume of storages as well as transfer the gains of storages directly to the farmers instead of traders. With higher realization of storage gains, higher is the possibility of increasing the efforts towards improvements in yield.

- ❖ To stabilize farmer's income in any abnormal situation (like overproduction or underproduction) as well as to induce farmer to opt for storage or processing, his immediate requirement of money can be satisfied with the help of establishment of price stabilization fund.
- ❖ Onion farmers can set up producers association for the productive purpose of securing remunerative prices. These associations can work for improving the quality of the produce, can avail bank credit for installation of sophisticated machinery for standardization and grading. Association can specialize itself in producing the quality and variety required by the processing industries or can set up its own processing unit. Association can build its own storages structures for its members. These types of associations have proven to be beneficial for many products like grapes, basmati rice, mangoes etc.

Of the different policy implications, the first three are examined in detail in the present thesis i.e. planning in production, storage policy by the farmers and establishment of price stabilization fund and their impact on stability of incomes ascertained.

#### NOTES

1. Author's meetings and discussions with experts, 2010.
2. Mahatma Phule Krushi Vidyapeeth, Rahuri
3. National Research Centre for Onion and Garlic, Rajgurunagar, Pune
4. See [http://commercenic.in/publicationsannualreport\\_chapter//asp,PriceStabilisationFund](http://commercenic.in/publicationsannualreport_chapter//asp,PriceStabilisationFund)
5. See <http://www.tnstate.gov.in>, Government of Tamil Nadu, Department of State and Statistics