

## *Chapter 1- The Objective of Income stabilization of Onion Producers*

### **1.1 THE HISTORY OF INCOME STABILIZATION THROUGH PRICE STABILIZATION AND PRODUCTION CONTROLS:**

Price stabilization and thereby income stabilization of essential agricultural commodities continues to remain an area of major concern for the policy makers. While the need for doubling the agricultural production and agricultural growth is acute, price and production volatility hampers the efforts. Price and production instability affects producers, consumers and has macroeconomic implications as well. It raises the risk involved in farm production and affects farmers' income. It also affects their decisions to adopt high paying technologies and investments in farming. If the situation of unstable and low farm income persists then we are on the edge of possible dangers of crop holidays, inadequate and unstable supplies, suicides by the farmers, declining standard of living of the masses and increase in poverty. Hence, income stabilization of the farming community as well as increasing the production levels of different agricultural commodities are the two fold objectives to be achieved to secure food availability to the huge population of India.

The literature is full of research which explains the volatility of commodity prices and the issue of consequences of stabilizing those prices, for producers' revenue. Price stabilization and production controls are the two possible stabilization measures. Price stabilization agreements have operated in the cocoa and natural rubber markets, and were proposed for UNCTAD's Integrated Commodity Programme. Production (export) restrictions have been used in the coffee, sugar and oil markets. Only the tin agreement used both instruments systematically and was quite successful in simultaneously raising and stabilizing prices until its collapse in 1985. Similarly the largest stabilization schemes, those for agricultural produce, have typically used a combination of price supports and production quotas (at least in Europe's Common Agricultural Policy and in the US's farm policy). A major difficulty with stabilization proposals has been confusion over what the proper objectives 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 producer's revenues, raising average prices and improving the functioning of the market or

securing greater certainty of supply. The present study recognizes the important role played by prices in production decisions and in deciding the income levels of farmers. The role of prices in bringing changes in quality and quantity and thereby bringing the desired changes in income levels are very well known in economic theory. As Newberry and Stiglitz (1981) point out; the broad objective of all commodity price stabilization programs is to improve the welfare of producers, by raising average prices and incomes. To resolve the conflict between the level of earnings and their stability we have to operate both stabilization instruments. This would involve a programme of price stabilization plus controlled increase (without surplus or scarcity of production) in planned supplies along with improvements in market functioning. Planned supply indicates the planning for the availability of a particular crop at a particular time as per market requirements. An important advantage of this combined approach, however, is that the degree of skew and kurtosis of earnings (strong positive skew in the price distribution implies that prices tend to spend longer periods below average, interspersed with shorter periods of very high prices), will be reduced so that the secondary aim of reducing the chances of low earnings, or large shocks in earnings, will also be achieved.

Many programs are practiced in the United States of America (Shepherd, 1947) from time to time like crop (yield) insurance, variable loan rates, food distribution programs or food subsidies (to remove the instability of income, which is due to variation in general supply and demand). But in India, there is dearth of product wise stabilization programs except for the establishment of price stabilization fund in the north eastern states for crops like tea, coffee, rubber and tobacco (April 2003). The agricultural price policy did not pay any attention to the objective of income stabilization or raising farm income till 1976 (Kahlon and Tyagi, 1983). In fact, it was only in 1977 that stress was laid on the concept of parity prices between agriculture and other sectors of the economy. It was for this reason that the terms of reference of the Agricultural Price Committee were revised in March 1978.

**1.1.1 ONION INCOME STABILIZATION PROGRAMS:** Onion is an important and essential horticultural vegetable and spice commodity grown in India and in Maharashtra. Onion is a foreign exchange earning crop. India produces around 151 lakh tons of onion annually ranking second in the world. The production has increased more than five times during past three decades<sup>1</sup>. However, the prices are not stable, affecting consumers as well

as farmers. Since Maharashtra is one of the largest onion producing states, the government initiated different stabilization programs to deal with price instability and the income instability of producers.

#### **ONION PRICE AND INCOME STABILIZATION PROGRAMS UNDERTAKEN BY GOVERNMENT:**

- Procurement of onion by NAFED under Market Intervention Scheme for price stabilization.
- Procurement and storage of onion by Maharashtra government for price stabilization.
- Provision of subsidy for storage for income stabilization.
- Establishment of standardization and gradation plant in Maharashtra for income stabilization.
- Changes in export policy for price and income stabilization.

#### **1.1.2 SUCCESS OF ONION INCOME STABILIZATION PROGRAMS:**

At the time of distress sales, NAFED procures onion to give remunerative prices to farmers. But this market intervention is not regular and continuous. In Maharashtra the procurement has not been undertaken since year 2000<sup>2</sup>. As a result the impact of its operations on reducing income instability is very low.

In the year 1999, the Maharashtra government procured the Kharif onion at Rs. 300 to Rs 350 per quintal and stored the crop for distribution through public distribution shops. But the market prices reduced and the government incurred heavy losses. Further as it was Kharif crop (with low storage life), the entire crop was rotten and the government incurred heavy losses. As a result of this experience, the government is now reluctant to undertake procurement and storage of onions.

The subsidy for undertaking the onion storage given by MSAMB is very low (at Rs. 1,500/MT). The investment for building a scientific storage structure is huge (Rs.6000/MT) for the small and medium farmers. Therefore the policy of allotment of subsidy for providing incentives to farmers to undertake storages has limited success, as only those farmers could avail subsidy who could afford construction costs. For majority of small and marginal farmers, construction cost is huge even after availability of subsidy. As a result income stability could not be achieved.

Standardization and grading plant was started by the government at Indapur, near Pune, with the objective of standardization and gradation of the crop. It was expected that farmers will avail these services, and standardized crops will fetch them good prices. But the farmers did not take any interest in standardization for the reason that it adds to their transport costs and further there is lack of an assurance that the standardized crop will fetch good returns.

It has been the experience of past years that the changes in the export policy do not come at the appropriate time. As a result farmers gain very little from the export policy. It is pointed out in the study of NCAER (2012), that changes in export policy mainly in the form of export ban at the time of supply shortages to control consumer prices had the deleterious effects of significantly reducing producer prices and undermining their longer term competitiveness in the 2010 upward spike in onion prices. Changes in export policy to control the onion price instability have not proved beneficial for bringing stability in farmers' incomes.

The limited success of the stabilization programs highlights the unresolved issues like yield losses, inadequate storages and income instability of farmers, market imperfections etc. which are becoming regular features of onion production economy.

## **1.2 PRESENT SCENARIO: MAHARASHTRA AS A MAJOR ONION SUPPLIER, BUT WITH MARKED PRICE INSTABILITY**

Maharashtra is one of the leading onion producing states in India. The state contributes to 33 percent of all India onion supply and 40 percent of all India onion exports, by that, acting as a source of income generation for more than 5 million small and medium farmers (source: NHRDF). It is observed that though onion cultivation is a source of income generation to more than 5 million farmers yet the income from onion cultivation is unstable and uncertain in normal harvesting years, as well as in extreme situations like overproduction or underproduction.

The unstable and uncertain revenue from onion cultivation is attributed to two prime factors; economic factors and non economic factors. Economic factors suggest the operation of and the perpetuating impacts of price variability and production instability, whereas non economic factors point towards the defective marketing and trading practices.

Onion price variations are result of high price seasonality and production instability. Price seasonality is due to the peculiar pattern of arrivals within each season, each month a season and different varieties with difference in yield levels harvested in each seasons of a year. Production fluctuations, on the other hand are attributed to two factors; yield uncertainty, affecting the very output itself and the absence of any planned supplies of the crop for the non harvesting period. Yield uncertainties are result of dependency of main Kharif crop on rains. Irregular supplies for non harvesting months on the other hand, are due to unavailability of proper warehousing facilities with farmers for storage of the summer crop. In addition to this, the non economic factors, in the form of defective marketing systems and trading practices of traders are unfair towards farmers. Existence of established traders, barriers to entry, small number of active traders, and collusion among traders, lower price bidding, engaging in intentional hoarding to create artificial scarcity for better price realization are loopholes of the present marketing system. With even a small expected or real possibility of irregularity in production, or in supply, market commission agents and traders manipulate the situation for their benefit by resorting to speculative practices leading to onion 'price crisis'.

### **1.3 INCOME INSTABILITY OF ONION PRODUCERS-ANALYSIS WITH THE HELP OF DECEMBER 2010, JULY 2013 PRICE CRISIS EXPERIENCE**

The strong positive skew (2.39 for Lasalgaon monthly prices) in price distribution implies that prices spend longer periods below average, interspersed with shorter periods of very high prices. That, coupled with the persistence of highly variable prices, will mean that there is a higher probability of large, rather than small, disturbances from the average price level. In such situation, in the absence of any income stabilization instruments, either in the form of production controls or price stabilization measures, producer's earnings get hit the worst. Onion production is the perfect example of such income variability.

The recent price rise series of December 2010 and July 2013 focus on all the elements involved and the price shocks themselves speak for the need necessary measures. Majority of onion farmers could not gain the benefits of the sky high price rise of onions, nor could cover their losses in both the periods. Producer's income has remained low and uncertain in both the situations; the year 2010 was a situation of production shortage and

year 2013 was a situation of normal production levels but with low storages with farmers and higher storages with traders.

### **1.3.1 THE DECEMBER 2010 PRICE RISE:**

In December 2010, uneven rains damaged crops up to 70 to 80 percent. Only 20 to 30 percent of the leftover poor quality, spoiled crop arrived in the market. As this was the year's first harvested produce (with depleted stocks of the Rabbi season), prices soared. In a situation of very low stocks, little quantity of fresh arrivals and heavy demand in the market, the price rise in first two weeks of December 2010, can be termed as economic but the tremendous price hike from 16th December till the end of the month appears to be uneconomic, deliberately made by traders. For the first two weeks of December when majority of farmers bring their produce for sale, prices were on purpose kept at lower ends (even with low level of production), for speculation. But in the third week of December, when majority of farmers sold off their produce prices were hiked all of a sudden. Traders released their own stocks, and hiked the prices. Traders made huge profits within just a week. Farmers received Rs 1100 -1700 per quintal (Rs. 11-17 / Kg.) but traders received Rs. 3800-4500 per quintal (Rs. 45 / Kg.), and the retail prices were in between Rs. 80-100 per Kg.

Further, 70 percent (or more) crop losses of the farmers could not be covered by the market prices with the low yields of only 30 percent. Majority of the farmers could not be benefitted from the price hike of 3<sup>rd</sup> week of December as they had already sold off their produce in the earlier weeks. The Competition Commission report (2010) has also derived conclusions that the December 2010 price rise was not just a demand (buyers) and supply (farmers) problem. The Report remarks that the traders and the international trade had a greater role in December 2010's high price episode. In normal conditions, unseasonal rains in October should have forced the prices to rise right from November, but this did not happen and there was sudden price rise in 3<sup>rd</sup> week of December which creates suspicion about the trading practices.

Table 1.1 : Onion Arrival and Price % Changes of December 2010 over December 2009

Dates	Arrival % Change	Price % Change
1 <sup>st</sup> to 3 <sup>rd</sup> Dec	-17.63	-6.66
4 <sup>th</sup> to 11 <sup>th</sup> Dec.	-14.66	32.07
13 <sup>th</sup> to 15 <sup>th</sup> Dec.	-33.42	23.54
16 <sup>th</sup> to 22 <sup>nd</sup> Dec.	-15.37	<b>61.75</b>
23 <sup>rd</sup> to 26 <sup>th</sup> Dec.	0.32	<b>72.45</b>
27 <sup>th</sup> to 29 <sup>th</sup> Dec.	-45.52	<b>77.01</b>

Notes: Figures in bold indicate sudden price rise.

(-) signs indicate percentage fall.

Source: Author's estimate based on online NHRDF data, 2014.

### 1.3.2 THE JULY 2013 PRICES RISE:

The price crisis of July 2013, as commonly understood is not a consequence of any production shortage. In 2011-12 the state's onion production at 5823.50 ('000MT) was the highest in the history of onion production of the state whereas the 2012-13 production at 4460('000) MT is no less than average of the state's onion production. The 2012-13 production was higher by 18 percent than the average of production from 2005-06 and the yield (in spite of severe drought in the state in 2012-13) was higher by 24 percent than the average of yield, from 2005-06 to 2011-12. Thus, it is observed that in spite of above average production level and adequate availability of onions, the prices soared. The month wise (from January to September) percent changes of arrivals and prices of the Lasalgaon market of 2013 over 2011 point out towards the influence of uneconomic factors on prices.

As may be observed from table 1.2, April and May arrivals do not record any arrival shortages. The traders manipulated the fact that 80 percent of farmers do not store the produce and whatever 20 percent of farmers store they bring their produce for sale in the market by June. As the Rabbi crop market arrival slowed down in June, traders were certain that no stocks are left with the farmers and they hiked prices for the produce which was stored by them. In September also the arrival shortage would not had been up to 49 percent had the traders not exported the huge quantities of the produce in August. Traders piled up huge stocks from April and May Rabbi arrivals at very low prices (Rs. 800 to Rs 1100 /quintal or Rs. 8 to 10 / Kg. in 2012-13).

Table 1.2 : Onion Month Wise Changes in Arrivals and Prices of 2013 over 2011

Months	Arrival Change	(per cent)
		Price Change
January	149	-39
February	50	73
March	-18	131
April	33	53
May	53	66
June	20	91
July	2	<b>150</b>
August	-9	<b>241</b>
September	-49	<b>334</b>

Notes: (-) signs indicate %age fall,  
 Figures in bold indicate speculative price rise.

Source: Author's estimates based on online NHRDF data.

Traders hiked the prices in July on the plight of production shortage up to Rs. 5700 per quintal (Rs. 57 / Kg.) and in retail markets the prices went up to Rs 100 a Kg. The prices farmers received did not even fully cover their cost of production, transport cost and other marketing costs. (Rs 721/qtl. or Rs.7.20/Kg. is the cost of Rabbi Onion production as per NHRDF 2011-12, Annual Report) The producers in this situation again were at a loss and earned nothing in 2012-13 price rise episode.

An examination of the onion price crisis, of the two seasons, Kharif and Rabbi, reveal the factors leading to income instability.

### 1.3.3 FACTORS LEADING TO INCOME INSTABILITY:

- Absence of onion production planning or lack of planning to control wastages due to uneven rains, leads to major supply shortages. As a result of weather dependency, farmers suffer from yield losses and consumers face price crisis.
- In normal harvesting years (years without any natural irregularity, with abundant/normal output), guidelines for the proper disposal of crop are not available on time (e.g. export policies, processing of the crop). As a consequence, farmers suffer the most from the market price fall (due to heavy arrivals)



- Lack of stockholding capacity with farmers, the limited finance, and hence the limits to the size of the stocks held by farmers, imply that larger price shocks could be modified proportionately less than smaller shocks.
- Absence of income support measures, allows the price variations to impact producer's revenue, by mostly dragging it to non profitable levels.
- Imperfections of market functionaries and the powerful monopoly of CAs and traders is responsible for sky high price series of situations which otherwise were manageable.

Such large price shocks are not affordable to the economy of growing population, where growing demand for the necessary items is being experienced. The income variability of the producers has its adverse impact on the very incentive of production. Consumers, on the hand, also suffer by being forced to pay high prices. Therefore income stabilization policy can only help in achieving the two fold objectives of increase in production as well as price stabilization.

#### **1.4 STATEMENT OF THE STUDY**

“Proper planning in production, management of storage and warehouse and price stabilization scheme will reduce the price fluctuations in onion and stabilize the income of the farmers.”

#### **1.5 OBJECTIVES OF THE STUDY.**

- To find out the possibility of planning in production of onion.
- To find out the impact of proper storage facilities on income stability.
- To find out whether income stabilization can be achieved, with a development of ‘price stabilization fund.’

#### **1.6 DETAILS ON OBJECTIVES OF THE STUDY.**

With the prime objective of stabilization of income of the onion farmers, the thesis concentrates on three important instruments:

- ❖ Proper planning in production to overcome the production fluctuations.
- ❖ Storage policy to regularize the supply and thereby the incomes.

- ❖ Establishment of price stabilization fund to avoid losses and instability in incomes.

**1.6.1. CONCEPT OF ONION PRODUCTION PLANNING:** In Maharashtra, onions are harvested in all the three seasons, the main Kharif season (harvested in November second week until December), the late Kharif season (harvested in January until March) and the Rabbi season (harvested in April and May). 20 per of the total produce enters in the market in season 1 i.e. Kharif season, 20 to 25 percent in season 2-late Kharif and 60 percent in season 3 i.e. Rabbi Season. It is considered as a cash crop by many small and marginal farmers which can offer good income opportunities in just three to four months. The short duration of the crop and the suitable climate govern the planting decisions of the farmers. Onion is a tropical/ subtropical crop which requires light moisture conditions at nursery and transplanting stage and dry climate in plant growth stage. Hence, intensive cultivation is confined to selected areas of the state. Onion is largely grown in Nashik district, Ahmednagar district and Pune district mainly by small and marginal farmers. The nature of the crop is such that Kharif crop is perishable and lasts for maximum ten to twelve days in good condition (although it has storage life of 1 month); however the summer season variety can be stored for six to eight months. It is only for the period of June to November that fresh onions are not harvested and at that time market relies on the stored crop. Thus onion produced in each season has different production features. These features act against the producers in the matter of securing remunerative prices. It is observed that in each season producers have small controls on market prices. To increase the producer's influence on prices, production quantity can be controlled.

Production Forecast: The concept of production planning has been analyzed with the help of two methods. First method plans for the quantity of onion required for direct and indirect consumption of the state. The required quantity, the required area to be brought under onion cultivation can be so planned to avoid overproduction or underproduction. The required quantity of the produce can be increased in proportion with the growth rate of population and exports. The prices can be predicted with the help of price-arrival forecast equation. Second method adopted in the study is to forecast the current year state production on the basis of previous year's national onion price index so as to determine whether the expected production of onion will mean overproduction or underproduction.

Staggered Production: While formulating the production planning, it needs to be considered that in Maharashtra the main Kharif and the late Kharif yield heavily depends on rainfall, making the production (or the quantity of produce) most uncertain and as Kharif marks the start of new arrivals after the end of storage season, inadequacy or shortage of production should be avoided. Yield fluctuations have in fact brought the question of unstable and low income to the forefront. With production abundance the problem of plenty and with scarce supply the prices crisis occurs. Both the situations affect the welfare of producers as well as consumers. In order to avoid this mismanagement in production, staggered production planning is suggested. Study suggests planning for the timings for the sowing and harvesting of the main Kharif and late Kharif onion in main producing areas like Nashik, Ahmednagar and Pune districts, as per rain behavior of each region. Instead of harvesting the crop by all the regions at the same time (in December), phased sowings and harvesting as per rainfall behavior of the regions, will avoid the problem of abundance or scarcity of the produce.

**1.6.2 CONCEPT OF ONION STORAGE POLICY:** Second important instrument of income stabilization, is in the form of production supply policy. The on farm storage of summer crop in scientifically built structures and its release in non harvesting seasons is expected to fetch remunerative prices for summer crop as well as transfer gains of storages directly to the farmers. The storage policy is expected to help in stabilizing producer's income. But, it is observed that majority of farmers (nearly 80 percent) are reluctant to opt for storage of the crop.

### **THE FARMER'S PERSPECTIVE ABOUT THE STORAGE OF ONIONS<sup>3</sup>**

- Farmers are not certain about the price levels that they may fetch for the stored crop. Traditional storage practices result in substantial losses in stored onions. Nearly 80% of the farmers are dependent upon primitive and old storage Chawls. As a result of high percentage of wastages during storage (nearly 40 to 50 percent), farmers find it difficult to cover the costs and they are reluctant to undertake storages.

Proper scientific storage structures developed by NRCOG, Rajgurunagar have shown that the storage losses could be reduced by 20 to 30 percent. However, the benefits of improved storage structure could not be reaped by majority of farmers due to

high cost of construction. The cost of construction is the main hurdle in increasing the storage capacity of farmers. Proper scientifically built storing needs investment. For 25 tons of 'Kanda Chal' (storage structure), total expenditure is Rs. 1,48,066 and for a 50 tons structure, total of Rs. 2, 94,528 investments are needed<sup>3</sup>. The construction cost of the onion storage structure is assumed at Rs. 6000/- per MT for this scheme. As per the scheme of MSAMB, subsidy to the extent of Rs.1500/- per MT storage capacity will be given. But this subsidy appears very meager as compared to the cost of finance. For construction of 50 tons of storage, with a total investment of Rs. 300000 (rounded off), farmer gets a subsidy of Rs. 75000. If a bank loan of remaining Rs 225000 is raised with 20 percent self margin, at 10 percent (minimum) rate of interest with repayment period of 5 years, it is observed that Rs. 36000 per annum is the principle with Rs. 3600 per annum as the interest. Thus the total storage cost is Rs 39600 p.a. Further, the sale of stored onion does not appear profitable as production cost of 50 tons of onions (Rs. 330 to 721 per quintal)<sup>4</sup> is very high, compared with low selling prices at Rs 450 to 550 per quintal (average of prices storage season, Lasalgaon, 1990 to 2010) with high percent of (30 to 40 percent) storage wastages. The small and marginal farmers cannot make this investment. As a result they either don't store at all or store in old bamboo structures where the losses are heavy. It is estimated that if a grant up to 80 percent of storage construction cost is given and if the market prices increase up to Rs. 1000 per quintal, then the farmers may reach to the breakeven point.

- Another important reason for avoiding onion storages is their immediate need of money to undertake next season's cultivation activities.

But storing the produce on large scale is necessary from the point of serving the domestic markets as well as to become a reliable exporter in the world market. Large scale storage is possible only when farmers themselves decide to store the produce and overcome the above mentioned limitations. Measures should be adopted on the government level to help farmers financially to increase their storage capacity.

The present study has illustrated with the help of data that if farmers use the scientific storage structures then storing the produce in April or May will raise the prices in

these months and as a result the income levels of summer season will improve. Further, selling the stored produce in non harvesting months will fetch remunerative prices even after deductions for storage wastage and cost of storage. Also, the percentage of risk involved in storage policy is calculated in the study.

**1.6.3 CONCEPT OF PRICE STABILIZATION FUND:** The unavailability of financial support system to farmers is one of the major causes of unstable and uncertain income. Hence establishment and development of a price stabilization fund becomes necessary. The central idea of the fund is to raise a corpus. Farmers will get financial support when the market prices are lower than the fund's minimum price. This will help in avoiding the losses as well as stabilize the incomes. The farmers can return the money to the fund in the next season or when they get higher price.

It is observed that for main Kharif and late Kharif season the prices rule high but if the yield level goes down then the market price is not sufficient to cover the yield losses. In such situation farmer's income needs support to make it stable and remunerative. Similarly for summer seasons, prices fetched are lowest of all seasons. Therefore financial support will increase the holding (storage) capacity of the farmers, which will result in higher stocks and better revenue.

## **1.7 METHODOLOGY**

**1.7.1 METHODOLOGY TO EXAMINE THE POSSIBILITY OF PRODUCTION PLANNING:** As per the NSSO (2004-05, vol. no. 1) onion consumption data, total direct onion consumption of the state is calculated. Indirect demand (data source: NHRDF) consists of exports (40%), processing (2%), storage wastages (30%) and handling and rotting wastages (3%). The proportion of indirect demand is calculated on the basis of state's average production from 2005-06 to 2012-13. The area required for total (direct + indirect consumption) onion quantity is given by total quantity divided by the average yield (average yield of 2005-06 to 2012-13) of the state. The prices are predicted as per the price arrival relationship which is examined with the help of a model. To capture the influence of arrivals on prices, the study proposes a model. The model considers prices, as determined broadly by two factors, local or market factors and national factors. The local or market factors include local arrival as the main determinant of prices and at national level, factors such as total supply by other states, exports quantity and export price, demand, weather etc. (which

get reflected in the national onion price index) are important price determinants. Hence, the impact of national price index on market prices is examined first by a simple linear regression where local prices are assumed to be dependent on national price index. The residual deviations of prices of this model are then assumed to be due to local arrivals. A linear regression of prices, net of influence of national price index, dependent on local arrivals explain the relationship between market prices and market arrivals. Similarly a linear regression of prices dependent on market arrivals and ONPI is also examined for price prediction. A linear regression of current year Maharashtra state annual production dependent on lag of onion national price index is examined to forecast the production levels. The prices of this quantity are predicted with the help of price arrival relationship.

**1.7.2 METHODOLOGY FOR ANALYZING STORAGE POLICY AND ITS IMPACT ON INCOME STABILIZATION:** Arrival and price seasonality is examined for the purpose of development of storage policy. The storage policy runs on the principle of deriving benefits from high price seasonality of non harvesting period. In other words, it means postponing the sale of summer season produce (March to May) as price seasonality is low, storing the summer produce as arrival seasonality is high (above normal) and releasing the stocks in the months of high price seasonality (from June to November). The estimations of increase in prices of the summer season due to reduction in arrivals, the probable impact on prices of non harvesting season due to release of stocks are drawn. The costs of storages, the benefits and the risk of the storage of onions are examined. For price prediction, the price forecasting equation of prices explained by national prices index and market arrivals is used.

**1.7.3 METHODOLOGY FOR ESTABLISHMENT OF PRICE STABILIZATION FUND AND ITS IMPACT ON INCOME STABILIZATION:** The data of Lasalgaon market, from the year 1990-91 till to 2009-10 is evaluated with the help of a price band. The band has lower and normal levels of prices (levels decided on the basis of cost of production, all market charges, transport costs and margin of the farmers). For over all the years, the number of times the prices were in between these categories is found out. The difference between the market price and the lower level of prices (when the market price is low than the lower price of the fund) is calculated. The total of this difference become the actual pay out- outflows from the fund. Similarly, whenever the prices were above the normal levels, i.e. when the farmers are getting supernormal profits then that is the time for pay in- inflows to the fund. If all

such supernormal profits are deposited to the fund then they are the receipts of the fund. Simulations of different levels of price bands are worked out to assess the impact of inflows and outflows on stability of revenue (revenue is calculated by multiplication of prices and arrivals). Different price band scenarios like raising the upper price limit while keeping the lower price level the same, reducing the lower price limit while keeping the upper price limit the same, broadening of the band like reducing the lower limit while increasing the upper price limit, narrowing of the band like raising the lower price limit while decreasing the upper price limit and the normal price band levels are created. The mean, the standard deviation and the coefficient of variation of revenue of each scenario is compared with the original revenue, (revenue without fund operation). The fall in standard deviation and coefficient of variation of revenue of each scenario measures the impact of operation of the fund on removing the instability in income.

### **1.8 DATA COLLECTION**

All data is collected online from the websites of National Horticultural Research Development Foundation (NHRDF) [www.nhrdf.com](http://www.nhrdf.com), Maharashtra State Agricultural Marketing Board (MSAMB) [www.msamb.com](http://www.msamb.com), and National Horticultural Board (NHB) [nhb.gov.in](http://nhb.gov.in). The data on all India onion national price index is collected from the website of Office of Economic Advisor, Ministry of Commerce ([eaindustry.nic.in](http://eaindustry.nic.in))

Personal meetings with the directors and Professors of research institutes like National Research centre for Onion and Garlic, Rajgurunar, National Horticultural Department, Pune, MSAMB, Pune, Agricultural Colleges - Pune, Rahuri and Dhulia, Ex-Agricultural Commissioner K. Lavekar, Pune, and many more people have added great value in understanding the onion price production scenario.

The cost of production for each season and the storage cost of Rabbi season onion is collected by way of discussions and meeting with farmers from Pune market, Chakan market and Lasalgaon and Nashik markets. The cost of production of onion as given by NHRDF is also collected.

The political economy of the onion prices is reviewed by attending a meeting of all party political leaders and farmers under the chairmanship of Member of Parliament Mrs. Supriya Sule at Pune. Leaders of political parties ask for subsidy to be provided to farmers so

as to cover up their losses. Farmers on the other hand demand remunerative market prices to be established with the help of sound marketing and auction systems.

### **1.9 MARKETS SELECTED AND PERIOD OF ANALYSIS**

The monthly price behavior of Lasalgaon, Pimpalgaon, Nashik, is examined. The choice of the markets would indicate that the onion producing belt is basically selected, as these are the Asia's biggest markets for onions. Lasalgaon price trends are considered as important because the trading quantity is the highest of all the markets.

It is observed that there may exist difference in the variety and quality of the produce that is brought in each of the market like Ahmednagar, Pune, Kolhapur, Dhulia, Chakan, Sangamner etc. for sale and the timings of start and end of each season in each market is also different by either 15 days or a month. This gives rise to small price differences at the time of seasonal peaks and lows in each market. The special local varieties that are available in markets like Ahmednagar, Nashik, Pune enjoy a premium, but the quantity of such produce is low. Therefore price behavior of such limited quantity arrivals is not examined. But the most common varieties of onion (Agrifound Dark Red, Agrifound Light Red and Agrifound Red onion) which are brought to the markets by the large number of farmers in abundant quantity are examined for price behavior.

#### **THE PERIOD OF ANALYSIS**

The data for Lasalgaon markets is available for a longer period from 1990 onwards till date than other markets. Hence, the same is selected. This analysis is based on the monthly prices received for the monthly arrivals (produce) brought by the farmers in the Bazaar Samities. Lasalgaon data for a period of 1990 to 2011 (i.e. total twenty two years) is selected for price analysis.

#### **NOTES**

1. See nhrdf.com
2. www.maharashtrastat.com
3. Author's discussions with farmers, Pune and Chakan markets, 2010
4. See msamb.com
5. See nhrdf.com