PRICE VARIATION OF VEGETABLES IN DIFFERENT SEASONS WITH REFERENCE TO ORGANIZED RETAILERS

Doctoral Thesis Submitted

In partial fulfillment of the requirements for the award of the degree of

DOCTOR OF PHILOSOPHY

In

MANAGEMENT

By

SHAKIL ANWAR SIDDIQUE

Under the guidance of

Dr. Amar Eron Tigga
(Research Co-Supervisor)
Professor
XISS, Ranchi,
Jharkhand, India

Dr. Birendra Goswami
(Research Supervisor)
Assistant Professor
ICFAI University Jharkhand
Ranchi, India

ICFAI UNIVERSITY JHARKHAND

RANCHI

JULY, 2019

THESIS COMPLETION CERTIFICATE

This is to certify that the research thesis titled – **"Price Variation of Vegetables in Different Seasons with reference to Organized Retailers"** submitted by **Mr. Shakil Anwar Siddique**, in Partial fulfillment of the requirements for the award of the Degree of Doctor of Philosophy in Management by the ICFAI University Jharkhand is an original work carried out by him under our joint guidance.

It is certified that the work has not been submitted anywhere else for the award of any other Degree or Diploma of this or any other University. We also certify that he complied with the Plagiarism Guidelines of the University.

Dr. Amar Eron Tigga
Professor
Xavier Institute of Social Service (XISS)
Ranchi, India
(Research Co-Supervisor)

Dr. Birendra Goswami
Assistant Professor
ICFAI University Jharkhand
Ranchi, India
(Research Supervisor)

DECLARATION OF AUTHORSHIP

I declare that this thesis entitled **"Price Variation of Vegetables in Different Seasons with reference to Organized Retailers"** submitted by me in fulfillment of the requirements for the award of the degree of Doctor of Philosophy of the ICFAI University Jharkhand, Ranchi is my own work. It contains no material previously published or written by another person, nor material which has been accepted for the award of any other degree or diploma of the university or other institute of higher learning, except where due acknowledgment has been made in the text. I further state that I complied with the plagiarism guidelines of the university, while preparing the thesis.

(Shakil Anwar Siddique)

UID No. 14JU11300023

Date:

Place:

ACKNOWLEDGEMENT

It is really a matter of pleasure for me to get an opportunity to thank all the persons who contributed directly or indirectly for the successful completion of the Theses, “Price Variation of Vegetables in Different Seasons with reference to Organized Retailers”. At first, I would like to thank Dr. Birendra Goswami, my Ph.D. supervisor and Dr. Amar Eron Tigga, my Ph.D. Co supervisor. Both of them have been inspiring, challenging and supportive in equal measure, and I consider myself very privileged to have worked under their guidance and support.

I am indebted to the Research Board of the ICFAI University Jharkhand headed by honorable Vice-Chancellor of the University that contributed in enabling a quality research by way of its suggestions in the various half-yearly progress reviews and would like to specifically thank our respected Vice Chancellor (Prof. O R S Rao)for his constant support and encouragement.

I would like to thank Dr. B. M. Singh, Dr. Rumna Bhatcharraya, Dr. K. K. Nag, Dr. Hari Haran, Dr. Raj Kumar, Dr. Mridanish Jha, and Dr. Sudipto Majumdar, Dr. Pallavi Kumari for their constant support. I would also like to thank all the staff-members of ICFAI University Jharkhand, my colleagues and my fellow research scholars for their help all throughout the journey of my Ph.D.

I would also thank to my department colleagues, college colleagues for their endless support and cooperation throughout the journey of my PhD.

Special thanks to Prof. Dr. Vanshi Dhar for his kind effort and cooperation.

My deepest gratitude to God Almighty for his grace and blessings in completing my Ph.D. Program.

Last but not the least I am particularly grateful to all my relatives, I would like to thank My Mom and Dad, my Wife, my Sons (Tamjid & Tanzeel), my Brother, Sister-in-law, My niece and nephew (Tasneem & Tahmeed) who had scarified and contributed a lot throughout my Ph.D. journey. I would not have been able to do this without their constant encouragement and support.

(Shakil Anwar Siddique)

UID No. 14JU11300023

Date:

Place:

EXECUTIVE SUMMARY

After China the second largest in population with various socio economical groups of peoples is India. Similar to dialects, their food habits also vary with every kilometer. The vegetables are basic piece of the day by day diet in India. From the most sections of the population, the vegetables are in great demand throughout the year. As the vegetables constitute of major source of minerals and vitamins it was found that globally there are around 2.7 million annually deaths happen because of low consumption of vegetables, Sachdeva et al, (2013). The vegetables are perishable products under the natural conditions.

The changing socio-economic scenario of Indian consumers and also change in processing and pattern of trade, the commercial value of vegetables has risen substantially.

In India the average monthly expenditure per capita on vegetables was Rs.87.33 (rural) and Rs. 112.44 (urban) which has increased manifold in present time [NSSO Survey 2009 -10]. Their financial significance has additionally expanded and high work force in the generation of most vegetable creation likewise makes them significantly from the business edge. Sharma, (1991). Increment in regional distribution under plant crops - proposed as a measure for horticultural broadening, expanded business and pay. Malik (1998)

In light of these problems, this research hopes to assess the economic situation for vegetables from farmers to organized sector. This topic itself becomes very important as stable price helps both the consumers and farmer. This also helps in economic growth and development of a region/country.

The findings of the study may help to provide a better path in terms of quality and price of green vegetables.

In light of these problems, this study seeks to assess the market environment for vegetables in the organized retail sector. It will examine various aspects of vegetable marketing such as market infrastructure, marketing practices, marketing costs etc. in the wholesale markets in the selected area. The study will further attempt to identify the prevailing value chain and the variation of price of the vegetables from the Farmer → The Mahajans → The Agent → The Wholesaler → The Retailer → The Consumer in terms of costs, prices and their shares in the selected markets.

Prices of vegetables are governed by the law of supply and demand. When the supply of any vegetable exceeds the demand for that product, prices tend to be lower than average.

If we talk about the perishable product it very sensitive regarding the price and that due to following reasons:

1. Very short shelf- life
2. Local production system
3. Import and export are very limited
4. These perishable products i.e. vegetables consumed locally
5. Very low influences are there by the distant consumers
6. Consumers also prefer the local products due to its freshness and quality
7. These products are sensitive to production due to environmental and climate factor.
8. Other factors are also important in price influence.

The farmers are the only reason why an organized retail are in vegetables business and providing fresh vegetables to their end users, so satisfying the

farmers will ultimately make retail business like Reliance Fresh, Big Bazaar, Vegfresh more profitable in terms of Perishable food products. There is a need to feature the significance of a farmer's administration in worth arrangement. An atmosphere that accentuates graciousness, ability and a workplace that advances solid working relationship and strengthening. The goal of this Research is to get help from farmer's input for not just recognize issue zones with respect to the development of vegetables yet in addition give the most ideal cost to their work. This examination will likewise show to farmers that we give it a second thought and are proactive in searching for approaches to improve the administration.

The present research was gone through different phrases which are following:

STAGE -1: Visit to the different area of Ranchi city like Brambe, Mandar, Chanho, Bero and Pithoria know about the total presence of farmers. The second side was known since it is regarding the organized retail stores in Ranchi which are in limited numbers.

STAGE 2: The next stage was to interact with the farmers and take their feedback on the questionnaire regarding the production of vegetables, kind of land they use for the cultivation, the total area of cultivation of different vegetables, the seasons variety of vegetables, the cost of production of these vegetables, the post harvest losses if any, who fixes the prices of these vegetables, major constraints regarding the marketing and production of these vegetables.

On the second hand of the stage-2, the organized retailer were interviewed regarding the processing of these vegetables, purchasing and selling of these vegetables, cost of transportation, packaging, merchandising, reprocessing,

or any other cost. Other than the cost they are also interviewed regarding the storage facilities and availability of distributors/intermediaries in this business.

STAGE-3: Analysis was done on the basis of the questionnaire filled up and the suggestions made by the respondents.

Further analyzing the researcher found that this research named "Price Variation of Vegetables in Different Seasons With Reference To Organized Retailers" was really the worthwhile to understand the pricing variation of vegetables in different seasons from farmers to organized retail chain and from organized retail chain to the end user.

But the line organizational functional systems are there having three strategic points which are:

a. Producer/Farmers

b. Marketer/Intermediaries

c. End consumer

After interacting with the farmers and retailers, the researcher came into the conclusion that producer/farmers are not realizing their perfect profiting condition and they compile to hand over their production to the vested interested marketing group who has the key capacity to mechanize the pricing system or we can say that this marketer group has the ultimate power in deciding the pricing system of the various products (vegetables). So it is very much a middle man dependant system. On the other hand, the consumers are compelled to buy different vegetables products as per their market price. But as per the present economic system, there are certain hope arises with the action of the government. The Government is now planning to support this system with exchange commodity with forward system,

scientific support as well as developing chain cold stores not only for potato or onion but for all vegetables. We hope that after 2025, the scenario will be changed with the price mechanism management of these products and a fair pricing formula with these products.

The essential focal point of this research paper is to know about the variation of price of vegetables in different seasons along with difficulties and issues of supply chain of vegetables. And furthermore to discover the variation in vegetables price, which emerge because of the nearness of various middle people and appropriation levels. In this research the extensive literature review is the base and the idea got from both the essential and auxiliary sources. The exertion is relied upon to give an understanding of the issues and would endeavor to recommend remedial measures for cost advancement and effectiveness in the production network of vegetables from the producer (farmers) to the consumer. The essential issue lies with a supply chain that climbs the costs of these vegetables. Farmers are not getting imperative acknowledgment of cost proportionate with their endeavors because of absence of storerooms, poor market data and unorganized supply chain.

There are different vegetables models and literature that exists which support that there is a variation in price of the vegetables from farmers to buyer through the presence of different intermediaries.

This research also states that the farmer does not get the actual value of their vegetables because of the existence of the intermediaries know as Mahajans. These people negotiate the price from the farmers and buy the vegetables in bulk and then sell those vegetables as per their pricing system, since there is a storage problem and a chance of waste dump the farmers sell their

vegetables as the intermediaries said price, due to which they are unable to charge as per their need and requirement.

On the other hand the farmers does have a proper marketing channel through which they can communicate with their customers like retailers, many of farmers produce the vegetables and come to sell in the market but not able to sell directly in a single day of operation due to which they have to take back the balance vegetable along with them which result more cost in terms of transportation or damage of the vegetables, so every farmers want to sell their vegetables in the same day of operation whether in good price or at average price. Thus, with this an intermediary takes an advantage and maximizes their margin instead of giving the value price to the farmers.

Due to the existence of these channel end-users have to pay more for these vegetables in every season whether it is pre-monsoon, monsoon or post-monsoon.

To overcome with this problem, it is revealed from the study that many of the farmers who do not want to invest so much of cost in production they simply give their some portion of land into contract farming and lease, the rest they keep for themselves and cultivate the limited amount of the vegetables which are later on sold to the specific Mandi and from there the farmers can earn more as compared to other.

There is a major price variation in price of some selected vegetables. There is a maximum variation regarding Tomato, Brinjal, Beans and Bottle Gourd. The farmers do not get appropriate value for their produce vegetables. Due to lack of storage they can’t be able to hold back these vegetables with them for an extensive stretch of time after the cultivation because perishability in nature, so they have to sell within a particular period of time at the

intermediary's price. The result the farmer does not get proper value and intermediaries like mahajans and other intermediaries earn more than the farmers. These intermediaries also play a vital role in fixitation of the vegetables price and sell in the market in accordance to their convenience.

There is a variation in price and quantity of different vegetables i.e. Cauliflower, Cabbage, Beans, Bottle Gourd, Brinjal and Tomato at different seasons regarding the average productivity, average production cost, average packaging cost and average transportation cost. The average productivity, the average production cost, the average packaging cost and the average transportation cost were found the highest for all the concerned vegetables during the post monsoon season which is at par with the monsoon season. The average productivity is significantly higher during the monsoon and post monsoon seasons than pre monsoon season. There is also a Percentage of Price variation between two seasons regarding total cost of production, selling price from the farmers to the retailers, selling price from retailers to consumers for major concerned vegetables i.e. Cauliflower, Cabbage, Beans, Bottle Gourd, Tomato and Brinjal.

Table of Contents

PART 1

PART 2

PART 3
LIST OF FIGURES

PART 4
LIST OF TABLES

CHAPTER 1

INTRODUCTION

INTRODUCTION

The chapter Introduction deals with the detailed information that has considered for the study and research work. The chapter introduction is divided into various segments which are:

1.1 Overview

1.2 Description of the study

1.3 History of Concerned Vegetables

1.4 Organization Profile

1.5 Business Models of Vegetables Retailers

1.6 Price Variation of Vegetables

1.7 Motivation for the Study

1.8 Scope of the Study.

1.1 Overview

India is a big country by population and by geographical area. There are many religions, caste and creed and living with their natural food habit across India. Due to living differentiation the food habits are also different, especially vegetable food products. The demand of the vegetables varies from one region to another. Generally, vegetables that are in demand by the local population are grown locally or in its adjoining area. These vegetables come under the perishable product category under the natural conditions.

The efficiency of marketing for vegetables in India has been of significant concern in the recent years. It is very poor capability in the advertising channels and inadequate showcasing foundation are acknowledged to be the reason for high and fluctuating customer costs, yet in addition excessively less of the end users rupee achieving the farmers. (Kaul 1997, Ashturker and Deole 1985).

Indian farmers normally depend completely on middlemen especially when we talk about the vegetable market. The purchaser and the farmers frequently receive a poor arrangement and the go between control the market, however don't include much worth. There is additionally gigantic wastage, decay in quality just as the successive befuddle

among interest and supply both involving and after some time (Subbanarasiah 1991, Singh M. et.al. 1985).

Vegetables consistently contain a fundamental piece of diet in India and from most areas of the majority they are in great in demand round the year. The estimated business of vegetables to the extent quick use, getting ready similarly as trade has risen altogether recently. Their money related importance has in like manner extended and high work influence in the formation of most vegetables age furthermore makes them huge from the business point too, Sharma (1991). Increment in region allotment under plant yields has frequently been recommended as a measure for farming broadening, expanded work and salary , Malik, (1998).

In light of these issues, this study tries find out the variation of price of the vegetables in different seasons with reference to organized retail. The investigation will further endeavor to distinguish the common worth chain from The Farmer → The mahajans → The Agent → The Wholesaler → Retailer → Consumer costs and their offers in the markets. Costs of vegetables are administered by the law of free market activity. At the point when the supply of any vegetable surpasses the interest for that item, costs will in general be lower than normal. Similarly, when the demand exceeds the supply, prices tend to rise. Often small changes in quantities offered for disposal on the National Markets have a magnified effect on prices. The year-round availability of processed vegetables (frozen, canned and, to a lesser extent, dehydrated) may reduce demand for the fresh product, particularly when prices are inflated. The availability of other products, which can be used as substitutes for a particular vegetable, may also play a role. Thus, when potatoes are very expensive, there is a greater consumption of sweet potatoes, rice and maize products. Various vegetable marrows or squash may substitute for pumpkins. The demand for a specific vegetable is also affected by changes in consumer preferences and eating patterns, and by change of the season. Serving of mixed greens harvests are progressively famous during the hotter summer months, while those vegetables utilized for cooking and for soups are more sought after during the cooler, winter period. Changes in expectations for everyday comforts, and expanding urbanization of the populace, influence the sort of sustenance that families devour. At the point when costs have been

anomalous high for a few while, numerous farmers who don't ordinarily develop the specific harvest endeavor to benefit from these costs by developing the yield. This prompts over-supply of the item, with resultant low costs. After times of low costs, a few cultivators suspend generation, bringing about a drop in supply and more expensive rates. It is typically just the steady maker who makes a money related accomplishment of vegetable cultivating over the long haul. The overall atmosphere in the creation regions is the significant reason for variances in the occasional supply of vegetables, and along these lines of costs. Ice delicate yields are typically just delivered in summer in many territories of the nation. The supply of vegetables intolerant of cold temperatures increases in summer, and lower prices prevail for these crops. In winter, and particularly in spring, creation of such warm-season harvests is confined to a couple of ice free territories. Makers in such zones may in this manner anticipate more expensive rates for their items. The contrary pattern happens with warmth touchy harvests, which require cooler conditions for best yields and quality. In such cases, costs will in general be lower in winter and spring and higher in the mid year to-harvest time period Another complicating factor is that, while the climate at a particular time of year may favor crop growth, it may also favor disease development or pest incidence. This may make creation of a particular vegetable progressively troublesome, or all the more expensive, with the additional contribution of fundamental control measures. Misfortunes from bugs and ailments can influence the supply circumstance, and costs at that season will ascend with deficiencies. Aside from occasional patterns, the powers of nature can have an exceptionally checked impact on provisions and costs acknowledged for vegetables. For instance, floods, hail, tempests or illness may cause an unseasonal lack of a specific yield, and costs can rise drastically. Substantial downpours may postpone gathering tasks. This could result in a sharp ascent in crisp produce costs, trailed by a droop when abundance supplies achieve the market with synchronous gathering of the postponed harvests. Regardless of the considerable number of elements which are equipped for influencing business sector costs, there are particular regular value patterns. This reality can be utilized to advantage by any planned producer, gave that the ecological conditions at his creation unit take into consideration the generation of a particular harvest when

progressively good costs are likely. In general, production of good yields of quality vegetables will be economic, even with relatively depressed prices. In India perishable product like vegetables are very price sensitive basically due to following reasons:

1. Very short shelf life
2. Local production system
3. Import and export are very limited
4. More over these types of product are consumed locally
5. Very low influences are there by the distant consumers
6. Consumers also prefer the local products due to its freshness and quality
7. These products are sensitive to production due to environmental and climate factor.
8. Other factors are also important in price influence.

Although Perishable Products include localized production and consumption, there is a limited scope of export. Even then there is an increasing trend of transporting to various possible distant places due to the availability of more logistics and supply chain facilities but still at certain limited geographical locations. Agricultural products are generally considered as perishable apart from milk and fruits which have more shelf life than vegetables. In general, most of the perishable products are dependent on local market and nearby market within the periphery of 100 to 200 kilo meters for its consumption. This is due to the fact that these products are not generally considered for keeping it in cold storages because forward trading on the entire agricultural products are not possible.

These are some of the important factors and considerations responsible for high level variation in prices of major green vegetables which impacts not only the economy but also the producers and consumers to a large impact. Thus understanding the price variation of major vegetables is an important to develop suitable strategies which will not only help the various stakeholders involved but also for the economy of our country.

One of the important agricultural products is Green Vegetable which is also one of the most important food items for day to day life of an individual or a family. This is also one of the most frequently purchased and consumed products for all. And this is one of the most important sources of nutrients (vitamins, minerals etc.) for people across their living standard. Globally, 2.7 million (4.9%) deaths annually happen because of low

consumption of fruits and vegetables, which also a matter of concern (Sachdeva etal, 2013). Thus, one of the major challenges to a government is to provide the vegetables of the right quality and an affordable price.

Considering the increase in health issue and requirement of people diet for the growth of an individual or a nation at large is making the availability of green vegetables more important.

Thus, the government should focus on the price of the vegetables because it is the day to day necessity to an individual or families. The Govt. gives a lot of importance to control or manage the price of vegetables but the output is always questionable. The end user who purchases these from various retail markets finds difficult to understand its price variation.

Also, the Govt. has developed policies and framework for controlling the vegetables price but then also not they are unable to understand the real dynamic of its price variation.

Therefore it become very important to study and recognize the elements which influence the cost of green vegetables and also suggest some measures to have better control on the mechanism so that our nation can get good green vegetables at its best price.

98% of vegetable Retail marketing is limited to unorganized sector, its effects the consumer price stability.

Due to perishable nature of products, over production and short production cause extreme price fluctuations are there and its effects consumer price of vegetables.

Vegetable market in the organized sector is nearly absent or its presence is very negligible, its increase the ultimate price of vegetable for the consumer.

In India Perishable Product are very sensitive to the price due to its very short shelf life and local productive system, import and export are very limited due to which high pricing on neighborhood and may demerged the farmer interest in the country. More over these types of product are consumed locally by the local consumers and very low influences are there by the outside consumers, these local consumer are also have the preferences over the local products due to its freshness and quality .These products are featured sensitive to production due to environmental factor which is depend on monsoon and other factors.

Agricultural products are generally considered as perishable apart from milk and fruits which have more shelf life than vegetables and raw eatables. In general consideration every perishable product depends on the local market and nearby market within the periphery of 100 to 200 kilo meters, as these products are also not very much considered for cold storage because forward trading on the entire agricultural product are not applicable. In this regard only a few category of product are considered as the cold storage system for the future use.

This is a typical situation regarding the price of vegetables where they have to be sold after the first phase of production. On the other hand, we can say that these types of product are also sensitive to nature peril from its first to the last stage of the agricultural operation unless and until the product are not sold through the local market and not may be exported to the nearby market. Considerable influences are there in the price front over the product.

Vegetables typically constitute an essential part of the daily diet of human beings and they are in great demand round the year from all sections of the population. The commercial value of vegetables in terms of direct consumption, processing as well as trade has risen substantially in recent years. Their economic importance has also increased and high labor intensity in the production of most vegetables production also makes them important from the employment angle as well. Increase in area allocation under horticultural crops has often been suggested as a measure for agricultural diversification, increased employment and income.

The farming marketing arrangement of perishables in the nation plays an unmistakable and prevailing job by righteousness of the idea of perishability that warrants due significance to vegetables. The segment of Indian agriculture is compelled by low profitability, surprising expense of generation, immense post-reap misfortunes, wasteful inventory network and low market insight. In India the vegetable generation has contacted another stature as of late, setting it as the second biggest producer of vegetables on the planet, next just to China. The improving financial and the developing populace status in the India have expanded vegetables utilization, both crosswise over areas and salary gatherings. Their interest is relied upon to become further. (www.rierc.org)

The high post-harvest misfortunes, incorporating those in advertising and transportation result in lower per-capita accessibility of concerned vegetables. Local markets for vegetables are thin and trading in distant markets is non-remunerative due to higher transportation costs. The prices of vegetables fluctuate frequently and often fall drastically during harvesting, hampering efforts of growers. In perspective on this, there has been a worry with respect to the effectiveness of promoting of vegetables and improving producer share in consumer rupee. India stands the second rank largest producer of vegetables, what's more, represents more or less 15% of the world's generation of vegetables. (Sreekumar, 2012)

This study was done to know about the Price Variation of Major Concerned Vegetables in Different Seasons with Reference to Organized Retailers in Ranchi. So for the study various retail outlets are sampled like Reliance Fresh, Big Bazaar and from the farmer side the different area of Ranchi are taken like Kanke, Itki, Brambe, Chatwal, Thakurgoan, Choria, Murma and Mandar.

The study is aimed on marketing of green vegetables and its price mechanism in the market has been undertaken in Ranchi to examine marketing efficiency and pricing mechanism. Marketing of perishable commodities is very important both in terms of price realization to the farmer - producer and prices within the reach of consumers. The marketing efficiency reflects the share of consumer rupee by the farmer (producer) to a greater extent possible, especially in the case of agricultural commodities which are perishable in their nature. The price escalation both at the producer level and consumer level is a common phenomenon as it depends upon the number of players involved in the marketing of the produce to make it available to the consumers in the most appropriate way. (www.rierc.org)

In marketing of vegetables the market efficiency in the case of producer-Retailer-consumer is 90% followed by the producer-wholesaler-Retailer-consumer and in the channel Producer-middleman-wholesaler-consumer 75%. The information indicates that more intermediaries in supply chain systems. The study reveals the Price spread of various selected perishable crops and ways to integrate the price level between producers and consumers for marketing efficiency pattern of each commodity and possibilities for

the increasing the marketing efficiency of the selected commodities. The price spread of vegetables with respect to various marketing channels has indicated that the producers' share has an inverse relationship with the number of intermediaries. The net price received by the producers is relatively higher in the channels in which the produce is directly sold to the consumers or retailers.

(www.rierc.org)

Agriculture and allied sector shares 17.32% and gva is around of 23.82 lakh crore. According to cia fackbook sector wise Indian GDP composition in 2014 are as follows: agriculture (17.9%), industry (24.2%) and services (57.9%). Total production of agriculture sector is $366.92 billion.

India has made significant progress on the map of the vegetable world with a total annual production of over 93.04 million ton, 88.60 million ton and 90 million ton during the year 2011-12, 2013-14 and 2015-16 respectively. In India overall productivity of vegetable is 14.40 ton per hectare.

According to Alina Petre, MS, RD (CA) on November 26, 2017, An average Indian consumes 434 gm. of cereals and 120 gm. of vegetables per day. But each adult requires 300gm. of vegetables per day for balance diet. The actual per capita consumption of vegetable is far below the requirement. Vegetables have noteworthy significance in giving nutrients and minerals in the eating regimen, other than protein and vitality. They assume critical job in beating the basic issue like healthful weakness, brought about by the iron and folic corrosive inadequacies. Vegetables assume a key job in killing the acids created during absorption of proteins and greasy nourishments and giving significant roughages, which advances assimilation and help in avoiding obstruction.

As we know that vegetables are short duration crops and one can earn more money in short span of time from the small piece of land by implementing new advanced technologies and overcoming the constraints in vegetable production. Ultimately, we may reach in surplus of vegetable production and it will contribution in GDP, which shows the developmental contribution of farming sector in the rural economy of the country.

It is very much came into the observation that producer are not realizing their perfect profiting condition and they compel to hand over their production to the interested middle

men and marketing group who has the key capacity to mechanize the pricing system. We can also say that this intermediaries and marketer group has the ultimate power in deicing the various pricing system of the products. So it is very much a middle man dependant system in the green vegetables. On the other hand the consumers are compelled to buy different vegetables products as per their market price. They do not have the ultimate power in the pricing decision making system of green vegetables, because the competitive system are the control of the market so more over an uncompetitive prices are revealed with these types of products and it is against the consumer interest.

But as per the present economic system, there are certain hope arises with the action of the government. The Government is now planning to support this system with exchange commodity with forward system, scientific support as well as developing chain cold stores not only for potato or onion but for all vegetables.

In the world, India ranks the second largest position in vegetable production. The average production in India is, however, very low. India and China contribute 11.50 percent and 46.10 percent production of total vegetables in the world respectively. Brinjal, tomato, cabbage, cauliflower, and lady's finger are the major vegetable crops in India on the basis of their production share.

The major production share of the vegetables in India of Brinjal, Tomato, Cabbage, cauliflower, lady's finger, and peas are 9.4%, 8.4%, 6.4%, 5.5%, 3.8%, 2.3% and rest is other which is 64.2% respectively. [Source: The Hindu, Survey of Indian Agriculture 2018].

Vegetables are significant for human eating regimen, particularly for nutrients and minerals. However, the per capita consumption of fruits and vegetables in Jharkhand is only 211 gm/day against a minimum requirement of 400gm/day (FAO/WHO 2003; BBS 2013), which manifests a poor dietary status of the people in the country. Presently, the vegetable produces around 10923 metric tons of vegetables per year, respectively (BBS 2013). However, due to seasonal glut and absence of proper Supply Chain Management systems, bulk quantity of harvested produce gets wasted every year. Recently, it is reported that postharvest loss of fruits and vegetables in Jharkhand ranged from 23.6% to 43.5%, which accounts for an annual loss of thousands of crore. Hence attention should

be given to the reduction of enormous postharvest losses of vegetables in Jharkhand. The changing demand in domestic and international markets for vegetables creates both challenges and opportunities. Therefore, efficient Supply Chain Management systems are of paramount importance to reduce postharvest loss and the risk and uncertainty in timely delivery of quality and safe produce at reasonable prices to the consumers.

Appropriate marketing channels and the market actors are important in timely delivery of vegetables from the producers to the consumers. But there is no proper systematic channel in the markets for which price of vegetables fluctuates. Different markets have different prices for the same vegetables. Price also differs significantly at different times on in the same day in the same market. For example in the evening price is differed from the morning price in the same market. There are no fixed price determination factors in vegetable markets. Variation in supply and demand is prime cause of price variation. Although ultimate price is determined through the bargaining between buyers and sellers. If demand is high and supply is low obviously the price will go up and vice-versa. It is also true for seasonal variation. But our main concern is how effective Supply Chain Management can reduce the fluctuation of price of vegetables and ensure the reasonable price for the producers of vegetables.

13 Different marketing channels have been identified by several authors. One of the most common channels is Growers - Mahajans – Retailers - Consumers. The price of vegetables is apparently higher at the retailers' level. Most of the surveys show that the prices of vegetables are increased at the retailer's level. The intermediaries are very often blamed to take the lion's share of profit.

In Ranchi, the consumption of vegetables has been increasing rapidly in the recent years, as the economy grows and consumers diversify their diets. This pattern is probably going to proceed later on. Besides, local agrarian markets have experienced modernization (however not unreasonably critical) because of quick urbanization, agro industrialization, ascent of grocery stores and exchange advancement and acquirement framework is slowly moving from customary discount markets toward vertically organized supply chains. At present, Jharkhand agricultural marketing system is often accused in the

popular press of being inefficient. In the case of vegetables, mahajans, vendors and wholesaler have been found to be critical players in the market.

Inefficient Supply Chain Management frameworks lessen request from buyers and cooperation by Farmers, who face noteworthy difficulties in taking advantage of lucky breaks to take an interest in developing markets for vegetables. Showcasing imperatives incorporate both surprising expenses and hazard. High promoting expenses frequently originate from poor transportation systems, absence of market data and now and again from absence of intensity in the market. Generation of vegetables can be truly vulnerable to bug flare-ups, and deterioration after gather is a significant issue because of exceptionally transient nature of generally vegetables. These factors in turn can lead to highly unstable prices. If these constraints can be removed, farmers will earn more by specializing in crops for which they have a comparative advantage. Presently, the crying need is the generation of reliable up-to-date data on the actual costs and returns of the market intermediaries. The outputs of the report will fill up the information gap and indeed, contribute greatly to find out the most efficient pricing mechanism and marketing options in order to formulate a meaningful national policy to improve the fragile pricing system and supply chain management systems of vegetables in Ranchi, Jharkhand.

1.2 Description of the Study

1.2.1 Overview

Knowledge about the area, its people, the demography, practices of cultivation and socio-economic characteristics are of the prime importance in the process of analysis of production problems of major vegetables. Without taking these factors into consideration, it would be difficult to suggest appropriate measures.

In view of the importance regarding the knowledge about the study area, information was gathered through secondary sources, mostly through the records of District Agriculture Officer and District Horticulture Officer Ranchi, concerned blocks and villages. The information collected pertains to the block as a whole, but some references have been made with regard to the selected villages.

1.2.2 General Information on Jharkhand

The study for the research was conducted in Ranchi the capital of Jharkhand. Total geographical area of Jharkhand is 74,766 Km^2 which is totally a level area. It is situated between 21.58, North to 25.18, North and 83.22, East to 87.57 East. It has an all out populace of around 27 million. Out of this about 21 million people reside in rural areas and six million reside in urban areas. Just around 33% of the all out topographical territory is cultivable and 35 percent is secured by backwoods. The all out number of areas in Jharkhand is 22. The state has 35 sub-divisions and 212 Community Development Blocks in which 115 Blocks are Scheduled Tribes Development Block. Jharkhand state is an ancestral commanded territory having a populace thickness of 338 individuals/Km^2 with male-female proportion as 1000:955.The statistic highlights of Jharkhand state have been exhibited in table1.1

Table 1.1 Demographic features of Jharkhand state (2015)

SN	Particular	Demographic count
1.	Population	26.9 million
2.	Rural population	21.2 million
3.	Urban population	5.7 million
4.	No. of districts	24
5.	No. of sub-divisions	35
6.	No. of blocks	212
7.	No. of Panchayats	3744
8.	Density of population	338/Km2
9.	Male-female ratio	1000: 941

Source: Internet, Jharkhand village profile (2015)

1.2.3 Climate and rainfall

The climate is subtropical. The table reveals that the mercury over around 29.56 ^{0} C during the summer months and 20.11 $^{0\,C}$ during the winter months. The month of May was generally the hottest, while January was the coldest month. From the below table the total rainfall was concentrated during the month of monsoon i.e. from June to September.

There is an uneven seasonal distribution of rainfall during the year, thereby limiting the cultivation of vegetables in general. The data on temperature and rainfall recorded in the year 2016 are presented in the table 5.2 and most prominent wind directions.

Table 1.2 Monthly temperature and monthly rainfall during 2016.

Month	Temperature (^{0}C)		Rainfall (mm)
	Maximum	Minimum	
January	13.0	24.4	16.2
February	11.7	26.7	12.5
March	17.1	34.7	16.2
April	22.3	37.7	19.2
May	24.7	38.2	40.4
June	25.6	36.1	210.5
July	25.1	28.9	421.1
August	24.9	29.7	352.3
September	24.0	29.7	269.9
October	19.4	28.7	58.3
November	14.6	27.5	9.8
December	13.6	27.6	3.6
Total	**-----**	**------**	**1420 mm**

Source: Green data book Government of India & India Metrological Department.

1.2.4 Land and soil

Jharkhand state is wealthy in various minerals however agribusiness, the pillar of the neighborhood individuals is undeveloped. Farming is for the most part drilled under rainfed conditions. Place where there is the district is undulating and there is transcendence of uplands.

Land is privately arranged into "Uplands" and "Swamp" as per nature and circumstance of the land. Uplands are additionally characterized into Uplands I, Uplands II and Uplands III. The upper most bit of the upland is named as Uplands I, which are

moderately less ripe and no yield is developed. Land arranged beneath the Uplands I is named as Uplands II and lower most part of the upland is named as Uplands III. Uplands II is minimal more ripe than Uplands I however less ripe than Uplands III. Soils in uplands are poor in accessible supplements, sand to sandy-topsoil finished and acidic in nature.

Swamps are called as "Don" by the neighborhood individuals. Swamps are additionally arranged into Low grounds I, Low terrains II and Low grounds III. Fertility statuses of these lands are somewhat directly related to the altitude. The low lands are comparatively heavier and richer in plant nutrients due to leaching with poor drainage facility.

Upland soils of the locale are acidic in nature and pH differs from 4.3 to 6.5. Uplands are sandy to sandy-topsoil in surface where as swamps are sandy earth soil to mud soil.

1.2.5 Cropping pattern

Rice is the chief harvest of the state. Other than rice, other significant yields are finger millet, maize and gundli. Wheat is trimmed in restricted degree in the region where there is water system office. Aside from coarse oats, heartbeats, for example, pigeon pea, lentil, kulthi, green gram, dark gram, and gram are developed. Linseed and sarguja are the principle oilseed crops where as linseed is developed as paira cropping. Vegetables are also cultivated extensively in Jharkhand i.e. cauliflower, cabbage, tomato, lady's finger, brinjal, capsicum, radish, carrot, spinach, coriander, cucurbits, onion, potato, garlic, ginger, etc. These vegetables are grown round the year especially in Rabi season. The cropping intensity of the locale is exceptionally low for example 115 percent. Paddy-wheat, paddy-beats, paddy-wheat + mustard, paddy-vegetables is the normal harvest pivot rehearses. Paddy + jowar, paddy + pigeon pea, paddy + kudrum and pigeon pea + maize are commonly developed as blended harvests.

1.2.6 General Information about the District under study

Ranchi, the capital city of Jharkhand state is located on southern part of the Chota Nagpur plateau which forms the eastern edge of the Deccan plateau system. The study was conducted in purposively selected Ranchi district which is bounded in the North by the

district of Hazaribagh, in the East by the district of Purulia (West Bengal), in the West by the district of Palamu, Lohardaga and Gumla and in the South by West Singhbhum district. The plateau of Ranchi extends over an area of 7701 sq. km. which is full of forests, rivers and rivulets, hills, hillocks, waterfalls and streams. The district is spread over 18.73 lakh acres.

Ranchi is situated between 20.21^0 N to 24.39^0 N and 83.22^0 E to 86.54^0 E altitude of 720 meter above mean sea level. The normal rain fall in Ranchi is 1250 mm. The climate is cool, pleasant and quite healthy. The district receives rainfall almost throughout the year, but the concentration is during Monsoon months from June to September. The annual average rainfall of the district as a whole is about 1480 mm. During the month of monsoon i.e. (June-September), the rainfall is and aberrant and the district receives nearly 85 percent of the annual rainfall. The district consists of 21 community development blocks in all and 319 village panchayats with a total number of 2145 villages with 336629 households and seven towns. The district has a population of 27, 83,577 i.e. rural population 18.06 lakh and urban population 9.77 lakh (2001 Census). the tribal population and 5.3% are for the scheduled caste. The Literacy is about 65.69%. Of the rural population 57.16% is Tribal

Ranchi is a standout amongst the most urbanized regions of Jharkhand state. Somewhat more than 30 percent of its populace lives in urban zones while in the state all in all around 22 percent (22.24 percent to be careful) lives in urban regions. In spite of being so urbanized a large number of its squares (14 out of 20 hinders) in the areas have 100 percent country populace. It demonstrates prevalence of agrarian populace in these squares and nonappearance of chances offered by urban focuses. (Ranchi locale 2001 statistics)

Ranchi district is one of the oldest districts of Bihar and is the capital city of the Indian state of Jharkhand Ranchi was the centre of the Jharkhand movement for a separate state for the tribal regions of South Bihar.

The absolute geological zone of the region is 7, 59,250 hectares. Net zone appeared 276091 hectors. Zone under twofold yield is 6%. The woodland spread is about 18% of

the complete land region. Mono trimming is the pillar because of deficient improvement of the water system. Presently, obviously, it is set to pursue an alternate pattern gradually. Out of complete operational possessions of 2, 44,073 in the region, 72% are claimed by little and peripheral Farmers bookkeeping 24% of the absolute geological region. Forty eight percent of the little and negligible Farmers have a place to innate network. The normal size of holding of little and peripheral Farmers is 0.62 ha.

Horticulture in the Ranchi locale is described by mono trimming, the fundamental yield being paddy. The vegetable is developed broadly in some square (AES-I) of locale. Fundamental vegetable are Cauliflower, Cabbage, Tomato, Beans, Brinjal, Capsicum, vegetables, Chilly Un-occasional vegetables are additionally developed on enormous scale in the District. The state Jharkhand is endowed with a favorable condition regarding the cultivation of various types of concerned vegetables. The vegetables produce including off seasons vegetables from state are being preferred in the neighboring states for their quality and the time of availability.

The main producing regions are Ranchi, Lohardaga, Dumka, Godda, Jamtara, saraikela etc. The maximum production of vegetables occurs in the central and Eastern region of Jharkhand. Major vegetables are Cauliflowers, Beans, Brinjal, and Tomato etc. In terms of cauliflower Jharkhand is the sixth major producing state in the country.

1.2.7 General information about the various blocks of the Ranchi

1.2.7.1 Kanke

Overview

Kanke is a Census Town city in region of Ranchi, Jharkhand. The Kanke Census Town has populace of 17,560 of which 9,166 are guys while 8,394 are females according to report discharged by Census India 2011.

Populace of Children with age of 0-6 is 1862 which is 10.60 % of all out populace of Kanke (CT). In Kanke Census Town, Female Sex Ratio is of 916 against state normal of 948. In addition Child Sex Ratio in Kanke is around 924 contrasted with Jharkhand state normal of 948. Education rate of Kanke city is 88.14 % higher than state normal of 66.41 %. In Kanke, Male education is around 91.58 % while female proficiency rate is 84.39 %.

Kanke Census Town has all out organization more than 2,995 houses to which it supplies essential civilities like water and sewerage. It is additionally approve to manufacture streets inside Kanke Census Town breaking points and force assesses on properties going under its locale. Right now our site doesn't have data on schools and clinic situated inside Kanke.

Kanke Work Profile

Out of the absolute populace, 4,649 were occupied with work or business movement. Of this 3,490 were guys while 1,159 were females. In enumeration overview, specialist is characterized as individual who works together, occupation, administration, and cultivator and work movement. Of complete 4649 working populace, 79.57 % were occupied with Main Work while 20.43 % of absolute laborers were occupied with Marginal Work.

1.2.7.2 Brambe

Overview

Brambe is a huge village situated in Mandar Block of Ranchi region, Jharkhand with all out 749 families living. The Brambe town has populace of 4230 of which 2134 are folks while 2096 are females as indicated by Population Census 2011. In Brambe town people of children with age 0-6 is 489 which makes up 11.56 % of the supreme masses of the town. Typical Sex Ratio of Brambe town is 982 which is higher than Jharkhand state ordinary of 948. The Sex Ratio for the Brambe according to enumeration is 956, higher than Jharkhand normal of 948. Brambe village has higher proficiency rate contrasted with Jharkhand. In 2011, proficiency rate of Brambe village was 73.94 % contrasted with 66.41 % of Jharkhand. In Brambe Male education remains at 81.00 % while female proficiency rate was 66.77 %. (India census , 2011)

As indicated by the constitution of India and the Panchyati Raaj Act, Brambe town is administrated by Sarpanch (Head of Village) who is picked illustrative of the town. Our site, don't have information about schools and crisis center in Brambe town. (India census , 2011)

Brambe Work Profile

In the Brambe village out of the all out populace, 1668 were occupied with work exercises. 85.97 % of laborers portray their work as Main Work (Employment or Earning over 6 Months) while 14.03 % were engaged with Marginal action giving business to under a half year. Of 1668 specialists occupied with Main Work, 581 were cultivators (proprietor or co-proprietor) while 505 were Agricultural workers. (India census , 2011)

Table 1.3 The profile of Brambe

Particulars	Total	Male	Female
Total No. of Houses	749	NA	NA
Population	4230	2134	2096
Child (0-6yrs)	489	250	239
Schedule cast	24	12	12
Schedule tribe	2836	1377	1459
Literacy	73.94%	81.00%	66.77%
Total workers	1668	994	674
Main worker	1434	1434	NA
Marginal worker	234	158	76

Source: Population Census 2011.

1.2.7.3 Chatwal

Overview

Chatwal is an enormous village situated in Mandar Block of Ranchi locale, Jharkhand with absolute 398 families living. The Chatwal town has people of 2163 of which 1115 are folks while 1048 are females as indicated by Population Census 2011. In Chatwal town masses of children with age 0-6 is 377 which make up 17.43 % of complete people of town. Ordinary Sex Ratio of Chatwal town is 940 which are lower than Jharkhand state typical of 948. The Sex Ratio for the Chatwal according to enumeration is 866, lower than Jharkhand normal of 948. Chatwal village has a lower proficiency rate contrasted with Jharkhand. In 2011, education rate of Chatwal village was 53.19 %

contrasted with 66.41 % of Jharkhand. In Chatwal Male proficiency remains at 61.12 % while female education rate was 44.90 %. (India census , 2011)

As indicated by the constitution of India and the Panchyati Raaj Act, Chatwal town is administrated by Sarpanch (Head of Village) who is picked illustrative of town. Our site, don't have information about schools and crisis facility in Chatwal town. (India census , 2011)

Chatwal work profile

In Chatwal village out of the all out populace, 1105 were occupied with work exercises. 34.03 % of laborers depict their work as a Main Work (Employment or Earning over 6 Months) while 65.97 % were associated with Marginal action giving business to under a half year. Of 1105 specialists occupied with Main Work, 227 were cultivators (owner or co-owner) while 94 were Agricultural workers. (India census , 2011)

Table 1.4 The profile of Chatwal

Particulars	Total	Male	Female
Total no. of Houses	398	NA	NA
Population	2163	1115	1048
Child (0-6yrs)	377	202	175
Schedule cast	86	51	35
Schedule tribe	1045	509	536
Literacy	53.19%	61.12%	44.90%
Total workers	1105	577	528
Main worker	376	376	
Marginal worker	729	370	359

Source: Population Census 2011.

1.2.7.4 Mandar

Overview

Mandar is an enormous village situated in Mandar Block of Ranchi area, Jharkhand with absolute 770 families dwelling. The Mandar town has a people of 4027 of which 2031 are

folks while 1996 are females as indicated by Population Census 2011. In Mandar town, the masses of adolescent's age 0-6 are 594 which make up 14.75 % of the hard and fast people of the town. Typical Sex Ratio of Mandar town is 983 which is higher than the Jharkhand state ordinary of 948. Child Sex Ratio for the Mandar as indicated by assessment is 892, lower than Jharkhand normal of 948. Mandar village has higher education rate contrasted with Jharkhand. In 2011, proficiency rate of Mandar village was 78.62 % contrasted with 66.41 % of Jharkhand. In Mandar Male education remains at 84.92 % while female proficiency rate was 72.32 %. (India census , 2011)

As indicated by the constitution of India and the Panchyati Raaj Act, Mandar town is administrated by Sarpanch (Head of Village) who is picked illustrative of the town. Our site, don't have information about schools and medicinal facility in Mandar town. (India census , 2011)

Mandar work profile

In Mandar village out of the all out populace, 1213 were occupied with work exercises. 54.66 % of laborers portray their work as a Main Work i.e. Employment or Earning over 6 Months) while 45.34 % were engaged with Marginal movement giving business to under a half year. Of 1213 specialists occupied with a Main Work, 166 were cultivators (owner or co-owner) while 29 were Agricultural workers. (India census , 2011)

Table 1.5 The profile of Mandar

Particulars	Total	Male	Female
Total no. of Houses	770	NA	NA
Population	4027	2031	1996
Child (0-6yrs)	594	314	280
Schedule cast	9	3	6
Schedule tribe	1611	782	829
Literacy	78.62%	84.92%	72.32%
Total workers	1213	864	349
Main worker	663	NA	NA
Marginal worker	550	387	163

Source: Population Census 2011.

1.2.7.5 Murma

Overview

Murma is an enormous village situated in Mandar Block of Ranchi area, Jharkhand with complete 462 families dwelling. The Murma village has a people of 2670 of which 1364 are folks while 1306 are females indicated by Population Census 2011. In Murma village masses of kids with age 0-6 is 383 which make up 14.34 % of complete populace of village. Normal Sex Ratio of Murma village is 957 which is higher than Jharkhand state normal of 948. Average Sex Ratio for the Murma according to evaluation is 896, lower than Jharkhand normal of 948. Murma village has higher education rate contrasted with Jharkhand. In 2011, education rate of Murma village was 70.18 % contrasted with 66.41 % of Jharkhand. In Murma Male proficiency remains at 77.80 %, on the other hand female education rate was 62.31 %.(India census , 2011)

As indicated by the constitution of India and the Panchyati Raaj Act, Mandar town is administrated by Sarpanch (Head of Village) who is picked illustrative of the town. Our site, don't have information about schools and medicinal facility in Murma village. (India census , 2011)

Murma Work Profile

In Murma village out of the all out populace, 968 were occupied with work exercises. 60.12 % of specialists depict their work as a Main Work (Employment or Earning over 6 Months) while 39.88 % were engaged with Marginal movement giving job to under a half year. Of 968 specialists occupied with a Main Work, 423 were cultivators (owner or co-owner) while 37 were Agricultural workers. (India census , 2011)

Table 1.6 The profile of Murma			
Particulars	**Total**	**Male**	**Female**
Total no. of Houses	462	NA	NA
Population	2670	1364	1306
Child (0-6yrs)	383	202	181
Schedule cast	22	13	9
Schedule tribe	1389	694	695
Literacy	70.18%	77.80%	62.31%
Total workers	968	707	261
Main worker	582	NA	NA
Marginal worker	386	193	193

Source: Population Census 2011.

1.2.7.6 Itki Thakurgoan

Overview

Itki Thakurgoan is an enormous village situated in Itki Block of Ranchi region, Jharkhand with absolute 2285 families living. The Itki Thakurgoan town has a mass of 12174 of which 6141 are folks while 6033 are females as per Population Census 2011.

In Itki Thakurgoan town masses of youths with age 0-6 is 1668 which makes up 13.70 % of the total people of the town. Typical Sex Ratio of Itki Thakurgoan town is 982 which is higher than the Jharkhand state ordinary of 948. Adolescent Sex Ratio for the Itki Thakurgoan according to registration is 955, higher than Jharkhand normal of 948. Itki Thakurgoan town has higher proficiency rate contrasted with Jharkhand. In 2011, education rate of Itki Thakurgoan village was 82.93 % contrasted with 66.41 % of Jharkhand. In Itki Thakurgoan Male education remains at 88.12 % while female proficiency rate was 77.67 %. (India census , 2011)

As per the constitution of India and the Panchyati Raaj Act, Itki Thakurgoan town is administrated by Sarpanch (Head of Village) who is picked illustrative of the town. Our site, don't have information about schools and center in Itki Thakurgoan town. (India census , 2011)

Itki Thakurgoan work profile

In Itki Thakurgoan village out of the all out populace, 3748 were occupied with work exercises. 69.85 % of specialists depict their work as a Main Work (Employment or Earning over 6 Months) while 30.15 % were engaged in Marginal action giving business to under a half year. Of 3748 specialists occupied with a Main Work, 590 were cultivators (owner or co-owner) while 262 were Agricultural workers. (India census , 2011)

Table 1.7 The profile of Itki, Thakurgoan

Particulars	Total	Male	Female
Total no. of Houses	2285	NA	NA
Population	12174	6141	6033
Child (0-6yrs)	1668	853	815
Schedule cast	176	89	87
Schedule tribe	2607	1250	1357
Literacy	82.92%	88.12%	77.67%
Total workers	3748	2745	1003
Main worker	2618	NA	NA
Marginal worker	1130	710	420

Source: Population Census 2011.

1.2.7.7 Boreya

Overview

Boreya is a medium size village situated in Itki Block of Ranchi region, Jharkhand with all out 153 families living. The Boreya town has a populace of 877 of which 445 are folks while 432 are females as per the Population Census 2011. In Boreya town the mass of youth with age 0-6 is 117 which make up 13.34 % of the all out populace of town. Normal Sex Ratio of Boreya town is 971 which is higher than the Jharkhand state normal of 948. Adolescent Sex Ratio for the Boreya according to enumeration is 857, lower than Jharkhand normal of 948. Boreya village has higher education rate contrasted with Jharkhand. In 2011, proficiency rate of Boreya village was 75.00 % contrasted with 66.41

% of Jharkhand. In Boreya Male proficiency remains at 85.60 %, on the other hand the education rate of female was 64.29 %. (India census , 2011)

As per the constitution of India and the Panchyati Raaj Act, Boreya village town is administrated by Sarpanch (Head of Village) who is picked illustrative of the town. Our site, don't have information about schools and center in Boreya village. (India census , 2011)

Boreya work profile

In Boreya village out of the all out populace, 447 were occupied with work exercises. 89.49 % of specialists portray their work as Main Work (Employment or Earning over 6 Months) while 10.51 % were associated with Marginal action giving vocation to under a half year. Of 447 specialists occupied with a Main Work, 297 were cultivators (owner or co-owner) while 81 were Agricultural workers. (India census , 2011)

Table 1. 8 The profile of Boreya

Particulars	Total	Male	Female
Total no. of Houses	153	NA	NA
Population	877	445	432
Child (0-6yrs)	117	63	54
Schedule cast	107	60	47
Schedule tribe	455	226	229
Literacy	75%	86%	64%
Total workers	447	227	220
Main worker	400	NA	NA
Marginal worker	47	28	19

Source: Population Census 2011.

1.3 History of Vegetables

Overview

Vegetables assume an imperative job for the presence of individuals and furthermore a very impacting job in the economy. In spite of the fact that new organic product, vegetable and staple retail have been considered as an incredibly low-edge business, the market potential has pulled in Indian business houses and corporate, driving the attacks through different models like single-plan, multi-gathering or joined urban-provincial models (Jacob, 2010)

The vegetables are very rich in vitamins and minerals, have almost no fat and are very rich in fiber which makes it very healthy to eat. The most common theory is that the West cabbage is domesticated in Europe some 3,000 years ago from its wild predecessors that had thick leaves that retained water which allowed them to survive in colder places with less water. In the East, cabbage is used since the 4,000 BC and was cultivated in North China. Mesopotamia also knew about cabbages while the ancient Egyptians didn't cultivate cabbages until the times of the Ptolemaic dynasty. By the time of the early Rome, cabbage became common food in the Egypt along with other vegetables. Theophrastus (371 – 287BC), which is considered “father of botany”, mentions cabbage in his texts, so we know that Greeks knew about them at least as early as 4th century BC. In Rome, cabbage was viewed as an extravagance and many viewed it as superior to every single other vegetable. They likewise utilized it for therapeutic reason as alleviation from gout, cerebral pains and the manifestations of noxious mushroom ingestion. Some even informed the utilization concerning cabbage-eater's pee, where newborn children may be washed. With the exception of sustenance, Ancient Egyptians and Romans ate bigger measures of cabbage before the evening of drinking which enabled them to drink more. During the season of Charlemagne (Charles the Great, eighth century), cabbages were coordinated to be developed in the "Capitulare de villis", a content that gave standards and guidelines on the most proficient method to deal with the grounds and laws in the nation.

The first round-headed cabbages showed up in fourteenth century England, and they turned out to be increasingly more prominent as cooking all through Europe. From

Europe, developed variations of cabbage spread to Asia and Americas. It was brought to India by colonizing dealers from Portugal somewhere close to a fourteenth and seventeenth century, and it was obscure in Japan until the eighteenth century. The principal cabbage in America was brought by a French voyager Jacques Cartier on his third voyage 1541 – 1542. Cabbage ended up important on long sea ventures since it has high measures of nutrient C which anticipate scurvy. Ship specialists (like for example specialist on Captain Cook's ship that cruised in 1769) utilized sauerkraut (cabbage saved in brackish water) to treat injuries of mariners and avoid gangrene. Cauliflower – The most established record of Cauliflower go back to the sixth century B.C. Pliny expounded on cauliflower in the second century. In the twelfth century three assortments were depicted. Recorded as a hard copy of Arab Botanist Ibn Al-Awwan and Ibn Al-Baitar, in the twelfth and thirteenth century when its starting points were said to be Cyprus. Francois Pierre La Varenne utilized Chouxfleurs in Lecuisinier Francosis. They were acquainted with France from Genoa in the sixteenth century and are included in Olivier De Serres Theater farming (1600) as cauli-fiori as the Ittalians call it. (Jacob, 2010)

1.3.1 Cauliflower

1.3.1.1 Etymology and Scientific Classification of Cauliflower

Cauliflower is a vegetable that has a place with the Cabbage family, which is moreover the Brassicaceae family of Cruciferae. Its legitimate name is Brassica oleracea var. bortytis. The plants in this family all offer a regular component: their four-petaled blooms look like to a Greek cross and are oftentimes suggested as crucifers or cruciferous vegetables.

Its coherent name begins from the old style Latin word for Wild Cabbage (Quattrocchi, 349).The name cauliflower starts from the Latin words caulis, which means ―stalk, and floris, which means ―flower. As proposed by its name, cauliflower is extremely a sprout. The editable bit of the plant is the head of juvenile, fragile bloom stems and buds. (https://academics.hamilton.edu/foodforthought/Our_Research_files/cabbage_cauliflower_kale.pdf)

1.3.1.2 Botanical Description

Cauliflower is a biennial and ice tolerant vegetable with diminished heads of an adolescent or rashly finished bloom contracted into a lone head. Its heads are ordinarily white anyway can in like manner be yellow or purple. Cauliflower is furthermore an out raising plant. Cauliflower and broccoli will cross with various groupings inside the gigantic B. oleracea species, which join all cabbages (beside Chinese cabbage), Brussels spouts, kale, collards, and kohlrabi, similarly likewise with each other (Ashworth, 52).

Besides, cauliflower must experience vernalization to bloom. In specific regions where winter temperature does not plunge under 28F, brassicas can be planted in the fall, and seed is assembled the going with summer. Most cauliflower is self-opposing. To give a nice seed set and of securing much inherited arranged assortment, in any event, six plants are ought to be used for seed saving (Ashworth, 53).

(https://academics.hamilton.edu/foodforthought/Our_Research_files/cabbage_cauliflower_kale.pdf)

1.3.1.3 Nutritional Chart

The serving size on the upper left corner uncovers to you the measure of the sustenance you need to eat to get the proportion of enhancements found in the blueprint. The Daily Value rate (DV %) addresses the proportion of enhancements in the step by step serving size (in grams). Supplement thickness is the extent of enhancement content (in grams) to the total imperativeness content (in kilocalories or joules). The enhancement examinations grasped by the U.S. Sustenance and Drug Administration's —Reference Values for Nutrition Labeling checks.

(https://academics.hamilton.edu/foodforthought/Our_Research_files/cabbage_cauliflower_kale.pdf)

Table 1.9 Cauliflower Nutritional Value **Cauliflower, boiled** **1.0 cup** **124.00 grams** **28.52 calories**				
Nutrient	**Amount**	**DV (%)**	**Nutrient Density**	**World's healthiest food rating**
Vitamin C	54.93 mg	91.5	57.8	Excellent
Vitamin K	11.17 mcg	14.0	8.8	Excellent
Folate	54.56 mcg	13.6	8.6	Excellent
Dietary Fiber	3.35 mg	13.4	8.5	Excellent
Vitamin B6	0.21 mg	10.5	6.6	Very good
Omega 3 fatty acid	0.21 gm	8.8	5.5	Very good
Tryptophan	0.03 gm	9.4	5.9	Very good
Manganese	0.17 mg	8.5	5.4	Very good
Vitamin B5	0.63 mg	6.3	4.0	Very good
Potassium	176.08 mg	5.0	3.2	Good
Protein	2.28 mg	4.6	2.9	Good

Source: http://whfoods.org/genpage.php,tname=foodspice&dbid=13#summary

1.3.1.4 Nutritional Profile and Health Benefits Highlight

One cup of foamed cauliflower is a splendid wellspring of supplement C (91.5% of the DV), folate (13.6% of the DV), and dietary fiber (13.4% of the DV). That proportionate proportion of cauliflower furthermore fills in as a by and large incredible wellspring of supplement B5, supplement B6, manganese, and omega - 3 unsaturated fats.

Utilization of cauliflower is known to diminish the danger of various diseases, for example, lung, colon, chest, ovarian and bladder dangerous development. Late research from the University of Hawaii reveals that crucifers like cauliflower similarly give noteworthy cardiovascular points of interest. Investigators have exhibited that a phytonutrient called indole-3-carbinol found in cruciferous vegetables, even in the unobtrusive union of 100 micromoles per liter, can cut down liver cell's release of the

cholesterol transporter ApolipoproteinB-100 (ApoB-100) by 56%. ApoB-100 is the basic transporter of LDL cholesterol to No's, and irregular states have been associated with plaque advancement in the veins. Right when liver cells were treated with I-3-C, an expert found not simply apoB-100 release was cut by the greater part, yet in addition the union of lipids (fats) was diminished altogether.
(https://academics.hamilton.edu/foodforthought/Our_Research_files/cabbage_cauliflower_kale.pdf)

1.3.1.5 Climate and Soil Requirements

Cauliflower can be abundantly conveyed from April to December in the maritime Northeast. This plant likes smooth summer climates (around 80-90F). Soil with rich humus is critical in light of the fact that cauliflower will in general have powerless root frameworks.

Since cauliflower will create the best quality heads just with nonstop quick development, perfect soil conditions ought to be prepared. Along these lines, one-quarter to a half cup of complete characteristic compost is relied upon to put into the earth and rapidly underneath the plant if the soil is light enough to permit extraordinary root improvement. A soil with pH somewhere in the range of 6.5 and 7.5 is significant for best improvement.
(https://academics.hamilton.edu/foodforthought/Our_Research_files/cabbage_cauliflower_kale.pdf)

1.3.1.6 Variety of Cauliflower

Table 1.10 The cultivars use of cauliflower

Cauliflower Types	Cauliflower Varieties
Early Cauliflower 	**a)Snow Crown** About 50-60 days from planting to harvest. It may show some pinking when maturing in the hotter parts of summer. Its hybrid vigor and rapid growth produce large, fully-domed curds with a mild and sweet flavor.

	b) Snow Peak About 50 days from planting to harvest. Snow Peak's dense white curds have a crisp, mild taste that attracts people back for more. It is best grown when planted in the Spring for an early Summer harvest.
Autumn Cauliflower 	**a) Ravella** About 65-85 days from planting to harvest. The heavy snow white hears are easily grown. It wraps its head almost perfectly under good growing condition and performs well during cold weather. Best sowing dates from March to June.
	**b) Alverda** About 80-100 days from planting to harvest. The medium-sized plants product a wonderful bright lime-green curd, particularly when planted to mature in cool weather. Pick before the head loosens up for the best eating quality.
 	**c) Fremont** About 75-85 days from planting to harvest. Fremont is the most popular choice for commercial growers in Northern areas. The 2-2.5 pound heads can endure well both Summer and Fall harvest periods. **d)White Rock** About 80-100 days from planting to harvest. It is a very popular, smaller headed variety. It has extremely well- wrapped curds, which offer good frost and rain protection for late harvest **e)Arbon** About 120-140 days from planning to harvest. It produces

	heavy yields of large, tender, sweet curds late October or November from a June sowing. It is also well-wrapped as White Rock.

Source: http://discworld.imaginary.com/lpc/links/cabbage/info/cauliflower.html

1.3.2 Cabbage

1.3.2.1 Etymology and Scientific Classification of Cabbage

The logical course of action of cabbage is the accompanying: Kingdom: Planate; Division: Magnoliophyta; Class: Magnoliopsida; Order: Brassicales; Family: Brassicaceae; Genus: Brassica; and Species: olearacea collection capitata. As needs be, the sensible name of cabbage is Brassica oleracea var. capitata. It is an agreeable plant of the Family Brassicaceae (or Cruciferae). Its coherent name begins from brassica, ae, the Latin old-style name for cabbage. (Quattrochi, 349) The English name cabbage gets from the French word ―cabochel (head). (http://www.biodatabase.de/Cabbage). Various arrangements of comparative plant creature gatherings are broccoli, cauliflower, collard greens, kohlrabi, Brussels develops, Chinese kale, broccolini, and broccoflower. (https://academics.hamilton.edu/foodforthought/Our_Research_files/cabbage_cauliflower_kale.pdf)

1.3.2.2 Botanical Description

Cabbage is herbaceous blooming plant with leaves encircling a preservationist head chrematistics. Around 400 sorts of cabbage have been recorded into five social affairs: The chief get-together consolidates the unmistakable round, smooth-leafed cabbages with the shades of white, green or red, and wrinkled-leafed combinations, for instance, Savoy. The ensuing social event includes the pointed cabbages like European spring and Chinese cabbages. The third assembling contains the cabbages with surprisingly enormous, developing stems like Brussels develops. The fourth assembling incorporates the cabbages with green wavy sorts, for instance, kale and collard greens. Cabbage species in this social occasion are normally used as animal's sustenance or upgrade of dishes for the

presentation. Finally, the last assembling consolidates gushing cabbages, like cauliflower and broccoli (Kiple and Ornelas, 290).
(https://academics.hamilton.edu/foodforthought/Our_Research_files/cabbage_cauliflower_kale.pdf)

Similarly, Cabbages are out imitating plants. Cabbages just produce suitable seeds through creepy crawly and hand fertilization. Most cabbages are self-contrary, implying that the dust is reasonable, however, can't develop in a blossom on a similar plant. Since the bugs must convey dust starting with one plant then onto the next rather than simply conveying starting with one blossom then onto the next in a similar vegetables, the more in a gathering of vegetables the better the fertilization and seed generation (Ashworth, 50-51).(https://academics.hamilton.edu/foodforthought/Our_Research_files/cabbage_cauliflower_kale.pdf)

1.3.2.3 Nutritional Chart

The serving size on the upper left corner uncovers to you the measure of the sustenance you need to eat to get the proportion of enhancements found in the outline. The Daily Value rate (DV %) addresses the proportion of enhancements in the step by step serving size (in grams). Supplement thickness is the extent of enhancement content (in grams) to the total essentialness content (in kilocalories or joules). The enhancement assessments grasped by the U.S. Sustenance and Drug Administration's ―Reference Values for Nutrition Labeling rules.
(https://academics.hamilton.edu/foodforthought/Our_Research_files/cabbage_cauliflower_kale.pdf)

Table 1.11 Cabbage Nutritional Value **Cabbage, boiled** **1.0 cup** **150.00 grams** **33.00 calories**				
Nutrient	**Amount**	**DV (%)**	**Nutrient Density**	**World's healthiest food rating**
Vitamin C	30.15 mg	50.3	27.4	Excellent
Vitamin K	73.35 mg	91.7	50.0	Excellent
Folate	30.00 mcg	7.5	4.1	Very good
Dietary Fiber	3.45 gm	13.8	7.5	Very good
Vitamin B6	0.17 mg	8.5	4.6	Very good
Omega 3 fatty acid	0.17 gm	7.1	3.9	Very good
Tryptophan	0.01 gm	3.1	1.7	Good
Manganese	0.18 mg	9.0	4.9	Very good
Potassium	145.50 mg	4.2	2.3	Good

Source: http://whfoods.org/genpage.php,tname=foodspice&dbid=13#summary

1.3.2.4 Health Benefit

Right when cabbage is cut, nibbled or handled, a sulfur-containing compound called sinigrin is conveyed into contact with the synthetic myrosinase, realizing the landing of glucose and the breakdown of things, including the exceedingly responsive compound, isothiocyanates. Isothiocyanates joins sulfora phane and indole-3-carbinol which are extraordinary inducers of the liver's Phase II impetuses and thusly detoxify cancer-causing agents.

Moreover, ongoing examination led by the Institute for Food Research in the U.K. found one of these blends, allyl isothicyanate, moreover obstructs mitosis (cell division) and enlivens apoptosis (changed cell destruction) in human tumor cells. Plus, sulforaphane may likewise furnish uncommon assurance to those with colon malignant growth helpless qualities.

(https://academics.hamilton.edu/foodforthought/Our_Research_files/cabbage_cauliflower_kale.pdf)

1.3.2.5 Climatic and Soil Requirements

Cabbage is a biennial that grows best in delicate summer environments reaching out from around 80-90F. The Farmers in the upper east direct seed their cabbage toward the beginning of May.

Late cabbage is seeded legitimately about seven days after the fact around May 10 to 15. The plant likes full sun and ordinary water (Ashworth, 51). Cabbage prospers in significant productive loamy soils, especially gave excrements lime and borax and having pH of somewhere in the range of 5.5 and 6.5. Additionally, soil ought to be all around depleted and circulated air through for best outcomes. (https://academics.hamilton.edu/foodforthought/Our_Research_files/cabbage_cauliflower_kale.pdf)

1.3.2.6 Variety of Cabbage

Table 1.12 The Variety of Cabbage

Cabbage Types	Cabbage Varieties
Green Cabbage 	Golden Acre Yellows Resistant, Stonehead, Early Jersey Wakefied (early), Marion Market, Market Size, Round-Up (mid-season), Danish Ballhead, Wisconsin All Seasons (late)
Red Cabbage 	Ruby Ball and Red Acre
Savoy Cabbage 	Savoy King (mid-summer and late) and Vanguard

Source: http://www.bloomingarden.com/cabbrobrucau.html

1.3.3 Tomato

1.3.3.1 Introduction

The developed tomato, Solanum lycopersicum, is becoming worldwide for its organic products. Tomatoes are local to South America, however were brought to Europe at some point during the 1500s, where they before long ended up famous and were sent out the world over (Eu-Sol: Tomato history).For quite a while tomatoes were known by the name Lycopersicon esculentum, yet late work by researchers has demonstrated that they are actually part of the sort Solanum - as Linnaeus perceived when he previously depicted the species. Today, researchers and plant reproducers all utilization the name Solanum lycopersicum for the developed tomato.

The tomato is a herbaceous plant with exceedingly isolated leaves that have long, thin hairs with a particular aroma (brought about by organs on the hair tips). The blooms are splendid yellow and have a jug formed stamen cone in the middle. The natural product is generally splendid red, yet can be a wide range of hues - there are numerous assortments of the tomato. Initially, the tomato was from the western waterfront deserts of South America, however today develops everywhere throughout the world.

Rambling or sub-erect fleeting herb, generally developed for its eatable organic product. It is known as an infrequent break from development. All pieces of the plant shrouded in long viscid hairs. Leaves pinnatisect, separated to the midrib. Blossoms in sidelong raceme-like heads on long peduncles, yellow. Natural product - the notable tomato - brilliant red when ready.

1.3.3.2 Botanical Description

The herb grouping of the tomato has a captivating history, first being placed in the family Solanum, close by the potato and being recognized as Solanum Lycopersicon. Be that as it may, this assignment was changed to Lycopersicon esculentum, Lycopersicon being gotten from the Greek word meaning "wolf peach," and esculentum just importance consumable. In spite of the fact that there are comparative plant qualities among potato and tomato plants, bloom concealing (yellow for tomato and generally white or violet for

potato) and particularly the shape and method for the opening of residue bearing structures are the qualities that separate the two plants. (www.growtomatoes.com)

Division: Anthophyta

Class: Dicotyledons

Family: Solanaceae

Sort: Lycopersicon esculentum Mill – tomato

Lycopersicon pimpinellfolium (L.) Mill – currant tomato

Lycopersicon esculentum var. cerasiforme – cherry tomato(www.growtomatoes.com)

1.3.3.3 Benefits

Leaf: Used in Surinam for treating nascent sickness spots, in a blend with castor oil. In a glue connected to filaria worm swellings on an excruciating crotch. Natural product: In Surinam, eaten to give customary defecations. Contains nutrients A, B, C and D.

1.3.3.4 Types of Tomato

There are various sorts and assortments of tomato plants. Pick tomato plants as per your needs and inclinations, yet in addition don't hesitate to analyze a tad. Customary tomato types that can be found at home and little gardens are given in the going with once-over:

Beefsteak tomatoes or meat tomatoes – These are enormous varieties with certain natural items weighing 500g or altogether more. By far most of the combinations are pink or red, as often as possible with verbalized ribbing.

(www.madaboutberries.com/tomatoes/tomato-types-and-varieties.html)

Ordinary beefsteak tomato – The arrangements incorporate Brandywine, Beefmaster, Beefsteak, Big Beef, Cherokee Purple, Mortgage Lifter, Bucking Bronco, Pink Beefsteak and various others. (www.madaboutberries.com/tomatoes/tomato-types-and-varieties.html)

Cherry tomatoes – These are close to nothing and balanced tomatoes grown in size from a cherry up to the size of a golf ball. Cherry tomatoes are round to somewhat oval fit as a fiddle and for the most part red in shading, however yellow, green and dark assortments

likewise exist. The more extended cherry tomatoes share a couple of traits with plum tomatoes and are normally known as grape tomatoes.

Most notable cherry tomato arrangements are Super Sweet 100, Yellow Pear, Italian Ice, Bloody Butcher, Black Pearl, Sun Gold, Honeybunch Cherry, Cherries Jubilee, Green Envy, Napa Grape, etc.(www.madaboutberries.com/tomatoes/tomato-types-and-varieties.html)

Grape tomatoes:

These are shaped equivalently to the oval plum tomatoes, anyway having the little size and sweetness of cherry tomatoes. Grape tomatoes produce close to nothing and normally elliptical organic products - like basic grapes.

Plum tomatoes:

These are a kind of tomato raised for sauce and squeezing purposes. They are normally oval or tube shaped fit as a fiddle, with altogether less seed compartments than standard round tomatoes and have a for the most part higher strong substance, making them progressively appropriate for preparing.

Campari tomatoes:

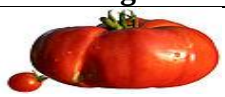
These will be tomatoes noted for their heavenliness, low sharpness, high sugar level and nonattendance of coarseness. Campari tomatoes are dull red and greater than a cherry tomato, yet more diminutive and rounder than a plum tomato. They are routinely sold on vines. Campari type tomatoes incorporate various assortments, for example, 'Enchantment Mountain', 'Cornell M'.

Porch tomatoes:

These are half and halves amazing for compartments and little gardens. They bear heavenly tomatoes on strong, moderate plants that grow only 2 - 2.5 feet tall. Plants, generally, needn't bother with assistance, yet the heaviness of the regular items can be absurdly significant for the plant, especially when exhibited to the breeze. During the 7-8 gathering period, the single little plant can make 50 or fundamentally more tomatoes.

Dim, purple, yellow, etc. Tomatoes is staggering improvement plants that yield heavenly tomatoes sensible for every usage, comparatively as typical tomatoes. Regardless, such collections are for the most part utilized for dinners and dishes like servings of mixed

greens and mixed drinks. (www.madaboutberries.com/tomatoes/tomato-types-and-varieties.html)

Table 1.13 Variety of Tomato						
Image	**Common Name**	**Color**	**Maturity Date**	**Generic Type**	**Shape**	**Size**
	Beefsteak	Red	96 days	Heirloom	Large	Beefsteak
	Cherry Bambelo	Orange	55–68	Hybrid	Small	Oval
	Plum tomato	Red	70–80	Heirloom	Medium/ Large	Standard
	Campari	Red	69–80	Hybrid	Small	Cocktail
	Azoychka	Yellow	68–78	Heirloom	Large	Beefsteak

Source: http://www.bloomingarden.com

1.3.4 Brinjal

1.3.4.1 Introduction and scientific classification

Daunay (2008) has secured eggplant reproducing broadly. As indicated by his aggregation, there are reports that S. incannum, a wild sort of S. melongena is found in Southern India. S. incannum isolated persistently, in South East Asia into an immovably related creature assortment, the wild S. melongena which is still found creating in trademark conditions in enormous domains from Southern and Eastern India to Southern China, Philippines and Indonesia and this has been depicted by past botanists as S. cumingii. (Brinjal (Eggplant): Origin, Breeding Methods and Varieties | India)

Solanum melangena has a place with family solanaceae. Plant type is polymorphous, erect developing. grow a tallness of 0.5 - 1.5m, tap root framework, basic leaves with praise type or elliptical organized on the other hand, blossoms conceived separately. An organic product is berry. It outlines a cup-like structure at the base.

Corolla is five-lobed gamopetalous with edges of folds incurved. There are five stamens that are free and implanted at the throat of the corolla. Anthers are cone-shaped, free and

with apical dehiscence. The ovary is hypogynous, bicarpellary, syncarpous and with basal placentation. Heterostyly is a run of the mill component. Four sorts of blooms have been accounted for relying on the length of style. (Brinjal (Eggplant): Origin, Breeding Methods and Varieties | India)

1.3.4.2 Types

1. Long styled with large ovary
2. Medium styled with medium size ovary
3. Pseudo-styled with rudimentary ovary and
4. True short styled with very rudimentary ovary

1.3.4.3 Varieties of Brinjal:

A couple of promising cultivars of brinjal, viz., Pusa Purple Long, Pusa Purple Cluster, Pusa Kranti, Pusa Purple Round, PH 4, Pant Samrat, Pant Rituraj, KT 4, Punjab Barsati, Azad Kranti, K 202-9, Arka Navneet (Hybrid), T 3, Jamuni Gola, Pant Brinjal Hybrid 1, Pusa Anmol (crossbreed), Arka Kusumakar, H7, Hisar Shyamal (H 8), H 16, Pusa Hybrid 5, Pusa Hybrid 6, NDB 25, Sel 4, DBSR 31, KS 224, DBR 8, DBSR 44, NDBH 6, ABH 2, BB 26, PLR 1, BB 7, BWR 12, Arka Nidhi, Swarna Mani, Punjab Sadabahar, Utkal Tarini, etc., have been perceived/released. (Brinjal (Eggplant): Origin, Breeding Methods and Varieties | India)

Figure 1.1 Varieties of Brinjals

1.3.4.4 Nutrition Chart

The serving size on the upper left corner uncovers to you the measure of the sustenance you need to eat to get the proportion of enhancements found in the diagram. The Daily Value rate (DV %) addresses the proportion of enhancements in the step by step serving size (in grams). Supplement thickness is the extent of enhancement content (in grams) to the hard and fast essentialness content (in kilocalories or joules). The enhancement assessments grasped by the U.S. Sustenance and Drug Administration's ―Reference Values for Nutrition Labeling benchmarks. (https://academics.hamilton.edu/foodforthought/Our_Research_files/cabbage_cauliflower_kale.pdf)

Table 1.14 The nutrient value of Brinjal

One cup of cooked eggplant, weighing around 99.00 grams (g), Calories: 35

Nutrient	Amount	DV(%)
Protein	0.82gm	2%
Carbohydrate	8.64 g	3%
Foliate	14 mcg	3%
Fat	0.23 g	0%
Dietary fiber	2.5 g	10%
Potassium	188 mg	3%
Calcium	6 mg	1%
Sodium	1 mg	10%
Vitamin B6	85 mcg	4%
Vitamin K	2.9 mcg	4%

Source: Nutrient data for this listing was provided by USDA SR-21.

1.3.5 Bottle Gourd

1.3.5.1 Introduction

As indicated by De Candolle (1882), bottle gourd has been found in wild structure in South Africa and India. In any case, Cutler and Whitaker (1961) are of the view that likely it is indigenous to tropical Africa based on inconstancy in seeds and organic

products. This species seems to have been tamed freely in Asia, Africa, and The New World.

It is not known whether domestication occurred in Africa followed by dispersal to the Americas and Asia or the wild forms dispersed followed by independent domestication in the Americas, Africa and Asia. Was dispersal carried out by humans or by ocean currents? Bottlegourds can float on the oceans for many months without losing seed viability, hence the latter alternative is possible.

Bottle gourd (Lagenaria siceraria 2n = 2x = 22) one of the important cucurbits, both as a rainy season and summer season vegetable. Bottle Gourd is also known as white-flowered gourd. It is one of the most important vegetables of ancient China. Because of hard rind of mature fruits, it is, known as gourd.

The evolution of the bottle gourd is not well understood. Two principal variants are recognized as subspecies, i.e. subsp. siceraria of Africa and the Americas and subsp. asiatica. It is not known if the progenitor of the bottle gourd was a wild form of the species or one of the other extant species.

1.3.5.2 Botanical Description

Bottle gourd is monoecious, yearly vine with delicate pubescence. The leaves are cordate-praise to reniform – applaud, 15-30 cm over, not lobed. The blossoms are white, singular, ostentatious and open around evening time. The blossom has five petals.

The staminate blooms are on long pedicels surpassing the foliage. The pistillate blossoms are single with short peduncle and furry ovary. Ovary has three placentae with various ovules.

The organic products are variable fit as a fiddle. Fit as a fiddle, they are tube shaped, oval, egg formed, club molded, round and so forth. The organic products at development are hard-shelled, smooth surfaced, green to whitish-green or tan in shading, and differently striped or mottled.There are three stamens, two as compound and one as single. Since flowers open at night, selfing/crossing must be done earliest in the morning. If possible, during evening/night also, it could be done. There are three stamens, two as

compound and one as single. Since flowers open at night, selfing/crossing must be done earliest in the morning. If possible, during evening/night also, it could be done.

1.3.5.3 Varieties of Bottle gourd

Pusa Summer Prolific Long:

This was developed at IARI through selection from local germplasm. It is particularly suitable for growing as a summer crop, although it can be grown in rainy season also. Fruits are 40-50 cm and girth is of 20-25 cm and it has been released by IARI, New Delhi.

Pusa Summer Prolific Round:

This was developed through selection in local germplasm at IARI and has been released by the same institution. It has vigorous growth, round fruits of 15-18 cm girth. It is prolific bearer and heavy yielder.

Pusa Meghdoot:

This is an F_1 hybrid cultivar between Pusa Summer Prolific Long and Sel-2, developed and released by IARI, New Delhi in 1971. Fruits are long, light green and attractive. It is relatively early and suitable for cultivation in spring-summer season.

It has shown considerable yield heterosis over Pusa Summer Prolific Long. No more in cultivation. Pusa Manjari. This is a round fruited F_1 hybrid cultivar developed and released at IARI in 1971 from a cross of Pusa Summer Prolific Round and Sel-11. It has given 48% higher early yield and 106% total yield over Pusa Summer Prolific Round. Not commercially cultivated now.

Pusa Naveen:

This is a new variety developed and released by IARI. More than 75 collections were purified and evaluated under the renewed programme which was taken-up in 1984-85. Sel-48 was released as Pusa Naveen by IARI variety release committee. It is high yielding (300 q/ha), and takes around 60 days for first reaping. Organic products are consummately tube shaped and straight with no criminal neck or bend. Normal organic product weight is 850 g.

Punjab Komal:

It is an early maturing, medium sized, oblong fruited variety developed and released by PAU, Ludhiana. Marketable fruits are available in about 70 days in the wake of planting. The natural products are light green with pubescence. There are 10-12 natural products for each vine. The natural products are delicate and borne on medium long, meager pedicels on fourth or fifth hub onwards. It is tolerant to cucumber mosaic infection. The yield potential is 400 q/ha.

Arka Bahar:

This was developed and released by IIHR, Bangalore. This is a selection in local cultivars of Karnataka. Natural products are straight, without law breaker neck, medium in size, each weighing around 1 kg. The skin is light green. The tissue is sparkling, delicate. The yield potential is about 400 q/ha in 120 days.

Kalyanpur Long Green:

This variety was developed at vegetable research station, Kalyanpur of CS Azad University of Agriculture and Technology, Kanpur. The vines are vigorous and long. Fruits are long with tapering and somewhat pointed blossom end. The yield potential is 300 q/ha in 120 days.

Pant Sankar Lauki 1:

A hybrid of PBOG 22 and PBOG 40 developed by GBPUAT, Pantnagar was released by CVRC in 1999. Fruits are 35 cm long. Yield is about 400 q/ha.

Pant Sankar Lauki 2:

A long fruited hybrid developed at Pantnagar.

A few bottle gord hybrids from private seed companies in India are Warad, Shashi, Satya, etc. These are about 30-40 cm long, weighing 800-900 g at marketable stage.

1.3.5.4 Nutritional Chart

The serving size of the upper left corner uncovers to you the measure of the sustenance you need to eat to get the proportion of enhancements found in the outline. The Daily Value rate (DV %) addresses the proportion of enhancements in the step by step serving size (in grams). Supplement thickness is an extent of enhancement content (in grams) to the hard and fast imperativeness content (in kilocalories or joules). The enhancement assessments grasped by the U.S. Sustenance and Drug Administration's ―Reference Values for Nutrition Labeling standards. (https://academics.hamilton.edu/foodforthought/Our_Research_files/cabbage_cauliflower_kale.pdf)

Table 1.15 The nutrient value of Bottle Gourd

Nutrient	Amount	DV(%)
Protein	0.72gm	1.44%
Carbohydrate	3.92gm	3.02%
Iron	0.23mg	2.88%
Fat	0.2gm	0.06%
Dietary fiber	0.6gm	1.58%
Potassium	174mg	3.70%
Calcium	30mg	3.00%
Sodium	2mg	0.13%
Vitamin C	11.7mcg	13%
Vitamin B1	0.034mg	2.83%
Vitamin B2	0.026mg	2.00%
Tryptophan	0.003gm	0.68%
Vitamin B3	0.371mg	2.32%
Vitamin B5	0.176mg	3.52%
Vitamin B6	0.046mg	3.5%

Source: Nutrient data for this listing was provided by USDA SR-21.

1.3.6 Beans

1.3.6.1 Introduction

Phaseolus vulgaris, otherwise called the normal bean and green bean among different names, is a herbaceous yearly plant developed worldwide for its eatable dry seeds or unripe natural product (both usually called beans). The regular bean is an exceedingly factor animal categories that have a long history of development.

The definite inception of the word bean is obscure, however, it is reminiscent of a couple of sources. Germanic bauno, Old Saxon bona, the Dutch shelter, or the Norwegian bonne are altogether identified with the contemporary English word 'bean.' Beans are found in various genera under the Leguminosae family. The most noticeably developed of these are the genera Phaseolus, Vigna, Vicia, and Glycine (Tobias 70). Inside the variety Phaseolus are the species tepary bean (Latin name acutifolius), sprinter bean (coccineus), lima bean (lunatus, alleged for its sickle shape), and normal or pinto bean (vulgaris). The word Phaseolus originates from the Greek phaselua, "which alludes to a kayak like pontoon reminiscent of a bean case" (Albala 7). Vigna species incorporate the moth bean (aconitifolia), azuki bean (angularis), urad bean (mungo), mung bean (radiata), rice bean (umbellatta), and cowpea (unguiculata) under which name both dark peered toward pea and yard long bean fall. The Vicia variety just contains the expansive or fava bean (faba). The Glycine variety contains just the soybean (max).

(https://academics.hamilton.edu/foodforthought/Our_Research_files/beans_peas.pdf)

1.3.6.2 Nutritional History

"Pretty much every spot on earth has its own one of a kind neighborhood animal type and about each culture has depended upon beans" (Albala 1).

Beans and bean things are diet staples far and wide (Tobias 70). Since everlastingly, the advancement and protection of vegetables around the world have as often as possible suggested the complexity among life and passing. Beans are among the most straightforward plants to create and are seen as a dumbfounding wellspring of protein (Albala 1). In addition, Legumes have certainly gone about as an essential wellspring of sustenance assurance against times of starvation, as they are considered for all intents and

purposes indestructible if appropriately all around dried and put away (Albala 1). (https://academics.hamilton.edu/foodforthought/Our_Research_files/beans_peas.pdf)

Vegetables have regularly been related to destitution from the beginning of time. In societies where a part of the mass can acquire protein from the creature sources, for the laborers beans are viewed as sustenance fit; the "poor man's meat" (Albala 2). Having beans is a shabby method for keeping up significant wholesome prerequisites, but at the same time is going to have a negative shame related to the lower segment of people; those that couldn't bear the cost of meat needed to rely upon beans. (https://academics.hamilton.edu/foodforthought/Our_Research_files/beans_peas.pdf)

In India the Retail Industry is the largest among every one of the enterprises, representing more than 10 percent of the GDP of the nations and around eight percent of the business. In India the Retail Industry has approached as a standout amongst the most powerful and quick paced businesses with a various players entering into the market.

Every one of them have not yet tasted achievement as a result of the overwhelming starting speculations that are required to make back the initial investment with different organizations.

Since this study also concentrates on Organized Retail Stores, so for this various organized retail outlet are selected like Reliance Fresh, Big Bazaar.

The India Retail Industry is the largest among all the industries, accounting for over 10 per cent of the country’s GDP and around 8 per cent of the employment. The Retail Industry in India has come forth as one of the most dynamic and fast paced industries with several players entering the market.

But all of them have not yet tasted success because of the heavy initial investments that are required to break even with other companies and compete with them. The India Retail Industry is gradually inching its way towards becoming the next boom industry. The total concept and idea of shopping has undergone an attention drawing change in terms of format and consumer buying behavior, ushering in a revolution in shopping in India. (Samson, 2014)

The retail business is the fastest growing business in the world. The significant portions in Indian retail are sustenance, apparel, buyer durables and so forth. Acquirement and promoting of vegetables are all the more testing due to its perishability, regularity, utilization example and cumbersomeness. Indian consumers demand fresh vegetables. Agricultural sector in Jharkhand is being characterized by a large number of small and marginal farmers having tiny plots of land for the production of these green vegetables. In Ranchi there are various channels that sell these vegetables as well as do marketing of these vegetables. The marketing of these perishable vegetables requires utmost attention rather than the cereals and other cash crops. The marketing agencies like VegFed and Sannat product Ltd. do marketing of these vegetables in Ranchi. VegFed as a marketing agency was established in 1993 in Ranchi with its headquarter in Ranchi and take part in all types of procurement and marketing functions.

This study makes an attempt to examine at what price the farmers grow and sell these selected vegetables to these channels and what kind of supply chain method they whereas in the second phase of the research, the study makes an attempt to know about how the organized retail procure these vegetables from the farmer or intermediaries and by what methodology they set the price of these vegetables and sell to the end users.

Apni Mandi or basic vegetables collection centers are the center for the organized retail in the market place of various villages like Brambe, Mandar, Chanho, Bero and Pithoria collects the vegetables from the farmers at the best possible prices. All the mandis have been sorting, grading, packaging and transportation facilities. The vehicles are basically mini trucks used for carrying the fresh vegetables from the collection to the organized retail stores. This method is widely used by the Vegfresh, as it acts as a medium of procurement and marketing of these vegetables in Ranchi. Sometime the organized retail stores consult the major vegetables wholesaler and vendor who supply these fresh vegetables as per the size and demand to them. There are around ten major wholesalers, eighteen to twenty vendors and three to five major exporters of vegetables in Ranchi.

1.3.6.3 Nutritional Chart

The serving size of the upper left corner unveiled to you the measure of the sustenance you need to eat to get the proportion of enhancements found in the chart. The Daily Value rate (DV %) addresses the proportion of enhancements in the step by step serving size (in grams). Supplement thickness is an extension of enhanced content (in grams) to the outright essentialness content (in kilocalories or joules). The enhancement examinations had gotten from the U.S. Sustenance and Drug Administration's ―Reference Values for Nutrition Labeling measures. (https://academics.hamilton.edu/foodforthought/Our_Research_files/cabbage_cauliflower_kale.pdf)

Table 1.16 The nutrient value of Beans

Nutrient	Amount	DV (%)
Protein	7.7g	15%
Carbohydrate	7.5g	3%
Iron	1.5mg	3%
Fat	0.9g	1%
Manganese	38.6mg	10%
Potassium	344mg	10%
Calcium	31.3mg	3%
Sodium	11.0mg	8%
Vitamin C	71.2mg	119%
Foliate	109mcg	27%
Vitamin B6	0.2mg	8%

Source: Nutrient data for this listing was provided by USDA SR-21

1.4 Organizational Profile

1.4.1 OVERVIEW OF RETAIL INDUSTRY:

The clearance of merchandise or products in little amounts legitimately to buyers is known as retailing. A "retailer" purchases merchandise or items in huge amounts from the makers or suppliers, either legitimately or through a distributor and after that offers littler amounts to the end client.

Retail is India's largest industry, accounting for over 10 percent of the country's GDP and around eight percent of employment. Retail in India is at the crossroads. It has emerged as one of the most dynamic and fast paced industries with several players entering the market. For making a business successful, it requires heavy initial investments to meet the break even and to achieve the goals, but many players have not tasted success to date. However, the future is promising; the market is growing, government policies are becoming more favorable and emerging technologies are facilitating operations.

Just 5-7 % of Indian retail is sorted out. Retailers of various brands in India can work through an establishment or a money and-convey discount model. Retailing in India has progressively crept its approach to turning into the following blast industry. The entire idea of shopping has adjusted as far as arrangement and buyer purchasing conduct, introducing an upset in shopping. Current retail has entered India as found in meandering strip shopping centers, multi-storied malls and huge buildings offer shopping, fervor, and sustenance all under one housetop. The Indian retailing region is at an accentuation point where the improvement of dealing with retail and advancement in the usage by Indians will receive a higher development direction.

(https://shodhganga.inflibnet.ac.in/bitstream/10603/9375/15/15_chapter%204.pdf)

The Indian populace is seeing a critical change in its socioeconomic. A huge youthful working mass with middle age of 24 years, family units located in urban territories, alongside expanding working-ladies populace and developing open doors in the administrations segment will be the key development drivers of the composed retail segment.

(https://www.slideshare.net/vagoel84/vishal-customer-relationship-management-new-1)

1.4.2 RELIANCE FRESH

Reliance Retail Limited (RRL) was incorporated in March, 17, 1998. has developed into an association that obliges a large number of clients, a huge number of Farmers and sellers. The company made fast advancement towards structure and coordinating whole worth chain beginning from the Farmers to the end purchasers. The number of locations of Reliance Fresh Store is operating with 700+ stores in 93 cities. The company has added new configurations to its range in the most recent year. The organization works, arrangements, for example, Reliance Fresh (neighborhood store), Reliance Mart (all under one rooftop grocery store) and Reliance Super (smaller than normal shop), which offer a scope of items for everyday family unit utilization.

It additionally has claim to fame positions, for example, Reliance Digital (shopper durables and data innovation), Reliance Trends (attire and adornments), Reliance Wellness (wellbeing, health and excellence), iStore (Apple items), Reliance Footprint (footwear), Reliance Jewels (gems), Reliance Time Out (books, music and excitement), Reliance AutoZone (car items and administrations) and Reliance Living (home-product, furniture, measured kitchens, goods). RRL has fashioned key associations with world-class organizations, for example, Marks and Spencer (clothing and embellishments), Office Depot (office stationery), Pearle Europe (optical items) and Hamleys (toys).

It has an immediate commitment with more than, a million clients following a dependability program 'Dependence One' which was offered from the primary day of its task. During the year, it kept on reinforcing its agricultural business and dairy worth chain to help its quickly growing store impression. By sourcing legitimately at the Farmer's doorstep, it guarantees reasonable and convenient installments to the Farmers, decrease in decay through its best in class store network and coordinations system and brilliant produce to its clients.

The organization is additionally dedicated to cultivating associations with accomplices that will make new roads of significant worth improvement for its clients. Reliance is a subsidiary of Reliance Industries Limited entered food and grocery business in 2006.

Currently, it operates Reliance Fresh, Reliance Select, Reliance Value, Reliance Super, and Reliance Mart.

The Reliance Fresh, Reliance Select, and Reliance Value are conveniently-located supermarkets offering wide range of food and grocery, bakery products, kitchen utensils and personal care products.

The Reliance Super offers fresh products, processed foods, FMCG, apparels, accessories, beverages, confectioneries and wellness products etc.

Reliance Mart is a hypermarket and carries over more 30,000 products of family need. Today, there are 1691 Reliance Fresh, Reliance Value and Reliance Select Stores spread over 6,000 sq ft area.

With a central target Reliance Fresh stores appeared:

- To give clients top notch family unit items at moderate rates.
- At a similar time, the organization goes all out to protect the enthusiasm of the farmers and manufacturers.
- The farmers get a wide opportunity to sell their items directly to the merchandise, and that too at the best cost.
  (https://www.indiaretailing.com/uploads/Market_Research_pdf/13-Reliance_Fresh-Amity.pdf)

Accordingly, it is a success win circumstance for all, the merchandise, farmers and customers.

Dependence Fresh is the comfort store group which structures, some portion of the business of retail, Reliance Industries of India which is going by Mr. Mukesh Ambani. Dependence has made a speculation of 250 billion over the most recent 4 years in their retail division. The organization as of now has 886 Reliance Fresh outlets the nation over and 9 in Ranchi. These stores sell new foods grown from the ground, staples, goods, crisp juice, bars and dairy items.

The organized retail outlets do not stock the vegetables for a long period, but they make a frequent purchase from the farmers because of its perishability in nature. This is very not the same as what the firm had initially arranged. On October 2006 when the primary Reliance Fresh store opened in Hyderabad, not exclusively did the organization state the

store's fundamental center would be new items or products like products of the soil at a much lower cost, yet additionally talked finally about its "farm to-fork" hypothesis. The thought of the organization talked about was to source from Farmers and sell in a best possible manner to the shopper, expelling brokers off the beaten path. (https://www.indiaretailing.com/uploads/Market_Research_pdf/13-Reliance_Fresh Amity.pdf)

A portion of the significant goals where they work and rival others are

- For solid and enduring bonds with a great many Farmer and will change the Relationship with prospects to another level
- Offer unrivaled, quality, comfort, administration and decision
- Offer our clients the broadest scope of foods grown from the ground at the best costs in the area
- Provide for the day to day needs of our customers by offering staples, basic food item and family unit items at incredible costs.
- Offer steady, high caliber, brilliant freshness and extraordinary administration so our Customers realize that we can be confided in consistently. (https://www.indiaretailing.com/uploads/Market_Research_pdf/13-Reliance_Fresh-Amity.pdf)

Figure 1.2 Organizational Structure of Reliance Fresh
Source: Primary Data

Figure 1.3 Food Retail Chain at Reliance Fresh
Source: Primary Data

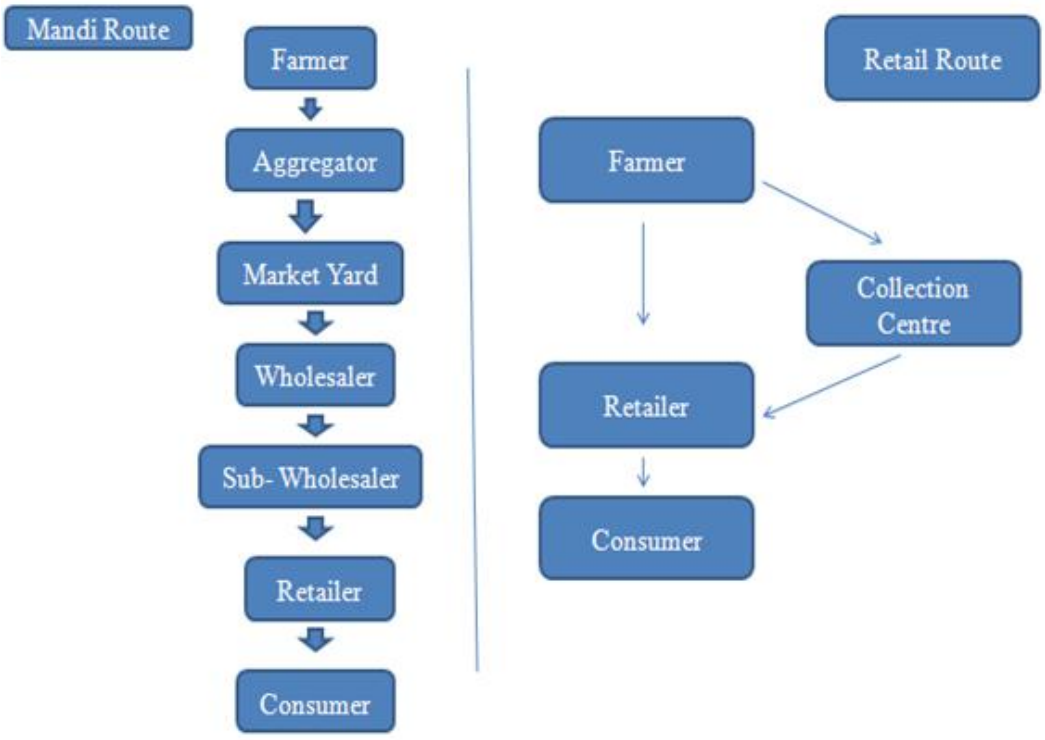


Figure 1.4 Farm-to-Fork Model

Source: Organized Retail

Reliance Fresh/Smart Stores in Ranchi

There are nine outlets of Reliance Fresh in Ranchi in almost all the major areas. The following are the locations of the Reliance Fresh Stores.

1. SPG Mart, Bahu Bazaar, Ranchi
2. Trikuta Hill
3. Rathod Towers, Circular Road, Ranchi
4. Vyas Enclave
5. L N Complex
6. M R Tower, Kutchery Road, Ranchi
7. Eyelex Hinoo
8. Prasad Motors, Ratu Road, Ranchi
9. Booty More, Ranchi

In Ranchi, Reliance Smart get a turnover around 50,000 every day, each store, though contrasted with others urban communities it is appallingly low. The primary focus of the store is to give great quality items at lower cost and endeavor consistently for client service and their fulfillment. As indicated by one of the Reliance Fresh Store's chief, they were fulfilling around 75% of client desires.

(https://www.indiaretailing.com/uploads/Market_Research_pdf/13-Reliance_Fresh-Amity.pdf)

The typical business hours for the Reliance Fresh store, Hinoo extends from 6.30 AM toward the beginning of the day till 10.30 PM during the evening. There are approx 20 CSA's for examples Clients Service Associates who help the clients in their buy choice and make them feel calm. CSA's typically taken a shot at two movements. First move is from 6.30 AM to 3.00 PM and second one is from 1.30 PM to 10.30 PM. Notwithstanding the above mentioned, there are 2 store administrators for each move and One Store chief is completely in charge of significant choices relating to the store.

The Reliance Fresh Store, Hinoo is arranged in a spot where there is a greater amount of settlements. Significant populace living there is of Service class, for example representative of MECON Ltd, SAIL Ltd. This Reliance Fresh Store has situated itself as an accommodation store situated in white collar class neighborhoods. It takes into account needs of its purchaser base by giving brilliant items in classifications of (a) Staples (b) Fruits and Vegetables (c) FMCG (d) Kitchenware (e) array of focused costs. Especially in Fruits and Vegetables class, as the name "Dependence Fresh" proposes the organization stresses on the property 'New'. Along these lines, so as to offer its shopper base quality items at focused costs, Reliance Fresh focus on its obtainment and coordination activities.

(https://www.indiaretailing.com/uploads/Market_Research_pdf/13-Reliance_Fresh-Amity.pdf)

1.4.3 BIG BAZAAR

The Future Group, which was prior known as PRIL (Pantaloon Retail India Limited) started as a pant producer in the mid 1980s. The Future Group is separated into six verticals – Future Retail, Future Capital, Future Brands, Future Space, Future Media, and Future Logistics. The Future Group began activities in the mid 1987's by joining the organization as Men's Wear Private Limited. The organization proceeded to make ready-made pants under the "Pantaloons" brand name. It turned out with an open No. in 1991. The primary select men's store called "Pantaloon Shoppe" was initiated in 1992.

Pantaloons went for a franchised course to extend the quantity of retail outlets and by 1995, it had achieved an essential number of 70. The principal Department store called Pantaloons was opened in Kolkata in 1997 with a speculation of Rs 0.7 million.

The store was a triumph and recorded incomes of Rs 100 million inside the principal year of activities. In 1999, the organization's name was changed to Pantaloon Retail (India) Limited (PRIL). The achievement of Pantaloons Department stores urged PRIL to think of other retailing configurations, for example, 'Enormous Bazaar ' to retail eases general promoting, and 'Nourishment Bazaar' to retail sustenance items. Starting at 2010, the Future Group has 15 million sq. ft. Of retail space and has diverse retail arranges in35 urban areas and 60 rustic areas the nation over. These stores pull in around 220 million clients every year (Future Group, 2011)

Enormous Bazaar is a chain of hypermarkets in India, with in excess of 100 stores in the task. It is a backup of Future Group Venture Ltd's, and pursues the plan of action of United States-based Wal-Mart. Offices offered by Big Bazaar web based shopping: Big Bazaar has an official site, FutureBazaar.com, which is a standout amongst the most loved destinations among individuals of India for internet shopping. Future Bazaar is an online business adventure of Future Group, which sells a variety of items, for example, design, which incorporates stock for people, versatile frill, portable handsets and hardware like home theaters, camcorders, computerized camera, LCD TVs, kitchen machines and some more.

Limits: "Hfte ka sabse sasta" commotion was presented by the Big Bazaar, wherein extra and unique limits were offered on Wednesday consistently, to draw in the potential purchasers into their store.

Security check: At each exit of Big Bazaar, they use alert frameworks or Electronic Article Surveillance framework, which distinguishes the items that has appended labels or not.

i. Big Bazaar is a chain of hypermarket in India, which takes into account each family's needs and necessities.
ii. Big Bazaar has discharged the entryways for the design world, general product like games merchandise, cutlery, porcelain, utensils, and home decorations and so on, best case scenario affordable costs.
iii. Big Bazaar gathering offers in excess of 100 stores everywhere throughout the nation with an amalgamation of Indian bazaars' vibe and contact with an accommodation and decision of the advanced retail offices
iv. The overall nation chain, Big Bazaar, is framed by CEO of Future Group, Mr. Kishore Biyani. Their fundamental fascination related to sensible costs is their Unique Selling Price.
v. Big Bazaar has turned into a huge hit with lower working class and white collar class individuals as a noteworthy customer base.
vi. Reflect the look and feel of Indian bazaars at their advanced outlets(Future Group, 2011)

1.5 Business Models of Vegetable Retailers

1.5.1 Overview

In India the retail area is still in its early stage. The arrangements and globalization of financial progression had lighted the nation's economy for faster development with the help of these retail businesses. The concurrent demonstration of advancement of the Indian economy and globalization set off a quickened modern development over the range of all the market areas in India. The mechanical development in Indian and changed efficient arrangement pulled in worldwide players to India in each modern

segment (Saxena and Sahay, 2000). The overall retail industry isn't a special case since it has seen headway into sorted out exchanging. Sorted out retailing alludes to promoting exercises undertaken by authorized retailers, that is, the individuals who are enrolled for deals charge, annual duty for whose business is corporate, who execute the executives methods overseen by experts as a firm or restricted organization or helpful. Conventional retailing alludes to the individuals who work in chaotic markets. The composed retailing had been started in a wide manner by the corporate, household and worldwide.

In India retail area is at the midpoint today. A move among sorted out and the chaotic retail area is obvious, particularly in the vegetable retailing zone. This move is a call for the trade of commercialization towards dealing with retailing. The penetration of dealt with retail in the field of vegetable retailing will go up against irate check from standard retailers with their present strong conventional balance. This block from the ordinary vegetable retail can't be disregarded. The most critical thing to note is that the standard retail association supports a greater mass and gives direct occupations. So it is amazingly far-fetched that organization or anyone can restrain these foundation stones of Indian economy. The activities of government and its course of action are basic in supporting, improving, and making standard vegetable retailers.

(https://documents.mx/documents/fv-retail.html)

The Vegetables, natural products, and basic food item assume an essential job for the presence of individuals and furthermore a very impacting job in the economy. In spite of the fact that new natural product, vegetable, and basic food item retail has been considered as an incredibly low-edge business, the market potential has pulled in Indian business houses and corporate, driving the assaults through different models like single-gathering, multi-position or joined urban-nation models (Sen Gupta, 2008). (Jacob, 2010)

To attract the overall pioneers in vegetable retailing, the organization licenses, remote direct enthusiasm for genuine cash and-keep up a sort game plan to the song of 100 percent. The joint undertakings of private Indian associations with overall players are allowed to work in India. Regardless, the nearby associations have a controlling stake in the vegetable and essential sustenance thing retail. By and by, dealt with retailers are tying down the metropolitan urban areas and urban markets. Sooner rather than later, the

corporate retailers will focus on the markets of the country, which have been revealed and have undiscovered potential. The retailers are un-composed little businesspeople, Kirana (mother and pop) stores administered by families or individuals. There are two courses of action of their designs—stores and non stores. Store arrangements join stores with never-ending and semi-unchanging structure, circumventing 50 square feet or more in size, corner stores, and paper and cigarette shops. Non-stores setup covers road sellers, asphalt merchants, truck merchants, versatile merchants (head conveying), and merchants at day by day or week after week Farmers markets. (https://documents.mx/documents/fv-retail.html)

An exploratory examination has been completed to comprehend customary and composed the vegetable retailing and it's calculated the process. In the city of Ranchi the region of the concentrate was restricted to the vegetable retailing.

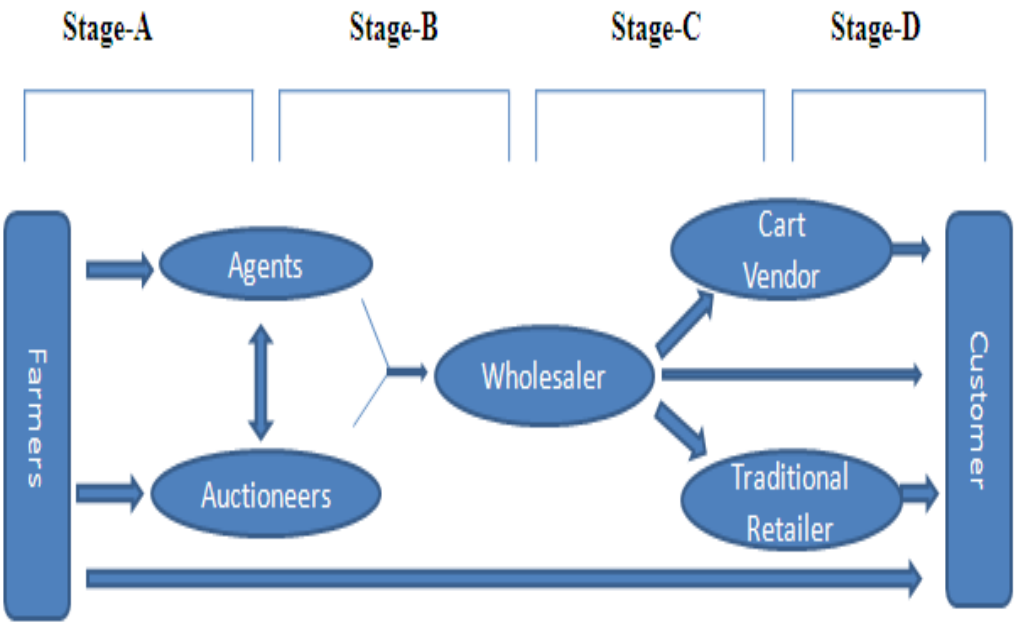


Figure 1.5 Traditional Model of Logistics

Source: Paulrajan Rajkumar 2010

1.5.2 Vegetable Retail Scenario

Standard Indian retailers speak to 12 million retail outlets all over India and more than 40 percent of them sell vegetable and staple (IBEF, 2008). Indian sustenance retail contains staple products including grains, pulses, and vegetables. The Indian sustenance retail business, especially vegetable retailing is seeing a quick advancement in India's created retail divisions. (https://documents.mx/documents/fv-retail.html)

The ordinary retailing of vegetables isn't particularly dealt with; entireties to 97% of the full-scale showcase (Ernst and Young, 2006), is incredibly confined and significantly partitioned with the gigantic number of center individuals. The center individuals between the customers and Farmers are standard retailers with different outlet structures mother and pop shops, non-enduring shops in the market, blacktop traders, roadside shippers, and push truck vegetable sellers, rebate merchants, commission pros, and salesmen. (https://documents.mx/documents/fv-retail.html)

The Farmers themselves sell their things direct to the end buyers in adjacent markets, controlled and unregulated ' farmer markets', or they offer to delegates – masters and dealt with retailers. The business focus is typically in proximity to the farmland and customers getting to the market live in and around the area. Farmers selling vegetables authentically to the customer signify, especially little part by Volume.

A farmer offers greater part of their produces to operators and salespeople. The specialists purchase little amounts of produces from Farmers and move it to wholesalers honestly or through another administrator. The barkers are people who go into an acquiring contract with Farmers for the whole or the deficient measure of the items and offer the item to a pro or a wholesaler. Salesmen also move the vegetables to wholesalers clearly or through another administrator. A wholesaler of vegetables offers to retailers—both traditional and dealt with retailers, and to the customers, who buy in gigantic sums. Truck traders, a kind of traditional retailer, buy vegetables from wholesalers or made retailers, offer to customers in compact trucks and pass on to customers at the customer's doorsteps. (https://documents.mx/documents/fv-retail.html)

1.5.3 Food Mileage

When selling the vegetables, the vegetables need to pick up the speed from farmers to retailers so that consumers can receive at specific times, if it won't happen then the chances of loss will be maximized. The sustenance mileage of vegetables causes a great impact on the vegetable on account of its transient nature. The term 'Sustenance Miles' or ' Food Kilometers' implies the detachment the sustenance goes from the zone where it is created or took care of to the region where it is eaten up, or so to speak, the separation nourishment makes a trip from farm to plate. Sustenance miles don't allude to the information, material, exertion, proficiency or the vitality of the harvest yield. Sustenance miles are a method for endeavoring to quantify how far nourishment has made a trip to achieve buyer. "That incorporates the adventure from ranch to processor, at that point from the processor to the retailer lastly from the retailer to the customer. Studies gauge that handled sustenance in the United States goes more than 2080 kilometers (1300 miles), and new produce goes more than 2400 kilometers (1500 miles), before being devoured (Holly Hill, 2008). In the UK, 20 percent of nourishment (by weight) moves in excess of 200 kilometers" (Garnett, 2003). (https://documents.mx/documents/fv-retail.html).

The sustenance mileage impact is recognized by players in the vegetable stock system, from Farmers to customers. "Sustenance Mileage" is a pointer that evaluates the impact on the monetary, social and characteristic structure and it relates the quality sustenance advantage, sustenance wastage, and move. 'Sustenance miles' is a factor to understand the inefficiency of the sustenance stock system. In a judicious or business perspective, every sustenance mile is excessive. The transportation cost is truly propositional to sustenance miles. Every mile choice in the vehicle is added to the cost of the items and the customer pays for it. The more the vegetables travel in miles, the less new they become. This infers customers to pay for vegetables, which have less starting solid advantages. (https://documents.mx/documents/fv-retail.html).

On the other hand, to hold freshness, molding is required while moving. Molded vehicle again adds cost of the merchandise. At the point when the nourishment ventures less; the cash is again reinvested closer to the homestead land network and increasingly money

related commitment is given to neighborhood economy. "Plant dollar near and dear and watch network develops" (The Food Routes Network, 2008). Neighborhood Farmers who sell directly to shoppers get a bigger portion of the benefit from their sustenance. The local family farmers spend their money with local merchants and build a stronger local economy. The social impact of higher mileage food is the food that comes in from abroad. The different food safety standard is more vulnerable to unsafe food. Vegetables with less mileage are fresh, preserve the original taste, retain initial ingredients and more palatable. Less food miles create more sense of closeness and trust. Ecologically, 'food mileage' is a convenient indicator of sustainability and sustainable development; wherein less food miles indicate more sustainability. Reducing food miles is reduction of emissions. Shorter distance travel leads to reduced usage of fossil fuels and thus, conservation. Minimum food, travel signifies minimum pollution, environmental degradation and global warming.

(https://documents.mx/documents/fv-retail.html).

Vegetables went in various courses log various mileages. The impacts of the 'Nourishment Mileage' on the players the vegetable natural pecking order can be followed. The nourishment mileage has been communicated in kilometers; "least" mileage is the most brief separation gone by a vegetable and "market" mileage is the normal mileage of a similar vegetable. The base mileage separation is contributed by extremely little amount, which is under 0.5%of the everyday exchange volume. (https://documents.mx/documents/fv-retail.html).

The nourishment mileage esteems are from the client's goal in Ranchi. The sustenance mileage determined for the vegetables directed through sorted out retailing depends on the composed retailer's outlets in Ranchi.

The nourishment mileage is the Weighted Average Source Distance (WASD) (Pirog and Benjamin, 2003). The equation for the WASD is:

$$\text{WASD} = \frac{\sum\{ (\text{Vegetable weight in Kg}) \text{x} (\text{Distance travelled in Km}) \}}{\sum(\text{Vegetable weight in Kg})}$$

Business pioneers have embraced sustenance miles as a model for understanding, proficiency in a nourishment production network. The Biologists consider sustenance

miles as pointers of maintainability and various sections of individuals and various organizations see nourishment miles in an unexpected way. There is a need felt to ponder the nourishment mileage for vegetables in India with current foundation and economic situation. As the time taken between any two was not watched, the speed at which vegetable achieves its goal has not been examined. (https://documents.mx/documents/fv-retail.html).

1.5.4 Marketing of Vegetables

In the marketing of vegetables, which is perishable in nature, supply chain plays a important role. In today's scenario marketing of vegetables is challenging because of its, nature, perishability, seasonality, bulkiness, and consumption habits of the Indian people. The poor condition of farmers should approach toward contract farming, farmer, producer organization, etc. To reduce the middleman in supply chain and gain maximum profit.

The major vegetables, which are marketed, are Cauliflower, Cabbage, Beans, Tomato, Ladyfinger, etc.

The marketing of these vegetables is not well organized. The major channels which play an important role in the vegetable marketing in Ranchi are:

- Sannat Product Ltd.
- Pandra Mandi
- Mother Diary Fruits & Vegetables Ltd.
- Daily Market Mandi
- Reliance Smart etc.

There are various small or medium channels which also do marketing of these major vegetables in an unorganized way. In Ranchi there are four to five major haats who deal with these vegetables and sometime the farmer it come to these bazaars or haats for the trading without the help of any middleman or intermediaries to gain maximum margin.

Beside the major channel there are the some mahajans who also play a significant role in the marketing of these major vegetables, they use to fix the price of the vegetables as per the last day market scenario.

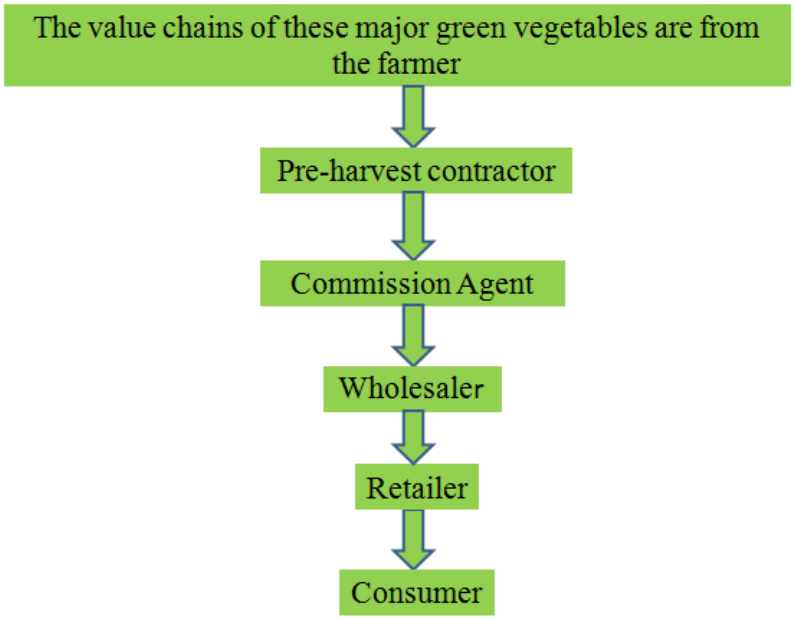


Figure 1.6 Various Sources through Which the Marketing of Vegetables Done
Source: Primary Data

In the present situation showcasing of vegetables is testing a direct result of its perishability, regularity, cumbersomeness, and utilization propensities for the Indian purchasers

Marketing of agricultural yields is very unpredictable and hazardous because of the short-lived nature of the produce, intermittent age, and unwieldiness. The scope of expenses from creator to the customer, which is a consequence of intrigue and supply of trades between various center individuals at different levels in the advancing system, is additionally remarkable for natural products. In addition, the showcasing plans at various stages additionally assume a significant job in value levels at different stages viz. from homestead entryway to a definitive client. These highlights make the showcasing arrangement of organic products to vary from other agrarian items, especially in giving time, structure and the space utilities. The market foundation is better created for the nourishment grains, leafy foods markets are not unreasonably very much created and markets are clogged and unhygienic.

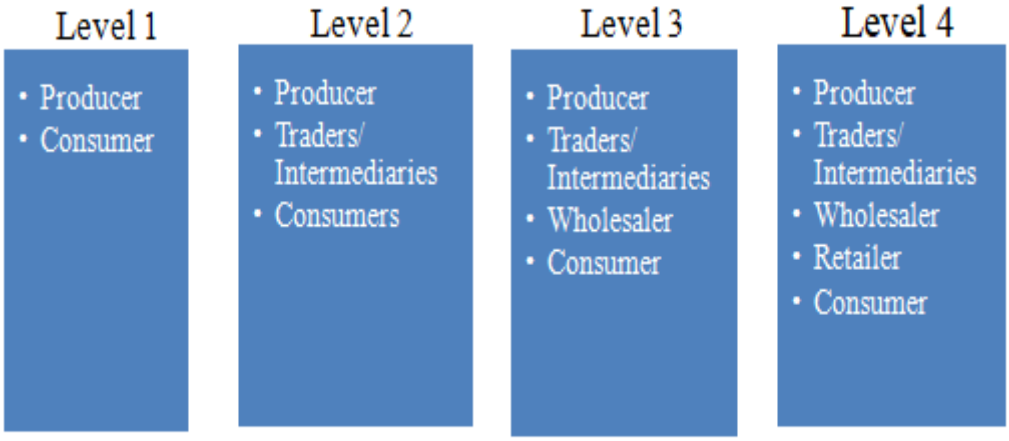


Figure 1.7 Different Marketing Channels of Vegetables

Various Marketing Channels

• Farmers-mahajans-wholesaler-retailer-consumer.

• Farmers - mahajans -retailer-consumer.

• Farmers- mahajans -consumer.

• Farmers-consumer.

India is Becoming an Important Market in the Global Vegetable Trade

The capable Agriculture Solutions offers a full administration consultancy along with production network. The solutions company covers the complete range of nourishment and farming part and sub-areas with the foods grown from the ground exchange India as the principle center.(A, Rasi M & Sheoran, 2015)

Able Agriculture Solutions give inventive homestead to market store network arrangements in retail and discount fragments of crisp, solidified, new cut and dried out Fruits &Vegetables its customers are built up organizations, farming new businesses and abroad organizations who wish to enhance or go into the Indian new product exchange or set up retail chains for transient produce. The organization likewise gives sourcing and promoting help, both for wares and apparatus/gear, to sorted out retail, nourishment handling organizations and people notwithstanding being a specialized warning and venture consultancy for bigger foundation tasks like discount produce markets,

sustenance parks and cold chain activities being attempted under aegis of the Indian Government offices like NHB, MOFPI, NHM, NABARD and so on. Capable Agriculture Solutions in additionally engaged with venture arranging, acquainting new items with the market and is likewise associated with connecting little towns who produce crisp produce to empower at that point to supply huge guaranteed markets, especially sorted out retailers. This assistance Farmers increment their pay by removing the center man, improving profitability, decreasing the expenses of generation other than it deliver higher quality foods grown from the ground because of less/improved dealing with over the inventory network. (A, 2015)

1.5.5 Hub and Spoke Model

At present, organized retailers including prominent players like Spencer's Retail, More (Trinethra Super Retail Ltd.) and Food Bazaar (Pantaloon Retail India Ltd.) is adopting 'Hub and Spoke' business model of retail vegetable marketing. Figure 1.8 illustrates the Hub and Spoke business model of retail vegetable marketing. Fewer players are involved in this model compare to the traditional retailing model. Farmers, organized retailers, wholesalers and customers form this chain. Buying centers, hub and stores (retail outlets) are operational units of the organized retailers. Small farmers and contract farmers who executed a trade contract with the organized retailers are the primary source of supply of vegetables to the organized retailers. The buying center makes the vegetable purchases directly from the farmers and transport to the hubs. A hub is served by one or more buying center and a buying center serves one or more hubs. Hub infrequently buys small Vol. of vegetables from the local wholesale market to balance demand supply gap. Hub in turn distributes vegetables to stores attached to it. A store is served by only one hub. The store sells vegetable in retail quantity to the customers. (https://documents.mx/documents/fv-retail.html).

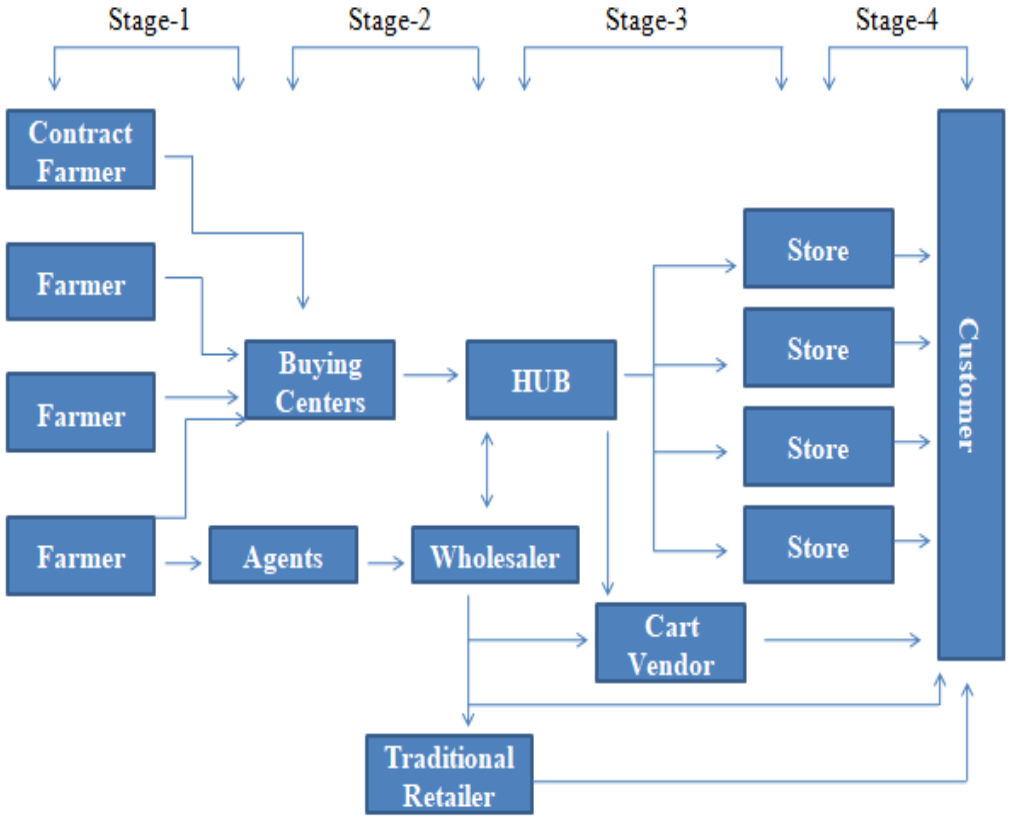


Figure 1.8 Hub and Spoke Model.

Source: Halder & Pati 2011

The center point deals with the supply of vegetables to the retail outlets. It has supply inclusion to all the stores of a particular topographical zone. A center is served by at least one combination focuses and a solidification focus serves at least one center point. A store is served by just a single center point. The store sells vegetable in retail amount to the clients and is the last period of conveyance of Value Chain Model plan of action. The hub disposes off the shelf life-expiring vegetables and do not sell to cart vendors. The Value chain business model differs from hub and spoke business model in dependency on the wholesale market and supply link between hubs. The center point in the Value Chain Model arranged off the time span of usability lapsed vegetables, yet center points in an HSM auction to the truck merchants. Stackable plastic cartons, beds and folded fiberboard boxes are utilized in dealing with vegetables. The stacking and emptying are

finished with self-loader stage trolleys and pressure driven stackers. On entry the vegetables are cleaned and washed at the center point. Starter arranging and evaluating are then done on the solidification focus without bundling. The weight arranging and the size arranging is done at the center point itself. The wrapping machine and the film pressing machines are then utilized in the centers. Each center point has stockroom and space is accessible for temperature-controlled capacity. Usage of data innovation and propelled the executives, systems are in advancement. (https://documents.mx/documents/fv-retail.html).

Vegetables travel in four stages, specifically Farmers to sort out retailers' purchasing focuses, purchasing focus to centers, from the center to the retail locations and the retail outlet to the client. The farmers transport theses vegetables from cultivating area to the purchasing point. The vehicle of vegetables in the second period of purchasing focuses to center is organized by purchasing focus. Method of vehicle is unconditioned trucks. New vegetables are moving into the third stage from center point to the stores and time span of usability lapsing vegetables are coming back from stores to center point. The time frame of realistic usability lapsed vegetables offers to truck seller. Clients purchase and get vegetables from the sorted out retail locations. The stores offer home conveyance for a shorter inclusion zone and high estimation of buying. (https://documents.mx/documents/fv-retail.html).

Vegetables are handled in stackable plastic crates and corrugated fiberboard boxes. The stacking and emptying are done physically. On entry vegetables are then cleaned and washed at the center. The arranging and evaluating is done at the center point without bundling. The space accessible for temperature-controlled capacity is less, however warehousing is utilized for it. Data innovation and propelled the board procedures are conveyed halfway. Network among center point and corporate office is built up. (https://documents.mx/documents/fv-retail.html).

1.5.6 Value Chain Model

Currently, organized retailer Reliance Fresh (Reliance Retail Ltd) follows a Value Chain business model (VCM). Organized retailers who adopt VCM procure the produces directly from farmers and sell to customers by avoiding intermediaries. This model is based on its core growth strategy of backward integration and progressing towards building an entire value chain starting from the farmers to the end consumers. Very fewer players are involved in this model compared to the traditional retail model or organized retailer's hub and spoke model.

Farmers, composed retailers, and customers are the players who structure this value chain. In this preparation, farmers, composed retailer's operational units, association centers, focus point (scattering centers) and retail outlet stores, and players are customer. Fewer farmers, contract farmers, and lease Farmers are the basic wellspring of supply of vegetables to the sorted out retailers. Contract farmers and lease farmers are farmers who execute a trade agreement with the organized retailers for sale of vegetables. Figure 1.9 speaks to the Value Chain Model strategy of vegetable retailing. Vegetables move from ranch territories to customers in four phase’s farmers to blend centers, association centers to focus guide, focus point to retail outlets (stores) and stores to customers. Free Farmers supply their produces to the mix centers; contract Farmers and lease farmers produces are gotten by hardening centers. One hardening center supplies vegetables to various focus focuses, depend upon the thing. Focus focuses get quick movement from the understanding of developing zones.

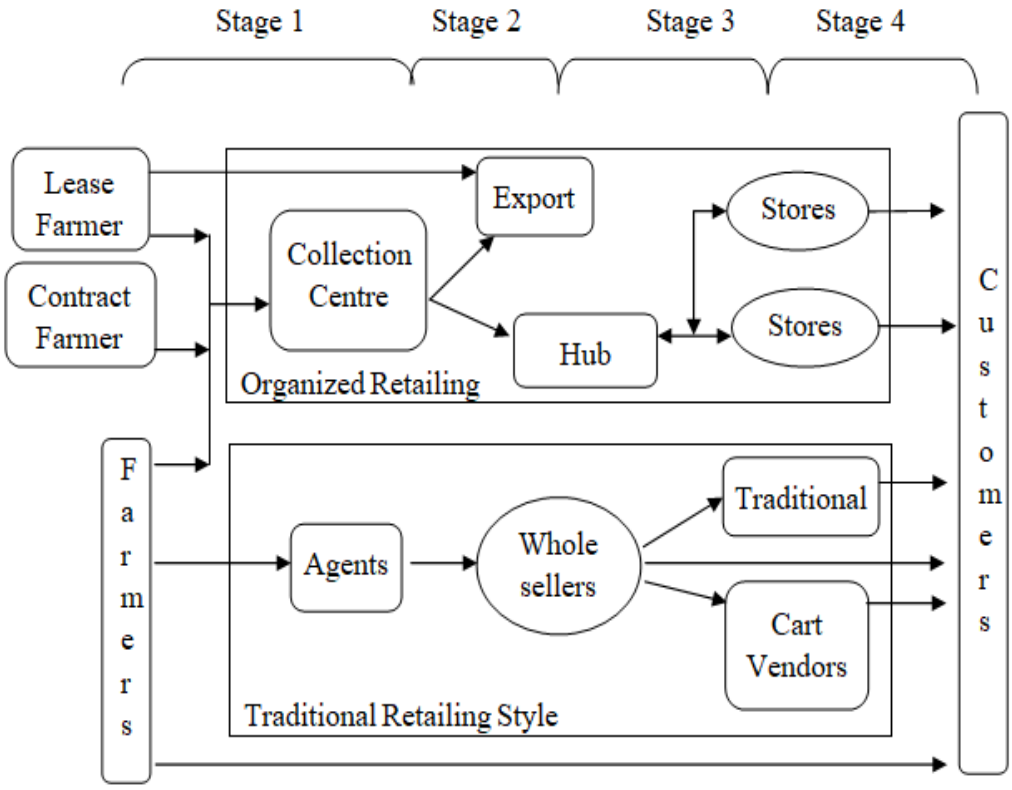


Figure 1.9 Value Chain Model

Source: Halder & Pati 2011

1.5.7 Supply Chain Management

Inventory network Management speaks for the administration of the whole arrangement of generation, fabricating/changes, dissemination, and showcasing exercises by which a shopper is provided with the ideal item. Store network the board includes the arranging and the executives of all exercises associated with sourcing, acquisition, change, and coordination the executives. It additionally incorporates coordination and joint effort with channel accomplices, which might be providers, middle people, outsider specialist co-ops, or clients. Production network the board coordinates free market activity the executives inside and crosswise over organizations. Hence, supply chain management is defined as the design and operation of physical, management information and financial systems needed to transfer goods and services from point of production to point of consumption in an efficient and effective manner. The whole production network

the boarding procedure is a worth chain where bottlenecks, esteem, including variables and obligation elements are distinguished and tended to, in this manner empowering the retail association to have a proficient inventory network. The supply is the piece of retail activities that guarantees that the correct item is in the perfect spot, at the opportune time and at the correct expense. The store network point of view can enable the retailers to distinguish unrivaled providers and merchants and help them to improve profitability, which at last cuts down clients' costs.

1.5.7.1 Supply Chain Operation at Ranchi Market

In Ranchi market, there is an existence of Apni Mandi through which the different retailers as well as the intermediaries collect the vegetables. The different operational activities are performed in these mandi with which they collect the vegetables. The below figure 8.6 shows the supply chain operational activity of vegetables.

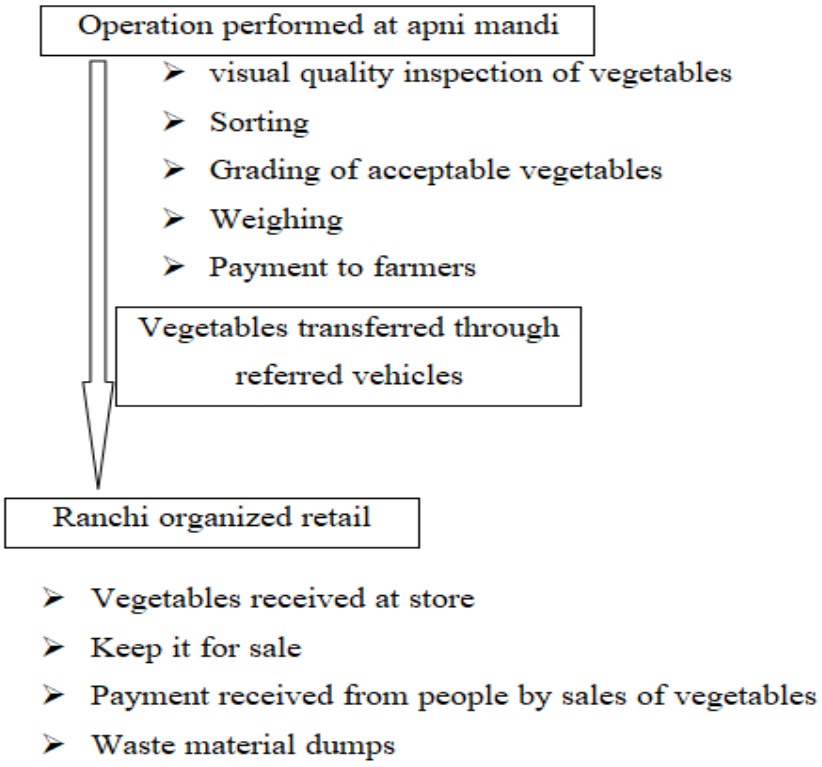
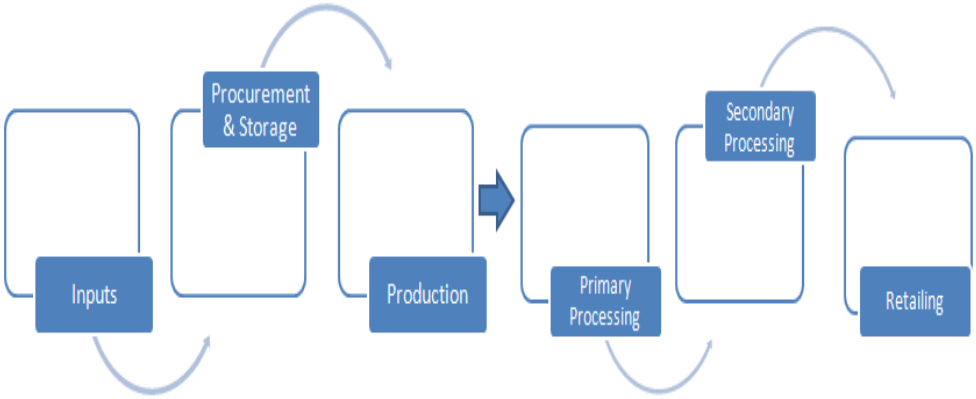


Figure 1.10 Supply Chain Operations at Ranchi Market from Farmer to Retailers

(Source: Project work of Birsa Agriculture University)

1.5.7.2 Need for a supply chain in vegetable marketing

The store network advancement benefits the private division, yet in addition makes turn offs that animate social, financial and ecological feasible improvement in the area (business age, included worth, minimization of item misfortunes and so on.) Kalidas et al. (2014)



Figures 1.11 Supply Chain in Vegetables Industries

Source: Logistics & Supply chain management, D K Agrawal 2003

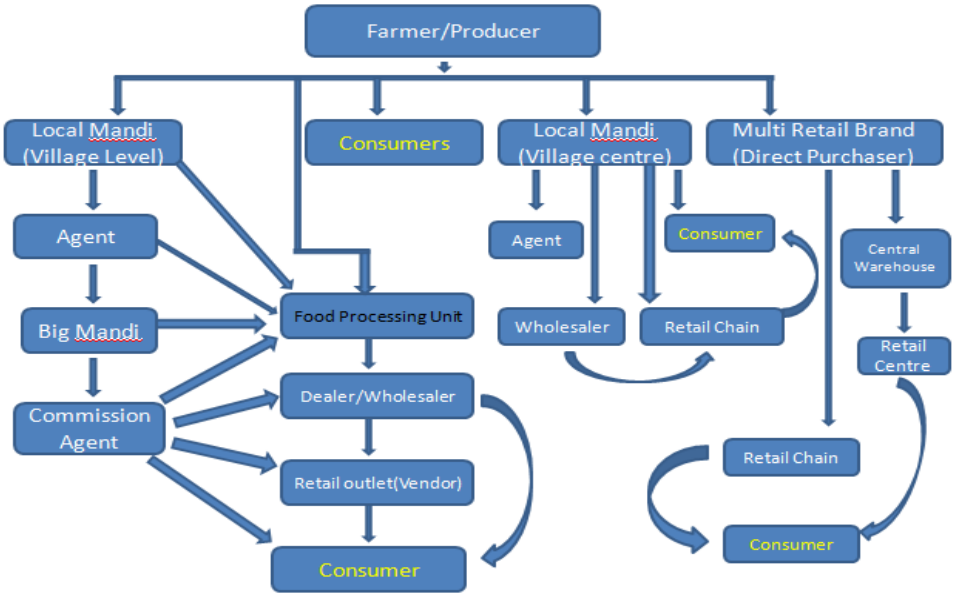


Figure 1.12 Supply Chains of Vegetables

Source: Logistics & Supply chain management, D K Agrawal 2003

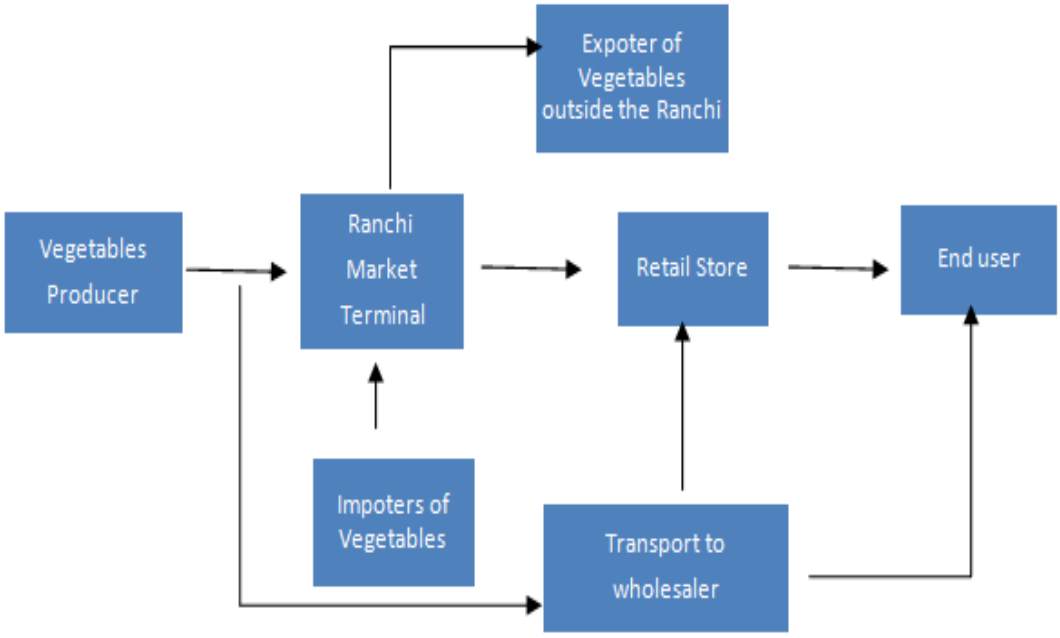


Figure 1.13 Distribution of Vegetables in Ranchi market

1.6 Price Variation of Vegetables

1.6.1 Overview

Costs of vegetables are administered by the law of free market activity. At the point when the supply of any vegetable surpasses the interest for that item, costs will in general be lower than normal.

Similarly, when the demand exceeds the supply, prices tend to rise. Often small changes in quantities offered for disposal on the National Markets have a magnified effect on prices.

The year-round availability of processed vegetables (frozen, canned and, to a lesser extent, dehydrated) may reduce demand for the fresh product, particularly when prices are inflated. The availability of other products, which can be used as substitutes for a particular vegetable, may also play a role.

The interest for a particular vegetable is likewise influenced by changes in shopper inclinations and eating designs, and by the difference in the season. A Plate of mixed greens yields is progressively well known during the hotter summer months, while those vegetables utilized for cooking and for soups are more sought after during the cooler, winter period. Changes in expectations for everyday comforts, and expanding urbanization of the populace, influence the sort of sustenance that families devour.

At the point when the costs have been unusually high for a few whiles, numerous Farmers who don't regularly develop the specific yield endeavor to benefit from these costs by developing the harvest.

This prompts over-supply of the ware, with resultant low costs. After times of low costs, a few cultivators suspend generation, bringing about a drop in supply and more expensive rates.

It is typically just the reliable maker who makes a budgetary achievement of vegetable cultivating over the long haul.

The overarching atmosphere in the creation territories is the significant reason for vacillations in the occasional supply of vegetables, and consequently of costs. Ice touchy harvests are generally just created in summer in many regions of the nation. The supply of vegetables bigoted of cold temperature increments in summer, and lower costs win for

these yields. In winter, and particularly in spring, generation of such warm-season yields is confined to a couple of ice free regions. Makers in such regions may subsequently anticipate more expensive rates for their items.

Another complicating factor is that, while the climate at a particular time of year may favor crop growth, it may also favor disease development or pest incidence. This may make the production of a specific vegetable more difficult, or more costly, with the added input of necessary control measures. Losses from pests and diseases can affect the supply situation, and prices at that time of the year rose with shortages.

At the demand level, the price of fresh fruit and vegetables is also influenced by many factors: variety, size, packaging, brand, organoleptic quality or the maturity of the product (ready to eat, etc.), demand for specific growing practices such as organic or fair trade, promotion activities, etc.

All these elements are influencing the price. Furthermore, logistical constraints or the place of purchase (supermarket, hard-discount, and grocery store) also exert an influence on the final price.

Finally, one should not forget the overall economic situation and purchasing power, the demand for competing products, changes in consumer demands and so on.

Starting at the production level climate contingencies, like frost, heat, rain, drought, etc. affects the production in terms of volume. As in terms of quality and availability. There may be also production contingencies due to plagues or pests. The price of fresh produce is also influenced by the time of the purchase, as products outside or at the beginning/end of the season might be more expensive than in the middle of it. Market elements such as differences in supply between regions and/or countries, shortages, abundant supplies or temporary delays and the interdependencies among product categories all influence the final price.

1.6.2 Major Factors Which Causes As A Trigger Factor In Price Sensitivity Mechanism Of Green Vegetables

At the time of a field survey from the observation and interaction with the farmers and retailers the researcher found the various trigger factors in the price sensitivity mechanism of green vegetables which affects the price of these vegetables. Some of the major factors are listed below.

1. Environment
2. Lack of scientific production approach of the farmer
3. Lack of storage and inventory system
4. Mismanagement of Supply Chain Management
5. Miss accessibility of the market demand and supply in region wise condition
6. Technical and skilled manpower's are not available in every region
7. Vegetables are not treated as a cash crop by the farmers
8. Particular forwarding or auction market is not available in every region
9. Transparency in the middle man operating system is not there
10. Hoarding is also ram pared with different political or power group supports
11. The export orientation of the green vegetables is lacking
12. Infrastructural supportive systems are also not there with the production of green vegetables
13. Green gas production are high with the captive production system
14. Cross Jenom and cross breeding scientific research are not so much conducted in this research
15. Lack of subsidy support
16. Lack of administrative supporting mechanism from the government.

1.6.3 Reasons Why Vegetable Prices Keep Increasing

The continuous rising prices of vegetables have been a serious concern in Indian. If you think that it is only onions whose price is increasing, you are highly mistaken. The price of major vegetables like cauliflower, cabbage and tomato are increasing with time. The average middle class families think twice before buying the vegetables because of its high prices.

Why the monetary values of vegetables are increasing at a continuous pace in India? It is not ascribable to a poor crop or a bad monsoon. Plus the country's backbone is agriculture. On that point are several components involved in the mounting costs of these products.

Figure 1.14 Reasons why there is a Price Variation in Vegetables Prices

Increase in the demand for protein-enriched green vegetables

The lesser-realized Bennett's law gives a significant clarification at rising sustenance costs. As per this law, when pay rises or individuals become wealthier, they change their dietary propensities, moving their preferences from basic dull plant-ruled weight control plans to assortment of nourishment things, including a scope of vegetables, natural

product, protein rich sustenance and dairy items. Notwithstanding, the supply of these vegetables and heartbeats isn't sufficient in contrast with their interest. Subsequently, the value rises.

Global inflation

Specialists state that ascent in basic nourishment things in India is basically a direct result of the expanding item costs abroad, increment in fuel costs and manures, which thusly influence the neighborhood produce by expanding info costs.

Less space for cultivation

With an expansion the populace, there is additionally an increment in the interest for vegetables and heartbeats. Increment in populace has likewise prompted expanded urbanization. Assembling, vitality and administration enterprises are on the whole going after land, water and HR. With less accessibility of land, the costs for rural land are rising, prompting expanded expenses of horticulture produce.

Less production of vegetables

Regardless of high discount vegetables costs as of late, Farmers of India are not extremely enthused about taking up development of vegetables because of high vacillations underway and costs. There is no viable government value bolster component. Farmers are excited about money crops development like cotton and maize as a result of better returns and lower hazard. This was distributed in an examination ponder by the National Council of Applied Economic Research. In a similar report, it was likewise referenced that creation of heartbeats has recorded under 1% yearly development during the most recent 40 years, which is not exactly 50% of the development rate in Indian populace. Accordingly, per capita creation and accessibility of heartbeats has seen sharp decrease in India. This perpetually prompts an ascent in the cost of heartbeats.

Improper management and distribution

A significant inquiry that emerges is whether the horticultural produce has been put away and conveyed ideally or not? There is dependably a hole in the nourishment part with respect to this. At whatever point, a report on environmental change is distributed or an expectation of a flood or dry spell, there are occasions of event of supply stuns. Due to the foolishness, the costs go up fundamentally. Intentional waste of sustenance because of

insufficient stockpiling and conveyance decreases supply, accordingly expanding the cost.

Hoarding

The idea of keeping the load of sustenance items like onions, potatoes, rice, beats and so on notwithstanding when the season is finished and exchanging at more expensive rates when there is request is known as accumulating. In India, accumulating of fundamental products is extremely normal and merchandise is sold at twofold the costs for expanded benefits.

Increased cost of transportation

With increment in fuel costs, the transportation charges additionally increment, prompting an ascent in costs everything being equal, and vegetables and heartbeats are no special case.

Increased cost of production

One noteworthy reason for increment in the costs of vegetables is the ascent in the costs of the crude materials required in the generation beginning from seeds, to manures, pesticides, and work costs. Thus, the expense of the final result likewise increments.

Many mediators

In India's exchanging network, the finished result achieves the customer in the wake of going through different mediators or brokers. Every go between attempts to get benefits by expanding the first expense and the end cost turns out to be extremely higher than the real cost. In this way, it is normal in India that we, as customers, pay a high cost and in the meantime the Farmers don't get a meriting cost for a similar nourishment item.

Supply chain mismanagement

There has been bungled in the inventory network of vegetables from the Farmers to the purchasers. As indicated by reports, the distinction among discount and retail costs is anyplace somewhere in the range of 40% and 60% and this edge is more inside urban communities where there are the discount markets. A portion of the major No's identified with store network botch in India are absence of rustic framework, insufficient and poorly prepared mandi, absence of appropriate taking care of and no immediate advertising by "farmers to consumers."

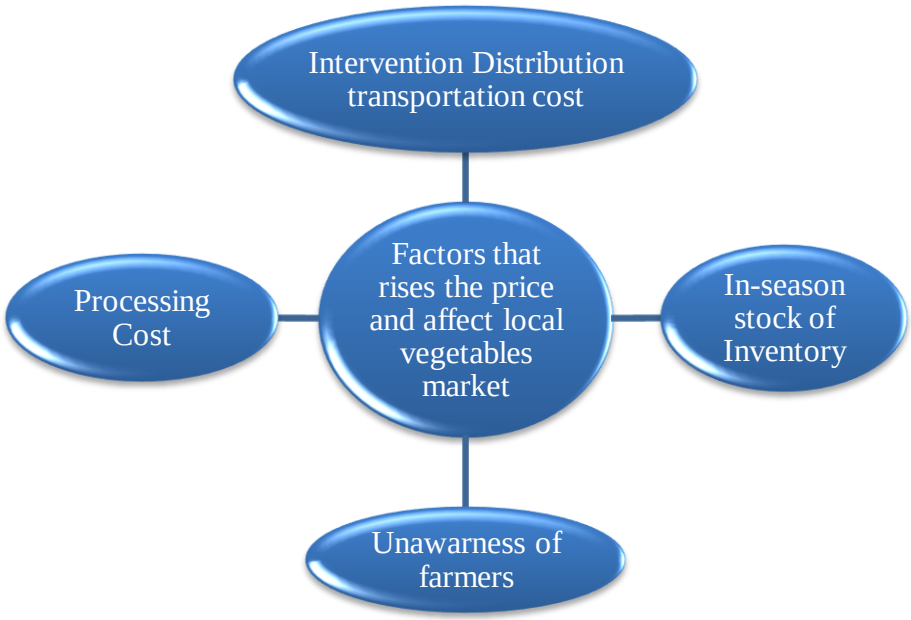


Figure 1.15 Factors that affect the Price of the Vegetables in Ranchi Local Mandi

By the field survey the researcher came to know about the variations of the price with context to selected vegetables exist on the basis of:

1. **Average production of the selected vegetables**
   a. Selling price of the selected vegetables from the farmers end
   b. Selling price of the selected vegetables from the retailers end
2. **Existence of various distribution channel which effect the vegetables price**
   a. Farmers – Consumer
   b. Farmers – Intermediaries – Consumers
   c. Farmers – Intermediaries (1) – Intermediaries (2) – Consumers

1.6.5 Measures for Improving Inventory Network and It's Practicable

Deliya et al. have suggested the accompanying measures: There must be auxiliary changes at various levels - farmers, delegates and customer. The administration, private, open private association, cooperatives, innovation suppliers, and even the media can assume a critical job. A foundation like streets, transport, data and correspondence

innovation and cold stockpiling are fundamental prerequisites for better outcomes in the Supply chain. (A, Rasi M & Sheoran , 2015)

- Demand estimating is one of the significant necessities for improving Supply Chain Effectiveness. Because of poor gauging, there is an irregularity among free market activity. In certain months vegetables are either not culled from the ranch because of the absence of interest. In some reason, produce isn't accessible and an outcome, the costs are boosting up. (A, Rasi M & Sheoran , 2015)
- The Department of Horticulture goes about as the facilitator for the formation of framework offices for the showcasing of foods grown from the ground in the state. The Department of Agricultural Marketing is encouraging the advertising of farming/green makers in the state. The Department of Agricultural Marketing as of late settled Raithra Santhe wherein the cultivators/ farmers can carry their foods grown from the ground to the market and sell them straightforwardly to the producers. The Department of Agricultural Marketing is additionally dealing with informed Fruits and Vegetables in the state through APMCS. (A, Rasi M & Sheoran , 2015)
- Vertical coordination of farmers through cooperatives, contract cultivating, and retail chains would encourage better conveyance of yield, decrease market dangers, give a better framework, pull in increasingly open premium, procure better augmentation benefits, and make mindfulness with respect to the predominant and new innovations(A, Rasi M & Sheoran , 2015)
- Logistics are redone to another significant prompt necessity to make calculated viable. This lessens the expense, encourages the support of the nature of the product and satisfies the prerequisites of focused clients. (A, Rasi M & Sheoran , 2015)
- The State Government is giving subventions of Rs.1/ - per KWH of power, devoured by chilly stockpiles in the agriculture division. Further, the National Horticulture Board is giving a back-finished endowment of i25% (limit of iRs.50 lakhs whichever is less) for the development/modernization of cold stockpiling units. Cold stockpiles are named Agro Food Processing Industry for giving motivations and concessions accessible to Agro Food Industry. (A, Rasi M & Sheoran , 2015)

- The Information framework for better coordination among various partners from farmers is the need of great importance. The web and versatile correspondence can likewise be utilized to empower data and money related exchange between the partners. (A, Rasi M & Sheoran , 2015)
- The Public-private association is another vital arrangement. Store network like washing, waxing, evaluating, arranging, pressing, pre-cooling, taking care of offices, protection, money, transportation, and handling offices would increase the value of production network capacities. (A, Rasi M & Sheoran , 2015)
- The primary goal of setting up Food and Technology Parks it to advance agro and handling enterprises in the group in zones where there is transcendent creation of processable agribusiness and Horticulture Products. These parks will likewise give the required infrastructural and basic offices which are fundamental for the sustenance of the ventures. Quality confirmation research facilities, Warehousing including cold stockpiles, regular gushing treatment plants, and so on. (A, Rasi M & Sheoran , 2015)

1.7 Motivation for the Research

My motivation of the research is to get knowledge and put a contribution to the farmers' side so that the farmers can get the best value for their vegetables production along with the best end user price.

1.8 Scope of the Research

It is understood that the number of organized retailers in various sectors is going to increase because of ease in shopping, better ambience, better assortment and great experiences. This study of price variation has good scope to understand the following areas for future strategic decisions by different stakeholders:

- The research tries to explore the price variation of vegetables in Ranchi district with reference to organized retail stores.
- The identification of various important factors which have an impact on variation regarding the price of the vegetables in different seasons.

- This research also helps to understand the various cost components in farming and possibility to reduce the farmers cost burden.
- The research also tries to identify, evaluate and understand the overall dynamics of price variation from farmers to consumers.

CHAPTER 2

LITERATURE REVIEW

LITERATURE REVIEW

The present chapter is devoted to review of relevant literature pertaining to the objectives of the study. For this an attempt has been made to review the available related literature under the following headings:

2.1 Price mechanism and marketing of vegetables

2.2 Supply chain management and small holder farmers

2.3 Supply chain management of vegetables

2.4 Micro-farming situations and bio-physical factors related to vegetable production

24.1 Land and soil

2.4.2 Pest and disease

2.4.3 Water resource

2.5 Production problems, their causes and constraints

2.5.1 Bio-physical constraint

2.5.2 Production problem

2.5.3 Post-harvest scenario

2.5.4 Socio-economic constraint

2.6 Association of socio-economic variables with knowledge, attitude and adoption of improved technologies

2.7 Adoption behavior of farmers with respect to vegetable production technologies

2.8 Characteristics on other agricultural products like milk

2.1 Price Mechanism and Marketing of Vegetables

Efforts to develop the agricultural sector in developing countries are now taking place against the background of major structural change in the world agricultural industry. In many developed countries, agricultural production is changing from an industry dominated by family-based, small-scale farms or firms to one of larger firms that are more tightly aligned across the production and distribution value chain. In addition, the trend of market-orientated reforms, following multilateral trade liberalization and

especially structural adjustment programmes in developing countries, has led to the increased integration of world markets. As per the observation of research conducted by Collaborations among companies are common in the business world but rarely observed among government organizations for agricultural development.

Mighell and Jones (1963) explain that the term includes all the ways of harmonizing the vertical stages of production and marketing. The market-price system, vertical integration, contracting, and cooperation singly or in combination are some of the alternative means of coordination." Within this succinct definition is the notion that vertical coordination encompasses a continuum of possibilities, from open market spot transactions at the one end, through to full vertical integration at the other and including strategic alliances, joint ventures, contracting, etc.

Boehlje, M. & Doering, O. (2000) concludes that the new conditions have affected the atmosphere in distribution channels encouraging more cooperative relationships.

Ganesh Iyer and J. Miguel Villas-Boas (2003) say that the bargaining power of retailers by concluding that an increase in the relative power of the retailer in the channel reduces double marginalization and promotes channel coordination. Balagtas and Holt's discussion has contributed to understand market information systems and the functioning of market-based mechanisms for agricultural risk management, including futures, options, and insurance. Though the progress over the decades have been a remarkable journey, Gulati explains the demand for stronger vertical coordination in the food system as a means of satisfying increasingly diverse consumer preferences are changing the landscape facing food supply chain participants. The consolidation trend in the marketing sector seems inexorable, implying that noncompetitive behavior and its effects will remain high on the research agenda.

Michael G. Jacobides (2005) found that gains from intra firm specialization set off a process of intra organizational partitioning, which simplifies coordination along parts of the value chain.

Alam, G. and Verma, D, (2007), Reaching the end of the period of 11thfive Years Plan (2007-2012), the support and available infrastructural facilities are in the process of expansion and very soon the 12^{th} Five Years Plan (2012-2017) will come up and expecting some positive support to agriculture to work on the road map of the agricultural growth.

Giancarlo Moschini, Luisa Menapace and Daniel Pick (2008), discusses that the economics of geographical indications (GIs) is assessed within a vertical product differentiation framework that is consistent with the competitive structure of agriculture.

Mangala, K.P. and Chengappa, P.G, (2008), say that strategic interaction between public and private actors is increasingly recognized as an important determinant of agricultural market performance in Africa and elsewhere.

Shawn Cole and Barrett Kirwan (2009) represent the attempt at exploring the individual, temporal, and regional determinants of participation in agricultural risk management.

To improve small producer's livelihoods Rakesh Singh and H.P Singh (2009) has developed many models. The fresh food retail chains are investing from farm to fork to buy fruits and vegetables directly from farmers and sell them to retail buyers. However, fresh food retail chains are largely found working with only large farmers and exclude small farmers for various reasons.

M S Jairath and Gaurav Jairath (2009) indicate that on an average on each rupee invested by the public sector, private sector. The analysis indicates that there is a very

strong complementarily between private and public investment. The study suggests that in order to give further fillip to investment in agricultural marketing infrastructure.

Kathryn A. Onken and John C. Bernard (2010) views that with the demand in local labeling programs such as the National Buy Fresh Buy local promotion appearing in increasing numbers, consumers will be seeing many messages about local and fresh produced vegetables. The study has also highlighted the needed effective measures to reduce marketing losses at various stages.

Naresh Singla et al. (2011) says that to improve small producer's livelihoods, linking primary producers with global and national markets through fresh food retail chains is seen as one of the emerging agricultural marketing practices in India.

Research conducted by Douglas E. Hughes et al. (2012) contributes that propositions linking the levers to market-based capabilities are offered to shape new research opportunities in the domain of the marketing and sales interface.

Nicholas Roberts and Varun Grover (2012) talks that Customer agility captures the extent to which a firm is able to sense and respond quickly to customer-based opportunities for innovation and competitive action.

A, Rasi M & Sheoran , (2015), For Sustainable agribusiness improvement an effective promoting framework is basic which influences the maker's pay as well as shapes the buyer's welfare. Market productivity does not depend just on homestead generation cost and yields in any case, on the system, wherein an item reaches to a shopper from the ranch entryway. The elements affecting the market effectiveness incorporate their transient nature, quality, cost and area like Ranchi and its adjoining area assembly markets are situated near farm-gates where vegetables are brought by farmers. Various intermediaries participate as buyers in these markets.

In vegetable markets, agents/mahajans perform work on commission by charging on sales revenue from farmers. They do not provide lodging, boarding, transport, and telephone facilities. Sometime these people purchase the whole from the farmers with least value and sells as per their price. They also fix the price for the vegetables as per the last day market operation. So an efficient marketing system has to be adopted where the farmers get directly in touch with the buyers.

S.H. Baba et al. (2015) have suggested that the coverage of technology mission should be expanded to other niche areas of vegetable cultivation.

A, Rasi M & Sheoran , (2015), Generally the price is paid by the different marketing agencies regarding the packing, transportation, storage and processing, but in the city like Ranchi the intermediaries or mahajans cut down the price of these variables from the farmers end and lower down their margin, an efficient marketing channel has to be developed through which the farmers can sustain with any losses. An efficient marketing system can reduce the post-harvest losses, enhances the farmers' realization, reduce the consumer price, promote grading and food safety practices, induce demand-driven production, enable higher value addition, and facilitate export.

Demand for stronger vertical coordination in the food system is discussed by (Uma Shankar Singh,Uma Sankar Mishra) as a mean of satisfying increasingly diverse consumer preferences are changing the landscape facing food supply chain participants.

Contracting and other forms of vertical coordination are important parts of the supply chains for many agricultural products. Ramesh Chand has a great contribution academically to provide the solution for a varied range of problems in agriculture sector, and throws light on the future of agriculture and expectation to the industry till 2020.

Berck and Perloff found the gap that retail chain procure only a limited proportion of the grower's crop without any firm commitment and, more so, on a day-to-day basis. It

has made no genuine provision for any agriculture-input or other services and does not have any formal contract arrangements with the farmers. The produce not accepted by the RC has to be disposed off by the farmers elsewhere.

Barnett, Mahul, Cramer, G. L. & Jensen, C. W reviewed the research on market structure and performance, vertical coordination arrangements, and institutions for producer collective action has brought a good insight about contributions to empirical modeling of agricultural price determination, and marketing margins are also evaluated, as are innovations in research on spatial market relationships and the role of storage.

William G. Tomek and Robert J. Myers has provided the empirical price analysis, research and concluded that it will face new data challenges in an environment where fewer and fewer transactions are being conducted in open markets, but this creates research opportunities as we seek answers to how different vertical coordination forms coexist and interact with one another. Paying close attention to the time-series properties of commodity market variables will continue to be important, irrespective of whether a structural or nonstructural modeling approach is being used.

Study conducted by M.S. Jairath to know the extent of investment made in promotion of marketing infrastructure in the country and find out whether private investment induces public investment or vice versa.

2.2 Supply Chain Management and Small Holder Farmers

Though the importance of supply chain management has been well established, it is very important to see what literatures have to say about its role for the small holders specifically. It is very important to see how small holder survives with their limited abilities. This section reviews some of the literatures based on supply chain management and small holder farmers.

Singgih and Woods (2002) made a case study research on two banana supply chains (BSC), one in Indonesia (BSC1) and one in Australia (BSC2). BSC1 sources bananas from small farmers for distribution through traditional markets in Jakarta.

Brithal et al. (2005) explored how smallholders can benefit from the emerging opportunities from silent demand-driven changes in high-value agriculture in India. They examined the institutional mechanisms adopted by different firms to integrate small producers of milk, broilers and vegetables in supply chain and their effects on producers' transaction costs and farm profitability. They found that the innovative institutional arrangements in the form of contract farming have considerably reduced transaction costs and improved market efficiency to benefit the smallholders. They do not find any bias against smallholders in contract farming. Also, the study does not find that the relevant firms have exploited their monopolistic position by paying lower prices to farmers. On the contrary, contract producers were found enjoying benefits of assured procurement of their produce and higher prices.

Martin and Jagadish (2006) presented the results of a study on the marketing of smallholder produce originating in the Highlands provinces and destined for a range of markets, including the coastal cities. They have used a defensible supply chain framework to evaluate a range of marketing numbers and to evaluate the performance of the marketing system.

They found that the marketing system was remarkably vibrant. It was characterized by entrepreneurial behavior by the private sector, where businesses along the chain compete and innovate in order to expand their operations and meet the needs of the customers in their varied market segments. However, they are constrained in their endeavors by poor infrastructure, which raises their costs of doing business.

They concluded that the use of a Supply Chain Framework can yield a very robust and insightful understanding of the performance of the agricultural marketing system in developing economies.

Kledal and Sulitand (2007) analyzed to what extent Chinese small lholders are included and benefited from converting their land to organic vegetable production supplying chains. They have investigated two case areas-Shanghai metropolis where organic vegetable production goes solely for domestic consumption and the rural area around Tai'an city in the province of Shandong where the organic vegetable production is destined for export only. In the Shanghai metropolis small holders are not included at all in the organic vegetable production due to better off - farm employment. In the Shandong case village cooperatives act as a contractor between an organic processing industry and smallholders/households. The small holders/households are receiving a higher pay than an unskilled labour would get in the industry.

Faure et al. (2007) analyzed the consequences of different coordination mechanisms on inclusion or exclusion of small farmers in the northern region of Costa Rica. They found that market coordination could be an efficient way to integrate farmers in supply chains in the case of low technical specifications and of existence of adequate selling mechanisms. Hybrid coordinate on is the main mechanism and facilitates the inclusion of small farmers, depending on the farmers' organizations capacities to negotiate adequate rules. In some situations hybrid coordination with captive relationships could occur but leads to a more or less rapid exclusion process.

Kalaitzis (2007) reports that supply chains for fresh fruit and vegetables are going through considerable re-shaping phase worldwide. There are many researchers who have highlighted that the smaller holders have the ability to produce what is demanded by the globalised market. It is very important that this re-shaping phase considers the importance of small holders and recognize them as important constituents of an efficient supply chain.

Milczarek-Andrzejewska et al. (2008) in their paper analyzed the impact of supply chain modernization on dairy farmers in Poland. It is shown that joining the modern marketing channel positively affects farmers' incomes. The decision to enter the

modern channel is crucially dependent on access to funds and facilitated by having larger cow herds.

BSC2 includes farmers supplying to both major and independent retailers in Sydney through a wholesale agency with some farmer ownership. In both chains, most transactions between farmers and their buyers were completed through a fixed price mechanism with little bargaining effort from the farmers. Because of their relative isolation, farmers relied on the buyers to offer them fair prices that reflect market movements in the city. Farmers in BSC1 based their trust on traditional value systems and the competition to secure a supply in the villages. In BSC2, farmers' trust in their agent developed over time in their relationships and by making comparisons between the prices farmers received for their bananas and the market information they have.

2.3 Supply Chain Management of Vegetables

Gupta and Ram (1981) conducted a study on price spread behavior of vegetables in Delhi and found that producers receive only 37.6 percent of consumer‘s price for all vegetables and the intermediaries shared 10.7 percent for wholesaler, 24.3percent for retailer and 2.6 per cent for commission agent. This indicated high profit margin of the intermediaries and a wide price spread.

Scott & Westbrook (1991) "supply chain is used to refer to the chain linking each element of the process from, raw materials through to the end customer"

Novak & Simco (1991) "The supply chain management covers the flow of goods from supplier through manufacturer and distributor to the end-user"

Towil, Naim, and Wikner (1992) "The supply chain is a system, the constituent parts of which include material suppliers, production facilities, distribution services,

customers linked together via the feed forward flow of materials and the feedback flow information".

Cooper & Ellram (1993) "SCM is an integrative philosophy to manage the total flow of distribution channel from the supplier to ultimate user".

Lee & Corey (1995) stated that SCM consists of the integration activities taking place among a network of facilities that procure raw material, transform them into intermediate goods and then final products, & deliver products to customers through a distribution system.

Ganeshan and Harrison (1995) "A supply chain is a network of facilities and distribution options that performs the functions of procurement of materials, transformation of these materials, intermediate and finished products, and the distribution of these finished products customers."

Ganeshan and Harrison (1995) has defined SCM as a network of facilities and distribution options that performs the functions of procurement of materials, transformation of these materials into intermediate and finished products, and the distribution of these finished products to customers.

Lee & Corey (1995) "The integration activities taking place among a network of facilities that procure Raw material, transform them into intermediate goods and then final products, & deliver Products to customers through a distribution system"

Richard Lamming (1996) has given a general review on lean supply chain in which Lean supply has been characterized as "beyond partnership". Lean supply is the system of purchasing and supply chain management required to underpin lean production. .

Christopher (1998) defined the supply chain as the network of organizations that are involved, through upstream and downstream linkages, in the different processes and activities that produce value in the form of products and services in the hands of the ultimate customer.

Christopher (1998) “The supply chain is the network of organizations that are involved, through upstream and downstream linkages, in the different processes and activities that produce value in the form of products and services in the hands of the ultimate customer”.

Handfield & Nichols (1999) “A supply chain encompasses all activities associated with the flow and transformation of goods from the raw material stage, through to the end user, as well as the associated information flows”.

Croom et al. (2000) analyze 84 studies on SCM in terms of level of analysis and research methodologies, but the time period for their data collection is ambiguous. Their study represents an early attempt to categorize the SCM literature.

Bailey (2001) stated that agricultural supply chains are both demand and supply driven. While demand and supply forecast are equally important in the agricultural supply chain, the ability of supply chain members to control supply is limited. As a result of factors specific to agricultural supply chains it is impossible for these supply chains to be purely customer driven. Seasonal patterns of production and other factors such as weather and diseases are beyond the ability of either a company or chain members to control. Agricultural supply chains can be considered as production adjusted customer driven systems.

Mentzer.et.al.(2001), SCM is the "strategic and systematic coordination of the traditional business functions and the tactics across these business functions within a

particular firm and across businesses within a supply chain, for the purposes of improving the long-term performance of the individual companies and the supply chain as a whole".

Chopra and Meindl (2001) “A supply chain consists of all stages involved, directly or indirectly, in fulfilling a customer request”.

Mentzer et al. (2001) “The systemic, strategic coordination of the traditional business functions and the tactics across these business functions within a particular company and across businesses within the supply chain, for the purposes of improving the long-term performance of the individual companies and the supply chain as a whole.”

Vaart and Pieter (2003) drawn conclusions on the need for an inter-disciplinary approach, combining the technical and relational aspects from the respective fields of system dynamics and collaboration in order to deliver superior order replenishment performance.

Carter and Ellram (2003) surveyed the articles published in the Journal of Supply Chain Management for the total period of 35 years since its launching i.e. for 1965 to 1999. Their objective was to offer a greater understanding of the evolution of purchasing and supply research over the first 35 years of the Journal of Supply Chain’s existence, and to provide guidance and prescriptions for future supply management research.

Nagarajan and Sosic (2004) reviewed literature dealing with buyer vendor coordination models that have used quantity discount as coordination mechanism under deterministic environment and classified the various models.

Verma & Singh (2004) estimated post-harvest losses in fresh vegetables at farm level and found that losses are mainly caused by inadequate means of harvesting.

Kader (2005) also found Lack of information as one of the socioeconomic factor causing post-harvest losses.

Gunasekaran and Ngai (2005) indicated that E-Business, product, and service-quality, all have a significant direct effect on customer behavioral intentions to purchase again.

Balakrishnan and Cheng (2005) reviewed and update the methodology based on spreadsheet that provided enhanced solutions in complex environments with multiple products and bottleneck situations.

Gajanana et al. (2006) found Pest and diseases at the field level, pressing and crushing of fruits at the market level and injury to fruits due to pressing at the retail level as the major causal factor of loss due to improper handling and storage.

P. K. Suri and Sushil (2006) observed that collaborations among companies are common in the business world but rarely observed among government organizations for agricultural development.

Vander Vorst et al. (2007) have distinguished two main types of agriculture food systems:

- Agriculture, food chains for fresh agricultural products (such as fresh vegetables, flowers, and fruits). In general, these chains may comprise growers, auctioneers, wholesalers, importers and exporters, retailers and specialty shops and their input and service suppliers. The main processes are the handling, conditioned storing, packing, transportation and especially trading of these goods.
- Agriculture, food chains for processed food products (such as portioned meats, snacks, juices, desserts, canned food products). In these chains, agricultural products are used as raw materials for producing consumer products with higher added value. Participants in both types of chains, e.g. farmers, traders, processors, retailers, etc,

understand that original good quality products can be subject to quality decay because of an inadequate action of another participant.

Viswanadham, (2007) Lack of information regarding demand was considered as a major reason of waste.

Ozcan (2007) listed lack of training and experience of workers as one of the reasons for post-harvest losses.

Rehman et al. (2007) found that losses, mainly occurred during picking of the crop. Author found harvesting at improper stage and improper care at harvest, post-harvest problems as the primary factor responsible for post-harvest losses in the tomato crop.

Ozcan (2007) listed Early or late harvest, Unsuitable method of harvest for specific product, and Use of improper tools and machines by the farmers in harvesting their farm fresh produce as the reasons for the marketing losses.

Jain (2007) discussed rough handling of produce as the main reason for post-harvest losses. There are several inefficiencies in storage and poor handling process which are the operational cause of waste in the supply chain, Murthy et al., (2009); Prigojin et al. (2004).

Singh et al. (2008) identified faulty method of harvesting as the factor responsible for losses.

Ben-Daya et al. (2008) explored the topic in a particular context, i.e. the industrial district (ID) that constitutes a specific production model where complex SC networks can be identified. SC cooperation may take on several forms in IDs and may produce several benefits (e. g. Upgrading quality and reducing costs).

Singh et al. (2009) Traditional supply chain in India for perishable fresh produce is very long and fragmented where they collect a sizeable share from the price paid by the customers for the produce.

Murthy, D. S. Gajanana, T. M., Sudha, M., & Dakshinamoorthy, V. (2009). "The supply chain concept consists of actively managed channels of procurement and distribution. It is the group of firms that add value along product flow from original raw materials to final customer".

Adeoye et al. (2009) also found such reasons as the causes of economic losses to tomato. Author also found that careless handling of fresh produces causes bruising, thereby resulting in splitting and skin breaks in the fresh produce. Rough handling causes damage during off-loading of the produces resulting in high percentage of losses in the fruits and vegetables.

Robert J. (2010) observed demand for stronger vertical coordination in the food system is discussed as a mean of satisfying increasingly diverse consumer preferences are changing the landscape facing food supply chain participants.

Babalola et al. (2010) found in his study that most of the farmers around 82.95 % were illiterate which could be a contributory factor to high losses in production of tomato because they cannot appreciate and use most post-harvest technology available and only farmers with post primary education can appreciate and use it.

Babalola et al. (2010) analyzed the determinants of post-harvest losses among tomato producers in Imeko -Afon local government area of Ogun state and revealed through regression analysis that the age of fruits at harvest and the number of baskets harvested as the major determinants of post-harvest losses because harvesting more than the actual demand at a wrong time may causes loss and wastage.

Buyukbay et al. (2011) also attributed lack of demand information as one of the main reason for waste.

Mena et al. (2011) The shortage of vegetables occurs when there is no information regarding demand and retailer orders more than the real demand.

Sharma & Singh (2011) also found in his study on Economic analysis of post-harvest losses in vegetable in Uttarakhand that the losses at grower level results from lack of farmer's knowledge about the post-harvest management. They also have the very less knowledge about the appropriate maturity of fresh produce and proper time of harvesting which results in losses.

Sharma & Singh (2011) also found harvesting at inappropriate maturity, results in erratic ripening and poor quality as one of the most important causes of Post-harvest losses.

Buyukbay et al. (2011) determined 5-12.97% and 18.44 % of losses due to early and late harvest in tomato and fresh bean production in Tokat province of Turkey.

Veena et al. (2011) Over 25 percent of fruits and vegetable production is spoiled due to improper handling and storage. Farmers do not take proper care of fresh produce. They handle, grade and pack these produce in a poor manner which subjected fresh produce too extreme of temperatures, atmospheric modification or contamination and attack by parasites/diseases.

Vipul Chandra Tolani and Huzefa Hussain (2013) conducted a study and found that Vegetables and fruits play a vital role for the existence of people and also a very influencing role in the economy of India. The traditional retailing of vegetables are not much organized, about 97% of the total market are extremely localized and highly

fragmented with a large number of intermediaries. The long transport process from the growers to the final consumer occurs the wastage of 10-12% of total in addition to the transportation cost. This increases the cost of fruit and vegetable for the final customer also hampers the quality.

Indian middle and upper middle class population are growing very rapidly and there is also increasing in number of young working couples, resulted in an increase in demand for semi-processed food, fast foods, packed foods, ready-to-eat foods. Changing tastes and preference towards consumption of basic food items, which is driven by longer working hours, increase in double income families, more exposure to advertising, for comfort and convenience etc. Especially people living in cities are becoming more health and hygiene conscious. In place of conventional wet markets, they prefer to buy vegetables, fruits and other agri-products from the super markets and modern retail stores, and this leads to the entry of more and more corporate into the agriculture food marketing.

Shukla & Jharkharia, (2013) with the timely information of the market demand farmers also need to plan and take care of the planting and harvesting activities as lack of proper planning and management practices is one of the reasons for losses in fresh produce supply chain.

Shukla & Jharkharia, (2013) Majority of the farmers are small land holder and share croppers and they have very little knowledge regarding the technology, demand in the market, and financial incentives

2.4 Micro farming situations and bio-physical factors related to vegetable production

2.4.1 Land and soil

Mohsin et al. (1984) In general, the soil of Jharkhand is red and acidic (pH 5.5 to 5.9) in uplands, yellowish and slightly acidic in medium lands (pH 6.5 to 7.3), and grey and alkaline in the lowlands, water holding capacity of upland soil is poor.

Singh et al. (1996) reported that during the diagnosis phase of project on TAR through IVLP, Agro-ecosystem diagnosis was done using the Participatory Rural Appraisal (PRA) tools. Through this analysis poor productivity and profitability in rainy season cauliflower was prioritized as the most important problem, out of seven identified production problems in vegetable crops. The criteria of problem prioritization included the extent of yield loss, intensity of occurrence, and importance of enterprise and distribution of the problem. Browning of curds and hollowness in stem, mainly due to deficiency of boron and molybdenum was identified as the major bio-physical cause as decided in the farmer-scientist interface meeting. Continuous cropping of cauliflower on the same land caused depletion of boron and molybdenum which led to curd rot and hollowness in the stem and thereby lowering the productivity tremendously.

Ray Chaudhuri (2005) reported that the problem of acidity needs to be managed by liming and discouraging shifting cultivation and deforestation in the North-east India. The nitrogen and phosphorus deficiency can be managed with the judicious and efficient combination of the organic and inorganic inputs on the basis of the soil test results. The use of lime, FYM, bio fertilizers along with inorganic fertilizers proved to be beneficial in managing these soils.

2.4.2 Pests and diseases

Chauhan et al. (1979) observed maximum disease incidence (58.3 per cent) in experimental plots of Ranchi Agricultural College, Kanke, followed by Samlong and Pithoria villages. Least incidence of disease was recorded in Bero followed by Chutia in Ranchi district.

Chauhan et al (1979) and Singh et al (1988). Ajay et al (2006) observed that key pest responsible for deterioration of quality and quantity in brinjal was shoot and fruit borer, Leucinodes orbonalis Guen (Pyralidae: Lepidoptera).

According to Jha et al. (2000) the disease collar rot of lady's finger was reported as major disease of lady's finger (Singh et al 1987-88) and caused 20-30 per cent loss every year in most of the lady's finger growing areas of the country.

Jha et al. (2000) found that the collar rot of lady's finger caused by Macrophomina phaseolina (Tassi) Goid (Rhizoctonia bataticola (Toub.) Briton. Jones) is a major disease and cause 20-30% plant loss every year. This disease is widely prevalent in the plateau region which causes considerable loss (12.7 to 50.3 %). Similar findings have also been revealed by

Kalita and Dhawan (2001-02) observed lowest whitefly population/plant, incidence of single and combined infection of yellow vein mosaic virus (YVMV) and leaf curl virus (LCV) were found on early sown crop (May) at closer row-to-row spacing (30 cm) and highest on late sown crop (August) at wider spacing (75 cm). Date of sowing (1st week of June) and row-to-row spacing (45cm) of lady's finger can be adjusted to escape or reduce the disease incidence to get maximum yield.

Chechani and Gupta (2003) identified the major sucking insect pests of vegetables which were whitefly, aphid, jassids and thrips. All these sucking insects besides damaging the crops directly sometimes become responsible for transmission of the viral, fungal, mycoplasmal and bacterial diseases in plants.

Deepak et al. (2017) reported that many insect pests and diseases associated with the tomato crop in Ranchi District which caused severe losses to the crop yield, i.e. alternaria leaf spot, damping off of seedlings, phytophthora fruit rot, bacterial wilt, soft rot, viral leaf curl, Helicoverpa armigera, Spadoptra lutera, semi looper, serpentine leaf minor and root knot nematode.

2.4.3 Water Resources

Gadgil D.R. (1954) in the title of 'The Industrial Evolution of India in Recent Times' studied the economic effects of irrigation and concluded that the total direct and indirect effects of irrigation projects were very favorable to the farmers. With irrigation, farmers received higher levels of income and they were able to make additional investment on cattle, farm implements and on commercial crops like sugarcane and cotton. Further, it generated additional employment opportunities as well.

Planning Commission (1964) in the study on 'Criteria for Appraising the Feasibilities of Irrigation Projects' during 1958 to 1961 observed that canal irrigation had helped in promoting greater utilization of land, enlarging the average size of the farm generating demand for additional farm labour, shifting to new and better varieties of crops, increasing additional production investment in farm business and widening the scope for increasing the revenue.

Jaiswal (1965) reported that lack of farming resource and irrigation facilities were the most important factors attributed by the field extension workers and farmers for non adoption of improved agricultural practices.

Moorthi T.V. and Mellor W.J. (1972) after a study on 'Cropping Pattern Yields and Income under Different Sources of Irrigation with Special Reference to IADP, Aligarh District, Uttar Pradesh, concluded that farmers with private tube-wells had better control over the water supply in terms of timely availability in adequate quantity. This resulted in higher cropping intensity, yield, higher crop income and cultivation of high yielding crops in such farms. This was attributed to the flexibility factors in quantity and timing available in those farms.

Shukla V.P. (1973) in his paper on 'Well Irrigation – Its Costs and Benefits in Jabalpur District in Madhya Pradesh' examined how far irrigation from wells either

through electricity or diesel pumps was profitable in Jabalpur district in Madhya Pradesh, especially in the context of advanced technology.

Behra and Sahoo (1975) found that the reason for non applicability of the demonstrated practices were lack of irrigation, lack of finance and unsuitability of land.

Vyas V.S. and Mathai G. (1978) in their paper on 'Farm and Non-farm Employment in Rural Areas: erspective for Economic Planning' confirmed the direct relationship between irrigation and use of other inputs like fertilizers and chemicals. They also concluded that it resulted in increased labour use.

Suryawanshi S.D. and Kapase P.M. (1985) have analyzed in their research paper on 'Impact of Chod Irrigation Project on Employment of female Agricultural Labour' that agricultural labour and farm cultivation as the main areas of economic activities for rural women. The National Sample Survey has shown that the percentage contribution of women in agriculture is higher than men, where most of the key operations at farm are done by them.

Navalawala B.N. (1995) stated in the article on 'Water logging - Problems and Solutions' that drainage is a measure to remove excess water from the soil or from the soil surface. It is known that canal irrigation upon overuse often leads to rise of water table and drainage is essential but even today adequate attentions is not being paid to this while designing and planning of canal irrigation projects. Owing to this neglect, many irrigation projects in the arid and semi-arid areas have created serious problems of water logging and of salinity and alkalinity.

Rasis Ahmad (1998) in his article on 'Water for Irrigation-An Overview' pointed out that for raising productivity of agriculture one has to shift from traditional to modernized and scientific system of farming for which regular supply of water for

irrigation is necessary. In India position is quite different as 2/3 farmers are small and marginal farmers and most of them continuing traditional system of farming. 2/3 cultivable area is dependent on scanty rainfall and any change in the timing of monsoon either before time or delayed and excess or less rainfall may cause extensive damage to crops.

Roy L.B. et al. (1999) described in the title on 'Farmers' Participation and the hare irrigated project' that generally most farmers do not irrigate during night time because of the fear from mosquitoes, snake bites, hyenas and other wild animals. Sometimes as it is expected everywhere, some conflicts arise during irrigation period. Some farmers used to illegally divert the water from the canal for continuous irrigation. Then the other farmers will report this matter to the local water committees. If a person is found guilty of such things, he will be charged up to 50 birrs as per the 'local water law'. All the farmers will pay revenue to the Government.

Nirmala et al. (2002) reported that the inadequacies of irrigation water at the time of application of bio fertilizers and inability to plan in advance were the major constraints in adoption of bio fertilizers. The other constraints like lack of enforcement upon the technology, inability to remember the quantity and delayed land preparation were reported by 34.16, 40.00 and 30.00 per cent of the respondents respectively.

Narendra Kumar I. and Chandrasekar Rao G. (2007) have analyzed in the title on 'Impact of Irrigation on Employment' on the basis of micro study that irrigation reduces the risk and uncertainty inherent in the rain fed cropping. Irrigation has a stabilizing impact on agriculture and generates farm employment through higher levels of cropping intensity adoption of new agricultural strategy, growth of high yielding crops and multiple cropping. Their study pertains to Kurnool district of Andra Pradesh with the objective of Impact of Canal and Bore Wells irrigation sources on the farm output and generation of employment relating to the crops like

paddy and cotton. They conclude that there is no significant difference between canal and bore well irrigation within the human labour and bullock labour. The important suggestions as follows: i) The main canals up to farm lands are to be lined cement can be avoid leakage of water ii) Ground water potentiality will be increased by different methods like check dams, watersheds and percolation tanks and iii) Micro irrigation is encouraged at every village level, so that the previous water is to be saved.

Somashekaraiah N.T. and Mahendra Kumar S. (2008) in their article, an attempt has been made to assess the impact of tube well irrigation on resource use efficiency in agriculture with special reference to paddy cultivation in the study area.

2.5 Production problems, their causes and constraints

Anderson R.L. (1968) in their research article on 'A Simulation Programme to Establish Optimum Crop Pattern in Irrigated Farms Raised on Pre-Season Estimation of Water Supply' has developed a simulation model to make the most efficient use of the predicted water supply throughout the season for higher net returns. The Model determined the optimum cropping pattern for each farm based on the individual farm water supply, crops grown, minimum and maximum acreage of each crop and water requirement of each crop.

Bandenhop M.P. and Cashdoller P.P. (1974) in the article on 'Land Water Use Potentials, Thungabhadara Irrigation Project' determined the most profit-mix-able crop that could be grown on the soils in the Thungabhadra Irrigation project under the alternative sets of land and water use regulations that might be adopted by project officials. Linear programming techniques were used to ascertain the most profitable crop combinations under twelve situations for each of the four selected representative farms.

A study conducted by the Evaluation Division of the State Planning Board (1975) in a title on 'Minor Irrigation in Kerala: An Evaluation Study' revealed that the

minor irrigation beneficiaries have very little awareness about the efficiency of water use. The farmers were found to be under the notion that the more water they use, the better would be the crop. It was noted that the cultivators seemed to ignore the use of irrigation water for alternative crops either through ignorance or negligence. Left to themselves they tended to grow only rice although its water requirement was much higher than that of other crops.

William K. Easter and Lee R. Martin, (1977) viewed in the title on 'Water Resource Problems in Developing Countries' that the location of the villages from the main canal happened to be the main factor influencing the cropped area and in turn the cropping intensity.

Harrington et al (1990) Even when researchers are convinced that productivity, at constant input levels, is declining over time, considerable further work may be needed to pinpoint the reason behind this decline. Hypothesis may include (but need not be restricted to) increasing scarcity of macro and micro nutrients; build up of pests and diseases, build up of problem weeds, deterioration in soil physical or chemical structure (including gradual salinization); reduced soil moisture holding capacity, soil loss through erosion, etc.

2.5.1 Bio-physical constraints

Soil

Conceptually, the identification and quantification of constraints to higher yield may be explained in several ways. One useful approach is to divide the problems into the "what" or the physical constraints limiting yield and the "why" or the socio-economic factors responsible for maximum input uses. The bio-physical constraints include soil, water, seed varieties, pest and diseases etc. With the proper choice of inputs and practices it would be possible to increase the yield in farmer fields. The review of the literature reveals the role of physical, biological and socio-economic constraints in attaining lower yields.

Kotur et al. (1976) reported that the cauliflower crop suffers due to boron deficiency (dead heart rot and hollow stem) in acidic soil of the plateau region of Bihar especially during the rainy season. Application of boron significantly overcomes this problem and improves yield.

Ghosh et al. (1994) reported that the boron requirement is high for the growth and development of cole crops and its deficiency has been identified as a major problem particularly in cauliflower growing areas of Jharkhand, causing heavy losses due to browning of curds and hollowness of stem symptoms.

Singh et al. (1995) conducted field studies at Varanasi (U.P.) to find out the effect of nitrogen and spacing on yield and quality attributes of brinjal. Results revealed that application of 100 kg nitrogen per hectare produced the highest number of fruits and yield of brinjal, while fruit weight, total soluble solids and ascorbic contents were highest at 150 kg nitrogen per hectare. Minimum values of these characters were recorded in no nitrogen plots. Plant transplanted at wider spacing (60 cm X 90 cm) resulted in the highest number of fruits, fruit weight as well as ascorbic content. However, the yield was highest at closer plant spacing (60 cm X 60 cm).

Prasad et al. (1997) reported the response of tomato to soil and foliar application of boron in acidic red loam soil of Ranchi. They found that significant response of crop to boron application. Among the methods tested foliar application of borax @ 2.5 Kg. /ha gave the highest yield with net additional income.

G. K. Sujayanand et al. (2015) reported that the intercrops viz. brinjal, french bean and marigold were responsible for reducing the shoot damage to the extent of 34.32 to 45.86 per cent as compared to sole crop of lady's finger which were comparable to lady's finger treated with Carbofuran 3G suppressing 42.20 per cent shoot infestation. Similarly these intercrops reduced the fruit damage to the extent of 28.10 to 37.50 per

cent over the untreated sole crop of lady's finger that remained comparable to that of okra plants treated with Ethoprophos 10 G which lowers the fruit infestation up to28.92 per cent.

Sangita Mehta, Birendra Prasad, Das, A. K. (2016) reported that lady's finger is moderately tolerant to salinity. Soil salinity is a major a biotic stress that limits crop. Salt injury affects germination and early seedling growth. The germination and vigor can be improved by pre-sowing treatments with recommended chemicals and growth regulators.

2.5.2 Production problems

Singh, D.P. (1990) found the problems in horticulture development in tribal areas of Bihar, i.e. non availability of genuine planting materials and quality seeds, lack of technical knowhow, lack of coordination among teaching, research and extension institutions, lack of availability of quality farm inputs, capital constraints, lack of irrigation, lack of marketing facilities and lack of processing industries and cold storage facilities.

Jain (1991) reported that bottleneck in the development of dry land horticultural crops are limited availability of genuine planting materials, attack of pests and diseases (particularly in vegetable crops), unavailability of agro-chemicals for plant protection, stray cattle grazing, lack of initial care and management, lack of knowledge, zeal and enthusiasm with the extension workers, lack of marketing, storage and processing facilities.

2.5.3 Post-harvest scenario

Singh and Singh (1992) has been stated that the different fruits and vegetables absorbs vibration and collapsed with each-other during road transportation, handling, loading and unloading which caused mechanical damage.

Singh and Singh (1992) The transportation of perishables agricultural commodities with the help of road transported vehicles hamper the quality of commodities and basically caused the significant textural damages (higher in the case of perishable commodities) due to the irregular and unsmooth roads..

Egharevba, (1995) Different fruits and vegetables treated as an important source of vitamins, minerals and fiber due to the several nutritional benefits the consumption of fruits and vegetables increased which also improve the commercialization of fruits and vegetables.

Kantor et al. (1997) In the case of developed countries the range of losses was observed 10-50%.

Lee et al., (2000), Different types of citrus fruits contains different amount of vitamin C and minerals, which can be lost in high temperature storage.

Bachmann et al. (2000) Fruits and vegetables require good packaging, which can prevent the physical and chemical damage.

Verma et al. (2004) reported that both the quantitative and qualitative losses of extremely variable magnitudes occur at all stages in the post-harvest system from harvesting, through handling, storage and marketing to final delivering to the consumer. It is evident from the losses that the overall losses varied up to 20 per cent in vegetables, viz., tomato, cabbage, cauliflower, and chilli. The maximum losses were observed at the retailer level for tomato, cabbage and cauliflower whereas for chilli it was at wholesale level. The more moisture content of tomato was responsible for maximum loss at storage followed by cauliflower and cabbage. The losses caused by sorting and storage operations were more in comparison to losses at transportation of produce.

Kader, (2005) Researchers have noticed that 20% fruits and vegetables wastage estimated as a consumer and food service losses.

Anonymous, (2006) Due to unavailability of suitable harvesting equipment, storage structure for storing the fruits and vegetables, hygienic packaging and appropriate transportation facilities caused the major deterioration in fruits and vegetables.

Kishor et al (2006) revealed that inadequate storage and transportation facilities coupled with bad weather conditions positively and significantly influenced the post-harvest losses at the farm level. The establishment of small sized cold storage units in the production centers would help in reducing the storage losses in vegetables. In this direction the zero energy cool chamber technology was being found to beneficial particularly for small and marginal farmers.

Sudheer et al. (2007) In the case of developing country like India, the postharvest losses noticed close to 50% of the total fruits and vegetables production which badly affects the availability of fruits and vegetables to the consumers.

Gupta et al. (2000) Postharvest losses depends upon the various significant factors after harvesting till consumption that is why estimation of exact losses value is difficult which required statistical methods for found out the accurate figure of postharvest losses, first statistical survey based on successive sample technique was conducted in Uttar Pradesh, India with the help of Indian Agricultural Statistics Research Institute. The sampling design used in the survey was based on successive sampling technique.

Ilic et al. (2009) Reduction in the quality, storage duration and shelf life can be minimized with the help of adequate storage, transportation and environment conditions.

Kitinoja et al. (2011). In Rwanda, Ghana, Benin and India, recent studies have generated similar findings, with losses ranging from 30% to 80%.

Hodges et al. (2011) With the help of modern techniques and approaches, developed countries have minimize the Post harvest losses up to some extent but due to less mechanized methods, developing countries are still facing a big challenge.

Buzby and Hyman, (2012) Deterioration in the weight, volume considered under the quantitative and losses of nutrient value, color, texture defined as the qualitative losses.

Sharma et al (2013) The microbial effect plays a vital role in spoilage of fruits and vegetables due to some extensive heat or cold resistance micro-organism the processed or canned product also can be damage.

Bhosale, (2013) After China, India is the world largest producer of total fruits and vegetables in the entire world but due to unavailability of appropriate cold storage, refrigerated transportation facilities, the fruits and vegetables of Rs. 13300 crores spoiled every year.

Wasala et al. (2014) Practices of postharvest technologies can reduce the quantitative and qualitative losses of fresh fruits and vegetables and also maintained the product quality up to final consumption. Attaining the hygienic agricultural produce should be focused on the varieties of higher postharvest longevity.

Yumbya et al. (2014) Shelf life of any product also enhanced with the help of modified atmospheric packaging by controlling the oxygen's and carbon-dioxide levels within the packaged products.

2.5.4 Socio-economic constraints

Singh (1968) reported that there was no significant variation in the extent of adoption of high yielding varieties due to difference in socioeconomic status of farmers.

Basran and Capener (1968) found that lack of money was perceived by non-adopters as an important barrier for not making use of chemical fertilizers and other social and psychological variables were also equally important.

Padheria (1973) reported that important factors responsible for resistance for improved farm practices were irregular rainfall, lack of irrigation facilities, lack of finance, high cost of inputs, lack of knowledge about important farm practices, lack of technical help and guidance, lack of timely supply of inputs in different quantity and non-availability of timely labor.

Behra and Sahoo (1975) reported that the main reasons for non adoption or partial adoption of recommended package of practices were lack 30 of finance, lack of irrigation, unsuitability of land, non availability of inputs in time and lack of technical know-how.

Kassar and Patil (1978) observed that the rural poor did not get the credit facility in an efficient manner. Large population of the rural India had not been able to grab the advantages offered by the credit institutions. The study revealed that only 40 per cent of the total rural credit needs were disbursed through recognized institutions. The rest 60 per cent depends on unrecognized and unscrupulous moneylenders. The plight of tribal's in remote areas was observed to be pitiable due to lack of credit facilities.

Bhagat et al. (1985) emphasized the need of irrigation facilities and credit for adoption of new technology by the tribal farmers. He put forth that possession of land itself may not lead to adoption of new technology.

Bhople et al. (2002) reported that the important constraints faced by the vegetable growers in adoption of bio-fertilizers were: scanty supply of bio-fertilizers and lack of knowledge about quantity and method of use of sticking agents during seed inoculation.

Dudhate et al. (2003) reported socio-economic factors as the major constraints in adoption of brinjal production technology. This was followed by technical and institutional factors with little variation in merit assigned by farmers.

2.6 Association of socio-economic variables with knowledge, attitude and adoption of improved technologies

In order to appreciate the difficulties involved in agriculture and especially in horticultural development, it is essential to study the socioeconomic profile of farmers.

According to Jodha (1980) the features of resource poor and small farmers, who practice mixed-farm operations have to be understood, together with their risk-management strategies, which are required to cope with the adverse market and agro-ecological environment.

Age

Patel and Modalia (1974) observed that young farmers were keen to adopt new practices.

Modalia and Rajwadi (1976) reported that among the various age groups, the average adoption percentage was maximum (77.35) among farmers up to 40 years of age. For the remaining age groups 41 to 45 years, 46 to 60 years and above 60 years, the average adoption was 60.57, 60 and 59.37 percent respectively.

Shrivastava et al. (2002) in Gujarat found that age was positively and significantly related with adoption level of chilli growers.

Krishnamurthy et al. (2006) reported that middle-aged of people are more enthusiastic, having risk bearing capacity, eager to learn and they are innovative in nature. The findings are in line with the results of Hanumanaikir et al (2006).

Bodake H. D. et al. (2007) found non-significant relationship with awareness and adoption levels of bio fertilizers in respect of age. Borude (1998) also reported non-significant relationship between ages of the respondents.

Education

Rao and Raheja (1959) found that in general farmers having higher level of education had adopted more improved practices. They further found that farmers having middle school education had adopted more than those of high school education.

Saha (1973) reported that education affected adoption of agricultural innovations. It was found that the adoption of innovations increased with the increase in education level of farmers.

Patel and Modalia (1974) found that education was also positively correlated to adoption.

Size of holding

Sahay (1960) found large farmers were pioneers in the introduction of improved farm practices.

Rai (1965) also found that size of holding was positively related to the adoption of improved practices.

Joon and Singh (1969) observed that all of the factors under study, the size of holding was found to be positively and significantly associated with the adoption of high yielding varieties.

Bhogle (1971) found that 47 per cent of adopters mentioned bigger land holding as a reason for higher adoption.

Saha (1973) revealed that there was positive association between size of holding and adoption of agricultural innovations.

Patel and Modalia (1974) reported that size of the holding and adoption was positively and significantly correlated.

Singh and Choubey (1975) concluded that a strong positive correlation existed between the operational farm size and adoption of high yielding varieties of wheat.

Modalia and Rajwadi (1976) reported that with the increase in size of holding, there was positive increase in adoption.

Deogare (1997) using linear programming technique suggested that there was under utilization of resources (land and man power) under existing cropping pattern and, therefore, recommended technology and adequate finance-based farm planning was necessary for the best utilization of the existing farm resources available with farmers. A liberal credit policy was also essential for increasing the income and employment on farm in the rural areas. By adopting the recommended level of technology, the income can be substantially increased.

Attitude

Bhople et al. (2002) reported that majority of the farmers (83.33%) were found to be neutral in their feeling about bio fertilizers. Nearly one-fourth of the farmers (24.67%) were found to be favorably disposed towards bio fertilizers. Only 12% farmers were observed to be unfavorable in their reaction about bio fertilizers. The farmers in general were thus neutral in their feelings towards bio fertilizers. It might be due to lack of

detailed knowledge about bio fertilizers. The persuasion through regular guidance, training and demonstrations seem to be essential.

2.7 Adoption behavior of farmers with respect to recommended technologies for production of major vegetables

Rai (1965) pointed out that less preference of laborers, difficulty in procuring seed, and high cost of seeds and failure of crops were the reason for non applicability.

Choudhary et al. (1999) made an attempt to ascertain the extent of adoption of fertilizers between contact and non-contact farmers in Ranchi, West Champaran and Patna districts representing the three different agro climatic regions of the state. The findings revealed that contact farmers were far ahead in making use of plant nutrients (N, P, K) in comparison to noncontact farmers. The study suggested the need to utilize the contact farmers as change agents for transforming the state agriculture scenario.

Shrivastava et al. (2002) reported about the knowledge and extent of adoption of S-49 chilli variety by the farmers of Kheda District in Gujarat. Constraints experienced by the chilli growers in adoption of recommended S-49 chilli cultivation technology were high price of chemical fertilizers, insecticides and pesticides, incidence of pests and diseases, lack of technical guidance from VLW, adverse climate, and lack of knowledge about technology. Poor economic conditions of the farmers, non-availability of plant protection appliances, unavailability of sufficient timely credit and labor at the time of picking, non-availability of seed of S-49 chilli variety in time, improper market facilities and non-availability of fertilizers and pesticides locally.

Jahagirdhar A.K. and Sundaraswamy B. (2002) stated that lack of knowledge as the main reason for non-adoption of practices like seed rate, spacing, application of FYM, application of chemical fertilizers as basal dose and top dressing, nursery management practices like type of seed bed and application of FYM and chemical fertilizers and plant protection measures.

Meena and Babel (2003) reported that friends, neighbors, local leaders and progressive farmers were frequently used among personal local sources of information by the cabbage growers and among cosmopolites, VLWs and AAOs were mostly used by both categories of farmers (peripheral and distant). Radio and farm literature were frequently used 35 among impersonal cosmopolite sources of information and among commercial agencies, seed merchant was most impressive on both categories of farmers. Significant difference in utilization of source of information by both the categories of farmers was also there.

Thygarajan and Prabhu (2005) reported that Tamil Nadu has increased the area and production under tomato, but it did not reflect significantly on farmer's income level and standard of life. Tomato cultivation is influenced by a number of factors and constraints. The findings on the constraints experienced by the tomato growers were wide price fluctuations, lack of adequate knowledge about modern technology, lack of knowledge to identify pests and diseases, high cost of labor, inadequate water supply, non availability of water supply, exploitation by middlemen by charging heavy rate of commission, lack of adequate market facilities, and lack of storage facilities at village level.

Malay K. Bhowmick et al. (2014) stated that lack of knowledge as the main reason for non-adoption of practices like seed rate, spacing, application of FYM, application of chemical fertilizers as basal dose and top dressing, nursery management practices like type of seed bed and application of FYM and chemical fertilizers and plant protection measures.

2.8 Characteristic of other agricultural products like milk

Mandeep Singh and Joshi.A.S. (2008) reported the economic analysis of dairy farming has been reported for marginal and small farmers in Punjab for the year 2003-04. It has been found that a majority of the farm households are not able to meet their requirements from their income from crops. Further dairy farming has emerged as a major allied enterprise for supplementing the income of marginal and small farmers in Punjab. Income from off-farm sources has been identified another important factor contributing significantly to the disposable income of these farm households. The study has suggested to further exploit the potential of off-farm sources towards meeting the domestic expenditure. Also, the technical efficiency of crops and dairy farming should be improved to provide more income to farmers.

Islam. S., Goswami. A. and Mazumdar. D. (2008) have analyzed Tehatta-II block of Nadia district in West Bengal. There were 17 blocks in the Nadia district of which Tehatta-II block was selected purposely. The block consisted of 7 gram panchayats and 2 gram panchayats namely Palsunda-I and Barnia were selected randomly. Fifty dairy farmers were selected from each gram panchayats based on judgment sampling. The study area was more or less homogenous with respect to animal husbandry practices, socio-cultural conditions, facilities for service and critical inputs. Most of the dairy farmers in the study areas were unorganized in milk production. Relevant information from the individual milk producers (dairy farmers) has been collected through personal interrogation method with the help of a structured interview schedule prepared for the study. The study revealed that crossbred cows were more economical and gave higher yield than the indigenous cows and the inclusion of a few crossbred cows can increase the income of a dairy entrepreneur and provide gainful and round the year employment. Family labor work was carried out in the mill pocket areas of eight districts of Marathwada region. About 59 percent of the dairy farmers belong to general (unreserved) category, 25 percent were backward class and only 8 percent each of SC and ST. The landless dairymen equally contributed with dairymen having (large) land; 13 landless dairymen reported comparable lactation yield as the number of milch animals increased,

the herd lactation performance decreased. The animals maintained by joint family were not properly cared for while they were cared for properly by singly family.

Dhanabalan. M. (2009) opined that dairy has an important role in improving the overall economic conditions of rural India. To maintain the ecological balance, there is need for sustainable and balanced development of agriculture and allied sectors. From our first plan onwards, planners have given priority to allied sector for the economic development of the rural sector. Dairy farming is described as a small industry which provides gainful employment opportunities. It comprises of about six per cent of the national income.

2.9 Research Gap

1. Local level management of the Vegetables foods Product and its storage is still not there.
2. Farmers are yet not very aware of the storage system of the perishable product.
3. Local level wastage is extremely high, so prices are unstable and it is depend as a seasonal and it is dependent on the season.
4. The vegetables are still not considered as a profitable farming, although the scenario is changing very fast.
5. In Jharkhand the price of vegetables are unstable prices despite of good production of different vegetables

CHAPTER 3

RESEARCH METHODOLOGY

RESEARCH METHODS AND TECHNIQUES

3.1 Overview

Research methodology is a systematic way to solve a problem. Essentially, the procedures by which researchers go through in their work of describing, explaining and predicting phenomena are called research methodology. It is also defined as the study of methods by which knowledge is gained.

As indicated by Goddard and Melville (2004), responding to unanswered inquiries or investigating which as of now not exist is an exploration. The Advanced Learner's Dictionary of ebb and flow English sets out the significance of research as a cautious examination or request, particularly through quest for new realities in any part of information.

Redmen & Mory (2009), define research as a systematized effort to gain new knowledge.

Research strategy is the blend of the different strategies, plans and calculations utilized in research. Every one of the strategies utilized by an analyst during an examination study are alluded as research techniques. They are basically arranged, logical and esteem nonpartisan. They incorporate hypothetical strategies, test thinks about, numerical plans, factual methodologies, and so forth. Research techniques help us to gather tests, information and after that discover an answer of the issue. Specifically, logical research techniques call for clarifications dependent on gathered certainties, estimations and perceptions and not on thinking alone. They acknowledge just those clarifications which can be confirmed by examinations.

Determination and reception of a proper and orderly methodological methodology is most significant for any logical examination as it includes the sharpness, knowledge, exactness, unwavering quality, legitimacy and extraction to the exploration discoveries. The strategies embraced for the examination ought to be clear, pretested and best fit. In the present examination, every conceivable exertion was made to choose out such methods keeping in view the objectivity and nature and degree of the investigation.

The present examination was taken up in Ranchi regions of Jharkhand. In perspective on most noteworthy Volume of creation of the chose vegetables in this locale and because of huge scale promoting action occurring in connection to these vegetables in Ranchi region

and in its bordering regions as they are enriched with moderately most noteworthy territories under particular vegetable. The Vegetables included in the present study were Cauliflower, Tomato, Cabbage, Brinjal, Bottle gourd, Tomato and Beans. The investigation depends on both optional and essential information. The optional information relating to the territory and generation of vegetables, and so forth were gathered from different distributed and the unpublished records of the Birsa Agriculture University, Government of Jharkhand. The essential data in regards to trimming framework and promoting of chosen vegetables was gathered from the Farmers drawn from territories like Thakurgoan, Choria, Chatwal, Boreya, Murma, Kanke of the locale of Ranchi utilizing the multistage stratified arbitrary inspecting procedure.

In the past part the survey of writing identified with the issue was introduced. This part manages the examination strategies and methods utilized in the present research. For accommodation of the introduction of research strategies and methods embraced, the present part has been isolated into the accompanying areas:

3.1 Overview

3.2 Statement of Problem

3.3 Objective of the Study

3.4 Pilot Study

3.5 Hypothesis

3.6 Research Design

3.7 Sampling Procedure

3.8 Data Collection & Statistical Analysis

3.2 Statement of Problem

In order to understand the price variation of vegetables it is necessary to know the different factors that influence the price of vegetables. It is identified that the various types of retailers that deals with vegetables in Ranchi market also play a vital role in price variation. This study also focuses on the process of procurement or supply chain mechanism of green vegetables by different retailers and its costs.

Since these products are perishable in nature, over production and short production cause extreme price fluctuations are there and its effects consumer price of vegetables.

There is no minimum support price like policy from the government; farmers are affected heavily due to any unfavorable and unpredicted situation. This also affects the consumer price.

98% of vegetable Retail marketing is limited to unorganized sector, its effects the consumer price stability. The Co-operative marketing policy is not present in this area, it ultimately unstable the consumer price. Cooperative farming is not present in this area; it increases the production price and affects the consumer price. The Adjoining territory of Ranchi considered highest vegetable producing area of Jharkhand but still cold storage facility is very negligible. It affects the price for the end consumer. Logistic & Transportation facility are not so much advanced, which also affects the consumer price. Vegetable processing industries are absent in these areas, it ultimately increase the price. Banking and micro financing facilities are not up to the mark, it's ultimately effect the consumer price. The Agricultural Insurance facility is not very much aware or applies by the farmer, due to crop loss in natural calamity, ultimately increases the consumer price.

Direct selling to the consumer is nearly absent, middlemen are involved in the selling process, and it's also increase the price for the consumer. Trained labour force is not available in this area, it's ultimately effects the production of vegetables and increase the consumer price. Composite farming is also not in practice, it's ultimately increase the consumer price. Organic farming is not available or very negligible, it ultimately not attracting quality and health conscious consumer to buy the crops at high prices.

Local level management of vegetables product and its storage is still not there.

Farmers are yet not very aware of the storage system of the vegetables product and also the advanced techniques of cultivation.

Local level wastage is extremely high:, so prices are unstable and it is depend as a seasonal. The vegetables are still not considered as a profitable farming:, although the scenario is changing very fast. In Jharkhand most unstable prices are there despite of good production of different vegetables.

Direct selling to the consumer is nearly absent, middlemen are involved in the selling process, and it's also increase the price for the consumer. Trained labour force is not available in this area, it's ultimately effects the production of vegetables and increase the consumer price. Composite farming is also not in practice, it's ultimately increase the consumer price. Organic farming is not available or very negligible, it ultimately not attracting quality and health conscious consumer to buy the crops at high prices.

3.3 Objective of the Study

Research Objectives have advanced from research issue explanations, look into holes and have been created for this exploration, after an inside and out investigation of the area and survey of writing. In conclusion of the examination targets, due thought has been taken to basically look the cost and the actual price variation of green vegetables.

The research study was taken up in Ranchi districts of Jharkhand. In view of highest volume of production of the selected vegetables in this district and due to large scale marketing activity taking place in relation to these vegetables in Ranchi district and in its adjoining areas as they are endowed with relatively highest areas under respective vegetable. The Vegetables included for the present study were Cauliflower, Tomato, Cabbage, Brinjal, and Local Beans. For the study there are various objectives which are needed to be analyzed for the final result so the research objectives have been developed accordingly are as follows:

1. To identify the extent of price variation of concern vegetables across different seasons with respect to farmers and organized retailers
2. To understand the major reasons or components of such price variation of concern vegetables
3. To understand the price gaps between farmers selling price and organized retailers selling price.

3.4 Pilot Study

In the period of pilot study the researcher want know about the variation in price of vegetables and the existence of various intermediaries.

3.4.1 Purpose of the pilot Study

A small group of farmer's i.e. 30 farmers were considered for the pilot study. The research work was conducted to know about the existence of price variation form farmers to consumer through organized retailers in different area of Ranchi area and its adjoining area. The survey was conducted in order to evaluate and know about the production cost and the profit margin of farmers and the price in which the organized retailers like Reliance and Big Bazaar are selling, So that actual price came into the picture and finally how much price the retailer pays to the farmer and then with what price they sell to the end users.

3.4.2 Methodology of the pilot study

The study is based on both secondary and primary data. The secondary data were collected from various published and unpublished records of the Birsa Agriculture University, Government of Jharkhand., Krishi Bhawan Kanke, Information Technology of Birsa Agriculture University. The primary information regarding the cropping system was collected from the farmers from the areas like Mandar, Thakurgoan, Chatwal, Choria, Itki, Kanke, Murma of the district of Ranchi using the multistage simple random sampling technique.

3.4.3 Data Collection Process

The research data were collected by interviewing the farmers and retailers personally by the investigator with the help of the standardized interview schedule. Apart from observation and some selected Participatory Rural Appraisal (PRA) tools and techniques were also employed during data collection.

To collect the data simple random sampling method is used from the farmers of Ranchi and its adjoining areas and organized retailers from Ranchi. Since the survey is confined

to those farmers who four acres of land or more than that for their cultivations. Thus, the number of respondent is very limited in the area. Thus, small farmers were not considered since they do not cultivate so much or do not have the relationship with the retailers, they only produce and sell to the villages.

STAGE 1: Visit to the different area of Ranchi city like Brambe, Mandar, Chanho, Bero and Pithoria know about the total presence of farmers. Then the researcher took 30 farmers data as a sample size for the farmer side. The second side was known since it is regarding the organized retail stores in Ranchi which are in limited numbers.

STAGE 2: The next stage was to interact with the farmers and take their valuable feedback on the questionnaire regarding the production of vegetables, which kind of land they use for the cultivation, the total area of cultivation of different vegetables, the seasons variety of vegetables, the cost of production of these vegetables, the post harvest losses if any, who fixes the prices of these vegetables, major constraints regarding the marketing and production of these vegetables.

On the second hand of the stage-2, the organized retailer were interviewed regarding the processing of these vegetables, purchasing and selling of these vegetables, cost of transportation, packaging, merchandising, reprocessing, or any other cost. Other than the cost they are also interviewed regarding the storage facilities and availability of distributors/intermediaries in this business.

STAGE 3: Analysis for the pilot study was done on the basis of the questionnaire and the suggestions made by the farmers and retailers.

On further analyzing the researcher found that this research named “Price Variation of Vegetables in Different Seasons with Reference to Organized Retailers” was really the worthwhile to understand the pricing mechanism from farmers to organized retail chain and from organized retail chain to the end user.

The data were collected by interviewing the respondents personally by the investigator with the help of the standardized interview schedule. Apart from observation and some selected Participatory Rural Appraisal (PRA) tools and techniques were also employed during data collection.

Primary and Secondary data was carried out for the research.

Primary data:

Data was collected directly from farmers and retailers through a survey (Questionnaire) i.e. designed for this research along with a personal interview wherever possible from both farmers' ends and organized retailer ends.

Secondary Data: Data was collected from the following sources;

1. Birsa Agriculture University Government of Jharkhand
2. Krishi Bhawan, Kanke
3. Information Technology of Birsa Agriculture University.
4. News papers
5. Magazines
6. Journals using services like(SCM and Articles on Vegetables)
7. Internet sites (Google, Proquest and Abscohost services)
8. Books (Library, SCM books section etc.)

3.4.3.1 Administering the Questionnaire

For the primary survey the respondents were contacted and the structured questionnaires were given to the farmers or at various points with both individual and group discussion. At the retail end the questionnaire was put up to the retail store manager, merchandising manager and warehouse manager.

3.4.3.2 Sampling

A simple random sampling method was used. In using this method each element in the population has a known and equal probability of being the sample actually selected. The selection of the sample is free from personal bias because the investigator does not exercise any discretion or preference in the choice of items. For the farmers the self – completed individual questionnaire method was selected where the questionnaire was personally handed 139 and collected after completion. This method helped the respondents to clarify the doubts with the researcher.

The respondents were randomly selected and asked to fill the questionnaire on request. The respondent who gave willingness to participate typically gave better response. The respondent who did not fill the form correctly and completely their forms were rejected. The researcher took all the care that no respondent were repeated. (Sample size -139 respondents), only those respondents (farmers) we considered who have four acres of land for the cultivation, small farmers were not considered since they do not cultivate so much or do not have the relationship with the retailers, they only produce and sell to the villages.

3.4.3.3 Sample Locations

Sample locations are different area of Ranchi city like Brambe, Mandar, Chanho, Bero and Pithoria, since these areas have those farmers who have around four acres of land and cultivate the selected vegetables throughout the year.

3.4.4 Result and Discussion

Table 3.1 The price variation of selected vegetables

Vegetables	Cost from the farmers Side				Farmers Selling Price in Rs./Kg	Consumer Price in Rs./Kg	Price variation of vegetables in Rs./Kg
	Production cost in Rs./Kg	Transportation cost in Rs./Kg	Packaging cost in Rs./Kg	Total Cost in Rs./Kg			
Cauliflower	12.87	3.12	0	16.00	18.00	30.00	12.00
Cabbage	10.62	3.12	0	13.75	16.00	23.00	7.00
Beans	8.62	3.12	0.27	12.02	18.00	62.00	44.00
Bottle gourd	9.87	3.12	1.00	14.00	16.50	45.00	28.50
Tomato	15.05	3.12	2.50	20.67	25.00	80.00	55.00
Brinjal	9.37	3.12	0.15	12.65	15.00	55.00	40.00

Source: Primary Data

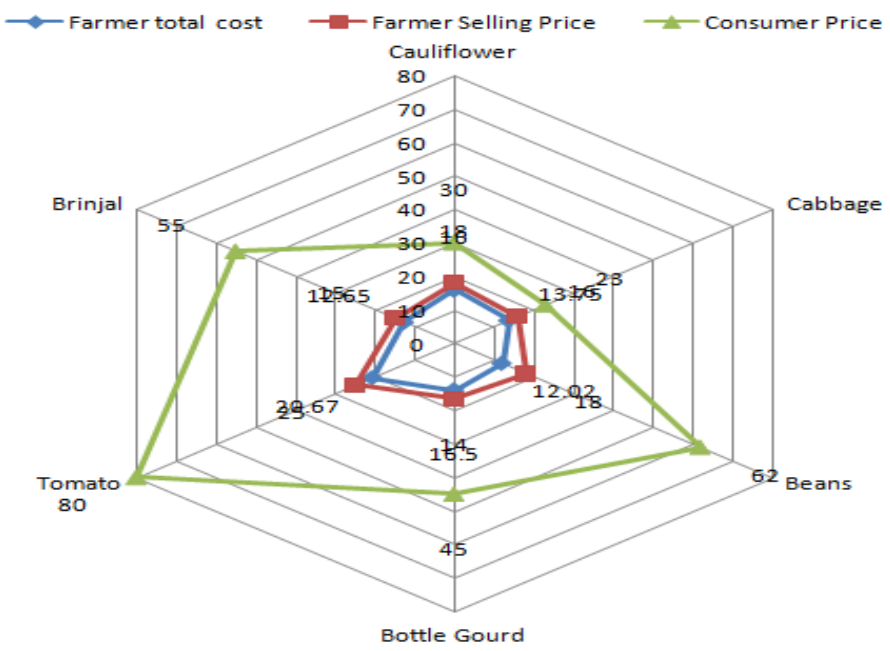


Figure 3.1 Price variations of different vegetables

The above table 3.1 and figure 3.1 shows the total cost taken by the farmers in the process of farming of the selected vegetables and the farmers done not get the expected margin due to the existence of various channels/intermediaries. The farmers are completely dependent on these for selling their vegetables and with lieu of this the intermediaries take advantage and make money.

In marketing and selling the selected vegetables market proficiency on account of maker Retailer-purchaser is 90% trailed by the maker distributer Retailer-buyer and in the channel Producer-broker distributer customer 75%. The data shows that more mediators in production network frameworks advertise proficiency is likewise the other way around. The examination uncovers the Price spread of different chose transitory harvests and approaches to incorporate the cost level among makers and buyers for showcasing productivity example of every item and conceivable outcomes for the expanding the promoting effectiveness of the chose wares. The value spread of vegetables as for different promoting channels has shown that the makers' offer has a reverse association with the quantity of the delegates. The net cost gotten by the farmers at different area is generally high in diverts in which the produce is legitimately offered to the buyers or the retailers.

Conclusions of Pilot Study

Marketing of vegetables is a complex phenomenon because of their transient nature, regularity and massiveness. It is additionally intensified by the way that Farmers have little regions under their development and little attractive amount. The generation and post-reap misfortunes are higher and in that capacity vegetables require a created promoting framework for their snappy transfer. It has additionally been seen that as the quantity of mediators' builds, the maker's offer in buyer's value diminishes. The net cost received by the creators is higher in the process where they sell the produce honestly to the purchasers or retailers. The producers have been found to get higher incomparable net returns in tomato, trailed by Cauliflower, cabbage, brinjal, and neighborhood bean in all of the channels.

3.5 Hypotheses

In order to achieve the desired result, a hypotheses have been formulated, which will be tested and conclusions will be drawn on the basis of the test results. The hypotheses are mentioned below:

H_1: There is a variation in average productivity of vegetables at different seasons.

H_{1a}: There is a variation in average productivity of Cauliflower at different seasons.

H_{1b}: There is a variation in average productivity of Cabbage at different seasons.

H_{1c}: There is a variation in average productivity of Beans at different seasons.

H_{1d}: There is a variation in average productivity of Bottle Gourd at different seasons.

H_{1e}: There is a variation in average productivity of Tomato at different seasons.

H_{1f}: There is a variation in average productivity of Brinjal at different seasons.

H_2: There is a variation in average production cost of vegetables at different seasons.

H_{2a}: There is a variation in average production cost of Cauliflower at different seasons.

H_{2b}: There is a variation in average production cost of Cabbage at different seasons.

H_{2c}: There is a variation in average production cost of Beans at different seasons.

H_{2d}: There is a variation in average production cost of Bottle Gourd at different seasons.

H_{2e}: There is a variation in average production cost of Tomato at different seasons.

H_{2f}: There is a variation in average production cost of Brinjal at different seasons.

H_3: There is a variation in average transportation cost of vegetables at different seasons.

H_{3a}: There is a variation in average transportation cost of Cauliflower at different seasons.

H_{3b}: There is a variation in average transportation cost of Cabbage at different seasons.

H_{3c}: There is a variation in average transportation cost of Beans at different seasons.

H_{3d}: There is a variation in average transportation cost of Bottle Gourd at different seasons.

H_{3e}: There is a variation in average transportation cost of Tomato at different seasons.

H_{3f}: There is a variation in average transportation cost of Brinjal at different seasons.

H_4: There is a variation in average packaging cost of vegetables at different seasons.

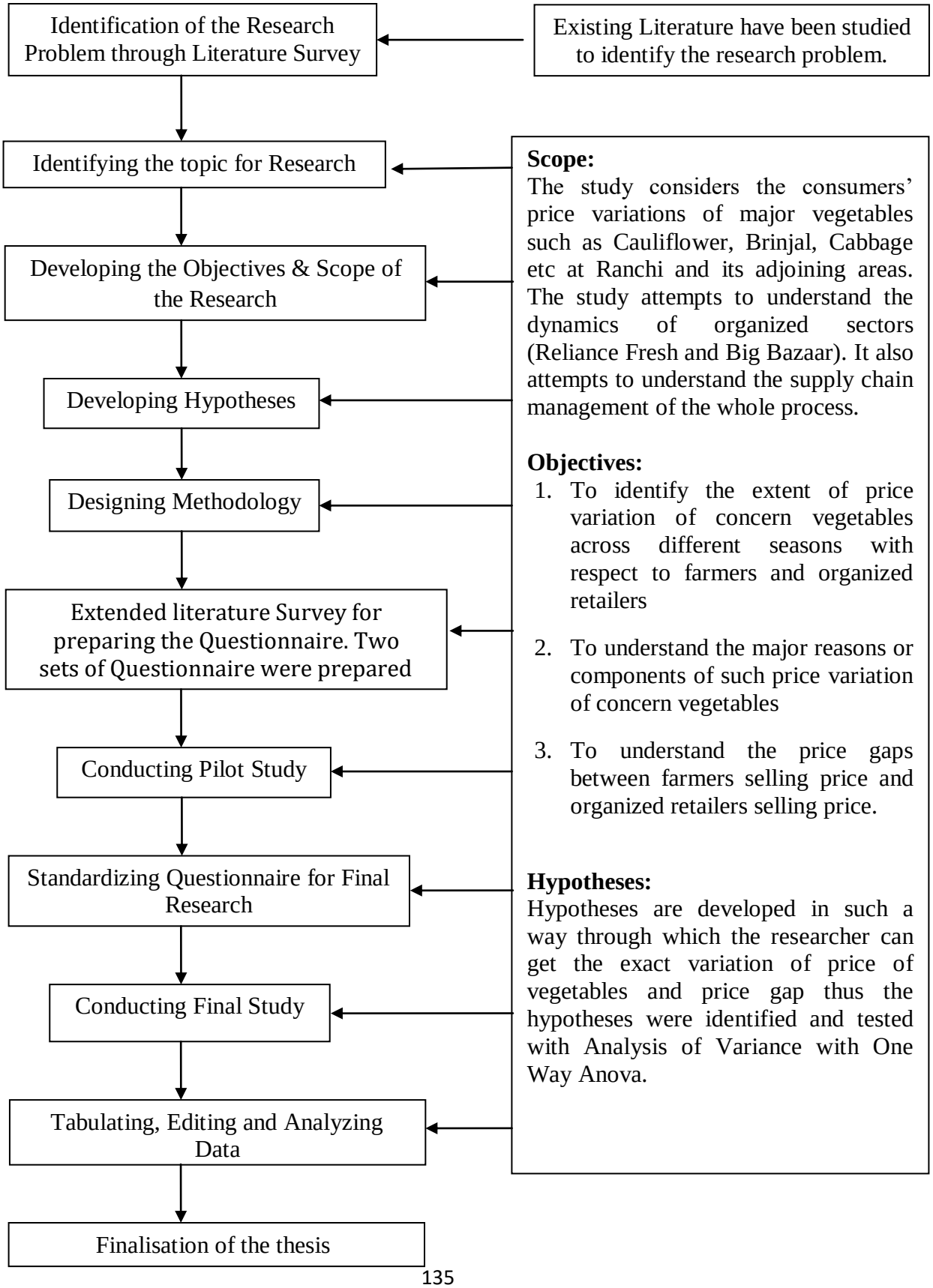
H_{4a}: There is a variation in average packaging cost of Cauliflower at different seasons.

H_{4b}: There is a variation in average packaging cost of Cabbage at different seasons.

H_{4c}: There is a variation in average packaging cost of Beans at different seasons.

H_{4d}: There is a variation in average packaging cost of Bottle Gourd at different seasons.

3.6 Research Design



3.7 Sampling Procedure

The total population were not confined because there are not much farmers who have more than four acres of land for the cultivation, thus comparing to the population size a small group is extracted from the population, that group is called as Sample and each member of a sample are called as participants.

The process of extracting a group of members of a population to make a sample is called as Sampling. Generally, sampling is done because the size of the population is quite big and it becomes a tough job to study a population size.

Since the study was targeted to study the price variation of the major vegetables as well as the production problems of major vegetables, two categories of respondents are taken care i.e. respondents belonging to farming and the organized retailer like Reliance Fresh and Big Bazaar constituted the sample. Selection of major vegetables was done with regard to the area, production and productivity of selected vegetables which were grown in the state vis-à-vis the district and block. A random list was prepared for the vegetable growers from each block. Thus, the whole sample constituted of 139 respondents form the vegetables grower and the two from organized retailer. The sample size is 139 because the farmers having four acres of land and more than that are considered as my sample.

For the study precision rate of 5% and Confidence level of 95% was considered. For sample:

$$n = \frac{z^2.p.q.N}{e^2.(N-1) + z^2.p.q}$$

Where,

Sample size is n, population size is N, Z is standard variate at given confidence level , e is error and p is sample proportion

A simple random sampling technique was used. In using this technique each group in the mass has a known and comparable probability of being the model truly picked. The assurance of the model is free from the individual tendency in light of the fact that the agent does not practice any prudence or inclination in the selection of things. For the

Farmers oneself – finished individual poll technique was chosen where the survey was by and by given 139 and gathered after fulfillment. This technique helped the respondents to explain the questions with the analyst.

The respondents were self-assertively picked and mentioned to fill the overview on requesting. The respondent who offered the enthusiasm to take an intrigue routinely gave a superior response. The respondent who did not fill the structure adequately and absolutely their structures were rejected. The master took all the thought that no respondent were reiterated. (Test measure - 139 respondents), only those respondents (farmers) we considered who have four acres of land for the cultivation, small farmers were not considered since they do not cultivate so much or do not have the relationship with the retailers, they only produce and sell to the villages.

Table 3.2 Sampling Frame

Area	Total Nos. of Respondent		Sample Contacted		Sample Responded	
	Farmers	Retailers	Farmers	Retailers	Farmers	Retailers
Brambe	230	NA	38	NA	22	NA
Mandar	160	NA	58	NA	38	NA
Pithoria	210	NA	60	NA	19	NA
Thakurgoan	285	NA	50	NA	35	NA
Itki	180	NA	30	NA	12	NA
Kanke	90	NA	30	NA	13	NA
Ranchi	NA	2	NA	2	NA	2
Total	1155	2	266	2	139	2

Source: Primary Data

Table 3.3 Revised Sample Size

Respondent Type	Sample Population	Revised Sample Size	Confidence Level
Farmers	1155	139	95%
Retailers	2	2	95%
Beside this during the survey period the researcher have interacted with 31 intermediaries from different locations of Ranchi			

Source: Primary Data

.

CHAPTER 4

DATA ANALYSIS & INTERPRETATION

DATA ANALYSIS & INTERPRETATION

The current chapter deals with the various analysis through which it can be shown that there is a variation in price of vegetables in different seasons from framers to consumers through the existence of different intermediaries. The chapter includes the following headings:

4.1 Overview

After collection of all the data from the source, the data were systematically arranged and tabulated for analysis and interpretation in a spread sheet. Since the price form the farmer and retailer was found as a price gap and variations because there are fixed price from both the side so, in order to test the significant differences between the seasons for Average productivity, cost of production, cost of transportation and cost of packaging of different vegetables i.e. Cauliflower, Cabbage, Beans, Bottle Gourd and Tomato at different Seasons (Pre Monsoon, Monsoon and Post Monsoon), Analysis of Variance with one way Anova was considered.

The study is conducted in the adjoining area of Ranchi city where the cultivation of the selected vegetables is major cultivation and the vegetable grower produces around 10-15 tons in every season. The major area/block that has taken into consideration is Thakurgoan, Choria, Chatwal, Boreya, Murma, and Kanke. Along with it the major giant retailers like Big Bazaar and Reliance Fresh of Ranchi city is also taken into consideration to know and find out the actual variation of these vegetables. There are various factors in term of production and marketing that influence the price of these vegetables. After the detailed study on my field data collection I had discussed the cost regarding the seeds, labor, fertilizers, insecticide, irrigation, and season variability of different vegetables at different seasons

On an average in all the cases in summer season maximum price load is bear by the farmer during the production as compared to other seasons. There is major variation in price of vegetables because of the following factors:

- Existence of various intermediaries
- Low literacy rate of farmers
- Least government support regarding the processing and storage of vegetables.
- Intervention Distribution transportation cost
- In-season stock of Inventory
- Unawareness of farmers
- Processing Cost
- Increased cost of transportation
- Hoarding & Proper irrigation facilities
- Increase in the demand for protein-enriched food and green vegetables
- Supply chain mismanagement
- Many mediators
- Less production of vegetables
- Less space for cultivation
- Global inflation
- Increased cost of production
- Improper management and distribution

4.2 The cost of different agricultural inputs for the selected vegetables

There are various agricultural inputs which directly affect the price of the vegetables.

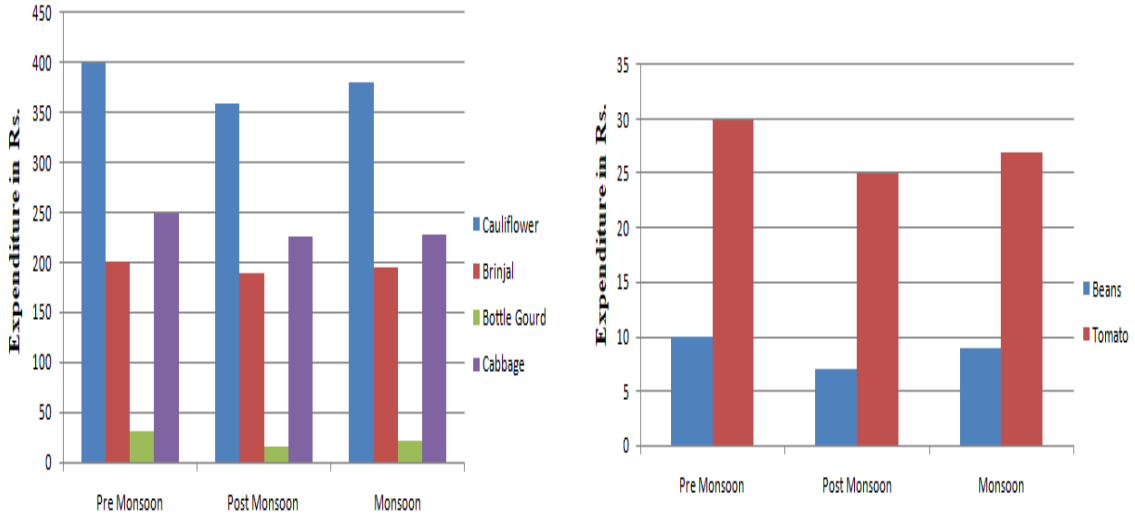


Figure 4.1 Vegetables seeds cost

The interpretation of the above figure 4.1 states the average cost of seeds in different climatic condition or farming seasons (i.e. Pre Monsoon, Monsoon and Post Monsoon).which was recorded at the time of the survey (data collection). The average cost of seeds for cauliflower was Rs. 400, Rs. 360 and Rs. 380 in Post Monsoon, Pre Monsoon and Monsoon. Similarly, The seed cost of Brinjal is Rs. 200, Rs. 190 and Rs. 195 in Post Monsoon, Pre Monsoon and Monsoon. The cost of seed for cabbage is Rs. 250, Rs. 225 and Rs. 228 in Post Monsoon, Pre Monsoon and Monsoon. The cost of seed for Bottle Gourd is Rs. 30, Rs. 15 and Rs 22 in Post Monsoon, Pre Monsoon and Monsoon. The seed cost of Beans is Rs. 10, Rs. 7 and Rs. 9 in Post Monsoon, Pre Monsoon and Monsoon. The seed cost of Tomato is Rs. 30, Rs. 25 and Rs. 27 in Post Monsoon, Pre Monsoon and Monsoon.

The interpretation form the above graph shows that the maximum average seed cost in all the seasons i.e. Post Monsoon, Pre Monsoon and Monsoon are cauliflower and minimum is for the beans and for the tomato respectively.

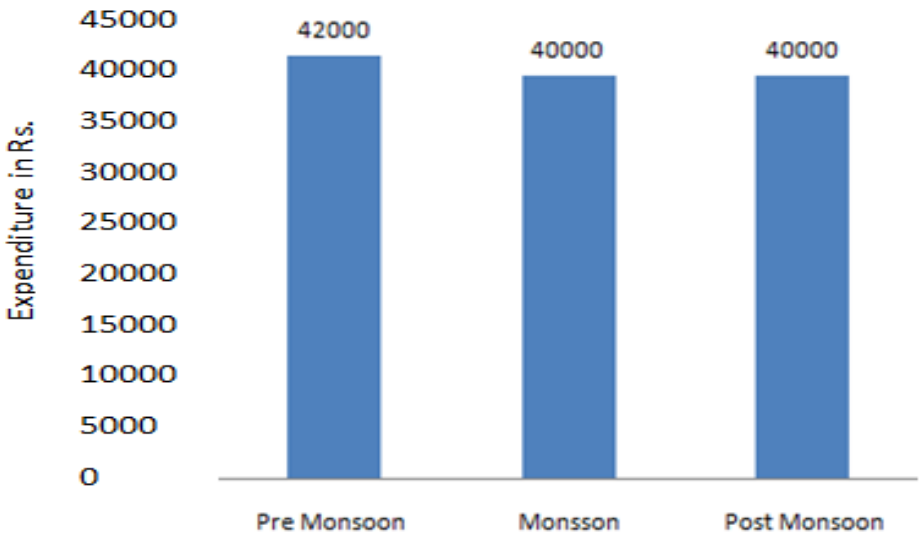


Figure 4.2 Cost of Labor

Presence or availability of the labor in different seasons is very important. This is an important factor in the farming sector. The above graph 4.2 shows the cost of labor in different seasons i.e. Post Monsoon, Pre Monsoon and Monsoon. The graph shows that the cost of labor in Post Monsoon the labor charger around Rs. 42000, in Pre Monsoon and Monsoon Rs. 40000. This shows the availability of labor in Post Monsoon is less due to which the price rises and similarly in other seasons like Pre Monsoon and Monsoon the availability is more due to which the price or cost gets lower down.

The cost of labor increases which directly effect in the price of the vegetables which result in the hike in price of the vegetables form the farmer's side.

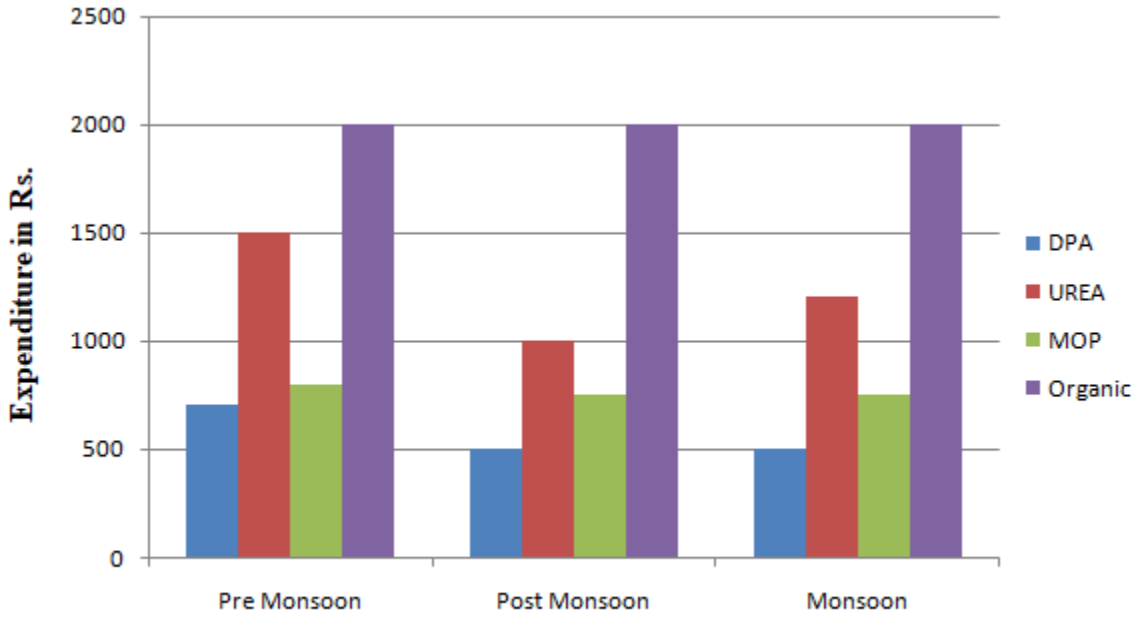


Figure 4.3 Cost of Fertilizer

Fertilizer, natural (organic) or artificial, Diammonium phosphate (DPA), Urea & Muriate potash (MOP) substance contain various elements that improve the growth and productivity of the selected vegetables. The fertilizers enhance the natural fertility of the soil.

The above graph 4.3 shows the cost of fertilizer used in different climatic condition for different vegetables. The figure represents that organic manure cost was Rs. 2000 which was highest in all the seasons. In the case of DPA it was higher in Post Monsoon with respect to Pre Monsoon and Monsoon.

Urea used in the vegetable production of vegetable, which cost Rs. 1000 in Post Monsoon, Rs. 1500 in Pre Monsoon and Rs. 1200 in Monsoon.

In the case of Muriate potash (MOP) the cost is higher in Post Monsoon as compared to other season like Pre Monsoon and Monsoon.

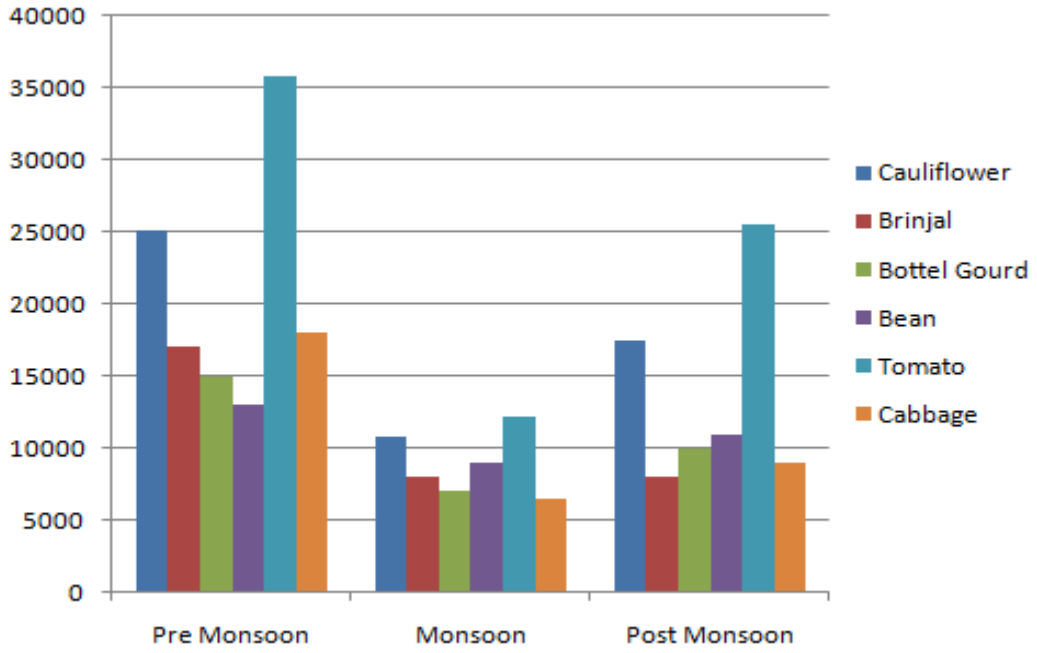


Figure 4.4 Cost of Irrigation

The artificial application of water is irrigation that is applied to those lands which is prepared for cultivation. Effective and efficient irrigation will enhance the growth of vegetables.

The above figure 4.4 shows the cost of irrigation in of different vegetables at different seasons. As per the observation this shows that there is the maximum irrigation requirement was needed in the post monsoon season for tomato production and minimum irrigation was needed for the production of cabbage in pre monsoon season.

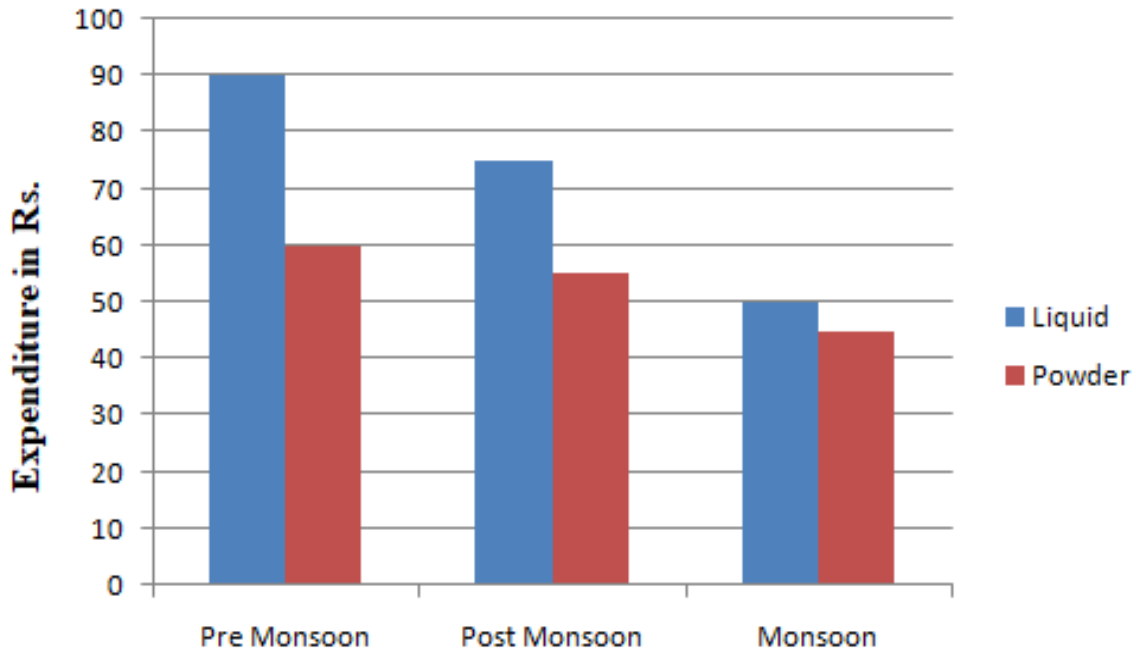


Figure 4.5 Cost of insecticide

Insecticides are the substance needed to kill insects. They include ovicides and larvicides used against eggs and larva respectively. Insecticides are widely used in agricultural, farming and gardening process. During the survey two different insecticides are observed which are used during the cultivation process those are Powder and Liquid.

The above figure 4.5 represents the cost of insecticides used in different climatic condition i.e. Pre Monsoon, Monsoon and Post Monsoon. The requirement of liquid insecticide is very much higher in Pre Monsoon and Monsoon. Similarly the requirement of power from insecticides is higher in Post Monsoon respectively.

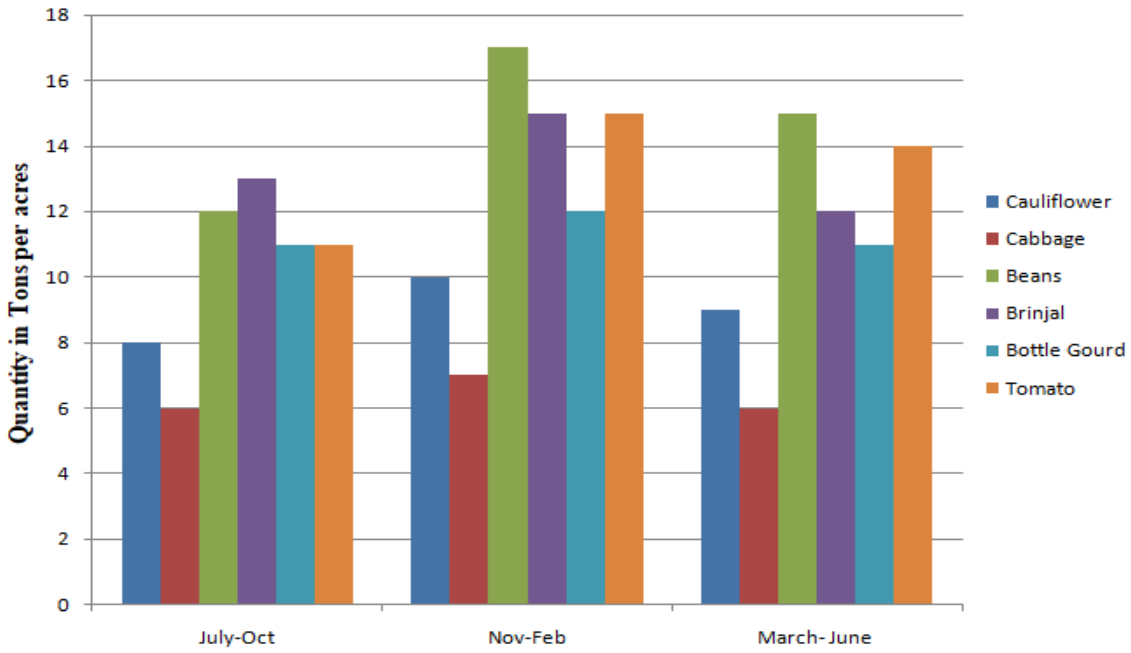


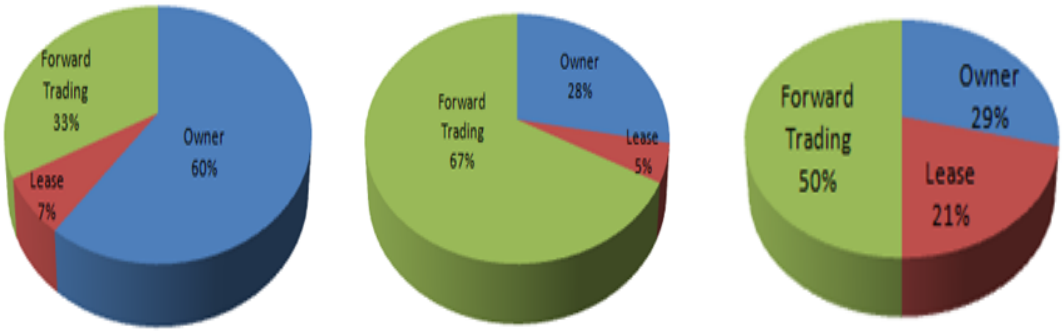
Figure 4.6 Season variability of selected vegetables

The production of vegetables is directly related to the atmospheric temperature, humidity, rainfall, solar radiation etc. If every climatic parameters are favorable than there is possibility of high rate of production of vegetables with best qualities.

The above figure 4.6 shows the average production rates in tons per acres at different months. The graph shows that July to October production rate in tons per acres are 8, 6, 12, 13, 11 and 11.for cauliflower, cabbage, beans, brinjal, bottle gourd and tomato respectively.

In the production time period from November to February production rate in tons per acres are 10, 7, 17, 15, 12 and 15.for cauliflower, cabbage, beans, brinjal, bottle gourd and tomato respectively.

In the production time period from March to June production rate in tons per acres is 9, 6, 15, 12, 11 and 14.for cauliflower, cabbage, beans, brinjal, bottle gourd and tomato respectively.



Pre Monsoon **Monsoon** **Post Monsoon**

Figure 4.7 Average distribution of land during cultivation in different seasons

The distribution of land plays a wide role in lowering down the posiblity of risk through which the loss can take place. Every farmer divides their land as per the requirement and seasons. At every season they categorize the land in such a way so that they can earn maximum. In Pre Monsoon the farmers give 33% of their land in forward trading, 7% to the lessee and keeps 60% with them for the cultivation.

Similarly, in Monsoon seasons the farmers give 67% of their land for forward trading, 5% to the lessee and keeps 28% with them for the cultivation. During Post Monsoon the farmers give 50% of their land in forward trading, 21% to the lessee and keeps 29% with them for the cultivation.

4.3 Price Variation of Concerned Vegetables from Vegetables Grower (Farmer) with respect to Organized Retail Stores

Total production cost of vegetables including all the agricultural inputs along with the transportation and packaging cost and their selling price at different seasons form the farmer's side to retailers and then consumers

4.3.1 Price Variation of Concerned Vegetables across the Seasons

For Cauliflower

Table 4.1 The total cost incurred by the farmer, farmers selling price, consumer price and price variation of cauliflower across the seasons.

Seasons	Cost from the farmers Side				Farmers Selling Price in Rs./Tons	Consumer Price in Rs./Tons	Price variation of vegetables in Rs./Tons
	Production cost in Rs./Tons	Transportation cost in Rs./Tons	Packaging cost in Rs./Tons	Total Cost in Rs./Tons			
Pre-Monson	12875.00	3125.00	0.00	16000.00	18000.00	30000.00	12000.00
Monsoon	10675.00	3125.00	0.00	13800.00	15000.00	26000.00	11000.00
Post-Monsoon	10137.00	3125.00	0.00	13800.00	14000.00	18000.00	4000.00

Source: Primary data

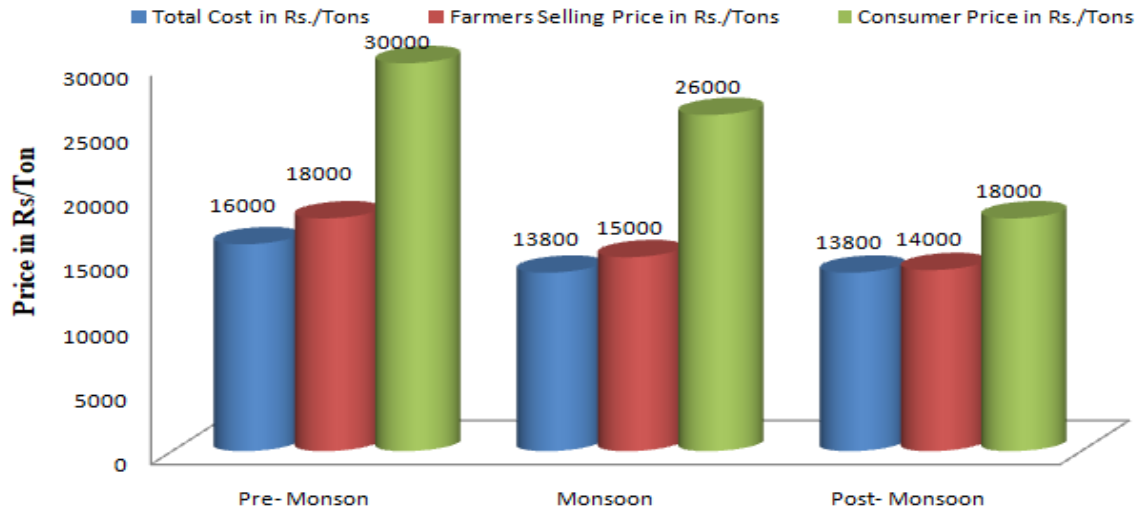


Figure 4.8 Price variations of cauliflower across the season

Interpretation – The table 4.1 and the figure 4.8 shows that the price variations of cauliflower across the seasons. In pre-monsoon the production cost is high as compared to the other seasons whereas, in monsoon and post-monsoon the cost of production is near about the same and the farmers also not getting a satisfactory value for their vegetables but there is a maximum difference in price to the consumer end. Cauliflower along with Cabbage is the only vegetable that has no packaging cost and transportation. Farmers get maximum profit while selling the cauliflower in pre-monsoon rather that the other seasons.

Percentage of Price variation between two seasons regarding total cost of production, selling price from the farmers to the retailers, selling price from retailers to consumers for Cauliflower.

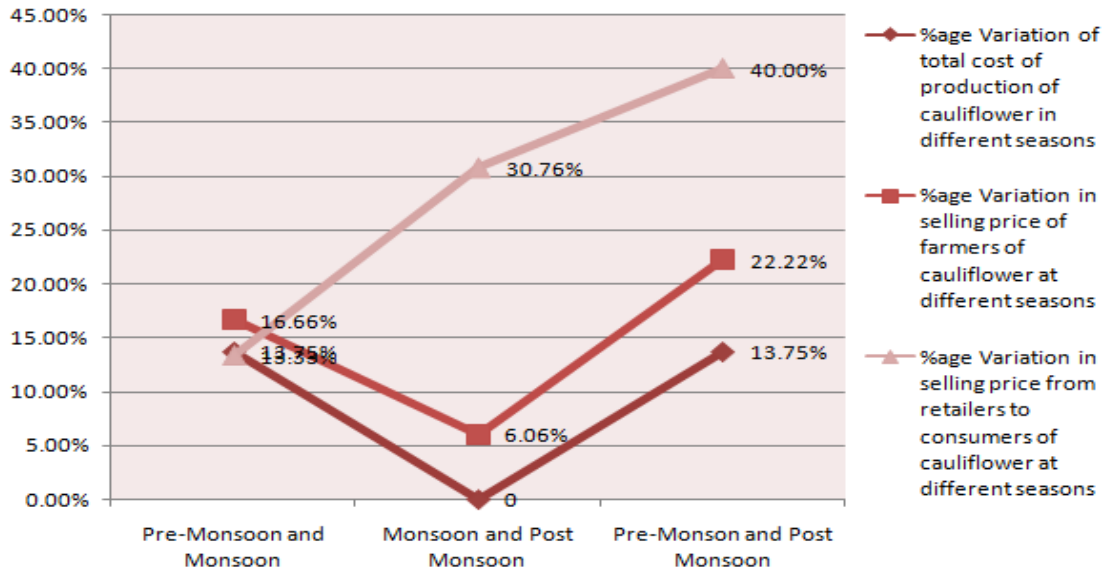


Figure 4.9 Price variations in respect to the total cost of production, farmers selling price, and retailers selling between two different seasons for Cauliflower

The average percentage variation of total cost of production of cauliflower was found 13.75% at pre monsoon season and post monsoon season, which is highest as compared to pre monsoon season and monsoon season i.e. 13.35%. In monsoon season and post monsoon season the percentage of price variation is nil which means there is no variation in total cost of production in these seasons.

The average percentage variation in selling price of cauliflower form farmers was found 22.22% at pre monsoon season and post monsoon season, which is highest as compared to pre monsoon season and monsoon season i.e. 13.35%. In monsoon season and post monsoon season the percentage of variation is minimum as compared to other season which is 6.06%.

The average percentage variation in selling price of organized retailers for cauliflower was found 40.00% at pre monsoon season and post monsoon season, which is highest as compared to monsoon season and post monsoon season i.e. 30.76%. In pre monsoon

season and monsoon season the percentage of variation is 13.35% which means these seasons have less variation than other seasons.

For Cabbage

Table 4.2 The total cost incurred by the farmer, farmers selling price, consumer price and price variation of cabbage across the seasons.

Seasons	Cost from the farmers Side				Farmers Selling Price in Rs./Tons	Consumer Price in Rs./Tons	Price variation of vegetables in Rs./Tons
	Production cost in Rs./Tons	Transportation cost in Rs./Tons	Packaging cost in Rs./Tons	Total Cost in Rs./Tons			
Pre-Monson	10625.00	3125.00	0.00	13750.00	16000.00	23000.00	7000.00
Monsoon	8487.00	3125.00	0.00	11612.00	14500.00	19000.00	4500.00
Post-Monsoon	8262.00	3125.00	0.00	11387.00	14000.00	17000.00	3000.00

Source: Primary Data

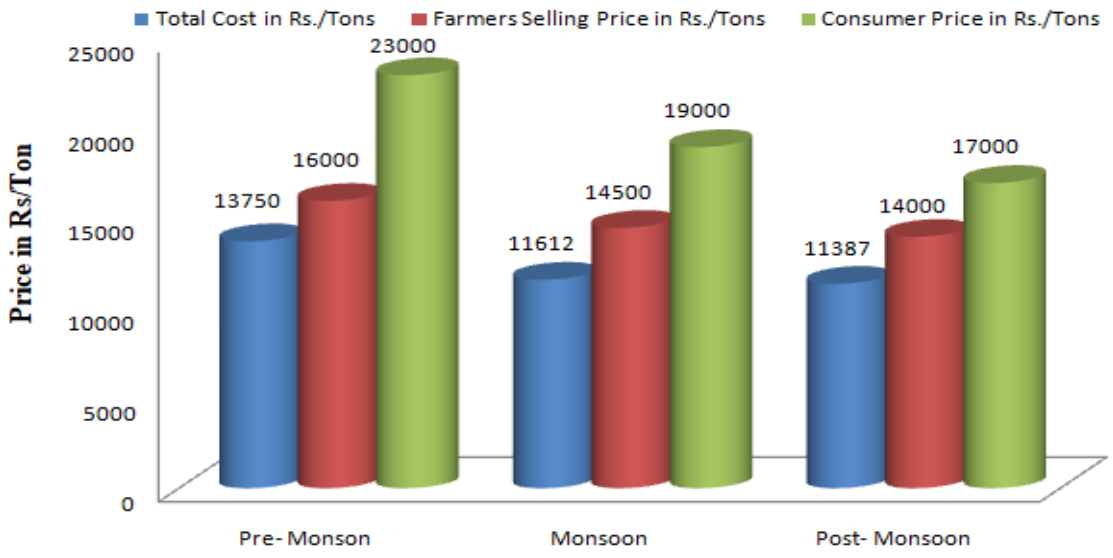


Figure 4.10 Price variations of cabbage across the season

Interpretation – The table 4.2 and figure 4.10 states that there is maximum price of cabbage in the pre-monsoon season as compared to other seasons, similarly the cost of production is less in monsoon and post monsoon. The farmers receive maximum profit in

the monsoon season rather than pre-monsoon season and post-monsoon season. Cabbage has also no packaging cost as similar to cauliflower.

Percentage of Price variation between two seasons regarding total cost of production, selling price from the farmers to the retailers, selling price from retailers to consumers for Cabbage.

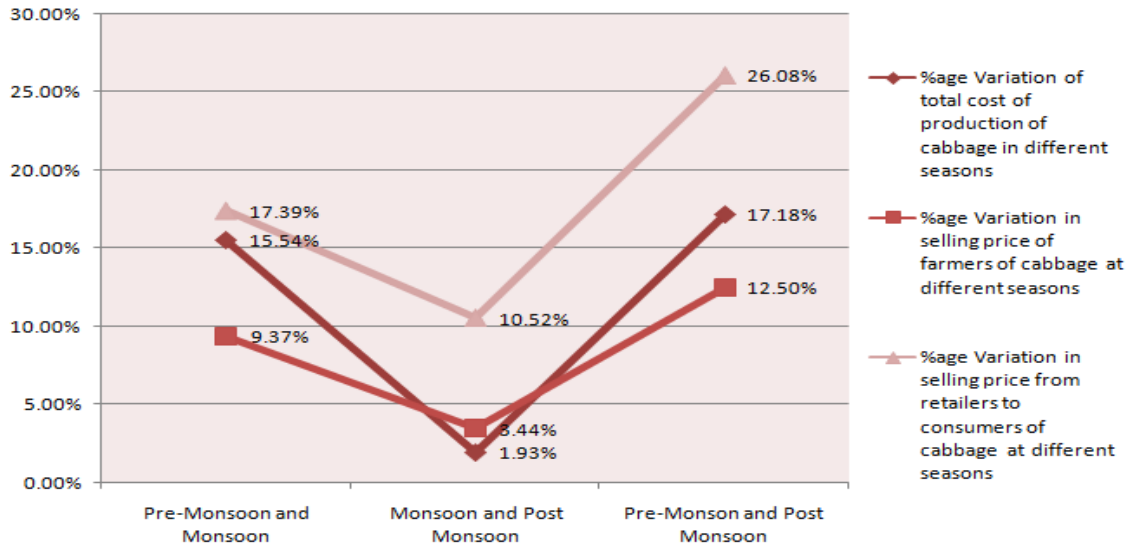


Figure 4.11 Price variations in respect to the total cost of production, farmers selling price, and retailers selling between two different seasons for Cabbage

The average percentage variation of total cost of production of cabbage was found 17.18% at pre monsoon season and post monsoon season, which is highest as compared to pre monsoon season and monsoon season i.e. 15.54%. In monsoon and post monsoon seasons the percentage of variation is 1.93% which means there is less variation in total cost of production in these seasons.

The average percentage variation in selling price of cabbage form farmers was found 12.50% at pre monsoon season and post monsoon season, which is highest as compared to pre monsoon season and monsoon season i.e. 9.37%. In monsoon season and post monsoon season the percentage of variation is minimum as compared to other season which is 3.44%.

The average percentage variation in selling price of organized retailers for cabbage was found 26.08% at pre monsoon season and post monsoon season, which is highest as

compared to pre monsoon season and monsoon season i.e. 17.39%. In monsoon season and post monsoon season the percentage of variation is 10.52% which means these seasons have less variation than other seasons.

For Beans

Table 4.3 The total cost incurred by the farmer, farmers selling price, consumer price and price variation of beans across the seasons.

Seasons	Cost from the farmers Side				Farmers Selling Price in Rs./Tons	Consumer Price in Rs./Tons	Price variation of vegetables in Rs./Tons
	Production cost in Rs./Tons	Transportation cost in Rs./Tons	Packaging cost in Rs./Tons	Total Cost in Rs./Tons			
Pre-Monson	8625.00	3125.00	270.00	12020.00	18000.00	62000.00	44000.00
Monsoon	7087.00	3125.00	270.00	10482.00	26000.00	58000.00	32000.00
Post-Monsoon	7137.00	3125.00	270.00	10532.00	21000.00	50000.00	29000.00

Source: Primary Data

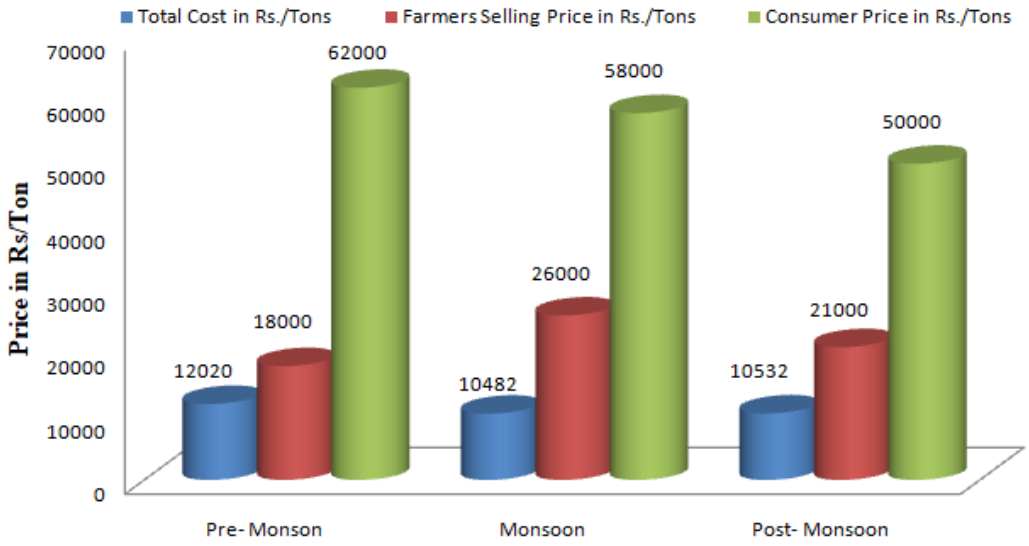


Figure 4.12 Price variations of beans across the season

Interpretation – The table 4.3 and the figure 4.12 shows that the price of beans is much higher in pre-monsoon than other seasons; despite of its high price from the retailer end the farmers do not get a reasonable value of beans. Since the production of beans is limited which results maximum production cost with least profit. On the other hand the intermediaries like mahajans and retailers earn more and more.

Percentage of Price variation between two seasons regarding total cost of production, selling price from the farmers to the retailers, selling price from retailers to consumers for Beans.

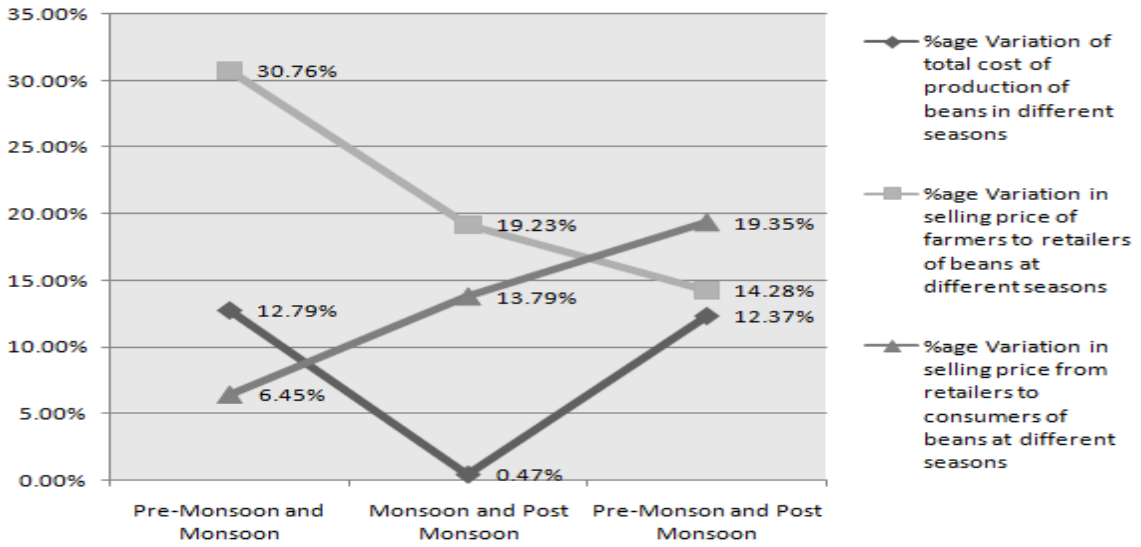


Figure 4.13 Price variation in respect to total cost of production, farmers selling price, and retailers selling between two different seasons for Beans

The average percentage variation of total cost of production of beans was found 12.79% in pre monsoon season and monsoon season, which is highest as compared to pre monsoon season and post monsoon season i.e. 12.37%. In monsoon season and post monsoon season the percentage of variation is 0.47% which means there is minimum variation in total cost of production in these seasons as compared to other seasons.

The average percentage variation in selling price of beans from farmers was found 30.76% in pre monsoon and monsoon seasons, which is highest as compared to monsoon and post monsoon seasons i.e. 19.23%. In pre monsoon and post monsoon seasons the percentage of variation is minimum as compared to other season which is 14.28%.

The average percentage variation in selling price of organized retailers for beans was found 19.35% in pre monsoon and post monsoon seasons, which is highest as compared to monsoon and post monsoon seasons i.e. 13.79%. In pre monsoon and monsoon seasons the percentage of variation is 6.45% which means these seasons have less variation than other seasons.

For Bottle Gourd

Table 4. 4 The total cost incurred by the farmer, farmers selling price, consumer price and price variation of bottle gourd across the seasons.

Seasons	Cost from the farmers Side				Farmers Selling Price in Rs./Tons	Consumer Price in Rs./Tons	Price variation of vegetables in Rs./Tons
	Production cost in Rs./Tons	Transportation cost in Rs./Tons	Packaging cost in Rs./Tons	Total Cost in Rs./Tons			
Pre-Monson	9875.00	3125.00	1000.00	14000.00	16500.00	45000.00	28500.00
Monsoon	7962.00	3125.00	1000.00	16000.00	16000.00	40000.00	24000.00
Post-Monsoon	7462.00	3125.00	1000.00	16000.00	16000.00	34000.00	18000.00

Source: Primary Data

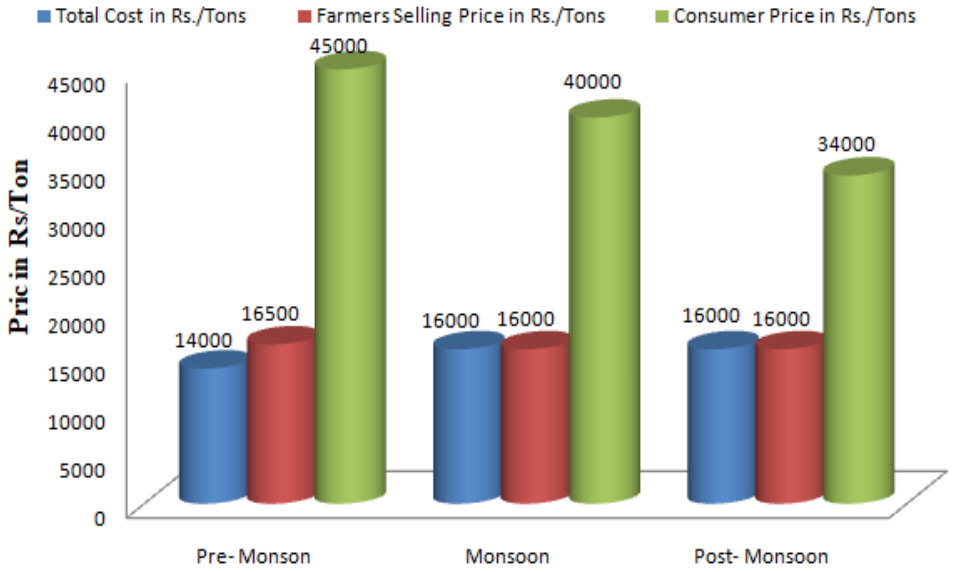


Figure 4.14 Price variations of bottle gourd across the season

Interpretation – The table 4.4 and figure 4.14 states that the price of Bottle gourd is higher in pre-monsoon. Same case also exist in this vegetable i.e. the farmers not able to earn more as profit since there is packaging cost where every bottle gourd is packed individually in a plastic bag so that the damage cannot occur, sometime every individual bottle gourd is packed and then packed in a number for the easy transportation. This cause increase in cost from the farmer's side.

Percentage of Price variation between two seasons regarding total cost of production, selling price from the farmers to the retailers, selling price from retailers to consumers for Bottle Gourd.

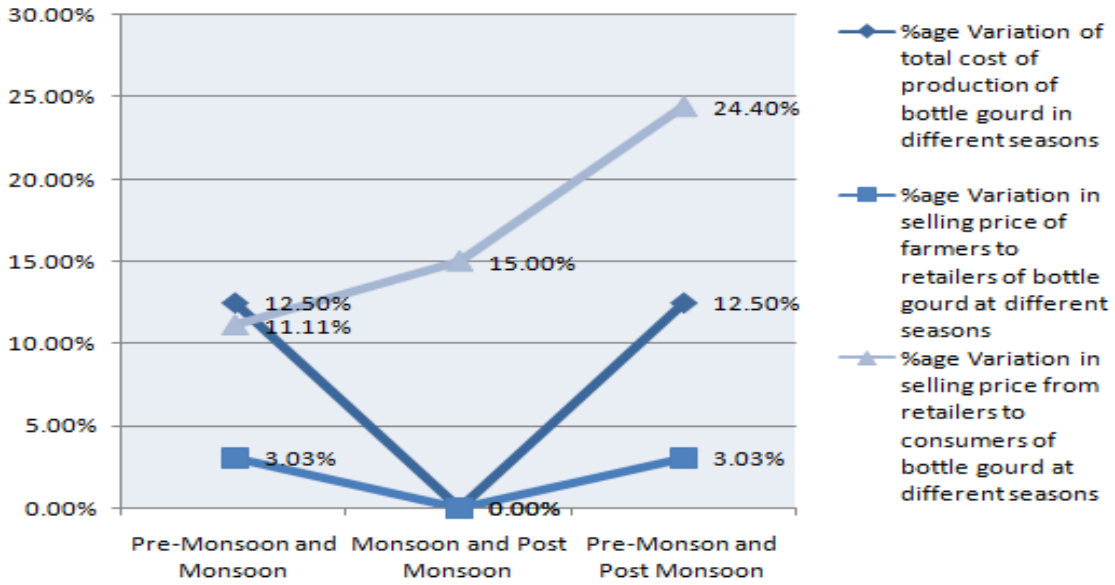


Figure 4.15 Price variation in respect to the total cost of production, farmers selling price, and retailers selling between two different seasons for Bottle Gourd

The average percentage variation of total cost of production of Bottle gourd was found same at pre monsoon and monsoon seasons, and pre monsoon and post monsoon seasons i.e. 3.03%. In monsoon season and post monsoon season the percentage of variation is nil which, means there is no variation in total cost of production in these seasons.

The average percentage variation in selling price of Bottle Gourd from farmers was found 12.50% in pre monsoon and post monsoon seasons, which is highest as compared to pre monsoon season and monsoon season i.e. 11.11%. In monsoon and post monsoon seasons the percentage of variation is minimum is nil which means there is no variation in farmers selling price to retailers i.e. 0.00%.

The average percentage variation in selling price of organized retailers for Bottle Gourd was found 24.40% in pre monsoon and post monsoon seasons, which is highest as compared to monsoon and post monsoon seasons i.e. 15.00%. In pre monsoon and monsoon seasons the percentage of variation is 12.50% which, means these seasons have less variation than other seasons.

For Tomato

Table 4.5 The total cost incurred by the farmer, farmers selling price, consumer price and price variation of tomato across the seasons.

Seasons	Cost from the farmers Side				Farmers Selling Price in Rs./Tons	Consumer Price in Rs./Tons	Price variation of vegetables in Rs./Tons
	Production cost in Rs./Tons	Transportation cost in Rs./Tons	Packaging cost in Rs./Tons	Total Cost in Rs./Tons			
Pre-Monson	15050.00	3125.00	2500.00	20675.00	25000.00	80000.00	55000.00
Monsoon	11512.00	3125.00	2500.00	17137.00	27000.00	69000.00	42000.00
Post-Monsoon	12562.00	3125.00	2500.00	18187.00	30000.00	65000.00	35000.00

Source: Primary Data

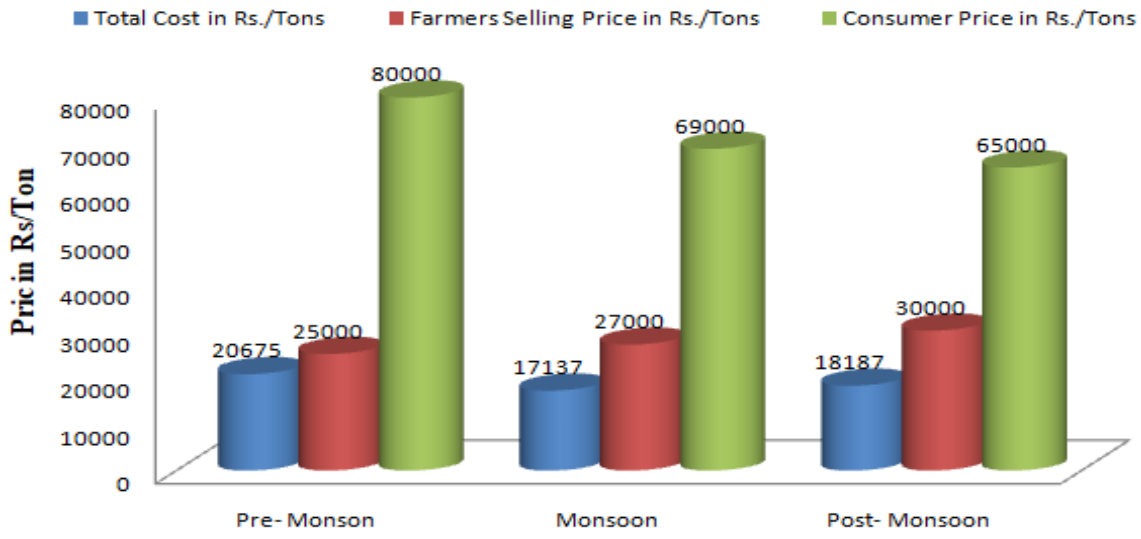


Figure 4.16 Price variations of Tomato across the season

Interpretation – The table 4.5 and figure 4.16 states that the price of tomato is high in pre-monsoon than other seasons. Due to its high market price the farmers not get reasonable value for their produce because the packaging cost is extremely high sine the packaging of tomato is carried out in a plastic carat which has high price and it has to be beared by the farmers only which lower down the value of farmers margin.

Percentage of Price variation between two seasons regarding total cost of production, selling price from the farmers to the retailers, selling price from retailers to consumers for Tomato.

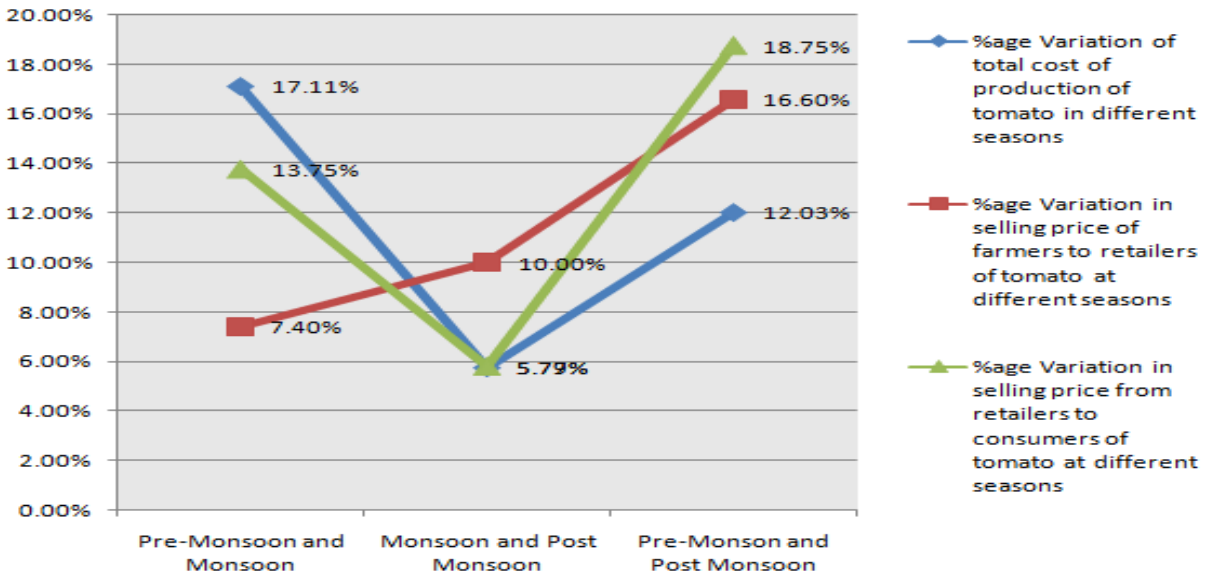


Figure 4.17 Price variation in respect to the total cost of production, farmers selling price, and retailers selling between two different seasons for Tomato

The average percentage variation of total cost of production of Tomato found 17.11% in pre monsoon and monsoon seasons, which is highest as compared to pre monsoon and post monsoon seasons i.e. 12.03%. In monsoon and post monsoon seasons the percentage of variation is 5.79%, which means there is less variation in total cost of production in these seasons as compared to other.

The average percentage variation in selling price of Tomato form farmers was found 16.60% in pre monsoon and post monsoon seasons, which is highest as compared to monsoon and post monsoon seasons i.e. 10.00%. In pre monsoon and monsoon seasons the percentage of variation is minimum as compared to other season which is 7.40%.

The average percentage variation in selling price of organized retailers for Tomato was found 18.75% in pre monsoon and post monsoon seasons, which is highest as compared to Pre monsoon and monsoon seasons i.e. 13.75%. In monsoon and post monsoon seasons the percentage of variation is 5.79% which means these seasons have less variation than other seasons.

For Brinjal

Table 4.6 The total cost incurred by the farmer, farmers selling price, consumer price and price variation of brinjal across the seasons.

Seasons	Cost from the farmers Side				Farmers Selling Price in Rs./Tons	Consumer Price in Rs./Tons	Price variation of vegetables in Rs./Tons
	Production cost in Rs./Tons	Transportation cost in Rs./Tons	Packaging cost in Rs./Tons	Total Cost in Rs./Tons			
Pre-Monson	9375.00	3125.00	150.00	12650.00	15000.00	55000.00	40000.00
Monsoon	7837.00	3125.00	150.00	11112.00	12000.00	46000.00	34000.00
Post-Monsoon	7662.00	3125.00	150.00	10937.00	12000.00	36000.00	24000.00

Source: Primary Data

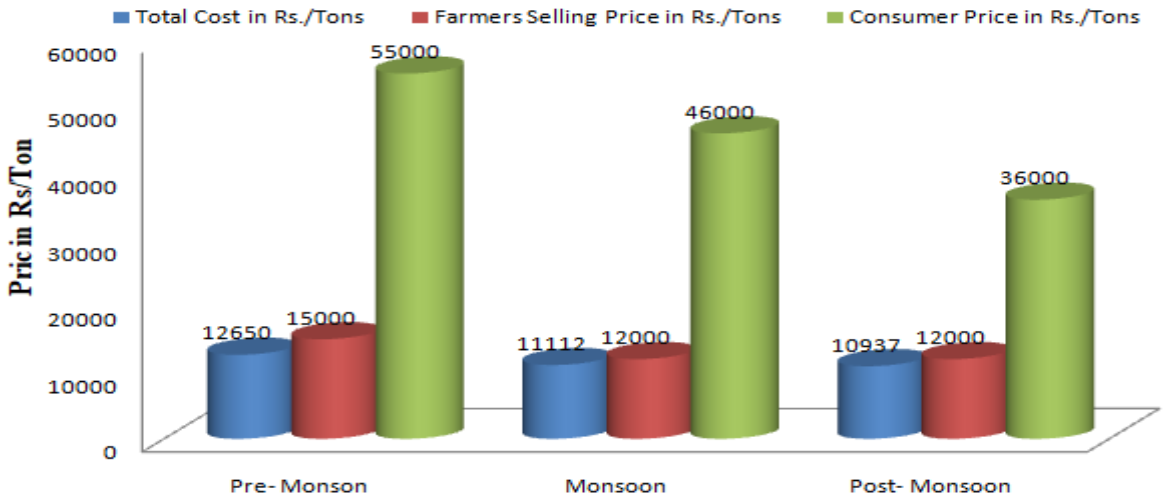


Figure 4.18 Price variations of Brinjal across the season

Interpretation – The table 4.6 and figure 4.18 states that the like all vegetables the price of brinjal is also high in pre-monsoon than other seasons, despite of its price hike the farmers does not get the value of their production. The cost of packaging is less as compared to Beans, Bottle Gourd and Tomato.

Percentage of Price variation between two seasons regarding total cost of production, selling price from the farmers to the retailers, selling price from retailers to consumers for Brinjal.

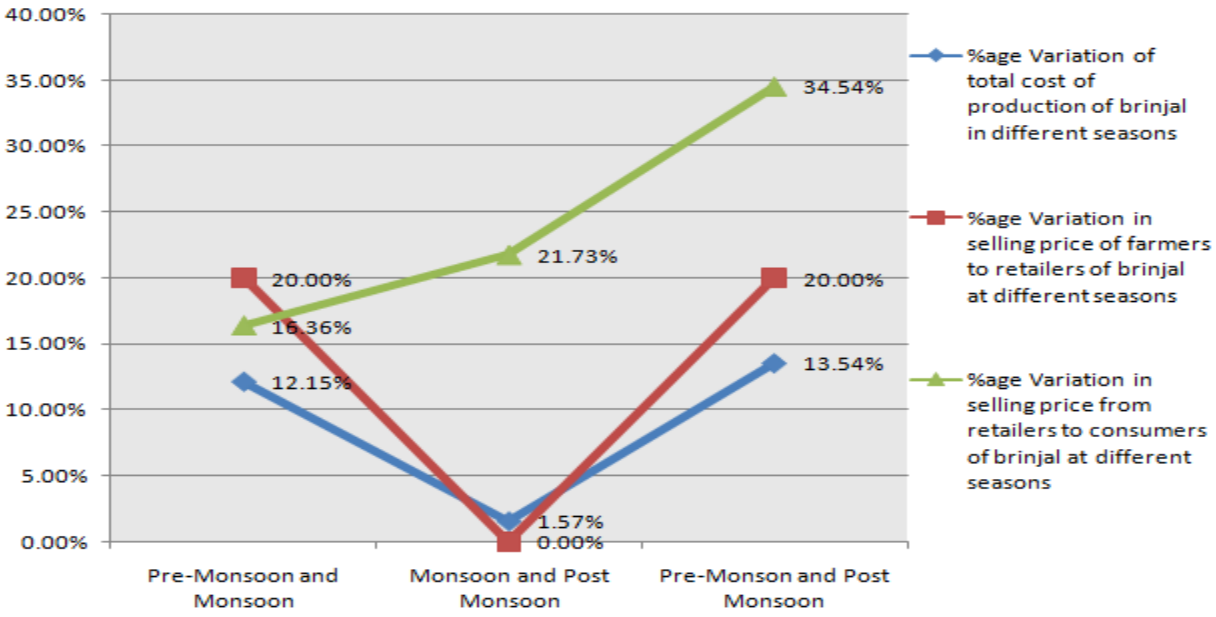


Figure 4.19 Price variation in respect to the total cost of production, farmers selling price, and retailers selling between two different seasons for Brinjal

The average percentage variation of total cost of production of Brinjal was found 13.54% at pre monsoon and post monsoon seasons, which is highest as compared to pre monsoon and monsoon seasons i.e. 12.15%. In monsoon and post monsoon seasons the percentage of variation is less as compared to other season i.e.1.57%.

The average percentage variation in selling price of Brinjal form farmers was found same at pre monsoon and post monsoon seasons, and pre monsoon and monsoon season i.e. 20.00%. In monsoon and post monsoon seasons the percentage of variation is nil as compared to other season.

The average percentage variation in selling price of organized retailers for Brinjal was found 34.54% in pre monsoon and post monsoon seasons, which is highest as compared to monsoon and post monsoon seasons i.e. 21.73%. In pre monsoon and monsoon seasons the percentage of variation is 16.36% which means these seasons have less variation than other seasons.

4.3.2 Price variation of vegetables in a particular season

For Pre-Monsoon

Table 4.7 Price variation of vegetables in Pre-Monsoon							
		Cauliflower	**Cabbage**	**Beans**	**Bottle Gourd**	**Tomato**	**Brinjal**
Pre-Monsoon	**Farmers total cost Rs./Tons**	16000	13750	12020	14000	20675	12650
	Farmers selling price Rs./Tons	18000	16000	18000	16500	25000	15000
	Consumer price Rs./Tons	30000	23000	62000	45000	80000	55000
	Price Variation in Rs./Tons	12000	7000	44000	28500	55000	40000

Source: Primary Data

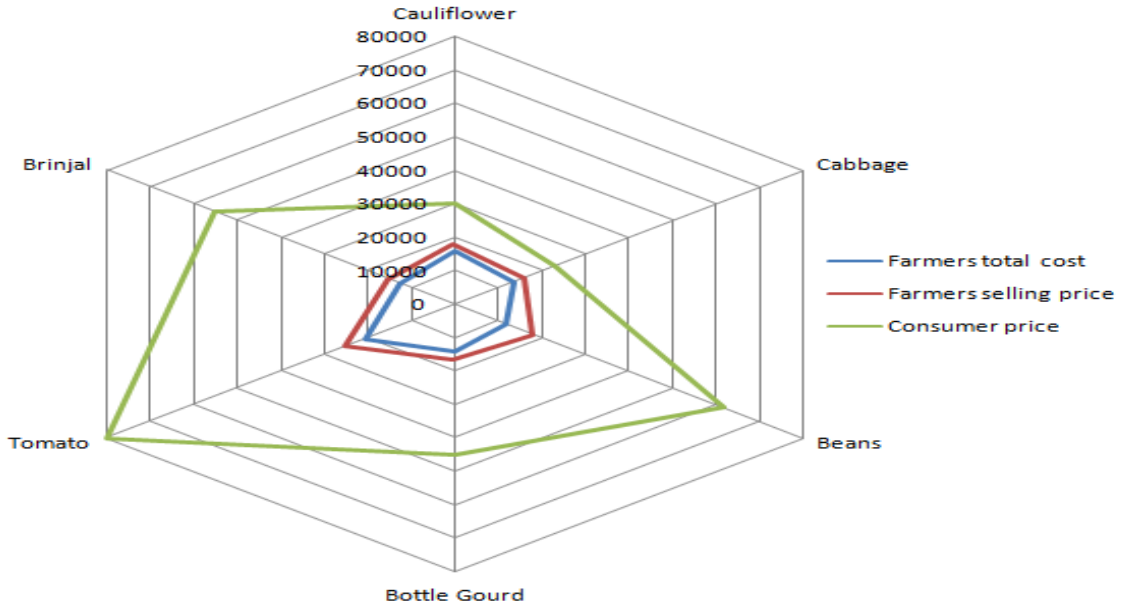


Figure 4.20 Price Variations of Vegetables in Pre-Monsoon Season

Interpretation –The table 4.7 and figure 4.20 states that in pre-monsoon the price of tomato is much higher than other vegetables. The major cultivation of vegetables in Ranchi and its adjoining areas is of cauliflower and cabbage which contribute fewer margins at the farmer's side but the consumer side tomato is maximum and then beans followed by the other vegetables. Since the cultivation of cauliflower and cabbage is high but the farmers does not get satisfied value for their vegetables.

For Monsoon

Table 4.8 Price Variation of Vegetables in Monsoon							
		Cauliflower	**Cabbage**	**Beans**	**Bottle Gourd**	**Tomato**	**Brinjal**
Monsoon	**Farmers total cost**	13800	11612	10482	16000	17137	11112
	Farmers selling price	15000	14500	26000	16000	27000	12000
	Consumer price	26000	19000	58000	40000	69000	46000
	Price Variation in Rs./Tons	11000	4500	32000	24000	42000	34000

Source: Primary Data

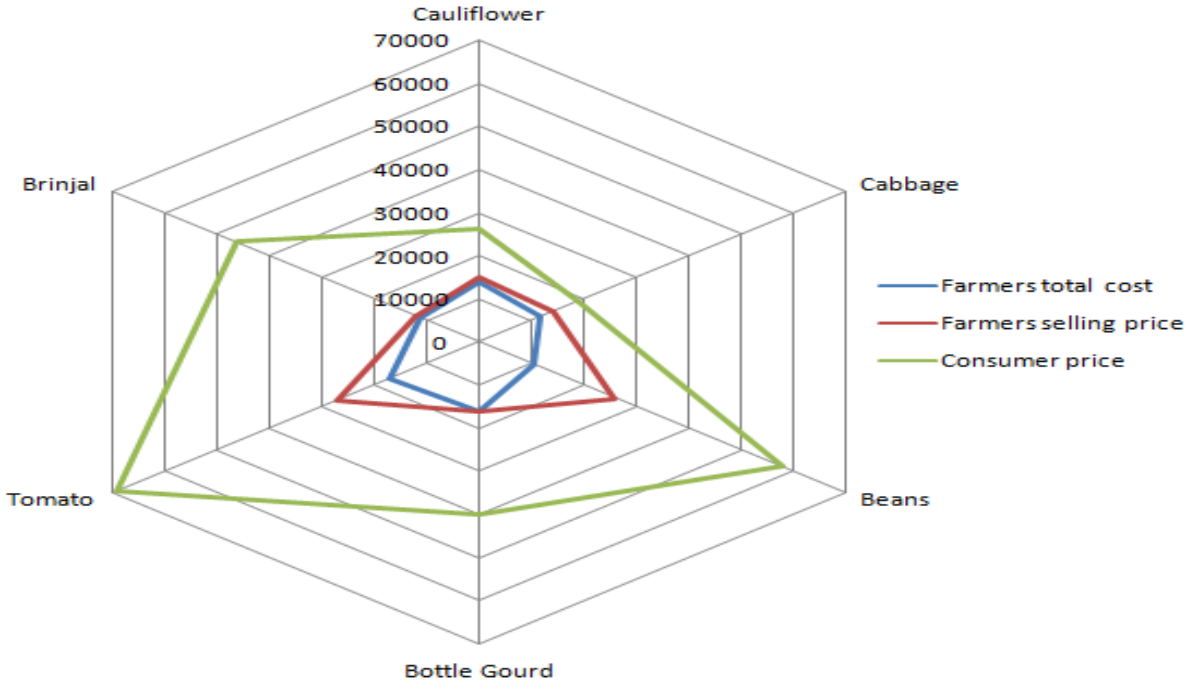


Figure 4.21 Price Variations of Vegetables in Monsoon

Interpretation – The table 4.8 and figure 4.21 states that in Monsoon season the price variation is minimum of cabbage but maximum of tomato, brinjal and beans. The mediators play a significant role in price fixation of the vegetables.

For Post-Monsoon

Table 4.9 Price Variation of Vegetables in Post-Monsoon							
		Cauliflower	**Cabbage**	**Beans**	**Bottle Gourd**	**Tomato**	**Brinjal**
Post-Monsoon	**Farmers total cost**	13800	11387	10532	16000	18187	10937
	Farmers selling price	14000	14000	21000	16000	30000	12000
	Consumer price	18000	17000	50000	34000	65000	36000
	Price Variation in Rs./Tons	4000	3000	29000	18000	35000	24000

Source: Primary Data

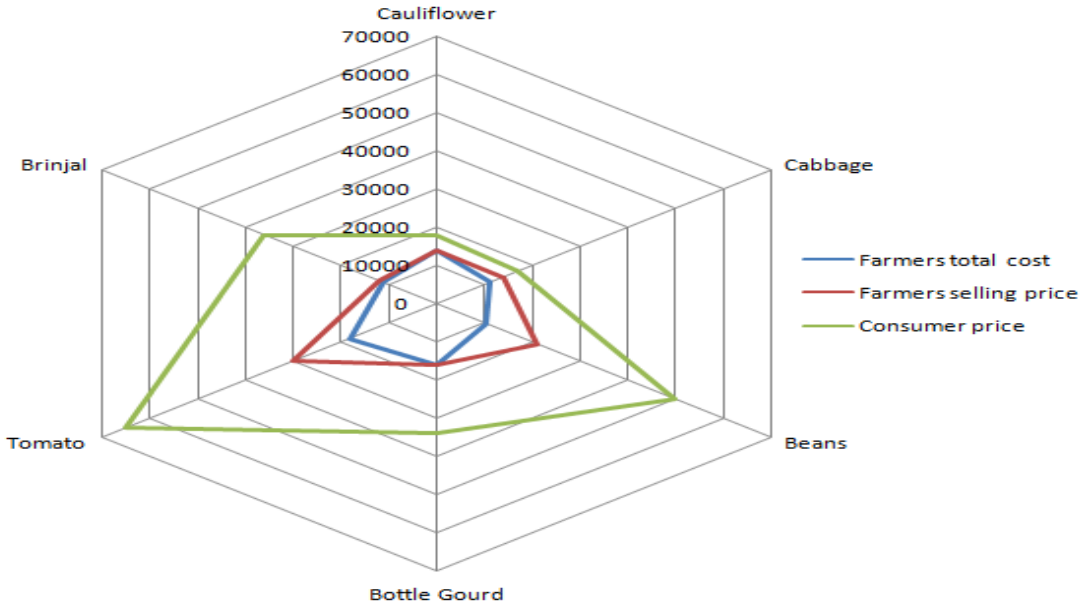


Figure 4.22 Price Variations of Vegetables in Post-Monsoon

Interpretation – The table 4.9 and figure 4.22 states that in Monsoon season the price variation is minimum of cabbage but maximum of tomato, brinjal and beans. The mediators play a significant role in price fixation of the vegetables.

4.3.3 Price variation of all concerned vegetables in different seasons

For all Concerned Vegetables (Cauliflower, Cabbage, Beans, Bottle Gourd, Tomato and Brinjal)

Table 4.10 The total cost incurred by the farmer, farmers selling price, consumer price and price variation of concerned vegetables at different seasons.

Vegetables	Seasons	Cost from the farmers Side				Farmers Selling Price in Rs./Tons	Consumer Price in Rs./Tons	Price variation of vegetables in Rs./Tons
		Production cost in Rs./Tons	Transportation cost in Rs./Tons	Packaging cost in Rs./Tons	Total Cost in Rs./Tons			
Cauliflower	Pre-Monson	12875	3125	0	16000	18000	30000	12000
	Monsoon	10675	3125	0	13800	15000	26000	11000
	Post-Monsoon	10137	3125	0	13800	14000	18000	4000
Cabbage	Pre-Monson	10625.00	3125.00	0.00	13750	16000	23000	7000.00
	Monsoon	8487.00	3125.00	0.00	11612.00	14500.00	19000	4500.00
	Post-Monsoon	8262.00	3125.00	0.00	11387	14000	17000	3000.00
Beans	Pre-Monson	8625	3125	270	12020	18000	62000	44000
	Monsoon	7087	3125	270	10482	26000	58000	32000
	Post-Monsoon	7137	3125	270	10532	21000	50000	29000
Bottle gourd	Pre-Monson	9875	3125	1000	14000	16500	45000	28500
	Monsoon	7962	3125	1000	16000	16000	40000	24000
	Post-Monsoon	7462	3125	1000	16000	16000	34000	18000
Tomato	Pre-Monson	15050	3125	2500	20675	25000	80000	55000
	Monsoon	11512	3125	2500	17137	27000	69000	42000
	Post-Monsoon	12562	3125	2500	18187	30000	65000	35000
Brinjal	Pre-Monson	9375	3125	150	12650	15000	55000	40000
	Monsoon	7837	3125	150	11112	12000	46000	34000
	Post-Monsoon	7662	3125	150	10937	12000	36000	24000

Source: Primary Data

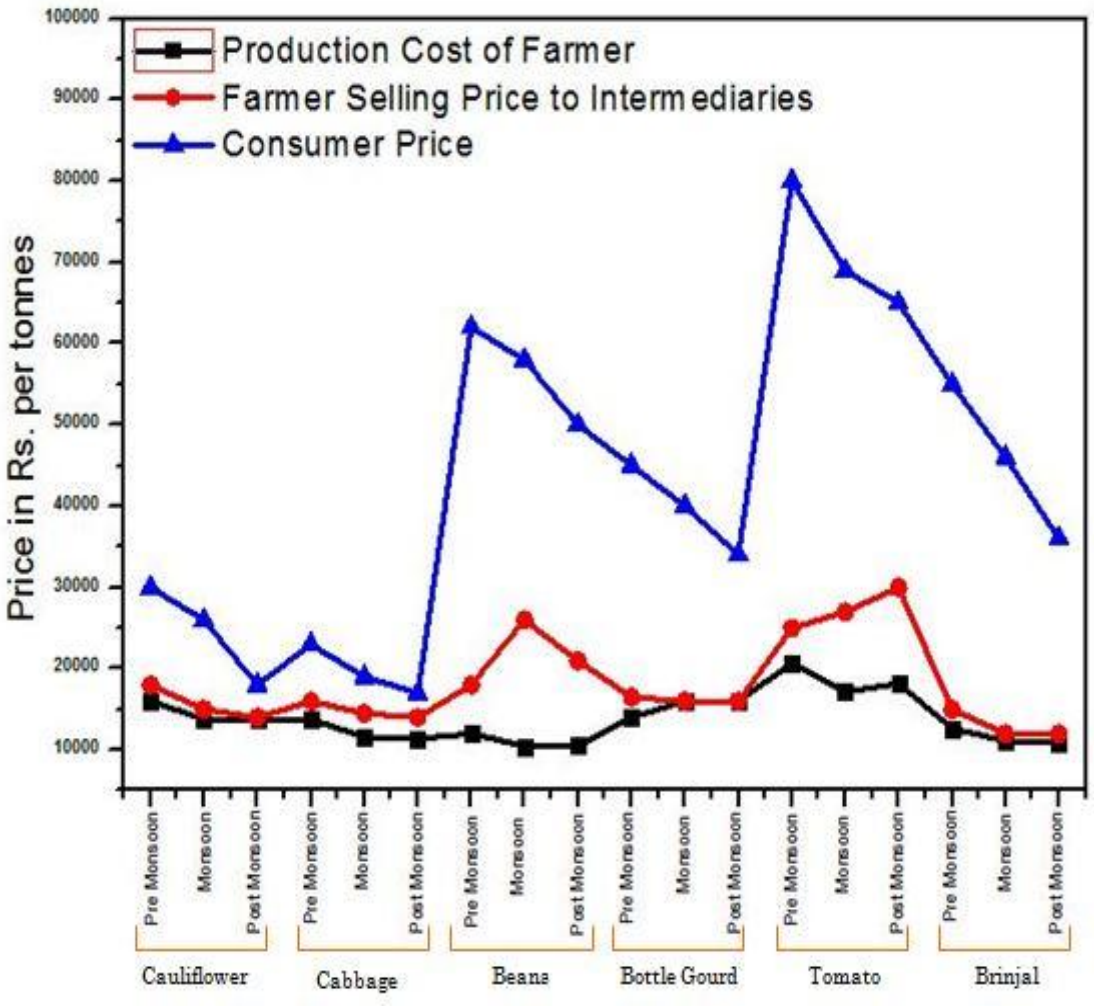


Figure 4.23 Price Variations of Vegetables in Different Season

Interpretation – The table 4.10 and figure 4.23 states that there is a variation in price of selected vegetables. There is a maximum variation regarding tomato, brinjal, beans and bottle gourd. The farmers does not get appropriate vale for their produce vegetables. Due to lack of storage they can't be able to hold back these vegetables with them for a long period of time after the cultivation because of its perishability in nature, so they have to sell within a particular period of time at the intermediary's price. The result the farmer does not get proper value and intermediaries like mahajans earn more than the farmers. These intermediaries also play an important role in fixing the price of the selected vegetables and sell in the market or to the retailers as their convenient.

4.4 Anova was carried out to find the price variation in Average productivity, Average Production Cost, Average Transportation Cost and Average Packaging Cost of vegetables in different seasons (Pre Monsoon, Monsoon and Post Monsoon).

Test for Hypothesis H_1 - There is a variation in the average productivity vegetables in different seasons.

H_{1a}: There is a variation in the average productivity of Cauliflower in different seasons.

Descriptive Statistics

Table 4.11 Average productivity of Cauliflower in tons in different seasons (Pre Monsoon, Monsoon and Post Monsoon)

Seasons	Mean (in Tons)	Std. Deviation
Pre-Monsoon	0.28	0.1527
Monsoon	0.52	0.2738
Post-Monsoon	0.60	0.3785

ANOVA

Table 4.12 Average productivity of Cauliflower in tons in different seasons (Pre Monsoon, Monsoon and Post Monsoon)

	Sum of Squares	df	Mean Square	F	Sig.
Between the seasons	1.387	2	0.693	8.607	0.000
Within seasons	5.800	137	0.081		

Interpretation

The above two table states about the descriptive statistics and analysis of variance. From the table it can be understood in Pre-Monsoon (M = 0.280, S.D = 0.1527), Monsoon (M = 0.52, S.D = 0.2738) and in Post-Monsoon (M = 0.60, S.D = 0.3785).

The analysis of variance table depicts, the value of F = 8.607 and the sig. value is 0.000, for the average productivity of Cauliflower in tons in different seasons.

The analysis of variance states that the average productivity of Cauliflower was found the highest during the post-monsoon season, which is at par with the monsoon season. The average productivity during the monsoon and post monsoon seasons was significantly higher than a pre monsoon season.

For Cauliflower, it has been inferred that the total production is showing an increment of 15.38% from monsoon to post-monsoon and on the other hand the same is showing a reduction of 46.15% from monsoon to pre-monsoon.

Hence, the alternative hypothesis has been accepted, which states that, there is a variation in the average productivity of cauliflower in different seasons.

H_{1b}: There is a variation in the average productivity of Cabbage in different seasons.

Descriptive Statistics

Table 4.13Average productivity of Cabbage in tons in different seasons (Pre Monsoon, Monsoon and Post Monsoon)

Seasons	Mean in Tons	Std. Deviation
Pre-Monsoon	0.56	0.3937
Monsoon	0.88	0.4272
Post-Monsoon	0.96	0.4153

ANOVA

Table 4.14 Average productivity of Cabbage in tons in different seasons (Pre Monsoon, Monsoon and Post Monsoon)

	Sum of Squares	df	Mean Square	F	Sig.
Between the seasons	2.240	2	1.120	6.588	0.002
Within seasons	12.240	137	0.170		

Interpretation

The above two table states about the descriptive statistics and analysis of variance. From the table it can be understood in Pre-Monsoon (M = 0.56, S.D = 0.3937), Monsoon (M = 0.88, S.D = 0.4272) and in Post-Monsoon (M = 0.96, S.D = 0.4153).

The analysis of variance table depicts, the value of F = 6.588 and the sig. value is 0.002, for the average productivity of Cabbage in tons in different seasons.

The analysis of variance states that the average productivity of Cabbage was found the highest during the post-monsoon season, which is at par with the monsoon season. The average productivity during the monsoon and post-monsoon seasons was significantly higher than the pre-monsoon season.

For Cabbage, it has been inferred that the total production is showing an increment of 36.36% from monsoon to post-monsoon and on the other hand the same is showing a reduction of 09.09% from monsoon to pre-monsoon.

Hence, the alternative hypothesis has been accepted, which states that, there is a variation in the average productivity of cauliflower in different seasons.

H_{1c}: There is a variation in the average productivity of Beans in different seasons.

Descriptive Statistics

Table 4.15 Average productivity of Beans in tons in different seasons (Pre Monsoon, Monsoon and Post Monsoon)

Seasons	Mean (in Tons)	Std. Deviation
Pre-Monsoon	0.04	0.0178
Monsoon	0.20	0.0957
Post-Monsoon	0.24	0.1118

ANOVA

Table 4.16 Average productivity of Beans in tons in different seasons (Pre Monsoon, Monsoon and Post Monsoon)

	Sum of Squares	df	Mean Square	F	Sig.
Between seasons	0.560	2	0.280	38.211	0.000
Within seasons	0.528	137	0.007		

Interpretation

The above two table states about the descriptive statistics and analysis of variance. From the table it can be understood in Pre-Monsoon (M = 0.04, S.D = 0. 0.0178), Monsoon (M = 0.20, S.D = 0.0957) and in Post-Monsoon (M = 0.24, S.D = 0.1118).

The analysis of variance table depicts, the value of F = 38.221 and the sig. value is 0.000, for the average productivity of Beans in tons in different seasons.

The analysis of variance states that the average productivity of Beans was found the highest during the post-monsoon season, which is at par with the monsoon season. The average productivity during the monsoon and post-monsoon seasons was significantly higher than pre-monsoon season.

For Beans, it has been inferred that the total production is showing an increment of 20.00% from monsoon to post-monsoon and on the other hand the same is showing a reduction of 80.00% from monsoon to pre-monsoon.

Hence, the alternative hypothesis has been accepted, which states that, there is a variation in the average productivity of Beans in different seasons.

H_{1d}: There is a variation in the average productivity of Bottle Gourd at different seasons.

Descriptive Statistics

Table 4.17 Average productivity of Bottle Gourd in tons in different seasons (Pre- Monsoon, Monsoon and Post-Monsoon)

Seasons	Mean (in Tons)	Std. Deviation
Pre-Monsoon	0.64	0.2783
Monsoon	1.20	0.5715
Post-Monsoon	1.40	0.9101

ANOVA

Table 4.18 Average productivity of Bottle Gourd in tons in different seasons (Pre-Monsoon, Monsoon and Post-Monsoon)

	Sum of Squares	df	Mean Square	F	Sig.
Between seasons	7.760	2	3.880	9.444	0.000
Within seasons	29.580	137	0.411		

Interpretation

The above two table states about the descriptive statistics and analysis of variance. From the table it can be understood in Pre-Monsoon (M = 0.64, S.D = 0.2783), Monsoon (M = 1.20, S.D = 0.5715) and in Post-Monsoon (M = 1.40, S.D = 0.9101).

The analysis of variance table depicts, the value of F = 9.444 and the sig. value is 0.000, for the average productivity of Bottle Gourd in tons in different seasons.

The analysis of variance states that the average productivity of Bottle Gourd was found the highest during the post-monsoon season, which is at par with the monsoon season. The average productivity during the monsoon and the post-monsoon seasons was significantly higher than pre-monsoon season.

For Bottle Gourd, it has been inferred that the total production is showing an increment of 16.66% from monsoon to post-monsoon and on the other hand the same is showing a reduction of 46.66% from monsoon to pre-monsoon.

Hence, the alternative hypothesis has been accepted, which states that, there is a variation in the average productivity of Bottle Gourd in different seasons.

H_{1e}: There is a variation in the average productivity of Tomato at different seasons.

Descriptive Statistics

Table 4.19 Average productivity of Tomato in tons in different seasons (Pre Monsoon, Monsoon and Post Monsoon)

Seasons	Mean (in Tons)	Std. Deviation
Pre-Monsoon	0.88	0.4113
Monsoon	1.60	0.7984
Post-Monsoon	2.00	0.9464

ANOVA

Table 4.20 Average productivity of Tomato in tons in different seasons (Pre Monsoon, Monsoon and Post Monsoon)

	Sum of Squares	df	Mean Square	F	Sig.
Between seasons	16.107	2	8.053	14.191	0.000
Within seasons	40.860	137	0.568		

Interpretation

The above two table states about the descriptive statistics and analysis of variance. From the table it can be understood in Pre-Monsoon (M = 0.88, S.D = 0.4113), Monsoon (M = 1.60, S.D = 0.7948) and in Post-Monsoon (M = 2.00, S.D = 0.9464).

The analysis of variance table depicts, the value of F = 14.191 and the sig. value is 0.000, for the average productivity of Bottle Gourd in tons in different seasons.

The analysis of variance states that the average productivity of Tomato was found the highest during the post-monsoon season, which is at par with the monsoon season. The average productivity during the monsoon and post -monsoon seasons was significantly higher than pre-monsoon season.

For Tomato, it has been inferred that the total production is showing an increment of 25.00% from monsoon to post-monsoon and on the other hand the same is showing a reduction of 45.00% from monsoon to pre-monsoon.

Hence, the alternative hypothesis has been accepted, which states that, there is a variation in the average productivity of Tomato in different seasons.

H_{1f}: There is a variation in the average productivity of Brinjal at different seasons.

Descriptive Statistics

Table 4.21Average productivity of Brinjal in tons in different seasons (Pre Monsoon, Monsoon and Post Monsoon)

Seasons	Mean (in Tons)	Std. Deviation
Pre-Monsoon	1.0	0.4453
Monsoon	2.0	0.6075
Post-Monsoon	3.0	1.1438

ANOVA

Table 4.22 Average productivity of Brinjal in tons in different seasons (Pre Monsoon, Monsoon and Post Monsoon)

	Sum of Squares	df	Mean Square	F	Sig.
Between seasons	50.000	2	25.000	39.982	0.000
Within seasons	45.020	137	0.625		

Interpretation

The above two table states about the descriptive statistics and analysis of variance. From the table it can be understood in Pre-Monsoon (M = 1.0, S.D =

0.4453), Monsoon (M = 2.0, S.D = 0.6075) and in Post-Monsoon (M = 3.0, S.D = 1.1438).

The analysis of variance table depicts, the value of F = 39.982 and the sig. value is 0.000, for the average productivity of Brinjal in tons in different seasons.

The analysis of variance states that the average productivity of Brinjal was found the highest during the post-monsoon season, which is at par with the monsoon season. The average productivity during the monsoon and post-monsoon seasons was significantly higher than the pre-monsoon season.

For Brinjal, it has been inferred that the total production is showing an increment of 50.00% from monsoon to post-monsoon and on the other hand the same is showing a reduction of 50% from monsoon to pre-monsoon.

Hence, the alternative hypothesis has been accepted, which states that, there is a variation in the average productivity of Brinjal in different seasons.

Test for Hypothesis H_2: There is a variation in the average production cost of vegetables at different seasons.

H_{2a}: There is a variation in the average production cost of Cauliflower at different seasons.

Descriptive Statistics

Table 4.23 Average production cost of Cauliflower in tons in different seasons (Pre Monsoon, Monsoon and Post Monsoon)

Seasons	Mean (in Tons)	Std. Deviation
Pre-Monsoon	3605.00	1966.68
Monsoon	5269.78	2775.14
Post-Monsoon	6405.00	4041.48

ANOVA

Table 4.24 Average production cost of Cauliflower in tons in different seasons (Pre Monsoon, Monsoon and Post Monsoon)

	Sum of Squares	df	Mean Square	F	Sig.
Between seasons	99168509.44	2	49584254.72	5.331	0.007
Within seasons	669670320.91	137	9300976.67		

Interpretation

The above two table states about the descriptive statistics and analysis of variance. From the table it can be understood in Pre-Monsoon (M = 3605.00, S.D = 1966.68), Monsoon (M = 5269.78, S.D = 2775.14) and in Post-Monsoon (M = 6405.00, S.D = 4041.48).

The analysis of variance table depicts, the value of F = 5.331 and the sig. value is 0.007, for the average cost of production of Cauliflower in tons in different seasons.

The analysis of variance states that the average cost of production of Cauliflower was found the highest during the post-monsoon season, which is at par with the monsoon season. The average cost of production during the monsoon and post-monsoon seasons was significantly higher than the pre-monsoon season.

For Cauliflower, it has been inferred that the total production cost is showing an increment of 31.59% from monsoon to post-monsoon and on the other hand the same is showing a reduction of 21.54% form monsoon to pre-monsoon.

Hence, the alternative hypothesis has been accepted, which states that, there is a variation in the average production cost of Cauliflower in different seasons.

H_{2b}: There is a variation in the average production cost of Cabbage at different seasons.

Descriptive Statistics

Table 4.25 Average production cost of Cabbage in tons in different seasons (Pre Monsoon, Monsoon and Post Monsoon)

Seasons	Mean (in Tons)	Std. Deviation
Pre-Monsoon	5950.00	4183.06
Monsoon	7468.56	3625.64
Post-Monsoon	7931.52	3431.46

ANOVA

Table 4.26 Average production cost of Cabbage in tons in different seasons (Pre Monsoon, Monsoon and Post Monsoon)					
	Sum of Squares	df	Mean Square	F	Sig.
Between seasons	53723149.54	2	26861574.77	6.588	0.002
Within seasons	1018039951.38	137	14139443.76		

Interpretation

The above two table states about the descriptive statistics and analysis of variance. From the table it can be understood in Pre-Monsoon (M = 5950.00, S.D = 4183.06), Monsoon (M = 7468.56, S.D = 3625.64) and in Post-Monsoon (M = 7931.52, S.D = 3431.46).

The analysis of variance table depicts, the value of F = 6.588 and the sig. value is 0.002, for the average cost of production of Cabbage in tons in different seasons.

The analysis of variance states that

For Cabbage, it has been inferred that the total production cost is showing an increment of 20.33% from monsoon to post-monsoon and on the other hand the same is showing a reduction of 6.20% form monsoon to pre-monsoon.

Hence, the alternative hypothesis has been accepted, which states that, there is a variation in the average production cost of Cabbage in different seasons.

H_{2c}: There is a variation in the average production cost of Beans at different seasons.

Descriptive Statistics

Table 4.27 Average production cost of Beans in tons in different seasons (Pre Monsoon, Monsoon and Post Monsoon)		
Seasons	Mean (in Tons)	Std. Deviation
Pre-Monsoon	345.00	153.48
Monsoon	1417.40	678.52
Post-Monsoon	1712.92	797.96

ANOVA

Table 4.28 Average production cost of Beans in tons in different seasons (Pre Monsoon, Monsoon and Post Monsoon)

	Sum of Squares	df	Mean Square	F	Sig.
Between seasons	25905046.43	2	12952523.21	34.672	.000
Within seasons	26897052.66	137	373570.17		

Interpretation

The above two table states about the descriptive statistics and analysis of variance of average production cost of Beans. From the table it can be understood in Pre-Monsoon (M = 345.00, S.D =), Monsoon (M = 1417.40, S.D = 678.52) and in Post-Monsoon (M = 1712.92, S.D = 797.96).

The analysis of variance table depicts, the value of F = 34.672 and the sig. value is 0.000, for the average production cost of Beans in tons in different seasons.

The average cost of production of Beans was found the highest during the post-monsoon season which is at par with the monsoon season. The average cost of production during the monsoon and post-monsoon seasons was significantly higher than the pre-monsoon season.

For Beans, it has been inferred that the total production cost is showing an increment of 20.84% from monsoon to post-monsoon and on the other hand the same is showing a reduction of 75.65% form monsoon to pre-monsoon.

Hence, the alternative hypothesis has been accepted, which states that, there is a variation in the average cost of production of Beans in different seasons.

H_{2d}: There is a variation in the average production cost of Bottle Gourd at different seasons.

Descriptive Statistics

Table 4.29 Average production cost of Bottle Gourd in tons in different seasons (Pre Monsoon, Monsoon and Post Monsoon)

Seasons	Mean (in Tons)	Std. Deviation
Pre-Monsoon	6320.00	2749.08
Monsoon	9552.61	4550.34
Post-Monsoon	10446.80	6971.37

ANOVA

Table 4.30 Average production cost of Bottle Gourd in tons in different seasons (Pre Monsoon, Monsoon and Post Monsoon)

	Sum of Squares	df	Mean Square	F	Sig.
Between seasons	235665412.24	2	117832706.12	4.752	0.012
Within seasons	1785261694.65	137	24795301.31		

Interpretation

The above two table states about the descriptive statistics and analysis of variance of average production cost of Bottle Gourd. From the table it can be understood in Pre-Monsoon (M = 6320.00, S.D = 2749.08), Monsoon (M = 9552.61, S.D = 4550.34) and in Post-Monsoon (M = 10446.80, S.D = 6971.37).

The analysis of variance table depicts, the value of F = 4.752 and the sig. value is 0.012, for the average production cost of Bottle Gourd in tons in different seasons.

The average production cost of Bottle Gourd was found the highest during the post-monsoon season which is at par with the monsoon season. The average production cost during the monsoon and post-monsoon seasons was significantly higher than the pre-monsoon season.

For Bottle Gourd, it has been inferred that the total production cost is showing an increment of 9.30% from monsoon to post-monsoon and on the other hand the same is showing a reduction of 33.84% form monsoon to pre-monsoon.

Hence, the alternative hypothesis has been accepted, which states that, there is a variation in the average production cost of Bottle Gourd in different seasons.

H_{2e}: There is a variation in the average production cost of Tomato at different seasons.

Descriptive Statistics

Table 4.31 Average production cost of Tomato in tons in different seasons (Pre Monsoon, Monsoon and Post Monsoon)

Seasons	Mean (in Tons)	Std. Deviation
Pre-Monsoon	13244.00	6190.04
Monsoon	18419.20	9191.59
Post-Monsoon	25123.28	11890.21

ANOVA

Table 4.32 Average production cost of Tomato in tons in different seasons (Pre Monsoon, Monsoon and Post Monsoon)

	Sum of Squares	df	Mean Square	F	Sig.
Between seasons	1773705641.70	2	886852820.85	10.071	0.000
Within seasons	6340304449.44	137	88059784.02		

Interpretation

The above two table states about the descriptive statistics and analysis of variance of average production cost of Tomato. From the table it can be understood in Pre-Monsoon (M = 13244.00, S.D = 6190.04), Monsoon (M = 18419.20, S.D = 9191.59) and in Post-Monsoon (M = 25123.28, S.D = 11890.21).

The analysis of variance table depicts, the value of F = 10.071 and the sig. value is 0.000, for the average production cost of Tomato in tons in different seasons.

The average production cost of tomato was found the highest during the post-monsoon season which is at par with the monsoon season. The average production cost during the monsoon and post-monsoon seasons was significantly higher than the pre-monsoon season.

For Tomato, it has been inferred that the total production cost is showing an increment of 36.39% from monsoon to post-monsoon and on the other hand the same is showing a reduction of 28.09% form monsoon to pre-monsoon.

Hence, the alternative hypothesis has been accepted, which states that, there is a variation in the production cost of Tomato in different seasons.

H_{2f}: There is a variation in the average production cost of Brinjal at different seasons.

Descriptive Statistics

Table 4.33 Average production cost of Brinjal in tons in different seasons (Pre Monsoon, Monsoon and Post Monsoon)

Seasons	Mean (in Tons)	Std. Deviation
Pre-Monsoon	9375.00	4175.12
Monsoon	15673.97	4761.69
Post-Monsoon	22986.00	8763.97

ANOVA

Table 4.34 Average production cost of Brinjal in tons in different seasons (Pre Monsoon, Monsoon and Post Monsoon)

	Sum of Squares	df	Mean Square	F	Sig.
Between seasons	2320017621.87	2	1160008810.93	29.766	0.000
Within seasons	2805905838.98	137	38970914.43		

Interpretation

The above two table states about the descriptive statistics and analysis of variance of average production cost of Brinjal. From the table it can be understood in Pre-

Monsoon (M = 9375.00, S.D = 4175.12), Monsoon (M = 15673.97, S.D = 4761.69) and in Post-Monsoon (M = 22986.00, S.D = 8763.97).

The analysis of variance table depicts, the value of F = 29.766 and the sig. value is 0.000, for the average production cost of Brinjal in tons in different seasons.

The average production cost of Brinjal was found the highest during the post-monsoon season, which is at par with the monsoon season. The average production cost during the monsoon and post-monsoon seasons was significantly higher than the pre-monsoon season.

For Brinjal, it has been inferred that the total production cost is showing an increment of 46.66% from monsoon to post-monsoon and on the other hand the same is showing a reduction of 40.18% form monsoon to pre-monsoon.

Hence, the alternative hypothesis has been accepted, which states that, there is a variation in the average production cost of Brinjal in different seasons.

Test for Hypothesis H_3: There is a variation in the average transportation cost of vegetables at different seasons.

H_{3a}: There is a variation in the average transportation cost of Cauliflower at different seasons.

Descriptive Statistics

Table 4.35 Average transportation cost of Cauliflower in tons in different seasons (Pre Monsoon, Monsoon and Post Monsoon)

Seasons	Mean (in Tons)	Std. Deviation
Pre-Monsoon	875.00	477.35
Monsoon	1625.00	855.81
Post-Monsoon	1875.00	1183.10

ANOVA

Table 4.36 Average transportation cost of Cauliflower in tons in different seasons (Pre Monsoon, Monsoon and Post Monsoon)

	Sum of Squares	df	Mean Square	F	Sig.
Between seasons	13541666.66	2	6770833.33	8.607	0.000
Within seasons	56640625.00	137	786675.34		

Interpretation

The above two table states about the descriptive statistics and analysis of variance of average transportation cost of Cauliflower. From the table it can be understood in Pre-Monsoon (M = 875.00, S.D = 477.35), Monsoon (M = 1625.00, S.D = 855.81) and in Post-Monsoon (M = 1875.00, S.D = 1183.10).

The analysis of variance table depicts, the value of F = 8.607 and the sig. value is 0.000, for the average transportation cost of Cauliflower in tons in different seasons.

The average transportation cost of Cauliflower was found the highest during the post-monsoon season which is at par with the monsoon season. The average transportation cost during the monsoon and post-monsoon seasons was significantly higher than the pre-monsoon season.

For Cauliflower, it has been inferred that the total transportation cost is showing an increment of 46.15% from monsoon to post-monsoon and on the other hand the same is showing a reduction of 15.38% form monsoon to pre-monsoon.

Hence, the alternative hypothesis has been accepted, which states that, there is a variation in the average transportation cost of Cauliflower in different seasons.

H_{3b}: There is a variation in the average transportation cost of Cabbage at different seasons.

Descriptive Statistics

Table 4.37 Average transportation cost of Cabbage in tons in different seasons (Pre Monsoon, Monsoon and Post Monsoon)

Seasons	Mean (in Tons)	Std. Deviation
Pre-Monsoon	1750.00	1230.31
Monsoon	2750.00	1335.00
Post-Monsoon	3000.00	1297.90

ANOVA

Table 4.38 Average transportation cost of Cabbage in tons in different seasons (Pre Monsoon, Monsoon and Post Monsoon)

	Sum of Squares	df	Mean Square	F	Sig.
Between seasons	21875000.00	2	10937500.00	6.588	0.002
Within seasons	119531250.00	137	1660156.250		

Interpretation

The above two table states about the descriptive statistics and analysis of variance average transportation cost of Cabbage. From the table it can be understood in Pre-Monsoon (M = 1750.00, S.D = 1230.31), Monsoon (M = 2750.00, S.D = 1335.00) and in Post-Monsoon (M = 3000.00, S.D = 1297.90).

The analysis of variance table depicts, the value of F = 6.588 and the sig. value is 0.002, for the average transportation cost of Cabbage in tons in different seasons.

The average transportation cost of Cabbage was found the highest during the post-monsoon season which is at par with the monsoon season. The average transportation cost during the monsoon and post-monsoon seasons was significantly higher than the pre-monsoon season.

For Cabbage, it has been inferred that the total transportation cost is showing an increment of 9.09% from monsoon to post-monsoon and on the other hand the same is showing a reduction of 36.36% form monsoon to pre-monsoon.

Hence, the alternative hypothesis has been accepted, which states that, there is a variation in the average transportation cost of Cabbage in different seasons.

H_{3c}: There is a variation in the average transportation cost of Beans at different seasons.

Descriptive Statistics

Table 4.39 Average transportation cost of Beans in tons in different seasons (Pre Monsoon, Monsoon and Post Monsoon)

Seasons	Mean (in Tons)	Std. Deviation
Pre-Monsoon	125.00	55.60
Monsoon	625.00	299.19
Post-Monsoon	750.00	349.38

ANOVA

Table 4.40 Average transportation cost of Beans in tons in different seasons (Pre Monsoon, Monsoon and Post Monsoon)

	Sum of Squares	df	Mean Square	F	Sig.
Between seasons	5468750.00	2	2734375.00	38.211	0.000
Within seasons	5152343.75	137	71560.33		

Interpretation

The above two table states about the descriptive statistics and analysis of variance of average transportation cost of Beans. From the table it can be understood in Pre-Monsoon (M = 125.00, S.D = 55.60), Monsoon (M = 625.00, S.D = 299.19) and in Post-Monsoon (M = 750.00, S.D = 349.38).

The analysis of variance table depicts, the value of F = 38.211 and the sig. value is 0.000, for the average transportation cost of Beans in tons in different seasons.

The average transportation cost of Beans was found the highest during the post-monsoon season which is at par with the monsoon season. The average transportation cost during the monsoon and post-monsoon seasons was significantly higher than the pre-monsoon season.

For Beans, it has been inferred that the total transportation cost is showing an increment of 20.00% from monsoon to post-monsoon and on the other hand the same is showing a reduction of 80.00% form monsoon to pre-monsoon.

Hence, the alternative hypothesis has been accepted, which states that, there is a variation in the average transportation cost of Beans in different seasons.

H_{3d}: There is a variation in the average transportation cost of Bottle Gourd at different seasons.

Descriptive Statistics

Table 4.41 Average transportation cost of Bottle Gourd in tons in different seasons (Pre Monsoon, Monsoon and Post Monsoon)

Seasons	Mean (in Tons)	Std. Deviation
Pre-Monsoon	2000.00	869.96
Monsoon	3750.00	1786.08
Post-Monsoon	4375.00	2844.15

ANOVA

Table 4.42 Average transportation cost of Bottle Gourd in tons in different seasons (Pre Monsoon, Monsoon and Post Monsoon)

	Sum of Squares	df	Mean Square	F	Sig.
Between seasons	75781250.00	2	37890625.00	9.444	0.000
Within seasons	288867187.50	137	4012044.27		

Interpretation

The above two table states about the descriptive statistics and analysis of variance of average transportation cost of Bottle Gourd. From the table it can be understood in Pre-Monsoon (M = 2000.00, S.D = 869.96), Monsoon (M = 3750.00, S.D = 1786.08) and in Post-Monsoon (M = 4375.00, S.D = 2844.15).

The analysis of variance table depicts, the value of F = 9.444 and the sig. value is 0.000, for the average transportation cost of Bottle Gourd in tons in different seasons.

The average transportation cost of Bottle Gourd was found the highest during the post-monsoon season which is at par with the monsoon season. The average transportation cost during the monsoon and post-monsoon seasons was significantly higher than the pre-monsoon season.

For Bottle Gourd, it has been inferred that the total transportation cost is showing an increment of 16.66% from monsoon to post-monsoon and on the other hand the same is showing a reduction of 87.50% form monsoon to pre-monsoon.

Hence, the alternative hypothesis has been accepted, which states that, there is a variation in the average transportation cost of Bottle Gourd in different seasons.

H_{3e}: There is a variation in the average transportation cost of Tomato at different seasons.

Descriptive Statistics

Table 4.43 Average transportation cost of Tomato in tons in different seasons (Pre Monsoon, Monsoon and Post Monsoon)

Seasons	Mean (in Tons)	Std. Deviation
Pre-Monsoon	2750.00	1285.30
Monsoon	5000.00	2495.11
Post-Monsoon	6250.00	2957.76

ANOVA

Table 4.44 Average transportation cost of Tomato in tons in different seasons (Pre Monsoon, Monsoon and Post Monsoon)

	Sum of Squares	df	Mean Square	F	Sig.
Between seasons	157291666.66	2	78645833.33	14.191	0.000
Within seasons	399023437.50	137	5541992.18		

Interpretation

The above two table states about the descriptive statistics and analysis of variance of average transportation cost of Tomato. From the table it can be understood in Pre-

Monsoon (M = 2750.00, S.D = 1285.30), Monsoon (M = 5000.00, S.D = 2495.11) and in Post-Monsoon (M = 6250.00, S.D = 2957.76).

The analysis of variance table depicts, the value of F = 14.191 and the sig. value is 0.000, for the average transportation cost of Tomato in tons in different seasons.

The average transportation cost of tomato was found the highest during the post-monsoon season which is at par with the monsoon season. The average transportation cost during the monsoon and post-monsoon seasons was significantly higher than the pre-monsoon season.

For Tomato, it has been inferred that the total transportation is showing an increment of 25.00% from monsoon to post-monsoon and on the other hand the same is showing a reduction of 45.00% form monsoon to pre-monsoon.

Hence, the alternative hypothesis has been accepted, which states that, there is a variation in the average transportation cost of Tomato in different seasons.

H_{3f}: There is a variation in the average transportation cost of Brinjal at different seasons.

Descriptive Statistics

Table 4.45 Average transportation cost of Brinjal in tons in different seasons (Pre Monsoon, Monsoon and Post Monsoon)

Seasons	Mean (in Tons)	Std. Deviation
Pre-Monsoon	3125.00	1391.70
Monsoon	6250.00	1898.72
Post-Monsoon	9375.00	3574.44

ANOVA

Table 4.46 Average transportation cost of Brinjal in tons in different seasons (Pre Monsoon, Monsoon and Post Monsoon)

	Sum of Squares	df	Mean Square	F	Sig.
Between seasons	488281250.00	2	244140625.00	39.982	0.000
Within seasons	439648437.50	137	6106228		

Interpretation

The above two table states about the descriptive statistics and analysis of variance of average transportation cost of Brinjal. From the table it can be understood in Pre-Monsoon (M = 3125.00, S.D = 1391.70), Monsoon (M = 6250.00, S.D = 1898.72) and in Post-Monsoon (M = 9375.00, S.D = 3574.44).

The analysis of variance table depicts, the value of F = 39.982 and the sig. value is 0.000, for the average transportation cost of Brinjal in tons in different seasons.

The average transportation cost of Brinjal was found the highest during the post-monsoon season which is at par with the monsoon season. The average transportation cost during the monsoon and post-monsoon seasons was significantly higher than the pre-monsoon season.

For Brinjal, it has been inferred that the total transportation cost is showing an increment of 50.00% from monsoon to post-monsoon and on the other hand the same is showing a reduction of 50.00% form monsoon to pre-monsoon.

Hence, the alternative hypothesis has been accepted, which states that, there is a variation in the average transportation cost of Brinjal in different seasons.

Test for Hypothesis H_4: There is a variation in the average packaging cost of vegetables at different seasons.

H_{4a}: There is a variation in the average packaging cost of Beans at different seasons.

Descriptive Statistics

Table 4.47 Average packaging cost of Beans in tons in different seasons (Pre Monsoon, Monsoon and Post Monsoon)

Seasons	Mean (in Tons)	Std. Deviation
Pre-Monsoon	10.80	4.80
Monsoon	54.00	25.85
Post-Monsoon	64.80	30.18

ANOVA

Table 4.48 Average packaging cost of Beans in tons in different seasons (Pre Monsoon, Monsoon and Post Monsoon)

	Sum of Squares	df	Mean Square	F	Sig.
Between seasons	40824.00	2	20412.00	38.211	0.000
Within seasons	38462.04	137	534.195		

Interpretation

The above two table states about the descriptive statistics and analysis of variance of average packaging cost of Beans. From the table it can be understood in Pre-Monsoon (M = 10.80, S.D = 4.80), Monsoon (M = 54.00, S.D = 25.85) and in Post-Monsoon (M = 64.80, S.D = 30.18).

The analysis of variance table depicts, the value of F = 38.211 and the sig. value is 0.000, for the average packaging cost of Beans in tons in different seasons.

The average packaging cost of Beans was found the highest during the post-monsoon season which is at par with the monsoon season. The average packaging cost during the monsoon and post-monsoon seasons was significantly higher than the pre-monsoon season.

For Beans, it has been inferred that the total packaging cost is showing an increment of 20.00% from monsoon to post-monsoon and on the other hand the same is showing a reduction of 80.00% form monsoon to pre-monsoon.

Hence, the alternative hypothesis has been accepted, which states that, there is a variation in the average packaging cost of Beans in different seasons.

H_{4b}: There is a variation in the average packaging cost of Bottle Gourd at different seasons.

Descriptive Statistics

Table 4.49 Average packaging cost of Bottle Gourd in tons in different seasons (Pre Monsoon, Monsoon and Post Monsoon)

Seasons	Mean (in Tons)	Std. Deviation
Pre-Monsoon	640.00	278.38
Monsoon	1200.00	571.54
Post-Monsoon	1400.00	910.12

ANOVA

Table 4.50 Average packaging cost of Bottle Gourd in tons in different seasons (Pre Monsoon, Monsoon and Post Monsoon)

	Sum of Squares	df	Mean Square	F	Sig.
Between seasons	7760000.00	2	3880000.00	9.444	0.000
Within seasons	29580000.00	137	410833.33		

Interpretation

The above two table states about the descriptive statistics and analysis of variance of average packaging cost of Bottle Gourd. From the table it can be understood in Pre-Monsoon (M = 640.00, S.D = 278.38), Monsoon (M = 1200.00, S.D = 571.54) and in Post-Monsoon (M = 1400.00, S.D = 910.12).

The analysis of variance table depicts, the value of F = 9.444 and the sig. value is 0.000, for the average of average packaging cost of Bottle Gourd in tons in different seasons.

The average packaging cost of Bottle Gourd was found the highest during the post-monsoon season which is at par with the monsoon season. The average packaging cost during the monsoon and post-monsoon seasons was significantly higher than the pre-monsoon season.

For Bottle Gourd, it has been inferred that the total packaging cost is showing an increment of 16.66% from monsoon to post-monsoon and on the other hand the same is showing a reduction of 46.66% form monsoon to pre-monsoon.

Hence, the alternative hypothesis has been accepted, which states that, there is a variation in the average packaging cost of Bottle Gourd in different seasons.

H_{4C}: There is a variation in the average packaging cost of Tomato at different seasons.

Descriptive Statistics

Table 4.51 Average packaging cost of Tomato in tons in different seasons (Pre Monsoon, Monsoon and Post Monsoon)

Seasons	Mean (in Tons)	Std. Deviation
Pre-Monsoon	2200.00	1028.24
Monsoon	4000.00	1996.08
Post-Monsoon	5000.00	2366.21

ANOVA

Table 4.52 Average packaging cost of Tomato in tons in different seasons (Pre Monsoon, Monsoon and Post Monsoon)

	Sum of Squares	df	Mean Square	F	Sig.
Between seasons	100666666.66	2	50333333.33	14.191	0.000
Within seasons	255375000.00	137	3546875.00		

Interpretation

The above two table states about the descriptive statistics and analysis of variance of average packaging cost of Tomato. From the table it can be understood in Pre-Monsoon (M = 2200.00, S.D = 1028.24), Monsoon (M = 4000.00, S.D = 1996.08) and in Post-Monsoon (M = 5000.00, S.D = 2366.21).

The analysis of variance table depicts, the value of F = 14.191 and the sig. value is 0.000, for the average of average packaging cost of Tomato in tons in different seasons.

The average packaging cost of tomato was found the highest during the post-monsoon season which is at par with the monsoon season. The average packaging cost during the monsoon and post-monsoon seasons was significantly higher than the pre-monsoon season.

For Tomato, it has been inferred that the total packaging cost is showing an increment of 25.00% from monsoon to post-monsoon and on the other hand the same is showing a reduction of 45.00% form monsoon to pre-monsoon.

Hence, the alternative hypothesis has been accepted, which states that, there is a variation in the average packaging cost of Tomato in different seasons.

H_{4d}: There is a variation in the average packaging cost of Brinjal at different seasons.

Descriptive Statistics

Table 4.53 Average packaging cost of Brinjal in tons in different seasons (Pre Monsoon, Monsoon and Post Monsoon)

Seasons	Mean (in Tons)	Std. Deviation
Pre-Monsoon	150.00	66.80
Monsoon	300.00	91.13
Post-Monsoon	451.80	176.97

ANOVA

Table 4.54 Average packaging cost of Brinjal in tons in different seasons (Pre Monsoon, Monsoon and Post Monsoon)

	Sum of Squares	df	Mean Square	F	Sig.
Between seasons	1138554.00	2	569277.00	38.738	0.000
Within seasons	1058094.00	137	14695.75		

Interpretation

The above two table states about the descriptive statistics and analysis of variance of average packaging cost of Brinjal. From the table it can be understood in Pre-

Monsoon (M = 150.00, S.D = 66.80), Monsoon (M = 300.00, S.D = 91.13) and in Post-Monsoon (M = 451.80, S.D = 176.97).

The analysis of variance table depicts, the value of F = 38.738 and the sig. value is 0.000, for the average of average packaging cost of Brinjal in tons in different seasons.

The average packaging cost of Brinjal was found the highest during the post-monsoon season which is at par with the monsoon season. The average packaging cost during the monsoon and post-monsoon seasons was significantly higher than the pre-monsoon season.

For Brinjal, it has been inferred that the total packaging cost is showing an increment of 50.60% from monsoon to post-monsoon and on the other hand the same is showing a reduction of 50.00% form monsoon to pre-monsoon.

Hence, the alternative hypothesis has been accepted, which states that, there is a variation in the average packaging cost of Brinjal in different seasons.

CHAPTER 5

RESULT, DISCUSSION & CONCLUSION

MAJOR FINDINGS

Based on the analysis various major findings are made which are listed below.

1. There is variation in production, production cost, transportation cost and packaging cost among the seasons.
2. The average productivity, average production cost, average transportation cost and average packaging cost were found the highest for all the vegetables during the post monsoon season which is at par with the monsoon season
3. The average productivity during the monsoon and post monsoon seasons was significantly higher than pre-monsoon season.
4. Production of cauliflower, cabbage and tomato is the highest where as the productivity of brinjal, beans and bottle gourd is found majority of the total area that is taken into consideration.
5. There is a percentage of variation regarding the total cost of production, selling price of the farmers and selling price of the organized retailers in two different seasons of a concerned vegetables.
6. It has been inferred that the total production is showing an increment of 46.16% for Cauliflower, 36.36% for Cabbage, 20.00% for Beans, 16.66% for Bottle Gourd, 25.00% for Tomato and 50.00% for Brinjal from monsoon to post-monsoon and on the other hand the same is showing a reduction of 15.38% for Cauliflower, 9.09% for Cabbage, 80.00% for Beans, 46.66% for Bottle Gourd, 45.00% for Tomato and 50.00% for Brinjal from monsoon to pre-monsoon.
7. It has been inferred that the total production cost is showing an increment of 31.59% for Cauliflower, 20.33% for Cabbage, 20.84% for Beans, 09.30% for Bottle Gourd, 36.39% for Tomato and 46.66% for Brinjal from monsoon to post-monsoon and on the other hand the same is showing a reduction of 21.54% for Cauliflower, 06.20% for Cabbage, 75.65% for Beans, 33.84% for Bottle Gourd, 28.09% for Tomato and 40.18% for Brinjal from monsoon to pre-monsoon.
8. It has been inferred that the total transportation cost is showing an increment of 46.15% for Cauliflower, 09.09% for Cabbage, 20.00% for Beans, 16.66% for Bottle Gourd, 25.00% for Tomato and 50.00% for Brinjal from monsoon to post-monsoon

and on the other hand the same is showing a reduction of 15.38% for Cauliflower, 36.36% for Cabbage, 80.00% for Beans, 87.5% for Bottle Gourd, 45.00% for Tomato and 50.00% for Brinjal from monsoon to pre-monsoon.

9. It has been inferred that the total packaging cost is showing an increment of 20.00% for Beans, 16.66% for Bottle Gourd, 25.00% for Tomato and 50.60% for Brinjal from monsoon to post-monsoon and on the other hand the same is showing a reduction of 80.00% for Beans, 46.66% for Bottle Gourd, 45.00% for Tomato and 50.00% for Brinjal from monsoon to pre-monsoon.

OBSERVATION ON THE BASIS OF RESEARCH SURVEY

Based on the research survey various major observation was observed during the time period which are listed below.

1. Major source of irrigation is tube well due to which the price of the vegetables rises.
2. Maximum vegetables are available in winter season.
3. Cabbage, tomato and cauliflower are the highly demanded vegetables in the Ranchi area.
4. Post harvest losses of cabbage and cauliflower are highest @13% among the six selected vegetables.
5. Vegetables grower avails a profit of Rs. 0.90 at the major vegetables cultivated at the adjoining area of Ranchi.
6. Vegetables grower avail least profit of at the cauliflower and cabbage.
7. Loss percentages of vegetables at retail store are around 11.2%.
8. Absence of central processing center(CPC)
9. Non-availability of storage facilities for short term storage.
10. The intermediaries are the constraint regarding the variation of the price of the vegetables.
11. Falling water levels and lack of irrigation facilities make the farmers in problems
12. Lack of market knowledge and marketing skills among the farmers
13. Expensive credit and Controlled prices
14. Poor infrastructure
15. Many intermediaries who increase cost, but do not add much value

SUGESSTIONS ON THE BASIS OF RESEARCH SURVEY

From the present study following suggestion is made for the development of this sector since it contributes a lot to the Indian economy.

1. Farmers may avoid the pre-harvest contractors and local traders since the farmers realized the least price
2. To prevent the post harvest loss there is a need for training in post harvest handling of the vegetables to the farmers and intermediaries
3. The government should train the farmer and provide some scientific production approach.
4. The marketing board should increase the storage system and inventory system.
5. The Jharkhand state agriculture marketing board hires some technical and skilled manpower at every region.
6. The Jharkhand state agriculture marketing board should focus on the export orientation of green vegetables.
7. Education facilities may be provided on priority basis in order to broaden their outward horizon.
8. Farmers must have the knowledge of market information, for taking better sales decision.
9. Development of infrastructure, including roads and efficient transport facilities and strengthening of the cooperative marketing institutions for the vegetables may help in improving the efficiency of vegetable marketing in the state.

CONCLUSION

Marketing of vegetables is a complex phenomenon due to their perishable nature, seasonality and bulkiness. It is further compounded by the fact, that farmers have small areas under their cultivation and small marketable quantity. The production and post-harvest losses are higher and as such vegetables require a developed marketing system for their quick disposal. It has also been observed that as the number of intermediaries' increases, the producer's share in consumer price decreases. The net price received by the producers is higher in the channel where they sell the produce directly to the consumers or retailers. The producers have been found to receive higher absolute net returns in tomato, followed by Cauliflower, cabbage, brinjal, and local bean in all the channels.

There is a major price gap in price of some selected vegetables. There is a maximum price gap regarding tomato, brinjal, beans and bottle gourd. The farmers do not get appropriate value for their produce vegetables. Due to lack of storage they can't be able to hold back these vegetables with them for a long period of time after the cultivation because of its perishability in nature, so they have to sell within a particular period of time at the intermediary's price. The result the farmer does not get proper value and intermediaries like mahajans earn more than the farmers. These intermediaries also play a vital role in fixing the price of the vegetables and sell in the market or to the retailers as their convenient.

There is a variation in price and quantity of different vegetables i.e. Cauliflower, Cabbage, Beans, Bottle Gourd, Brinjal and Tomato at different seasons regarding the average productivity, average production cost, average transportation cost and average packaging cost. The average productivity, average production cost, average transportation cost and average packaging cost were found the highest for all the vegetables during the post monsoon season which is at par with the monsoon season. The average productivity during the monsoon and post monsoon seasons was significantly higher than pre monsoon season. There is a percentage of variation in total cost of production, selling price of farmers and selling price of the organized retailers in two different seasons.

SCOPE OF FUTURE RESEARCH

Considering the country India, still a more agrarian society, it has lot of future scope to contribute to the development and growth of our country from Rural to Urban society. The following future study can be done:

- The research was mainly confined to Ranchi district, so this study can be explored in other locations or different states of the country.
- During the research it was found that the large quantity of vegetables is sold through unorganized retails. Therefore a separate study can be done on the price variation of vegetables with respect to unorganized retails.
- The survey can be conducted by increasing sample size of all categories in other regions of the state and country where most of the farmers and retailers can be entertained.
- The research framework, which has been used in the research, can be used for research in other countries or states with similar socio-economic conditions.

RESEARCH CONTRIBUTION

In this study six vegetables are considered to find out the price variation from farmers to consumer through different intermediaries like middle men, wholesaler, and organized retailers, especially the organized retailers. In this context it is important to examine the actual cost of production, total land for cultivation, the various agricultural inputs and the selling price of the vegetables from the farmers end and on the other side numbers of intermediaries that exist in the process of supply chain and marketing of vegetables through which the retails get in touch for procuring of these vegetables.

Also, it was said the farmers get a less price for their vegetables as compared to the haats and mandi. The various areas were considered so that the actual value of the product can be identified and the price variation of the concerned vegetables can be identified in different seasons.

LIMITATIONS

Limitations of this research are as follows:

- The research study is limited to those respondents related only to selected vegetables and the farmers who owe around four acres of land. The other types of vegetables and farmers are not being studied in this research work.
- The study is limited to only Ranchi and its adjoining area like Brambe, Murma, and Thakurgoan only. The other parts of Ranchi are not being studied.
- The awareness about proper cultivation, marketing and supply chain of vegetables was not there among the farmers.
- Only organized retail is considered instead of complete unorganized retail and major haats or bazaar.
- The study limited to data collection over a period from December 2016 to January 2018
- The responses from the respondents can be biased and as a result some findings can be incorrect.

References

1. Adeoye, IB, Odeleye, OMO, Babalola, SO and Afolayan, SO (2009). "Economic Analysis Of Tomato Losses In Ibadan Metropolis", Oyo State, Nigeria. African Journal of Basic & Appl. Science, Vol. 1, pp. 87-92. .
2. Ajayi, M. and Nawalieji, (2010) "Production and Marketing of Vegetable", Indian Journal of Agricultural Marketing, Vol. 15, No. 3, pp. 34-38.
3. Ajit Bhalla, Chinyamata Chipeta, Haile Taye and Mjedo Mkandawire, (2005) "Globalization And Sustainable Human Development: Progress And Challenges For Malawi", United Nations Conference On Trade And Development United Nations Development Programme, pp 33.
4. Alam, G. and Verma, (2014) "Changes in Traditional Agriculture Ecosystem in Rawain Valley of Uttarakhand State in India", Ecology and Environmental Sciences, Vol. 2, No. 4, pp.90-93.
5. Albala, Ken. (2007) Beans: A History. New York: Berg, pp.3.
6. Allen, G. R, (1972) "An Appraisal of Contract Farming". Journal of Agricultural Economics, Vol. 23, No. 2, pp. 89-98.
7. Vijay Kumar, (2015), "An Analytical Study Of WTO On The Indian Agriculture Sector", Ph.D Thesis, Lucknow University, page no. 15-18.
8. Anderson R.L. (1968), "A Simulation Programme to Establish Optimum Crop Pattern in Irrigated Farms Raised on Pre-Season Estimation of Water Supply", American Journal of Agricultural Economics, Vol. 50, No. 5, pp.15. .
9. Anil Kumar, Dr. G.S. Kushwaha,Food (2014) "Supply Chain Management Sustainability: A Review", Research Journal Of Science And It Management, Vol. 03, no. 10, pp. 30-40.
10. Ankita Suvasmita, (2016) "Marketing Analysis Of Vegetables In Khorda District Under Octmp", Orissa University of Agriculture and Technology, Bhubaneswar, , pp. 4-15.
11. Anu Rahal, Mahima , Amit Kumar Verma, Amit Kumar , Ruchi Tiwari , Sanjay Kapoor , Sandip Chakraborty andKuldeep Dhama(2014), "Phytonutrients and Nutraceuticals in Vegetables and Their Multi-

dimensional Medicinal and Health Benefits for Humans and Their Companion Animals: A Review" Journal of Biological Science, Vol. 1, pp. 1-19

12. Anonymous, (2006). Postharvest Management of Fruit and Vegetables in the Asia-Pacific Region. Asian Productivity Organization, Japan. ISBN: 92-833-7051-1. .
13. Ashworth, Suzanne. (2002) Seed to Seed: Seed Saving and Growing Techniques for Vegetable Gardeners. New York: Seed Savers Exchange Inc. pp. 14.
14. Babalola, D. A., T., O. B., Oyekanmi, M. O., & O, M. Y. (2010). "Determinants Of Post Harvest Losses In Tomato Production: A Case Study Of Imeko – Afon Local Government Area Of Ogun State", Acta SATECH-Journal of Life and Physical Sciences, Vol. 3, No.1
15. A, Rasi M & Sheoran (2015), Scope of Supply Chain Management In Fruit And Vegetables, Journal Of Food Processing & Technology, Vol. 6, Issue. 3, pp.1-7
16. Babalola, D. A., T., O. B., Oyekanmi, M. O., & O, M. Y. (2010). "Determinants Of Post Harvest Losses In Tomato Production: A Case Study Of Imeko – Afon Local Government Area Of Ogun State", Acta Satech-Journal Of Life And Physical Sciences, Vol. 7, No.3
17. Babalola, D. A., T., O. B., Oyekanmi, M. O., & O, M. Y. (2010). "Determinants of Post Harvest Losses In Tomato Production: A Case Study Of Imeko – Afon Local Government Area Of Ogun State". Acta SATECH-Journal of Life and Physical Sciences, Vol. 3, No.1
18. Bachmann, J. and Earles, R. (2000). "Postharvest Handling Of Fruits And Vegetables. Appropriate Technology Transfer for Rural Areas". NCAT Agriculture Specialists. pp. 1-19. .
19. Bailey, W. C. (2001) "Applying SCOR in a Vertical Industry Food and Agriculture." World Supply Chain Council Annual Meeting. Chair in Agribusiness, Palmerston North, New Zeland. .

20. Balakrishnan J., and Cheng, C. H., (2005) “The Theory Of Constraints And The Make-Or-Buy Decision: An Update And Review”, The Journal of Supply Chain Management, Vol. 41, No. 1, pp. 40-47.
21. Bandenhop M.P. and Cashdoller P.P. (1974) “Land Water Use Potentials, Thungabhadara Irrigation Project”, Karnataka, University of Agricultural Science, Technical Series No.4, pp.1-38.
22. Basran, G. and Copener, S.S., (1968) “Factors Related To The Acceptance Of New Ideas And Techniques In Farming”, Indian Journal of Extension Education, Vol. 4, No. 1&2, pp. 29.
23. Basu, Priya, Improving Acess To Finance For India's Rural Poor, The World Bank Washington, D.C., 1966.
24. Behra, C.S. and Sahoo, M.S., (1975) “Impact National Demonstration on Adoption of Agricultural Practices”, Indian Journal of Extension Education, Vol. 11, No. 1&2, pp. 32-35.
25. Behra, C.S. and Sahoo, M.S., (1975) “Impact of National Demonstration on Adoption of Agricultural Practices”, Indian Journal of Extension Education, Vol. 11 No. 1&2, pp. 32-35.
26. Ben-Daya M.,Hariga M. and Khursheed S. N., (2008) “Economic Production Quantity Model With A Shifting Production Rate” International Transactions in Operational Research, Vol. 15, No. 1, pp 87-101.
27. Bhogle, S.K., (1971) “Factors Affecting Adoption Of New Farm Practices”, Kurukshetra, Vol. 19, No. 11, pp. 8-9.
28. Bhople, R.S. and Borker, R.D., (2002) “Bio Fertilizers Farmers Attitude And Adoption”, Agricultural Extension Review, pp. 18-21.
29. Bhople, R.S. and Borker, R.D., (2002) “Bio Fertilizers Farmers Attitude And Adoption”, Agricultural Extension Review, pp. 36-41.
30. Bhosale, J. (2013). Emerson Climate Technologies India, A Business Of The Us-Based Manufacturing And Technology Company Emerson. ET Bureau, 28thNovember, 02:53 PM, IST.

31. Bodake, H.D., Gaikwad, S.P. and Shirke, V.S, (2007) “Study Of Constraints Faced By The Farmers In Adoption Of Biofertilizers” Asian Journal of Extension Education, Vol. 27, pp. 61-63.
32. Boehlje, M.& Doering, O., (2000) “Farm Policy In An Industrialized Agriculture”. Journal of Agribusiness, Vol.18, No. 1, pp. 53-60.
33. Bonnen, J.T. & Schweikhardt, D.B., (1998) “The Future Of Us Agricultural Policy: Reflections On The Disappearance Of The Farm Problem”. Review of Agricultural Economics, Vol. 20, No. 1 , pp. 2-36.
34. Borude, H.P., “Fertilization, Utilization Pattern Of Sugarcane Growers” M. Sc. (Agriculture), Thesis (Unpublished), Dr. P.D.K.V., Akola. 1998.
35. Brithal, P. S., Joshi, P. K., & Gulati, A. (2005) “Vertical Coordination In High – Value Food Commodities: Implications For Small Holders”. MTID Discussion Paper No. 85, Washington DC, USA: International Food Policy Research Institute (IFPRI).
36. Buyukbay, E. O., Uzunoz, M. and Bal, H. S. G., (2011) “Post-Harvest Losses In Tomato And Fresh Bean Production In Tokai Province Of Turkey” .Scientific Research and Essays. Vol. 6, No. 7, pp. 1656-1666.
37. Buzby, J. C. and Hyman, J. (2012). “Total and Per Capita Value Of Food Loss In The United States”. Food Policy, Vol. 37, No. 5, pp. 561-570.
38. C Gasche, M C E Lomer, I Cavill, and G Weiss, (2004), “ Iron Anaemia And Inflammatory Bowel Diseases” Bmj Publishing Group, Volume 53, issue 8, pp. 1190-1197.
39. Chechani, V.K. and Dr. Gupta, H.C.L. (2003) “Major Pests Of Vegetables And Their Management”, Intensive Agriculture, Vol. 1, pp. 9-12.
40. Chopra S. and Meindl's (2001) Book, Supply Chain Management: Strategy, Planning, and Operation, Prentice Hall of India.
41. Choudhary A.K. and Singh Madan, (1999) “Fertilizer Adoption Behaviour of Contact and Non contact Farmers.” Journal of Research (B.A.U.), Vol. 11, No. 1, pp. 59-61.

42. Christopher M. (1998), Logistics & Supply Chain Management: Strategies for Reducing Costs and Improving Services, Pitman Publishing, and London.
43. Cooper M. C. and L. M. Ellram. , (1993) “Characteristics of Supply Chain Management and the Implications for Purchasing and Logistics Strategy, "International Journal of Logistics Management, Vol. 4, No. 2, pp. 13-24.
44. Cramer, G. L. & Jensen, C. W. (1988), "Agricultural Economics and Agribusiness", Fourth Edition. John Wiley and Sons, Inc.
45. Croom S., Romano P, and Giannakis M., (2000) “Supply Chain Management: an Analytical Framework for Critical Literature Review, "European Journal of Purchasing and Supply Management, Vol. 6, No. 1, pp. 67-83.
46. Dr. Dhanabalan. M. (2009), “Productive Efficiency of Milk Production In Tamil Nadu”, Indian Journal of Marketing, Volume 39, No. 12, pp-21.
47. Deepak et al , (2017)“A Study To Differentiate The Nitrogen Fixing And Microcystin Producing Cyanobacteria By Tlc Profiling.” International Journal Of Scientific Research, Vol. 6, No. 6 , pp. 1-2.
48. Deepak Kumar Gautam and GC Yadav, (2017) “Gene Action For Growth, Yield And Quality Traits In Bottle Gourd [Lagenaria Siceraria (Mol.) Standl]”, Journal of Pharmacognosy and Phytochemistry, Vol. 6, No. 4, pp. 84-88.
49. Douglas E. Hughes, Avinash M Alshe, Joel Le Bon, (2012) “The Marketing–Sales Interface at the Interface: Creating Market-Based Capabilities through Organizational Synergy”, Journal of Personal Selling & Sales Management, Vol. 32, No. 1, pp. 57–72.
50. Dudhate, D.G. and Wangikar, S.D., (2003) “Constraints Faced By Farmers In Adoption Of Brinjal Production Technology”, Agricultural Extension Review, pp. 30-31.
51. Egharevaba, R.K.A. (1995). “Physiology Of Fruits And Vegetables”. Journal of Tropical Postharvest, Vol. 2, pp. 51-73. .
52. Ernst & Young. The Great Indian Retail Story, Ernst & Young's report, April, 2006.

53. Faure, G., Maitre d'Hotel, E., Le Coq, J. F., Saenz, F, (2007) "Can supply chain's Coordination Mechanisms Include Small Holders? Insight From An Empirical Work in Costa Rica", Paper Presented at the 106th Seminar of the EAAE. Pro-poor Development in .
54. Food Routes Network., (2007) "Plant Your Dollars Close To Home And Watch Your Community Grows". Retrieved June 4, 2007, from http://www.foodroutes.org/whycare3.jsp, 2008.
55. Frank, S. D. & D. R. Henderson. (1992) "Transaction Costs as Determinants of Vertical Coordination in the US Food Industries", American Journal of Agricultural Economics, Vol. 74, pp. 941-950.
56. G. K. Sujayanand, R. K. Sharma, K. Shankarganesh, Supradip Saha and R. S. Tomar, (2015) "Crop Diversification For Sustainable Insect Pest Management In Eggplant (Solanales: Solanaceae)", Florida Entomologist, Vol. 98, No. 1, pp. 305-314.
57. Gadgil D.R. (1954), "The Industrial Evolution of India in Recent Times", Calcutta: Oxford University Press, pp. 128-133.
58. Ganesh Iyer, J. Miguel Villas-Boas, (2003) "A Bargaining Theory of Distribution Channels". Journal of Marketing Research, Vol. 40, No. 1, pp. 80-100.
59. Ganeshan, R, and Harrison Terry P., (1995) "An. Introduction to Supply Chain Management," Department of. Management Sciences and Information Systems.
60. Ganeshan, R, and Harrison Terry P., (1995) "An. Introduction to Supply Chain Management," Department of. Management Sciences and Information Systems.
61. Ganpat Lal Yadav,(2014), "Effect of Nitrogen and Bio-organics on Growth, Yield and Quality of okra [Abelmoschus esculentus(L.) Moench]", PhD. Thesis, Sri Karan Narendra Agriculture University, Jobner.
62. Garnett, Tara. Wise Moves, (2003): Exploring the relationship between food, transport and CO2. London: Transport 2000 Trust.
63. Ghosh G.K. and Sarkar A.K. (1994) "Availability Of Sulfur And Some Micro Nutrients In Acidic Sedentary Soils Of Chotanagpur Region". Journal of Indian Social Science, Vol. 42, pp. 464.

64. Giancarlo Moschini, Luisa Menapace and Daniel Pick, (2008) "Geographical Indications and the Competitive Provision of Quality in Agricultural Markets", American Journal of Agricultural Economics, Vol. 90, No. 3, pp. 794–812.
65. Gunasekarana, A., Ngai E. W. T., (2005) "Build-to-Order Supply Chain Management: Literature Review and Framework for Development" Journal of Operations Management, Vol. 23, No. 5, pp. 423-451.
66. Gupta, A. K., & Ram, G. S. (1981) "Price Spread Behavior Of Vegetables In Delhi", Agriculture Situation in India, Vol. 36 , No. 7, pp.557-559.
67. Gupta, H.C., Singh, J. and Kathuria, O.P. (2000). "Methodological Investigation on Postharvest Losses", Journal of Indian Society Agriculture Statistics, Vol. 53, No. 2, pp. 161-171.
68. Halder, P., and Pati, S., (2011) "A Need for Paradigm Shift to Improve Supply Chain Management of Fruits and Vegetables in India", Asian Journal Agriculture Rural Development, Vol. 1, No. 1 , pp. 1-20.
69. Handfield R. B. and Nichols E. L., (1999) "Introduction to Supply Chain Management", Prentice-Hall, New Jersey, pp. 1-83.
70. Hazarika, T.K. and Phookan, B.D. (2005) "Performance of Tomato Cultivars For Poly House Cultivation During Spring Summer In Asam", Indian Journal of Horticulture, Vol. 62, No. 3, pp. 268-271.
71. Hill, Holly, "Food Miles: Background and Marketing". Retrieved September 19, 2008, from http://www.attra.ncat.org/attra-pub/PDF/foodmiles.pdf.
72. Hodges, R.J., Buzby, J.C. and Bennett, B. (2011). "Postharvest Losses And Waste In Developed And Less Developed Countries: Opportunities To Improve Resource Use". Journal of Agricultural Science, Vol. 149, pp. 37-45. .
73. Ilic, Z., Fallik, E. and Dardic, M. (2009). Harvest, Sorting, Packaging and Storage of Vegetables. Agriculturae Conspectus Scientificus, Vol. 77, No. 1, pp. 1-4.
74. Indian Brand and Equity Foundation (IBEF),Retrieved October 1, 2008 from www.ibef.org.

75. Islam. S., Goswami. A. and Mazumdar. D. (2008),"Comparative Profitability of Cross Breed and Indigenous Cattle in West Bengal" Indian Res. J. Ext. Edu, Vol. 8, No.1, pp- 28-30.
76. Jahagirdhar A.K. and Sundaraswamy B. (2002), "Adoption Of Recommended Practices Of Tomato Cultivation", Agricultural Extension Review, May-June, Vol. 14, No. 3, pp. 12-16.
77. Jacob, Paulrajan Rajkumar & Fatima(2010). Business Models of Vegetables Retailers in India. Great Lakes Herald, 4 (1), 36-41
78. Jain, N. (2007). International Conference on Agribusiness and Food Industry in Developing Countries : Opportunities and Challenges. Retrieved February 19, 2013, from IIM Lucknow: http://www.iiml.ac.in/events/Program.html.
79. Jain, S. K. & De Filipps, R. A.,(1991) Medicinal Plants of India. 1–2. - Reference publication, Inc. Michigan, pp. 849 .
80. Jaiswal, N.K. (1965) "A Study Of Factors Associated With Low Level Of Improved Practices", Ph.D. Thesis, Division of Agricultural Extension, IARI, New Delhi.
81. Jemal Haidar, (2010) "Prevalence of Anaemia, Deficiencies of Iron and Folic Acid and Their Determinants in Ethiopian Women" Journal of Health, Population and Nutrition, Vol. 28, issue 4, pp. 359-368.
82. Jha, A.K. and Dubey, S.C. (2000) "Occurrence Of Collar Rot Of Okra (Abelmoschus esculentus) In The Plateau Region of Bihar", Journal of Research (BAU), Vol. 12, No. 1, pp. 67-72.
83. Jha, A.K., Dubey, S.C. and Jha, D.K. (2000) "Evaluation of Different Leaf Extracts And Oil Cakes Against Macrophomina Phaseolina Causing Collar Rot Of Okra", Journal of Research (BAU), Vol. 12, No. 2, pp. 225-228.
84. Johann Kirsten & Kurt Sartorius, (2002) "Linking Agribusiness And Small-Scale Farmers In Developing Countries: is There A New Role For Contract Farming?", Development Southern Africa, Vol. 19, No. 4, pp.1-26.

85. Jones, C.S., Holt, J.E. and Schoorl, D. (1991). “A Model To Predict Damage To Horticultural Produce During Transport”. Journal of Agriculture Engineering Research, Vol. 50, pp. 259-72. .
86. Joon, S. and Singh, K.N., (1969) “High Yielding Varieties Acceptance By Farmers”, Kurukshetra, Vol. 18, No. 3, pp.26.
87. K.P. Mangala and P.G. Chengappa, (2008) “A Novel Agribusiness Model For Backward Linkages With Farmers: A Case Of Food Retail Chain”, Agricultural Economics Research Review, Vol. 21, No. 8, pp. 1-8.
88. Kader, A.A. and Rolle, R.S. (2004). The Role of Postharvest Management in Assuring the Quality and Safety Horticultural Crops. Food and Agriculture Organization. Agricultural Services Bulletin, pp. 152: 52. .
89. Kajale, S. S. (2008) Government Intervention in Horticulture Development – The Case of Maharashtra, Indian Journal of Agriculture Economy, No. 3, pp. 322-331. , Ed. pp. 322-331.
90. Kalaitzis, P., Van Dijk, G. & Baourakis, G. Euro-Mediterranean Supply Chain Developments And Trends In Trade Structures, In The Fresh Fruit And Vegetable Sector. Paper presented at the Mediterranean Conference of Agro-Food Social Scientists. 103rd EAA.
91. Kalidas K, Jiji S, Sureka M, (2014) “Supply Chain Management in Vegetables”, Paripex. Indian Journal of Research Vol. 3, pp. 315-316.
92. Kalita, M.K. and Dhawan, P. (2006) “Management of Yellow Vein Mosaic And Leaf Curl Disease Of Okra By Adjusting Date Of Sowing And Row To Row Spacing”, Indian Journal of Agricultural Science, Vol. 76 No. 12, pp. 762-765.
93. Kanaujia, S.P. and Narayan, R., (2003) “Bio Fertilizers For Sustainable Vegetable Production”, Intensive Agriculture, pp. 15-19.
94. Kandiwa, V. (1999) “Economic Performance Of Smallholder Farmers Using Alternative Vertical Coordination Mechanisms For Horticultural Crops”, MS thesis, Department of Agricultural Economics. Cornell: Cornell University.
95. Kantor, L.S., Lipton, K., Manchester, A., and Oliveira, V. (1997). Estimating and addressing America’s food losses. Food Review, Vol. 20, pp. 3-11.

96. Kathryn A. Onken, (2010)"willingness to pay for locally grown, organic and natural foods: implications for producers and state-sponsored agricultural marketing programs", PhD Thesis, University of Delaware, pp. 14-20.
97. Kathryn A. Onken, John C. Bernard, (2011) "Comparing Willingness to Pay for Organic, Natural, Locally Grown, and State Marketing Program Promoted Foods in the Mid-Atlantic Region". Agricultural and Resource Economics Review, Vol. 40, No.1, pp. 33–47 .
98. Kiple, Kenneth F. and Kriemhild Conee Omelas. (2000) The Cambridge World History of Food. Cambridge, UK: Cambridge University Press. pp. 23.
99. Kishor Kumar, D. Basavaraja, H. and Mahajanshetti, S.B. (2006) "An Economic Analysis of Post Harvest Losses in Vegetables in Karnataka", Indian Journal of Agricultural Economics, Vol. 61, No. 1, pp. 134-146.
100. Kitinoja, L., Saran, S., Roy, S.K. and Kaderc, A.A. (2011). "Post Harvest Technology For Developing Countries: Challenges And Opportunities In Research, Outreach And Advocacy". Journal of Food Science and Agriculture, Vol. 91, pp. 597–603. .
101. Kledal, P. R. & Sulitang, T, (2007) "The Organization Of Organic Vegetable Supply Chains In China: Flexible Property Rights And Different Regimes Of Small Holder Inclusion", EAAE Pro-poor Development In Low Income Countries: Food,-54-Agriculture Trade.
102. Kotur S.L. and Kumar S. (1976) "Effect of Molybdenum On Cauliflower." South Indian Horticulture, Vol. 24, No. 4, pp. 145.
103. Krishnamurthy, A.T., Sanathkumar, V.B. and Basvaraju, (2007) "A Study On Awareness Of Soil And Water Testing And Adoption Level Of Dry Land, pp. 2.
104. Kumar, M.P, (2012) "A Study On Problems Of Marketing Vegetables In Farmers Market". International Journal Rural Development Management Studies Vol. 6. No. 1, pp. 241-251.
105. Lee Hau L., and Corey Billington, (1995) "The Evolution of Supply-Chain-Management Models and Practice at Hewlett-Packard. Interfaces", Vol. 25, pp. 42-63.

106. Lee Hau L., and Corey Billington, (1995) "The Evolution of Supply-Chain-Management Models and Practice at Hewlett-Packard. Interfaces", Vol. 25, pp. 42-63.
107. Lee, S.K. and Kader, A. A. (2000). "Pre Harvest And Postharvest Factors Influencing Vitamin C Content Of Horticultural Crops". Postharvest Biology and Technology, Vol. 20, pp. 207–220.
108. Lowder, A. C. (2018), Social Protection And Agriculture: Introduction to the Special No., Global Food Security,. Vol. 1, pp. 65-68.
109. M Raja Krishna Murthy, GP Reddy, KH Rao, (2012) "Estimating Market Efficiency & Price Mechanism In Retailing Of Fresh Vegetables In Andhra Pradesh". Radix International Journal Of Research In Marketing, Vol. 1, No. 11, pp. 1-2.
110. M. Lalitha. V. Kasthuri Thilagam, N. Balakrishnan and Mostafa Mansour, (2010) "Effect of Plastic Mulch On Soil Properties And Crop Growth – A Review", Agriculture Review, Agricultural Research Communication Centre, Vol. 31, No. 2, pp. 145 – 149.
111. M.S. Jairath, (2008) "Trends in Private and Public Investments in Agricultural Marketing Infrastructure in India", Agricultural Economics Research Review, Vol. 21, pp. 371-376.
112. Malay K. Bhowmick, Madhab C. Dhara, Sudhanshu Singh, Manzoor H. Dar, Uma S. Singh, (2014) "Improved Management Options for Submergence-Tolerant Rice Genotype in Flood-Prone Rainfed Lowlands of West Bengal", American Journal of Plant Sciences
113. Mandeep Singh and Joshi. A.S. (2008), "Economic Analysis of Crop Production and Dairy Farming on Marginal and Small Farms in Punjab" Agricultural Economics Research Review, Vol. 21, No.2, pp-30.
114. Martin, S. & Jagadish, A. (2006) "Agricultural Marketing And Agribusiness Supply Chain No.s in Developing Economies: The Case Of Fresh Produce in Papua New Guinea." Paper Presented at the New Zealand Agricultural and Resource Economics Society Confere.

115. Meena, K.C. and Dr. Babel, K.S., (2003) "Information Source Used By The Cabbage Growers", Agricultural Extension Review, pp. 15-19.
116. Mena, C., Adenso-Diaz, B., & Yurt, O. (2011). "The Causes Of Food Waste In The Supplier-Retailer Interface: Evidences from the UK and Spain. Resources, Conservation and Recycling", Vol. 55, No. 6, pp. 648-658. .
117. Mentzer J. T. , DeWitt V, Keebler K. S., Min S., Nix N. W. and Smith. C. D, (2001) "Defining Supply Chain Management, "Journal of Business Logistics, Vol. 22, No.2.
118. Mentzer J. T. , DeWitt V, Keebler K. S., Min S., Nix N. W. and Smith. C. D, (2001) "Defining Supply Chain Management, "Journal of Business Logistics, Vol. 22, No.2 .
119. Michael Boehlje, Steven L Hofing, R Christopher Schroeder, (1999) "Value Chains In The Agricultural Industries", Department of Agricultural Economics Purdue University, Agriculture Education & Consulting, LLC, pp. 5-22.
120. Michael G. Jacobides, "Industry Change Through Vertical Dis-integration: How And Why Markets Emerged", Academy of Management Journal, Vol.3, pp.79-86.
121. Milczarek-Andrzejewska, D, Malak-Rawlikowska, A., Falkowski, J., & Wilkin, J. (2008) "Supply Chain Restructuring And Its Impact On Famers' Income- The Evidence From The Dairy Sector In Poland". Paper Presented at the 12th EAAE Congress
122. Ministry of Commerce And Industry, Department Of Commerce Government Of India, http://commerce.gov.in/InnerContent.aspx?Id=83.
123. Modalia, V.K. and Jajwadi, R.B., (1976) "Adoption of Agricultural Innovations –A study", Kurukshetra, Vol. 24, No. 10, pp.14-15.
124. Moorthi T.V. and Mellor W.J. (1972), "Cropping Pattern Yields and Income under Different Sources of Irrigation with Special Reference to IADP, Aligarh District, Uttar Pradesh", Indian Journal of Agricultural Economics, Vol. 27, No. 4, pp.117-125.

125. Murthy, D. S., Gajanana, T. M., Sudha, M., & Dakshinamoorthy, V. (2009). "Marketing and Post harvest Losses In Fruits: Its Implications on Availability and Economy". Indian Journal of Agricultural economics, Vol. 64, No. 2, pp. 259-275. .
126. N. G. Tzortzakis, (2009) "Effect of Pre-sowing Treatment On Seed Germination And Seedling Vigour In Endive And Chicory", Horticulture Science, (Prague), Vol. 36, No. 3, pp. 117–125.
127. Nagarajan M. and So i G., (2004) "Stable Far Sighted Coalitions in Competitive Markets" Management Science, Vol. 53, No. 1, pp. 29-45.
128. Nanak Kakwani, Hyun Hwa Son, (2017), "Social Welfare Foundations And Development", Measurement and Policy Applications, pp. 77-109
129. Narendra Kumar I. and Chandrasekar Rao G. (2007),"Impact of Irrigation on Employment", Southern Economist, Vol.46, No.7, pp.13-14.
130. Naresh Singla, Sukhpal Singh, Paramjeet Kaur Dhindsa, (2011) "Fresh Food Supermarkets in the Indian Punjab: Organisation and Impacts", Journal Of Physics And Science, Vol.21, No. 1 , pp. 91-108.
131. Navalawala B.N. (1995), "Waterlogging – Problems and Solutions", Yojana, Vol. 39, No.11, pp.39. .
132. Nicholas Minot and Ruth Vargas Hill, (2007) "Developing And Connecting Markets For Poor Farmers", International Food Policy Research Institute, Vision 2020, pp. 1-4.
133. Nicholas Roberts and Varun Grover, (2012) "Absorptive Capacity and Information Systems Research: Review, Synthesis, and Directions for Future Research", Society for Information Management, Vol. 36, No. 2, pp. 625-648.
134. Nirmala, L.,Ranganathan, G. and Ashokan, M. (2002) "Constraints of bio fertilizers adoption", Agricultural Extension Review, p. 30-31.
135. Novack R. A. and Simco S. W., (1991) "The Industrial Procurement Process: A Supply Chain Perspective", Journal of Business Logistics, Vol. 12, No. 1, pp. 145-67.

136. Ozcan, M. (2007). Affects on Quality and Durability of Harvest and Post-Harvest Practices in Horticultural Products. Retrieved September 18, 2013, from http://www.carsambaziraatodasi.com/ab1_1.asp.
137. Ozcan, M. (2007). Affects on Quality and Durability of Harvest and Post-Harvest Practices in Horticultural Products. Retrieved September 18, 2013, from http://www.carsambaziraatodasi.com/ab1_1.asp,.
138. P. K. Suri and Sushil , (2006) "E-Governance through Strategic alliances - A case of agricultural marketing information system in India", IIMB Management Review 18, No. 4, pp. 389-401.
139. P. K. Suri and Sushil, (2006) "E-Governance Through Strategic Alliances - A Case Of Agricultural Marketing Information System in India", IIMB Management Review, Vol. 18, No. 4, pp. 389-401 .
140. Padheria, (1973) "Farmer Resistance To Technological Change In Dholka Taluk A Of Gujarat State", PhD. Thesis, Gujarat Agricultural University.
141. Parit, R.N. Bhosale, S.S. and Dr. Patil, H.K., (2005) "Resource Use Efficiency And Profitability Of Tomato Crop In North Konkan Coastal Zone Of Maharashtra", Rural India, pp. 232-234.
142. Patel, Y.A.S. and Modalia, V.K., (1974) "Adoption Of Improved Farm Practices In Village Bajpura", Kurukshetra, Vol. 21, No. 23, pp. 14.
143. Patel, Y.A.S. and Modalia, V.K., (1974) "Adoption Of Improved Farm Practices In Village Bajpura", Kurukshetra, Vol. 21, No. 23, pp. 17.
144. Patel, Y.A.S. and Modalia, V.K., (1974) "Adoption Of Improved Farm Practices In Village Bajpura", Kurukshetra, Vol. 21, No. 23, pp. 26.
145. Paulrajan Rajkumar and Fatima Jacob, (2010) "Business Models of Vegetable Retailers in India", Great Lakes Herald, Vol. 4, No. 1, pp. 31.
146. Pepijn Schreinemachers, E. B. (2018), Tapping The Economic And Nutritional Power Of Vegetables, Global Food Security, . Vol.16, pp. 36-45.
147. Pirog, Rich and Benjamin, Andrew. (2003), "Checking The Food Odometer", Comparing Food Miles For Local Versus Conventional Produce Sales To Iowa Institutions, Lowa State University.

148. Planning Commission, (1964), "Criteria for Appraising the Feasibilities of Irrigation Projects", Government of India, New Delhi, pp.7.
149. Praduman kumar and Mruthyunjaya, (1995) "Demand For Fruits And Vegetables In India", Agriculture Economics Research Review, Vol. 8. No. 2 , pp.7-17.
150. Prasad K.K., Choudhary B.M., and Kumar Amarendra, (1997) "Response of Tomato To Boron Application in Chhotanagpur Region". Journal of Research (B.A.U.), Vol. 9, No. 2, pp. 145-147.
151. Radha Krishnan, Nigam. S. and Shantanu Kumar (2008), "Contribution of Livestock in Indian Scenario", Agricultural Situation in India, Vol. 66, No.1, April, pp. 25-28.
152. Rai, H.N., (1965) "Diffusion Of Information And Farmers Response In Relation To Improved Farm Practices", Indian Journal of Extension Education, Vol. 1, No. 2, pp. 23-25.
153. Rao, C.S.S. and Raheja, P.C., (1959) "Evaluation Of Extension Methods And Changing The Attitude Towards Improved Farm Practices", Indian Journal of Agronomy, Vol. 3, No. 3, pp. 194.
154. Rasis Ahmad (1998), "Water for Irrigation-An Overview", Edited By Farooq Khan, Water Resource Management Thrust and Challenges, Anmol Publications Pvt. Ltd., New Delhi, pp. 195.
155. Raveesh kumar gangwar, (2012) "Pest Succession And Management Of Shoot And Fruit Borer,Leucinodes Orbonalis Guenee Of Brinjal", Ph.D. Thesis, Sardar Vallabhbhai Patel University Of Agriculture & Technology, Meerut, Vol. 1, pp.33-42 .
156. Ray Chaudhuri Mausumi , (2005) "Nutrients Management Of Acid Soils Of The North-East India", Indian Farming , Vol. 1, pp. -22-25.
157. Rehman, M. u., Khan, N., & Jan, I. (2007). "Post Harvest Losses In Tomato Crop (A Case of Peshawar Valley)". Sarhad Journal of Agriculture, pp. 1279-1284.
158. Robert J., (2010)"A Century Of Research On Agricultural Markets", American Journal Agriculture of Economics, Vol. 92, No. 2, pp. 376-402.

159. Rodrigues Neto Angéloco L, Arces de Souza GC, Almeida Romão E, Garcia Chiarello P,(2018,) "Alkaline Diet and Metabolic Acidosis: Practical Approaches to the Nutritional Management of Chronic Kidney Disease" Journal of Renal Nutrition, Vol. 28, Issue 3, pp. 215-220.
160. Ronald lester Mighell and Lawrence arthur Jones, (1963) "Vertical Coordination in Agriculture", Farm Economics Division, Economic Research Service, U.S. Department of Agriculture, Vol. 1, No. 19, pp. 45-77.
161. Roy L.B., Rheenen W.V., Abraham T. and Habte A. (1999), "Farmers Participation And The Hare Irrigation Project", Integrated Development for Water Supply and Sanitation, 25thWEDC Conference, Addis Ababa, Ethiopia, pp. 252.
162. S.H. Baba, M.H. Wani, S.A. Wani and Shahid Yousuf, (2010) "Marketed Surplus And Price Spread Of Vegetables In Kashmir Valley", Agricultural Economics Research Review , Vol. 23, pp. 115-127.
163. S.H. Baba, S.A. Mir, Aijaz A. Khan, N.H. Bazaz and Muzaffer Manzoor, (2015) "Rural Infrastructure And Agricultural Growth Linkages In Jammu and Kashmir", Economics Affairs, Vol. 60, No.1, pp.143-150.
164. Saha, N.K. (1973), "Adoption Problem Of Small Farmers" Kurukshetra, Vol. 20, pp.10-11.
165. Samson, (2014), Online International Interdisciplinary Research Journal, vol. 4, pp. 375-882
166. Saha, N.K., (1973) "Adoption Problem Of Small Farmers", Kurukshetra, Vol. 20, pp. 20-21.
167. Sahay, R.R., "Role Of Size Of Farm, Farm Income And Farming Efficiency In The Adoption Of Improved Agricultural Techniques", M. Sc. Thesis (unpublished), Bihar Agricultural College, Sabour, Bhagalpur, 1960.
168. Sandeep Sachdeva, Tilak R Sachdev, Ruchi Sachdeva, "Increasing Fruit And Vegetable Consumption: Challenges and Opportunities", Indian s, Vol. 38, No. 38, pp. 192-197.

169. Sangita Mehta, Birendra Prasad, Das, A. K., (2016) “Pre-sowing Seed Treatments With Different Chemicals And Growth Regulator On Seed Germination And Growth Of Passion Fruit.”, Advance Research Journal of Crop Improvement, Vol.7, No. 2, pp.201-206.
170. Sanjai Bhagat James A. Brickley Ronald C.Lease, (1985) “Incentive Effects Of Stock Purchase Plans”, Journal of Financial Economics, Vol. 14, No. 2, pp. 195-215.
171. Sandeep Sachdeva, Tilak R Sachdev, Ruchi Sachdeva, (2013) “Increasing Fruit And Vegetable Consumption: Challenges and Opportunities”, Indian Journal for Community Medicine, Volume 38, Issue 38, pp. 192-197
172. Saxena, K.B.C., & Sahay, B.S. (2000) “Managing It For World Class Manufacturing: The Indian Scenario”, International Journal of Information Management, Vol. 20, pp. 29-57.
173. Scott C. and Westbrook R., (1991) “New Strategic Tools for Supply Chain Management, "International Journal of Physical Distribution & Logistics Management, Vol. 21, No. 1, pp 23-33.
174. Seema Rawat, (2015) “Food Spoilage: Microorganisms and their prevention”, Asian Journal of Plant Science and Research, Pelagia Research Library, Vol. 5, No. 4, pp.47-56.
175. Sekara, A. Cebula, S., (2008) Cultivated eggplants – “origin, breeding objectives and genetic resources”, A Review, Food and Agriculture organization of the united nation.
176. Sengupta, Anirban., (2008) “Emergence of modern Indian retail: an historical perspective”. International Journal of Retail & Distribution Management, Vol. 36, No. 9, pp. 89-700.
177. Sharma, G., & Singh, S. (2011). “Economic Analysis of Post-harvest Losses in Marketing of Vegetables in Uttarakhand”. Agricultural Economics Research Review, Vol. 24, pp. 309-315.

178. Sharma, G., & Singh, S. (2011). “Economic Analysis of Post-harvest Losses in Marketing of Vegetables in Uttarakhand”. Agricultural Economics Research Review, Vol. 24, pp. 309-315.
179. Sharma, N., Garcha, S. and Singh, S. (2013). Potential of Lactococcus Lactis Subspecies Lactis Mtcc 3041 As A Bio Preservative. Journal of Microbiology, Biotechnology and Food Sciences, Vol. 3, No. 2, pp. 168-171.
180. Shawn Cole, Barrett Kirwan, (2009) “Between the Corporation and the Household: Commodity Prices, Risk Management, and Agricultural Production in the United States”, American Journal of Agricultural Economics, Vol. 91, No. 5, pp. 1243–1249.
181. Shrivastava, K.K., Trivedi, M.S. and Lakhera M.L., (2002) “Knowledge and adoption behavior of chilli growers”, Agricultural Extension Review, Vol. 14, No. 4, pp. 22-25.
182. Shrivastava, K.K., Trivedi, M.S. and Lakhera M.L., (2002) “Knowledge and Adoption Behavior Of Chilli Growers”, Agricultural Extension Review, Vol. 14, No. 4, pp. 22-25.
183. Shukla V.P. (1973), “Well Irrigation – Its Costs and Benefits in Jabalpur District in Madhya Pradesh”, Indian Journal of Agricultural Economics, Vol. 28, No. 4, pp.235. .
184. Shukla, M., & Jharkharia, S. (2013). “Agri-fresh produce supply chain management: a state-of-the-art literature review”. International Journal of Operations & Production Management, Vol. 33, No. 2, pp.114-158. .
185. Shukla, M., & Jharkharia, S. (2013). “Agri-Fresh Produce Supply Chain Management: A State Of The Art Literature Review”. International Journal of Operations & Production Management, Vol. 33, No. 2, pp.114-158.
186. Siddique, S. A. (2018). Green Vegetables force Mechanism in Ranchi Market. IOSR Journal of Business and Management , 20, No. 6, pp. 58-63.
187. Singgih, S., & Woods, E. (2002) “Banana Supply Chains In Indonesia And Australia: Surviving Isolation From End Markets”. International Farm Management Congress, Australia.

188. Singh R.K., Choudhary B.M. and Singh, R. P. Ratan, (1996) "Overcoming Lower Productivity And Profitability In Rainy Season Cauliflower Through Farmers Participatory Approach", Recent trends in Horticultural Research, 2001, Horticultural Society.
189. Singh, A. and Singh, Y. (1992). "Effect Of Vibration During Transportation On The Quality Of Tomatoes". Journal of Agriculture Machinery, Asia, Africa and Latin America, Vol. 23, pp. 57-62.
190. Singh, A. and Singh, Y. (1992). "Effect Of Vibration During Transportation On The Quality Of Tomatoes". Journal of Agriculture Mechinary, Asia, Africa and Latin America, Vol. 23, pp. 70-72.
191. Singh, A.K. Singh, A. Kumari and Chandra, P., "Cultivation Of Tomato In Green House", Intensive Agriculture, pp. 14-16.
192. Singh, A.N., "A Study Of Farmers Response Towards High Yielding Varieties", M. Sc. Thesis, Bihar Agricultural College, Sabour, Bhagalpur, 1968.
193. Singh, D.P. and Singh, H.P. (1987) "Horticultural Development in Chotanagpur plateau-A strategy", Chotanagpur Horticulture, Vol. 4, No. 2&3, pp.13.
194. Singh, D.P. and Singh, H.P., (1987) "Horticultural development in Chotanagpur plateau-A strategy", Chotanagpur Horticulture, Vol. 4, No. 2&3, pp.34.
195. Singh, D.P., (1990) "Horticultural Development in Tribal areas of Bihar: Challenge Ahead", Chotanagpur Horticulture, Vol. 7, No. 4.
196. Singh, K.N. and Choubey, C.L., (1975) "Operational Farm Size And Differential Adoption Of High Yielding Varieties Technology", Indian Journal of Extension Education, Vol. 10, No. 1&2, pp.42.
197. Singh, S. P., Sikka, B. K., & Singh, A. (2009). Supply Chain Management and Indian Fresh Produce Supply Chain: Opportunities and Challenges.
198. Singh, S.K. Singh, S.D. Singh, M.P. and Chauhan, J., (2004) "Role Of Micro Farming In Poverty Alleviation", Agricultural Extension Review, pp. 27-30.
199. Singh, T. S. (2017), An Analysis on Problems of Vegetables Marketing in Farmers' Market of Jharkhand - A Case Study in Ranchi District, MPRA, PUSA Bihar, . Vol. 1, pp. 1-16.

200. Socio-Economic Research, Planning Commission, Government of India, (2013), Estimation Loss of Horticulture Produce due to Non-Availability of Post Harvest & Food Processing Facilities in Bihar & UP, ASET, New Delhi, pp. 3-10.
201. Somashekaraiah N.T. and Mahendra Kumar S. (2008),"Tube Well Irrigation on Resource Use Efficiency in Agriculture", Vol. 47, No.12, Southern Economist, pp. 9-13.
202. State Planning Board, (1975) Minor Irrigation in Kerala: An Evaluation Study, Government of Kerala, Trivandrum, pp. 44-45.
203. Special issue of Pratiyogita Darpan "INDIAN ECONOMY"- 2015.
204. Sudheer, K.P. and Indira, V. (2007). Post Harvest Technology Of Horticultural, pp. 01-05.
205. Surabhi Mittal, (2007) Indian Council For Research On International Economic Relations, "Can Horticulture Be A Success Story For India?" ICRIER, New Delhi, pp. 22-33.
206. Suryawanshi S.D. and Kapase P.M. (1985), "Impact of Chod Irrigation Project on Employment of Female Agricultural Labour", Indian Journal of Agricultural Economics, Vol. 11, No. 3, pp. 240-244.
207. Tara Shankar and K.M. Singh, (2016) "An Analysis of Marketed Surplus and Price Spread of Cauliflower in S. Chotanagpur (Jharkhand) for Sustainable financial inclusion of Tribal Farmers", Munich Personal RePEc Archive (MPRA), Vol. 1, pp. 1-10.
208. Thomas Reardon ,Christopher B. Barrett, "Agroindustrialization, Globalization, and International Development: An Overview of No's, Patterns, and Determinants", Agricultural Economics, The Journal of the International Association And Agriculture Economy.
209. Thyagarajan S., and Prabhu R., (2005) "Recommended Technologies Adopted By Tomato Growers", Agricultural Extension Review,March-April, Vol. 17, No. 2, pp. 27-30.

210. Towill D. R., N. M. Naim and J. Wikner. (1992) “Industrial Dynamics Simulation Models in the Design of Supply Chains”, International Journal of Physical Distribution and Logistics Management, Vol. 22, No. 5, pp. 3-13.
211. Uma Shankar singh & Uma sankar mishra, (2013) “Vegetables Supply Chain: A Conceptual Study”, Food Science & Quality Management, Vol.15, pp.32.
212. Uma Shankar Singh, Uma Sankar Mishra, (2013) “Vegetable Supply Chain: A Conceptual Study”, Food Science and Quality Management, Vol. 15, pp. 30-32.
213. Vaart T. V. And Pieter D., (2003) “Buyer-Focused Operations As A Supply Chain Strategy", International Journal of Production and operation Management, Vol. 26, No. 1, pp8-23.
214. Vander Vorst, J. G. A. J., Tromp, S. O., and Vander Zee, D. J., (2009) “Simulation Modeling For Food Supply Chain Redesigns; Integrated Decision Making On Product Quality, Sustainability And Logistics”, International Journal of Production Research, Vol. 7, pp.24.
215. Veena, Babu, K. N., & Venkatesha, H. R. (2011). “Supply Chain: A Differentiator in Marketing Fresh Produce”. The IUP Journal of Supply Chain Management, Vol. 8, No.1, pp. 23-36.
216. Verma, A. Kumar Sanjeev and Singh, K.P., (2004) “PRA Approach For Loss Assessment Of Vegetable: No’s”, Agricultural Extension Review, pp. 21-24.
217. Vipul Chandra Tolani and Huzefa Hussain, (2013) “Strategic Change in Model of Fruit and Vegetables Supply Chain”, Global Journal of Management and Business Studies. Vol. 3, No. 9, pp. 965-970.
218. Viswanadham, N. (2007). Can India Be The Food Basket For The World?, WorkingPaperseries,IBS,Hyderabad.Retrievedfrom,http://www.cccindia.co/core centre/Database/Docs/DocFiles/Can_India_be.pdf .
219. Vulavala jyoshna, (2003), “Optimum Production Pattern For Farmers In Chittoor District, Andhra Pradesh”, PhD. Thesis, Acharya N.G. Ranga Agricultural University.

220. Vyas V.S. and Mathai G. (1978), "Farm and Non-Farm Employment in Rural Areas: Perspective for Economic Planning", Economic and Political Weekly, Vol. 28, No. 6 & 7, pp.85.
221. Wasala, C. B., Dissanayake, C. A. K., Dharmasena, D. A. N., Gunawardane, C. R., and Dissanayake, T. M. R. (2014). "Postharvest Losses, Current No's and Demands For Postharvest Technologies For Loss Management In The Main Banana Supply Chains in Sri Lanka.
222. William G. Tomek and Robert J. Myers, (1993) "Empirical Analysis of Agricultural Commodity Prices: A Viewpoint", Review of Agricultural Economics , Vol. 15, No. 1, pp. 181-202 .
223. William K. Easter and Lee R. Martin (1977), "Water Resource Problems in Developing Countries", Bulletin Number 3, University of Minnesota, pp. 1-107.
224. Young, L. M., & Hobbs, J. E. (2002) "Vertical Linkages In Agri-Food Supply Chains: Changing Roles For Producers, Commodity Groups, and Government Policy". Review of Agricultural Economics, Vol. 24, No. 2, pp. 428-441.
225. Yumbya, P., Ambuko, J., Shibairo, S., and Owino, W. (2014). "Effect of Modified Atmosphere Packaging (MAP) on the Shelf Life And Postharvest Quality Of Purple Passion Fruit (Passiflora Edulis Sims)". Journal of Post-Harvest Technology, Vol. 2, No. 1, pp. 24-26.
226. Waghmare P.R. and Hedgier D.N. (2007), "Econometric Analysis Of Integrated Dairy Development Programme In Parbhani District", Agricultural Situation in India, Vol. 64, No.3, pp. 97-101.

WEBLIOGRAPHY

1. http://www.urbanext.uiuc.edu/veggies/cauliflower1.html
2. http://www.cauliflowerfestival.com/cauliflower-history.html
3. http://www.urbanext.uiuc.edu/veggies/cauliflower1.html
4. http://www.history.org/history/CWLand/resrch3.cfm
5. http://www.urbanext.uiuc.edu/veggies/cauliflower1.html
6. http://www.cauliflowerfestival.com/cauliflower-history.html
7. http://www.urbanext.uiuc.edu/veggies/cauliflower1.html
8. http://www.history.org/history/CWLand/resrch3.cfm
9. http://discworld.imaginary.com/lpc/links/cabbage/cabbage.html
10. http://cuke.hort.nesu.edu/cucurit/webner/vegcult/cauliflower.html
11. http://www.whfoods.com/genpage.php?tname=foodspice&bid=13
12. User point & click http://flickr.com/photos/hate_clothes/581079748/
13. User polar 905 http://flickr.com/photos/polar905/179735424/
14. User oh candy http://flickr.com/photos/sayonara/44813578/
15. User steve. wilson http://flickr.com/photos/steve-wilson/823568320/
16. User dey http://flickr.com/photos/dey/95133323/
17. User flickrichhttp://flickr.com/photos/richardthomas78/251685311/
18. User Andy2Boyzhttp://flickr.com/photos/andy2boyz/508412811/
19. User flickrichhttp://flickr.com/photos/richardthomas78/486305014/
20. User oldboneshttp://flickr.com/photos/gembone/2271326136/
21. User Ian Fullerhttp://flickr.com/photos/ianfuller/205402306/
22. Userpizzodisevohttp://flickr.com/photos/globetrotter1937/2182404943/
23. User In Praise of sardineshttp://flickr.com/photos/83096974@N00/475025885/
24. User nephttp://flickr.com/photos/nep/2783599/
25. User ksbuehlerhttp://flickr.com/photos/buehlerphoto/2241524705/
26. User IwateBuddyhttp://flickr.com/photos/brucewood/1437492113/
27. User ateotohttp://flickr.com/photos/ateoto/218097901/
28. User cava cavienhttp://flickr.com/photos/cava_cava/276127828/
29. User wistinehttp://flickr.com/photos/wistine/739410127/

30. https://en.wikipedia.org/wiki/Phaseolus_vulgaris
31. https://relianceretail.com/reliance-fresh.html
32. https://relianceretail.com/
33. www.reliancefresh.co.in/
34. https://en.wikipedia.org/wiki/Reliance_Fresh
35. https://www.bigbazaar.com/
36. https://en.wikipedia.org/wiki/Big_Bazaar
37. www.futureretail.in/businesses/big-bazaar.html
38. www.futuregroup.in/pdf/bb_ranchi_birthday2.pdf
39. www.futuregroup.in/
40. Amla Cluster Production & Processing Sansthan, c.ted india.org
41. Small Farmers‟ Agribusiness Consortium (SFAC), http://sfacindia.com
42. Fruit & Vegetable Processing Cluster, Pune ,http://www.punebds.com
43. Global Green contract farming, http://www.globalgreengroup.com
44. http://www.rierc.org/marketing/paper34.pdf
45. https://en.wikipedia.org/wiki/Betawad
46. https://www.census2011.co.in/data/village/
47. https://academics.hamilton.edu/foodforthought/Our_Research_files/cabbage_cauliflower_kale.pdf
48. www.growtomatoes.com
49. www.madaboutberries.com/tomatoes/tomato-types-and-varieties.html
50. https://academics.hamilton.edu/foodforthought/Our_Research_files/beans_peas.pdf
51. https://www.slideshare.net/vagoel84/vishal-customer-relationship-management-new-1
52. https://www.indiaretailing.com/uploads/Market_Research_pdf/13-Reliance_Fresh-Amity.pdf

ANNEXURE – I

ICFAI UNIVERSITY, JHARKHAND

QUESTIONNAIRE FOR FINDING THE VARIATION IN THE PRICE OF VEGETABLES

This questionnaire is designed for academic research & analysis the price variation of vegetables.

Annexure – I (A)

Questionnaire for Organized Retailer

1. **Name of the Retailer/Wholesaler:-**
2. **Location:-**
3. **Contact No:-**
4. **Vegetables are processed by:-**
   a. Farmer
   b. Self Farming
   c. Others
5. **Vegetables are brought by:-**
   a. Producer
   b. Agents
   c. Wholesaler
   d. Others
6. **Purchasing and Selling price of the Vegetables(Season Wise):-**

Vegetables Name	Purchasing Price(Rs/Tons)			Selling Price (Rs/Tons)		
	Pre Monsoon	Monsoon	Pre Monsoon	Pre Monsoon	Monsoon	Pre Monsoon
Cauliflower						
Cabbage						
Beans						
Brinjal						
Bottle Guard						
Tomato						

7. **Transportation Cost :-**

8. **Packaging Cost:-**

9. **Merchandising Cost:-**

10. **Reprocessing Cost:-**

11. **Any other Cost:-**

12. **Type of Storage Facilities used**:-

13. **Number of Distributors/Intermediaries:-**

ANNEXURE – I (B)

Questionnaire for Vegetable Farmer

1. **Vegetables Growers/Farmer Name:-**
2. **Address:-**
3. **Age:-**
4. **Type of Land:-**

Land Type	Pre Monsoon	Monsoon	Pre Monoson
Owner			
Lease			
Forward Trading			

5. **Name of the vegetables grown(Area and Season wise):-**

SN	Vegetables Name	Area(acres)	Seasons		
			Pre Monsoon	Monsoon	Pre Monsoon
1.	Cauliflower				
2.	Cabbage				
3.	Beans				
4.	Brinjal				
5.	Bottle Guard				
6.	Tomato				

6. **Cost of Production of Cauliflower, Cabbage, Beans, Brinjal, Bottle Guard, Tomato.**

S. N	Particulars	Rs/acres											
		Cauliflower		Cabbage		Beans		Brinjal		Bottle Guard		Tomato	
		Qty	Amt	Qty	Amt	Qty	Amt	Qty	Amt	Qty	Amt	Qty	Amt
1.	Seed												
2.	Labor												
3.	Fertilizer												
4.	Insecticide												
5.	Irrigation												
6.	Ploughing												
7.	Cost of production												
8.	Growth regulator												

7. Season variability of vegetables w.r.t production in tons:-

SN	Vegetables Name	July-Oct	Nov-Feb	March- June
1.	Cauliflower			
2.	Cabbage			
3.	Beans			
4.	Brinjal			
5.	Bottle Guard			
6.	Tomato			

8. Cost of Transportation and marketing for selling in the market:-

Market Type	Cost of Transportation		Cost of Marketing	
	Particulars	Amount	Particulars	Amount
Wholesale Market	1. 2. 3. 4. 5.		1. 2. 3. 4. 5.	
	Particulars	Amount	Particulars	Amount
Retail Market	1. 2. 3. 4. 5.		1. 2. 3. 4. 5.	

9. Post harvest losses:-

10. Quantity demanded by an Organized Retail Outlets which may affect the Selling Price of the grower:-

11. Satisfaction Level of the Retailers/Wholesaler:-

a. High b. Moderate c. Dissatisfied

12. Generally vegetables are sold to:-

a. Mahajans b. Agents c. Wholesaler d. Retailers e. Others

13. Who fixes the price of vegetables:-

a. Self decision b. Intermediaries c. others

14. What are the factors do you considered before fixing the price of a vegetables:-

a. Size of the vegetables
b. Quality of vegetables
c. Seasons
d. Any others

15. What are the major constraints regarding the production of vegetables:-

a. High labor cost
b. High fertilizer cost
c. High seed cost
d. Irrigation problems
e. High ploughing cost
f. Any other please specify

16. What are the major constraints regarding the marketing of vegetables:-

a. Lack of cold storage
b. Improper transaction
c. Political bandi
d. Involvement of middlemen
e. Transportation problems

17. Suggestion in improving the vegetables production:-

i.
ii.
iii.
iv.
v.

18. Suggestion in improving the vegetables marketing:-

a.
b.
c.
d.
e.

19. Any other suggestion if Any:-

ANNEXURE – II (A)

Vegetables Name	Seasons	Production per acres(Tons)	Production Cost(Rs.)		Transportation Cost(Rs.)		Packaging Cost(Rs.)		Total Cost form farmer side(Rs.)		Farmer SP(Rs.)		Farmer Profit(Rs.)		Retailers Profit(Rs.)		Consumer Price(Rs.)	
			Per Tons	Per Kgs	Per Tons	Per Kgs	Per Tons	Per Kgs	Per Tons	Per Kgs	Per Tons	Per Kgs	Per Tons	Per Kgs	Per Tons	Per Kgs	Per Tons	Per Kgs
Cauliflower	Pre-Monsoon	11.9 Tons	12875	12.87	3125	3.12	NIL		16000	16	18000	18	2000	2	12000	12	30000	30
	Post-Monsoon		10137	10.13	3125	3.12			13262	13.26	14000	14	737	0.73	4000	4	18000	18
	Monsoon		10675	10.67	3125	3.12			13800	13.8	15000	15	1200	1.2	11000	11	26000	26
Cabbage	Pre-Monsoon	20 Tons	10625	10.62	3125	3.12	NIL		13750	13.75	16000	16	2250	2.25	7000	7	23000	23
	Post-Monsoon		8262	8.26	3125	3.12			11387	11.37	14000	14	2613	2.61	3000	3	17000	17
	Monsoon		8487	8.48	3125	3.12			11612	11.61	14500	14.5	2888	2.88	4500	19	19000	19
Beans	Pre-Monsoon	4 Tons	8625	8.62	3125	3.12	270	0.27	12020	12.02	18000	18	5980	5.98	44000	44	62000	62
	Post-Monsoon		7137	7.13	3125	3.12	270	0.27	10532	10.53	21000	21	10467	10.46	29000	29	50000	50
	Monsoon		7087	7.08	3125	3.12	270	0.27	10482	10.48	26000	26	15517	15.51	32000	32	58000	58
Bottle Gourd	Pre-Monsoon	27 Tons	9875	9.87	3125	3.12	1000	1	14000	14	16500	16.5	2500	2.5	28500	28.5	45000	45
	Post-Monsoon		7462	7.46	3125	3.12	1000	1	11587	11.58	16000	16	4413	4.41	18000	18	34000	34
	Monsoon		7962	7.96	3125	3.12	1000	1	12087	12.08	16000	16	3913	3.91	24000	24	40000	40
Brinjal	Pre-Monsoon	50 Tons	9375	9.37	3125	3.12	150	0.15	12650	12.65	15000	15	2350	2.35	40000	40	55000	55
	Post-Monsoon		7662	7.66	3125	3.12	150	0.15	10937	10.93	12000	12	1063	1.06	24000	24	36000	36
	Monsoon		7837	7.83	3125	3.12	150	0.15	11112	11.11	12000	12	888	0.88	34000	34	46000	46
Tomato	Pre-Monsoon	34 Tons	15050	15.05	3125	3.12	2500	2.5	20675	20.67	25000	25	4325	4.32	55000	55	80000	80
	Post-Monsoon		12562	12.56	3125	3.12	2500	2.5	18187	18.18	30000	30	11813	11.81	35000	35	65000	65
	Monsoon		11512	11.51	3125	3.12	2500	2.5	17137	17.13	27000	27	9863	9.86	42000	42	69000	69

ANNEXURE – II (B)

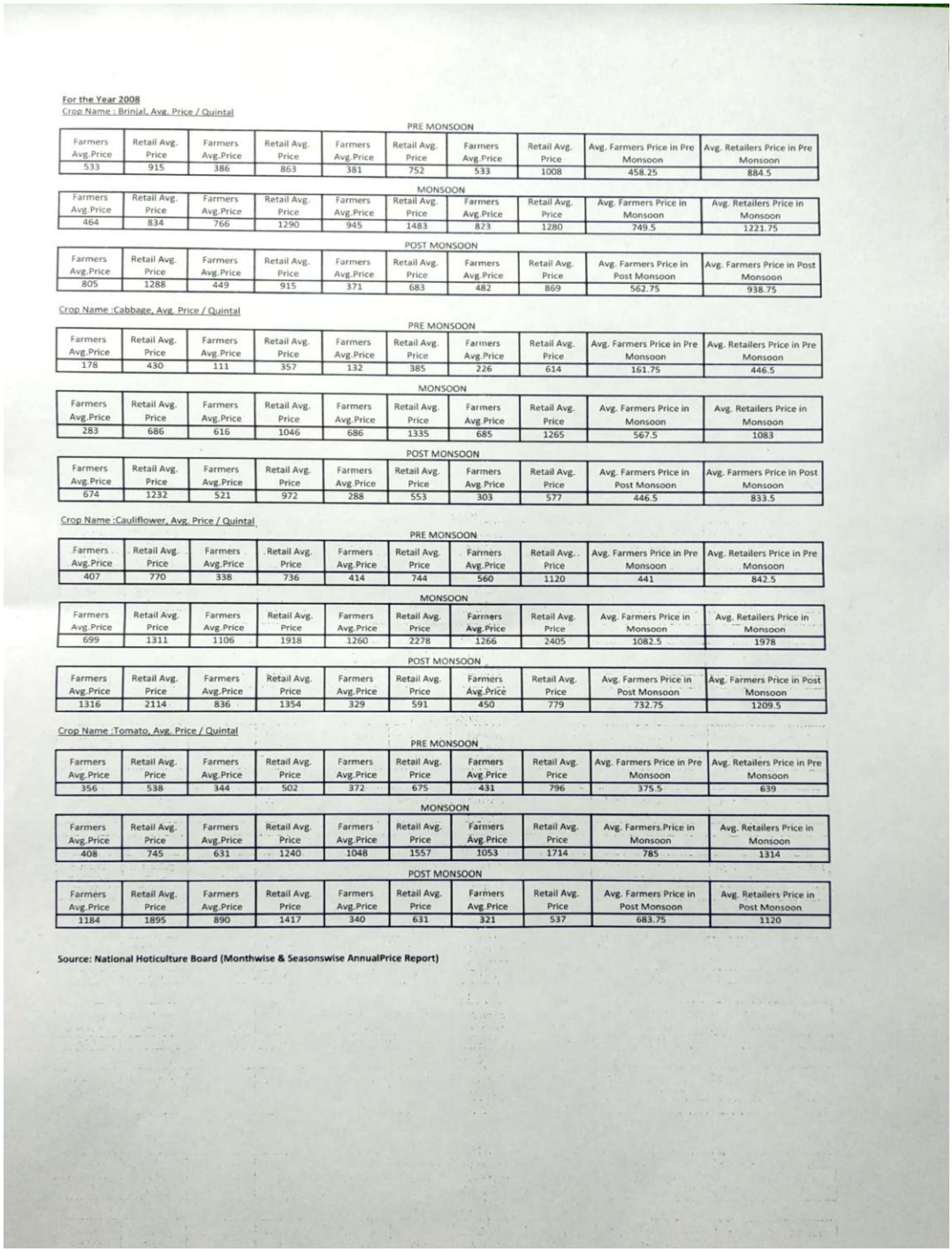
SCALE OF FINANCE FOR THE TOTAL COST OF CULTIVATION OF CONCERNED VEGETABLES

(Amt. in Rs.)

Sl. No	Name of the crop	Scales of Finance per Acre						
		Land preparation	Seed	Fertilised & Pesticide	Irrigation	Labour cost for cultivation & harvesting	Misc cost	Total Cost of Cultivation
1	Paddy (HYV)	5200	2000	3700	0	12300	4000	27200
2	Paddy SRI	5200	800	3700	900	9800	3000	23400
3	Maize	3400	2200	3200	0	8250	3000	20050
4	Wheat	5200	1900	3700	5600	9800	2650	28850
5	Pulses (Excluding Gram)	3050	800	2300	1500	4500	2100	14250
6	Gram	1000	3600	2000	1200	4750	2000	14550
7	Oil seeds (R & M)	3050	800	2300	1300	4600	2050	14100
8	Potato	5500	27400	9100	5500	9950	3000	60450
9	Ginger	4000	20000	5000	4500	21150	5200	59850
10	Tomato	3500	6000	5000	4000	15200	4200	37900
11	Brinjal	3500	5000	5000	3000	15200	4100	35800
12	Chilly	3500	6000	6000	3000	21150	4200	43850
13	Lady Finger	3500	5000	5000	4000	15200	4200	36900
14	Cauliflower	4000	4000	6000	4000	21150	5100	44250
15	Turmeric	3500	15000	2500	1500	21150	5200	48850
16	Watermelon	5000	8000	7000	6000	26050	6100	58150
17	Leafy vegetables	2500	3000	2000	2000	10300	3100	22900
18	Cabbage	4000	4000	3000	4000	15200	5100	35300

ANNEXURE – II (C)

PREVIOUS 12 YEARS NATIONAL HOTICULTURE BOARD (NHB) REPORT REGARDING THE PRICES OF FARMERS AND RETAILERS



For the Year 2008

Crop Name : Brinial, Avg. Price / Quintal

PRE MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Pre Monsoon	Avg. Retailers Price in Pre Monsoon
533	915	386	863	381	752	533	1008	458.25	884.5

MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Monsoon	Avg. Retailers Price in Monsoon
464	834	766	1290	945	1483	823	1280	749.5	1221.75

POST MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Post Monsoon	Avg. Farmers Price in Post Monsoon
805	1288	449	915	371	683	482	869	562.75	938.75

Crop Name :Cabbage, Avg. Price / Quintal

PRE MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Pre Monsoon	Avg. Retailers Price in Pre Monsoon
178	430	111	357	132	385	226	614	161.75	446.5

MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Monsoon	Avg. Retailers Price in Monsoon
283	686	616	1046	686	1335	685	1265	567.5	1083

POST MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Post Monsoon	Avg. Farmers Price in Post Monsoon
674	1232	521	972	288	553	303	577	446.5	833.5

Crop Name :Cauliflower, Avg. Price / Quintal

PRE MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Pre Monsoon	Avg. Retailers Price in Pre Monsoon
407	770	338	736	414	744	560	1120	441	842.5

MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Monsoon	Avg. Retailers Price in Monsoon
699	1311	1106	1918	1260	2278	1266	2405	1082.5	1978

POST MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Post Monsoon	Avg. Farmers Price in Post Monsoon
1316	2114	836	1354	329	591	450	779	732.75	1209.5

Crop Name :Tomato, Avg. Price / Quintal

PRE MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Pre Monsoon	Avg. Retailers Price in Pre Monsoon
356	538	344	502	372	675	431	796	375.5	639

MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers.Price in Monsoon	Avg. Retailers Price in Monsoon
408	745	631	1240	1048	1557	1053	1714	785	1314

POST MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Post Monsoon	Avg. Retailers Price in Post Monsoon
1184	1895	890	1417	340	631	321	537	683.75	1120

Source: National Hoticulture Board (Monthwise & Seasonswise AnnualPrice Report)

For the Year 2009

Crop Name : Brinjal, Avg. Price / Quintal

PRE MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Pre Monsoon	Avg. Retailers Price in Pre Monsoon
434	776	372	731	442	775	413	872	415.25	788.5

MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Monsoon	Avg. Retailers Price in Monsoon
492	982	838	1315	746	1215	963	1600	759.75	1278

POST MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Post Monsoon	Avg. Farmers Price in Post Monsoon
1112	1746	861	1510	720	1208	397	688	772.5	1288

Crop Name :Cabbage, Avg. Price / Quintal

PRE MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Pre Monsoon	Avg. Retailers Price in Pre Monsoon
386	635	432	817	400	848	525	1044	435.75	836

MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Monsoon	Avg. Retailers Price in Monsoon
628	1116	1054	1893	903	1576	758	1385	835.75	1492.5

POST MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Post Monsoon	Avg. Farmers Price in Post Monsoon
592	1674	624	1219	821	1196	281	525	679.5	1153.5

Crop Name :Cauliflower, Avg. Price / Quintal

PRE MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Pre Monsoon	Avg. Retailers Price in Pre Monsoon
461	743	479	858	515	1070	656	1232	527.75	975.75

MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Monsoon	Avg. Retailers Price in Monsoon
1105	1922	1688	2842	1165	2100	1204	2046	1290.5	2227.5

POST MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Post Monsoon	Avg. Farmers Price in Post Monsoon
1456	2587	882	1695	1170	2033	453	721	990.25	1759

Crop Name :Tomato, Avg. Price / Quintal

PRE MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Pre Monsoon	Avg. Retailers Price in Pre Monsoon
393	702	372	725	428	786	496	948	422.25	790.25

MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Monsoon	Avg. Retailers Price in Monsoon
709	1240	1083	1867	0	0	809	1360	867	1489

POST MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Post Monsoon	Avg. Retailers Price in Post Monsoon
923	1633	1622	1881	749	1317	365	532	914.75	1430.75

Source: National Horticulture Board (Monthwise & Seasonswise AnnualPrice Report)

For the Year 2010

Crop Name : Brinjal, Avg. Price / Quintal

PRE MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Pre Monsoon	Avg. Retailers Price in Pre Monsoon
513	961	437	908	540	1057	497	1076	496.75	1000.5

MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Monsoon	Avg. Retailers Price in Monsoon
685	1430	947	1624	783	1378	770	1377	796.25	1425.25

POST MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Post Monsoon	Avg. Farmers Price in Post Monsoon
782	1464	751	1925	838	1646	604	1165	743.75	1550

Crop Name :Cabbage, Avg. Price / Quintal

PRE MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Pre Monsoon	Avg. Retailers Price in Pre Monsoon
178	365	216	480	237	600	326	727	216.75	543

MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Monsoon	Avg. Retailers Price in Monsoon
0	0	0	0	1168	1910	736	1362	952	1636

POST MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Post Monsoon	Avg. Farmers Price in Post Monsoon
618	1224	632	1271	544	1138	402	779	549	1103

Crop Name :Cauliflower, Avg. Price / Quintal

PRE MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Pre Monsoon	Avg. Retailers Price in Pre Monsoon
213	487	310	640	560	1065	950	1652	508.25	961

MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Monsoon	Avg. Retailers Price in Monsoon
1440	2667	1597	2928	1559	2935	1218	2165	1469.25	2676.25

POST MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Post Monsoon	Avg. Farmers Price in Post Monsoon
1320	2152	1161	1992	1053	2069	608	1235	1035.5	1862

Crop Name :Tomato, Avg. Price / Quintal

PRE MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Pre Monsoon	Avg. Retailers Price in Pre Monsoon
222	500	489	924	443	857	539	1024	423.25	826.25

MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Monsoon	Avg. Retailers Price in Monsoon
956	1715	1419	2575	1442	2656	1258	2150	1268.75	2274

POST MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Post Monsoon	Avg. Retailers Price in Post Monsoon
778	1392	600	1129	743	1365	452	800	643.25	1171.5

Source: National Hoticulture Board (Monthwise & Seasonswise AnnualPrice Report)

For the Year 2011

Crop Name : Brinjal, Avg. Price / Quintal

PRE MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Pre Monsoon	Avg. Retailers Price in Pre Monsoon
735	1200	739	1392	638	1200	710	1400	710	1298

MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Monsoon	Avg. Retailers Price in Monsoon
872	1646	1150	2062	1305	2332	1179	2100	1126.5	2035

POST MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Post Monsoon	Avg. Farmers Price in Post Monsoon
1288	2396	1292	2225	743	1465	834	1546	1039.25	1908

Crop Name :Cabbage, Avg. Price / Quintal

PRE MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Pre Monsoon	Avg. Retailers Price in Pre Monsoon
455	925	546	1062	490	1010	313	777	451	943.5

MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Monsoon	Avg. Retailers Price in Monsoon
593	1485	1121	2000	1320	2440	1244	2324	1069.5	2062.25

POST MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Post Monsoon	Avg. Farmers Price in Post Monsoon
1267	2317	891	1683	418	904	620	1250	799	1538.5

Crop Name :Cauliflower, Avg. Price / Quintal

PRE MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Pre Monsoon	Avg. Retailers Price in Pre Monsoon
531	946	817	1485	635	1262	935	1754	729.5	1361.75

MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Monsoon	Avg. Retailers Price in Monsoon
1255	2377	1522	3269	2347	4060	1635	3432	1689.75	3284.5

POST MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Post Monsoon	Avg. Farmers Price in Post Monsoon
2391	4583	1480	2692	683	1350	1049	1850	1400.75	2618.75

Crop Name :Tomato, Avg. Price / Quintal

PRE MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Pre Monsoon	Avg. Retailers Price in Pre Monsoon
534	1096	855	1542	446	962	348	742	545.75	1085.5

MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Monsoon	Avg. Retailers Price in Monsoon
935	1846	1273	2415	1347	2564	1274	2408	1207.25	2308.25

POST MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Post Monsoon	Avg. Retailers Price in Post Monsoon
1389	2606	1389	2517	731	1442	827	1542	1084	2026.75

Source: National Hoticulture Board (Monthwise & Seasonswise AnnualPrice Report)

For the Year 2012

Crop Name : Brinjal, Avg. Price / Quintal

PRE MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Pre Monsoon	Avg. Retailers Price in Pre Monsoon
1114	1967	574	1191	530	1205	704	1441	730.5	1451

MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Monsoon	Avg. Retailers Price in Monsoon
1033	1919	931	1656	935	1604	931	1696	957.5	1718.75

POST MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Post Monsoon	Avg. Farmers Price in Post Monsoon
1050	1792	894	1617	884	1488	737	1413	891.25	1577.5

Crop Name :Cabbage, Avg. Price / Quintal

PRE MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Pre Monsoon	Avg. Retailers Price in Pre Monsoon
207	496	220	517	325	710	578	1230	332.5	738.25

MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Monsoon	Avg. Retailers Price in Monsoon
1118	2019	1079	1964	1271	2261	1062	2017	1132.5	2065.25

POST MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Post Monsoon	Avg. Farmers Price in Post Monsoon
1124	2158	793	1546	646	1242	249	633	703	1390.25

Crop Name :Cauliflower, Avg. Price / Quintal

PRE MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Pre Monsoon	Avg. Retailers Price in Pre Monsoon
434	1025	424	1026	508	1257	756	1556	530.5	1216

MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Monsoon	Avg. Retailers Price in Monsoon
1381	2269	1812	3348	1922	3587	1643	3308	1689.5	3128

POST MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Post Monsoon	Avg. Farmers Price in Post Monsoon
2443	3950	1226	2258	903	1684	580	1213	1288	2276.25

Crop Name :Tomato, Avg. Price / Quintal

PRE MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Pre Monsoon	Avg. Retailers Price in Pre Monsoon
290	610	510	1070	461	1005	673	1476	483.5	1038

MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Monsoon	Avg. Retailers Price in Monsoon
938	1742	1387	2524	1259	2630	1128	2124	1178	2259.5

POST MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Post Monsoon	Avg. Retailers Price in Post Monsoon
990	1750	1043	2442	675	1224	416	833	781	1562.25

Source: National Hoticulture Board (Monthwise & Seasonswise AnnualPrice Report)

For the Year 2013

Crop Name : Brinjal, Avg. Price / Quintal

PRE MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Pre Monsoon	Avg. Retailers Price in Pre Monsoon
811	1504	836	1526	674	1326	770	1623	772.75	1494.75

MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Monsoon	Avg. Retailers Price in Monsoon
920	1646	1237	2007	1258	2233	1041	1856	1114	1935.5

POST MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Post Monsoon	Avg. Farmers Price in Post Monsoon
1535	2463	2276	3550	1301	2172	868	1588	1495	2443.25

Crop Name :Cabbage, Avg. Price / Quintal

PRE MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Pre Monsoon	Avg. Retailers Price in Pre Monsoon
487	971	338	770	339	839	524	1012	422	898

MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Monsoon	Avg. Retailers Price in Monsoon
834	1521	1178	3137	1402	2592	1211	2140	1156.25	2347.5

POST MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Post Monsoon	Avg. Farmers Price in Post Monsoon
1416	2467	2111	3467	1107	1996	431	908	1266.25	2209.5

Crop Name :Cauliflower, Avg. Price / Quintal

PRE MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Pre Monsoon	Avg. Retailers Price in Pre Monsoon
805	1471	478	1052	482	1009	853	1683	654.5	1303.75

MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Monsoon	Avg. Retailers Price in Monsoon
1879	3196	2049	3478	2617	4100	2304	3720	2212.25	3623.5

POST MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Post Monsoon	Avg. Farmers Price in Post Monsoon
2843	5913	3410	5012	2099	3296	956	1740	2327	3992.5

Crop Name :Tomato, Avg. Price / Quintal

PRE MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Pre Monsoon	Avg. Retailers Price in Pre Monsoon
393	821	940	1596	541	1091	585	1177	619.75	1171.25

MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Monsoon	Avg. Retailers Price in Monsoon
1123	1767	2471	3652	1731	2675	1307	2764	1658	2714.5

POST MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Post Monsoon	Avg. Retailers Price in Post Monsoon
1889	2809	2401	3396	1336	2160	422	852	1512	2304.25

Source: National Hoticulture Board (Monthwise & Seasonswise AnnualPrice Report)

For the Year 2014

Crop Name : Brinjal, Avg. Price / Quintal

PRE MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Pre Monsoon	Avg. Retailers Price in Pre Monsoon
886	1561	913	1688	857	1677	856	1638	878	1641

MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Monsoon	Avg. Retailers Price in Monsoon
804	1592	1055	2004	1301	2327	1329	2312	1122.25	2058.75

POST MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Post Monsoon	Avg. Farmers Price in Post Monsoon
1134	2008	1302	2345	934	1896	770	1416	1035.25	1916.25

Crop Name :Cabbage, Avg. Price / Quintal

PRE MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Pre Monsoon	Avg. Retailers Price in Pre Monsoon
436	991	325	816	348	882	411	977	380	916.5

MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Monsoon	Avg. Retailers Price in Monsoon
660	1271	1250	3080	1470	2727	1343	2496	1180.75	2393.5

POST MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Post Monsoon	Avg. Farmers Price in Post Monsoon
1375	2725	938	1895	676	1384	783	1496	943	1875

Crop Name :Cauliflower, Avg. Price / Quintal

PRE MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Pre Monsoon	Avg. Retailers Price in Pre Monsoon
508	1117	416	984	710	1409	1504	2835	784.5	1586.25

MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Monsoon	Avg. Retailers Price in Monsoon
1993	3346	2772	4292	2778	4295	2767	6154	2578	4521.75

POST MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Post Monsoon	Avg. Farmers Price in Post Monsoon
2748	4396	1650	3023	938	1964	999	1956	1583.75	2843.75

Crop Name :Tomato, Avg. Price / Quintal

PRE MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Pre Monsoon	Avg. Retailers Price in Pre Monsoon
549	1048	685	1284	339	827	345	735	479.5	973.5

MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Monsoon	Avg. Retailers Price in Monsoon
608	1213	2232	3293	3764	5455	2362	3808	2241.5	3442.25

POST MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Post Monsoon	Avg. Retailers Price in Post Monsoon
1422	2538	1192	2023	901	1568	692	1240	1051.75	1842.25

Source: National Hoticulture Board (Monthwise & Seasonswise AnnualPrice Report)

For the Year 2015

Crop Name : Brinjal, Avg. Price / Quintal

PRE MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Pre Monsoon	Avg. Retailers Price in Pre Monsoon
1018	1729	958	1917	876	1983	861	1867	928.25	1874

MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Monsoon	Avg. Retailers Price in Monsoon
929	1835	1050	2008	1523	2812	1288	2275	1197.5	2232.5

POST MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Post Monsoon	Avg. Farmers Price in Post Monsoon
1574	2675	1014	2114	797	1575	874	1705	1064.75	2017.25

Crop Name :Cabbage, Avg. Price / Quintal

PRE MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Pre Monsoon	Avg. Retailers Price in Pre Monsoon
400	1000	479	1092	674	1409	772	1533	581.25	1258.5

MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Monsoon	Avg. Retailers Price in Monsoon
973	1885	1156	2381	1868	3108	1656	3000	1413.25	2593.5

POST MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Post Monsoon	Avg. Farmers Price in Post Monsoon
1230	2067	644	1333	460	1092	414	1545	687	1509.25

Crop Name :Cauliflower, Avg. Price / Quintal

PRE MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Pre Monsoon	Avg. Retailers Price in Pre Monsoon
739	1600	938	2033	966	2083	1238	2283	970.25	1999.75

MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Monsoon	Avg. Retailers Price in Monsoon
2208	3788	2493	4115	3326	5164	3676	5417	2925.75	4621

POST MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Post Monsoon	Avg. Farmers Price in Post Monsoon
2268	3750	943	2052	929	1954	720	1505	1215	2315.25

Crop Name :Tomato, Avg. Price / Quintal

PRE MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Pre Monsoon	Avg. Retailers Price in Pre Monsoon
378	800	852	1675	730	1561	969	1870	732.25	1476.5

MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Monsoon	Avg. Retailers Price in Monsoon
1632	2919	2228	3585	1688	3096	1899	3200	1861.75	3200

POST MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Post Monsoon	Avg. Retailers Price in Post Monsoon
2265	3375	1761	2771	753	1350	570	1123	1337.5	2154.75

Source: National Hoticulture Board (Monthwise & Seasonswise AnnualPrice Report)

For the Year 2016

Crop Name : Brinjal, Avg. Price / Quintal

PRE MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Pre Monsoon	Avg. Retailers Price in Pre Monsoon
2068	3296	1427	3767	1380	2636	987	1768	1465.5	2867.25

MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Monsoon	Avg. Retailers Price in Monsoon
904	1640	1030	2068	1245	2230	997	1983	1044	1980.25

POST MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Post Monsoon	Avg. Farmers Price in Post Monsoon
982	2054	1281	2292	1164	2328	1608	2824	1258.75	2374.5

Crop Name :Cabbage, Avg. Price / Quintal

PRE MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Pre Monsoon	Avg. Retailers Price in Pre Monsoon
1632	3375	2228	2771	1688	3090	1899	3200	1861.75	2154

MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Monsoon	Avg. Retailers Price in Monsoon
1177	1200	1249	2600	1654	2000	1834	2100	1478.5	1825

POST MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Post Monsoon	Avg. Farmers Price in Post Monsoon
1965	3371	1436	2538	811	1665	606	1200	1204.5	2193.5

Crop Name :Cauliflower, Avg. Price / Quintal

PRE MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Pre Monsoon	Avg. Retailers Price in Pre Monsoon
1177	1200	1249	2252	1654	2891	1834	3263	1478.5	2626.5

MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Monsoon	Avg. Retailers Price in Monsoon
1177	2100	1249	2252	1654	2891	1843	3263	1336.25	2475

POST MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Post Monsoon	Avg. Farmers Price in Post Monsoon
930	1200	1400	2000	1100	2000	1300	2100	1182.5	1825

Crop Name :Tomato, Avg. Price / Quintal

PRE MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Pre Monsoon	Avg. Retailers Price in Pre Monsoon
786	1632	3801	8536	3022	7617	2026	3946	2408.75	5432

MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Monsoon	Avg. Retailers Price in Monsoon
4583	9038	2692	5304	1350	2700	1850	3700	2618.5	5185

POST MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Post Monsoon	Avg. Retailers Price in Post Monsoon
2843	5700	3410	7000	2099	4200	1956	4000	2577	5225

Source: National Hoticulture Board (Monthwise & Seasonswise AnnualPrice Report)

For the Year 2017

Crop Name : Brinjal, Avg. Price / Quintal

PRE MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Pre Monsoon	Avg. Retailers Price in Pre Monsoon
1788	3088	1729	3004	1507	2646	779	1588	1450.75	2594

MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Monsoon	Avg. Retailers Price in Monsoon
937	2152	1105	2246	1580	2973	1432	2529	1263.5	2475

POST MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Post Monsoon	Avg. Farmers Price in Post Monsoon
935	1617	915	1772	979	2035	1016	2035	961.25	1864.75

Crop Name :Cabbage, Avg. Price / Quintal

PRE MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Pre Monsoon	Avg. Retailers Price in Pre Monsoon
1632	3375	2228	2771	1688	3090	1899	3200	1861.75	2154

MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Monsoon	Avg. Retailers Price in Monsoon
1177	1200	1249	2600	1654	2000	1834	2100	1478.5	1825

POST MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Post Monsoon	Avg. Farmers Price in Post Monsoon
1965	3371	1436	2538	811	1665	606	1200	1204.5	2193.5

Crop Name :Cauliflower, Avg. Price / Quintal

PRE MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Pre Monsoon	Avg. Retailers Price in Pre Monsoon
1177	1200	1249	2252	1654	2891	1834	3263	1478.5	2626.5

MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Monsoon	Avg. Retailers Price in Monsoon
1177	2100	1249	2252	1654	2891	1843	3263	1336.25	2475

POST MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Post Monsoon	Avg. Farmers Price in Post Monsoon
930	1200	1400	2000	1100	2000	1300	2100	1182.5	1825

Crop Name :Tomato, Avg. Price / Quintal

PRE MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Pre Monsoon	Avg. Retailers Price in Pre Monsoon
786	1632	3801	8536	3022	7617	2026	3946	2408.75	5432

MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Monsoon	Avg. Retailers Price in Monsoon
4583	9038	2692	5304	1350	2700	1850	3700	2618.5	5185

POST MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Post Monsoon	Avg. Retailers Price in Post Monsoon
2843	5700	3410	7000	2099	4200	1956	4000	2577	5225

Source: National Hoticulture Board (Monthwise & Seasonswise AnnualPrice Report)

For the Year 2018

Crop Name : Brinjal, Avg. Price / Quintal

PRE MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Pre Monsoon	Avg. Retailers Price in Pre Monsoon
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Monsoon	Avg. Retailers Price in Monsoon
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

POST MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Post Monsoon	Avg. Farmers Price in Post Monsoon
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Crop Name :Cabbage, Avg. Price / Quintal

PRE MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Pre Monsoon	Avg. Retailers Price in Pre Monsoon
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Monsoon	Avg. Retailers Price in Monsoon
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

POST MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Post Monsoon	Avg. Farmers Price in Post Monsoon
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Crop Name :Cauliflower, Avg. Price / Quintal

PRE MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Pre Monsoon	Avg. Retailers Price in Pre Monsoon
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Monsoon	Avg. Retailers Price in Monsoon
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

POST MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Post Monsoon	Avg. Farmers Price in Post Monsoon
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Crop Name :Tomato, Avg. Price / Quintal

PRE MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Pre Monsoon	Avg. Retailers Price in Pre Monsoon
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Monsoon	Avg. Retailers Price in Monsoon
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

POST MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Post Monsoon	Avg. Retailers Price in Post Monsoon
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Source: National Hoticulture Board (Monthwise & Seasonswise AnnualPrice Report)

For the Year 2019

Crop Name : Brinjal, Avg. Price / Quintal

PRE MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Pre Monsoon	Avg. Retailers Price in Pre Monsoon
1204	2500	1041	2283	1213	2556	1345	3500	1200.75	2709.75

MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Monsoon	Avg. Retailers Price in Monsoon
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

POST MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Post Monsoon	Avg. Farmers Price in Post Monsoon
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Crop Name :Cabbage, Avg. Price / Quintal

PRE MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Pre Monsoon	Avg. Retailers Price in Pre Monsoon
561	1242	647	1496	798	1833	988	2425	748.5	1749

MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Monsoon	Avg. Retailers Price in Monsoon
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

POST MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Post Monsoon	Avg. Farmers Price in Post Monsoon
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Crop Name :Cauliflower, Avg. Price / Quintal

PRE MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Pre Monsoon	Avg. Retailers Price in Pre Monsoon
915	2067	1497	3014	1476	2889	NA	NA	NA	NA

MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Monsoon	Avg. Retailers Price in Monsoon
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

POST MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Post Monsoon	Avg. Farmers Price in Post Monsoon
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Crop Name :Tomato, Avg. Price / Quintal

PRE MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Pre Monsoon	Avg. Retailers Price in Pre Monsoon
380	921	1095	2325	1219	2417	1325	2625	1004.5	2072

MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Monsoon	Avg. Retailers Price in Monsoon
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

POST MONSOON

Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Farmers Avg.Price	Retail Avg. Price	Avg. Farmers Price in Post Monsoon	Avg. Retailers Price in Post Monsoon
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Source: National Hoticulture Board (Monthwise & Seasonswise AnnualPrice Report)

ANNEXURE – III

RESEARCH PAPER PUBLISHED

Research Publication (UGC Approved Journals)

1. Shakil Anwar Siddique, Gautam Rudra, Dr. Amar. Eron Tigga, Dr. Birendra Goswami, (2017), "Supply Chain of Vegetables in Ranchi, Jharkhand", International Research Journal of Management Science & Technology (IRJMST), Vol. 8, No. 8, pp. 417-422
2. Shakil Anwar Siddique, Gautam Rudra, Dr. Birendra Goswami, (2018), "Green Vegetables Price Mechanism in Ranchi Market", International Organization of Scientific Research (IOSR) Journal of Business and Management, Vol.20, No. 6, Ver. 1, pp. 58-63
3. Gautam Rudra, Shakil Anwar Siddique, Dr. Rumna Bhatcharraya, (2017), "Influence of Visual Merchandising on Consumer behavior in Apparel with Reference to Pantaloons, Ranchi", International Research Journal of Management Sociology & Humanities (IRJMSH), Vol.8, No.8, pp. 80-85
4. Gautam Rudra, Shakil Anwar Siddique, Dr. Rumna Bhatcharraya, (2018), "A Review on New Research Methodology Adopted In the Field Of Retail Management", International Organization of Scientific Research (IOSR) Journal of Business and Management, Vol.20, No.6, Ver. 1, pp. 1-4
5. Shakil Anwar Siddique, Nidhi Arya (2019), "A Study on Web Marketing and Its Impact On Different Segment of People at Ranchi", International Journal of Recent Scientific Research, Vol. 10, No. 07(C), pp. 33524-33527

Research Paper / Abstract Presented / Attended

1. Shakil Anwar Siddique, (2015), National Conference on People Management: Emerging Trends in the Current Millennium, The ICFAI University, Jharkhand.
2. Shakil Anwar Siddique, (2017), "New Trend in Marketing Research", National Doctoral Conference on Recent Trends in Management, The ICFAI University, Jharkhand.
3. Shakil Anwar Siddique, (2017), " Perspective on Business Policies, Strategy and Performance", Association for Research in Social Science, Commerce and Management (ARISCOM) National Conference on Contemporary Issue in Social Science, Commerce and Management, Institute of Management Studies, Ranchi University, Ranchi.

4. Shakil Anwar Siddique, (2018), “Green vegetables price mechanism in market”, National Conference on Management in 21st Century: A Paradigm Shift, ICFAI Business School, Kolkata.
5. Shakil Anwar Siddique, (2019), “A Study on Financial Inclusion: Perspective from Cauliflower Producer in Ranchi Area”, National Conference on Environmental Ethics & Sustainable Development, Sarla Birla University, Ranchi.