DISTRIBUTION, COMPOSITION AND FUNCTIONAL ATTRIBUTES OF AGRICULTURAL MARKETS IN NALANDA DISTRICT OF BIHAR (2004-2013)

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DECLARATION

I, Sandip Sagar, Hereby declare that the thesis entitled "**Distribution, Composition and Functional attributes of Agricultural Markets in Nalanda District of Bihar (2004-2013)**" Submitted by me for the award of the degree of **DOCTOR OF PHILOSOPHY** is my bonafide work, and it has not been submitted so far in part or in full for any degree or diploma of this university or any other university

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Dedicated to

Papa

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INTRODUCTION

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INTRODUCTION

1.1 INTRODUCTION

Agricultural markets have given good experience and exposer to Indian farmers. Especially focused on distribution, composition and functional Markets in Nalanda District of Bihar. The farmers have observed the metamorphosis of their agriculture from a largely subsistence orientation to commercial agriculture since the advent of the "Green Revolution" in the mid-1960s. Foreign countries were succeeding in using technology. Indian farmers by imbibing the scientific technology in agriculture have resulted in a large amount of production of food grains and cash crops. As a result, many farmers for the first time found themselves with a surplus of produce for market sale. Sustainable increase in production has been reached, particularly after the adoption of Mexican wheat and Philippine varieties of rice along with other agricultural inputs and the resultant. The marketable surplus has touched new heights. All the material production has increased; the date will show the status of increased level. The production of food grains during 2011-12 touched an all-time high of 259.3 million tons from a mere 72.0 million tons in1965-66. Cereal production has sustainable growth from 62.2 million tons to 242.3 million tons in this period. In the absence of any technological breakthrough, the production of pulses has increased marginally from 11.1 million tons in1965-66 to 17.0 million tons in 2011-12. However, production of oil seeds has more than tripled from 6.4 million tons to 29.8 million tons during the same period. And the Production of fibers such as cotton has increased from 4.8 million bales to 35.2 million bales, and Sugar cane production has increased from 119.6 million tons in 1965-66 to 361.1 million tons in 2011-12. Fruits and vegetables have also increased to an impressive level in production.

Sustainable growth in Indian agricultural performance in the pre and post-green revolution periods is presented in Table. It is clear from the table that in the pre-green revolution period (1950 through 1966), growth in output was attributed to the

expansion in area under the crops. However, the remarkable increase in production of food grains and other cash crops during the post-green revolution period (1966-67 to 2011-12) was primarily due to increase in the yield rates. Even though the production has shown the significantly higher level of growth but, the distribution system has not developed adequately to cope with the increased production.

Table 1.1

Compound Annual Growth Rates of Areas, Production, and Yield of Major Crops in India

	1967-68 to 1979-80			1980-81 to 1989-90			1990-91 to 1999-00			2000-01 to 2011-012			1967-68 to 2011-12		
Crops	**Area**	**Prod**	**Yield**	**Area**	**Prod**	**Yield**	**Area**	**Prod**	**Yield**	**Area**	**Prod**	**Yield**	**Area**	**Prod**	**Yield**
Rice	0.74	1.84	1.09	0.41	3.62	3.19	0.68	2.02	1.34	-0.11	1.9	2.01	0.45	2.47	2.01
Wheat	2.87	5.03	2.1	0.46	3.57	3.1	1.72	3.57	1.82	1.25	1.38	0.13	1.14	3.63	2.45
Coarse Cereals	-0.98	1.11	2.11	-1.3	0.04	1.39	-1.83	-0.5	1.37	-0.47	3.52	4.01	-1.35	0.56	1.93
Pulses	0.71	-0.26	-0.97	-0.1	1.49	1.59	-0.6	0.67	1.28	1.93	3.31	1.35	-0.01	0.71	0.72
Total Cereals	0.39	2.16	1.77	-0.3	2.26	2.52	0.12	1.72	1.59	0.14	2.2	2.05	-0.06	2.06	2.12
Food Grains	0.43	2.19	1.75	-0.2	2.73	2.97	-0.08	2.26	2.34	0.48	2.01	1.53	-0.07	2.27	2.33
Groundnut	0	1.64	1.64	1.65	3.76	2.08	-2.31	-1.3	1.08	-0.4	3	3.41	-0.26	0.86	1.12
Rapeseed & mustard	1.05	0.64	-0.4	1.94	7.29	5.24	0.62	0.73	0.11	6.15	8.22	1.95	2.13	4.55	2.37
Oilseeds	0.76	1.88	1.11	2.44	5.46	2.95	0.15	2.27	2.12	3.43	7.44	3.88	1.53	3.51	1.95
Fiber crops	-0.34	3.44	3.79	-1.5	1.52	3.07	2.44	2.03	-0.4	1.08	9.68	8.51	0.35	2.45	2.09
Cotton	0.38	-0.41	-0.79	3.5	5.19	6.01	2.34	2.69	0.34	0.42	3.21	2.79	2.06	3.06	1.18
Sugarcane	1.41	1.99	0.57	1.26	2.71	1.43	1.67	3.05	1.36	1.91	2.39	0.47	1.63	2.68	1.03
Potatoes	4.08	8.07	3.83	2.93	5.17	2.18	3.84	5.44	1.54	3.46	1.65	-1.74	2.99	4.93	1.88
Coconuts	0.38	-0.41	-0.79	3.5	5.19	6.01	2.34	2.69	0.34	0.42	3.21	2.79	2.06	3.06	1.18

Sources: Directorate of Economics and Statistics, Ministry of Agriculture, Government of India

Distribution system plays a crucial role in the market. Thus, an adequate amount of resources has fully hit the bottom of the market structure, which was needed to provide incentives for increasing agricultural production. The perusal of the history of economic development reveals that the investment in the development of market structure lagged behind the development of production technology and in most cases adversely affected the production trends. Ruttan and Hayami (1971) stressed that market structure reforms are an important pre-requisite for successful agricultural development. Functional improvement relating to science and crafts of agriculture may result in increased productivity in general and may delay the operation of the law

of diminishing returns in the farming business. Productivity, however, will not Increase agricultural be translated into a proportionate increase in the level of real income in an economy in which the distributive system is inefficient. Hence, the economic need for an efficient marketing set up is imperative. Sustainable and efficient Marketing is required to reach the level.

An efficient marketing system is required to rationalize the economic incentives, which should reach to its producers. Agricultural planners should go head based on their plans by keeping the market system in the mind. The basic aim of an orderly marketing system is to ensure that the producer realizes a reasonable price for his production level that should be subjected less to traditional malpractices and has to pay as little as possible for the services of marketing for his produce. By Following the basic principles or criteria of marketing an orderly marketing environment is built that brings the good results. Otherwise, with negative results, the majority of agricultural producers, who are mainly small and marginal farmers, will just get the share of the final price of their production.

According to Thomsen (1951) from the producers' viewpoint, an efficient marketing system is one which gives maximum returns from products sold after deduction of minimum market charges so as to induce further production of these products. Production and marketing of produce are interdependent in the sense that products in the field have no value unless they are converted into a consumable form and reach the ultimate consumer at his convenience. Since the greater part of farm output in many countries is not consumed by the people, who produce it, it must, like industrial products, be sold to satisfy the consumers' demand. There is an increasing awareness that it is not enough to produce a crop, it must be marketed. Marketing of agricultural products is a process which starts with a decision to produce a marketable farm commodity. It involves an integrated market system, both functional and institutional based on techno-economic considerations. In its essence, the marketing process is the mechanism for fixing prices, just as a market is a place where buyers and sellers together arrive, by bargaining, at the current price". Thus agricultural marketing is a process whereby prices of agricultural commodities are determined, either by the

forces of demand and supply or by some other mechanism. The process involves are; assembling, grading, storage, transportation and distribution activities apart from the pre and post-harvest operations.

With development, marketing gradually becomes more complex than a simple producer-consumer relationship. Various intermediaries come in between these two extremes to facilitate marketing. This complex marketing system operates and behaves under an orderly society which sets rules and norms for the system. The efficiency and effectiveness of the marketing system depend on how these rules and norms are obeyed. Producers are the people who feed the marketing system, and as such, they are the people most affected by its inefficiency.

It would be useful to distinguish between 'technical efficiency' and 'economic efficiency.' Technical efficiency relates to such matters as mechanization and rationalization of individual work processes. To be technically efficient, a marketing structure would have to utilize the best method available for every marketing job and to use these methods with maximum effectiveness. Economic efficiency, on the other hand, reflects the efficiency of the functioning of the marketing system. An economically efficient marketing system will ensure that the physical savings realized in improvements in the handling of the product are transmitted to producers as well as consumers in the form of a reduction in money costs. It involves the elimination of wastes, high costs and exploitative profits. The principal means of ensuring this elimination is the pressure of competition. The more nearly perfect a market is, the closer it is to an economically efficient one, and the stronger would be the possibility for minimizing wastes and exploitation.

Economically efficient marketing system must ensure as highest possible returns for the produce to the farmer, minimum incidental costs and reasonable prices to the consumers. In general, economic efficiency implies operational and pricing efficiency. Operational efficiency refers to the input- output ratio and focuses on reducing costs in

the performance of physical marketing functions, e.g., storage, transportation, etc. The pricing efficiency refers to the situation where the sellers get the value of their produce, and the consumers receive the value of their money. Pricing efficiency improves the buying, selling and pricing aspects of the marketing process so that it remains responsive to consumer directives. Uniform pricing over the entire market area is an important attribute of pricing efficiency. Over the years, the policy-makers have emphasized more on the pricing efficiency to protect both the producers and consumers from the exploitation of the middlemen.

In India, agricultural markets were viewed as imperfect, exploitative and unhelpful to the development of agriculture, has been gradually changing over the years. However, the general belief that traders in these markets manipulate prices through malpractices and reap excessive profits has not much changed. Contrary to such common belief, researchers have found that most agricultural markets are benefiting farmers and contribute substantially to the economic development process. However, it has been observed that agricultural commodity market, though, appears to be competitive, but is restrained by recurring uncertainties. These uncertainties are related to supply and demand of agricultural commodities, especially in seasonal periods when supplies are not sufficiently available to carry out necessary adjustments after demand changes are recognized.

As a result, the short run prices may be above or below the expected levels which cannot be achieved under pure competition. It is imperative that arrangements should exist for efficient movements of the farmers' produce to the consumers and for adequately and timely supply of superior inputs to the farmers. Regarding farmers' economic benefits from the operations of the marketing system, it is essential that an effective marketing system is brought about by regulation of the marketing system through rules and norms formulated by society. Where society itself is unable to ensure the operation of these norms, the government has to play a vital role.

Government attention has been focussed on agricultural marketing reforms since 1897. However, the creation of an orderly and efficient marketing system has received particular attention from various state governments and the central government since the inception of formal national planning in 1951.

However, a breakthrough in agricultural marketing reforms took place after the creation of regulated markets in most of the states. These regulated markets function with clear cut rules and regulations with regards to open auctioning and fixed marketing charges including those for various operations. These markets provided adequate infrastructure regarding marketing yards and succeeded in reducing many illegal exactions earlier charged by the traders.

Regulated marketing system was further strengthened by the significant development of rural credit. With the nationalization of banks, cooperative and other institutional credit have become an important component of total credit available in rural areas.

Such development of regulated marketing supported by the institutional credit has resulted in weakening, if not breaking the credit-marketing nexus competitive advantage competitors. Likewise, which earlier gave the trader a and a visible edge over his with the setting up of regulated mandis, market sales by farmers have increased and physical losses during handling, storage and transportation have been reduced along with the rationalization of market charges.

The process of price settlement in most of the markets has become quite transparent and backward and forward linkages of wholesale mandis have been considerably strengthened. Owing to the widening of production base of the agricultural sector, the market orientation of farm sector has considerably increased. The overall impact of the working of these institutions on agricultural marketing has decidedly been positive and

has helped to increase its competitiveness and efficiency. However; these institutional reforms have not been able to cover the whole of India successfully.

These regulated markets are more successful in agriculturally advanced areas and have relegated the importance of trader-cum-moneylender to a secondary position mostly in areas of the green revolution. Market imperfections continue to operate in most of the areas where agricultural breakthrough has not taken place. In the backward areas, the number of these markets is limited, and further, the markets continue to be dominated by the trader-cum moneylenders. In the agriculturally advanced regions, market infrastructure is fairly developed resulting in effective marketing. In agriculturally underdeveloped parts of India, it is highly inadequate, and consequently, the marketing system continues to be non-competitive and dominated by monopolistic interests.

The factors which affect the marketed surplus and the nature of flow from producers to the ultimate consumers over time, space and form affect the marketing efficiency to a great extent. Nevertheless, merely the creation of infrastructure in agriculturally backward regions does not help much if sufficient marketed surpluses do not accrue. The developmental programs to increase production will not be a stimulus to economic development if the producers themselves consume the whole production. If the marginal propensity to sell is low and the income elasticity of demand for food grains is high, the additional increase in Food grains will be consumed by the producers. Marketed surplus needs to be accelerated to pull the agricultural economy on the hump. Agricultural marketing problem starts only after the generation of sufficient amount of surplus on the field. The marketed surplus, if generated by all size of farmers would help in creating market infrastructure in rural areas and thus fasten the process of effective marketing.

The differences in infrastructural facilities also create marketing problems in particular areas for the same commodity. As infrastructural facilities undergo change over time in the same area, there can be differences in problems faced between two periods of time. The price differentials thus found between markets can be taken as a yardstick

for measuring the efficiency and dimensions of marketing Performance. It is also needed to examine the various elements which influence the net prices received by various categories of farmers for the same quality and quantity of goods at the same point in time.

The small volume of the produce of the small farmers is relatively uneconomic and costly to handle in the market and so may fetch lower net price to the producer. Those farmers, who borrow from the moneylender-cum-traders on the understanding of repaying the loans by selling the produce to them, lose their bargaining power in the open markets and become victims of exploitation both as borrowers as well as sellers. Finally, the rise and fall of the seasonal pattern of prices can help in the testing the· hypothesis of exploitation by traders comparing the seasonal rise in prices with the storage costs. Due to the pressure of such discrimination existing in the market, the marketing system becomes inequitable and hence · inefficient. The present study is an attempt to identify the marketing problems of farmers. Before we mention the main objectives of the study and the methodology followed, a brief description of the classification of agricultural markets is given here.

The market organization means the whole economic structure involved in marketing functions. There exists an elaborate and interconnected system of agricultural production Markets through which the produce flows from producer to the consumer. These agricultural markets may be classified into different categories according to their functions and seller-buyer participation potential. In a nutshell, the agricultural markets can have a three order classification: Primary Agricultural Village Markets; Secondary Markets; and Terminal Markets.

1.2 Primary Agricultural Village Markets

These are periodical markets, locally known as haats, paints or shandis. These markets are held once or twice a week, sometimes over longer intervals. The place where these markets are held is generally in the open on the roadside at important and centrally situated localities. The days on which these markets meet are fixed so that

that itinerant merchant can visit the area. As these markets are situated in the producing areas, commodities produced in the surrounding neighbourhood are sold in them. Producers sell their surpluses and purchase supplies for their daily requirements. Markets involve very Most of the transactions in this small quantity. Cultivators, labourers, small retailers and itinerant traders deal in these markets.

Village markets are very poorly equipped, generally uncovered and are without drainage and storage facilities. On account of their location in the interior, roads approaching these markets are kaccha and rough. Under such circumstances, the important means of transportation are

head loads, pack-animals, and bullock carts. Some markets lack even a proper kaccha road. Hardly there is any modern facility like telephone, postal or banking available. On an average, a primary village market serves an area of 16 km of radius. There are about 30,000 such markets located in the rural areas of the country (Rajagopal, 1988, p.44; Naayar and Ramaswamy, 1995, p.28).

1.2 Secondary or Wholesale Markets

Contrary to the primary village markets, these markets also known as mandis are regular wholesale markets. These markets are held in fixed places where business is transacted daily, with the help of intermediaries. Some wholesale markets also serve as assembly points for distant producing centers. These markets are situated in all the small and big towns, cities and other important trading centers. Some of these mandis have their sub-yards also, located in the villages or production areas. These sub-yards serve the purpose of assembling the produce of the farmers and supplying it to these wholesale markets working under the network of these mandis.

Most of the wholesale markets are better equipped with telephone, telegraph, postal and banking facilities. These markets are not specialized, and business is done in all kinds of food grains, oil seeds, cotton, jute and other agricultural products. These secondary markets are connected to distant consuming and terminal markets by pucca

roads. Many of these markets are situated on railway lines. These markets serve an average of 500 square kilometers. There are about 7,000 agricultural wholesale markets in the country (Nayyar and Ramaswamy, 1995, p. 28).

1.3 Terminal Markets

Terminal markets are those markets in which the produce is either finally disposed off direct to the consumer or processor or assembled for shipment to a foreign destination or redistribution to the surrounding areas**.** In terminal markets, transactions take place mainly among traders, instead of between cultivators and traders. In these markets, traders are well organized and use modern methods of marketing. Such markets are situated in all the metro cities like Bombay, Delhi, Calcutta, Madras, Kanpur, etc.

A market cannot function in isolation. It influences other markets in the market circuit and, in turn, gets influenced by other markets. The primary, secondary and terminal markets are also interrelated. The markets in rural areas for agriculture are generally of primary nature where the assembling of produce is the dominant function. Such markets should have a link with the secondary markets where the grading, standardization, and redistribution of the produce take place. The produce is supplied to the terminal market from the secondary market where it is exported to inter-country and intra-countryside markets. If these markets are not linked to higher order markets by appropriate transport and communication network, the market system will undergo as undesirable business affects about demand, supply, and price. As a result, interruption in the mobility of goods and services would cause monetary loss both to the producers and traders and high price to the consumers.

This study examines the participation of farmers in the market, and pricing and operational efficiency of marketing at the whole sale level as well as at the farm size level. The study is undertaken with the following objectives and hypotheses to be tested.

1.4 Objectives

1. Study the settlement distribution pattern in Nalanda district of Bihar and their agricultural characteristics.
2. Examine the distribution, characteristics, and composition of agricultural market centers in Nalanda.
3. What are the functions and hinterland of agriculture market/ Mandi/ Bazar Samiti?
4. Evaluate the role of the network, connectivity, and accessibility in the agricultural market for input and output flow of agricultural products.

1.5 Research Questions

1. Whether any relationship exists between marketed surplus and distance of the village from the market?
2. Whether the agriculture market centers are distributed uniformly in space or not?
3. Whether the identified agricultural market centers are associated with centrality and economic base of the village?
4. Whether the intensity of linkages regarding marketing is affected by distance from the agricultural service centers?
5. Whether agricultural service centers have marketing function to perform as main centers for the hinterland region?
6. Whether an infrastructure facility of Nalanda district is efficient of the sale of agricultural outputs?

1.6 Data Base and Methodology

The present study is based on both the primary and the secondary sources of data. Primary data have been generated from three tier marketing agencies i.e. village level, periodic market and regulated market. They represent the major components of agro-marketing system in Nalanda district. Six per cent of total villages and ten per cent of total periodic markets have been selected on the basis of stratified random sampling technique for detail enquiries. Hundred per cent regulated markets (02) are also selected for the survey. The reason is, they are government controlled, and represent

regulated agriculture markets in each district of every province of the country. 50 households of each sampled village have been selected on the basis of stratified random sampling techniques. They have been thoroughly interviewed for relevant enquiries regarding the various aspects of research problem. Besides, more periodic markets based on some specific consideration like distance from road, location in an urban centre or along the canal and so on, are also being included in the sampled markets. Major crops like rice, wheat, maize, pulses, potato and onion have been taken into consideration in the present study programmes. The criteria of selection of crops are based on their hectare, production and quantities of marketable and marketed surplus in the markets.

All the sampled villages were visited before conducting actual survey. In this preliminary survey list of households was prepared and village inhabitants were classified on the basis of size of landholding, i.e. marginal, small, medium and big farmers. Keeping in view total 50 households in each of sampled villages, farmers belonging to different categories according to size of land holding were selected in the proportion, following stratified random sampling technique. The researcher enquired from them about market participants' socioeconomic behaviour at the time of agricultural transaction, mode and volume of transactions of commodities and their specific market channels, and the spatio-temporal patterns of market transaction of agro products and that of the traders in sampled markets and villages.

In addition to primary data, the study is also based on secondary sources of data which have been collected mainly from the following sources.

(1) Census Office Patna.
(2) District Statistical Office Biharsharif.
(3) Agricultural Marketing Office Biharsharif.
(4) District Council (Zila Parisad) Office Biharsharif.

The collected data have been processed and brought in to tabular forms. These processed data are analyzed by using simple statistical techniques especially

percentage method with a view to derive some specific conclusion regarding spatio-temporal patterns of agricultural marketing of Nalanda district

1.7 Selection of Markets

The basic purpose of the primary survey in the present study is to analyze the market participation of farmers and the pricing efficiency of the production what they sell in the Market. Therefore, for the selection of households, those mandi areas were chosen where the arrivals of products to the market were highest.

Selection of Farmers and Formation of Size Groups

1. Marginal farmers with operational holdings up to 1 hectare.
2. Small farmers with operational holdings from 1 hectare to 2 hectares.
3. Semi-Medium farmers with operational holdings from 2 hectares to 4 hectares
4. Medium farmers with operational holdings from 4 hectares to 10 hectares
5. Large farmers with operational holdings from 10 hectares and above

Systematic random sampling method was adopted for the selection of households. Tippett's random numbers table was used for the random start for the selection of households in each category. This method is very simple and easy for operational purposes and selects sample households which are approximate to their probability proportion. For Example, the number of households in any village in the category of marginal farmers were 50, and 10 number of households were selected from this category. One starts with the random number drawn from the random number table and adds to it the random Interval which equals 50/10 = 5. The random start was 29 in this category, and selected households will be numbered as 29^{th}, 34^{th}, 39^{th} ...The same procedure is followed to select all the other category of Households.

1.8 Review of Literature

Waite and Trelogan (1951) states that "A market may be defined as a sphere within which price making forces operate and transfer of ownership are consummated." Marketing adds value to agricultural produce and through marketing agricultural produce reaches to the ultimate consumer. As farmers are no more subsistence

producers and produce more than their home needs so, marketing has become essential for farmers. Facilities their production system and specialize in the production of those crops, which give them best returns. If not techniques of marketing and organizations are available to take the produce of specialized crop to the consumers till farmers cannot avail the opportunity to produce a specialized crop.

The interest in the problem of crop's marketing is traced back to 1897, when the first legislation of Indian government, viz. 'Berer Cotton and Grain marketing Law' granted the government to open bazaars and regulate markets, which was enacted (Shah, 1971). The law was framed in order to protect the interest of Farmer's, who were unable to gain from the marketing of crops. Since then, extensive study of problems relating to the marketing of field crops have been done from different angles and therefore the question of market efficiency and the existence of exploitation have been subjected to continuous debate.

In the initial stages, government agencies have mainly conducted the study of the marketing of crops. Directorate of Marketing and Inspection specially created for serving this purpose. However their surveys lacked the basis for any scientific sampling designs and hence, the estimates are not fully reliable. After independence, economists carried out the numbers of research on the problem of agricultural marketing. There is an availability of a wide range of research studies on different aspects of marketing such as Market surplus and Market supply; Price structure and Factors – influencing the farmer's price; the pattern of Market Arrivals; Marketing structure; Price spread Distribution channels and Marketing cost; Efficiency of Marketing and Market Integration.

However, the survey of recent literature is confined to only such studies which have a bearing on those marketing aspects which are analysed in this study 'Actually, there is a linkage among the aspects of marketing which has been mentioned earlier and hence, it is difficult to separate them and make a review of each category separately. Therefore, present review is parted into broad categories – First, discussing the

marketing surplus, Farmer's Price, and related aspects and second, the Market structure and Price spread and Margins, Market Integration and Marketing Efficiency.

1.8 (a) Marketed Surplus and Price Difficulties Over Farmer Size

The studies which were conducted in the fifties and early sixties were majorly focused on the relationship between marketed surplus and different farm size holdings. These studies laid emphasis on the investigation that whether the marketed surplus was limited to the particular category of farmers or it is spread over farmers of all categories. The studies which are based on marketed surplus can be categorized into two. The first categories of studies look into marketed surplus distribution by farmers of different size based on indirect estimation from secondary data, covering India as a whole. The second category analyzes the relationship between the marketed surplus and size on land holding based on direct estimation from micro level data. These studies are examined in brief.

To bring out the theoretical distinction between the two concepts of ‘Marketed surplus' and ‘marketable surplus' is essential before to examine the studies based on marketed surplus. Marketed surplus denotes that part of farm produce, which is actually marketed irrespective of the fact whether the household requirements have been met or not. On the other hand, the marketable surplus refers to that part of the farm after meeting his family consumption requirements, seeds and kind payment of different types on the farm. In the review of the literature, the term, ‘marketed surplus' has been used in the discussion except where there is an attempt to measure the exact quantity of marketable surplus.

Dharam Narain (1961), in his study estimated for the period 1950-51 the market surplus across different classes of farmers – with the aid of data generated at all India level for total output based on many sources namely: Land holdings and consumer expenditure data by NSS; National Income Accounts, surveys of form management, All India Rural credit surveys by Reserve Bank of India and Reports of the Agricultural Labour Enquiry. The marketed surplus was described as the difference between total agricultural produce and the possession for households which includes

consumption at the source, rent on leased – in land, ways, seed, and feed for animals and payments to artisans. Land holdings were divided into 9 sizes of classes for analytical purposes.

From Narain's study, the estimated marketed surplus worked out to around 33 percent of the total production of 1950-51. It was estimated that the lower three classes of holdings (those operating up to 15 acres) contributed around 54.4 percent in the total value of marketed surplus. And the remaining 45.6 percent of contribution was estimated by the larger holdings of operant, 15 acres and above. Even within the lower class, 46.5 per cent of the contribution by the lowest 2 classes (operating up to 10 acres) has been noticed. Furthermore, he also noticed that a size of holdings increased up to the size class of 10-15 acres, market surplus as a proportion of output declined; it went up steadily only thereafter along with the size of holdings, thereby giving a shape of 'U' like curve.

Interpreted the higher proportion of sale by the lower size class up to 10-15 acres as an indicator of distress sales, which presumably had perverted relationship with output and contributed more than half of the marketed surplus. For the cash requirement of 50, the small farmers forced for making distress sales, and later, a part of that product was purchased by them from the open market at higher prices. Thus, in the study of Dharam Narain, the quantity of marketed surplus was consisted of (1) Distress stop surplus with backward stopping curve and (2) commercial with forward sloping curve while, their distress surplus was supplied mostly by smaller size class of farmers, and their commercial surplus of agricultural al produce was supplied by the farmers of large size class.

However, the pioneering study of Dharam Narain has a lot of shortcomings and has been criticized by many scholars. His findings have a major drawback as they have not been found from any direct observations of marketed surplus of the adopted statistical devices and assumptions formed may not be valid under all circumstances. The sources of data used in diverse number had made the indirect estimates very unreliable. Each source of data of the study has limitations of the distinct set. As for

example – the distribution of the value of agricultural produce for the country was got from the FMS data collected from a few districts of Uttar Pradesh. Likewise, the NSS data, which he has used was not given according to size class of holdings but was according to size class of total per capita expenditure.

It appears as if manipulation of published data has been done in the study for bringing the desired results for the structure of ownership of land holdings in the country. Dandekar (1964) and others have doubted on the validity of the observations that more than half of the total marketed surplus comes from farmers of smaller size class. 'U' shape curve of marketed surplus has also been challenged.

As a stark reaction to the study of Dharam Narain, Utsa Patnaik (1975) re-estimated the marketed surplus distribution by size class of holdings for the year 1960-61 and also re-estimation for the year 1950-51 was done. She applied the same database of secondary sources as of Dharam Narain and corrected the secondary data by applying improved methodologies before using them in her marketed surplus estimates. For example, while Narain used figures of a single year (1954-55) for the size class wise per hectare yield but in the FMS data, she adopted in the 3-year average method. Secondly, the use of NSS second round figure for consumption by Narain was believed to be overestimated especially for the classes of upper expenditure. Utsa made corrections for using this data in her study. Due to the adoption of improvements and corrections, Utsa was provided with a much more normal database and left farmers of Upper size classes with the much higher amount of marketed surplus in contrast to the study of Dharam Narain.

Thus, Utsa Patnaik observed from her marketed surplus and estimated that 32.2 per cent contribution is done by the farmers up to 10 acres of holdings and those up to holdings of 15 acres contributed only 44.4 per cent of total marketed surplus of all size of holdings. Besides, Utsa did not notice any perversity as the proportion of marketed surplus increased steadily from 20 per cent in the lowest size class of one hectare and below to 63 per cent in the highest size class of 20 hectares and above.

A surplus has been seen in any of size class due to the exclusion of the quantities of food grains purchased. Furthermore, Gross value of output is used by both the studies. Patnaik made use of the data for this purpose from the National Produce estimate which also included commercialized plantation crops that cannot be compared with the normal agricultural holding and thus the value of output gets inflated.

In a detailed study, an indirect estimation of marketed surplus was carried out by Sharma (1972). He made an analysis of a lot of secondary data which were collected from the household of the 1961 population census. Sharma, separately, presented his observations for the country as a whole and for the 15 states individually after examining carefully the data of the year 1960-61. The analysis reveals that at the national level the size class up to 5 acres was having negative marketed surplus and the same condition exists for all the states except Andhra Pradesh, Kerala, and Tamil Nadu. In Gujarat and Maharashtra, even the next size class of 5 to 10 acres was found to be deficient. With the increase in the size of holdings, the proportion of marketable surplus to net production of food grains also increased consistently production, unlike the gross output, which was used in the earlier studies, Sharma used only net production as the calculation basis for the proportion of marketed surplus. Besides, Sharma also fixed a minimum desirable level of consumption as the cut-off point for the determination of consumption intention. Together for all the classes, the proportion of marked surplus to net production of food grains nets is estimated at 37.4 percent.

Utsa found no fluctuations in proportions of marketed surplus among the farmers of the ascending ordered size class. Further, the results of her study were not consistent with the dominant role of small farmers in output and marketed surplus, As found by Dharam Narain. Utsa Patnaik observed that her estimation of proportions of marketed surplus for 1960-61, hold food for the year 1950-51, the period for which Dharam Narain made his estimates. Thus, Patnaik has placed the question of marketed surplus in a more realistic perspective through his in-depth and critical study.

Rastyannikov (1975) arranged the data from All India Rural Debt and Investment Survey (1961-62) of Reserve Bank of India and on the basis of the value of assets he

classified the data and estimated the behavior of marketed Surplus. Rastyannikov observed that behavior of marketed surplus is similar as in the study of Patnaik. A steady increase was noticed in the proportion of marketed surplus to the total product from 19.8 per cent in the lowest asset group of less than Rs.1000 to 41.4 per cent in the highest group of Rs.20.000 and above. Together for all households, marketed surplus value amounted to 31.4 per cent of total value of farm produce. The lowest two asset groups (up to Rs.2500)have amounted for the 10.7 of the marketed produce. The figure for the two largest asset groups is 56.3 per cent.

However, both the studies of Patnaik and Rastyannikov have the limitation that they used the gross sales which were overestimated. In both the studies, none of the size class had negative marketed surplus, because of non-inclusion of the purchased quantities of foodgrains. Moreover, both the studies used the gross values of output. Patnaik used the data from the National Produce estimate for this purpose which also included the plantation crops which were commercialized and not comparable with the normal agricultural holding and thus, inflated the value of output.

In a detailed study, Sharma (1972) carried out an indirect estimation of marketed surplus. He analyzed a mass of secondary data, collected through household schedules of the 1961 population census. After careful examination of 1960-61 data, Sharma presented his findings separately for the country as a whole and the 15 states individually. The analysis had shown that size class up to 5 acres was having negative marketed surplus at the national level and also in all the states except, Andhra Pradesh, Kerala, and Tamil Nadu. Even the next size class of 5 to 10 acres was found to be a deficit in Gujarat and Maharashtra. The proportion of marketable surplus to net production of food grains also increased consistently with the increase in the size of holdings.

Unlike the earlier studies which have used the gross output, Sharma used only net production as the basis for calculating the proportion of marketed surplus. Also, Sharma also fixed a minimum desirable level of consumption as the cut-off point for the determination of consumption retention. The proportion of marketed surplus to net

production of food grains for all the classes together was estimated at 37.4 percent. However, this study also suffers from the same deficiencies and limitations as encountered by earlier studies using indirect estimates of marketed surplus.

In addition to the above-mentioned studies on marketed surplus and size of holdings based on secondary data at the macro level, there are a number of micro level studies carried out by individual scholars based on the data collected from the field. A brief review of these studies is given below.

Bhattacharjee (1960) examined the marketed surplus by using the household level data of a survey of six villages conducted by Agro Economic Research Centre of the Visva-Bharati University. A detailed analysis of marketed surplus concerning size of holdings was made for three states of Bihar, Orissa and West Bengal for two years period from 1955-56 to 1956-57. The study revealed that during 1955-57, the small farmers operating less than 5 acres of land contributed less than 1/4th of the total marketed, a surplus of paddy. The relative shares of medium and large farmers, operating above 5 acres, were found to be dominant in all the selected villages. The variations in the proportions of marketed surplus of different villages reflected differences in the stage of development of the respective villages. He also compared the above-marketed surplus data of West Bengal with village level data of the Institute of Rural Reconstruction, Sriniketan for the period of 1942-45 for paddy crop.

It was observed from the comparison that there was a tremendous increase in the relative share of marketed surplus of large farmers, between the early forties and the middle fifties. The relative share of medium and small farmers, on the other hand, declined by 16 and 25 per cent respectively. Comparing the number of sales per acre of land holdings, Bhattacharjee found that the extent of cash sales of small farmers decreased, that of medium farmers remained more or less the same, while that of large farmers increased considerably during the above mentioned period. He concluded that the speculative and precautionary motives of the medium and large farmers added to the problems of frequent price rises and seasonal price variations and suggested for government price policy to control the anti-seasonal elements.

A widely quoted study of Ram Dayal (1963) based on the survey of Sanoli village of Saharanpur district in Western Uttar Pradesh analyzed the behaviour of marketed surplus over farm size. His analysis indicated the concentration of marketed surplus among big farmers. Nearly one-half of the total agricultural production and about 2/3rd of the total sales of cereals were carried out by big farmers who accounted for just 25 per cent of the total cultivators. The concentration was found even greater in the case of pulses. The study also shows the presence of distress sales and buying back of food grains by the small cultivators from the market.

Muthaiah (1964) analyzed the data of 6 selected villages of Rajasthan and two villages of Madhya Pradesh for Jowar and wheat crops. The study found the marketed surplus of wheat as a proportion of net produce steadily increasing from 24 per cent in the holding size of fewer than 5 acres to 64 per cent in the highest size of more than 100 acres. Corresponding percentages for Jowar were 18 and 50, respectively. Further, the study revealed a positive relationship between per capita annual income of the cultivators and proportion of marketed surplus to total production.

Parthasarathy and Rao (1964) examined the production and marketed surplus data for another set of six villages selected from the Godavari, Krishan, Pennar and Cauvery delta regions of South India. The data for paddy crop related to the triennium 1958-61 have been used in this study. The main findings of the study were that the large majority of small and marginal farmers accounted only a small proportion of marketed surplus, while that a few large and medium cultivators contributed a major chunk of marketed surplus of paddy. However, marketed surplus was found to be positively related to the level of production among all size classes of farmers. The study found that the marginal propensity to market paddy of big farmers was much higher than the small farmers.

In their study, Vyas and Maharaja (1966) found interesting contrasts between the two regions of Himatnagar (Gujarat) and Desuri (Rajasthan) during the period 1963-64. The farm households were stratified according to the value of produce so that the corresponding size classes in the two states became comparable. The study found that

the proportion of marketed surplus in the cotton growing Gujarat was more than 70 per cent of the total value of produce, while it was 49 per cent in the coarse grains cultivation of Rajasthan. The elasticity of marketed surplus was observed to be positive for both the regions.

Another important and controversial study by Raj Krishna (1965) used a wide range of data drawn from 8 states of India for 23 samples of farmers, to study the marketed surplus in a partially monetized economy. Raj Krishna introduced family size as an additional factor in explanatory variables. All disposals other than family consumption were treated as the marketed surplus in the study. Working on the functional relationship between the quantity of marketed surplus and level of output, linear as well as the nonlinear relationship was observed by Krishna.

The most important findings of Raj Krishna's study were - (i) There was constancy of marginal propensity to sell a wide range of output above the minimum subsistence level; (ii) The average propensity to sell increased as the output increased above the minimum subsistence output, but at a decreasing rate; (iii) The elasticity of sale with respect to output was positive and high ranging 1.04 to 1.60 for wheat and 1.04 to 1.36 for rice. Raj Krishna observed that 17 out of 23 samples had positive price relationship and elasticity with linear only six samples depicted significant functional deviations from a linear relationship. These six samples were either very rich or very poor farmer. These observations led him to draw the policy conclusion that it was best for the government to concentrate on encouraging higher farm output without any special discrimination in favour of small or large farmers. What it was, proportionate Even with the farm size structure remaining increase in output would lead to more than the increase in marketed surplus without any discriminatory or coercive policy.

Raj Krishna's study is not free from limitations and has been widely criticized. His observation of linear relationship in most of the samples might be due to the unique definition of marketed surplus taken by him. His assumption that all produce disposals should be considered as the real components of the marketed surplus was unrealistic. If kind payments were deducted from the defined marketed surplus, the results would

have shown nonlinear zones in more number of samples. Criticising Raj Krishna's study, Rao (1965), Mazumdar (1965) and Prasad (1965) expressed the view that a linear marketed surplus function did not appeal to them as satisfactory, and that linearity violated a matter of common sense and general observation that marketed surplus was concentrated among the bigger size class of holdings.

In their study on Punjab, Kahlon and Vashishtha (1968) analyzed 43 selected farm households of Ludhiana district to study marketed surplus by size class of holdings. The study identified six key factors, viz. volume of produce, the size of family and holdings, consumption habits of people, relative prices of different farm products and the accessibility to markets as important factors which determine the proportion of marketed surplus of different products and farmers. No definite relationship was found between the size of holdings and the marketed surplus of cash crops like cotton, groundnut, and sugarcane. As these crops were grown primarily for market sales, their proportion of marketed surplus to total produce ranged from 71 per cent to 92 per cent.

They used the tool of partial correlation coefficient and observed that the coefficient between marketed surplus and volume of production (when the size of holding remaining constant) was positive and significant for maize and positive and non-significant for wheat. Correlation between the size of family and proportion of marketed surplus as well as between distance from the village and marketed surplus were found to be negative. Thus, the other important factors in the determination of marketed surplus were highlighted in this study.

Bhargava and Rustogi (1972) compared the concentration of cultivated area with the concentration of marketed surplus of paddy among different size classes of farmers in Burdwan district of West Bengal for the year 1967-68. Marketed surplus as a proportion of output was worked out to 9.2 per cent in the lowest size class, 51.3 per cent in the highest size class of 4 hectares and above and 33.9 per cent of all holdings together. The lowest size class had accounted only 1.4 per cent of the total marketed surplus, while the highest class accounted exactly half of the total marketed surplus.

Marketed surplus was found to be positively related to the size of holdings and also showed much higher concentration than area.

Hati (1976) analyzed the relationship between a marketable surplus of paddy and farm size for the period 1971 -72 to 1972-73 for Hooghly district in West Bengal. He defined marketable surplus as marketed surplus net of repurchases and fitted two nonlinear equations and grafted them into one. The results when plotted on a graph gave a curve with three distinct parts. Each part represented a particular group of land holdings. The marketable surplus was found to be negative for the first part of the curve up to the size class of 0.66 hectares. The curve rises sharply upwards till it crosses the zero line. For holdings between 0.66 and 1.98 hectares, the curve flattens at about 5 percent of marketable surplus and an increase in farm size has practically no effect. In the case of farm holdings above 1.98 hectares, the proportion of marketable surplus rises at an increasing rate as farm size increases.

In his micro level study, Nadkarni (1980) made use of Farm Management Survey data of 1969-70, 1970-71 and 1971-72 for 143 farm households spread over 15 villages in Ahmednagar district of Maharashtra. He made an in depth study of marketed and marketable surplus in a predominantly millet region.

He observed that net marketed surplus was negative for jowar and bajra and total food grains in the smallest two size classes of below 2 hectares and 2 to 4 hectares and the case of jowar even for the next size class of 4 to 6 hectares. Net marketed surplus as a percentage of output for jowar, bajra and wheat were respectively 16, 20 and 30 per cent for all size of holdings. In the case of all food grains, the figure stands at 21 per cent. It was observed in the study that percentage of net marketed surplus to net output for wheat remained positive even for the lowest size of category which indicates that in this millet region, wheat was treated as a cash crop, and the smallest size of cultivators were forced to sell superior grains (wheat) for purchasing relatively inferior cereals (jowar and bajra) for consumption.

Talukdar (1984) following Hati's model (1976) in a field study of Assam found the factors like family size, the size of holdings, gross income, total consumption, kind receipts of the crop, the level of debt and total production of substitute crop significantly affecting the marketed surplus of rice and areca nut. He observed that small and semi medium farmers were below the subsistence level and medium and large farmers contributed a major amount of marketed surplus.

Chattopadhyay and Sen (1988) used Farm Management Survey data on paddy for West Bengal, A.P. and Tamil Nadu for the period 1970-71 to 1972-73 for the former two states and 1968-69 and 1970-71 for the latter state. They fitted regression between per capita marketable surplus and average farm size, per capita farm size and per capita land ·cultivated under a specific crop. They analyzed the data separately for the above mentioned three states and observed that distress sale of rice among the smaller farms were pervasive in West Bengal. In the case of Andhra Pradesh, the phenomenon of distress sales as well as negative marketable surplus was prominent. In the case of Tamil Nadu the phenomenon of distress sales was not prevalent, rather small farmers were found to be the primary source of marketable surplus of rice.

In the determination of marketable surplus, the most important factor was found to be the family size, having a negative relationship with a marketable surplus even in the case of big size class of farmers. The outstanding finding of their study was that "per capita availability of cultivated land

among the larger farms is certainly higher compared to the smaller ones, but per capita availability of land under a specific crop need not be higher in the larger size groups than, the smaller farms. The phenomenon of the marketable surplus should be examined not regarding size classes of holdings but with the average of individual crops separately against each size class".

The results of Dharam Narain' s study (1961) which showed that small farmers' contribution to market' d surplus was sizeable, attracted the attention of economists regarding the relationship between market supply and price level. Supply theory in traditional economics postulates a positive and direct relationship between market

price and quantity of supply. In their controversial study, Mathur and Ezekiel (1961) put forth the hypothesis that market prices and the quantity of marketed surplus of food grains are inversely related. The hypothesis they have tested, "Farmers sell that amount of the output which will give them the amount of money needed to satisfy their cash requirements and retain the balance of their output for their consumption. If prices rise, the sale of a smaller amount of food grains provides the necessary cash and vice versa. Thus prices and marketed surplus tend to move in opposite directions".

Their study was based on certain assumptions as (i) non-monetised economy, (ii) cash needs of the farmers are fixed and (iii) own consumption retentions of farmers are only the residuals. It was further assumed that farmers generally save in kind rather than in cash and that the food grains output in the short run remains fixed. These assumptions were severely criticized by Dandekar (1964) who pointed out that small farmers sold little of their food grains and depended on other sources to meet their cash needs such as wages of labour, the sale of other crops and remittances received. Even the large farmers, according to Dandekar, accounted for the .larger part of the area and responded normally to economic stimuli rather than price stimuli. Thus, the Mathur-Ezekiel proposition had little applicability in their case.

Krishnan found an inverse relationship between the proportions of marketed surplus and price changes without involving the assumptions of fixed cash requirements and saving habits as in the previous study. He observed the elasticity of marketable surplus concerning price equal to -0.303. Just against the Mathur and Ezekiel's contention that the amount of food grains set aside for family consumption by subsistence farmers was a residual factor, Krishnan argued that for the same category of farmers, the retentions set aside for household consumption were fixed and the quantity of marketed surplus was only a residual factor. However, both the studies concluded the existence of the inverse relationship.

Most of the empirical studies that propounded the theory relating to the behaviour of the farmer about the market supply of food grains assumed one homogeneous community of agricultural producers. Dandekar (1964) and Chakraborthy (1966)

disputed the validity of such aggregative assumption about the market supply of food grains. They pointed out that the results of disaggregated study would be different from that of an aggregative one. On the whole, the big farmers would dominate the market supply, and their behaviour regarding the market supply of food grains in response to price changes would not be inverse. By improving upon Raj Krishna (1965), Jere Behrman (1966) estimated the price elasticity of output. He concluded that at the lower levels of sales - output ratio, the price elasticity of marketed surplus was negative and at the higher levels of sales output ratio, the price elasticity of marketed surplus was positive for wheat in Punjab.

Bardhan and Bardhan (1969 and its revised version of 1971) analyzed the national level data on consumption and output of the farm sector to derive the time series of marketed surplus of cereals. The purpose of their study was to observe long term responsiveness of prices to the output level. The main findings of their study were - (i) The responsiveness of marketed surplus with respect to the ratio of cereal prices to the prices of other food products was positive; (vii) The responsiveness of marketed surplus with respect to the ratio of commercial crop prices to the prices of cereals was negative and (iii) Ratio of cereal prices to non-cereal prices influenced the marketed surplus of cereals due to substitution in consumption at source.

In an another attempt, Hassel (1975) used Kalpana Bardhan's (1964) data and developed a model to study the relationship between consumption decision and food grains price and farmers' income, while treating the marketing as residual. He observed from his analysis that short run price elasticity of marketed surplus was positive and its value ranged from 2.7 for the entire sample to more than 3 for large farmers. Further, the elasticity of marketed surplus concerning output was observed to be much greater than unity. He concluded from his findings that farmers were price and income responsive as consumers, and higher prices would result in larger quantities marketed.

It is considered that small and marginal farmers are victims of exploitation and they receive lower prices for their produce when compared to their counterpart large

farmers. This is because of differences in place of sale, time of sale, indebtedness, etc. Hence, this area of market equity has attracted many researchers, to identify the factors determining the prices received by the farmers. Some important studies conducted in this field are discussed below:-

Jasdanwalla (1966) identified the factors such as location, place of sale, time of sale and financial obligations to private agencies were responsible for the price variations among the farmers. Hanumantha Rao and Subba Rao (1976) threw light on inter-village and intra-village differences in prices received by farmers. They found that infrastructural under development which was common to all classes of farmers was the most important source of price differences.

Small farmers received little lower prices on the whole, but it was the spatial differences that were more conspicuous. Such differences may be greater still in less developed millet tracts, where the density of population was lower than in paddy areas, where infrastructural facilities were more concentrated spatially.

Pandey et al., (1979) observed that the net price received by producer was influenced more by distance and marketing cost in case of the small farmers as compared to medium and large farmers. Mukherjee (1983) in his study found that rise or fall in cereal production leads to variation in prices of cereals. He found that whenever the production of cereals declined, the prices of cereals increased. The increase in prices was reflected comparatively more in rice. However, this often led to rising in the price of wheat also, even though its production did not decline as compared to its previous year's production.

Ninan (1988) in his study of the market participation of small farmers, used farm level data of 4 villages in Kerala The study made an attempt to find out whether there was price bias in favor of any particular class of farmers and whether these price advantages were specific to particular crop or choice of market outlets. Ninan observed that the small farmers tried to concentrate on commercial crops, and food crops mostly they grew only for self-consumption. Big farmers, on the other hand,

grew food crops not only for subsistence purpose but also for the market.· Further, he observed that there was no conclusive evidence to support the view that small farmers were paid less for their produce than those offered to big farmers. Further, the price differentials across size classes were smaller when the market outlet was a co-operative against an agent.

1.8 (b) Marketing Efficiency - Market Structure, Price Spread, and Market Integration

A pioneering research study on the structure of market organization for an important commercial crop like cotton was undertaken by Dantwala (1937, 1952). Incidentally, it can be considered as the foremost scientific research inquiry on market structure for any crop in India. Besides describing the functioning of the cotton market, he examined the competitive character and efficiency of marketing operations. He did not notice any exploitative character in the cotton market organization. The organization seemed to function efficiently by minimizing the cost of marketing. Information flowed quickly from one stage to the other. Thus, although market operated efficiently, he also recorded certain malpractices leading to the conclusion that market forces did operate, but with constraints.

In addition to the studies conducted by the Directorate of Marketing & Inspection of the Government of India, individual attempts have been made to study market structure for individual commodities confined to particular state or mandis. Mathur and Kulkarni (1965) analyzed the working of Ghoti regulated market in Maharashtra. They found that there were a close understanding and personal relationship among traders which enabled them to circumvent the market regulations.

Mirchandani and Hirachandani (1965) studied the impact of market regulation in different states for the period of 1950-51 to 1965-66. They observed that regulation exercised a wholesome influence on the market structure and though it raised the marketing efficiency by reducing the market charges, it could not eliminate the prevailing intermediaries. However, the highly increased amount of arrivals in the regulated markets was a clear indication of reduced sale at the village level. Chauhan

and Singh (1971) conducted a study on wheat markets in Rajasthan during 1969-70 and 1970-71. They stated that only a few farmers handled more than 50 per cent of the total wheat purchases in spite of a large number of traders operating in the market. Even the new entry in the market was stated to be unprofitable. They concluded that the wheat markets in Rajasthan were imperfect.

George and Singh (1970) made a structure, conduct and performance study of wholesale vegetable markets in Punjab for selected vegetables. They observed a lot of exploitation in the vegetable commodity market. Sellers, though in large numbers coming from widely dispersed areas were operating without any organization. On the buyer's side, however, there was oligopsony with a few large firms handling most of the business and a large number of small buyers handling the rest. Intermediaries like traders were found exploiting the inter-market price differences.

Gaya Deen (1977) used Lorenz Curve and Markov Chain Analysis to examine the structure and structural changes of selected four potato markets in Farrukhabad district of Uttar Pradesh. He observed that the market structure showed a high degree of concentration in market share amongst both buyers and sellers. The study concluded that the potato market in this district had a structure of oligopoly and was far from perfect competition. Subba Rao (1978) studied the efficacy of the existing market structure in case of paddy rice. He studied the existing marketing organization, reasons for different prices in different villages, the spatial integration of prices, government intervention, etc. He concluded that government intervention in the paddy marketing system in the form of compulsory levy both from the farmers as well as traders influenced the free market supply and paddy prices.

Bhide et al., (1981) studied structural changes of areca nut market in Karnataka. They used Lorenz Curve and Markov Chain Analysis to analyze the degree of concentration. The study concluded that the degree of competitiveness was increasing over time in areca nut market structure. Aulakh {1983) in his study on food grain market structure in Punjab found that a few large buyers purchased the major share of arrivals from the farmers. Despite the above fact, the study concludes that food grain markets in Punjab

were competitive in operation as there was no indication of any collusion between the traders.

Some studies relating to the structure of markets also examined the problem of the cost of marketing and price spread.

Kulkarni (1965) made an attempt to analyze the price spread in two groundnut markets in Maharashtra. He used the field data for the year 1958-59 in Dhulia and Barsi regulated markets. He observed that these two markets were well connected with the terminal market Bombay. The interlinkages between these primary markets and the terminal market were to such an extent that 80 per .cent of the variation in the prices in the former markets can be termed as due to the variation in the prices of the latter market.

Krishnaswamy (1971) in his study on wheat markets in Rajasthan concluded that marketing cost is not fixed and it even varies between neighbouring markets. The distance between the primary and secondary wholesale markets contributed the highest percentage of the cost of marketing the food grains. It was further observed that out of the total margins in marketing the product, the commission agents earned a major share. The wholesalers, due to the unusual trend of selling prices, earned a comparatively lower margin. He also observed that the wholesale prices and consequently margins were more elastic than retailers' margins, which were more or less constant due to the- inelasticity of consumers' preferences prevalent in the retail trade.

Singh and Sidhu (1974) in their study on Khanna market of Punjab found that 95 per cent of the total arrival of the groundnut in Khanna market was purchased by the oil millers and rest of the produce was purchased by retailers and consumers directly. They also studied the costs and returns of crushing by small, medium and large mills and found that net return was directly related with size of the mill as the net profit for crushing one quintal of pod by large, medium and small sized mills was Rs.30.92, Rs.24.85 and Rs.23.15 respectively.

Analyzing the profitability of different marketing channels, Thakur (1974) pointed out that the most profitable channel from producer's point of view is in order of consumer, retailer, wholesaler, commission agents, cooperatives and itinerant village merchants respectively. Suryaprakash et al., (1979) analyzed the price spread of areca nut, coconut, copra, cotton and groundnut in several regulated markets in Karnataka. They identified four different channels of distribution. It was observed that price spread was smaller in groundnut marketing than in other crops viz. copra, coconut, and cotton. They concluded that the differences in producer's share in different channels were due to the difference in commission charged by commission agents. Similarly, in a study conducted by Verma and Nigam (1979) in Kanpur district of UP during 1977-78 found that the producer's share in the consumer's price of groundnut purchased for roasting and for making oil came to 63.85 and 73.82 per cent respectively.

Bhupinder Singh et al., (1979) reported from Punjab that the major change that had occurred so far was the government intervention in food grain marketing. They concluded that it has brought about noticeable changes in the costs and margins by reducing the market middlemen. However, despite the increase in marketing efficiency, unfortunately, the operating costs of the government agencies are relatively higher as compared to the private traders. Sinha et al., (1979) also concluded for foodgrain price spread in Bihar that the two markets under study showed high marketing costs and large price spread. This was due to handling and storage losses, high transport charges, higher costs of weighing, loading and unloading and high commission charges by intermediaries.

Talukdar (1985) concluded in his study on Assam that there is an indirect relationship between marketing cost and size of holdings and direct relationship between marketing cost and length of the channel. It was observed that farmers received different prices due to differences in market arrival and channels of sale. Reddy et al., (1985) observed in their study that the producer's share in the consumer's rupee was quite low and price spread accounted for quite a big chunk of the consumer's rupee. It was further observed that there is considerable scope for improvement by creating cooperative infrastructures such as co-operative finance, processing, storage and

marketing facilities. Gangwar and Pandey (1985) made a study on Haryana. Their research work points out that the efforts of the government ensuring a higher share for the producer in the price paid by the consumer through market intervention and price policies have not yielded the desired results. However, in the absence of the government intervention and price policies, the producer's interest would have been still adversely affected.

Rajagopal (1986) in his study of paddy marketing in Chhattisgarh region in Madhya Pradesh took six performance indicators viz. producer's share, marketing costs, middlemen's margins, price deviation and peak and lean seasonal price variability to calculate the marketing efficiency of dif£erent channels. He found that the most efficient channel was cooperatives, followed by agents/brokers to the rice millers; regulated markets; agents/brokers to the trader's in· village market in that order respectively. It was observed that the farmer's response to the marketing channels was found significant in the co-operative sector, compared to other channels of paddy marketing.

Thus, in the above analysis, attempts have been made to chalk out the marketing efficiency by market structure, price differentials, costs, and margins. However, marketing efficiency has been investigated more directly through the study of the relationship of pricesin different market organizations. Such studies inquire into whether movements of prices in different markets for the same commodity are synchronized or divergent. Synchronizing movements would imply efficient relaying of price signals from the consumer level to that of producers. It would also imply that there prevail conditions of perfect competition in the market.

Marketing efficiency is calculated by measuring the market integration between agricultural markets in these studies by correlating time series of price data for different market places and products. This procedure builds on the rationale that if markets are perfectly competitive and spatially well integrated, differences in prices between markets will reflect transport and processing cost only. The bivariate correlation coefficient between a pair of such time series of prices will be equal to one.

According to this reasoning, a lower correlation will reflect bottlenecks arising, e.g. ·from lack of market information, lack of product homogeneity or presence of monopoly power. The studies undertaken with this method have yielded ambiguous results. Some of these studies are being reviewed here.

Jasdanwalla (1966) studied the marketing and pricing efficiency in Rajkot district of Saurashtra (Gujarat) during 1956-57 for two important cash crops, viz. groundnut and cotton. She concluded that the requirements essential to efficient and perfectly competitive market conditions were substantially satisfied in the district studied. Market information was available to most of the cultivators, and they avoided making glut in the market by selling immediately after the harvest. Utilized in the area were The storage facilities relatively effective and satisfactory. Deductions for imperfections in the quality of the product were taken but they were not exploitative. She found that inter-village sales were more in those villages which were located at a distant place from the market.

In the further analysis of groundnut, Jasdanwalla observed that the variations of prices among the farmers were not much due to the activities of the traders but due to the location of place 'or time of sale, etc. At the wider plane, she observed that a significant degree of coordination existed in wholesale prices over the entire market area of groundnut. Further, not only was the link between major terminal markets in the country well maintained, but also there was a significant degree of
coordination in price movements between the upcountry and terminal markets. A significant degree of coordination was observed between prices of the raw product (groundnut) and the final product (groundnut oil). It was also found that market perfection increased further through a significant reduction in seasonal variation in groundnut.

Cummings (1967) examined the wholesale wheat trade to evaluate the role of prices and private trade in the functioning of Indian wheat market. Time series data about wheat prices arrivals, stocks, etc. in the Khanna market in Punjab were analyzed. Utilizing the technique of correlation among the wholesale prices in different markets,

Cummings pointed out that if prices were at a perfectly competitive equilibrium level, then differences in prices between places would reflect only transport and processing costs and r = + 1.00. Cummings presented model correlation coefficients of price series between 27 North Indian wheat markets from 1956 to 1974 equal to 0.85 during times of free trade and 0.65 during government intervention According to him, real world coefficients being less than one by the fact that temporal and spatial frictions occur as a result of transport costs, lack of product homogeneity and uncertainty regarding the direction of movement of future prices.

Cummings concluded that although private wheat marketing system suffered from certain imperfections, yet it was efficient and did not need overall replacement by the government. A large number of producers, consumers and the marketing firms responded to economic incentives. Price prevailing in the markets showed that there was no evidence that seasonal and spatial price differences were due to collusion. It was pointed out that government through its well-designed policy could remove the weaknesses in the food grains market, but such measures should aim only at supplementing the private trade.

Differences in the prices obtained by different producers in different regions and by different categories are explained by economic factors, the major one among them is the cost of transport and storage. Lele (1968, 1971) has investigated into the problem of costs in detail in her study of the performance of .private marketing system in respect of wheat, rice, and jowar in selected markets in India. She has covered four states - the Punjab, West Bengal, Tamil Nadu, and Maharashtra. Lele observed that the temporal and spatial price differences were largely explained by storage and transportation costs. Prices in different markets moved in unison, implying thereby perfect system of signals in different markets. Further, the inter year variations in prices were such that it would not pay the traders to carry over stocks from one year to the next continuously and earn out of this activity. She observed that rigging up of the prices or exploitation of the producer in any other respect through explicit or implicit collusion among dealers at different stages was not observed. The higher price differentials (as in the case of paddy-rice in West Bengal) were not due to the

differences in milling equipment, but rather due to the governmental policies, which resulted in higher incidental costs. The observed marketing inefficiency was thus attributed mainly to the effect of governmental controls and not due to any inherent weaknesses of the marketing system as such.

Lele found all price correlations between Delhi and five Punjab wholesale wheat markets from 1955 to 1965 exceeding 0. 90. However, significant results were not obtained for paddy and rice markets. From her correlation analysis of Tamil Nadu paddy and wholesale rice prices, she has found that only in 3 cases out of 507 cases, correlation coefficient exceeded 0.8. Lele concluded that as patterns of market flow was so diverse that the correlations in Tamil Nadu were slightly lower than obtained in Punjab or West Bengal. Harriss (1979) pointed out that the obvious reason for the diverse results obtained by Lele was the data used in the study.

Lele (1967) also examined the problem of market integration of Sorghum in Western India regarding inter-market price relationship. The hypothesis that there existed a large regional price difference, which caused speculative activities in trade, was tested. The study brought out that the inter market price variations could be attributed to the differences in varieties of foodgrain trade in the different markets. Price differences exceeding the costs of movements of food grains were explained regarding transport bottlenecks, which did not allow the producer-farmer to reach distant markets. The government policy of food grains also aggravated the price differences between regions and distorted price relationship over space.

Gupta (1973) made an attempt to study the pricing pattern in the selected markets of the Madhya Pradesh economy. Looking into the supply response to prices, Gupta concluded that in Madhya Pradesh, farmers while allocating land, did not consider prices as an important variable. Cultivators marketed 50 to 70 per cent of their total surplus during first three months of harvesting, and so price during this period recorded to be the lowest. Looking into the market integration, he observed that competitive market conditions prevailed among the various markets in the state during 1961-62 to 1965-66. He found the prices in these various markets were fairly

associated with each other. Average correlation coefficients among different markets were: rice= 0.79, wheat = 0.71, jowar = 0.85 and groundnut = 0.91 during the above said period.

Diwaker and Muralidharan (1979) examined the pricing efficiency of potato in Farrukhabad district of Uttar Pradesh. They examined the spatial integration of consumption and production markets of Farrukhabad, Meerut, Mettupalayam, and Kanpur. The results of the study showed that correlation coefficients of potato prices were high and significant in the consumption and producing markets except for ·in Mettupalayam. They indicated that markets within the region were integrated, but the actual price differences between the markets were not fully explained regarding transport cost, except Kannuj and Kaimganj markets. Similarly, price differences over time were not at all explained regarding storage cost in any of the selected markets of Farrukhabad district. Thus, they concluded that the marketing of potato in selected markets was not fully efficient.

Kainth's study (1982) showed that wheat markets were highly integrated with a price correlation coefficient varying from 0.83 to 0.93. The regional price differences in the case of wheat normally did not exceed the cost of transportation. According to Kainth, the high integration of these markets could be attributed to the development of roads, infrastructure, market intelligence and better spread network of markets and purchase centers in the state. In the case of paddy, the markets were found less integrated as compared to wheat; the reason seemed to be the lesser mobility of paddy from one market to the other. Similarly, Thakur (1974) found that 71 per cent of correlations between seven Gujarat wheat markets during 1965-71 exceeded 0.75. However, Thakur observed that on the whole, the existing food grains marketing system was not efficient, as was clear from high-profit margins of intermediaries.

Muniyandi (1985) studied groundnut marketing in the region of North Arcot district of Tamil Nadu by taking data from three regulated mandis of Vellore, Arni, and Tiruvannamalai. Correlation coefficients between the selected markets i.e. Vellore, Arni, Tiruvannamalai and Madras for the period 1977 to 1984 were calculated. The

values of these coefficients were very high and significant ranging between 0.94 to 0.98. This led to the conclusion that the groundnut prices moved in unison and the markets in the region were integrated. Furthermore, the spatial- temporal and form pricing efficiency was assessed by comparing the Inter market price differences with transport costs; seasonal price differences with storage cost and finally differences in oil and oilseed prices with the processing cost (by oil millers). It was observed that there were no excessive profits earned in any of this form and price differences in all these cases were normally less than the concerned costs. Thus, the study concluded that the marketing system for groundnut in North Arcot district was functioning efficiently. There was no evidence of price manipulations by traders either through collusive or exploitative activities.

Naik and Arora (1986) made an attempt on pricing efficiency of areca nut market. They used primary data of a random sample of 50 producers from the Sisri market in Karnataka and wholesale price data of other secondary markets from all over the country to calculate price integration of areca nut. From the analysis of correlation, it was observed that correlation coefficients were most significant with very high values. It was found that all the primary markets were well integrated. Also, the distant secondary markets like Delhi, Cochin, and Bombay were well integrated regarding price movements. Regarding the integration between the wholesale and retail markets, it was observed that retail pride sat Nagpur were highly correlated with the wholesale prices at Sisri and Mangalore markets. However, retail prices in Kanpur were not found to be integrated with the wholesale prices of the primary markets and reason given was the long distance between the markets.

Jayaraj (1992) starts his paper with a detailed discussion on adequacy and non-adequacy of correlation coefficient technique and finally applies this technique to both the raw data as well as the residuals. Also, he has applied regression analysis to the residual prices data. He has used monthly wholesale prices data of groundnut kernels for the period 1975-76 to 1983-84 for ten centers in Tamil Nadu.

Jayaraj concluded from his analysis that price integration was efficient and instantaneous for the majority of the markets. The results of correlation coefficients of residual price series were lower than those obtained for absolute prices. As the residual prices were correlated significantly, that indicated real integration between different market centers. Moreover, Jayaraj explained that due to a shortage of production period, instantaneous price adjustment was given preference to short run and long run market integration as considered by Ravallion (1986).

In addition to the above-mentioned studies in India, there are many studies completed in West Africa, using the same correlation technique to calculate the degree of market integration. West African studies give much lower figures in comparison to Indian studies. These studies include Jones (1968), Thodey (1986), Hays (1975), Kholers (1977), Elliot Berg (1977) and Southworth et al. (1979).

Correlation coefficient calculated in this manner from raw price data, however, is not free from shortcomings. Ashok Rudra (1982) pointed out that two price series can indeed differ by a large margin and yet they move together in the same direction and yield a correlation coefficient of one. In fact, in some of the studies discussed above, the correlation was found to be quite high between markets which had no physical contact, or during periods when one should expect contacts to be less intense. Hence, the technique has been criticized by some scholars and strides have been made to search out new methods to look into the problem of market integration.

George Blyn (1973) criticized correlation technique pointing out that there may be common, underlying trends in the series which provide an upward bias to the results. Inflation or population growth, for example, may give rise to linear trends and because of such trends, there is a perfect correlation even if the markets in question are not even remotely integrated. Moreover, seasonal variations may be synchronized, for example, due to a common climatic pattern with planting and harvesting taking place at the same time, near all the markets included in the sample. This would lead to spurious correlation, even when there is no or little contact between markets. Heytens

(1986) pointed out that two functionally isolated markets can appear to be synchronized if prices in each are influenced by a third market or by a common factor.

To get the solution of the above problem, Blyn suggested that the data should instead be combined into twelve groups, one for each month, and a trend should be fitted to each of these series and that the residuals within each group should after that be correlated. In other words, instead of correlating raw data, trend and season free data should be correlated to find out the market integration. He had also calculated monthly coefficients from Cummings data after making it trend-free and showed that this produced a correlation of 0. 68, which was much below the Cummings figure (0.85).

Following the same lines, Subba Rao (1978) in his study of rice in Andhra Pradesh calculated the correlation coefficient between de-trended and deseasonalized wholesale monthly price data between the six selected markets during April 1968 to December 1971. The results of the study revealed that only four out of fifteen correlation coefficients exceeded the value of 0. 80. Thus, he concluded that although trading connections and flows of information existed between the market centers to a considerable extent and the wholesale assembly markets were reasonably integrated, the ideal perfectly competitive environment indicated by correlation coefficients close to unity was not prevalent. Further, the correlation coefficients of the study were lower than those obtained by others, i.e., without detrending the data. Thus, the validity of the technique is weakened by the presence of autocorrelation in time and space. Similarly, the results of Jayaraj (1992) study showed that the correlation coefficients of residual series (which are trend free) were lower than those obtained for absolute prices and so supported the Blyn's results.

A spatially integrated market indicated by the ·high correlation coefficient, however, does not necessarily have to be competitive. So that this concept of correlation based integration itself appears hazy from the view point of assessing the degree of competition. This is because, as pointed by Timmer (1974) in his study of rice marketing margins in Indonesia that integration methodology in time and space is

based on the unidirectional model of price formation. Timmer suggested two way model of price formation between rural producer market and urban consumer market. In this two way model, during the lean season, rural hinterland prices may rise above the urban prices. And if rural demand is significant, it becomes possible to reverse flow from urban, back to rural areas according to Timmer, marketing margin between rural and urban trades, under the circumstances, could be positive, zero or negative. Thus, if the unidirectional model is replaced by Timmer's two way model of price formation; high, low or negative spatial price correlations possible. So, great care is necessary before drawing inferences about the nature of competition from indices of market integration. If one allows for two way trade, the correlation coefficient appears to be an unsatisfactory tool and may tell nothing about either market integration or the degree of competition.

Finally the correlation method has been criticized by Harriss (1979) on the ground that a high correlation between two markets does not necessarily mean that these two markets are well integrated in the sense that a competitive network of traders exists which ensures that agricultural goods move between market places in swift response to price differences that exceed transport costs. The high correlation could just as easily indicate stable margins and monopolistic imperfections in the marketing system as competitive conditions and efficiency. Similarly, low correlation does not have to be an indication that markets are not well integrated.

Goodwin and Schroeder (1991) used cointegration approach for the analysis of the integration of 11 regional cattle markets in the USA, using weekly price series over the period 1980-87. They used seven empirical tests of Engle and Granger (1987) for cointegration analysis. The study concluded that several markets were not cointegrated over 1980 through 1987 period. Markets separated by long distances had a lower degree of cointegration than markets nearby. However, this divergence of price over a long distance might be warranted by market conditions but was not large enough to permit profitable trade through regional movements of cattle. Furthermore, significant increases in cointegration of several regional livestock markets were observed through the 1980s. A formal analysis of market characteristics revealed that distance between

markets, industry concentration ratio, market volumes and market types had significant influences on cointegration relationship between markets.

Perhaps first ever study conducted on Indian data using the latest technique of time series of cointegration is by Palaskas and Harriss (1993). To examine the dynamic relationship of market commodity prices in West Bengal, they analyzed the weekly spot prices for the period of 1988 to 1990 for three commodities - rice, potato, and mustard. In addition to the error-correction mechanism, the study also examined the statistical adequacy of the estimated equation by using the following tests - LM test to determine whether the residuals were serially correlated; ARCH test to test conditional heteroscedasticity of residual and other explanatory variables; Chow test (post sample stability test) to test for parameter constancy. Cointegration tests suggested that the markets were integrated, but a lower degree of integration of rice and mustard was identified. The hypothesis of full market integration was rejected. Thus, the study negated some of the results of the previous study done by Lele (1968). Also, the study tried to locate the structural and institutional factors affecting the marketing performance. The factors found most important were the institutional set-up of the marketing system, the availability of market information and the state regulatory policy.

In their study, Carol and Wyeth (1994) observed that the procedure suggested by Ravallion was still widely used and they proved that Ravallion model was a special case within the more general framework of cointegration. They used the reduced form of error-correction mechanism which made it possible to test for exogeneity as well as indicating the direction and strength of causality in price formation between markets. The method was illustrated with monthly data on rice prices in different parts of the Indonesian market. Out of the seven markets studied, cointegration was found in five markets. The results confirmed among other things that supply ·sources were more important than demand sources in driving prices.

Goletti and Babu (1994) undertook a study to see how market integration has been affected by market liberalization. Several measures of integration such as ointegration,

dynamic adjustments, and price asymmetry were introduced to analyze both the co-movement of prices and the price adjustment over time. Monthly retail prices of maize at eight main locations in Malawi over the period January 1984 to December 1991 were considered. It was observed from the study that almost all markets exhibited cointegration, thereby suggesting a causal relationship among them. The number of markets that were cointegrated increased after liberalization took place in July 1987. However, the degree of integration was not perfect as adjustment of price changes to stock originating elsewhere was not 100 per cent and for most of the markets,

It was below 50 per cent. Contrary to the general belief that price increases are transmitted to consumers, whereas traders are the main beneficiaries of price decreases, it was observed; however, that supply (and demand) shocks were transmitted equally, both when they tend to increase prices and when they put downward pressure on prices. Finally, the study concluded that market liberalization could not achieve a structural change in market integration unless investment in marketing infrastructure (transport, communication, etc.) is undertaken. However, the study lacks by the fact that cointegration and long term dynamic multipliers have been computed without having their proper linkages.

Diakosevvas (1995) examined market integration between Australian and US beef prices at the farm gate level. Cointegration analysis and a time varying parameter estimation procedure based on the Kalman filter model was applied. The study used monthly beef prices data over the period 1972 to 1993. The results of the study indicate that there was cointegration between Australian and US beef prices, albeit not full. Further, the degree of convergence between the various price pairs has not substantially increased over time. Diakosevvas concluded that Australian prices could not unequivocally be adopted as world prices in empirical analysis.

Sinharoy and Nair (1994) concluded in their study of pepper price variations in the international trade that the international prices of pepper for Indonesia and India have moved synchronously in the long run. This movement was although the short run drifts and so indicated the integration of these world pepper markets. The study

pointed out that there might be a kind of tacit collusion among exporters on market sharing and price parity. However, the results are not likely to vary even if stock adjustment and forward trading in pepper are considered. To test the temporal ordering of oil and oilseeds price, Nasurudeen and Subramanian (1995) used Kock's distributed lag model, considering its superiority over the correlation analysis. The daily wholesale prices for the Bombay market were collected from October 1993 to September 1994 from the daily issues of the Economic Times and the Financial Express to calculate horizontal and vertical integration for the ten selected oils. The authors observed from the analysis that there was integration between prices of oil and oilseeds, but complete oil price integration was lacking. Price integration in most of the cases was bi-directional except in castor oil. The results of vertical integration established that changes in oilseed prices were linked to changes in oil and cake prices. The study found that the vertical integration in oilseed prices was much quicker than horizontal integration in oil prices. A quick adjustment to price changes was observed in Bombay oilseed market.

Thus, all the above studies discussed on cointegration used the Augmented Dickey-Fuller procedure to test the null hypothesis of no cointegration of prices. Although this OLS approach is relatively simple and intuitive, it suffers from some shortcomings. One disadvantage is that the distribution of the test statistics is not invariant concerning the nuisance parameter and therefore, the critical values, given in Engle and Granger (1987) can be taken only as a rough guide. Second, the procedure of considering pairs of markets ignores any linkages which might operate through a third market. Third, there may exist more than one long run relationships, but these cannot be captured by the Dickey-Fuller procedure. Fourth, the tests for identifying the driving forces in the two markets ignore the possible existence of multiple 'common trends' which would imply multiple dominant markets. Finally, given a priori belief that markets are in fact integrated, it is preferable to test the null hypothesis that prices are cointegrated. A better and more powerful test for cointegration presented by Johansen (1988) is maximum likelihood procedure, 'multiple cointegration tests,' which overcomes many of the above problems. This technique is particularly important when testing for cointegration between more than two variables. The

mathematics underlying the methodology is quite complex, however, and need sophisticated software packages. Due to the lack of package and time, the above technique has not been used in this study. The cointegration tests (with OLS) represent necessary, rather than sufficient condition for aggregation and must be supplemented by information on market structure. With these caveats in mind, the empirical analysis in this study should be considered as an attempt to examine the market integration in Haryana mandis.

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CHAPTER - 2

NALANDA DISTRICT: A GEOGRAPHICAL OUTLOOK

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2.1 INTRODUCTION

Nalanda is one of the thirty-eight districts of Bihar state and Biharsharif town is the administrative headquarters of the district in India. Nalanda district is a part of Patna division. Nalanda is famous all over the world for the ancient international monastic university established in the 5th century AD, which taught Vedas, logic, grammar, medicine, metaphysics, prose composition, and rhetoric. The district is divided into 20 blocks they are Giriyak, Rahui, Nursarai, Harnaut, Chandi, Islampur, Rajgir, Asthawan, Sarmera, Hilsa, Biharsharif, Ekangarsari, Ben, Nagarnausha, Karaiparsurai, Silao, Parwalpur, Katrisari, Bind, and Tharthari. It is spread over the area of 2,355 sq.km. The total population of the district is 2,877,653.

The river Phalgu and Mohane flow through the district of Nalanda. Agriculture is the main source of occupation. The farmers mainly grow paddy, apart from this, they grow potato and onion. Few people involved in handloom weaving. Since the district is a famous tourist destination, tourism plays a vital role in the economy of Nalanda.

2.2 HISTORY

Nalanda is famous for his ancient university. Which is situated in the village of 'Badagaon' founded in the 5th century A.D, Nalanda is known as the ancient seat of learning 2000 teachers and 10,000 students from all over the Buddhist world lived and studied at Nalanda the first residential international university of the world.

A walk in the ruins of the university. Takes tells about an era that saw India leading in imparting knowledge to the world – The era when India was a coveted place for studies. The university flourished during the 5th and 12th century.

Although Nalanda is one of the places distinguished and have been blessed by the presence of the Buddha. It later became particularly removed from the site of the great monastic university of the same name, which was to become the crown jewel of the development of Buddhism in India. The name derived from one of Shakyamuni's former births, which he was a king whose capital was here.

This place saw rise and fall of many empires and emperors who contributed to the development of Nalanda University. They built many monasteries and temples. King Harshwardhana gifted a 25 m high copper. Statue of Buddha and Kumar Gupta endowed a college of fine arts era. Nagarjuna, a Mahayana philosopher dinnaja founder of the school of logic and Dharmapala –the Brahmin scholar, taught here. The famous Chinese traveler and scholar hieun-Tsang stayed here and had given a detailed description of the situation prevailing at that time. Careful excavation of the place has revealed many stupas, monasteries, hotels, staircases, meditation hall, lecture halls and many other structures which speak of the splendor and grander this place enjoyed. When the place was a center of serious study.

Pali Buddhist literature too has ample references to Nalanda, which used to be visited by Lord Buddha. During the days of Mahavira and Buddha, Nalanda was apparently a very prosperous temple city. A great place for pilgrimage and the site of a celebrated university. It is said that King Ashoka gave offerings to the chaitya of Sariputra at Nalanda and erected a temple there. Taranath mentions this and also that Nagarjuna, the famous Mahayana philosopher of the second century A.D. studied at Nalanda later became the high priest there.

The Gupta kings patronized their monasteries, built in old Kushan architectural style, in a row of cells around a courtyard. Ashoka and Harsha Vardhan were some of its most celebrated patrons who built temples and monasteries here. Recent excavations have unearthed elaborate structures here Huen Tsang had left ecstatic accounts of both

the ambiance and architecture of the university of ancient times. During the Gupta age, the practice and study of the Mahayana especially the Madhyamika flourished.

2.2 Physical Profile

2.2.1 Relief & Structure

Although the study area forms a part of southern Ganga Plain, its relief features are slightly different from other areas. The inliers of hilly areas of Rajgir and Bihar Sharif have disturbed the homogeneity of the land surface and associated topographic features. The southern parts of Nalanda district have almost different relief features than the northern areas. As such the district is divided into two physical units, viz.:

1. Alluvial lands of the north, and
2. Rajgir hilly areas of south,

2.2.1.1. Alluvial Lands of the North

As mentioned earlier the low alluvial lands of the north lies in the south of the River Ganga is the result of deposition of the river Ganga and the tributaries coming from the south. This area is almost homogeneous excepting a small very low-lying area in the southeast portion. The general slope of the land is from southwest to northeast. Rivers flowing from south to north-east have deposited relatively more silt in the north near river Ganga. In spite of that the land slopes towards north and east. Here it should be noted that all tributaries follow the directions of Ganga for some time and then finally join near Mokama Tal. The slope of this area is from west to east in the northern area. The general slope of the study area is about 9 cm per kilometer except for the hilly areas. The north-eastern area of the Nalanda district is part of Tal area of Mokama which is a low land area, and it remains waterlogged during the rainy season.

In addition to this low land, there are several smaller low land areas caused by uneven silt deposition and shifting course of the river flowing in the areas.

2.2.1.2 Rajgir Hilly Areas of the South:

This area consists of the hilly areas of Rajgir and Bihar Sharif and the relatively higher alluvial plains of the south. The hilly areas formed of metamorphic rocks of the Puran age. Two parallel ranges of hills stretch away from southwest of the study area and encircle a narrow ravine through which a rivulet Bawan Ganga rushes down cascades and rapids and finally joins the Panchane river. These two parallel ranges finally merge east of Rajgir. At Rajgir sites of ancient historical importance, hot springs, religious places, and ancient township are encircled by these two hilly ranges. The northern range rises to a considerable height whose peak is known as Ratnagiri. From this place two spurs diverged into two directions, one descending southwards towards Giriak while the other strikes off to the northwest and joins the Vipulagiri peak. To the west, the latter peak is narrow ravine through which the Saraswati streams courses its way into the low lying areas. West of the river Saraswati the hilly ranges extends far about 4 or 5 kilometers towards the southwest direction till it attains a considerable elevation here Vaibhar hill situated. Very close to this hill the southern corner of the Rajgir valley is marked by the south-eastern corner of the Rajgir valley is marked by the Udaygiri peak has a spur towards north which joins the Vipulagiri hill. To the west hill sink into a defile, beyond which is a high hill called Sonagiri, opposite the Vaibhar hill. At this point, the two ranges again resume their south westerly direction and again endorse a narrow ravine evergreen with jungle.

2.2.2 Drainage

Since all rivers passing through the study area have their origin from the Hazaribagh plateau, They are rain-fed and seasonal in character. In fact, all rivers remain dry during the summer season. Most of the rivers have meandering courses, especially in northern low lying areas. It is remarkable to note that most of these rivers and their tributaries do not maintain their independent course, rather they sometimes join each

other and again separate making braided patterns. Secondly, most of the rivers as stated earlier, flow from south to north direction of the river Ganga. The elevated high levee along Ganga prevents any of these rivers from joining the main river as such after flowing towards north these rivers take eastwards course almost course almost parallel to the Ganga river. Besides drainage system, the region is influenced by the Rajgir hilly areas determines the courses of the river Panchane and few rivulets like Saraswati, Baitarni, etc. The Rajgir hill forces the river Panchane much eastwards. Some of the rivers appeared to have their relationships with the river Falgu as they are assumed off-shoot of the river Falgu. Important rivers of the study area are the Sakari, the Panchane, the Paimar, the Muhane, the Lokain, the Goithwa, etc. The greater part of the water brought down by these rivers is divided into irrigational networks of Pynes of Ahars and distributed to agricultural fields so that their main beds remain dried up for the greater part of the year.

2.2.3 Climate

Of all the factors of geographical environments, the climate is of vital significance for the study of the land use of an agro-economic area as it determines the activities of farmers and controls the production of crops to a great-extent. The favorable weather conditions govern the farm's operations such as plowing, sowing of seeds, transplantation, irrigation, manuring, harvesting, threshing, winnowing, sugarcane crushing. Indeed climatic factors account for at least 50 percent of the variabilities of crop yields over a series of years, manures variety, cultural operations, and accounting for remaining fifty percent.

The area under study experiences tropical monsoon type of climate. Due to its location, the climate of the region is controlled by a few factors. Firstly, it is located in the wet and humid climate of Bengal and Assam in the east and relatively dry climate of the west. The region is open to the east and relatively dry climate of the west. The

region is open to the east a and west for the free entrance of oceanic monsoon winds from the east and dry continental winds from the west. The location of Himalayan Mountains ranges in the north influences the direction of Central Asiatic cold wind from entering the area. The area is located north of the Tropic of Cancer, so it experiences the tropical type of climate. The nearness of the Bay of Bengal is another factor due to which the temperature of the region is not as high or low as that in the central and northern part of the area. The region is also influenced by the movement of the sun from Tropic of Cancer to that of Capricorn. This change gives birth to the monsoon which influences the whole of India including this region.

By temperature, rainfall, and of atmospheric disturbances, three distinct seasons with two well-marked transitions are found here. These seasons are as follows:

1. The Cold weather season: November to February
2. The Hot weather season: March to Mid-June.
3. The Rainy season: Mid –June to October.

Table 2.1

Average of 50 years Temperature and Rainfall in Nalanda

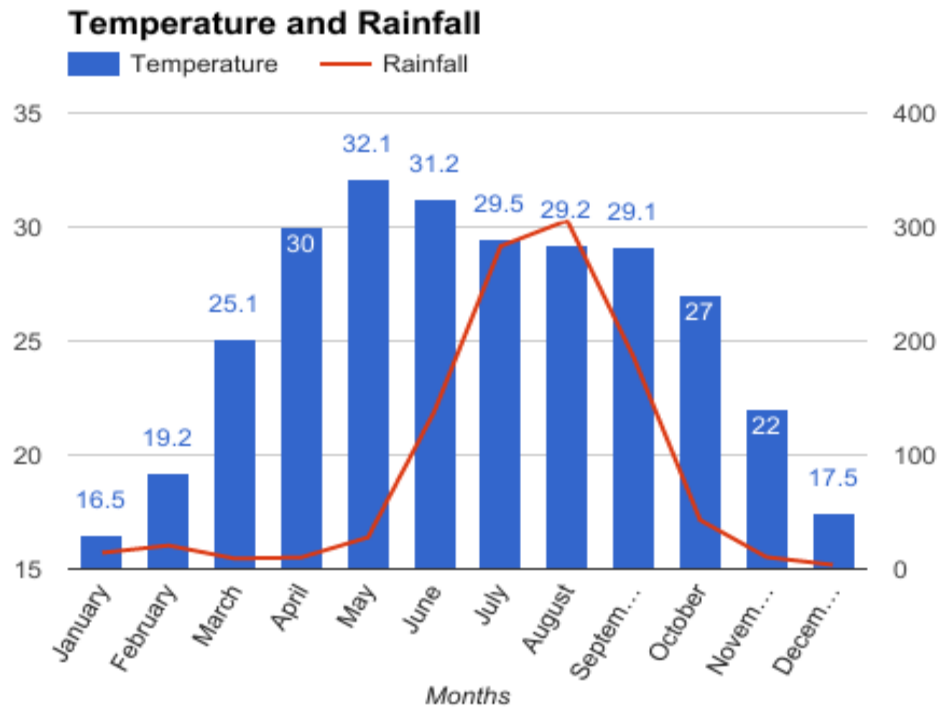
S.N.	Months	Temperature In Degree	Rainfall in mm
1	January	16.5	14.2
2	February	19.2	20.6
3	March	25.1	9.1
4	April	30.0	10.2
5	May	32.1	27.7
6	June	31.2	138.2
7	July	29.5	283.2
8	August	29.2	305.8
9	September	29.1	185.7

10	October	27.0	42.9
11	November	22.0	10.4
12	December	17.5	3.6

Source: IMD

Figure 2.1

Average of 50 years Temperature and Rainfall



2.2.3.1 Regional Variations in Rainfall

The relationship between seasonal variation in rainfall and production of crops has been analyzed in the earlier pages and relationship between the regional distribution of rainfall and crop production has been analyzed here. Although the study area is not large enough to produce regional contrast the location of hilly areas in the southern portion causes relatively more rainfall than remaining areas. Rajgir, Giriyak anchals having relatively hilly areas receive above 1200 mm rainfall. Adjacent areas of

Biharsharif and Asthawan also receive rainfall between 1000 and 1200 mm. Only Sarmera, Islampur, and Hilsa anchals receive rainfall less than 1000 mm.

The south-eastern portion having relatively more rainfall specialized in the production of Aghani crops like paddy, Rabi crops like wheat and pulses and Bhadai crops like maize, ragi, and varieties of vegetables. Certainly, production of vegetables and rabi crops are based on irrigation facilities rather than rainfall. Only Bhadai and Aghani crops mainly depend on rainfall. Even production of these crops depends upon tube-well or other irrigation facilities in case of drought.

As regards variability of maximum rainfall variation is marked in Rajgir, Giriyak and Asthawan were variations are marked in Rajgir, Giriak and Asathawan Anchals where variation is almost 8 to 9 percent. Parts of Islampur, Noorsari, Chandi, Rahui, Biharsharif experience to 6 to 8 percent rainfall variation and remaining areas have less than 5 percent variation.

2.2.4 Natural Vegetation

Since the study area lies in the densely populated belt of the middle Ganga Plain, it has very little natural vegetation. People have almost removed the vegetational cover and converted these areas into cultivable land. Only the hilly areas of Rajgir are left with natural vegetation. Other than these areas only orchards exist close to the settlement. Even most of the orchards consisting of mango, guava, etc., are day by day vanishing because cultivators grow more crops than fruits. The net return of the orchards becomes much less than the production of crops. As such only those people prefer to keep some of their plots engaged in orchards who have enough hand otherwise smaller farmers consider it unprofitable.

Important vegetation cover lies in the Rajgir hilly areas, and remaining areas have only considerable orchards. The Rajgir hills and valleys are covered with a scrub jungle interspersed with small trees like Boswellia Serrale, Roxle, Cassia Fistula linn.,

etc., and scrubs like Seeurinagh version, etc. in the crevices of the rocks in the lower regions of the hills grow scrubby specimens of Murraya Paniculata (Linn) Jack, etc. the vegetation of the valley is predominantly of the thorn scrub forest type with Dendrocolamus Strictus need predominating.

The scrubs grow in clumps separated from each other by coarse grasses. Except for some jungles in the Rajgir hills, the district is devoid of forest wealth of any consequence. The government has put a restriction on the merciless cutting of trees in this area to preserve the natural forest and to develop wild life.

Although orchards are vanishing day by day due to competition with other cash crops but the Government incentive towards planting more trees and use of waste land specially road-side areas are being converted into orchards. The incentive has spread throughout the region, and people have become also aware of the importance of the tree plantation.

2.2.5 Soils

The soil is one of the most important resources of a nation. It is the gift of immense values. The most common use of the word soil is in the sense of a medium in which plants grow, although it has a different connotation at different time and place. The soil is the backbone of agriculture and industrial development. The soil of Nalanda is Gangetic alluvium which is khaddar in nature. Which means new soil deposited by the river.

2.3 Demographic Profile

According to 2011 census, the district of Nalanda had a total population of 2872523 persons and an area of 2355 sq. km. The district of Nalanda is one of the densely populated districts. The large population and its spatial distribution, density and its occupational structure reveal that here people have not only been the creator of the cultural landscape but also a basic constituent of the eco-system of the region. The

regional distribution of population and its growth is mainly related to the economic landscape of the district. The average density of population for the district is 1222 persons per square kilometer. The highest density i.e. 2893 persons per square kilometer is found in Biharsharif block and lowest density i.e. 716 persons per square kilometer is found in Sarmera. The decadal population growth for the district is 21.17 per cent. Both the density and growth rate of population is higher in the sub-division of Biharsharif and Islampur because of good quality of agricultural land and increasing urbanization which has made the area comparatively prosperous.

Table 2.2

Decadal population growth rate (1971-2011)

	Total	Rural	Urban
1971-81	25.67	19.72	83.71
1981-91	21.73	20.00	32.71
1991-01	18.65	18.52	19.38
2001-11	21.17	19.97	29.48

Source: District Census Handbook, Census of India 1971-2011.

2.3. Distribution and Density of Population

Fig. 2.5 shows the distribution of population density in the district. It clearly indicates that there is considerable variation in the number of persons living in different blocks. The main cause of this uneven distribution can be attributed to the existence of the uneven distribution of fertile agricultural land, the level of urbanization and the facilities of transport and communication.

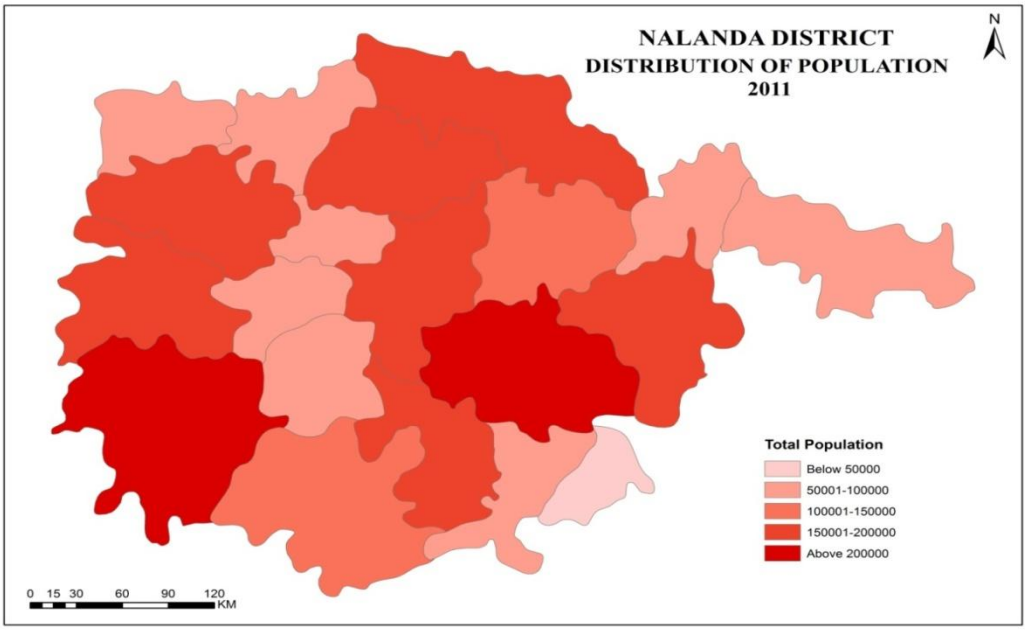
Table 2.3

Block-wise Distribution of Population and its Density in Nalanda District (2011)

S.N.	Blocks	Area	Population (2011)	Density (Per/sq km)
1	Karai Parsurai	64.95	73951	1139
2	Nagar Nausa	75.4	94467	1253
3	Harnaut	181.58	176140	970
4	Chandi	147.15	152156	1034
5	Rahui	124.26	144040	1159
6	Bind	73.32	61984	845
7	Sarmera	135.55	97083	716
8	Asthawan	138.58	163938	1183
9	Biharsharif	170.9	494489	2893
10	Noorsarai	123.41	172351	1397
11	Tharthari	62.03	68393	1103
12	Parbalpur	61.8	70316	1138
13	Hilsa	141.15	197309	1398
14	Ekangarsarai	133.22	171214	1285
15	Islampur	225.87	232337	1029
16	Ben	100.15	87387	873
17	Rajgir	143.74	130183	906
18	Silao	143.74	151249	1052
19	Giriak	93.03	96845	1041
20	Katrisarai	30.76	41821	1360
	Total	**2355**	**2872523**	**1222**

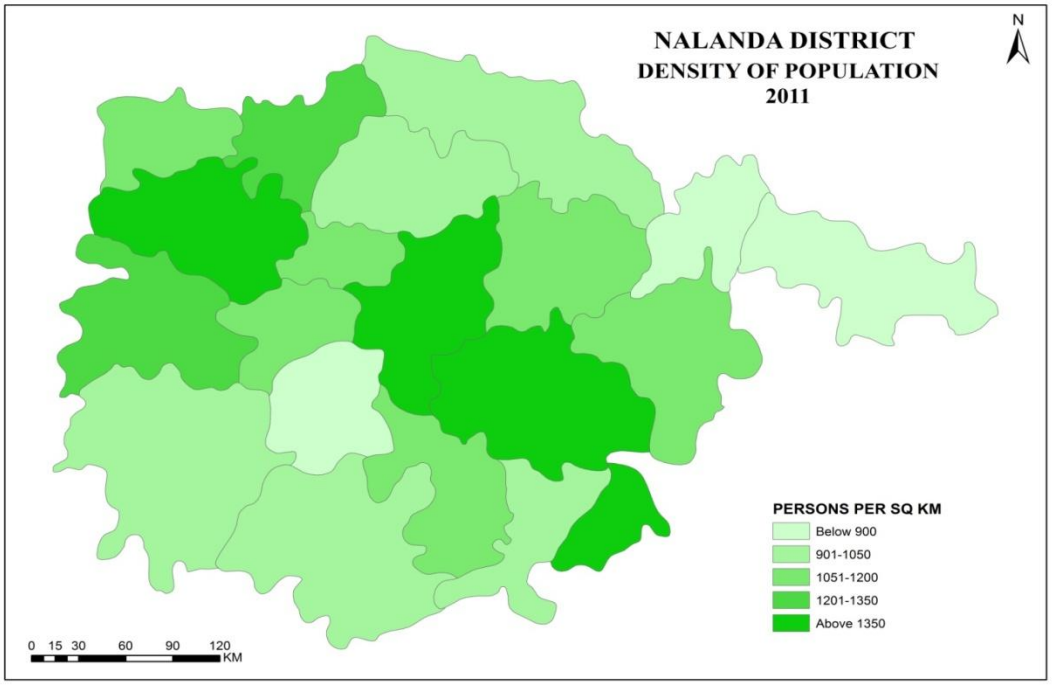
Source: Census of India 2011

Map 2.1: Distribution of population 2011



Source: Census of India 2011

Map 2.2 Density of Population 2011



Source: Census of India 2011

The density of population is the measurement of population pressure on a given unit of land. The density of the district as a whole is 1222 persons per square kilometer, which is lower than that of whole Bihar. Fig- 2.5 based on census data of 2011 shows the block-wise density of population. It is seen that only one block, namely, Biharsharif (2893) is having a very high group of density which is above 850 persons per square kilometer. The high concentration (density of population) is found in Blocks Noorsari (1397), Katrisarai (1360) and Ekangarsari (1285). Blocks include Nagarnausa (1253) and Asthawan (1183) representing medium concentration. Sarmera and Bind represent (716) and (845) persons per square kilometer and come under low concentration (density) of the population (Table-2.3).

2.3.2 Growth of Population

There has been a rapid increase in the population of the district since 1951 (Table 2.4). The greatest increase was, recorded during the decade 1971-81 when the population increased by more than 23.41 per cent, while lowest population growth was recorded during 1951-61 is only 17.14 per cent (Table-2.4). The block-wise population growth rate during 2001-2011 varies between a maximum of 31.43 per cent in Tharthari to the minimum growth of 10.83 per cent in Katrisari block. Tharthari, Nagarnausa and Giriak blocks recorded the highest growth rate which is more than that of other parts of the district. The percentage of growth of population recorded in different blocks varies with Tharthari reporting 31.43 per cent, Nagarnausa 30.34 per cent, Giriak 27.87 per cent, Noorsari 25.56 per cent, Biharsharif 25.00 and Katrisari per cent recording a growth of 10.83 per cent during the same period (Table-2.5).

Table 2.4

Growth of Population in Nalanda District (1951-2011)

year	Total Population	Decadal Variation	Growth
1951	**928642**		
1961	**1087817**	**159175**	**17.14**
1971	**1327568**	**239751**	**22.04**
1981	**1638364**	**310796**	**23.41**
1991	**1996257**	**357,893**	**21.84**
2001	**2370528**	**374,271**	**18.75**
2011	**2872523**	**501,995**	**21.17**

Source: Census of India 2011

Table 2.5

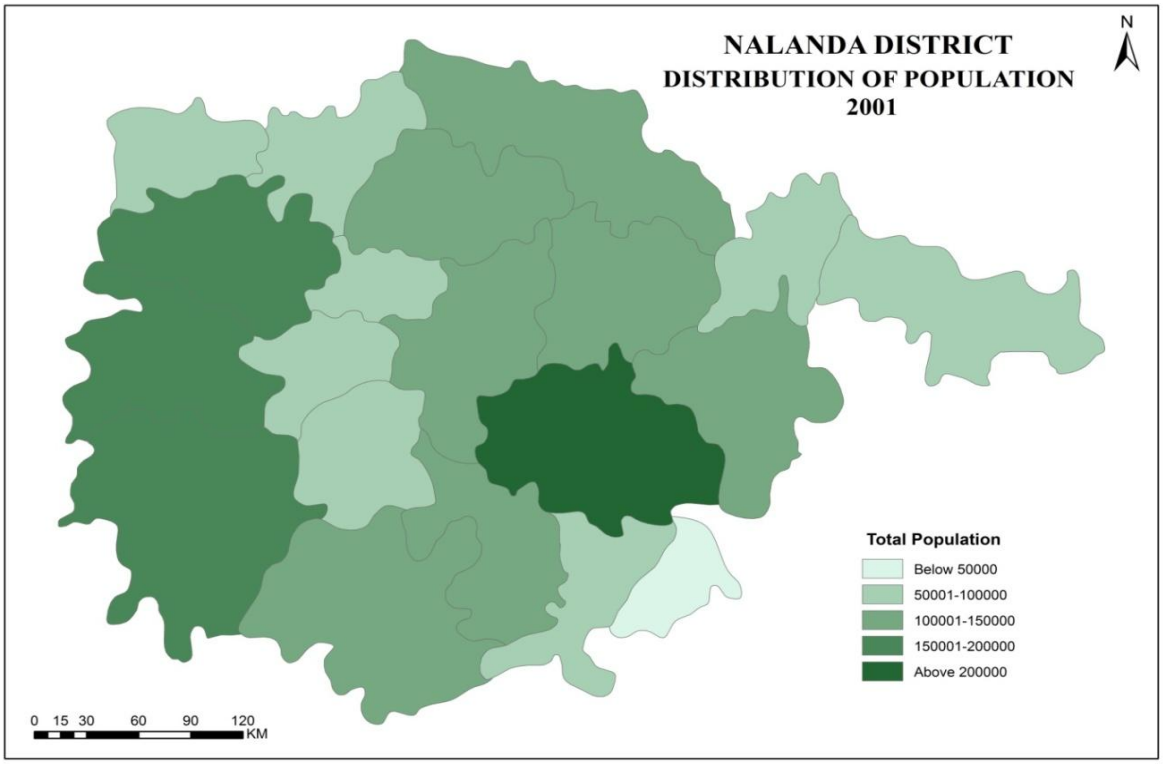
Block-wise Growth of Population in Nalanda District (2001-2011)

S.N.	Blocks	Population 2011	Population 2001	Variation	Growth in (%)
1	Karai Parsurai	73951	60127	13824	22.99
2	Nagar Nausa	94467	72475	21992	30.34
3	Harnaut	176140	143922	32218	22.39
4	Chandi	152156	125990	26166	20.77
5	Rahui	144040	127975	16065	12.55
6	Bind	61984	56240	5744	10.21
7	Sarmera	97083	78610	18473	23.50
8	Asthawan	163938	143867	20071	13.95
9	Bihar	494489	395588	98901	25.00
10	Noorsarai	172351	137267	35084	25.56

11	Tharthari	68393	52039	16354	31.43
12	Parbalpur	70316	58501	11815	20.20
13	Hilsa	197309	162546	34763	21.39
14	Ekangarsarai	171214	152097	19117	12.57
15	Islampur	232337	192113	40224	20.94
16	Ben	87387	72193	15194	21.05
17	Rajgir	130183	109136	21047	19.29
18	Silao	151249	122991	28258	22.98
19	Giriak	96845	75735	21110	27.87
20	Katrisarai	41821	37734	4087	10.83
	Total	**2872523**	**2370528**	**501995**	**21.17**

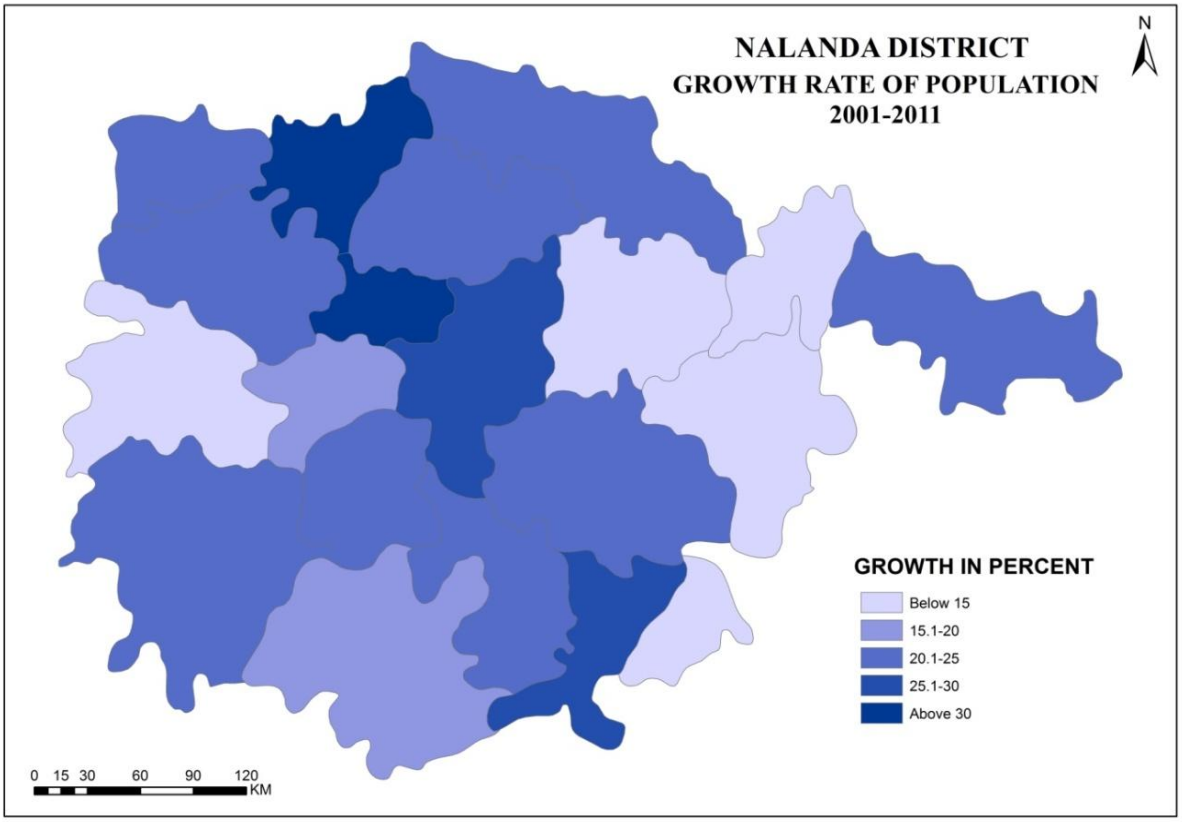
Source: Census of India 2011

Map 2.3 Distribution of Population 2001



Source: Census of India 2001

Map 2.4 Growth Rate of Population 2001-2011



Source: Census of India 2011

2.3.3 Sex-Ratio

The sex-ratio of Nalanda district data shows a dominance of male population. In 2011, the district reported 922 females per 1000 males. The sex-ratio is higher in rural areas (923) as compared with the urban areas (913). Many socioeconomic factors contribute to this disparity of sex-ratio. Block level distribution of sex-ratio shows that the highest ratio has been found in Bind and Rahui i.e. 953 and 948, while a minimum of 904 females per 1000 males was registered in Harnaut block (Table-2.6).

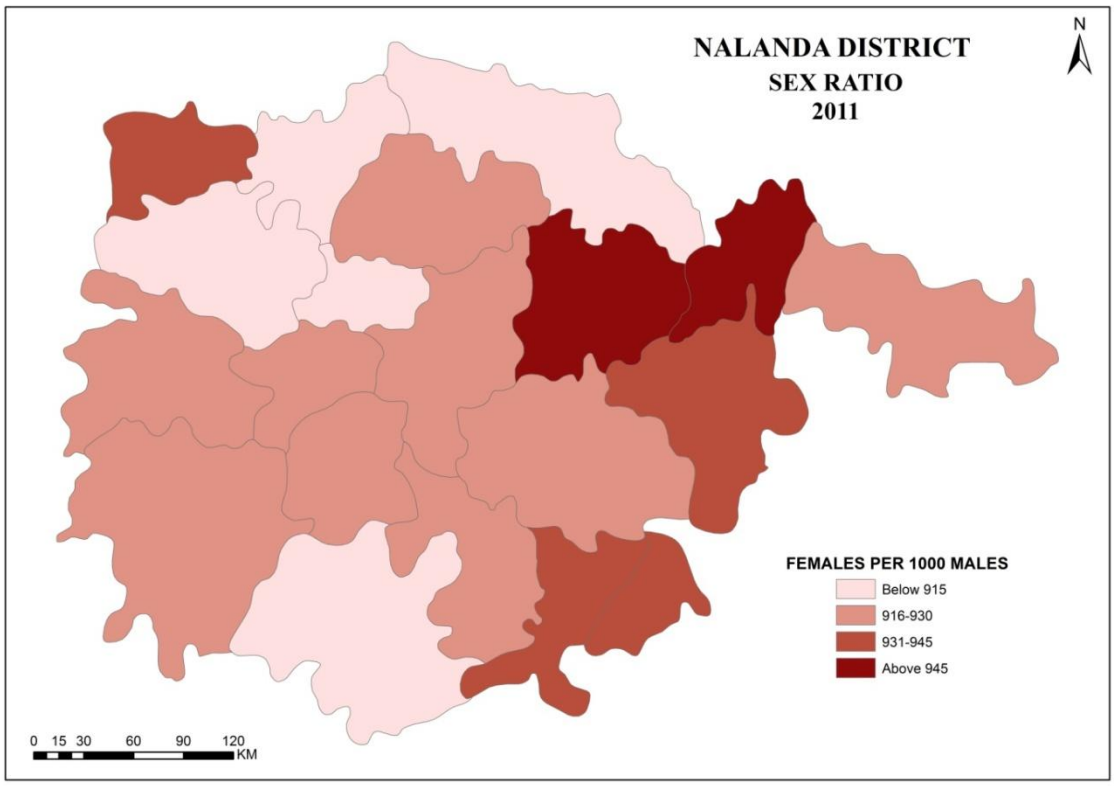
Table 2.6

Block-wise Distribution of Sex-Ratio in Nalanda District (2011)

S.N.	Blocks	Rural	Urban	Average
1	Karaiparsurai	931		931
2	Nagarnausa	915		915
3	Harnaut	904		904
4	Chandi	923		923
5	Rahui	948		948
6	Bind	954		954
7	Sarmera	919		919
8	Asthawan	939		939
9	Bihar	925	915	919
10	Noorsarai	924		924
11	Tharthari	911		911
12	Parbalpur	917		917
13	Hilsa	920	887	911
14	Ekangarsarai	916	897	916
15	Islampur	918	942	921
16	Ben	919		919
17	Rajgir	918	902	913
18	Silao	924	928	925
19	Giriak	932		932
20	Katrisarai	943		943
	Total	**923**	**913**	**922**

Source: Census of India 2011

Map 2.5 Sex Ratio 2011



Source: Census of India 2011

2.3.4 Literacy

The literacy rate of any area has great significance since it serves as an indicator of the capacity of people to learn and adopt new techniques and methods of production both in agriculture and industry, and to live a more healthy, prosperous and active life. The district had registered a continuous increase in the literacy rate since 1951. It is reported that in Nalanda district Total literacy rate increased from 33.04 per cent in 1981 to 53.19 per cent in 2001. In 2011, the district registered 64.43 per cent literacy rate (Table-2.7), with the female literacy of 53.10 per cent and male literacy of 74.86 per cent. Block-wise literacy level shows that Parbalpur is having the highest literacy rate of 70.22 per cent, while the lowest literacy rate has been recorded as 54.37 per cent in Bind block.

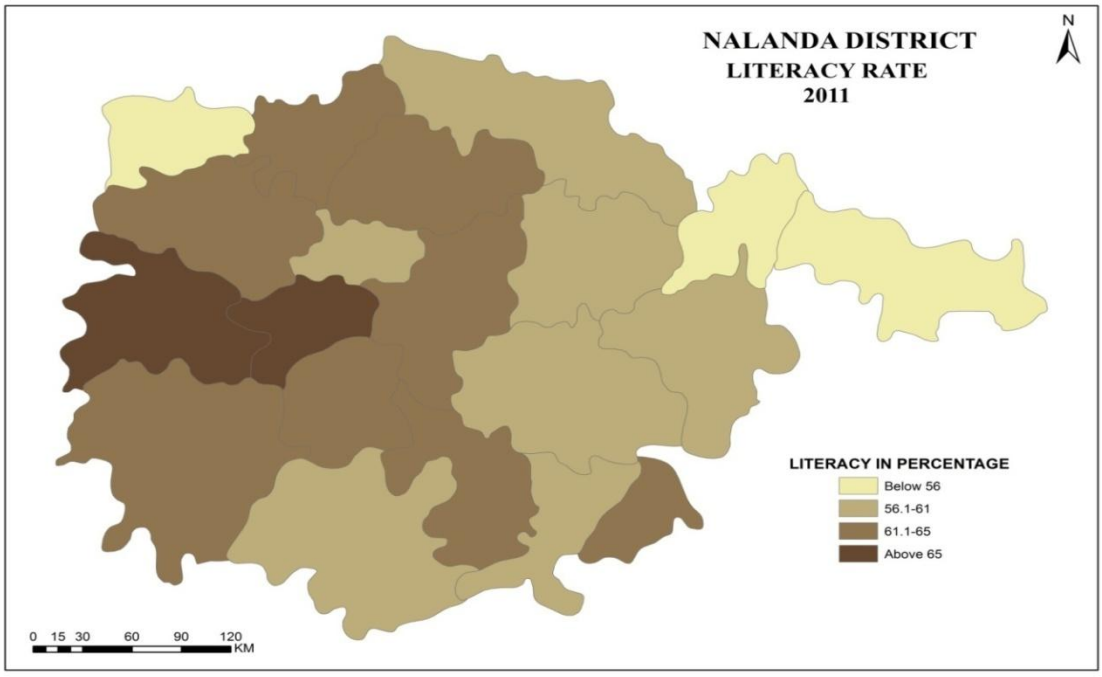
Table 2.7

Block-wise Distribution of Literacy in Nalanda District (2011)

S.N.	Blocks	Male	Female	literacy
1	Karai Parsurai	68.13	43.98	56.52
2	Nagar Nausa	74.48	51.98	63.72
3	Harnaut	71.63	50.09	61.45
4	Chandi	75.88	52.91	64.88
5	Rahui	73.60	48.48	61.35
6	Bind	66.64	41.50	54.37
7	Sarmera	66.00	43.15	55.06
8	Asthawan	70.81	47.88	59.71
9	Bihar	71.58	47.29	59.93
10	Noorsarai	75.98	51.91	64.43
11	Tharthari	73.13	47.70	61.01
12	Parbalpur	81.40	57.94	70.22
13	Hilsa	75.81	49.58	63.21
14	Ekangarsarai	80.62	56.81	69.23
15	Islampur	75.77	51.88	64.34
16	Ben	74.75	53.52	64.62
17	Rajgir	70.49	50.16	60.76
18	Silao	73.11	51.60	62.79
19	Giriak	71.55	49.70	61.00
20	Katrisarai	76.29	51.50	64.29
	Total	**74.86**	**53.10**	**64.43**

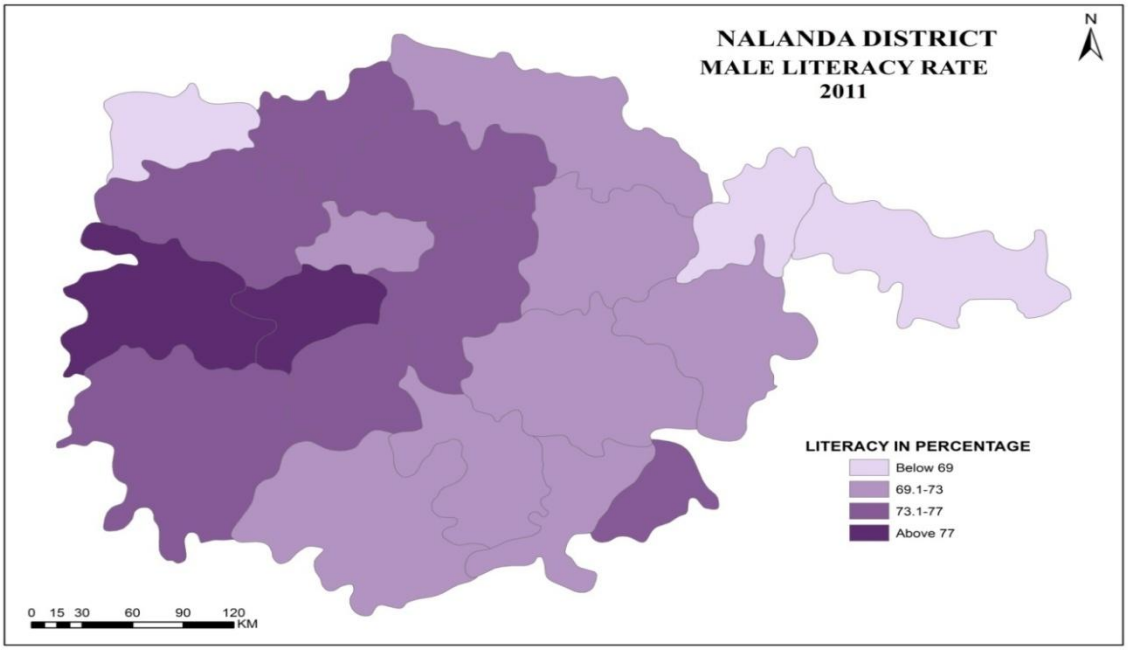
Source: Census of India 2011

Map 2.6 Literacy Rate, 2011



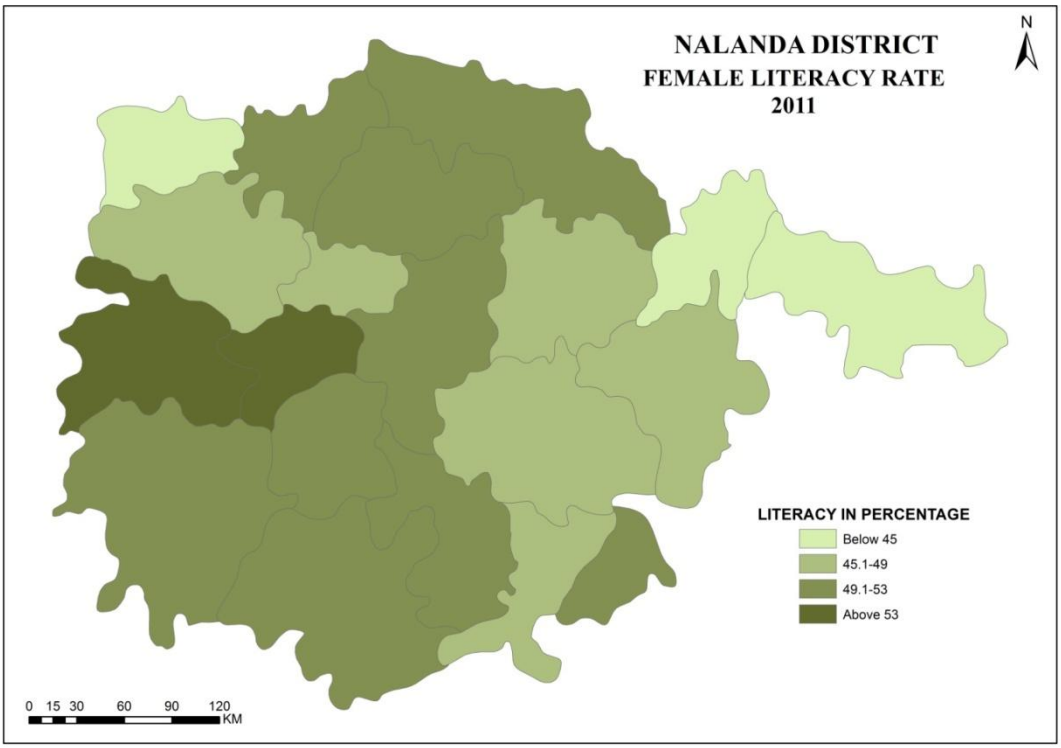
Source: Census of India 2011

Map 2.7 Male Literacy Rate, 2011



Source: Census of India 2011

Map 2.8 Female Literacy Rate, 2011



Source: Census of India 2011

2.3.5 Urban Population

The urban population in the district is only 15.91 per cent of total population. The level of urbanization is below the state average. Out of 20 development blocks, only six blocks have an urban population which spread on the three towns. The highest concentration is found in Biharsharif block which has 60.12 per cent urban population. The largest town is Biharsharif with a population of 297268 persons. It is a sub-division and a block headquarters and is connected with good road and railway transport network. The second town of the Nalanda is Hilsa with a population of 51052 persons.

The third concentration of urban population is found in Rajgir block, which constitutes 31.95 per cent of total population. Biharsharif is the largest town in the district with a population of 297268 (Table-2.8)

Table 2.8

Block-wise Rural-Urban Population in the Nalanda District (2011)

S.N.	Block	Rural Population	Urban Population	% Urban Population
1	Karaiparsurai	73951		
2	Nagarnausa	94467		
3	Harnaut	176140		
4	Chandi	152156		
5	Rahui	144040		
6	Bind	61984		
7	Sarmera	97083		
8	Asthawan	163938		
9	Bihar	197221	297268	60.12
10	Noorsarai	172351		
11	Tharthari	68393		
12	Parbalpur	70316		
13	Hilsa	146257	51052	25.87
14	Ekangarsarai	164542	6672	3.90
15	Islampur	196696	35641	15.34
16	Ben	87387		
17	Rajgir	88596	41587	31.95
18	Silao	125575	25674	16.97
19	Giriak	96845		
20	Katrisarai	41821		
	Total	2419759	457894	15.91

Source: Census of India 2011

2.4 Agricultural Economy

2.4.1 Land Use

Land use of an area is determined by the nature and general layout of physical elements. Classification of land use (Table-2.9) shows that the net sown area occupies about 77.44 per cent of the total area of the district, and thus constitutes the most dominant category of the land use. It is followed by the category of land put to non-agricultural uses, which accounts for 15.03 per cent of the total area. The current and other fallow lands account for3.97 per cent and 0.20 per cent of the area. Culturable-waste land accounts for 0.05 per cent of the reported area. Forests, trees, groves, etc. accounts for only 1.74 per cent of the total reported area.

Table 2.9

Land-use Pattern in Nalanda District 2013

S.N.	Land-use Type	Area (in Acres)	Percent
1	Land put to non-agricultural uses	86832	15.03
2	Barren and uncultivated land	8206	1.42
3	Cultivable waste land	285	0.05
4	Other fallow	1178	0.20
5	Permanent pastures and grazing land	2	0.00
6	Forest	10036	1.74
7	Current fallow	23001	3.97
8	Net sown area	447572	77.44
	Total	578003	100

Source: District Statistical Handbook

2.4.2 Cropping Intensity

Nalanda district's economy is primarily based on agricultural production. There are three agricultural seasons in the district viz., Rabi, Kharif, and Zaid. Rabi season starts

in October or November and harvesting is done in March and April. The important rabi crops are wheat, barley, gram, peas, mustard, linseed, potato, etc. Kharif season starts in July, and the harvesting is done in October or November. The millets, maize, arhar, rice, and sugarcane, etc. are the main crops of Kharif season. Zaid crops. which is of relatively little importance, occupy the fields from April to July. These crops are synchronized with the winter, rainy and summer seasons respectively.

Cropping intensity is measured regarding the number of times a land is put to agricultural use within a year, serves as a good index for assessing the agricultural prospects of an area. The average cropping intensity of 20 development blocks of Nalanda district was 168.48 per cent in 2000-2001. It is not uniformly distributed within the district. As may be noted from (Table 2.10).

Biharsharif, Giriak, Harnaut, Ekangarsari and Rahui blocks which have a higher value of cropping intensity than the average cropping intensity of the district, which is 168.48 per cent. The lowest cropping intensity of 152.50 per cent was recorded for Islampur block.

2.5 Transportation

Transport influences the economy as also the land use of a region. Its role in the economic development is as important as that of the blood circulation in the body. In an agricultural region, it acts as the main vehicle for bringing different raw materials, seeds, fertilizers, implements and distributes the product of the region in the areas which need such products. The district of Nalanda has a very rich in transport and communication system. The main systems are the railways, the roadways, and ropeways.

2.5.1 Railways

Nalanda is well served by two parallel lines of railways both of them terminate in the district itself. The most important railway line is from Bakhtiarpur to Rajgir. It is a broad-gauge line of the Eastern Railway. This line passes through the heart of the district. The main line, viz., Patna-Calcutta is only 5 km north of the district. The Bakhtiarpur-Rajgir line crosses through the Anchals of Harnaut, Rahui, Biharsharif, and Rajgir. The important railway stations are Harnaut, Wena, Bhaganbiggha, Biharsharif, Nalanda, and Rajgir. The line is connected with the main line at Bakhtiarpur and facilitates the transportation of agricultural raw materials and products. It brings seeds, fertilizers, and pesticides from the places located far away from here. The surplus products of the district such as potato, vegetables, and grains are exported from this district. This railway line brings a large number of international and national tourist to the tourist centers of Rajgir, Nalanda, and Pawapuri.

The other railway line is just parallel to the former and runs from Fatwah to Islampur where it terminates. It is light railway and Passes through Hilsa, Ekangarsai and Islampur Anchals. The important railway station stations are Diawan, Lohanda, Hilsa, Rambhan, Ekangarsari, Auguari, and Islampur. This railway line joins Fatwah which is 13km to the north of the district. In the beginning, this line was the only transport system of the area. But due to the development of roadways, its relative importance has decreased sharply. It is because only one town runs up and down in a day causing much inconvenience to the passengers. Its speed is also very slow. It is incurring a huge loss, and there is a proposal to close it down and convert the line into a meter-gauge.

2.5.2 Roadways

The road transportation of Nalanda is very developed. Its headquarters town Biharsharif is the node of the roads. The district is served with the National Highway

No. 31. Which is locally called Patna-Ranchi Road? This road runs almost parallel to the Bakhtiarpur-Rajgir railway line up to kiosk village situated south of Biharsharif. To the south of this village, it bifurcates from the railway line, the Rajgir hills bring the base. This road is very busy and all vehicles starting from Patna-Jamshedpur, Darbhanga and going to Ranchi, Hazaribagh, Jamshedpur, Dhanbad etc. have to travel through this district. Thus, this district joins the agricultural towns of Bihar Plain with the industrial towns of Chota Nagpur Pleatue. Biharsharif is the center of roadway from where the radial pattern of roadways has developed. The roads starting from Biharsharif join Jehanabad in the west, Hilsa and Patna in the northwest, Bakhtiarpur in the north, Rahui in the north-east, Barbigha in the east, and Nawada in the south and Rajgir in the southwest.

CHAPTER -3

REGULATED MARKETS AND AGRICULTURAL DEVELOPMENT

CHAPTER -3

REGULATED MARKETS AND AGRICULTURAL DEVELOPMENT

3.1 Introduction

Indian people are mostly dependent on Agriculture. It is essential to develop it. Agricultural development is a multi-dimensional process in which crop productivity is one of the important aspects. Crop productivity can simply be measured by the yield per hectare of various crops. Diversification of cropping is another important aspect of agricultural development being supported not on economic grounds but considerations of self-reliance in agricultural production and maintenance of soil fertility. Commercialization of agriculture is the very important dimension of agricultural development in the context of marketing. The degree to which market forces have penetrated in an area and the scale upon which they operate will be the crucial factors in almost every question related to agricultural development'. An effort at commercialization of agriculture involves articulation of farmer's psychology toward that end, provision of marketing facilities and above all rise in the yield of agricultural produce. It will bring the target level results. Non-exploitative and tension-free agrarian relations are essential ingredients of agricultural development.

The agricultural farmers will involve according to production. The nature of relations between different categories of farmers may be inferred from the comparative benefits they are deriving from the various decision-making bodies in respect of the supply of irrigation, fertilizers, a high yielding variety of seeds, loans, marketing facilities and land reform policies. This agricultural development explains the quality of the agricultural system of a region regarding productivity, commercialization, and diversification consistent with the desired state of agrarian relations and balance of the ecological system.

Markets were regulated by the government. The Regulated markets are the collection point of agricultural produce and reflect the regional development in general and agricultural development in particular. These places are the contact points of rural

people with the residents of urban or economically developed places whom they sell their products in the market and purchases either of agricultural inputs or other items of daily necessities. Thus, for the agricultural development in the study area concerning regulated markets, there should be an assessment of the growth of marketed surplus in different markets. Consequent to growth in marketed surplus in the market, there would be changes in cropping pattern, crop combination, the growth of area under tillage, changes in the quality of production, and yields, changes in irrigated area, consumption of fertilizers, the growth of technological factors, etc. This kind of inquiry will be helpful in determining the impact of regulated markets in agricultural development.

3.2 Methodology

The year of 2003-04 and 2013-2014 has been taken for the study to understand the overall agricultural development in Nalanda district. The reference period (2003-04 and 2013-2014) has not taken in isolation, but their triennium has been calculated. Block has been taken as the unit of study. In the first section of this chapter general growth of agricultural development has been analyzed. While in the second section the agricultural development has been examined concerning regulated markets. To understand the causal relationship between market and agricultural development, some variables have been selected. Variables have been selected from the factors which have a direct relation to agricultural production and productivity.

In the present study market arrival is considered as an independent factor to understand the effect of the market on agricultural development. It is the agricultural variables like production, yield, cropped area, irrigated area, fertilizer consumption, tractors, the price of commodities, storage facilities, cropping intensity, etc. have been taken as dependent variables.

The regulated markets were taken as a separate entity because each of them has its own defined trade area. Biharsharif regulated market encompasses Biharsharif, Asthawan and Islampur blocks in its trade influence. Islampur market covers

Ekangarsari, Parbalpur and Islampur blocks; Hilsa regulated market serves Karaiparsurai, Nagarnausa, Chandi and Tharthari blocks, while Rajgir market has Silao, Ben Giriak and Katrisari blocks as its notified area.

Regulated market arrival considered as one of the important performance variables to understand the strength of the regulated market. Therefore, market arrival has been taken from each market, whereas to understand the role of regulated markets in agricultural development, factors associated with agricultural development has been taken i.e. production, yield, area, irrigated area, fertilizer consumption, tractors, price of agro-commodities, roads, market infrastructure, seasonal agro-markets, number of godowns, capacity of godowns, cropping intensity, etc.

Karl Pearson's coefficient of correlation technique has been used to assess the causal relationship between the variables of regulated markets and agricultural development for two different periods, viz. 2003-04 and 2013-2014 by mean of 14 variables for each period. The level of significance of these variables correlation has been determined with 5 degrees of freedom based on student's 't' test technique.

3.3 Cropping Pattern

Cropping pattern means the proportion of area under different crops at a point of time.' The adoption of crops in any area can be understood by the physical characteristics and socioeconomic conditions of the people in the concerned area. To analyze the cropping pattern in Nalanda district, it would be useful to give some preliminary ideas about the crops with sowing and harvesting seasons, etc. As it is well known, that in India, there are three seasons, e.g., Kharif or the season of summer crops, Rabi or the season of winter crops and Zaid crops. June to November is the period of Kharif crops. November to April is the period for Rabi crops and April to June is the period for Zaid crops.

The crops of Kharif season are rice, maize, arher (pigeon pea), moong (green gram), urad (black gram) which needs high temperature and plentiful water supply. The crops

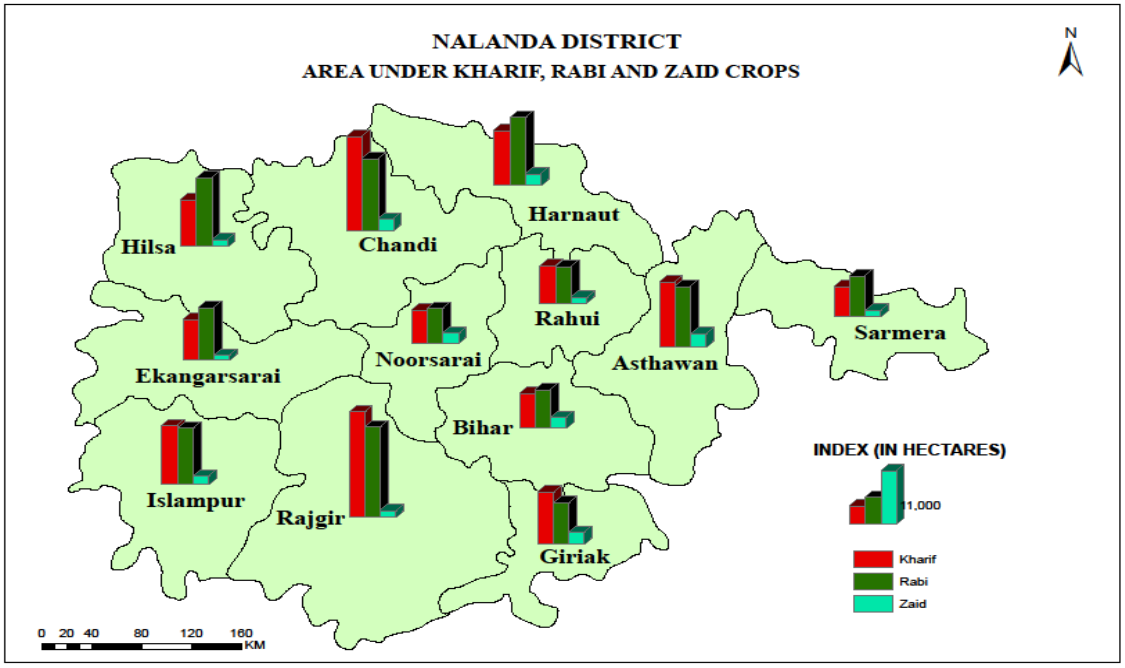
of Rabi season are Wheat, gram, masoor (lentil), peas and Potato which require cool weather and a moderate supply of water. Water melon, musk melon, cucumber, jackfruit, etc., are included in zaid crops. Regulated markets of the study area deal different agricultural commodities according to the rhythm of the seasons. Table 3.1 shows that in the total cropped area of the district 46.47 per cent is accounted by Rabi crops, 46.11 per cent of Kharif crops and 7.42 per cent by zaid crops. Ranking at the level of the development blocks shows that Rajgir (19487 hectares), Rajgir (22770 hectares) and Asthawan (2835 hectares) are the blocks having largest areas under Rabi, Kharif and zaid crops.

Table 3.1

Area under Kharif, Rabi and Zaid Crops in Nalanda District (2013-2014)				
Blocks	**Kharif**	**Rabi**	**Zaid**	**Total Cropped Area**
Biharsharif	7373.25	8169.41	2227.57	17770.23
Giriak	11214.67	8935.29	2539.34	22689.31
Rajgir	22770.72	19487.44	1407.48	43665.65
Noorsarai	7262.12	7573.72	2218.53	17054.37
Islampur	8035.04	7772.28	1140.90	16948.22
Harnaut	11808.26	14622.67	2435.42	28866.35
Asthawan	14116.99	13005.81	2835.30	29958.10
Sarmera	6398.05	8665.81	1215.45	16279.31
Hilsa	10014.41	14750.32	1357.78	26122.51
Chandi	20383.31	15558.75	2568.71	38510.77
Ekangarsari	8803.83	11261.30	1046.01	21111.14
Islampur	12550.41	12027.18	1649.22	26226.81
District Total	140731.07	141830.00	22641.70	305202.77
Percent	46.11	46.47	7.42	100.00

Source: Statistical Magazine, District Nalanda (In Hectares)

Map 3.1 Area under Kharif, Rabi and Zaid Crops in Nalanda District (2013-2014)



Source: Statistical Magazine, District Nalanda (In Hectares)

Ranking of different agricultural commodities in the district by the area under each crop in 2013-2014 shows that Paddy, Gram, Khesari, Wheat, Masoor, Maize, Vegetables, and Potato are the leading crops in descending order. The crops of Barley, Arhar, Sugarcane, and Fruits are having less than one per cent of the total cropped area of the district (Table 3.2).

Table 3.2

Rank of Main Crop in Nalanda District (2013-2014)			
Crop	**Rank**	**Area (Hectare)**	**Percentage of Total Cropper Area**
Paddy	**I**	127828.74	33.13
Gram	**II**	89989.07	23.32
Khesari	**III**	53993.12	13.99

Wheat	**IV**	41978.54	10.88
Masoor	**V**	26948.18	6.98
Maize	**VI**	16782.59	4.35
Vegetables	**VII**	14667.21	3.80
Potato	**VIII**	10023.89	2.60
Barley	**IX**	1385.83	0.36
Arhar	**X**	957.89	0.25
Sugarcane	**XI**	714.17	0.19
Fruits	**XII**	570.45	0.15

Source: Statistical Magazine, District Nalanda (In Hectares)

3.4. Changing Pattern of Crop Combination

Comprehensive understanding of crop combination in an area makes it possible to analyze the development of agricultural practices and crop preferences. These changes have a direct relationship with the commercial aspects of agricultural activities. Crop combination is of great significance to assess the impact of marketing on agricultural development. The present study focuses on the analysis of crop combination in the Nalanda district, using the available data at block level for the year of 2003-04 and 2013-2014 to understand the changes, taking place during this period.Weaver's method (1954) has been used to find out the crop combination region in the district Aligarh. In his work, Weaver calculated the deviation from the real percentage of crops for all possible combination of the component aerial units against a theoretical standard. The theoretical curve for the standard measurement was employed as given below:

Monoculture: 100 per cent of the total harvested crop land in one crop

Two crop combination: 50 per cent in each of two crops

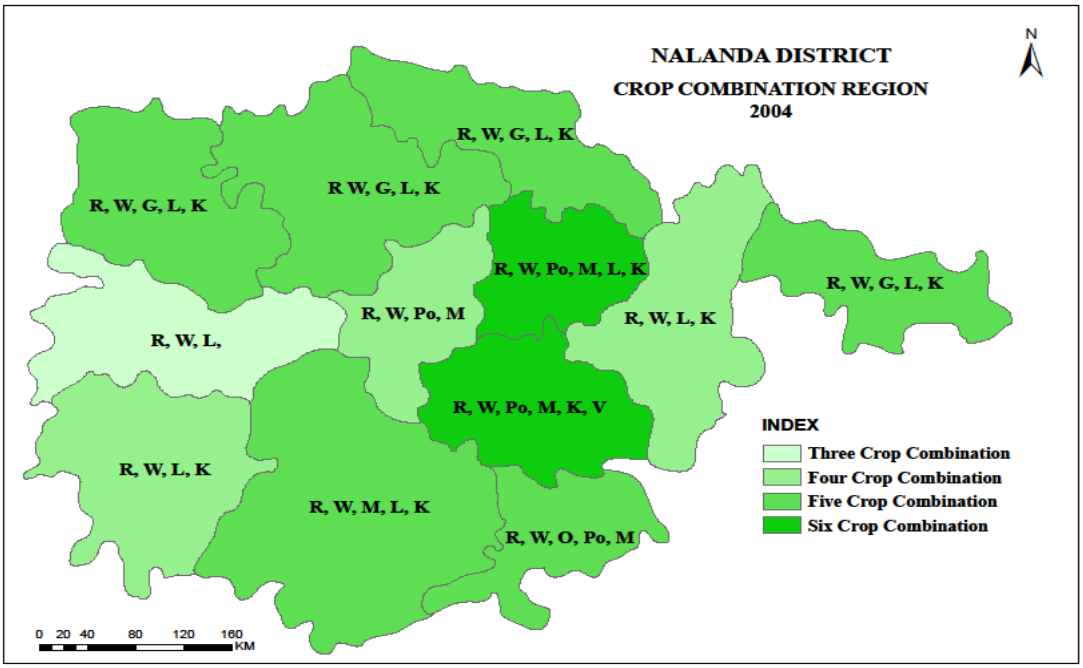
Three crop combination: 33.33 per cent in each of three crops and so on down the scale.

Table 3.4

Crop-Combination zones of Nalanda District				
	2003-04		2013-14	
Blocks	Number of zones	Crop Combination	Number of zones	Crop Combination
Biharsharif	6	P, W, Po, M, L, O	6	P, W, Po, M, O, V
Giriak	5	P, W, O, Po, M	3	P, W, Po
Rajgir	5	P, W, M, L, O	3	P, W, Po
Noorsarai	4	P, W, Po, M	6	P, W, Po, M, O, V
Islampur	6	P, W, Po, M, L, O	6	P, W, Po, M, O, V
Harnaut	5	P, W, G, L, V	3	P,W, M
Asthawan	4	P, W, L, V	5	P, W, M, O, V
Sarmera	5	P, W, G, L, O	4	P, W,M , G
Hilsa	5	P, W, G, L, V	5	P, W, M, O, V
Chandi	5	P, W, G, L, O	4	P, W, V, M
Ekangarsari	3	P, W, L	3	P,W,M
Islampur	4	P, W, L, O	3	P,W,M

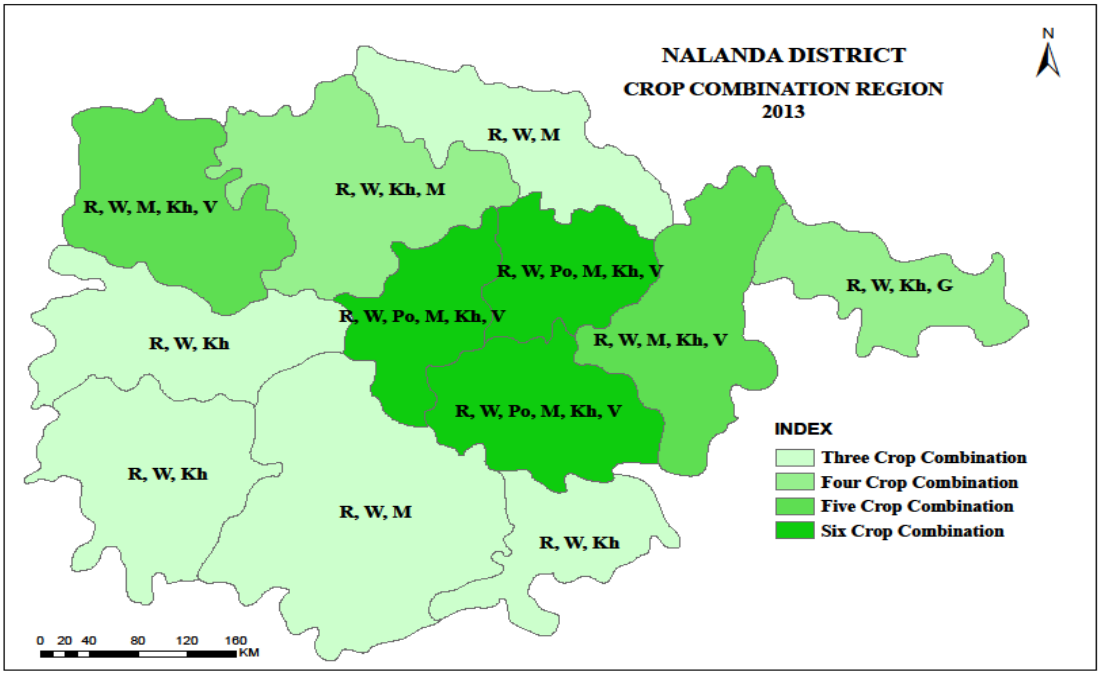
Source: District Statistical Book

Map 3.2 Crop-Combination zones of Nalanda District 2004



Source: District Statistical Book

Map 3.3 Crop-Combination zones of Nalanda District 2013



Source: District Statistical Book

For the determination of the minimum deviation, the standard deviation method was used

$$SD = \sqrt{\frac{\Sigma d^2}{n}}$$

:

Where'd' is the difference between the actual crop percentages in a given areas unit and appropriate percentage in a theoretical curve and 'n' is the number of crops in a given combination.

$$d = d^2/n$$

3.5 Growth in Area, Production, and Yield of Crops

Since the period of 2003-04, a considerable change has been taken place regarding net sown area, total cropped area, and yield per hectare of land. From the beginning of the period of 2003-04, cropping pattern of the study area has started to react more vigorously due to the development of new markets and enhanced socioeconomic level of the farmers and their interaction with the urban centers and increased demand and supply of different agricultural commodities. Changes in the cropping pattern at the block-level have already been analyzed, but it is rewarding and important, to sum up, these changes under growth in the area put to agricultural use, changes in the quantity of production and improvements in the yield per hectare of land under different crops. Therefore, an attempt has been made to examine the changes in the area, production, and yield per hectare of agro-commodities at the district level, over a period of twelve years in between 2003-04 and 2013-14. These changes at the district level have been discussed under the following headings.

3.5.1 Growth of Area under Different Crops

Table 3.5 shows net sown area, total cropped area, and the area sown more than once. This table reflects the changes during ten years interval from the period of 2003-04 to

2013-14. Data shows frequent fluctuations regarding net sown area, total cropped area and the area sown more than once. Continuous increase or decrease has not been observed. Taking into consideration of the entire period of 10 years from 2003-04 to 2013-14 the net sown area has increased by 16.88 per cent, area sown more than once by 19.84 per cent and the total cropped area by 17.73 per cent. A good percentage of increase in area has sown more than once reflects an increase in the cropping intensity of that region. Annual fluctuations represent the variable nature of the climatic conditions, increase in population, and fluctuating increase in net sown area, the area is sown more than once, and ever-increasing demand for the total cropped area will be helpful in fulfilling the agricultural commodities especially food grains.

Table 3.5

Net Sown Area, Area Sown More than Once and Total Cropped Area			
	2004	**2014**	**Percentage increase**
Net Sown Area	181203.2	218002.5	16.88
Area Sown More than Once	69900.5	87200.3	19.84
Total Cropper Area	251103.7	305202.8	17.73

Source: District Statistical Book (In Hectares)

3.5.2 Growth in the Production and Yield of Agricultural Commodities

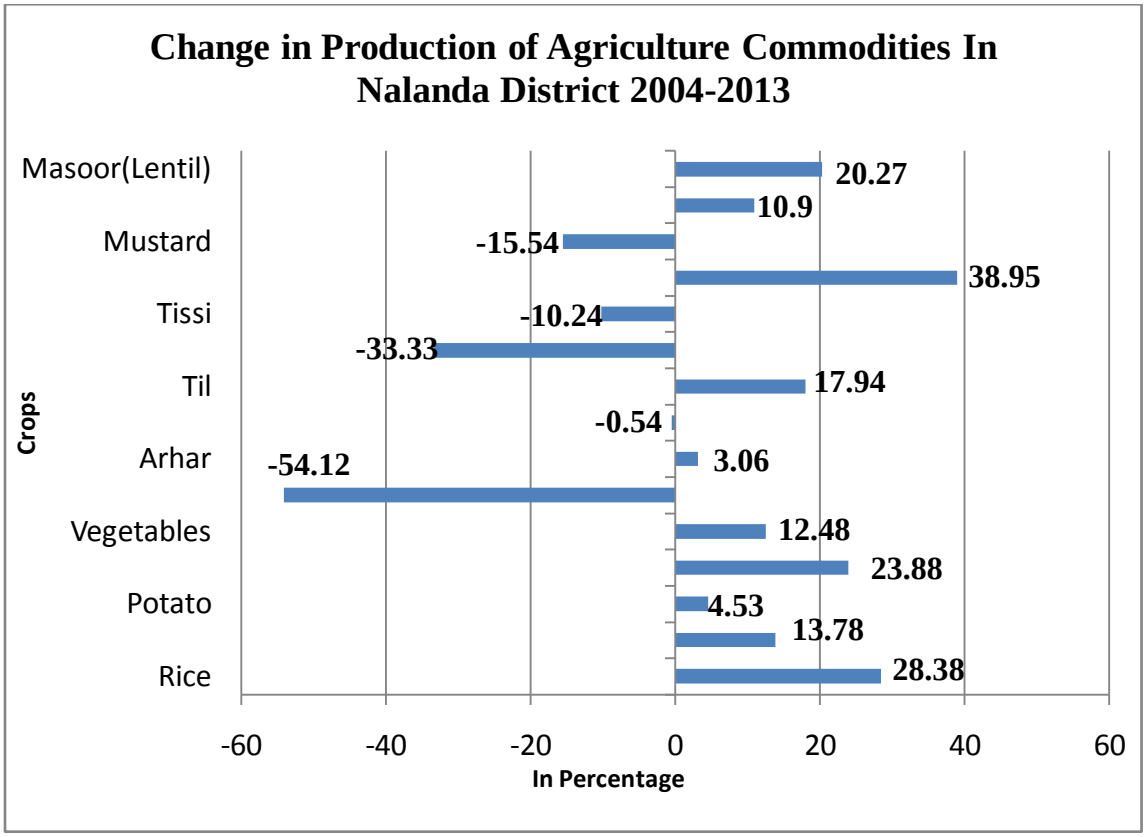
Table 3.6 shows the production of principal crops in the study area. All the cereal crops like Rice, Wheat, Potato, Onion except Vegetables and Matar have recorded increased production. The increased production of Rice and Wheat vary from 8.57 per cent for Wheat, 39.60 per cent for Rice.

Table 3.6

Production of Agriculture Commodities In Nalanda District			
Crops	**2003-04**	**2013-14**	**Growth**
Rice	2328300	3251040	28.38
Wheat	3049130	3536470	13.78
Potato	5380000	5635350	4.53
Onion	598500	786300	23.88
Vegetables	155725	177936	12.48
Matar(Peas)	5325	3455	-54.12
Arhar	36976	38145	3.06
Peanut	7070	7032	-0.54
Til	558	680	17.94
Moong	2320	1740	-33.33
Tissi	7146	6482	-10.24
Sunflower	1343	2200	38.95
Mustard	37620	32560	-15.54
Gram	83034	93195	10.90
Masoor(Lentil)	133263	167150	20.27

Source: District Statistical Book (In Quintals)

Figure 3.1 Change in production of Agriculture Commodities in Nalanda District (2004-2013)



Source: District Statistical Book (In Quintals)

In pulses crops, Gram and Mansoor recorded increased production of10.90 and 20.27 percent while Matar and Moong recorded decreased production between the period of 2003-04 and 2013-2014. Mustard recorded decline in production by 15.54 per cent. Besides, other Vegetable crops recorded the considerable increase in production.

The production of pulses declined due to low returns in the markets. The increased production of cereals is the reflection of farmers attitude towards the market oriented crops because Wheat and Paddy are considered as commercial crops due to increasing price in the market. The government is also encouraging the production of Wheat and rice through Minimum Support Price (MSP) for increasing stock of food in reserves. Simultaneously Potato also registered fast growth to a magnitude of 4.53 per cent during the same period because of increased facilities of storage as well as markets.

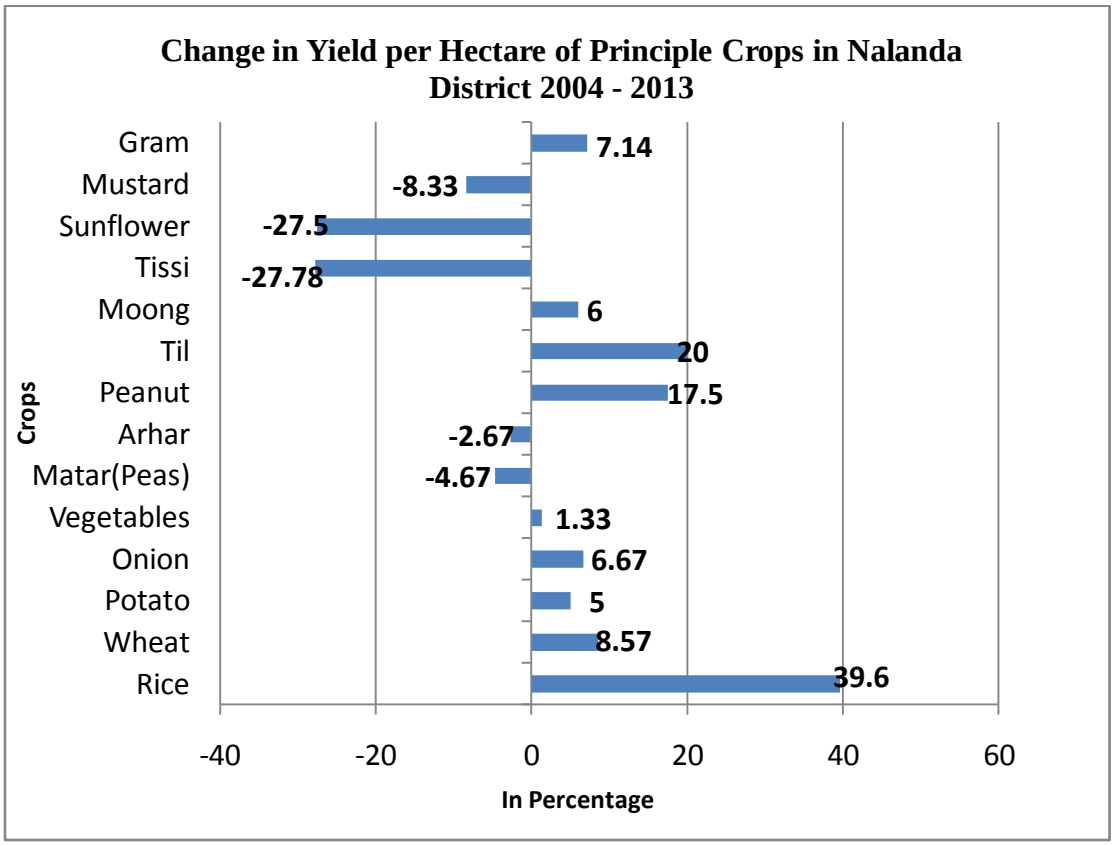
Table 3.7

Yield per Hectare of Principal Crops in Nalanda District			
Crops	**2003-04**	**2013-14**	**Growth**
Rice	30	41.88	39.60
Wheat	35	38	8.57
Potato	200	210	5.00
Onion	300	320	6.67
Vegetables	75.1	76.1	1.33
Matar(Peas)	15	14.3	-4.67
Arhar	15	14.6	-2.67
Peanut	12	14.1	17.50
Til	5	6	20.00
Moong	10	10.6	6.00
Tissi	9	6.5	-27.78
Sunflower	12	8.7	-27.50
Mustard	12	11	-8.33
Gram	14	15	7.14
Masoor(Lentil)	9	10	11.11

Source: District Statistical Book (In Quintals)

It is not sufficient to give only data regarding the production of principal crops because it may give some misleading information about the reality. Therefore it is necessary to give the data about the yield of the principal crops too. Table 3.7 gives an account of the changes in the yield per hectare of the principal crops during ten years from the period 2003-04 to 2013-14. It can be understood by the table that not only the yield per hectare of Matar has declined, but its total production has got negative

Figure 3.2 Changes in Yield per Hectare of Principle Crops in Nalanda District 2004 - 2013



Source: District Statistical Book (In Quintals)

growth in the study area. Contrary to this the yield of Moong has improved by 6 per cent while its production decreased during the same period. The massive increase in the yield has been recorded for Rice (39.60 per cent), followed by Til (20 percent), Peanut (17.50 per cent), Wheat (8.57), Gram (7.14 per cent), Onion (6.67 per cent) and Moong (6 per cent).

3.6 Growth in Irrigation Facilities

Among all the factors, which lead towards surplus agricultural production, availability of irrigation facilities and their proper use are most crucial. Irrigation is indeed the life-breath of agriculture. All the inputs give better results only when controlled supply of water is made available because crops require water at the specific period of

growth. Therefore irrigation is an important factor leading towards best returns from other inputs like insecticides and fertilizers.'

The presence of Ganga River, which is a perennial source of water with a gentle slope, is favorable for the construction of canals. Fertile alluvial soils are also major factors leading towards the development of irrigational facilities in the study area.

The appropriate method is not available for measuring the intensity of irrigation except analysis of the ratio, which exists between the net irrigated area and the total irrigated area, which if expressed in percentage gives a measure of the intensity of irrigation. Table 3.9 shows the block-wise data for this purpose explains that the average intensity of irrigation was 135.6 per cent for the district as a whole. It varies from 110.38 per cent for Giriyak block to 160 per cent for Hilsa block. The intensity of irrigation is very high in Biharsharif block (139.88 per cent) and Rajgir block (130.74 per cent).

Table 3.9

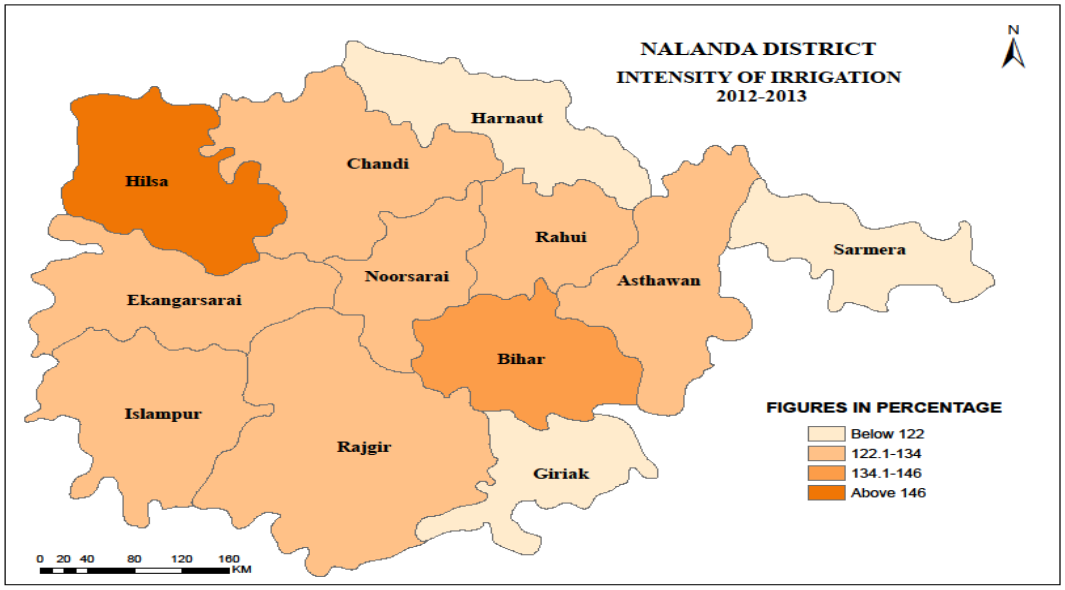
Intensity of Irrigation in Nalanda District (2013-2014)			
	Total Irrigated Area	**Net Irrigated Area**	**Intensity of Irrigation**
Biharsharif	17090	12218	139.88
Asthawan	21190	16286	130.11
Harnaut	18158	16192	112.14
Sarmera	13555	11110	122.01
Noorsari	12341	9582	128.79
Islampur	12426	9869	125.91
Rajgir	37419	28622	130.74
Giriyak	17191	15575	110.38
Hilsa	21210	13195	160.74
Chandi	6203	4347	142.70
Tharthari	7540	6281	120.04
Nagarnausa	13392	10820	123.77

Chandi	27135	21448	126.52
Chandi	27135	21448	126.52
Ekangersari	28773	22986	125.18

Source: District Statistical Book (In Percentage)

While Giriyak (110.38 per cent) and Harnaut (112.14 per cent) blocks which lie in the south and North have the very low intensity of irrigation. The high intensity of irrigation in the block Hilsa and Biharsharif leads to Paddy cultivation and the arrival of Paddy in Hilsa and Biharsharif regulated market has increased several folds.

Map 3.4 Intensity of Irrigation 2013-2014



Source: District Statistical Book (In Percentage)

3.7 Growth of Fertilizers Consumption

Fertilizers are also one of the very important inputs for crop production. For achieving the success in the bumper production of any crop the application of fertilizers according to soil quality is a must. The cultivators have well appreciated the importance of fertilizers. The provision of fertilizers availability at a reasonable price, and at the appropriate time, is an essential requirement for the growth of crops.

With the growing emphasis on commercialization of agriculture by the establishment of agricultural markets in the district, fertilizers constitute an important input in agricultural operations. In any scheme for boosting agricultural output, the use of chemical fertilizers has an important role to play.

Table 3.10

Consumption of Fertilizers in Nalanda District			
Fertilizers	**2003-04**	**2013-14**	**Percentage Increase**
Nitrogen	107668	137384.37	27.60
Phosphorous	99984	127579.58	95.80
Potash	76090	97090.84	184.06

Source: District Statistical Book (In metric tons)

It can be understood by the table 3.10 that the consumption of nitrogen increased from 107668 metric tons in the period of 2003-04 to 137384.37 metric tons in 2013-14. The overall increase was 27.60 per cent. In the case of phosphorous during 2003-04, its consumption was 99984 metric tons, but it again increased to 127579.58 metric tons in the period of 2013-14. The total increase in phosphorous consumption was 95.80 per cent. Potash consumption in the period of 2003-04 was 76090 metric tons, and in the period of 2013-14, it increased to 97090.84 metric tons. The total increase in potash consumption was 184.06 per cent.

3.8 Mechanization of Agriculture

The use of mechanical appliances in agriculture means replacement of human as well as animal power by machinery wherever it is possible, plowing is to be done by tractor, sowing and putting of fertilizers by drilling machines and reaping and harvesting by the combined harvesters, threshers and so on. A man by himself produce very little, but with the help of machines, one can produce much more. The use of machinery in agriculture is not a very easy task, especially for small and marginal

fanners. Only the farmers of sound economic status are getting the benefits of machinery in agri-business.

The extent of Power tiller and tractors can be judged by table 3.11 and 3.12. It can be understood by the table 3.11 that the high growth of Power tiller machines was in the blocks of Harnaut, Sarmera, and Rajgir While the medium growth can be observed in the blocks of Islampur, Chandi, Hilsa and Asthawan. Biharsharif, Noorsari, Islampur, Giriyak, and Ekangersari are the blocks in which the growth of the Power tiller machines was very low.

Table 3.11

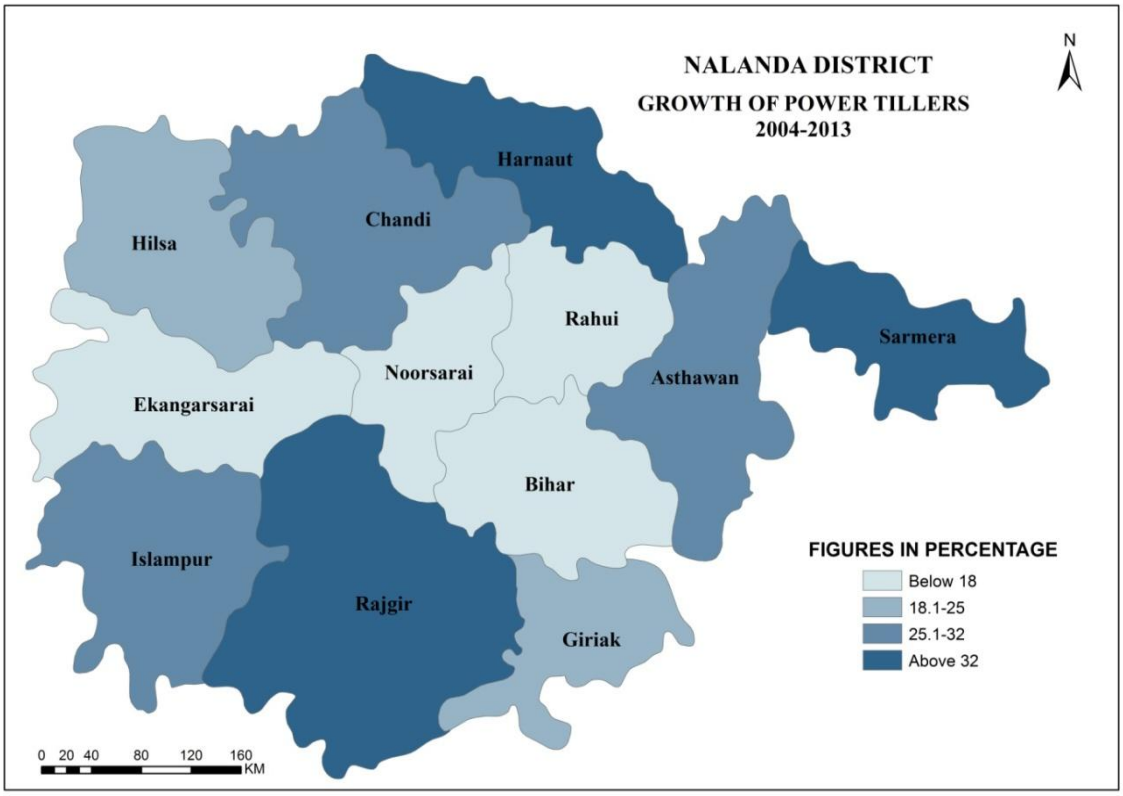
Block-wise Growth of Power Tiller in Nalanda District			
Blocks	**2003-04**	**2013-14**	**Percent of Increase**
Biharsharif	68	80	17.65
Harnaut	13	19	46.15
Sarmera	6	9	50.00
Noorsari	12	14	16.67
Islampur	11	13	18.18
Islampur	45	58	28.89
Giriyak	17	21	23.53
Chandi	47	63	34.04
Hilsa	49	62	26.53
Ekangersari	54	60	11.11
Rajgir	29	42	44.83
Asthawan	67	87	29.85

Source: District Statistical Book (In Percentage)

Table 3.12 explains the block-wise growth of tractors. Giriyak block records the highest growth of tractors (43.75 per cent) during the study period. After that the blocks of Islampur (38.46 per cent), Hilsa (34.56 per cent), Noorsari (29.73 per cent), Ekangersari (27.27 per cent), Rajgir (25.93 per cent),Biharsharif (24.41 per cent),

Asthawan (24 per cent), Islampur (23.19 per cent) and Harnaut (20 per cent) records the growth of tractors in descending order. It can be understood from both the tables that the use of mechanical appliances is continuously increasing and the growth is going on in the positive direction.

Map 3.5 Growth of Power Tillers



Source: District Statistical Book (In Percentage)

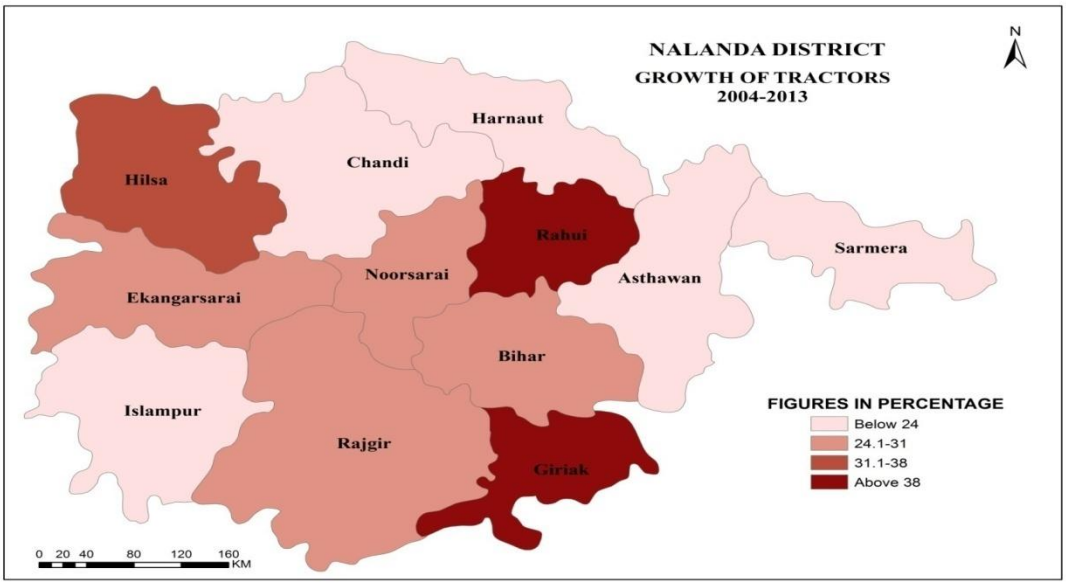
Table 3.12

Block-wise Growth of Tractors in Nalanda District			
Blocks	**2003-04**	**2013-14**	**Percent of Increase**
Biharsharif	127	158	24.41
Harnaut	45	54	20.00

Sarmera	22	26	18.18
Noorsari	37	48	29.73
Islampur	13	18	38.46
Islampur	69	85	23.19
Giriyak	32	46	43.75
Chandi	96	113	17.71
Hilsa	123	166	34.96
Ekangersari	66	84	27.27
Rajgir	54	68	25.93
Asthawan	75	93	24.00

Source: District Statistical Book (In Percentage)

Map 3.6 Growth of Tractors 2004-2013



Source: District Statistical Book (In Percentage)

3.9 Inter Correlation between the Variables of Regulated Markets and Agricultural Development

Identification of the causal relationship between the different characteristics of any study is an essential concern of a scientific investigation. A causal relationship between the two characteristics exists only when one of them may logically be considered as the cause of the other. The factor which is supposed to be the cause is

known as the independent variable, and the one which is supposed to be the effect is known as a dependent variable. Thus the variations in an independent variable may be explained regarding the variations in the dependent variables. In case there exists a causal relationship both the values of independent and dependent variables will vary together. The property of co-variation is also termed as correlation.

In a bivariate case of an increase in the independent variable also tend to cause an increase in the dependent variable the correlation is said to be positive. On the other hand, if an increase in the independent variable tends to cause a decrease in the values of the dependent variable the correlation is said to be negative.

In case there is no logical basis for a correlation between variables it should not be taken as a causal relationship. Any such relationship is spurious and should not be attempted. This correlation is found only because of the influence of a third unknown variable on both the variables.

Measurement of the degree and direction of correlation helps the geographers particularly in explaining the variations in various geographical features.

By the curve around which the values of a bivariate data, more, the correlations are classified into two broad categories, namely linear correlation and nonlinear correlation. If the values of a bivariate data are moving around a line, the correlation between them is said to be linear. On the other hand if the values more around any curve the correlation is said to be nonlinear or curvilinear.

The degree of relationship (linear or curvilinear) between any two variables says X and Y on the closeness of the cluster of points to the straight line or any curve. If the values of X and Y vary such that each point falls exactly in a straight line (or curve) the relationship is said to be perfectly linear (or curvilinear). The higher the deviation of these points from the straight line (or curve) the weaker will be the correlation between X and Y variables. Measurement of linear Correlation: A precise quantitative measurement of the degree and direction of a linear correlation was suggested by Karl Pearson as follows:

$$r = \frac{\Sigma xy - \frac{\Sigma x \Sigma y}{N}}{\sqrt{\Sigma x^2 - \frac{(\Sigma x)^2}{N}} \sqrt{\Sigma y^2 - \frac{(\Sigma y)^2}{N}}}$$

This measure is known as product moment correlation coefficient or simply correlation coefficient. By symmetry it is clear that rxy = ryx = r

Where

r = coefficient of correlation

x,y = two given variables, and

n = number of observations

Properties of correlation coefficient (r)

1. If the sign of r is positive, the variables x and y are positively related, and if the sign is negative, they are negatively correlated.

2. The value of r varies between - 1 and +1. The value +1 or - 1 indicates a percent positive or negative correlation. As the extent of correlation decreases, the value of r approaches zero.

Significance test of correlation coefficient: A coefficient correlation based on a smaller number of observations is generally considered as a sample correlation. Using the test of significance of r, it is possible to infer whether the correlation coefficient of the bivariate normal population (the correlation between the same variables but based on a fairly large number of observations) will be zero or not. Under the null hypothesis, that the population correlation is zero, the expression as given below will follow 'the students 't' distribution with (n-2) degree of freedom:

$$t = r \sqrt{\frac{n-2}{1-r^2}}$$

Where n is the number of observations used

r is the coefficient of correlation, and

t is the calculated value

Thus if any computed value of 't' is less than the corresponding tabulated value the correlation coefficient is said to be insignificant, meaning thereby that over a large number of similar observations the two variables will be independent, as the hypothesis that the population correlation coefficient is zero is accepted.

Whatever sample correlation is this case we get may be attributed to the chance factors only. On the other hand if the computed value of 't' is greater than the tabulated 't' the correlation coefficient is said to be significant, and the population correlation coefficient between the two variables, in this case, is not considered to be zero.

It is evident from this test that the significance of the correlation coefficient is directly proportional to not only r but also to (n-2). In some cases, because of a large value of 'n' a smaller correlation coefficient may become significant, whereas in some other cases, a large correlation coefficient may become insignificant because of the smaller value of 'n.'

Based on the technique of Karl Pearson's coefficient of correlation, the causal relationship between the variables of a regulated market and agricultural development has been finding out for two different periods, viz. 2003-2004 and 2013-2014 by mean of 14 variables for each period. The level of significance of these variables correlation has been determined with 5 degrees of freedom based on student's 't' test technique. In present study (2003-04) the given correlation, matrix reveals the inter correlation between fourteen selected variables of regulated markets and agricultural development (X_1, X_2, X_3, X_4 ....X_{14}).The table shows that different variables of market and agricultural development. The table depicts the fact that variable market arrival X_1 though insignificantly but negatively correlated to the variables of X_2, X_3, X_{11}, X_{13} and X_{14}. In the present analysis, it is observed that variable X_2 (Growth of area under crops) is very poorly correlated with other variables of regulated markets and agricultural development either positively or negatively. Similarly, X_3 (production of

crops) is significantly negatively correlated with X_6 (Consumption of fertilizer) at .05 per cent level of significance having an r value of -.964. X_4 (yield) is negatively co-related with X_{11} (seasonal agro-markets) at .05 per cent level of significance has an r value of -960 that the size of the area plays a little role in the regional variations of agricultural and socio-economic development.

Again, it is X_4 (Yield) is highly positively correlated with .01 per cent level of significance with X_{10} (marketing infrastructure) having an r value of .999. Therefore, it may be concluded that yield and marketing infrastructure is very closely correlated. Irrigated area X_5 is negatively correlated with X_1 (Tractor) at .05 per cent significance level having an r value of -.985. X_6, (Fertilizer consumption) either negatively or positively correlated with the variables of regulated market and agricultural development. Tractors X_7 is also very poorly correlated with market and agricultural development variables either positively or negatively.

Roads X_9 is significantly negatively co-related with X_{10} market infrastructure at .05 per cent level of significance has an r value of -983. Remaining variables i.e. roads X_9, market infrastructure X_{10}, seasonal agro markets X_{11} and cropping intensity X_{14} is very poorly correlated with the variables of market and agricultural development.

Based on the technique of Karl Pearson's coefficient of correlation, the causal relationship between the variables of regulated markets and agricultural development has been identified for the period of 2003-2004. The level of significance of their correlation is also determined with 5 degrees of freedom based on student's 't' test technique.

Table 3.13 Coefficient of Correlation between the Variables of Regulated Markets and Agricultural Development 2003-2004

		X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9	X_{10}	X_{11}	X_{12}	X_{13}	X_{14}
Market Arrival	X_1	1.000													
Area	X_2	.861	1.000												
Production	X_3	.583	.898	1.000											
Yield	X_4	-.381	.063	258	1.000										
Irrigated Area	X_5	-.035	.231	.578	-.031	1.000									
Fertilizer Consumption	X_6	-.563	-.904	-.964 *	- 437	-.378	1.000								
Tractors	X_7	-.026	-.351	-.696	-.096	-.985*	.525	1.000							
Price Of Agro-Com	X_8	-.050	.340	.406	.935	-.173	-.615	.013	1.000						
Roads	X_9	-.011	.472	.656	.898	.211	-.786	-.366	.925	1.000					
Market Infrastructure	X_{10}	-.425	.013	.213	.999 **	-.044	-.393	-.078	.920	.876	1.000				
Periodic Agro.Markets	X_{11}	.182	-.306	-.516	-.960*	-.154	.661	.300	-.939	-.983*	-.947	1.000			
Number of Godowns	X_{12}	-.387	.132	.513	.795	.579	-.535	-.666	.637	.835	.789	-.862	1.000		
Capacity of Godowns	X_{13}	.409	.749	.736	.687	-.020	-.889	-.153	.878	.886	.651	-.812	.503	1.000	
Cropping Intensity	X_{14}	.911	.669	.273	-.347	-.444	-.334	.386	.007	-.116	-.380	.245	-.600	.357	1.000

* Correlation is significant at the 0 05 level (2-tailed)
** Correlation is significant at the 0 01 level (2-tailed)

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The given correlation matrix reveals that the variable market arrival X_1 is insignificantly correlated with all the variables of market and agricultural development except with cropping intensity .945. The variable X_2 area under crops is negatively correlated with the X_{12} (number of godowns) with an r value of -958 at .05 level of significance. It is X_3 (production) is negatively correlated with most of the variables. Similarly, X_4 is positively correlated which has their effect opposite to the previous variables.

It is X_4 positively correlated at .01 per cent level of significance with the X_4 price of agro-commodities and X_{10} marketing infrastructure with .05 per cent level of significance with an r value of .996 and 990 respectively. Therefore, it may be concluded that X_8 price and X_{10} marketing infrastructure is very highly positively correlated with other variables of market and agricultural development.

Moreover, X_4 is negatively correlated with X_4 at .05 per cent level of significance with an r value of -.970. The variable X_5 irrigated area is positively correlated with most of the variables. Similarly, X_6, fertilizers and X_7 tractors are highly negatively correlated with most of the variables.

One striking feature is observed from the present analysis that correlation between price X_8 and marketing infrastructure X_{11} is highly positively correlated with 1 per cent significance level with an r value of .996. Therefore, it has very important role in market and agricultural development of the Nalanda district. X_9 (roads) either positively or negatively correlated with all the variables of market and agricultural development in the district. X_9 (roads) is significantly negatively

correlated with X_{11} (Seasonal agro-markets) with r value of -.983 at the level of .05 per cent level of significance. The variable X_{10}, (marketing infrastructure), X_{11} (Seasonal agro-markets), X_{12} (Number of Godowns), X_{13} (Capacity of Godowns) and X_{14} (Cropping intensity) either positively or negatively correlated with all the variables.

Table 3.14 Coefficient of Correlation between the Variables of Regulated Markets and Agricultural Development 2013-2014

		X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9	X_{10}	X_{11}	X_{12}	X_{13}	X_{14}
Market Arrival	X_1	1.000													
Area	X_2	.196	1.000												
Production	X_3	-.168	.811	1.000											
Yield	X_4	-.326	-.732	-.217	1.000										
Irrigated Area	X_5	-.339	.400	.856	.318	1.000									
Fertilizer Consumption	X_6	-.491	.752	.776	-.499	.492	1.000								
Tractors	X_7	.072	.732	.943	-.078	.874	.525	1.000							
Price Of Agro-Com	X_8	-.384	-.688	-.147	.996**	.384	-.424	-.024	1.000						
Roads	X_9	-.074	-.894	-.551	.921	-.049	-.786	-.366	.885	1.000					
Market Infrastructure	X_{10}	-.457	-.714	-.173	.990*	.356	-.393	-.078	.996**	.876	1.000				
Periodic Agro.Markets	X_{11}	.237	.870	.448	-.970*	-.078	.661	.300	-.948	-.983*	-.947	1.000			
Number of Godowns	X_{12}	-.469	-.958*	-.672	.767	-.245	-.535	-.666	.745	.835	.789	-.862	1.000		
Capacity of Godowns	X_{13}	.367	-.666	-.447	.751	-.039	-.889	-.153	.701	.886	.651	-.812	.503	1.000	
Cropping Intensity	X_{14}	.945	.364	.129	-.255	-.013	-.334	.386	-.293	-.116	-.380	.245	-.600	.357	1.000

* Correlation is significant at the 0.05 level (2-tailed)
** Correlation is significant at the 0 01 level (2-tailed).

After going through a detail discussion, it has been observed that inter correlation between the different variables of regulated markets and agricultural development strongly correlating from 2003-04 to 2013-2014. Therefore, it may be concluded that with the passage of time inter correlation between different variables of regulated markets and agricultural development is increasing. Increasing correlation between different variables indicates that regulated market has an important role in the agricultural development of the district Nalanda. Thus it supports the hypothesis that there is a positive relation between regulated market and agricultural development.

3.10 Need for Regulated Market

The onset of the technological revolution, better communications, and introduction of money economy has increased the size of the market and the marketing of agricultural produce. Marketing of agro-commodities has now become a very complicated process beyond the comprehension of the producer'. Added to this, some steps, institutional, financial, technological, managerial, etc., have been taken in India for increasing agricultural production and their marketing so as to bridge the gap between the demand and supply. Foodgrains, pulses, and commercial crops size of marketed surplus has increased due to increased production.

Primary assembling markets, therefore, grew up as staging areas at convenient points for assembling, distribution and exchange of goods moving from the village to the bigger cities where demand was concentrated. These primary and secondary markets constitute the first and most vital links in the long chain of agro-marketing. It is the primary market that the cultivator-seller first comes in contact with the trader. These traders, being the main functionaries, dominate in every activity in these markets and ignore the interests of the producers both as sellers and as buyers of consumer goods.

The producer, on the other hand, is not getting adequate returns commensurate with the labor and investments due to the intervention of intermediaries and due to the prevalence of many malpractices in marketing. Even he does not know the price that

he is to receive for his produce. Neither he knows the prevailing prices. If he decides not to sell on that particular day, the producer has no facility to store his produce. This facility is provided only by the commission agent, who though supposed to look after the interests of the producer, actually, colludes with the wholesaler and acts against the interests of the producer. The producer does not find even basic amenities of drinking water through for his cattle on the market. Moreover, the cultivator being heavily dependent for his cash needs, on the commission agent is usually under an obligation to sell his produce through him. Under these circumstances, he finds difficult to sell his produce in the urban market.

In the villages, on the other hand, a number of traders purchasing of agro commodities from the cultivators is very much limited. Some of the small villages have only one trader who does not only buy all the produce available in the village for the market but also meets the credit needs of farmers as also the consumer goods and agricultural inputs required by the village population. Under these conditions, the trader not only buys produce at a low price but also charges a high price for inputs he supplied to the cultivators. As a result in most of the markets in the country, the proportion of produce brought by the cultivators themselves is very little as compared to the total arrivals in the market.

Creating fair competitive conditions to increase the bargaining power of producer-sellers are considered to be the most important pre-requisite of orderly marketing. Most of the defects and malpractices, under, the marketing system of agricultural products have been more or less removed by the exercise of public control over markets through the establishment of regulated markets in the country.

Government action pertains to the formulation of rules and regulations necessary to be followed by all the market functionaries and also evolving an institutional structure vested with authority to see that the market functionaries obey the directives. The

enforcement of market regulation for agricultural produce through the Agricultural Produce Marketing Committees in various states has attempted to organize the agricultural marketing to a large extent.

A market regulated through governmental intervention strives to create mutual trust, confidence between traders and cultivators, establish fair trade policies and assures them reasonable returns.

'A regulated market is a market in which market functionaries are controlled by legislative measures designed to regulate the marketing of agricultural produce.'

According to Mamoria and Joshi 'when the state or any public authority comes forward to enforce regulation for the organization of a market, it is termed as regulated market".

'Regulated Agricultural Markets have been established by the government to save the farmers from the exploitation by middlemen about the sale of his agricultural produce in an open market .'

A regulated market is a government controlled exchange place of agricultural commodities in which efforts are made to ensure maximum benefit and fair price to the producer seller for their products. These markets play an important role in the development of food grains and vegetable cultivation. The regulated markets act not only as exchange centers but also provide market infrastructures at the site and diffuse the agricultural innovations in their market areas. They are not only a place of the transaction of agricultural commodities but also provide an opportunity for people to meet and discuss matters of mutual interest, particularly social, economic and political conditions.

The regulated markets provide maximum facilities to both producer sellers and buyers by removing all kinds of problems like illegal deductions, wrong weighing and so on.

Commission agents, weighmen, laborers etc., also license holders and their all functions are controlled by a market committee consisting of representatives of different market participants like a producer, sellers, buyers, as well as administrators.

3.11 Important Features of Regulated Market

Under the provisions of Agricultural Produce Market Act, the state government gives notice of its intention to bring a particular area under regulation by notifying the market area, market yard, main assembling market and sub-market yard if any, under the principal regulated the market. The meaning of these terms is explained under the following heads:

(a) Market Area

The area from which the produce naturally and abundantly flows to a commercial center, i.e., the market, and which assures adequate business and income to the market committee.

(b) Principal Assembling Market

It is the main market which is declared as a principal market yard by transactions and income generated by the market committee.

(c) Sub-Market Yard

It is the sub-yard of the principal assembling market. This is a small market and does not generate sufficient income to be declared as a principal assembling market.

(d) Market Yard

This is a specified portion of the market area where the sale, purchase, storage, and processing of agricultural commodities are carried out. A market area is a spatial unit closely inter connected with a market, therefore forming a geographical unit. The market area is a geographical concept because it denotes a region which is served by a

particular market. Market area of a regulated market is an area from where producer/farmers, traders bring their products for sale.

A regulated market can not sustain in isolation, and its origin, growth, and development depend on the surplus production from its surrounding region. Market area of a regulated market is a result of lots of factors such as:

1. Productivity of the region
2. Nature of accessibility
3. Size of the market
4. Location of other regulated markets
5. Administrative boundaries
6. Range of goods
7. Consumer behavior etc.

Sometimes physical factors like terrain, forest, rivers, etc. also have had an impact on the boundary of the market area. But basically, market areas are the result of economic and demographic factors. Marketing geographers are interested in delimitation of trade area boundaries to understand present status of the market and for its future planning (Saxena. H.M. 2004)'

In the present context, i.e., the market area of the regulated markets, the problem of delimitation of market area is not applicable here because each regulated market has a declared market area under a section of the 'Uttar Pradesh Rajya Krishi Utpadan Mandi Adhiniyam Act, 1964.

The state government may at any time by notification in the Official Gazette, exclude from a market area any area or include in any market area any other area. For each market area, there shall be one principal market yard and one or more sub-market

yards, as may be necessary. Therefore, it becomes clear that all regulated markets in the state have their specified area.

Table 3.15 Numbers of Villages around Regulated Market of Nalanda District (2011)

Regulated Markets	Number of Villages
Bihar Sharif	71
Hilsa	58

Source: Records from the Respective Markets of Nalanda District-2013

The study also indicates that most of the villages located in marginal areas between two markets have a choice to go to the market of their liking. There is no agency to check this practice. Apart from this, inter-district and even interstate movement of commodities are also in practice (Saxena. 1992).

For an effective regulation and centralization of sales, the establishment of spacious and well laid out market yards is necessary. In fact, it is impossible for the market committees to exercise supervision over multifarious transactions involved in the marketing process unless the sales are affected in a centralized place.'

Therefore, for this purpose market committees must give top priority to acquire land for the construction of market yards at suitable locations and to develop them with necessary amenities at the earliest possible time.

According to H.M. Saxena "market yard or agricultural mandi is a place where all marketing activities are performed such as assembling, sale, and purchase, grading, storage, banking, etc. This is also a place where all marketing agencies like a producer- sellers, commission agents, traders, bankers, insurance people, administrative agencies, etc. either have their permanent base, or they use this place temporarily like farmers. The market yard is a nerve center for the performance of the

activities of a regulated market. The proper location and layout of a market yard is the degree of success of a committee. During the planning of location and layout of a market yard, it is necessary to provide communication facilities, proper structures, buildings and other amenities so as to ensure orderly and efficient movement of goods.

3.12 Objectives of the Regulated Market

The main objective of the regulation of agricultural produce markets is to protect the interest of producers in the markets. Before this, producer sellers were severely exploited by the monopoly of traders in unregulated markets.Maximum efforts are made to fulfill the following objectives.

(a) To prevent the exploitation of farmers by the traders in the marketing of their products.

(b) To make the marketing system more effective and efficient too (or "intending to") provide better prices of products to the producer sellers and to make available to the consumers at a reasonable price.

(c) To encourage the farmers for better production both quantitatively and qualitatively by ensuring remunerative price incentives to the producers.

(d) To make an orderly marketing system of agricultural produce through the development of infrastructural facilities like link roads to villages from the regulated markets, storage, credit facilities, input facilities, etc., in the market complex.

3.13 Significance of Regulated Market

A regulated market is a place where producer sellers, traders, intermediaries market administrators and workers assemble for the marketing of agricultural products to fulfill the demands of society. These markets not only function as exchange centers but also provide market infrastructures at the site and diffuse the agricultural innovations in their market areas. They are not only a place of the transaction of agricultural

commodities, but they provide an opportunity for people to meet and discuss matters of mutual interest, particularly social, economic and political conditions as well.

The marketing system, as well as social structure, is always in a state of change both regarding space and time. Whatever change has occurred in the social structure is the result of multiple factors. Among them, marketing is also one of the most important factors because it provides an opportunity for interaction between rural population and urban environment. The relationship between producer farmers and traders has undergone a great change. Similarly, a change has also come in the farmers' way of life, his system of agriculture and social relationship, etc

Regulated markets have created a feeling of confidence of receiving a fair deal, in the minds of the cultivators. This provides the urge in which they are well ready to accept new ideas and to strive to increase their agricultural production.

Regulated markets would benefit the producers economically, socially and psychologically. Economically, the producer gains by way of reduction of unwarranted market charges and unauthorized deductions. Socially, it profits the producer as he is now directly involved in the management of market committee and it provided him with a platform where he can vent out to his grievances and discuss matters concerning his interest. Psychologically, the producer occupies a dominant position in the market committee and faces the traders with greater confidence.

3.14 Historical Background of Regulated Markets

The history of the establishment of regulated markets is traced back to 1886. When the elements of regulation were introduced in the Karanja Cotton Market under the Hyderabad Residency's order. Though the motive behind this regulatory measure by the then British rulers was to ensure supply of pure cotton at reasonable prices to the textile mills of Manchester (U.K.). Subsequently, in the year 1897, the Berar Cotton and Grain Market law were enacted. This law was constituted by the orders of the

Governor General in Council on 6 May 1897. It was the first statute on the regulation of marketing of agricultural produce. The subsequent acts, whenever passed were virtually based on the general principles embodied in this law. The salient features of this law were:

(i) All the markets as existed on the date of the enforcement of the law came into its fold.

(ii) The resident could declare any additional market or bazaar for the sale of agricultural produce.

(iii) The Commissioner was to appoint from amongst the list of eligible persons submitted by the Deputy Commissioner, a committee ordinarily of five members two representing the Municipal Authority concerned and remaining three from amongst the cotton traders for enforcing the law.

(iv) The committee was authorized to appoint a subcommittee or joint committee from amongst its members for the conduct of any work and delegate its duties to one or more members.

(v) Trade allowances or customs in usage were abolished.

(vi) Unauthorized markets and bazaars were banned within five miles of the notified market or bazaar.

(vii) The resident was empowered to make rules for some specific matter.

(viii) Market functionaries were required to take out licenses.

(ix) Penalties for breach of certain provisions of the law were laid down.

The main drawback in this law was that it provided no representation for the growers in the committee. In fact, it was the grower, who needed the maximum legislative protection. The Indian Central Cotton Committee was appointed by the Governor General in Council in 1917 to look into the problems of marketing of cotton.

This committee had observed that in most of the cases the cotton growers were selling cotton to the village trader-cum-money lender, under whose financial obligation they came and their price was much below the ruling market rate. Other agriculturists were seriously handicapped in securing the adequate price for their produce because of a long chain of intermediaries in the marketing process.

The committee recommended that on Berar system markets for cotton should be established in other provinces having compact cotton tracts. This could be done by the introduction of suitable provisions in the Municipal Acts or under a special regulation as in the case of Berar Act. The Government of Bombay presidency was the first to implement this recommendation by enacting the Bombay cotton Markets Act in 1927. This act was an improvement over the Berar cotton and Grain Markets Law of 1897 as it provided for representation to the growers on the market committee and also contained provisions for spending the surplus funds of the market committee, which should be transferred to the respective local bodies in whose jurisdiction the market used to be situated. The rules under this act were framed in 1929, and the first regulated market was established under this act at Dhulia during the year 1930-31.

The Royal Commission on Agriculture (1928) recommended the establishment of regulated markets on the Berar pattern as modified by the Bombay Cotton Markets Act 1927, with special emphasis on the application of the scheme of regulation to all agricultural commodities instead of cotton alone; provision for establishment of machinery in the form of a board of arbitration for the settlement of disputes; prevention of brokers from acting for both buyers and sellers in the markets; adequate storage facilities in the market yards; standardization of weights and measures and the establishment of market committees only under a single pervading provincial legislation.

The commission also recommended that the Provincial Governments should take the initiative in the establishment of regulated markets and grant loans to market committees for meeting initial expenditure on land and buildings. This recommendation had a salutary effect on the states as borne out by the fact that some states enacted regulated markets act after that. In the year 1930, the 'Hyderabad Agricultural Markets Act' largely modeled on the 'Bombay Cotton Markets' Act 1927, was passed. The Central Provinces (now Madhya Pradesh) came next with the 'Central Provinces Cotton Market' Act, 1932. In 1935, another law called 'Central Provinces Agricultural Produce Markets Act' was passed on lines of the Central Provinces Cotton Markets Act, 1932. According to this act, markets could be regulated for the sale and purchase of all kinds of agricultural products other than cotton as the latter was already covered by the 'Cotton Markets' Act of 1932.

The market regulation was introduced in Madras (now Tamil Nadu) under the 'Madras Commercial Crops Markets' Act, 1933 and the first regulated market was established in this state in 1936 at Tripura in Coimbatore district.

In 1938, Model Bill was prepared by the Central Agricultural Marketing Department (DMI) on the lines of which several states drafted their bills.

In 1939, the Government of Bombay enacted the Bombay Agricultural Produce Markets' Act and made it applicable to all the agricultural commodities including cotton. As a result, the cotton market Act of 1927 was repeated, and all the market committees set up under this act were declared deemed to be the market committees under the new Act.

In Mysore State (now Karnataka), the 'Mysore Agricultural Produce Markets' Act was passed in 1939. However, the first regulated market at Tiptur could be established only about a decade later i.e. in November 1948.

The outbreak of the Second World War in September 1939 dislocated the normal economic activities in the country. Controls on food grains and other essential commodities were imposed, and their free movement was restricted. The levy system for direct procurement of food grains from producers resorted and price control and statutory/informal rationing was introduced. As a result, very limited progress could be achieved in the field of regulation during the war period.

The market regulation was introduced in the erstwhile Patiala state in January 1948 under the 'Patiala Agricultural Produce Markets' Act, 1947. The Government of Madhya Bharat passed the 'Madhya Bharat Agricultural Produce Markets' Act in 1952. This was modeled mostly on the line of Bombay Act. All mandis which were governed by the previous laws of the respective states were declared as regulated markets under the new Act.

The government of Sourashtra enacted the Sourashtra Agricultural Produce Maricets' Act, in February 1955. This Act was also framed on the lines of the Bombay Act.

3.15 Progress and Distribution of Regulated Market

The progress of market regulation was not substantial until the Second World War. After independence, the planning commission laid emphasis on a market regulation scheme. Up to March 2005. 7,557 markets were brought under regulation. The progress of market regulation in India during different periods is given in table 3.16.

The state wise progress of market regulation shows that Andhra Pradesh, Bihar, Haryana, Himachal Pradesh, Kamataka, Madhya Pradesh, Rajasthan, Punjab, Uttar Pradesh, Maharashtra, each introduced a scheme for the regulation of all

Table 3.16: Progress of Market Regulation in India

Period	Number of Regulated markets	Regulated markets as percent of total wholesale assembling markets (28090)
Before Commencement of First Five Year Plan (April 1951)	236	0.84
At the End of First Five Year Plan (March 1956)	470	1.67
At the End of Second Five Year Plan (March 1961)	715	2.54
At the End of Third Five Year Plan (March 1966)	1012	3.60
At the End of October (1973)	2754	9.80
At the End of March (1976)	3528	12.55
At the End of September (1977)	3763	13.39
At the End of March (1979)	4345	15.46
At the End of March (1980)	4446	15.82
At the End of March (1981)	4605	16.39
At the End of March (1982)	4792	17.05
At the End of March (1984)	5579	19.86
At the End of March (2005)	7557	29.90

Source: Directorate of Marketing and Inspection, Faridabad, (2005)

assembling wholesale markets. The progress in Goa, Meghalaya, Sikkim, Pondicherry, Chandigarh, Tripura, and Manipur is extremely poor. Among the union territories, the progress of market regulation in Delhi and Pondicherry is good. Market regulation acts

have not been implemented or passed in Jammu & Kashmir, Kerala, Manipur, Andaman & Nicobar, Dadar and Nagar Haveli, and Lakshadweep.

3.16 Administrative Organization

A sound and effective administration is essential for the successful operation of any organization. Newman defines 'administration' as "the guidance, leadership, and control of the efforts of a group of individuals towards some common goal.'" Undoubtedly, a good administration is one which enables the group to achieve its objectives with minimum expenditure, resources and efforts, and least interference with other worthwhile activities. It is however felt necessary to study the administrative machinery at the state level since the administrative body at the level of an individual market cannot function independently.

The respective market legislations largely influence the administrative patterns of regulated markets in different states. These legislations intend to regulate the sale and purchase of agricultural produce at the primary level of marketing. Having regard to the fact that every transaction involves a buyer and a seller whose interests are diagonally opposite, these acts protect the interests not only of the producer sellers but also of buyers by imposing some restrictions on the manipulative activities of various market functionaries. Though these acts contain various penal clauses, regulation of markets is to be understood as a developmental measure rather than a police action.

The administration of Agricultural Produce Market Acts in different states is carried out by different authorities. The Director of Agriculture is, in charge of the administration of the Markets Acts in Bihar, Rajasthan, Madhya Pradesh, Tamil Nadu, Uttar Pradesh, Tripura and Himachal Pradesh.

The state government is empowered to declare a market area (except under the Gujarat Act, where this power is vested in the Director) to notify commodities as agricultural produce, to establish market committees under the Act, to permit market committees

to raise loans (except under the Maharashtra Act, where the Director is empowered), to supersede market committees, to make rules, etc. In all the states, except in Karnataka, the state governments are also vested with the power to remove any member or members of the market committee from holding their office.

3.17 Organization and Composition of Market Committee

A market committee established under the markets Act is entrusted with the responsibility of enforcing within the notified area, the different provisions of the Act, the rules, and the by-laws framed there under. Furthermore, the act enjoins upon a market committee to establish markets within its market area and provide the necessary facilities to persons using it for an orderly marketing of agricultural produce and as directed by the Government from time to time. Such facilities may include competitive conditions for the sale and purchase of agricultural commodities, storage facilities, arrangements for weighing and prompt payment, provision of amenities in the market- yards such as drinking water, rest houses, cattle sheds, cart-parks, roads, covered pucca platforms, lighting and sanitary arrangements, etc. A market committee is, therefore, the pivot of the whole mechanism designed to improve the standards of marketing within its jurisdiction.

Market committees are corporate bodies comprising members representing various interests involved in the sale and purchase of agricultural produce. There is a great heterogeneity in the composition and constitution of market committees as provided in the various Acts.

3.17.1 Constitution of Market Committee

The seminar on regulated markets organized by the Ministry of Food and Agriculture, in January 1959, was of the view that (i) the strength of the committee be such as to accommodate various interests in proper proportions. The committee should neither be too small nor too unwieldy; (ii) the committee should consist of 12 to 18 members

depending on the size of the market and other considerations; (iii) the interests of the grower should predominate with at least 50 per cent seats going to them, (iv) the traders representation should not exceed 25 per cent and (v) the cooperative marketing societies, the municipal or local bodies and government nominees should have a remaining seat and if there is a warehousing corporation one seat should go to it.

In connection with the election of growers' representatives, it favored the adoption of the system of the indirect election through the grower- members of the panchayats other registered growers associations and the agricultural cooperatives. Under the Uttar Pradesh Act (the Uttar Pradesh Krishi Utpadan Mandi Adhiniyam, 1964), the market committees consist of 19 members or more in cases where more than one local body is exercising jurisdiction over the principal market- yard or a part thereof.

3.17.2 Functions of the Market Committee

The main functions of the market committees are:

(a) To ensure fair dealing between the producers/sellers and purchasers/ traders and efficient marketing of the produce.

(b) To ensure prompt and ready payment to the sellers.

(c) To manage for grading, standardization, and auction of the produce.

(d) To check the weights and measures used by the traders.

(e) To provide better facilities in the yard and also to accelerate rural Development programmers in the area.

(f) To collect and provide up to date and reliable market information to the participants, and

(g) To act as a mediator in case of disputes between the parties.

3.18 Infrastructural Facilities

A regulated market yard is a place where marketing of agricultural produce is carried out and also where agencies relating to agricultural marketing are located. So from the

structural point of view, an agricultural market yard is different from other market places. Every market is supposed to have a standard layout in which all the market infrastructures are located. One of the main objectives of regulated marketing is to construct a planned market yard, where all the facilities of the market are available. The need for planned and orderly regulated markets has been felt because of difficulties experienced in the previous regulated market places. The following are the common difficulties or conditions which were existing in traditional or unplanned regulated markets.

(i) The market place (generally known as dhanmandi) were congested and often located along narrow lanes which do not permit easy access to vehicular traffic. It becomes very difficult for traders to handle their products and for market committees to supervise transactions.

(ii) The shops were scattered all over the town, and the transaction took place all over the locality,

(iii) Adequate space was not available for exhibiting the produce, it's cleaning, and grading, etc.

(iv) There were no auction platforms. The producer used to sell his produce on the day of its arrival in the market at whatever price.

(v) There was neither place for parking of cars nor cattle.

(vi) No facilities of drinking water, public toilets, veterinary dispensary, canteen, rest house, etc., were available.

(vii) Similarly, banks and post offices were located away from the markets.

These difficulties are still there in most of the regulated markets where yards have not been constructed. But at present, the regulated market yards are providing lots of infrastructural facilities. The regulated market yards besides providing facilities for storage and sale of agricultural produce etc. also provides facilities for the sale of agricultural inputs, banking, and insurance. It also has consumer stores where farmers

can buy their requirements, post office, veterinary dispensary, etc. The details of regulated market yard infrastructure are as follows:-

(a) Shop-cum-godowns (b) Godowns (c) Retail shops, (d) Market committee office (e) Grading laboratory (f) Boundary wall, (g) Veterinary dispensary (h) Sale platforms, (i) Farmers guest house Q) Water troughs (k) Water huts (1) Canteen (m) Public urinals, latrines and bathrooms (n) Dust bin (o) Cycle stand (p) Bank (q) Post office (r) Internal roads (s) Drainage (t) Water supply arrangements (u) Electricity and lighting arrangements (v) Space for fodder shops, petrol pump, automobile workshop, godowns of FCI, CCI, CWC, etc.

The above-mentioned structures/facilities may differ from one market to another in size according to the status of the market. With the growth of a market, the size and number of structures also increase. In fact, the infrastructure must be according to the needs, i.e., the volume of trade in that particular market. The classification of markets in A, B, and C category is only for convenience and often the status of market changes. Therefore, for the construction of a market yard, proper perspective is needed so that it will be useful for a long time. In recent years, a new class of market- super 'A' class has also been identified, which is a top class market having much more facilities and infrastructure

3.19 Notified Commodities

Market legislation in India covers all agricultural as well as horticultural produce, livestock, their products and forest products. But, since the regulation of the market is a state subject, there are some variations in the state legislations. In the case of Mysore Agricultural Produce Marketing (Regulation) Act, 1965.

The Madras Agricultural Produce Markets Act, 1951, and Uttar Pradesh Act, 1964, since no schedules have been appended to these Acts; a separate notification has

always to be issued in respect of every commodity to be notified for regulation under the acts.

Most of the regulated markets now functioning are, by and large, multi commodity markets. There are, however, some markets which deal in a single commodity like tobacco, vegetables or livestock.

3.19.1 Commodities under Market Regulation

The Bihar Mandi Adhiniyam 1964 has specified the commodities for marketing in regulated markets of the state. The following commodities have been listed after amendment.

1. **Cereals:** Paddy, Rice, Jawar, Bajra, Maize, Barley, Wheat, Bejhar
2. **Legumes**: Urd, Moong, Gram, Pea, Arhar, Masur, Lobia, Soybean, Dnchsd, Guar, Snseeds .
3. **Oil** seeds: Groundnut, Til, Mustard, Castor, Linseed, Sehwan, Mahua, Gullu, Coconut, Sunflower.
4. **Fibers**: Cotton, Jute, Sani, Patson, Dancha, Mesta.
5. **Narcotics**: Tobacco
6. **Spices**: Coriander, Rapechillies, Methi, Turmeric, Amchur.
7. **Miscellaneous**: Gur, Khandsari, Popsyd, Rab, Sakkar, Jaggery, Makhana
8. **Vegetables**: Potato, Onion, Garlic, Celosia, Ginger, Chillies, Tomato, Cabbage, Cauliflower, Carrot, Radish, Brinjal, Tinda, Battleguard, Greenpeace, Parwal, Jackfruit, Cucumber, Whiteguard, Ladyfinger, Pumpkin, Beterguard, Sweet potato.
9. **Fruits**: Lemon, Orange, Mosmbi, Malta, Grapefruit, Banana, Pomegranate, Muskmelon, Watermelon, Papaya, Apple, Guava, Ber, Aonla, Litchi, Chicu, Peches, Loquat, Mango, Jackfruit, Apricot, Pear, Grapes, Pumelo.
10. **Forest Produce**: Gum, Wood, Ctechu, Lac
11. **Animal Husbandry**: Ghee
12. Fish

3.20 Site of the Regulated Market

The site of the market yard is another important aspect, which requires special consideration by geographers, i.e., its actual location- whether located in the congested part of the town, along with the main road, at the periphery of the town or away from the town. Before regulation, all the markets of Nalanda district was located at the heart of the city or along the main road of the town, at the periphery of the town or away from the town. There was a heavy rush of vehicles both of town dwellers as well as of farmers who brought their products mostly in bullock and camel carts. There was no facility of auctioning and other processes of marketing. Soon this fact was realized, and the construction of new market yards was taken up. Now four regulated markets have well-designed market yards in Nalanda district. The study shows that all the new regulated markets have been shifted to outside of towns, or along the main road. The main consideration for the location of the regulated market is the availability of land. On an average 20 hectares land will be needed for 'A' class market yard, 13 hectares for 'B' class and 7 hectares for ' C class. Sometimes it happens that other factors are neglected, but land availability remains to be the prime consideration for the location of the regulated market.

3.21 System of Agricultural Marketing: Nalanda District

Agricultural marketing is the performance of all business activities involved in the flow of goods and services from the point of initial agricultural production until they are in the hands of the consumer. Among the various forms of marketing, the marketing of agricultural products is of prime importance, because it provides food to the billions of people throughout the world. The development of agricultural marketing is closely associated with the development of agriculture.

Especially when surplus production starts. From village exchange system it has now grown into not only national but as the international system as well. Thus, agricultural

marketing is a system through which commodities are moved from farmers' home to ultimate consumers. During this entire process, the commodity moves from one hand to another hand and also from one place to another place. But all these actions and events take place in some sequence which is known as a marketing system.

The agricultural marketing system starts with the farmer and his production, while at the other end of the system is the consumer. The process starts with the movement of farm products to the market and its contact with business firms or traders. The factors affecting this contact are transportation, communication, the system of law and order and monetary system, which is associated with business management activities. The actual buying and selling activities are done under certain norms and also under some organizational system. And ultimately, the products first being purchased by traders/wholesalers or retailers through intermediaries/agents and other internal agencies, reach the consumers. In fact, agricultural marketing functions are the activities that are to be performed during the marketing of any farm products and all these functions are inter-linked with each other, thus forming a part of the efficient marketing system.

3.22 The Nature of Agriculture Trading System

In the study area, the agricultural products are marketed through different agencies. The farmers sell their surplus of different commodities mainly through two types of trading system:

Private Trading System (Informal Agencies), and

Public Trading System (Formal Agencies).

3.22.1. Private Trading System (Informal Agencies)

In the private trading system, the purchasing agents work as an independent body, on an individualistic basis. They are in themselves responsible for profit and loss in the trade. Wholesale traders, village traders, itinerant traders, commission agents and so

on are included in the group of private trading agencies who purchase the agricultural surplus from producers at a free rate by price agreement between producer-sellers and buyers. This transaction takes place in the village as well as at market center. In this system, the farmers, especially the small and marginal farmers, are exploited by traders on account of their indebtedness, small size of surplus and ignorance of market price and rules. The informal agencies are concerned with the private trading system. These are private mills, periodic rural markets, direct farm gate sale and so on. The Periodic market is one of the important informal agencies of the agricultural marketing system.

3.22.2 Public Trading System (Formal Agencies)

The public or government agricultural trading system has come into existence to (or "intending to") ensuring fair price for producer's surplus as an incentive to increase the production, to supply essential commodities to the consumer at a reasonable price, to minimize seasonal fluctuation in price and to undertake procurement for maintenance of buffer stock. The main public trading agencies are Food Corporation of India (FCI), State Food Corporation (SFC) and Bihar State Cooperative Marketing Union (BISCOMAUN). All these trading agencies undertake the purchase of different commodities under the scheme of procurement and minimum support price declared by either the central or the state government.

3.23 Methods of Transaction of Agricultural Products

The nature of transaction methods of agricultural products in the study area through different marketing agencies is found to vary according to quantity and quality of products under sale process. Thus accordingly, these transaction methods can be grouped into various categories as discussed below:

(a) Undercover Method

(b) Open Auction Method

(c) By Quotation on Samples

(d) Private Negotiation

(e) Close Tender System

(f) Government Purchase

(a) Undercover Method

This is a very primitive method, which is rarely in operation in periodic markets. In this method, Arhatiya forms a group of buyers and sellers. He clasps their hands under a cover cloth, usually small towel or dhoti and presses the fingers on sellers palm to indicate the rate at which the buyer is ready to purchase. The undercover method is practiced only in periodic wholesale markets at Harnaut, Islampur, Nagarnausa, and Sarmera.

(b) Open Auction Method

This is also a wholesale trading process in which the buyer declares his bids aloud to the auctioneer who may be an Arhatiya, broker or seller himself. The goods are usually sold to highest bidder. However, in some markets, double auction system prevails. At first, the market official auctions each heap of commodities to Dalal/broker. In the second auction the Dalal/broker or wholesale trader auctions his own purchases (from the first auction) to other buyers. This system is found in both the regulated markets of Hilsa and Biharsharif of the district. This system of sale is preferred over all other systems because of the fact it ensures fair dealing to all parties.

(c) By Quotation on Samples

Under this system, the commodity is not heaped up but is kept in bags on the cart, etc. and the Arhatiya collects samples from the seller's samples and takes them round, and offers are made by these samples. This kind of method is found in big rural markets where bigger wholesale transactions take place. They are Harnaut, Islampur, Nagarnausa, and Sarmera.

(d) Private Negotiation

Under this system, the seller may invite offers for his produce and sell to one who might have offered the highest price for the produce. It is most common in the unregulated market.

(e) Close Tender System

This is similar to auction but the rates are not open, and bids are invited in the form of a closed tender, and the product is given to the highest bidder.

(f) Government Purchase

The government agencies make a purchase to (or "intending to") ensuring a fair price for producers' surplus, as an incentive to increase the production, supply of essential commodities to the consumer at a reasonable price, to minimize seasonal fluctuation and to undertake procurement for maintenance of buffer stock. The main public trading agencies are Food Corporation of India (FCI), State Food Corporation of India (SFC), Bihar State Cooperative Marketing Union (BISCOMAUN). All these trading agencies undertake the purchase of different commodities under the scheme of procurement and minimum support price declared by the government.

3.24 Market Functionaries

The study of market functionaries involved in trading of agricultural commodities is an important aspect of agricultural marketing system in India. The system of agricultural marketing is saddled with a long chain of intermediaries who in turn, reduce the effective share of producers to the consumers' price, to a considerable extent. The number of intermediaries or functionaries and their operations vary with the nature of commodities dealt with. The important functionaries involved in agricultural marketing system are.

(a) Village Beoparies

(b) Itinerant Traders

(c) Arhatiyas

(d) Brokers (Dallas)

(e) Auctioneers

(f) Wholesalers

(g) Retailers

(h) Processing agents

(i) Weighmen

(j) Palledars

(k) Others

(a) Village Traders/Beoparies

Village trader is the most usual purchase of agricultural produce. He usually collects the produce from the villages/ haats and brings it to the secondary markets, and from there it reaches consumers. The village trader is sometimes also a producer, and he buys locally for sale to secondary markets. Thus storing and primary assembling is his main functions. Often he advances money to the producers, thus acting as a financier too. In almost all of the sampled villages, village traders had given advanced money at the time of sowing to the producers, and in return, producers sold their product to the village traders.

(b) Itinerant Traders

Itinerant dealer wanders village to village, purchases and collects the agricultural produce and takes, it to the nearest market. He purchases the product at a cheaper rate from the Farmers owing to the lack of competition from other traders. Sometimes he also finances the cultivators at the time of sowing and instead of that he purchases the produce from them at cheaper rates.

(c) Arhatiyas

They are also known as commission agents. The arhatiyas are of two types, viz: (i) Katcha arhatiyas and (ii) Pucca arhatiyas. The Katcha arhatiyas are men of small capital, who sell the produce in assembling market on behalf of those farmers of the village from whom they collect the produce. The Pucca arhatiyas own big capital and buy and sell the produce on behalf of the merchants from outside markets. Arhatiyas often perform the function of wholesale merchants also. Thus, the Katcha arhatiya is concerned with the assembling of produce while the Pucca arhatiya distributes it. They also advance loans to the village beoparies and itinerant dealers on the conditions that the product will be sold to them or through them.

(d) Brokers or Dalals

Generally speaking, the Dalal assists the arhatiya in bringing together sellers and buyers and arranging the sale of produce. The charge paid to dalals instead of their services is known as brokerage or dalali.

(e) Auctioneers

The auctioneers play an important role in the marketing of fruits, vegetables, and other perishable agricultural commodities. The auctioneer brings the produce before the purchases and auctions it to the highest bidder often charging a commission for his service.

(f) Wholesalers

Wholesalers are those traders who sell and purchase the agricultural produce in very large quantities.Village traders and arhatiyas assist the wholesalers in their trade. They perform the functions of assembling, storing, grading, risk bearing and marketing finance.

(g) Retailers

Retailers purchase the agricultural produce from wholesalers at a wholesale price and sell it to final consumers. The profit earned by the retailers in buying and selling the produce is known as retailer's margin. The growers sometimes also work as retailers in rural periodic markets, dealing with the consumers directly.

(h) Processing Agents

Processors are that group of traders who purchase the agricultural produce directly from the farmers and some other intermediaries to add variability to the products before they go to the consumers. These traders may be small scale processors in rural areas itself, big farmers or the owners of big mills.

(i) Weighmen (Taulas)

Taula not only weighs the products but sometimes collects their samples from villages and takes them to the dealers in towns. He gets his commission as well as taulai (charge for weighing the products).

(j) Palledars

Palledars are the market laborers who attend the collection and handling of produce in the markets. They are usually independent workers, though in certain cases they are permanent employees of commission agents. The charge paid to the palledars is known as palledari. Their charges are deducted from the producer sellers.

(k) Others

There are a number of other minor functionaries such as a sweeper, water carriers and other servants of arhatiya who attend the affairs of arhatiya client.

3.25 Marketing Channels of the Agricultural Products

Agricultural commodities namely, paddy, rice, wheat, maize, pulses, potato, onion, etc. undergo a change of ownership through time and space. The intermediaries are

involved in the passing of the commodities from producer to ultimate consumer through different market channels of the commodities. In Nalanda district following marketing channels have been identified in rice, wheat, maize, pulses, potato, and onion. They are given below.

(1) Produce → Consumer (Direct Sale).

(2) Producer → Village Trader → Wholesale Trader → Mills → Government Agencies → Fair Price Shop → Consumer.

(3) Producer → Itinerant Trader → Primary Wholesaler → Miller → Secondary Wholesaler → Retailer → Consumer.

(4) Producer → Miller → Wholesaler → Retailer → Consumer.

(5) Producer → Miller → Consumer.

(6) Producer → Commission Agent → Miller → Wholesaler → Retailer → Consumer.

(7) Producer → Government Agencies → Miller → Fair Price Shop → Consumer.

(8) Producer → Cooperative Marketing Societies → Cooperative Processing Unit → Wholesaler → Retailer → Consumer.

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CHAPTER -4

PATTERNS OF MARKETED SURPLUS IN AGRICULTURAL MARKETS IN NALANDA DISTRICT

CHAPTER -4

PATTERNS OF MARKETED SURPLUS IN AGRICULTURAL MARKETS IN NALANDA DISTRICT

4.1 Introduction

The quantity of marketable surplus of agricultural products plays a significant role in their transaction of agro-commodities in market centers. Marketable surplus represents the surplus of agricultural products available to the farmers for disposal, left after meeting his requirements of family consumption, payment of wages in kind, seed and wastage, etc. In general marketable surplus of agricultural products refers to the amount which a farmer can sell on the market. It consists of the entire output in the case of cash crops (commercial crops) but only that part of food grains which is above the subsistence needs of the family.

Marketed surplus, on the other hand, represents only that portion of the marketable surplus which is put on the market for sale or it is placed at the disposal of non-farming rural as well as urban population. Thus in a way, marketed surplus is part of the marketable surplus. In this chapter, the concern has been basically with the marketed surplus. The study of marketed surplus has been organized under the following sections:

Section I It is devoted to the study of spatial patterns of marketed surplus by the arrival size of six major commodities i.e. rice, wheat, maize, pulses, potato, and onion. They have been selected, and spatial patterns of their marketed surplus are discussed from the sampled regulated and periodic market centers of the district.

Section II Temporal patterns of marketed surplus are analyzed by data collected from the different sampled regulated and primary markets i.e. periodic markets, through

field survey, records of the concerned markets and other government agencies. Seasonal arrival pattern is also discussed.

Section III It deals with village level marketed surplus to the different marketing agencies. It also takes into consideration the size of land holding as a factor determining the marketing of different agricultural commodities.

4.1.1 Village Level Marketed Surplus of Agricultural Commodities

The transaction of marketed surplus at the village level, by the size of land holdings of farmers growing different agricultural commodities at the village level, is given in the Tables- 4.1 to 4.7. An overview of these tables indicates that the village level transactions of various crops .i.e. rice, wheat, maize, pulses, potato, onion constitute a high share of the total transactions of these crops performed through different market agencies.

Table-4.1

Village Level Marketed Surplus of Agricultural-Commodities According to Size of Land Holding in Nalanda District (2013-2014)

S.N.	Size of Holding (in Hectares)	Village	Rural/Periodic Markets	Main Markets	Overall
1	Below 1 Hec.	1209.15 71.05	492.78 28.95	-	1701.94 100
2	1 - 2 Hec.	2471.9 54.62	762.34 16.84	992.09 21.92	4525.29 100
3	2 - 4 Hec.	2718.43 39.45	1061.29 15.04	3409.54 49.48	6890.33 100
4	4 - 10 Hec.	8372.83 41.49	2653.51 10.25	14868.89 57.38	25973.29 100
5	10 and Above	12411.98 41.49	2653.51 8.8	14868.89 49.63	29912.45 100
	District Total	**27184.3 39.45**	**7623.46 11.06**	**34095.4 49.48**	**68903.16 100**

Source: Field Survey 2013-2014 (Weight in Quintal and its Percentage in bracket)

The share of village level sale for all the selected crops is 39.45 percent. For the rice, it is 52.38 percent, for wheat 31.97 percent, for maize 46.59 percent. While pulses, potato, and onion it is 45.88, 50.72 and 50.63 percent respectively. The sale of selected agro-commodities in weekly/periodic markets is 11.06 percent and it varies according to the size of holding. The highest selling activities for all commodities in the weekly markets are performed by those villagers who belong to lowest socioeconomic stratum, having a holding up to 2 hectares. They have contributed 28.95 percent of marketed surplus in the periodic markets during 2013-2014. The sale of rice, wheat, maize, pulses, potato, and onion is 11.32 percent, 21.72 percent. 16.36 percent, 16.02 percent. 10.87 percent, and 11.63 percent respectively to the total marketed surplus of these crops in the periodic markets as evident from the village level survey. Through the Table 4.1, it is found that 49.48 percent of total marketed surplus of all agricultural commodities are marketed in regulated/urban markets in the study area. But the proportion of marketed surplus exchanged in these markets varies according to the nature of the crop.

Table 4.2

Village Level Marketed Surplus of Rice According to Size of Land Holding in Nalanda District (2013-2014)

S.N.	Size of Holding (in Hectares)	Village	Rural/Periodic Markets	Main Markets	Overall
1	Below 1 Hec.	488.52 70.04	208.89 29.95	-	697.41 100
2	1 - 2 Hec.	1265.69 67.53	256.68 13.69	351.9 18.77	1874.27 100
3	2 - 4 Hec.	991.53 46.28	273.45 12.76	877.45 40.95	2142.43 100
4	4 - 10 Hec.	3955.39 55.86	1169.55 16.51	1956.15 27.62	7081.47 100
5	10 and Above	5955.39 52.37	825.93 6.67	5589 45.18	12370.32 100
	District Total	**12656.9 53.38**	**2734.5 -11.32**	**8774.5 -36.31**	**24165.9 -100**

Source: Field Survey 2013-2014 (Weight in Quintal and its Percentage in bracket)

Table 4.3

Village Level Marketed Surplus of Wheat According to Size of Land Holding in Nalanda District (2013-2014)

S.N.	Size of Holding (in Hectares)	Village	Rural/Periodic Markets	Main Markets	Overall
1	Below 1 Hec.	300.69 63.77	170.82 36.22	-	471.51 100
2	1 - 2 Hec.	438.88 43.1	298.09 29.27	281.16 27.6	1018.13 100
3	2 - 4 Hec.	560.43 32.89	507.78 29.8	635.44 37.29	1703.65 100
4	4 - 10 Hec.	1531.53 39.58	1085.76 28.06	1251.55 32.34	3868.84 100
	10 and Above	1557.27 23.37	918.45 13.78	4186.26 62.83	6661.98 100
	District Total	**4388.8** **31.97**	**2980.9** **21.72**	**6354.41** **46.3**	**13724.1** **100**

Source: Field Survey 2013-2014 (Weight in Quintal and its Percentage in bracket)

Table 4.4

Village Level Marketed Surplus of Maize According to Size of Land Holding in Nalanda District (2013-2014)

S.N.	Size of Holding (in Hectares)	Village	Rural/Periodic Markets	Main Markets	Overall
1	Below 1 Hec.	49.86 62.78	29.55 37.21	-	79.42 100
2	1 - 2 Hec.	95.07 19.79	33.39 6.95	351.9 73.25	480.37 100
3	2 - 4 Hec.	122.68 11.72	46.36 4.43	877.45 83.34	1046.37 100
4	4 - 10 Hec.	130.17 6.06	60.19 2.8	1956.15 91.13	2146.52 100
5	10 and Above	552.96 8.76	164.45 2.6	5589 88.68	6306.41 100
	District Total	**950.76** **9.45**	**333.96** **3.32**	**8774.5** **87.22**	**10059.2** **100**

Source: Field Survey 2013-2014 (Weight in Quintal and its Percentage in bracket)

Table 4.5

Village Level Marketed Surplus of Pulses According to Size of Land Holding in Nalanda District (2013-2014)

S.N.	Size of Holding (in Hectares)	Village	Rural/Periodic Markets	Main Markets	Overall
1	Below 1 Hec.	54.18 66.81	26.91 33.19	-	81.09 100
2	1 - 2 Hec.	110.84 55.19	38.69 19.26	51.3 25.54	200.84 100
3	2 - 4 Hec.	134.91 47.55	56.7 19.98	92.07 32.45	283.68 100
4	4 - 10 Hec.	148.42 45.72	67.33 20.74	108.81 33.52	324.56 100
5	10 and Above	660.09 43.25	197.33 12.93	668.55 43.81	1525.98 100
	District Total	**1108.45** **45.88**	**386.98** **16.02**	**920.74** **38.11**	**2416.17** **100**

Source: Field Survey 2013-2014 (Weight in Quintal and its Percentage in bracket)

Table 4.6

Village Level Marketed Surplus of Potato According to Size of Land Holding in Nalanda District (2013-2014)

S.N.	Size of Holding (in Hectares)	Village	Rural/Periodic Markets	Main Markets	Overall
1	Below 1 Hec.	169.92 79.19	44.64 20.81	-	214.56 100
2	1 - 2 Hec.	370.75 60.87	94.87 15.58	143.38 23.54	608.99 100
3	2 - 4 Hec.	442.52 50.46	99.27 11.32	335.05 38.21	876.84 100
4	4 - 10 Hec.	1375.74 54.79	411.84 16.4	722.92 28.8	2510.5 100
5	10 and Above	2066 45.78	298.05 6.6	2149.12 47.61	4513.44 100
	District Total	**4425.19** **50.72**	**948.67** **10.87**	**3350.47** **38.4**	**8724.33** **-100**

Source: Field Survey 2013-2014 (Weight in Quintal and its Percentage in bracket)

Table 4.7

Village Level Marketed Surplus of Onion According to Size of Land Holding in Nalanda District (2013-2014)

S.N.	Size of Holding (in Hectares)	Village	Rural/Periodic Markets	Main Markets	Overall
1	Below 1 Hec.	145.98 80.09	36.27 19.9	-	182.25 100
2	1 - 2 Hec.	291.6 58.4	83.93 16.81	123.75 24.78	499.28 100
3	2 - 4 Hec.	365.42 49.89	94.5 12.9	272.42 37.19	732.34 100
4	4 - 10 Hec.	1231.25 55.3	375.3 16.85	619.83 27.84	2226.33 100
5	10 and Above	1620 45.28	249.3 6.97	1708.2 47.74	3577.5 100
	District Total	**3654.2 50.63**	**839.3 11.63**	**2724.2 37.74**	**7217.7 100**

Source: Field Survey 2013-2014 (Weight in Quintal and its Percentage in bracket)

Wheat has recorded 46.30 percent, rice 36.3 percent, maize 37.05 percent, pulses 38.11 percent, potato 38.40 percent and onion 37.74 percent share of their total marketed surplus in regulated markets (Tables- 4.1, 4.2, 4.3, 4.4. 4.5, 4.6 and 4.7). The marketed surplus of agricultural commodities transacted at Inter, and intra-village levels stood at second rank concerning total marketed surplus of the district. The village sale accounted for 39 percent of marketed surplus of agricultural commodities.

The crop-wise analysis shows that rice is the most important commodity transacted at the village level. A Large quantity of its marketed surplus is exchanged at village level because it is a staple food. Inter and intra-village demand of rice are very high. Similarly, maize, pulses, potato, and onions also have appreciable shares at the village level sale in the study area. Their shares range between 40 to 50 percent of the total marketed surplus of respective crops.

The large share of marketed surplus of these crops at village level is attributed to their small size of surplus available with individual producer which does not seem to be economically viable if transacted in distant big markets, due to high transport and time cost incurred per unit of weight.

However, big farmers having the highest size of land holding, above 8 hectares sell 49.63 percent of their total marketed surplus in the main (regulated and urban) markets. Whereas farmers with, the lowest size of land holding, up to 2 hectares, have almost no surplus to sell in the main market centers (regulated and urban). Farmers with 2.1 to 4 hectares and 4.1 to 8 hectares size of holdings contribute 21.92 percent and 57.38 percent of their total marketed surplus in the main market centers (regulated and urban). The proportion of marketed surplus varies crop-wise too. Big farmers with more than 8 hectares of holding contribute 45.18 percent rice, 62.84 percent wheat, 43.21 percent maize, 43.81 percent pulses, 47.62 percent potato and 47.75 percent onion of marketed surplus in the main markets(regulated and urban). It is on account of the fact that they have their means of transportation and hence they do not find any difficulty in selling their produce in the main market centers (regulated and urban).

The disincentive to the poor farmers with the small size of holding to sell in main markets (regulated and urban) is, the lack of transportation facilities and also that they have a few surpluses to sell in the main market centers (regulated and urban). Thus it is found that proportion of sale of marketed surplus in the main (regulated and urban) market centers rises as the size of land holding of the farmer increases.

No doubt, the sale of all food grains and other important crops in the main (regulated and urban) market centers is influenced by the availability of transportation facilities and better market accessibility. The large proportion of sale can be attracted in the main market centers (regulated and urban) by providing farmers, particularly the small

farmers the better communication and transport facilities. Thus, one of the important reasons for the highest sale at the village level is due to poor communication and transport facilities. Recently, the establishment of the market yard (Regulated Market) has also not been able to attract a large number of farmers to sell their products in new market centers. Participation of farmers in the market yard (Regulated Market) is also determined by their size of land holding. It supports the findings of this study that the big farmers are more dominant in selling their produce in the market yard and urban market centers than the small one. The reason is well known that these farmers are well equipped with better transportation facilities and are better informed about the market conditions.

4.2 Spatial Patterns of Marketed Surplus of Agricultural Commodities

Data have been collected and processed to get the value of the average marketed surplus of selected agro-commodities in different sampled markets i.e. regulated and periodic market. It revealed that 473388 quintals of selected agricultural commodities (rice, wheat, maize, pulses, potato, and onion) were marketed during 2013-2014. Among these selected crops, rice has accounted for the highest share of 38.93 percent (220720 quintals) of marketed surplus in the sampled markets. Wheat follows it with 31.08 percent (125209 quintals), potato with 9.77 percent (49144 quintals), onion with 13.20 percent (46920 quintals), maize and pulses constituting 2.10 percent (15697.5 quintals), and 4.9 percent (15698.2 quintals) of marketed surplus in sampled market centers of the district. The variation in marketed surplus of different commodities is mainly due to the variation in the production of crops in the study region' (Table 4.8).

4.2.1 Marketed Surplus of the Agricultural Commodities in the Sampled Markets of Nalanda District

Market-wise analysis done for the selected crops reveals a great variation in its magnitude in regulated and urban periodic markets. And it is found that the markets which are located at the district/block headquarters and other administrative centers attracted big marketed surplus. Hilsa and Biharsharif regulated mandi of the district

Table 4.8

Spatial Patterns of Marketed Surplus of Agricultural Commodities in the Sampled Market Centers of Nalanda District (2013-2014)

SN	Sampled Markets	Food grains			Pulses	Vegetables		
		Rice	Wheat	Maize		Potato	Onion	Total
Regulated Markets								
1	**Hilsa**	69635	28359	4482	3884	14319	12047	**132726**
2	**Biharsharif**	96821	51154	8657	5293	21676	16938	**200539**
Periodic Markets								
1	**Harnaut**	17340	12903	724.2	1020	3366	3604	**38957.2**
2	**Rajgir**	2805	2346	290.7	561	1428	1581	**9011.7**
3	**Islampur**	3009	2448	244.8	510	1275	1377	**8863.8**
4	**Chandi**	3621	2907	198.9	510	1020	1377	**9633.9**
5	**Ekangarsari**	2550	2397	112.2	504.9	969	1377	**7910.1**
6	**Nagarnausa**	2703	3009	0	484.5	765	1224	**8185.5**
7	**Noorsarai**	4641	3876	188.7	474.3	918	1428	**11526**
8	**Parwalpur**	3417	3315	0	459	663	1377	**9231**
9	**Ashthawan**	2856	2550	0	314.5	280.5	765	**6766**
10	**Sarmera**	4998	4896	153	663	1020	1275	**13005**
11	**Giriyak**	3162	2550	391	561	765	1377	**8806**
12	**Rahui**	3162	2499	255	459	680	1173	**8228**
	Total	**220720**	**125209**	**15697**	**15698**	**49144**	**46920**	**473388**

Source: Field Survey 2013-14 (Weight in Quintals)

received/transacted more than 50 percent of the total marketed surplus of agro-commodities in the sampled markets of the district. The sampled periodic markets also have a lion share of marketed surplus of agricultural commodities in the district. For example Harnaut has a share of 8.23 percent (38957.2 quintals), Sarmera 2.75 percent (13005 quintals), Noorsarai 2.43 percent (11526 quintals), Chandi 2.04 percent

(96335.9 quintals), Parbalpuri 1.95 percent (9231 quintals), Islampur 1.87 percent (8863.8 quintals), Giriyak 1.86 percent (8806 quintals), and Rahui 1.74 percent (5069.4 quintals) total of marketed surplus of the agricultural commodities. The remaining market (periodic) centers have contributed less than one percent of marketed surplus of different agricultural commodities in the selected market centers of Nalanda district (Tables-4.8 and 4.9).

4.2.2 Marketed Surplus of Rice in the Sampled Markets

The proportion of an individual crop in the district's total marketed surplus of that crop in different market centers also shows variation. As far as the rice is concerned, it's marketed surplus varies from market to market. The selected regulated markets have received 75 percent of the total marketed surplus of rice in the district. Biharsharif regulated market has the highest share of marketed surplus of rice constituting 43.78 percent (96821 quintals) and Hilsa regulated market has 31.55 percent (69635 quintals) of the total quantity of marketed surplus of rice in the district. So far marketed surplus of rice in the periodic markets is concerned; there is a great regional variation in its marketed surplus. Harnaut urban periodic market has the highest share of the marketed surplus of rice amounting 7.86 percent (17340 quintals), followed by Sarmera 2.26 percent (14790 quintals), Noorsarai 2.10 percent (4641 quintals), Chandi 1.64 percent (3621 quintals) and Parbalpur 1.55 percent (3417 quintals). Whereas remaining sampled periodic markets have dealt with less than one percent of the total marketed surplus of rice during 2013-2014 (Tables- 4.8 and 4.9).

4.2.3 Marketed Surplus of Wheat in the Sampled Markets

Like rice, wheat also has great spatial variation in the marketed surplus in different markets. Hilsa and Biharsharif share 22.65 percent (28359 quintals) and 40.85 percent (51154 quintals) of the total marketed surplus of wheat in the sampled markets of the study area respectively. Among the sampled periodic markets, Harnaut constitutes the highest share of 10.31 percent (12903 quintals) of marketed surplus of wheat,

followed by Sarmera 3.91 percent (4896 quintals), Noorsarai 3.10 percent (3876 quintals), Parbalpur 2.65 percent (3315 quintals), Chandi 2.32 percent (2907 quintals). The remaining periodic markets constitute less than 2 percent of the total marketed surplus of wheat in the district (Tables- 4.8 and 4.9).

4.2.4 Marketed Surplus of Maize in the Sampled Markets

Among the food grains, maize constitutes 2.10 percent (15697.5 quintals) of the total marketed surplus of agricultural commodities in the sampled market centers of the district. Two regulated markets, Hilsa and Biharsharif, constitutes about 80 percent of marketed surplus of maize among the sampled district markets. While among the periodic markets Harnaut contributes 4.61 percent (724.2 quintals), Giriyak 2.49 percent (391 quintals) and remaining markets contribute less than 2 percent of marketed surplus (Tables- 4.8 and 4.9).

Table-4.9

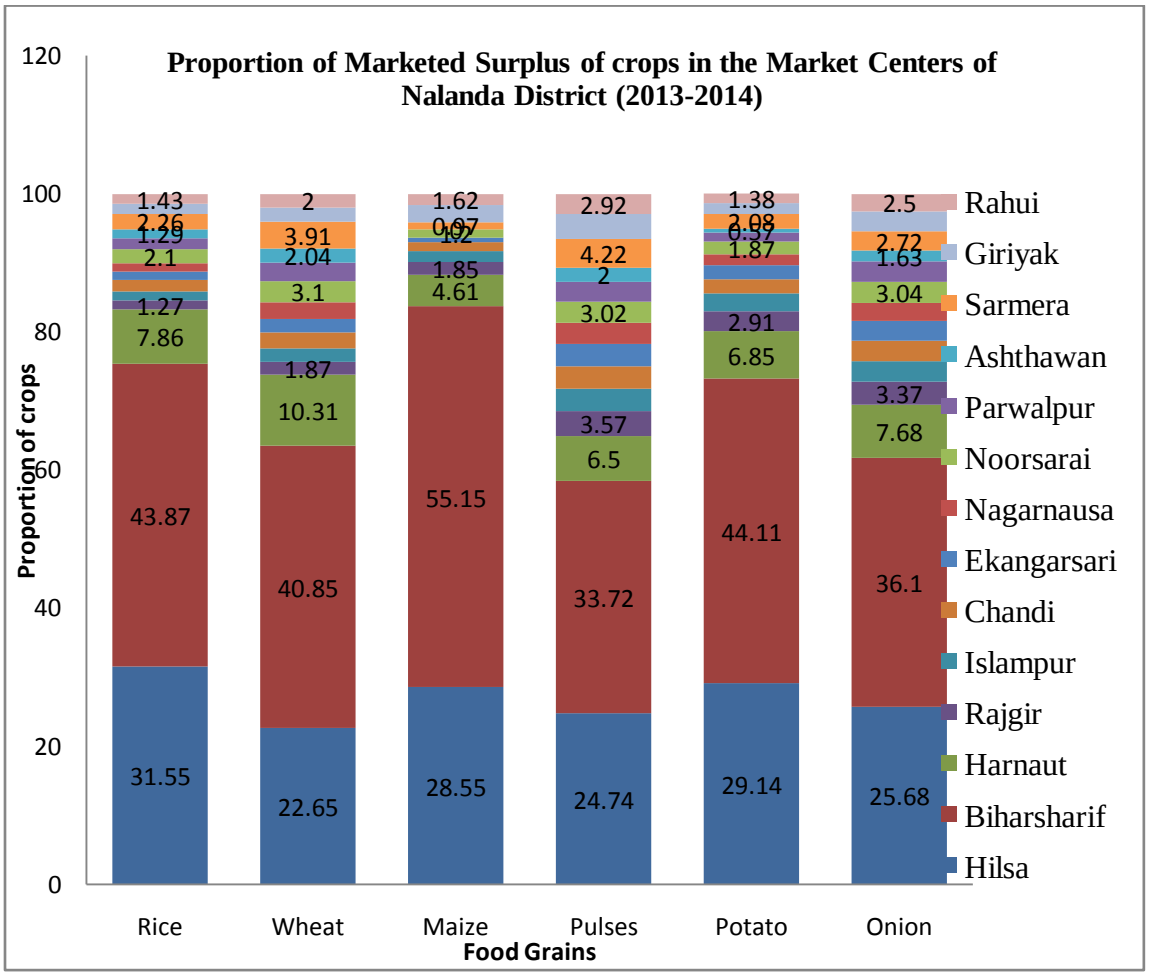
Proportion of Individual Crop of in the District's Marketed Surplus in the Sampled Market Centers of Nalanda District (2013-2014)

SN	Sampled Markets	Food grains			Pulses	Vegetables		District Average
		Rice	Wheat	Maize		Potato	Onion	
Regulated Markets								
1	**Hilsa**	31.55	22.65	28.55	24.74	29.14	25.68	**28.04**
2	**Biharsharif**	43.87	40.85	55.15	33.72	44.11	36.1	**42.36**
Periodic Markets								
1	**Harnaut**	7.86	10.31	4.61	6.5	6.85	7.68	**8.23**
2	**Rajgir**	1.27	1.87	1.85	3.57	2.91	3.37	**1.9**
3	**Islampur**	1.36	1.96	1.56	3.25	2.59	2.93	**1.87**
4	**Chandi**	1.64	2.32	1.27	3.25	2.08	2.93	**2.04**

5	**Ekangarsari**	1.16	1.91	0.71	3.22	1.97	2.93	**1.67**
6	**Nagarnausa**	1.22	2.4	0	3.09	1.56	2.61	**1.73**
7	**Noorsarai**	2.1	3.1	1.2	3.02	1.87	3.04	**2.43**
8	**Parwalpur**	1.55	2.65	0	2.92	1.35	2.93	**1.95**
9	**Ashthawan**	1.29	2.04	0	2	0.57	1.63	**1.43**
10	**Sarmera**	2.26	3.91	0.97	4.22	2.08	2.72	**2.75**
11	**Giriyak**	1.43	2.04	2.49	3.57	1.56	2.93	**1.86**
12	**Rahui**	1.43	2	1.62	2.92	1.38	2.5	**1.74**

Source: Field Survey

Figure 4.1 Proportion of Marketed Surplus of crops in the Market Centers of Nalanda District (2013-2014)



Source: Field Survey

4.2.5 Marketed Surplus of Pulses in the Sampled Markets

Among the pulses gram, masoor and Khesari are grown abundantly in different parts of the district. There is great regional variation in the marketed surplus of pulses. Hilsa and Biharsharif regulated markets contribute 24.74 percent (3884 quintals) and 33.72 percent (5293 quintals) of the total marketed surplus of pulses respectively.

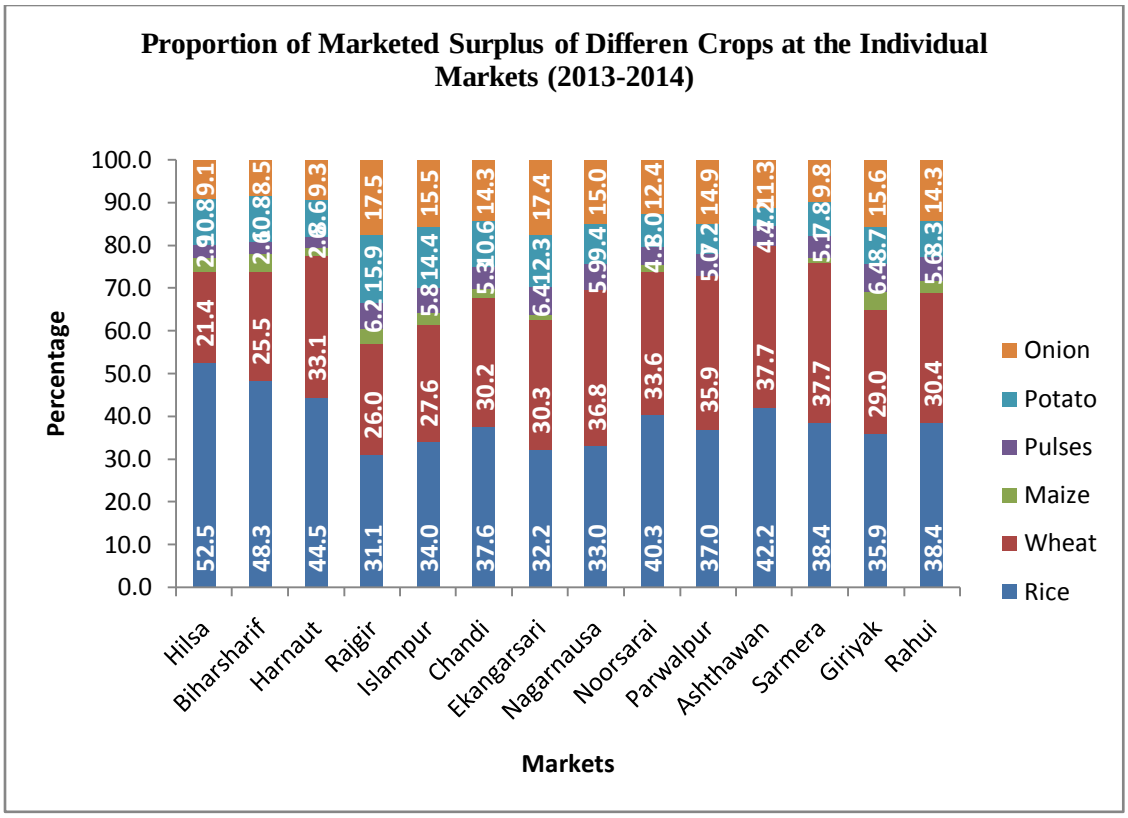
Table 4.10

Proportion of Marketed Surplus of Different Crops at the Individual Market (2013-2014)

SN	Sampled Markets	Food grains			Pulses	Vegetables	
		Rice	Wheat	Maize		Potato	Onion
Regulated Markets							
1	**Hilsa**	52.47	21.37	3.38	2.93	10.79	9.08
2	**Biharsharif**	48.28	25.51	4.32	2.64	10.81	8.45
Periodic Markets							
1	**Harnaut**	44.51	33.12	1.86	2.62	8.64	9.25
2	**Rajgir**	31.13	26.03	3.23	6.23	15.85	17.54
3	**Islampur**	33.95	27.62	2.76	5.75	14.38	15.54
4	**Chandi**	37.59	30.17	2.06	5.29	10.59	14.29
5	**Ekangarsari**	32.24	30.3	1.42	6.38	12.25	17.41
6	**Nagarnausa**	33.02	36.76	0	5.92	9.35	14.95
7	**Noorsarai**	40.27	33.63	1.64	4.12	7.96	12.39
8	**Parwalpur**	37.02	35.91	0	4.97	7.18	14.92
9	**Ashthawan**	42.21	37.69	0	4.65	4.15	11.31
10	**Sarmera**	38.43	37.65	1.18	5.1	7.84	9.8
11	**Giriyak**	35.91	28.96	4.44	6.37	8.69	15.64
12	**Rahui**	38.43	30.37	3.1	5.58	8.26	14.26
	Average	**38.96**	**31.08**	**2.1**	**4.9**	**9.77**	**13.2**

Source: Field Survey 2013-2014

Figure 4.2 Proportion of Marketed Surplus of Different Crops at the Individual Markets (2013-2014)



Source: Field Survey 2013-2014

Among the periodic markets, Harnaut shares 6.50 percent (1020 quintals), Sarmera 4.22 percent (663 quintals), Rajgir and Giriyak 3.57 percent (561 quintals) each, while Islampur and Chandi's share is 3.25 percent (510 quintals) of total marketed surplus of pulses in the different sampled markets of the district. The remaining periodic market centers contribute less than 3 percent marketed surplus of pulses in the sampled periodic market centers (Tables- 4.8 and 4.9).

4.2.6 Marketed Surplus of Potato and Onion in the Sampled Markets

The share of vegetables, i.e. potato and onion in the marketed surplus of agro-commodities also varies among the sampled markets. Biharsharif and Hilsa constitute 44.11 percent (21676 quintals), 29.14 percent (14319 quintals) and 36.10 percent (16938 quintals), 25.68 percent (12047 quintals) of marketed surplus of potato and

onion in sampled regulated markets of the district. While among the periodic markets, Harnaut constitutes the largest share of 6.85 percent (3366 quintals) and 7.68 percent (3604 quintals) respectively of potato and onion marketed surplus (Tables- 4.8 and 4.9). The remaining markets contribute 5 percent of marketed surplus in all sampled markets of the district during 2013-2014.

The spatial pattern of marketed surplus of selected crops in sampled markets shows that rice accounts for highest share of 38.96 percent of total marketed surplus of various agricultural products. Wheat follows it with 31.08 percent, potato 9.77 percent, onion 13.20 percent, maize, and pulses 2.10 percent and 4.80 percent respectively. The variation in marketed surplus of different crops in the district is due to variation in demand and supply of these commodities in the region (TabIe-4.10). Similarly, the different types of marketing agencies dealing with agricultural commodities also show variation in their marketed surplus. Regulated and urban periodic markets have the highest proportion of marketed surplus in the area. The analysis shows that the market centers which are well connected with roads and railways have a higher proportion of marketed surplus. Moreover, spatially the market centers which are located in the eastern and northern parts of Nalanda district have higher marketed surplus of the agricultural commodities than that of the market centers located on the western side of the district.

It is because of well connectivity of eastern and northern parts as well as higher productivity in these regions. On the other hand, lower marketed surplus in the western part of the district is due to lower productivity of crops caused by the flood from Muhane River as well as lesser spatial connectivity among the markets. This supports the hypothesis that better spatial integration of market centers at different levels of marketing channels due to efficient transportation and other infrastructural facilities reduces spatial unevenness of marketed surplus.

4.3 Seasonal Arrival Patterns of Agricultural Commodities

The market arrival of an agricultural commodity is that quantity which is brought into the market by the producer-sellers, itinerant dealers, village merchant, Katcha arhatiyas, etc., for sale purpose. In this section, an attempt has been made to examine the market arrivals of selected agricultural commodities in Nalanda district. (Table-4.11)

Table 4.11
Seasonal Variations in Arrival of Major Crops in the Nalanda District (2013-2014)

SN	Commodities	Post- Harvest Period	Intermediate Period	Pre-harvest Period
1	**Rice**	52.74	29.74	17.52
2	**Wheat**	51.88	26.37	21.75
3	**Maize**	48.27	30.12	21.61
4	**Pulses**	43.97	31.69	24.33
5	**Potato**	57.42	28.46	14.11
6	**Onion**	55.47	30.02	14.51
Average		**51.62**	**29.4**	**18.98**

Source: Field Survey 2013-2014 (Unit in Percent)

4.3.1 Seasonal Arrival Pattern of Rice

There are well marked seasonal trends in the arrivals of various agricultural products brought in to the different regulated and periodic market centers. The arrival of agricultural products at different markets is not evenly distributed over all the year round. It is because the production patterns of most commodities have a seasonal character'. However, according to the nature of the market, whether regulated or periodic, market arrival varies spatially and temporally. Hilsa and Biharsharif regulated markets have received 47.01 percent (32737 quintals) and 50.04 percent (48452 quintals) of the total market arrival of rice in the first four busiest months i.e. post-harvest season as shown in Table-4.12. Out of 14 periodic market centers, 12 periodic markets have received more than 50 percent of market arrival in the

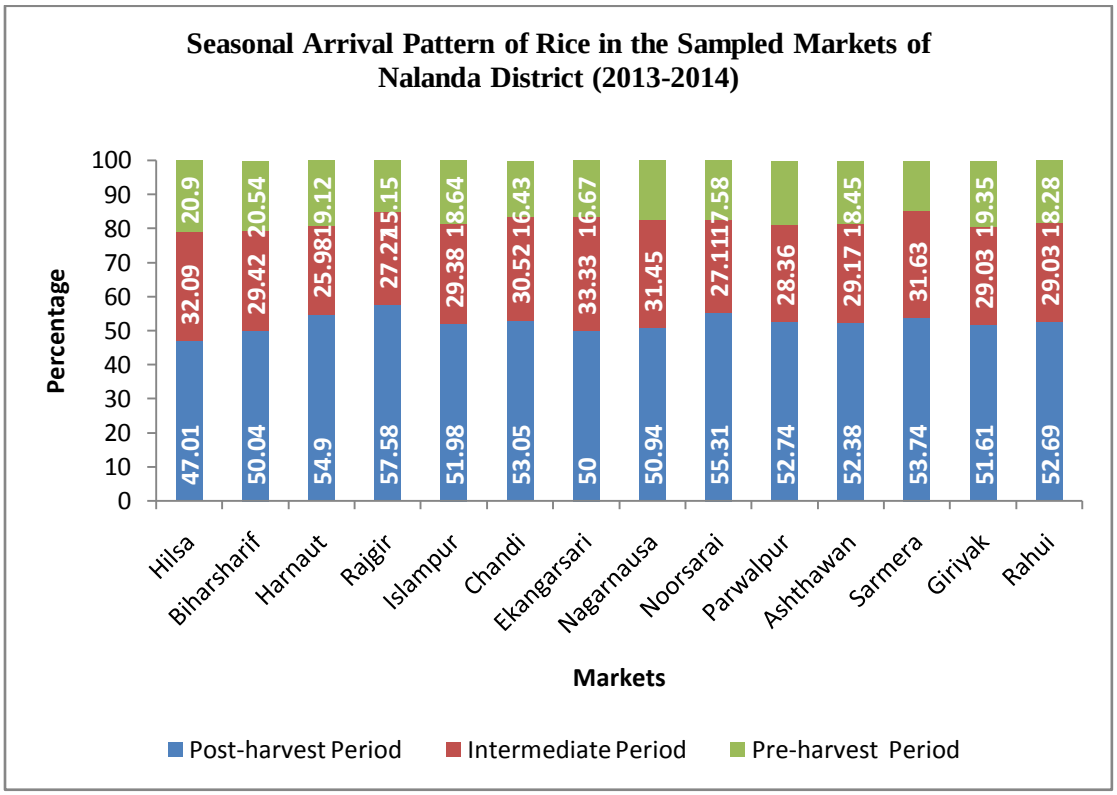
postharvest period. It ranges between minimum 47 percent in Hilsa to maximum 57.58 percent in Rajgir periodic markets.

Table 4.12
Seasonal Arrival Pattern of Rice in the Sampled Markets of Nalanda District (2013-2014)

SN	Sampled Markets	Post-harvest Period		Intermediate Period		Pre-harvest	
Regulated Markets		**Weight**	**Percent**	**Weight**	**Percent**	**Weight**	**Percent**
1	**Hilsa**	32737	47.01	22345	32.09	14553	20.9
2	**Biharsharif**	48452	50.04	28482	29.42	19887	20.54
Periodic Markets							
1	**Harnaut**	9520	54.9	4505	25.98	3315	19.12
2	**Rajgir**	1615	57.58	765	27.27	425	15.15
3	**Islampur**	1564	51.98	884	29.38	561	18.64
4	**Chandi**	1921	53.05	1105	30.52	595	16.43
5	**Ekangarsari**	1275	50	850	33.33	425	16.67
6	**Nagarnausa**	1377	50.94	850	31.45	476	17.61
7	**Noorsarai**	2567	55.31	1258	27.11	816	17.58
8	**Parwalpur**	1802	52.74	969	28.36	646	18.91
9	**Ashthawan**	1496	52.38	833	29.17	527	18.45
10	**Sarmera**	2686	53.74	1581	31.63	731	14.63
11	**Giriyak**	1632	51.61	918	29.03	612	19.35
12	**Rahui**	1666	52.69	918	29.03	578	18.28
	Total	**110310**	**49.98**	**66263**	**30.02**	**44147**	**20**

Source: Field Survey (Weight in Quintals)

Figure 4.3 Seasonal Arrival Pattern of Rice in the Sampled Markets of Nalanda District (2013-2014)



Source: Field Survey

During intermediate period average market arrival of rice is found 30.02 percent (66263 quintals) for the whole district. But it varies market-wise from the minimum arrival of 25.98 percent in Harnaut to the maximum arrival of 31.63 percent in Sarmera. Besides, Pre-harvest has received an average 20 percent (44147 quintals) of marketed surplus of rice, with minimum 14.63 percent in the Sarmerart periodic market to maximum 20.94 percent in Hilsa regulated market (Table - 4.12).

4.3.2 Seasonal Arrival Pattern of Wheat

The sampled markets have received maximum 50.9 percent (63738 quintals) of the market arrival of wheat in different sampled markets in the first four months of the year (April, May, June, and July). Though the arrival of wheat varies from market to market during the same period. During post-harvest period, Sarmera periodic market center has received maximum 52.78 percent (2584 quintals) of wheat, while minimum

arrival amounting 49.33 percent (1250 quintals) of the total surplus of wheat is being received in Giriyak. Remaining market centers lie between them. Similarly, during the intermediate period, the sampled markets of the district have received 28.43 percent (35600 quintals) of the total market arrival. In this period the arrival of wheat ranges between a maximum of 29.70 percent (15195 quintals) in Biharsharif to minimum 25.34 percent (884 quintals) in Sarmera. Moreover, during Pre-harvest district sampled markets received only 20.67 percent (25871 quintals) of the total marketed surplus of wheat ranging between a maximum of 23.39 percent (680 quintals) in Chandi to minimum 19.23 percent (9837 quintals) in Biharsharif (Table-4.13)

Table 4.13

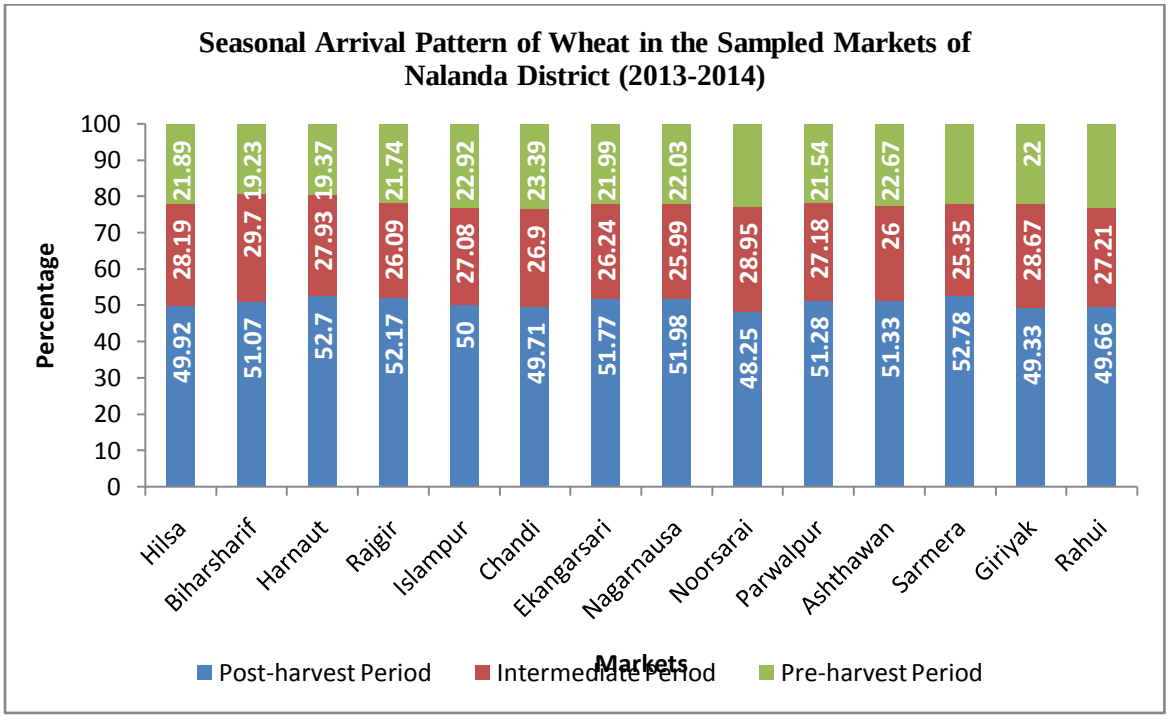
Seasonal Arrival Pattern of Wheat in the Sampled Markets of Nalanda District (2013-2014)

SN	Sampled Markets	Post-harvest Period		Intermediate Period		Pre-harvest	
Regulated Markets		**Weight**	**Percent**	**Weight**	**Percent**	**Weight**	**Percent**
1	**Hilsa**	14156	49.92	7995	28.19	6208	21.89
2	**Biharsharif**	26122	51.07	15195	29.70	9837	19.23
Periodic Markets							
1	**Harnaut**	6800	52.70	3604	27.93	2499	19.37
2	**Rajgir**	1224	52.17	612	26.09	510	21.74
3	**Islampur**	1224	50.00	663	27.08	561	22.92
4	**Chandi**	1445	49.71	782	26.90	680	23.39
5	**Ekangarsari**	1241	51.77	629	26.24	527	21.99
6	**Nagarnausa**	1564	51.98	782	25.99	663	22.03
7	**Noorsarai**	1870	48.25	1122	28.95	884	22.81
8	**Parwalpur**	1700	51.28	901	27.18	714	21.54
9	**Ashthawan**	1309	51.33	663	26.00	578	22.67
10	**Sarmera**	2584	52.78	1241	25.35	1071	21.88

11	**Giriyak**	1258	49.33	731	28.67	561	22.00
12	**Rahui**	1241	49.66	680	27.21	578	23.13
	Total	**63738**	**50.91**	**35600**	**28.43**	**25871**	**20.66**

Source: Field Survey (Weight in Quintals)

Figure 4.4 Seasonal Arrival Pattern of Wheat in the Sampled Markets of Nalanda District (2013-2014)



Source: Field Survey

4.3.3 Seasonal Arrival Pattern of Maize

Nearly half of the total annual arrival of maize is received during the first four busiest months after the crop harvest in the region. As much as 48.26 percent (7576.4 quintals) of the total arrival of maize is recorded during the post-harvest season. Whereas 21.61 percent (3392.6 quintals) of the total arrival is found to be during Pre-harvest and 30.12 percent (4728.5 quintals) during the middle period.

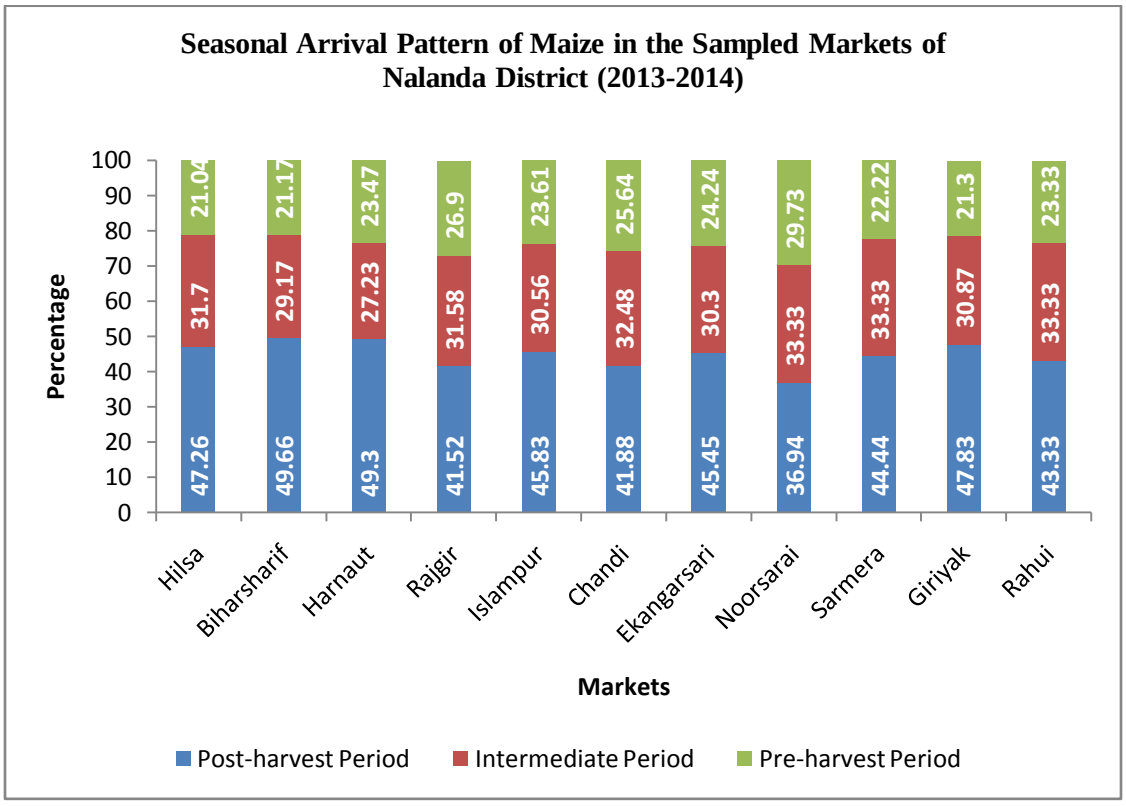
Table 4.14
Seasonal Arrival Pattern of Maize in the Sampled Markets of Nalanda District (2013-2014)

SN	Sampled Markets	Post-harvest Period		Intermediate Period		Pre-harvest	
Regulated Markets		**Weight**	**Percent**	**Weight**	**Percent**	**Weight**	**Percent**
1	**Hilsa**	2118	47.26	1421	31.70	943	21.04
2	**Biharsharif**	4299	49.66	2525.5	29.17	1832.5	21.17
Periodic Markets							
1	**Harnaut**	357	49.30	197.2	27.23	170	23.47
2	**Rajgir**	120.7	41.52	91.8	31.58	78.2	26.90
3	**Islampur**	112.2	45.83	74.8	30.56	57.8	23.61
4	**Chandi**	83.3	41.88	64.6	32.48	51	25.64
5	**Ekangarsari**	51	45.45	34	30.30	27.2	24.24
6	**Nagarnausa**	-	-	-	-		-
7	**Noorsarai**	69.7	36.94	62.9	33.33	56.1	29.73
8	**Parwalpur**	-	-	-	-	-	-
9	**Ashthawan**	-	-	-	-	-	-
10	**Sarmera**	68	44.44	51	33.33	34	22.22
11	**Giriyak**	187	47.83	120.7	30.87	83.3	21.30
12	**Rahui**	110.5	43.33	85	33.33	59.5	23.33
	Total	**7576.4**	**48.27**	**4728.5**	**30.12**	**3392.6**	**21.61**

Source: Field Survey (Weight in Quintals)

During post-harvest period a maximum 49.65 percent (4299 quintals) of the market arrival is recorded in Biharsharif and minimum 36.94 percent (697 quintals) in Noorsari. Similarly, during intermediate period maximum arrival of 33.33 percent (85 quintals) is found in Rahui and the minimum market arrival of 27.23 percent (197.2 quintals) in Harnaut. (Table-4.14)

Figure 4.5 Seasonal Arrival Pattern of Maize in the Sampled Markets of Nalanda District (2013-2014)



Source: Field Survey

TabIe-4.15

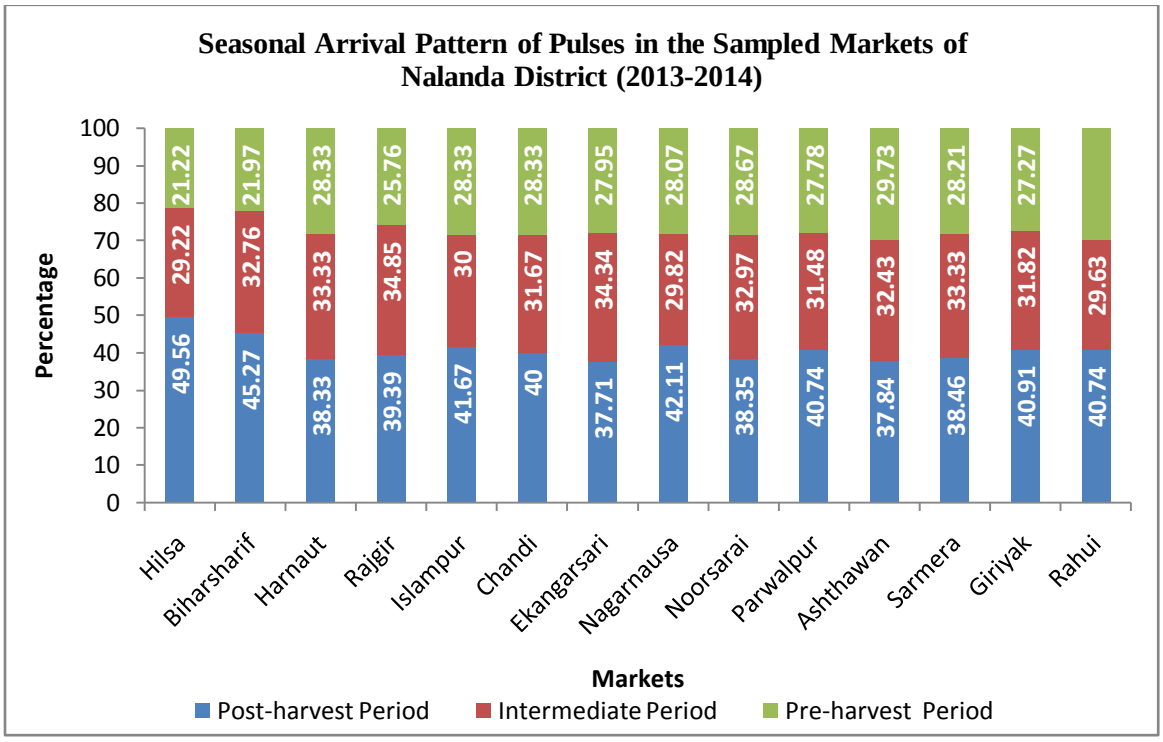
Seasonal Arrival Pattern of Pulses in the Sampled Markets of Nalanda District (2013-2014)

SN	Sampled Markets	Post-harvest Period		Intermediate Period		Pre-harvest	
Regulated Markets		Weight	Percent	Weight	Percent	Weight	Percent
1	Hilsa	1925	49.56	1135	29.22	824	21.22
2	Biharsharif	2396	45.27	1734	32.76	1163	21.97
Periodic Markets							
1	Harnaut	391	38.33	340	33.33	289	28.33

2	**Rajgir**	221	39.39	195.5	34.85	144.5	25.76
3	**Islampur**	212.5	41.67	153	30.00	144.5	28.33
4	**Chandi**	204	40.00	161.5	31.67	144.5	28.33
5	**Ekangarsari**	190.4	37.71	173.4	34.34	141.1	27.95
6	**Nagarnausa**	204	42.11	144.5	29.82	136	28.07
7	**Noorsarai**	181.9	38.35	156.4	32.97	136	28.67
8	**Parwalpur**	187	40.74	144.5	31.48	127.5	27.78
9	**Ashthawan**	119	37.84	102	32.43	93.5	29.73
10	**Sarmera**	255	38.46	221	33.33	187	28.21
11	**Giriyak**	229.5	40.91	178.5	31.82	153	27.27
12	**Rahui**	187	40.74	136	29.63	136	29.63
	Total	**6903.3**	**43.98**	**4975.3**	**31.69**	**3819.6**	**24.33**

Source: Field Survey (Weight in Quintals)

Figure 4.6 Seasonal Arrival Pattern of Pulses in the Sampled Markets of Nalanda District (2013-2014)



Source: Field Survey

However, during Pre-harvest share of market arrival varies between a maximum 29.73 percent (5611 quintals) in Noorsari to 21.03 and 21.30 percent of the total arrival of maize in Hilsa and Giriyak. Remaining market centers lie between them (Table- 4.14).

4.3.4 Seasonal Arrival Pattern of Pulses

The sampled markets have received 43.97 percent of total (6903 quintals) market arrival of pulses during post-harvest period, 31.69 percent (4975.3 quintals) during the intermediate period and 24.33 percent (3819 quintals) during Pre-harvest. Its arrival varies from market to market during these three identified periods. It is found that during post-harvest period maximum market arrival i.e. 49.56 percent (1925 quintals) is received in Hilsa regulated market while the minimum arrival of 37.71 percent (190.4 quintals) is found in Ekangarsari. During intermediate period maximum, 34.84 percent (195.5 quintals) of the marketed surplus of pulses is received in Rajgiri, while minimum 29.22 percent (1135 quintals) of marketed surplus of pulses is received in Hilsa. Besides, during Pre-harvest a maximum 29.74 percent (141.1 quintals) of the marketed surplus of pulses in Ekangarsari and minimum 21.21 percent (824 quintals) are being received in Hilsa periodic market (Table-4.15).

4.3.5 Seasonal Arrival Pattern of Potato

The sampled markets received 57.42 percent (28220 quintals) of total marketed surplus of potato during post-harvest period, 28.46 percent (13988.7 quintals) during intermediate period, while 14.11 percent (6935 quintals) during Pre-harvest. It is found that during post-harvest period maximum 59.16 percent (12825 quintals) of the market arrival of potato is recorded in Biharsharif and minimum of 54.54 percent (153 quintals) in Ashthawan. Similarly, during intermediate period maximum, 31.11 percent (238 quintals) of market arrival is recorded in Giriak, and minimum 26.67 percent (272 quintals) of potato is reported in Sarmera.

Table-4.16

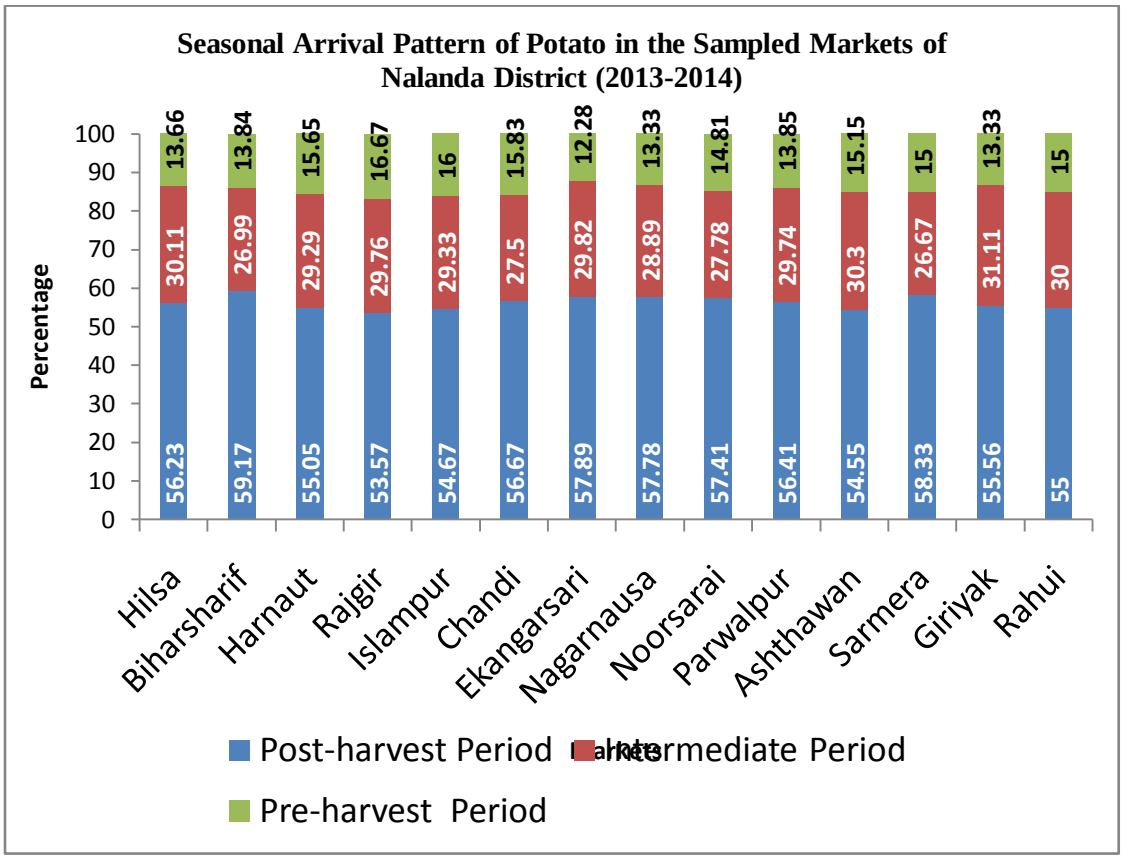
Seasonal Arrival Pattern of Potato in the Sampled Markets of Nalanda District (2013-2014)

SN	Sampled Markets	Post-harvest Period		Intermediate Period		Pre-harvest	
Regulated Markets		**Weight**	**Percent**	**Weight**	**Percent**	**Weight**	**Percent**
1	**Hilsa**	8051	56.23	4312	30.11	1956	13.66
2	**Biharsharif**	12825	59.17	5850	26.99	3001	13.84
Periodic Markets							
1	**Harnaut**	1853	55.05	986	29.29	527	15.65
2	**Rajgir**	765	53.57	425	29.76	238	16.67
3	**Islampur**	697	54.67	374	29.33	204	16.00
4	**Chandi**	578	56.67	280.5	27.50	161.5	15.83
5	**Ekangarsari**	561	57.89	289	29.82	119	12.28
6	**Nagarnausa**	442	57.78	221	28.89	102	13.33
7	**Noorsarai**	527	57.41	255	27.78	136	14.81
8	**Parwalpur**	374	56.41	197.2	29.74	91.8	13.85
9	**Ashthawan**	153	54.55	85	30.30	42.5	15.15
10	**Sarmera**	595	58.33	272	26.67	153	15.00
11	**Giriyak**	425	55.56	238	31.11	102	13.33
12	**Rahui**	374	55.00	204	30.00	102	15.00
	Total	**28220**	**57.42**	**13988.7**	**28.46**	**6935.8**	**14.11**

Source: Field Survey (Weight in Quintals)

Besides, during Pre-harvest maximum arrival of 16.67 percent (238 quintals) in Rajgir to minimum 12.28 percent (119 quintals) of marketed surplus of potato is received in Ekangarsari, periodic market. (Table-4.16).

Figure 4.7 Seasonal Arrival Pattern of Potato in the Sampled Markets of Nalanda District (2013-2014)



Source: Field Survey

TabIe-4.17

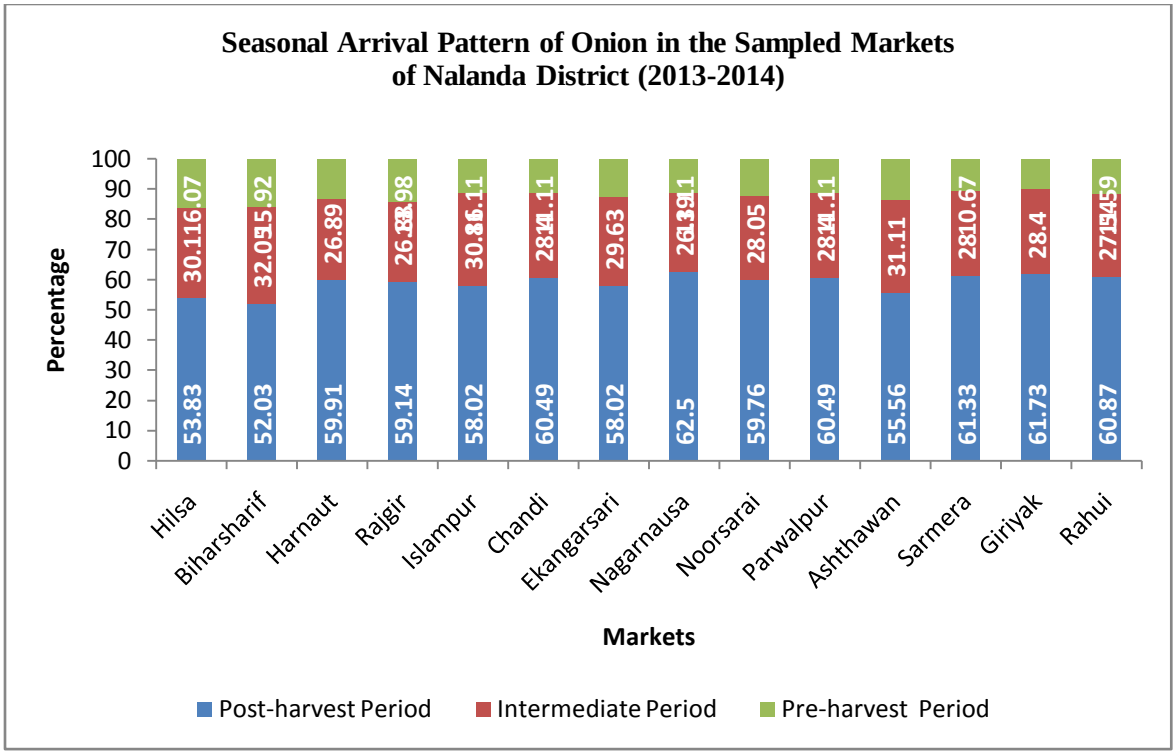
Seasonal Arrival Pattern of Onion in the Sampled Markets of Nalanda District (2013-2014)

SN	Sampled Markets	Post-harvest Period		Intermediate Period		Pre-harvest	
Regulated Markets		**Weight**	**Percent**	**Weight**	**Percent**	**Weight**	**Percent**
1	**Hilsa**	6485	53.83	3626	30.10	1936	16.07
2	**Biharsharif**	8813	52.03	5429	32.05	2696	15.92
Periodic Markets							
1	**Harnaut**	2159	59.91	969	26.89	476	13.21

2	**Rajgir**	935	59.14	425	26.88	221	13.98
3	**Islampur**	799	58.02	425	30.86	153	11.11
4	**Chandi**	833	60.49	391	28.40	153	11.11
5	**Ekangarsari**	799	58.02	408	29.63	170	12.35
6	**Nagarnausa**	765	62.50	323	26.39	136	11.11
7	**Noorsarai**	833	59.76	391	28.05	170	12.20
8	**Parwalpur**	833	60.49	391	28.40	153	11.11
9	**Ashthawan**	425	55.56	238	31.11	102	13.33
10	**Sarmera**	782	61.33	357	28.00	136	10.67
11	**Giriyak**	850	61.73	391	28.40	136	9.88
12	**Rahui**	714	60.87	323	27.54	136	11.59
	Total	**26025**	**55.47**	**14087**	**30.02**	**6808**	**14.51**

Source: Field Survey (Weight in Quintals)

Figure 4.8 Seasonal Arrival Pattern of Onion in the Sampled Markets of Nalanda District (2013-2014)



Source: Field Survey

4.3.6 Seasonal Arrival Pattern of Onion

Seasonal arrival pattern of onion is different than that of food grains due to being a commercial crop. It is market arrival at maximum in the post-harvest period. More than 55 percent (26025 quintals) of market arrival has been recorded during first four busiest months. 30.02 percent (14087 quintals) of its market arrival is received during intermediate. The seasonal pattern of market arrival varies from market to market. During the post-harvest period, the maximum arrival of 62.5 percent (765 quintals) is found in Nagarnausa, and minimum 52.03 percent (8813 quintals) is received in Biharsharif regulated market. During intermediate period maximum arrival of 31.11 percent (238 quintals) is received in Ashthawan and the minimum arrival of 26.58 percent (323 quintals) in Nagarnausa market centers. Moreover, during Pre-harvest, maximum arrival of 16.07 percent (1936 quintals) is received in Hilsa regulated market while minimum arrival of 9.87 percent (136 quintals) is received in Giriyak market (Table-4.17)

CHAPTER-5

SPATIO-TEMPORAL PATTERNS OF PRICE STRUCTURE AND MARKETING COSTS IN NALANDA DISTRICT

CHAPTER-5

SPATIO-TEMPORAL PATTERNS OF PRICE STRUCTURE AND MARKETING COSTS IN NALANDA DISTRICT

5.1 Introduction

There are several factors which determine the price of an agro commodity in a given market. Some very important factors are demand and supply of the commodity, traders travel costs, market charges, the durability of commodity and storage facilities, etc. Among the above-said factors, market arrivals of the commodities play an important role in determining the price of agro-commodities as they represent the supply-side. The market arrivals of different agricultural commodities are high during the immediate post-harvest period. The main reason behind it is the low storage/holding capacity due to lack of the infrastructure and distress sale by the farmers. This abnormal arrival causes lowering of the price of the commodity to a considerable extent in the markets. Further, the price of a commodity is found directly proportional to the size of land holding and storing capacity of the growers during glut period.

In this chapter, an effort has been made to understand the price structure of the selected commodities and its variation at different points of time in an agricultural year in the sampled markets and villages i.e. its spatiotemporal variations. Data for the agricultural year 2013-2014 have been collected with the help of structured schedules from the sampled markets. The schedules contain information about the commodities which are handled and transacted on the market day. The selected variables are related to (a) commodities-wise arrival (b) wholesale purchase price (c) wholesale sale price, and (d) retail price. The arrival of each selected crop has been studied concerning three distinct periods i.e. (a) post-harvest period (b) intermediate period and (c) Pre-harvest in an agricultural year. Post-harvest refers to the immediate period after harvesting of a particular crop. The lean or pre-harvest indicates the immediate period before the harvest, while mid-period between these two pre and post-harvest periods is described as the intermediate period in the present study.

5.2 Cropping Seasons

Two well-defined cropping seasons exist throughout the district as in the case of the whole state. The autumn or Kharif crops are sown at the beginning of rainy season, i.e. June-July and are harvested in autumn (i.e. between October and November). A major portion of the annual production of rice and maize is grown in the Kharif season. The Rabi or spring crops are sown in autumn and harvested at the end of cold weather. Wheat, pulses, potato, and onion are the Rabi crops. However, the introduction of new technology in agriculture in Bihar has popularized the Garma and Bhadai crops. Following these two seasons, the agriculture year is now divided into four recognized agricultural seasons in the state for all kinds of crop. These are (a) Aghani (b) Bhadai (c) Rabi and (d) Garma. Orchard crops are included in the Garma season after the name of the same season.

In the case of rice, normal harvest time is October to November. But the product comes to the market after a month or two and as such post-harvest effects are felt from December to March. In the case of wheat, the post-harvest period continues from the month of April to July. In the case of maize, there are two growing periods, July to September and October to December. But in the study area, the major portion of maize is grown during October to December or in Kharif season.

5.3 Price Structure of the Agricultural Commodities

During different periods of the agricultural year, the price structure of six important crops namely rice, wheat, maize, pulses, potato and onion including both wholesale purchase price and wholesale sale price has been taken into consideration in the present study. The retail price, however, has been taken into account only while discussing the different components of price spread in the marketing channels such as producer's share, margins of intermediaries and the marketing costs, etc.

5.3.1 Wholesale Purchase and Wholesale Sale Prices

The wholesale purchase price refers to that price which the wholesalers/commission agents pay to the producer-sellers and other selling agencies. Since this is the price that mainly producer-sellers receive after selling their produce; this price is also

treated as harvest price or farm price. Data on farm level price are relatively scanty and generally of poor quality. That is why all purchase price data used in this study represent harvest price and are collected from the sampled markets.

Whereas wholesale sale price is that price which the wholesale traders/commission agents get for the sold commodities from their counterparts in the terminal markets. It also refers to that price which the retailers pay to the wholesalers/commission agents in the market. It, thus, expresses the relationship between two groups of traders; wholesalers/commission agents on the one hand and the retailers on the other.

5.3.2 Wholesale Purchase and Wholesale Sale Prices of Rice

Rice is harvested in October, but the product comes in the market after one or two months and so the post-harvest transaction season of this crop starts from December and continues until April. Therefore, the post-harvest period has been identified from December to April. The analysis of wholesale purchase price of rice during the post-harvest period as evident from Table-5.1 reveals that the lowest price of rice is found in all the markets during this period. The average wholesale purchase price of rice for the district as a whole has been recorded as Rs 1432.14 per quintal during post-harvest period. But it shows great spatial variation from market to market. Among the surveyed markets, the regulated markets have offered highest price. The rate of the wholesale purchase price in both the regulated markets is found to be Rs 1500 per quintal. The wholesale purchase price of rice varies between Rs 1400 and Rs 1500 per quintal among all the periodic markets.

Asthawan and Noorsarai markets have recorded a purchase price of Rs 1450 per quintals, whereas Harnaut and Islampur periodic markets have commanded a purchase price of Rs 1440 per quintal. These markets have recorded the purchase price of rice more than that of the district average.

Similarly, the average wholesale sale price of rice is found Rs 1673.57 per quintal. The Table 5.1 shows that maximum wholesale sale price is recorded in the regulated markets of Biharsharif and Hilsa, being Rs 1725 per quintal, followed by Ashtawan and Noorsarai markets recording Rs 830 per quintal. Study finds that Parbalpur and

Giriak periodic markets have recorded the sale price of rice at Rs 1650 per quintal. Chandi, Islampur, Ekangarsari have recorded Rs 1660 per quintal. Sarmera, Rajgir, and Rahui have a sale price of rice at Rs 1670 per quintal. These all periodic markets have recorded a wholesale sale price below the district average. While remaining markets have recorded the sale price of rice above the district average.

TABLE 5.1

Seasonal Pattern of Price of Rice in Nalanda District (2013-2014)

S.N	Sampled Markets	Wholesale Purchase Price			Wholesale sale Price		
		Post-harvest period	Intermediate Period	Pre-harvest	Post-harvest period	Intermediate Period	Pre-harvest
Regulated Markets							
1	Biharsharif	1500	1900	2100	1725	2185	2415
2	Hilsa	1500	1900	2080	1725	2185	2415
Periodic Markets							
1	Ashthawan	1450	1850	2040	1700	2150	2400
2	Harnaut	1440	1850	2040	1690	2150	2390
3	Sarmera	1410	1825	2010	1670	2120	2380
4	Noorsarai	1450	1850	2040	1700	2150	2400
5	Rahui	1410	1825	2010	1670	2120	2360
6	Rajgir	1410	1820	2010	1670	2120	2360
7	Giriyak	1400	1800	2000	1650	2100	2350
8	Chandi	1400	1800	2010	1660	2090	2350
9	Nagarnausa	1400	1800	2010	1600	2080	2340
10	Ekangarsari	1420	1825	2015	1660	2090	2340
11	Parbalpur	1420	1815	2015	1650	2090	2340
12	Islampur	1440	1825	2025	1660	2130	2375
District Average		**1432.14**	**1834.64**	**2028.93**	**1673.57**	**2125.71**	**2372.50**

Source: Field Survey 2013-2014 (unit in Rupees per Quintal)

The intermediate period starts from May and lasts until August. During this period, the average wholesale purchase price of rice has been recorded Rs 1834.64 per quintal with maximum Rs 1900 per quintal in Biharsharif and Hilsa regulated markets. It is followed by Asthawan, Harnaut and Noorsarai periodic markets at Rs 1850 per quintal. While the minimum wholesale purchase price of rice is being recorded in Giriak, Chandi and Nagarnausa Rs 1800 per quintal. So far the average wholesale sale price of rice during the intermediate period is concerned it is recorded Rs 2125.71 per quintal for the district. It varies from market to market ranging between maximum Rs 2185 per quintal in Biharsharif and Hilsa regulated markets to minimum Rs 2080 per quintal in Nagarnausa periodic market.

During Pre-harvest the wholesale purchase price and wholesale sale price of rice appear to be highest for the whole agricultural year as revealed by the survey. The district average of the purchase price is Rs 2028. It ranges between R5 2000 to Rs 2100 per quintal. In the regulated markets the purchase price is found higher than that of the periodic markets as in the case of other seasons discussed earlier. Biharsharif and Hilsa regulated markets have recorded Rs 2100 and 2080 per quintal sale price of rice respectively during 2013-2014. While the price among the periodic markets varies from Rs 2000 to Rs 2040. Asthawan, Harnaut, and Noorsarai periodic markets have recorded the purchase price more than the average district price. In the remaining periodic markets, the purchase price of rice is found to be lower than that of the district average.

Moreover, during the same period, the average wholesale sale price of rice is recorded Rs 2312.50 per quintal with a maximum wholesale sale price of Rs 2415 per quintal in Biharsharif and Hilsa regulated markets. The minimum wholesale sale price of rice has been recorded at Nagarnausa, Ekangarsari and Parbalpur periodic markets located on the northern side of the district.

5.3.3 Wholesale Purchase and Wholesale Sale Prices of Wheat

In the case of wheat, the post-harvest situation of high arrival and the consequent low price continues from April to July. During post-harvest period, the average wholesale purchase price of wheat has been recorded Rs 1406.79 per quintal in the year 2013-2014. Table 4.2 shows that maximum wholesale purchase price of wheat is recorded in Biharsharif regulated markets worth of Rs 1450 per quintal. Among the periodic markets highest wholesale purchase price is being recorded in Asthawan, Harnaut, Noorsarai and Rajgir periodic markets because the urban and semi-urban nature of these markets provides the largest number of consumers to the market hinterlands. While the minimum price of Rs 1380 per quintal has been found in Giriak and Nagarnausa periodic markets. Similarly, the average wholesale sale price of wheat is found to be Rs 1579.29 per quintal. Maximum wholesale sale price is being recorded in Biharsharif and Hilsa regulated markets at Rs 1620 per quintal. It is followed by Islampur recording as Rs 1590 per quintal as the sale price of wheat. The minimum wholesale sale price of wheat is recorded Rs 1560 per quintal in Giriak, Chandi and Nagarnausa periodic markets.

Intermediate period of wheat has been identified from August to November. During this period, the average wholesale purchase price of wheat recorded for the district as a whole is Rs 575.71 per quintal. Maximum wholesale purchase price during this period has been recorded in Biharsharif and Hilsa regulated markets as Rs 1600 per quintal. It is followed by Islampur markets at Rs 1590 per quintal. The minimum wholesale purchase price of Rs 1550 per quintal is recorded in Giriak and Chandi located in the extreme northern part of the district.

Similarly, during intermediate period average wholesale sale price for wheat is being recorded as Rs1722 per quintal. Maximum wholesale sale price being recorded in Biharsharif and Hilsa regulated markets is Rs 1750 per quintal. While minimum wholesale sale price of wheat has been recorded in Nagarnausa and Giriak as Rs 1700 per quintal.

TABLE 5.2

Seasonal Pattern of Price of Wheat in Nalanda District (2013-2014)

S.N	Sampled Markets	Wholesale Purchase Price			Wholesale sale Price		
		Post-harvest period	Intermediate Period	Pre-harvest	Post-harvest period	Intermediate Period	Pre-harvest
Regulated Markets							
1	Biharsharif	1450	1600	1800	1620	1750	1940
2	Hilsa	1440	1600	1800	1620	1750	1920
Periodic Markets							
1	Ashthawan	1415	1580	1800	1580	1720	1900
2	Harnaut	1410	1580	1790	1580	1720	1900
3	Sarmera	1400	1570	1780	1570	1770	1890
4	Noorsarai	1410	1580	1790	1580	1720	1900
5	Rahui	1400	1580	1780	1570	1710	1890
6	Rajgir	1410	1570	1770	1570	1710	1890
7	Giriyak	1380	1550	1770	1560	1700	1880
8	Chandi	1390	1550	1770	1560	1710	1880
9	Nagarnausa	1380	1560	1760	1560	1700	1870
10	Ekangarsari	1390	1570	1750	1570	1710	1880
11	Parbalpur	1400	1580	1760	1580	1720	1880
12	Islampur	1420	1590	1770	1590	1720	1880
District Average		**1406.79**	**1575.71**	**1777.86**	**1579.29**	**1722.14**	**1892.86**

Source: Field Survey 2013-2014 (unit in Rupees per Quintal)

Pre-harvest is identified from December to March for wheat marketing. During this period both wholesale sale and purchase prices increase sharply because of low market arrival. During Pre-harvest average wholesale purchase price of wheat for the district is recorded Rs 1777.86 per quintal. During this period, maximum wholesale purchase

price recorded in Biharsharf and Hilsa regulated markets and Asthawan periodic market is found to be Rs 1800 per quintal. It is followed by Noorsarai and Harnaut periodic markets at Rs 1790 per quintal. Minimum wholesale purchase price during Pre-harvest is recorded Rs 1750 per quintal at Ekangarsari. Moreover, the average wholesale sale price of wheat during Pre-harvest is found Rs 1892.86 per quintal. Among the sampled markets maximum wholesale sale price is being recorded Rs 1940 per quintal in Biharsharif regulated market, followed by Hilsa at Rs 1920 per quintal, Ashthawan and Harnaut have recorded Rs 1900 per quintal. The minimum wholesale sale price of wheat is recorded at Nagarnausa periodic market as Rs 1870 per quintal. (Table-5.2)

5.3.4 Wholesale Purchase and Wholesale Sale Prices of Maize

The crop Maize is the third important food grain crop after rice and wheat which is produced and marketed in the study area. A major portion of the maize is grown during the Kharif season, and the post-harvest effects are recorded from October to January. During post-harvest period average wholesale purchase price for the maize is found Rs 1239.29 per quintal. During this period, the difference between maximum purchase price and the minimum purchase price of maize does not exceed more than Rs 20 per quintal. Maximum wholesale purchase price Rs 1250 per quintal is recorded in Biharsharif and Hilsa regulated markets. Similarly, Ashthawan, Harnaut, and Nagarnausa periodic markets have recorded the same price i.e. Rs 1250 per quintal. Whereas minimum wholesale purchase price of maize is recorded at Noorsarai, Chandi, and Ekangersari at the rate of Rs 1230 per quintal. Similarly, the average wholesale sale price of maize during the post-harvest period is recorded Rs 1355.71 per quintal with a variation, maximum being Rs 1400 per quintal in Biharsharif regulated the market and minimum being recorded Rs 1340 per quintal at Noorsarai, Giriak, Chandi, and Ekangersari.

Spatially the difference of maximum and minimum wholesale sale price of maize does not exceed more than Rs 60 per quintal of maize during post-harvest period. Intermediate period of maize begins from February and ends in May. During this period, the average wholesale purchase price is recorded Rs 1343.57 with a maximum

of Rs 1350 per quintal in Biharshaif and Hilsa regulated markets. It is followed by few urban and semi urban periodic markets with the same price. The minimum wholesale purchase price of maize during the intermediate period is recorded at Ekangersari as Rs 1320 per quintal. Similarly, the average wholesale sale price of maize during the intermediate period is found Rs 1580 per quintal. Table-4.3 shows that during intermediate period wholesale sale price of maize has been recorded as Rs 1620 per quintal at Biharsharif and Hilsa regulated markets.

It is followed by Ashthawan, Harnaut, Noorsarai, Rahui, Chandi and Nagarnausa periodic markets, being urban and semi urban in nature. Moreover, the lowest wholesale sale price of maize during the intermediate period is recorded at Parbalpur at the rate of Rs 1550 per quintal.

TABLE 5.3

Seasonal Pattern of Price of Maize in Nalanda District (2013-2014)

S.N	Sampled Markets	Wholesale Purchase Price			Wholesale sale Price		
		Post-harvest period	Intermediate Period	Pre-harvest	Post-harvest period	Intermediate Period	Pre-harvest
Regulated Markets							
1	Biharsharif	1250	1350	1500	1400	1620	1750
2	Hilsa	1250	1350	1500	1390	1620	1750
Periodic Markets							
1	Ashthawan	1250	1350	1450	1360	1580	1720
2	Harnaut	1250	1350	1420	1360	1580	1720
3	Sarmera	1240	1340	1440	1350	1570	1700
4	Noorsarai	1230	1350	1450	1340	1580	1720
5	Rahui	1240	1340	1440	1350	1580	1720
6	Rajgir	1240	1330	1430	1350	1570	1710

7	Giriyak	1240	1340	1450	1340	1570	1710
8	Chandi	1230	1340	1430	1340	1580	1720
9	Nagarnausa	1250	1350	1440	1350	1580	1730
10	Ekangarsari	1230	1320	1430	1340	1570	1710
11	Parbalpur	1240	1350	1450	1350	1550	1700
12	Islampur	1240	1350	1450	1360	1570	1730
District Average		**1241.43**	**1343.57**	**1448.57**	**1355.71**	**1580.00**	**1720.71**

Source: Field Survey 2013-2014 (unit in Rupees per Quintal)

Low arrival and the high price of maize have been recorded in lean or before harvest period. During this period average wholesale purchase price has been recorded as Rs 1448.57 per quintal in Nalanda district. Maximum wholesale purchase price recorded at Biharsharif and Hilsa. Regulated markets are Rs 1500 per quintal. It is followed by Asthawan, Noorsarai and Islampur periodic markets as Rs 1450 per quintal. Lowest wholesale purchase prices of maize recorded at Harnaut is Rs 1420 per quintal. In this period most of the periodic markets have recorded wholesale purchase price of maize below the district average. Similarly, the average wholesale sale price of maize during Pre-harvest is found Rs 1720.71 per quintal, with maximum sale prices being recorded at Biharsharif and Hilsa regulated markets as Rs 1750 per quintal. It is followed by Islampur and Nagarnausa markets as Rs 1730 per quintal. The minimum wholesale sale price of maize has been recorded at Sarmera and Parbalpur being Rs 1700 per quintal.

5.3.5 Wholesale Purchase and Wholesale Sale Prices of Pulses

Pulses which include Gram, Arhar, Khesari, and Masoor are Rabi crops. These pulses are sown in autumn and harvested at the end of cold weather. Arhar wholesale purchase price of pulses for the district during post- harvest period is recorded Rs 1769.13 per quintal. It varies spatially from market to market. Maximum purchase price of pulses is recorded at Biharsharif as Rs 5600 per quintal, followed by Hilsa regulated market as Rs 5500 per quintal. Maximum purchase price among the periodic markets is recorded at Islampur as Rs 5350 per quintal. And minimum wholesale purchase price as Rs 5210 per quintal is recorded in most of the markets located in the

eastern and northern part of the district. Similarly, the average wholesale sale price of pulses during the Post-harvest period is recorded Rs 5806.43 per quintal. Market-wise maximum wholesale sale price of pulses is recorded at Biharsharif and Hilsa regulated markets as Rs 6000 per quintal. Among the periodic markets maximum wholesale sale price of Rs 5800 per quintal is recorded in Asthawan, Harnaut, and Islampur. While minimum sale price of pulses is recorded at Chandi and Nagarnausa as Rs 5720 per quintal.

TABLE 5.4

Seasonal Pattern of Price of Pulses in Nalanda District (2013-2014)

S.N	Sampled Markets	Wholesale Purchase Price			Wholesale sale Price		
		Post-harvest period	Intermediate Period	Pre-harvest	Post-harvest period	Intermediate Period	Pre-harvest
Regulated Markets							
1	Biharsharif	5600	7500	8000	6000	8500	9000
2	Hilsa	5500	7500	8000	6000	8500	9000
Periodic Markets							
1	Ashthawan	5320	7350	7980	5800	8300	8900
2	Harnaut	5330	7300	7980	5800	8300	8900
3	Sarmera	5220	7250	7970	5750	8200	8880
4	Noorsarai	5320	7340	7950	5750	8270	8870
5	Rahui	5210	7340	7940	5740	8260	8840
6	Rajgir	5300	7320	7960	5760	8280	8860
7	Giriyak	5280	7240	7950	5780	8290	8880
8	Chandi	5320	7350	7970	5720	8300	8870
9	Nagarnausa	5300	7280	7950	5820	8450	8860
10	Ekangarsari	5340	7320	7960	5790	8350	8870

11	Parbalpur	5280	7280	7940	5780	8440	8860
12	Islampur	5350	7350	7980	5800	8450	8900
District Average		**5333.57**	**7337.14**	**7966.43**	**5806.43**	**8349.29**	**8892.14**

Source: Field Survey 2013-2014 (unit in Rupees per Quintal)

During intermediate period, the average wholesale purchase price of pulses is found Rs 7373.14 per quintal. Maximum purchase price is found Rs 7500 per quintal at Hilsa and Biharsharif regulated markets. As far as the periodic markets are concerned maximum purchase price of pulses is recorded at Asthawan, Harnaut and Islampur as Rs 7350 per quintal, while remaining periodic markets have recorded almost below the district average purchase price ranging between a maximum of Rs 7340 per quintal to a minimum of Rs 7280 per quintal. Similarly, the average wholesale sale price of pulses of the district is recorded Rs 8349.29 per quintal with maximum to minimum variation from Rs 8500 per quintal in Biharsharif and Hilsa regulated markets to Rs 8200 per quintal in Sarmera.

Moreover, during Pre-harvest average purchase price of pulses is found Rs 7966.43 per quintal for the district as a whole. Maximum purchase price of pulses is recorded Rs 8000 per quintal in Biharsharif and Hilsa regulated markets. Maximum purchase price during this period in periodic markets is recorded at Asthawan, Harnaut and Islampur as Rs 7980 per quintal. Whereas, remaining periodic markets have recorded below Rs 7970 per quintal. The average wholesale sale price of pulses during Pre-harvest is found Rs 8892.14 per quintal for the district as a whole. The maximum sale price of Rs 9000 per quintal is recorded at Biharsharif and Hilsa.

5.3.6 Wholesale Purchase and Wholesale Sale Prices of Potato

Potato is rabi crop, and one of the important crops grown and marketed in the district. Average purchase price of potato during the postharvest period is recorded Rs 1052.86 per quintal. Maximum purchase price of potato recorded at Hilsa regulated markets is Rs 1120 per quintal, followed by Biharsharif regulated market at Rs 1110 per quintal. Among periodic markets, the urban/semi urban periodic markets have fetched highest

purchase price of potato at Rs 1050 per quintal in Harnaut, Asthawan, Noorsarai, Rahui, and Islampur. These periodic markets have larger catchments area, attracting a larger number of sellers and purchasers. That is why in these markets wholesale purchase price is higher, while the price in the remaining periodic markets varies between a maximum of Rs 1040 per quintal to Rs 1030 per quintal. Similarly, the average wholesale sale price of potato during the post-harvest period is found Rs 1367.86 per quintal. Maximum sale price is recorded in Biharsharif and Hilsa regulated markets. Periodic markets like Asthawan, Harnaut and Rahui have recorded Rs 1375 per quintal. Remaining markets have recorded below district average ranging between Rs 1360 to Rs 1370 per quintal.

During intermediate period average purchase price of potato is found Rs 1250.71 per quintal with maximum Rs 1300 per quintal in Biharsharif and Hilsa Regulated markets. Among the periodic markets, the maximum purchase price of potato is recorded at urban / semi-urban and markets which are well connected with roads and transport system. They include Asthawan, Harnaut, Noorsarai, Rahui, Parbalpur and Islampur recording a price of Rs 1250 per quintal. Minimum purchase price is recorded at Rajgir, Giriyak, and Nagarnausa being Rs 1230 per quintal. Similarly, the average wholesale sale price of potato is found to be Rs 1584.29 per quintal. During this period most of the markets have recorded of sale Rs 1600 per quintal. It includes Biharshaif and Hilsa regulated markets. Among the periodic markets Asthawan and Harnaut are included, which is located in the central and eastern part of the district. These parts of the district are well connected with roads and other transport facilities. Sarmera and Nagarnausa have recorded same sale price of Rs 1590 per quintal.

Moreover, during Pre-harvest average purchase price of potato is found Rs 1627.14 per quintal with maximum Rs 1700 per quintal at Biharshaif and Hilsa regulated markets. Among the per iodic markets, Parbalpur and Islampur have recorded the highest purchase price of Rs 1630 per quintal, while minimum purchase price of Rs 1610 per quintal is being recorded at Giriyak. Similarly, during Pre-harvest average sale price of potato recorded is found Rs 1927.86 per quintal. Maximum sale price

TABLE 5.5

Seasonal Pattern of Price of Potato in Nalanda District (2013-2014)

S.N	Sampled Markets	Wholesale Purchase Price			Wholesale sale Price		
		Post-harvest period	Intermediate Period	Pre-harvest	Post-harvest period	Intermediate Period	Pre-harvest
Regulated Markets							
1	Biharsharif	1110	1300	1700	1375	1600	1950
2	Hilsa	1120	1300	1700	1375	1600	1950
Periodic Markets							
1	Ashthawan	1050	1250	1610	1375	1600	1950
2	Harnaut	1050	1250	1610	1375	1600	1940
3	Sarmera	1040	1240	1610	1365	1590	1920
4	Noorsarai	1050	1250	1620	1365	1580	1920
5	Rahui	1050	1250	1620	1375	1560	1910
6	Rajgir	1040	1230	1610	1360	1570	1920
7	Giriyak	1030	1230	1600	1360	1580	1910
8	Chandi	1030	1240	1610	1360	1580	1920
9	Nagarnausa	1040	1230	1610	1365	1590	1930
10	Ekangarsari	1040	1240	1620	1370	1580	1920
11	Parbalpur	1040	1250	1630	1360	1570	1920
12	Islampur	1050	1250	1630	1370	1580	1930
District Average		**1052.86**	**1250.71**	**1627.14**	**1367.86**	**1584.29**	**1927.86**

Source: Field Survey 2013-2014 (unit in Rupees per Quintal)

recorded at Biharsharif and Hilsa is Rs 1950 per quintal, followed by few periodic markets with a same sale price of potato. While the minimum price of Rs 1920 per quintal is recorded at Rahui and Giriyak. The difference between the maximum and

minimum sale price of potato during Pre-harvest does not exceed more than Rs 40. This shows that markets are very much spatially integrated. (Table-5.5)

5.3.7 Wholesale Purchase and Wholesale Sale Prices of Onion

Onion is one of the important crops which are produced and marketed in the district. Average purchase price of onion during the postharvest period is recorded Rs 941.43 per quintal for the district. But it varies from maximum Rs 1000 to minimum Rs 920 per quintal. The highest purchase price of potato as Rs 1000 per quintal is recorded in Biharsharif followed by Hilsa regulated market. Among the sampled periodic markets maximum wholesale purchase price of Rs 940 per quintal is recorded at Asthawan, Harnaut, Sarmera, Noorsarai, Rahui, and Islampur. All the remaining markets have recorded below the district average. Similarly, the average wholesale sale price of onion is recorded as Rs 1171.43 per quintal for the district, with a maximum of Rs 1200 per quintal in Biharsharif and Hilsa regulated markets and minimum of Rs 1150 per quintal in Rajgir, Chandi, Giriyak, and Ekangarsari.

TABLE 5.6

Seasonal Pattern of Price of Onion in Nalanda District (2013-2014)

S.N	Sampled Markets	Wholesale Purchase Price			Wholesale sale Price		
		Post-harvest period	Intermediate Period	Pre-harvest	Post-harvest period	Intermediate Period	Pre-harvest
Regulated Markets							
1	Biharsharif	1000	1400	2000	1200	1750	2400
2	Hilsa	990	1420	2020	1200	1750	2400
Periodic Markets							
1	Ashthawan	940	1420	1850	1200	1750	2400
2	Harnaut	940	1410	1850	1190	1740	2380
3	Sarmera	940	1400	1840	1180	1730	2380

4	Noorsarai	940	1410	1850	1170	1730	2300
5	Rahui	940	1410	1860	1170	1740	2360
6	Rajgir	930	1400	1850	1150	1730	2350
7	Giriyak	930	1390	1830	1150	1740	2360
8	Chandi	920	1390	1840	1150	1730	2370
9	Nagarnausa	920	1390	1840	1160	1740	2350
10	Ekangarsari	920	1390	1850	1150	1730	2340
11	Parbalpur	930	1400	1830	1160	1730	2350
12	Islampur	940	1400	1850	1170	1750	2380
District Average		**941.43**	**1402.14**	**1868.57**	**1171.43**	**1738.57**	**2365.71**

Source: Field Survey 2013-2014 (unit in Rupees per Quintal)

However, during intermediate period average purchase price of Rs 1402.14 per quintal is recorded for the district with a maximum of Rs 1420 per quintal at Hilsa regulated market. Ashtawan urban periodic markets have recorded same purchase price of onion. While minimum purchase price recorded for most of the periodic markets is Rs 1390 per quintal. Similarly, average sale price during the intermediate period is found Rs 1338.57 per quintal. Maximum sale price recorded at Biharshari and Hilsa regulated markets is Rs 1750 per quintal. Among the periodic markets, Asthawan periodic markets have recorded the same sale price. Market-wise the difference between the maximum and minimum sale price does not exceed more than Rs 20 per quintal.

Moreover, during Pre-harvest average purchase price of onion is recorded as Rs 2365.71 per quintal. In this period maximum purchase price of Rs 2020 is being recorded at Hilsa regulated market. Among the periodic markets, Rahui periodic market has recorded maximum purchase price of onion at Rs 1860 per quintal. Remaining periodic markets have recorded below the district average. Similarly, average sale price of onion during Pre-harvest has been Rs 1651.43 per quintal in which maximum sale price of Rs 2400 per quintal is being recorded at Biharsharif and Hilsa regulated markets Asthawan periodic market at Rs 2400 per quintal. While the

price of onion at remaining periodic markets varies between Rs 2380 per quintal at Harnaut to Rs 2340 per quintal at Ekangarsari.

5.4 Marketing Costs of the Agricultural Commodities

The role of marketing is to move the goods from the producer to the consumer which involves various types of costs. The focal point of interest, in this section, is these marketing costs. The costs of marketing are the expenses required in bringing goods and services from producer to the consumer. These costs normally include handling charges at the farm level, assembling charges, storage charges, wholesaling and retailing charges applied on customers. Sometimes, it becomes very difficult to separate the costs of marketing from the marketing margins. As such, marketing costs and margins are defined as the difference between the ultimate price paid by the consumer for a commodity or product and the price received by the farmer or a primary producer.

Study of marketing costs and margins is one of the most popular issues, undertaken by the marketing sections of government in the region. But only a limited use is made of these studies and seldom is they updated. Though marked changes have taken place in the marketing system, production areas and production techniques. Furthermore, it is a general belief in India that the costs of marketing of agro-commodities are high. Various studies have shown that intermediaries take away the considerable portion of the payment made by the consumers of the agricultural produce . Little attempt is made to identify and analyze the nature of costs of marketing and their implications in the context of the imperfections of agricultural marketing.

The study of marketing costs and margins is essential for the formulation of an appropriate price policy. Besides, this also helps to ascertain as to what extent the intermediaries intervene between the producer and consumer and what profit they get for such services. And further, it helps to examine whether such services are necessary and if they are getting costlier, etc. Suodgrass (1982) in their studies have estimated that the farmers have received only one-third of the retail price of the foodgrain. Such studies are useful in ascertaining the functions performed by some of the intermediaries/agencies employed and the costs involved. It helps in coming to a

conclusion as to how best such integration at different levels of marketing channel could be brought about. It is a common experience that the marketing of agricultural produce is more expensive than the marketing of manufacturing goods on account of certain peculiar features of agricultural products. It has also been noticed that the farmers often borrow funds for cultivation and other expenses and sell their crops in advance to a financier who is also a merchant. Thus, farmers, particularly small and marginal, sell their crops much ahead of the harvest to the merchants from whom they derive their finance. Most of these merchants are agents and brokers in the primary markets. Thus they have an assured crop-year and assurance of marketing. When there are some such agencies operating in a market, however, small their turnover of business may be, they are difficult to be ousted by more efficient intermediaries doing business on a large scale.

Similarly, the number of retailers of food grains is unnecessarily large. In both the cases, it is obvious that if there are a fewer number of intermediaries working with a greater degree of efficiency and a greater volume of turnover in business, the costs of marketing is likely to be lower. Similarly, the wholesalers of agricultural produce exact a disproportionate price for their services. The presence of such a large number of market agencies results in increased marketing costs. There is no gain saying the fact that in the countries like India where the marketing of agricultural commodities is not at all properly organized, some other factors are also responsible for the higher costs of marketing. The most important factors are (a) poor storage facilities, (b) inadequate transportation and communication facilities, (c) lack of facilities for grading and standardization (d) inadequate and higher priced finance for marketing of crops, and (e) a low degree of competitiveness among the intermediaries.

From the above analysis, it is apparent that the factors responsible for high costs of marketing are too many and these make the agricultural marketing system highly imperfect. Under highly competitive conditions consumer will get agro-commodities at near the level of costs of production. Under the monopolistic condition, however, this will probably not be true, because of monopolistic profits, failure to adopt efficient practices and failure to provide goods and services most required.

Data on marketing costs have been collected from farmers and different market functionaries, operating in sampled markets of Nalanda District, viz; village merchants, itinerant traders, etc. regarding marketing expenses incurred by them and their purchase and sale prices of the commodities.

5.5 Price Spread of the Agricultural Commodities

The price spread refers to the difference between the ultimate price paid by the consumer and the price received by the producer for an equivalent quantity of farm product. The price spread consists of marketing costs and margins of the intermediaries which ultimately determine the overall effectiveness of the marketing system. If goods could be moved from producers to ultimate consumers at the minimum cost along with provisions of basic services and consideration of consumer's choice, the marketing system is considered to be efficient. Reduction in the costs of performance of various marketing functions and improving the standard of services at same or lower costs represents a case of marketing efficiency.

The knowledge of price spread between the producers' price and consumer's price is important for producers and consumers. The costs incurred and margins of intermediaries in the marketing of each commodity influence the price that the producer gets as well as the price which consumer pays for it.

The study of price spread is complicated because of the wide variations in the channels of the agricultural marketing and also the conditions under which agricultural commodities are marketed. Thus depending upon the channels through which the commodities enter the markets, the producer sellers will get varying returns for their products. Further, price spread varies considerably according to the nature and location of the market.

Market charges paid by the producer for his products are likely to be higher in unregulated markets than the regulated markets. The mode of sale, weigh men facilities, etc., as present in different markets, would also influence the producer's share in the consumer's price differently. The costs of marketing vary widely, spatially

and temporally both, depending upon the distances involved and services performed. The absence of perfect grading and standardization of agricultural commodities add to difficulties in conducting the study of price spread of Agro commodities. In the absence of relevant records to be maintained by the traders' associations, commercial or state organizations, it becomes quite difficult to have an exact idea about the share obtained by each type of intermediary involved. However, an attempt has been made in this section to determine the costs and margins and the resultant price spread of important crops.

There are two methods through which price spread can be determined, i.e. the 'concurrent margin' and the 'lagged margin.' Both the concurrent margin and lagged margin methods are used in deriving the marketing margin. The difference between the price paid by the ultimate consumer and the price received by the producer is found by taking account of the cost of assembling, processing, storage, transportation and handling charges in moving the product from the farmer to the ultimate consumer. Concurrent margin refers to the difference between the prices prevailing at successive stages of marketing on the same date, while lagged margin is the difference between the price of farm produce obtainable at a particular stage of marketing and the price paid for it at the preceding stage of marketing during an earlier period, the length of time between the two dates being the average period for which the marketing agency holds the products. Concurrent margin does not take into account the time that elapses between purchase and the sale of produce by the same party either due to procuring or stock-holding for price consideration.

Lagged margin takes into account the time that elapses between purchase and sale by a party and for that matter between sale by the farmer and purchase by the consumer, and, thus. Allows for the choice of time which the traders exercise while carrying out his business.In the present analysis, the price spread has been estimated by comparing the price at different levels of marketing with the help of method of concurrent margin. For determining the margins of various intermediaries, the difference between prevailing prices on the same day at successive stages of marketing is worked out.

The differences so obtained at various stages of marketing provide information on gross margin at each stage. From these gross margins, those costs of marketing and processing which are incurred by the intermediaries concerned are subtracted, and the balance gives an idea of the margin of profit or loss for the traders. For calculation of costs of marketing at different stages, the actual rates of charges in kind are converted in term of rupee value.

The method adopted in the collection of data was to approach the producer-sellers themselves when they visited the market yard to sell their produce, and from the various intermediaries to whom they sold and also all other possible sources of information available in the market. Besides, the information collected in one visit has verified during the successive visits. Further, since there is no uniform channel in the marketing of the agro-commodities and the costs of marketing and margins vary from commodity to commodity and according to the number of intermediaries involved, it is presumed and found true that the retailers' price represents the price paid by ultimate consumers. Thus, in this study, the retailers' price is considered as representative of consumer’s price.

5.4.1 Market Charges

The details of market charges of different products have been reduced for the sake of comparison to a uniform level; viz. charges incurred per hundred rupees worth of produce. It is found that there is no relation between the charges of one market and those of another. Market charges vary among regulated and periodic markets depending upon their location and volume of arrival and transaction. These charges also differ regarding their payment by the seller in one situation and by the buyer in the other. In regulated markets, Katcha acharyas or commission agents also incur expenditure on certain items, e.g. gaddi expenditure, weighing, etc., all of which have to be ultimately recovered either from sellers or buyers according to the local custom. There is also no uniformity or recognized rule as to which charges should be borne by the sellers and which by the buyers. As a result, though total market charges do not differ much from one market to another, the payments made by sellers and buyers differ quite largely.

5.4.2 Transportation Cost

Transportation cost is a major cost borne by the farmers. This cost is to be paid by him to bring his produce from his village to the market place. The transportation cost paid by the farmers in the different market area. This information is obtained from the farmers of the sampled study area. The data have details of the transportation cost paid by respective groups of farmers having different size of landholding i.e. marginal, small and large, in the regulated and periodic markets.

It can be seen from the table that the big farmer with the largest size of land holding is paying on an average Rs 21 per quintal with maximum Rs 40 per quintal in Hilsa regulated and Harnaut periodic markets and minimum Rs 15 per quintal in Chandi, Sarmera, and Parbalpur. Similarly, average transportation cost paid by small farmers is an average Rs 30 per quintal for the district as a whole. Maximum transportation cost is paid in the Hilsa and Biharsharif regulated markets being Rs 36 per quintal and minimum transportation cost Rs 24 per quintal in many periodic market centers of the district.

Moreover, the average transportation cost paid by marginal farmers is quite high at Rs 36 per quintal, maximum being Rs 44 per quintal in Hilsa regulated market. While minimum transportation cost of Rs 28.5 per quintal is reported in Nagarnausa and Noorsarai periodic market centers. Variation in the transportation cost in different categories of the farmer i.e. marginal, small and big is due to variations in market area and mode of transportation.However, it can be seen from this table that transportation cost per quintal borne by big farmers is less as compared to that borne by the marginal and small farmers.

The reason for this difference might be because marginal and small farmers have a small quantity of produce to be transported to the market and the minimum transportation charges might be fixed per trip. Alternatively speaking, the trip of large cart/van has some excess capacity and therefore per quintal transport cost of a small and marginal farmer is higher than that of paid by a big farmer. The big farmer, on the other hand, has enough quantity to be transported in one trip of a large cart/van

reducing his transportation cost'. Traders pay all the other charges like market fee, commission charges, tulai except handling which is born by both buyers and sellers. The nature and amount of market charges vary from market to market.

5.4.3 Market Fee

The market fee is that charge which is borne by the buyer and the seller in the regulated and periodic markets, but its nomenclature varies in regulated markets and periodic markets. Generally, in regulated markets, it is called as a market fee/market tax, while in periodic markets it is locally called batti. The average market charge for the district as a whole is Rs 4.5 per 100 rupees, but it varies in regulated and periodic markets. In regulated markets, it is fixed Rs 2 per 100 rupees, while in periodic markets it varies in nature and amount from maximum Rs 4.75 in Harnaut periodic market to minimum Rs 3 in the various markets.

5.4.4 Commission (Arhat)

This is the Arhatiya 's remuneration paid by the buyer and the seller both. Whenever commission is levied on the buyer, it may be termed arhat. This is almost invariably payable in cash. However, in some markets of other states in the country, Arhat always includes weighing men charges.The charges of weighmen and brokerage are always separated from Arhat or commission charges. Commission/Arhat in both the regulated markets i.e. Nalanda and Forbesganj is Rs 1.50 per 100 rupees. It is paid by the sellers and buyers jointly in regulated markets, while in periodic markets no arhatiya is found.

5.4.5 Brokerage *(*Dalali)

The Dalal assists the arhatiya in bringing together sellers and buyers and arranging the sale of produce in regulated markets. Similarly, he is involved in arranging the price in a periodic market. After setting up of the market yard, the amount of brokerage is fixed at the rate of 0.25 per cent, and buyers pay it. Moreover, in periodic markets, there is no maximum limit to it. It is found from the survey that it varies up to a maximum of 0.50 per cent in Hilsa and Biharsharif. All these markets are of urban and semi-urban character while remaining periodic markets have reported dalali of Rs 0.25

between buyers and sellers. Dalali is paid by both the buyer and seller in the periodic market.

5.5.6 Handling Costs

The costs of handling normally comprise of wages paid to laborers, weighing charges and cartage to the buyer's godown/vehicle. For the sake of convenience, these costs are treated under two heads, (a) handling including the weighing stage (b) from the weighing stage up to the buyer's vehicle or godown including cartage.

Under the first head, the usual items are unloading the cart, dressing the produce, sieving, and cleaning and weighing done in the regulated markets. Remuneration of these services is paid both in cash and kind by sellers. At the farm level where the farmers sell the produce to village merchants and itinerant dealers, the charges for weighing and cleaning are paid by the producer-sellers. However, the buyers pay the handling charges by either per quintal or bora at the rate of Rs 3 per quintal in Hilsa and Biharsharif regulated markets. While among the periodic markets maximum handling charges are paid at the rate of Rs 5 per quintal in Chandi and Harnaut. And remaining markets have reported Rs 4 per quintal as handling charges.

From the above analysis, it is found that the costs of marketing are lower in regulated markets than the periodic markets. However, among the periodic markets, the urban periodic markets are having higher costs than that of rural periodic markets.

CHAPTER -6

MARKET ARRIVAL INTENSITY AND ITS RELATION TO MARKET HINTERLAND

CHAPTER -6

MARKET ARRIVAL INTENSITY AND ITS RELATION TO MARKET HINTERLAND

6.1 Introduction

Regulated markets are one of the important institutions in contemporary agro-marketing. These regulated markets not only provide marketing facilities to the farmers but also had a very close relationship with their notified area. These market centers are playing very important role in decision making of the farmers to cultivate a different kind of crops in their market hinterland on the one hand and maintaining a link between market and its' hinterland. Dependency on the markets to sell agro-commodities is determined by the distance from the villages to the markets and the categories of the farmers. Other factors like access and mode of transport also influence the farmer's decision to sell their commodities in these market centers. Therefore, theoretically, the zone of maximum arrival intensity, as well as the proportion of market arrival, should occupy the nearest position to the market center and varies inversely with the distance.

Moreover, the farmers who have fields near the market will pay fewer transport expenses than one who is at some far distance. The difference in the saving transport costs per acre will be the economic rent. Economic rent decreases as the distance from the market increases'. It is thus obvious that farmers of the small size of landholding will not come to the market from far distances. This results small size of the farmers frequently will come to the market from nearby areas. Because these market centers are playing very important role in the marketing of agro-commodities and the direct beneficiaries of these markets are their hinterland farmers. Therefore (regulated market) would be considered as one of the most important indicators for the development of the agrarian economy. Thus, there is need to evaluate the role of regulated markets concerning their hinterland. Keeping in view, the importance of regulated markets in agricultural marketing process of the study area the following objectives have been taken.

1. To estimate the market arrival intensity of different agricultural commodities in the regulated markets.

2. To assess the proportion of marketed, surplus of different agro commodities from the different zones to the market.

3. To estimate the number of producer sellers coming from different zones according to the size of land holdings in different regulated markets.

The following hypotheses are to be tested in the present study to understand the above-said objectives:

1 Highest market arrival intensity zone and proportion of marketed surplus of agro-commodities are the closest to the market centers. It is inversely related to the distance from the market.

2 The number of sellers and frequency of their visit to market decreases as the distances increases from the market centers.

To test the above hypothesis, Von Thunen model of rings (Zone around the mandi) have been applied. Total ten kilometers circle demarcated from the regulated market, and further, it is sub-divided into five concentric zones with two kilometers apart from each other. Three villages from each concentric zone have been selected for detailed inquiry by randomly stratified sampling technique. Stratified random sampling technique has selected total fifty households from each sampled villages. They have been thoroughly interviewed regarding various aspects of the regulated market and its role in the transaction of agricultural commodities. Market arrival intensity has been calculated by dividing the total quantity of the marketed surplus of a crop by the number of villages in that distance zone.

6.2 Market Arrival Intensity of Agro-Commodities

The intensity of market arrival determines the inter-relationship of market hinterland tested by Neal et.al (1975) and Ibrahim (1984). Markets have circular-shaped hinterlands comparable to notified hinterland and zone of maximum intensity should occupy the nearest position to the market.

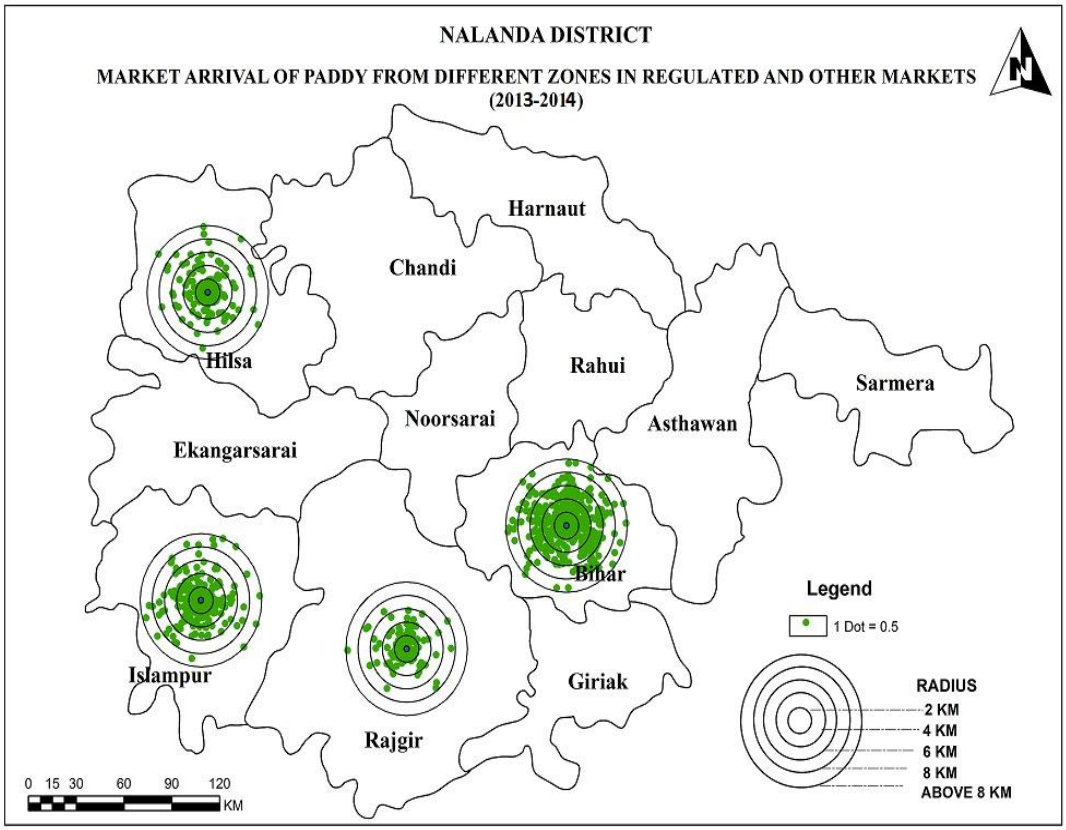
6.2.1 Market Arrival Intensity of Paddy

The data of Paddy marketable surplus intensity in regulated markets of Biharsharif and Islampur shows that the intensity of arrival is fluctuating with increasing distance. The villages located in the inner most zone of up to 2 kilometers radius from the Biharsharif and Islampur markets contributes 53.32 and 34.24 quintals of Paddy per village respectively. Whereas the next outer zone of 2.1-4 kilometers adds another 32 and 40 quintals of Paddy per village around Biharsharif and Islampur regulated markets. Thus all the villages located within the radius of 6 kilometers contribute 60 and 18.46 quintals of Paddy per village to both the regulated markets respectively. Whereas the next two outer zones together account for 79.2 and 31.41 quintals of Paddy per village around Biharsharif and Islampur markets respectively. The intensity of Paddy per village does not decline consistently with the increasing distance from both Biharsharif and Islampur regulated markets. It is interesting to note that in Biharsharif, the highest intensity arrival per village is from those villages which are located at the distance of 4.1-6 kilometers. While in Islampur the highest intensity arrival per village is from 2.1-4 kilometers from the market center. It is attributed to the high level of transport network connectivity and accessibility of traders with the market, better economic conditions of the farmers and big size of surplus to counter the transport and time cost and efficient market information system.

Contrary to this, two other regulated markets in the district show the inverse relationship between the distance and intensity of market arrival from their nearby areas. In the case of Rajgir and Hilsa regulated market, the inner most zone of up to 2 kilometers radius contributes highest Paddy arrivals of 22.44 and 53.32 quintals per village respectively. Market arrival intensity from the second zone of (2.1 to 4 kilometers) is 15.21 quintals for Rajgir and 14.08 quintals for Hilsa market per village, while from third distant zone market arrival intensity is 8.52 and 16 quintals per village around the market of Rajgir and Hilsa respectively.

The lowest arrival intensity per village is contributed by the outer most zone of above 8 kilometers i.e. 3.27 quintals for Rajgir market and 5.96 quintals for Hilsa regulated market per village. As the distance from the market center increases the size of arrival is going down (Table and Fig 6.1).

Map 6.1 Market Arrival Intensity of Paddy from Different Zones in Regulated and Other Markets (2013-2014)



Source: Field Survey. (In Quintals)

Table 6.1

Market Arrival Intensity of Paddy from Different Zones in Regulated and Other Markets (2013-2014)

Distance	Biharsharif	Islampur	Rajgir	Hilsa
Up to -2	53.32	34.24	22.44	53.32
2.1 - 4	32	40	15.216	14.08
4.1 - 6	60	18.464	8.52	16
6.1 - 8	44.44	14.456	5.624	9.24
Above 8	34.76	16.96	3.272	5.96

Source: Field Survey. (In Quintals)

6.2.2 Market Arrival Intensity of Wheat

Wheat is the most important and widely grown crop of Nalanda district. It becomes clear from the table 6.2 that Wheat is coming in good ratio to Biharsharif, Hilsa and Islampur regulated markets. The intensity of Wheat has shown a reverse trend rather. As we go away from the market, the intensity of arrival is increasing. The highest intensity of Wheat is coming from third distance zone of 4.1-6 kilometers to Biharsharif regulated market and inner most zones of up to 2 kilometers to Hilsa regulated market and second inner most zone of 2.1-4 kilometers in Islampur regulated the market. The second zone of 2.1-4 kilometers contributed lowest market arrival intensity of Wheat, i.e., only 34.64 quintals to Biharsharif regulated the market and 21.16 quintals to Hilsa regulated market per village. While in Islampur regulated market the lowest market arrival intensity i.e. 13.72 quintals is coming from the second outer most zone (6.1-8 kilometers). The intensity of Wheat arrival to the Hilsa market is slightly different from other markets. In Rajgir regulated market the inner most zone contributed highest market arrival intensity of 40 quintals, and a minimum of 3.68 quintals is contributed by the outer most zone per village. The arrival of Wheat to Rajgir market decreases as we go away from the market (Table and Fig 6.2). The small size of land holdings (marginal and small) a small quantity of marketable surplus and bad road linkages are the main attributes which discouraged the arrival of Wheat marketable surplus in Rajgir market concerning increasing distance from it.

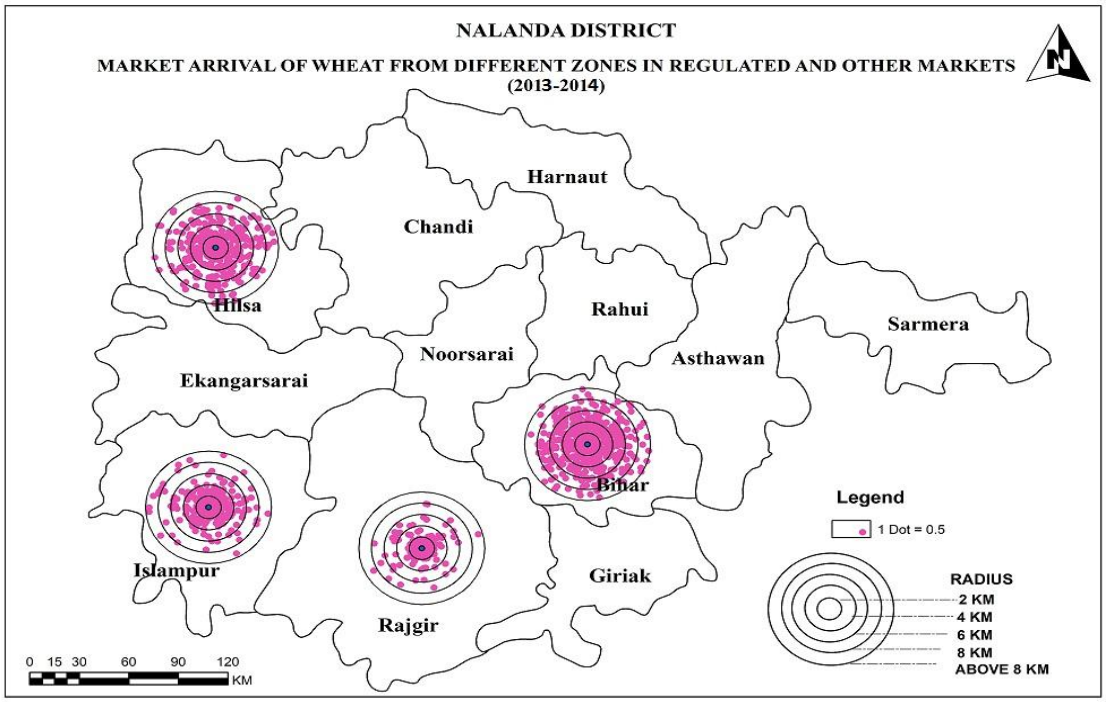
Table 6.2

Market Arrival Intensity of Wheat from Different Zones in Regulated and Other Markets (2013-2014)

Distance	Biharsharif	Islampur	Rajgir	Hilsa
Up to -2	46.64	22.84	40	80
2.1 - 4	34.64	40	15.36	21.16
4.1 - 6	70	19.04	12.28	40
6.1 - 8	66.4	13.72	6.8	45.6
Above 8	43.44	14.52	3.68	35.88

Source: Field Survey. (In Quintals)

Map 6.2 Market Arrival Intensity of Wheat from Different Zones in Regulated and Other Markets (2013-2014)



Source: Field Survey. (In Quintals)

6.2.3 Market Arrival Intensity of Maize

Maize is another important food crop of the study area. Table 6.3 explains that the intensity of maize in all the regulated markets is in the same manner. The villages which are located around each regulated market in a circle of 2 kilometers contributed the highest intensity of maize i.e. 26.64, 13.6, and 17.6 quintals to Biharsharif, Rajgir and Hilsa market per village respectively. While in Islampur market the highest arrival comes from 2.1-4 kilometers distance (19.2 quintals). Whereas the next outer zone of 2.1-4 kilometers adds another 13.32, 19.2, 9.76, 13.6 quintals market arrival intensity per village to Biharsharif, Islampur, Rajgir and Hilsa markets respectively. The third zone (4.1-6 kilometers) market arrival intensity per village again rises to 14 quintals to Biharsharif market. While it (market arrival intensity per village) declines to 11.16 quintals, 5.20 quintals and eight quintals to Islampur, Rajgir and Hilsa market respectively.

Table 6.3

Market Arrival Intensity of Maize from Different Zones in Regulated and Other Markets (2013-2014)

Distance	Markets			
	Biharsharif	**Islampur**	**Rajgir**	**Hilsa**
Up to -2	26.64	16	13.6	17.6
2.1 - 4	13.32	19.2	9.76	14.08
4.1 - 6	14	8.96	5.2	8
6.1 - 8	9.96	6.72	4.8	4.8
Above 8	8.12	5.2	4	3.2

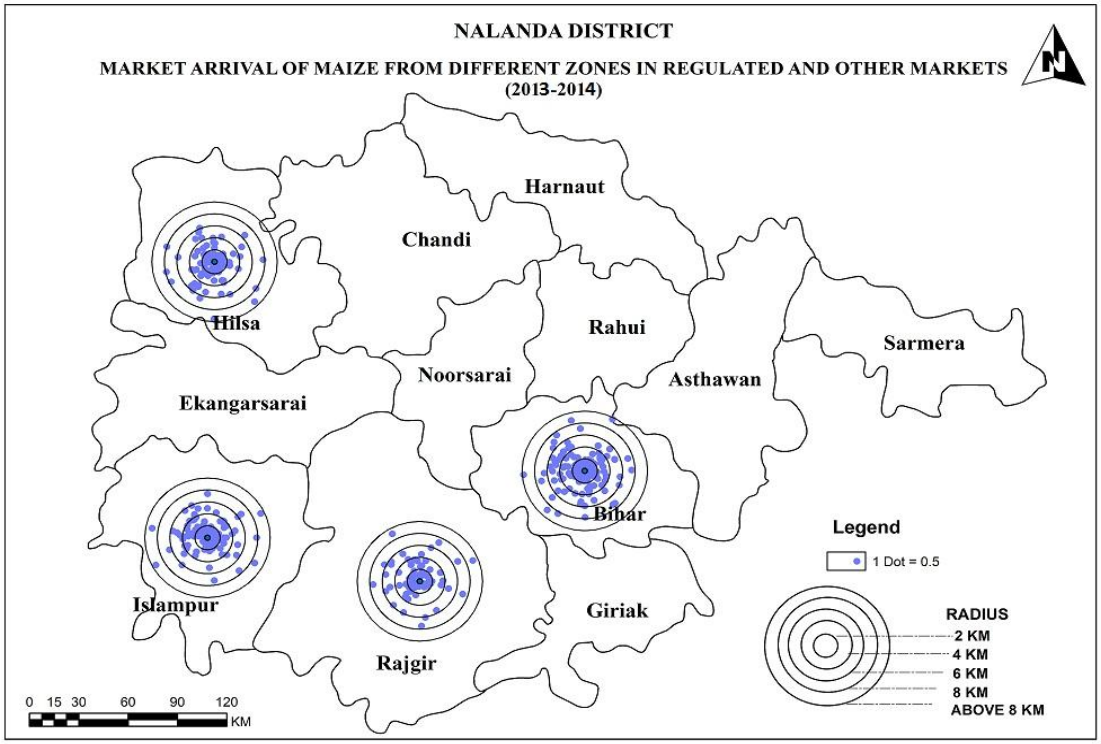
Source: Field Survey. (In Quintals)

The outer most zones of all the regulated markets contributed the lowest 8.12, 5.2, 4 and 3.2 quintals market arrival intensity per village of maize to all the regulated markets of Biharsharif, Islampur, Rajgir, and Hilsa respectively. The market arrival intensity of maize decreases in all the regulated markets with the increasing distance because this crop gives low returns to the farmers. Therefore, it will be uneconomical to travel a long distance to sell this crop in the regulated market.

6.2.4 Market Arrival Intensity of Arhar

The crop of Arhar is widely grown in Nalanda district. It becomes clear from the Table 6.4 that the villages located in the inner most zone of 2 kilometers away from Biharsharif regulated market contributed highest market arrival intensity of Arhar 6.64 quintals per village. And the lowest market arrival intensity of Arhar 3.84 quintals per village is contributed from zone V of above 8 kilometers to Biharsharif market.

Map 6.3 Market Arrival Intensity of Maize from Different Zones in Regulated and Other Markets (2013-2014)



Source: Field Survey. (In Quintals)

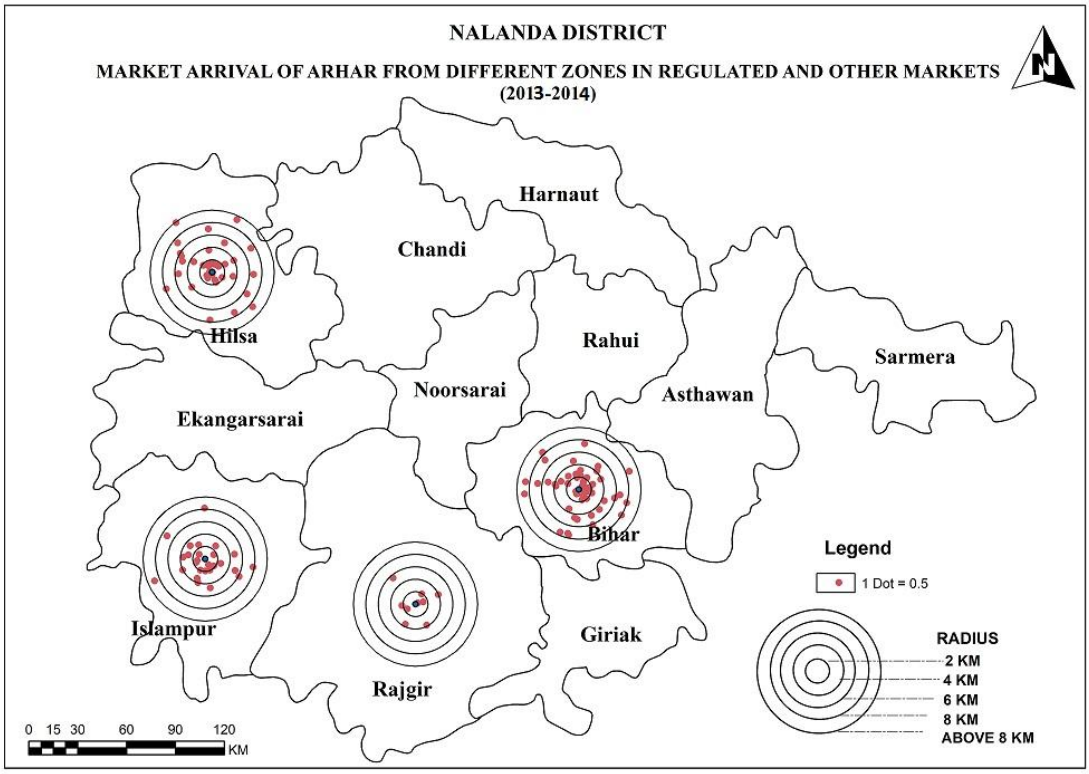
Table 6.4

Market Arrival Intensity of Arhar from Different Zones in Regulated and Other Markets

Distance	Markets			
	Biharsharif	**Islampur**	**Rajgir**	**Hilsa**
Up to -2	6.64	2.84	1.12	6.64
2.1 - 4	5.32	4	1.2	2.32
4.1 - 6	5	1.88	0.84	3
6.1 - 8	5	1.84	0.8	3.84
Above 8	3.84	2.16	0.48	3.04

Source: Field Survey. (In Quintals)

Map 6.4 Market Arrival Intensity of Arhar from Different Zones in Regulated and Other Markets



Source: Field Survey. (In Quintals)

Therefore, as the distance from Biharsharif market increasing, the intensity of arrival is decreasing. The village located 2.1-4 kilometers away from Islampur and Rajgir regulated market contributed highest market arrival intensity of Arhar i.e. 4 and 1.2 quintals per village to both the markets respectively But the lowest market arrival intensity of 1.84 quintals per village coming to Islampur from 6.1-8 kilometers. While in Rajgir, market arrival intensity of Arhar coming from the outer most zone (above 8 kilometers) i.e. 0.48 quintal per village. The villages located in the periphery of 2 kilometers from Hilsa regulated market contributed 6.64 quintals per village which are the highest market arrival intensity of Arhar. The second zone of 2.1-4 kilometers from Hilsa market contributed the lowest market arrival intensity per village which is 2.32 quintals for Arhar (Table and Fig 6.4).

6.2.5 Market Arrival Intensity of Moong

Moong is the second important crop among the pulses in the study area. In the case of Moong inner most zone of 2 kilometers radius provides 2.64 quintals of market arrival intensity that are the highest arrival intensity per village to the Biharsharif market. But the villages located in the second, third and fourth distance zone from Biharsharif market possess the same market arrival intensity of 2 quintals per village. Above 8 kilometers away from Biharsharif regulated market, the outer most zones provide the lowest market arrival intensity of 1.28 quintals per villages. The market arrival in Islampur regulated market is almost very low in 2003-2004. In the Rajgir regulated market, the villages located in the inner most distance zone (up to 2 kilometers) and second outer most distance zone (6.1-8 kilometers) provides almost the same market arrival intensity per village (0.56 and 0.16 quintals) of Moong which is the highest arrival intensity. And the lowest market arrival intensity of 0.06 quintals per village has been discovered in the villages located in the outer most zone of above 8 kilometers. The villages located in the inner most distance zone (up to 2 kilometers) provides the highest market arrival intensity of 1.32 quintals of Moong in the Hilsa market. But as we move from the inner most zones to the outer most zone, the intensity of arrival of Moong is decreasing (Table 6.5).

Table 6.5

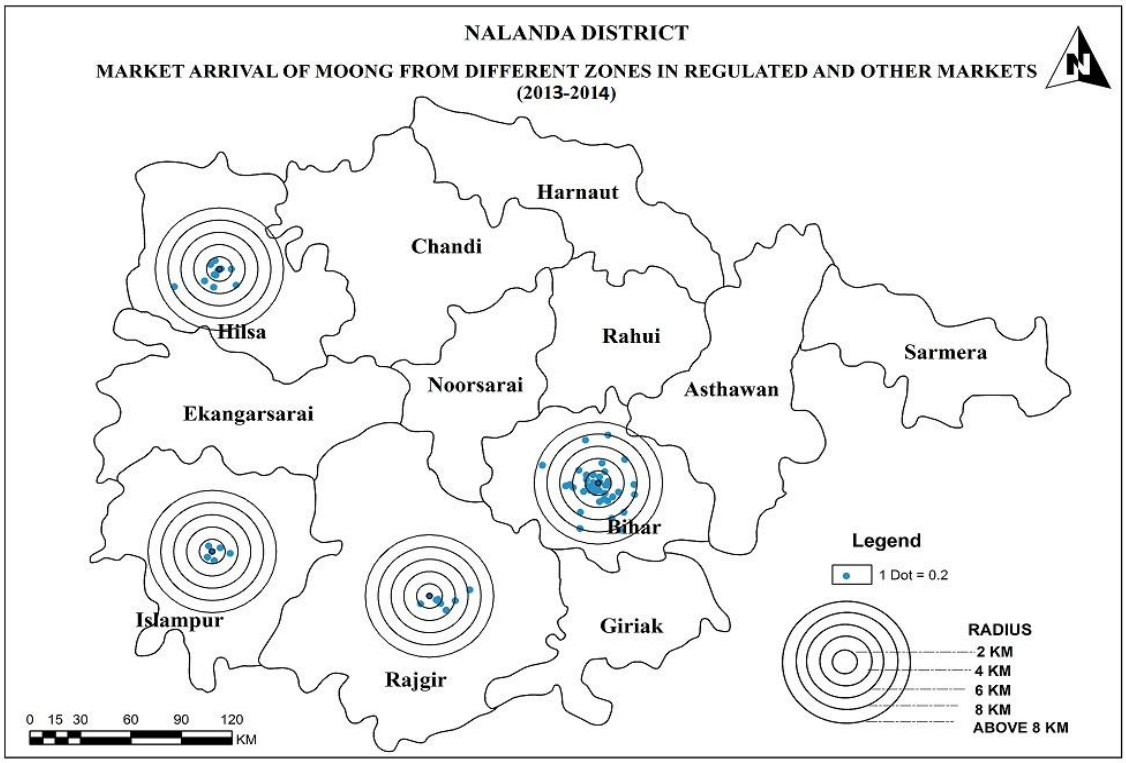
Market Arrival Intensity of Moong from Different Zones in Regulated and Other Markets (2013-2014)

Distance	Markets			
	Biharsharif	**Islampur**	**Rajgir**	**Hilsa**
Up to -2	2.64	0.45	0.56	1.32
2.1 - 4	1.60	0.22	0.28	0.20
4.1 - 6	1.60	0.22	0.28	0.20

6.1 - 8	1.60	0.13	0.16	0.32
Above 8	1.28	0.05	0.06	0.08

Source: Field Survey. (In Quintals)

Map 6.5 Market Arrival Intensity of Moong from Different Zones in Regulated and Other Markets (2013-2014)



Source: Field Survey. (In Quintals)

6.2.6 Market Arrival Intensity of Mustard

The market arrival intensity of Mustard in the villages located in different distance zones around the regulated market of the study area cannot be generalized. Biharsharif and Islampur regulated market had 15.98 and 4.56 quintals market arrival intensity of Mustard in the inner most circle of 2 kilometers. The market arrival intensity per village declines and became 8.30 quintals in Biharsharif regulated the market and increased 7.48 quintals in Islampur market in the second inner most distance zone of 2.1-4 kilometers. The third zone of 4.1-6 kilometers, records 16.80 quintals of market

arrival intensity to Biharsharif market and 5.68 quintals of market arrival intensity to Islampur market. The fourth zone of 6.1- 8 kilometers records 20.42 quintals (highest) market arrival intensity of Mustard per village to Biharsharif aid 5.00 quintals market arrival intensity per village to Islampur market. The lowest (3.12 and 1.00 quintals) market arrival intensity of Mustard per village is in the outer most distance zone (above 8 kilometers) of Biharsharif and Islampur market. The market arrival intensity of Mustard to the Rajgir market is, in the same way, i.e. from the highest market arrival intensity of 4.08 quintals (First inner most distance zone) to the lowest of 0.48 quintals market arrival intensity (outer most distance zone). While in Hilsa, the highest market arrival intensity of 10.56 quintals are provided by the villages which are located in the inner most distance zone of up to 2 kilometers. The market arrival intensity declines to 3.68 quintals in the second inner most distance zone, again it raises to 8 quintals in the third zone per village. But it is continuously going down as the distance increases (6.1-8 kilometers) from the Hilsa market (Table 6.6).

Table 6.6

Market Arrival Intensity of Mustard from Different Zones in Regulated and Other Markets (2013-2014)

Distance	Markets			
	Biharsharif	**Islampur**	**Rajgir**	**Hilsa**
Up to -2	15.98	4.56	4.08	10.56
2.1 - 4	8.30	7.48	3.60	3.68
4.1 - 6	16.80	5.68	3.36	8.00
6.1 - 8	20.42	5.00	1.20	7.36
Above 8	3.12	1.20	0.48	1.60

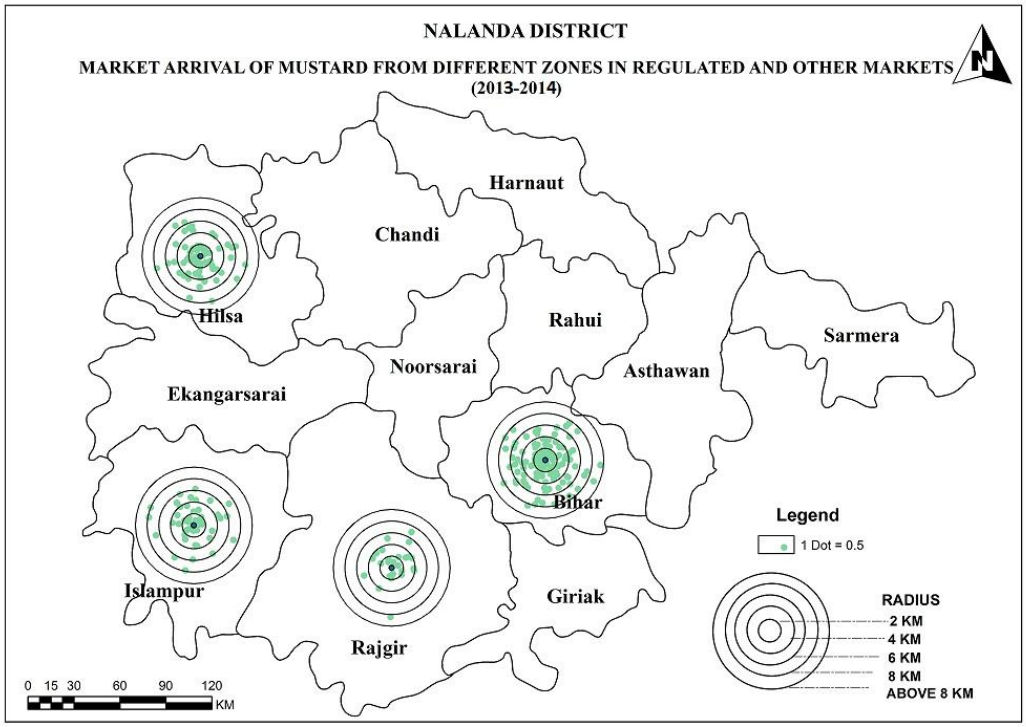
Source: Field Survey. (In Quintals)

6.2.8 Market Arrival Intensity of Potato

The market arrival intensity of Potato is quite different for Biharsharif in comparison to another regulated market of Nalanda district. Table 6.8 explains that the villages located far away (6.1-8 kilometers) contribute maximum (37 quintals) arrival intensity

to the total marketed Potato. Third, first and second zone occupy second, third and fourth place respectively to the Biharsharif market. The intensity of Potato per village

Map No 6.6 Market Arrival Intensity of Mustard from Different Zones in Regulated and Other Markets (2013-2014)



Source: Field Survey. (In Quintals)

declines above the distance of 8 kilometers from Biharsharif market. The First inner most distance zone (Up to 2 kilometers) of Islampur provides the highest six quintals of market arrival intensity of Potato per village and continually decreasing regarding arrival intensity of Potato per village to the Islampur market. The villages located in the Third distance zone (4.1 -6 kilometers) provides the highest market arrival intensity (4 quintals) of Potato to Rajgir market per village, while the lowest arrival intensity is contributed by the outer most distance zone (above 8 kilometers) which is 0.8 quintals per village to Rajgir market. The Second distance zone (2.1- 4 kilometers) provides the highest intensity (14.96 quintals per village) of Potato to the Hilsa market (Table 6.8).

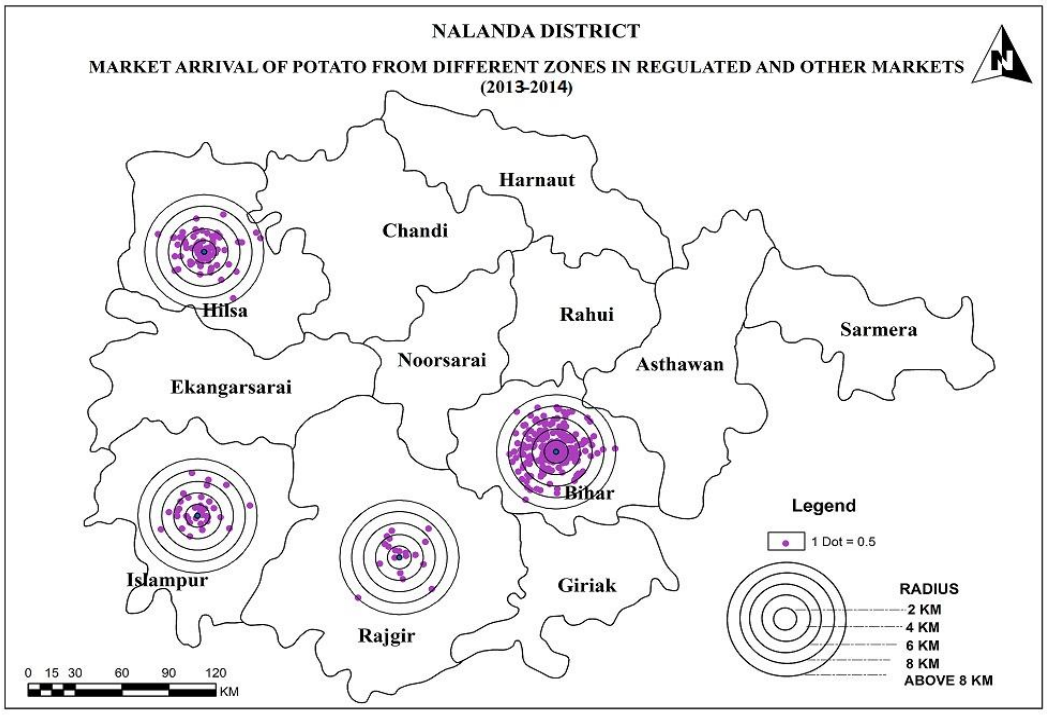
Table 6.8

Market Arrival Intensity of Potato from Different Zones in Regulated and Other Markets (2013-2014)

Distance	Markets			
	Biharsharif	**Islampur**	**Rajgir**	**Hilsa**
Up to -2	26.64	6.8	1.064	9.12
2.1 - 4	16	4.88	2.72	14.96
4.1 - 6	30	2.8	4	9.52
6.1 - 8	37	2.4	1.12	2.48
Above 8	6.24	1.84	0.8	2.64

Source: Field Survey. (In Quintals)

Map 6.7 Market Arrival Intensity of Potato from Different Zones in Regulated and Other Markets (2013-2014)



Source: Field Survey. (In Quintals)

6.2.9 Market Arrival Intensity of Onion

Table 6.9 explains the market arrival intensity of Onion from the villages located in the hinterland of regulated market of Nalanda district. The villages located in the third distance zone (4.1-6 kilometers) provide the maximum market arrival intensity (24 quintals per village) of Onion to the Biharsharif market. Second maximum arrival intensity (21.28 quintals per village) is coming from the inner most distance zone (up to 2 kilometres) to Biharsharif market Fourth and second zones occupy third and fourth place respectively for Biharsharif and outer most distance zone (above 8 kilometres) contribute the lowest market arrival intensity (3.36 quintals per village).

Moreover, in Islampur regulated market, the villages located in the distance zone of 2.1-4 kilometers contributed the highest 5.92 quintals market arrival intensity. First, third and fourth zone occupy second, third and fourth place respectively regarding market arrival intensity of Onion to the Islampur market.

The market intensity of Onion from the inner most distance zone to the outer most distance zone shows the trend from highest market arrival intensity per village to the lowest market arrival intensity per village of Rajgir market. Almost same conditions are prevailing for Hilsa market regarding Onion market arrival intensity.

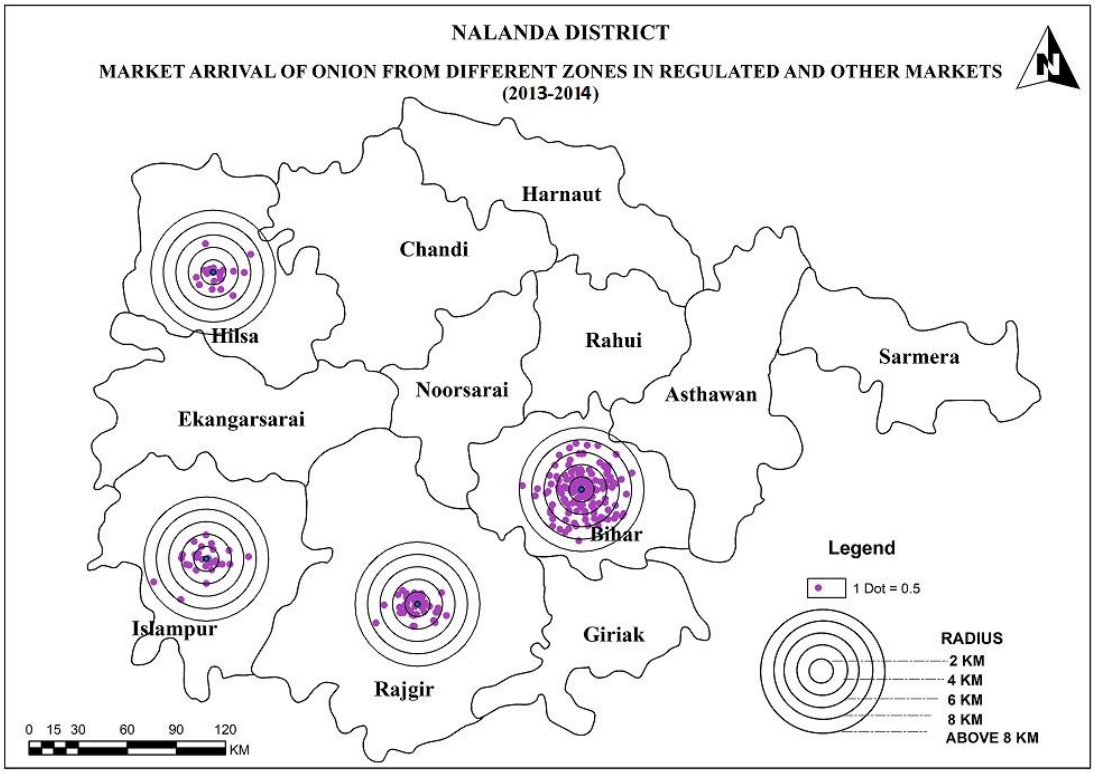
Table 6.9

Market Arrival Intensity of Onion from Different Zones in Regulated and Other Markets (2013-2014)

Distance	Markets			
	Biharsharif	**Islampur**	**Rajgir**	**Hilsa**
Up to -2	21.28	4.48	13.6	5.28
2.1 - 4	16	5.92	6.08	1.76
4.1 - 6	24	1.44	1.6	1.6
6.1 - 8	20.64	0.96	0.8	0.48
Above 8	3.36	0.8	0.48	0.32

Source: Field Survey. (In Quintals).

Map 6.8 Market Arrival Intensity of Onion from Different Zones in Regulated and Other Markets (2013-2014)



Source: Field Survey. (In Quintals)

Thus it is found from the above analysis that there is a close relationship between the distance from the market and intensity of agro-commodities. The spatial distribution and location of the markets are responsible for the distortion of distance decay patterns. The hypothesis that as the distance increases the market arrival intensity declines does not hold true for every crop and market. For Paddy market arrival intensity declines with distance in Rajgir and Hilsa regulated market but it is not true for Biharsharif and Islampur regulated market. Similarly in case of the Wheat intensity of market arrival increases in Biharsharif and Islampur market. While Rajgir and Hilsa market registered declining trend in market arrival intensity with distance. Moreover, maize, Arhar, groundnut, and Moong have also registered declining trend as one move from the market. Whereas Mustard, Potato, and Onion do not have identical market arrival intensity. The assumption that as the distance increases the arrival intensity declines does not hold true in the case of Wheat, Paddy Mustard, Potato, and Onion

but for maize, Arhar and Moong it proves true. Thus researcher arrived at a conclusion, that in a country where farming is the mainstream of the people. The variations in mandi arrival intensity are related indirect proportion, other things being equal to variation in distance from the market.

6.3 Proportion of Agro-Commodities Arrival

The size of the marketable surplus is one of the important variables that influence the decision of the farmers to sell their commodities in the markets. Therefore, from the nearby villages even smallest surplus quantity of agricultural produce which a farmer wishes to sell can be transported economically with any mode of transportation, where as from the distant villages, it is not economical to bring small producers to the regulated market. Thus as the distance from the market increases, it receives less produce from each zone. To understand the proportion of agro-commodities from each zone around market hinterland total quantity of market arrival was taken from each zone around the market.

6.3.1 Proportion of Market Arrival in Biharsharif Market

Dhanipur market is one of the important regulated markets of the Aligarh district. The arrival pattern of major agro-commodities at Dhanipur market shows large deviations from the hypothesis that with the increasing distance the arrival size declines from the market hinterland. The villages located in the inner most zones of 2 kilometres of radius from the market centres contributes only 23.75 per cent Paddy, 17.86 per cent of Wheat, 36.98 per cent of maize, 25.74 per cent of Arhar, 30.28 per cent of Moong, 24.73 per cent of Mustard, 22.99 per cent of Potato and 24.95 per cent of Onion respectively. Whereas next outer zone of 2.1-4 kilometers adds 14.25 per cent of Paddy, 13.27 per cent of Wheat, 18.49 per cent of maize, 20.62 per cent of Arhar, 18.35 per cent of Moong, 12.85 per cent of Mustard, 13.81 per cent of Potato and 18.76 percent of Onion. Thus all the villages located within the radius of 4 kilometers contribute 35 to 55 per cent of total agro-commodities. The area having a radius of six kilometers from the market contributes up to 80 per cent of total arrival in the market. Decreasing proportion of market arrival has been registered from fourth distance zone

around the markets. The Very sharp decrease in marketed surplus has been registered in fifth distance zone around the market of Biharsharif. Thus it may be concluded from the table 6.10 that the maximum arrival of agro-commodities in the Biharsharif market is not from the inner most zones, rather, it is the second and third distance zone which contributes maximum market arrival. From fourth distance zone proportion of the market, arrival is being started decreasing outward from the market center.

Table 6.10

Proportion of Marketed Surplus from Different Zones in Biharsharif Market (2013-2014)

Distance	Rice	Wheat	Maize	Arhar	Moong	Mustard	Potato	Onion
Up to -2	23.75	17.86	36.98	25.74	30.28	24.73	22.99	24.95
2.1 - 4	14.25	13.27	18.49	20.62	18.35	12.85	13.81	18.76
4.1 - 6	26.72	26.81	19.43	19.38	18.35	25.99	25.89	28.14
6.1 - 8	19.79	25.43	13.83	19.38	18.35	31.60	31.93	24.20
Above 8	15.48	16.64	11.27	14.88	14.68	4.83	5.38	3.94

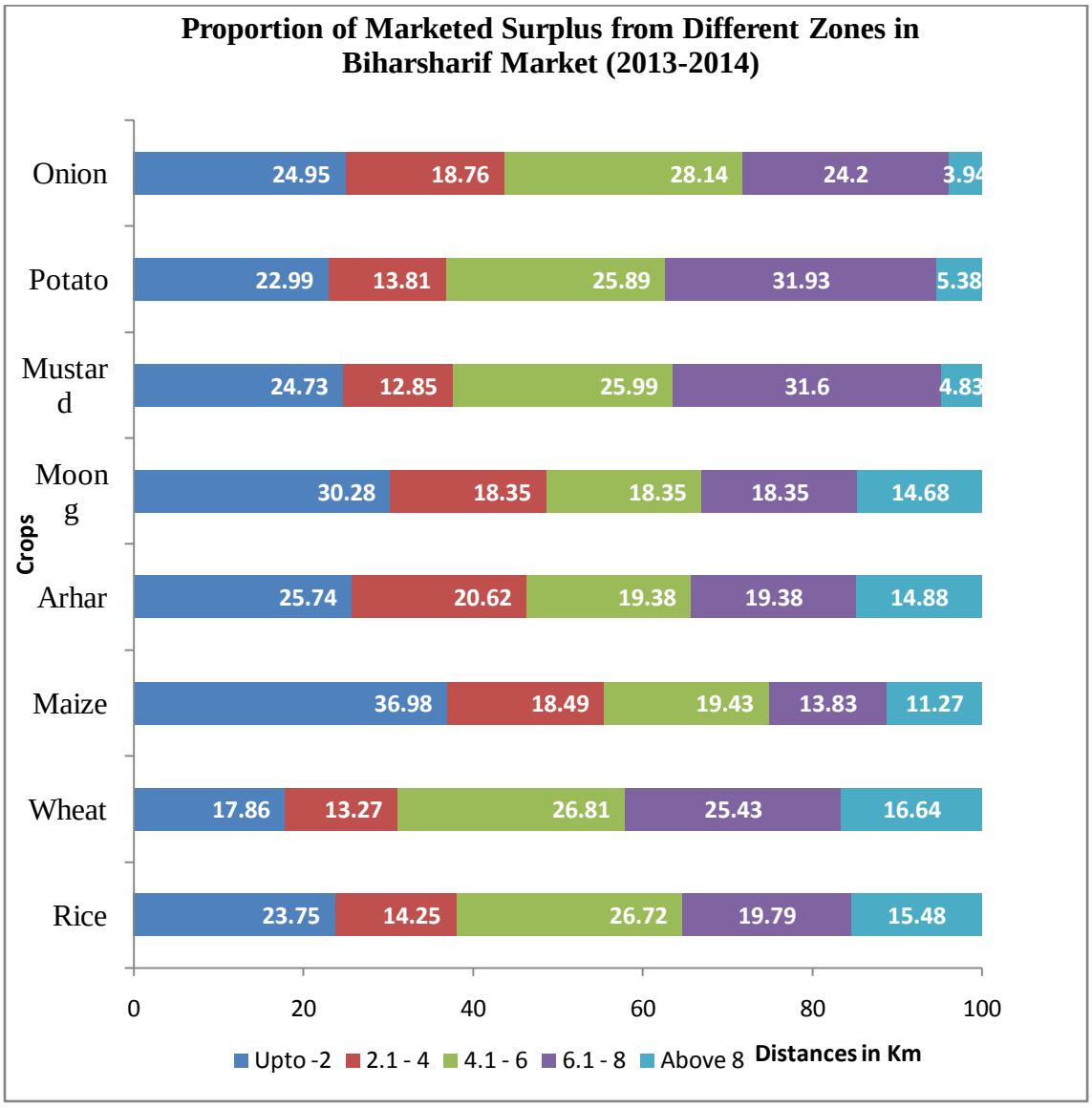
Source: Field Survey. (In Quintals)

6.3.2 Proportion of Market Arrival in Islampur Market

The proportion of market arrival of two inner most distance zone is almost identical in all crops except Potato and Moong. The proportion of market arrival Increases as the distance increases is valid and true. Up to 2 kilometers radius from the market contributes 27.59 per cent of Paddy, 20.74 per cent of Wheat, 28.53 per cent of maize, 22.33 per cent of Arhar, 19.06 per cent of Mustard, 36.32 per cent of Potato and 32.94 per cent of Onion. Whereas next distance zone contributes 32.23 per cent of Paddy, 36.32 per cent of Wheat, 34.24 per cent of maize, 31.45 per cent of Arhar, 31.27 per cent of Mustard, 26.07 per cent of Potato and 43.53 per cent of Onion. Together with up to 4 kilometers from the market contributes about 50 per cent of market surplus.

Leaving apart the third concentric zone (4.1-6 kilometers away from the market point), the proportion of agro-commodities has shown declining trend with increasing distance from the market. The proportion declines with the distance between third and fourth distance zones are not very high, but it is very much noticeable between fourth and fifth distance zones.

Figure 6.1 Proportion of Marketed Surplus from Different Zones in Biharsharif Market (2013-2014)



Source: Field Survey.

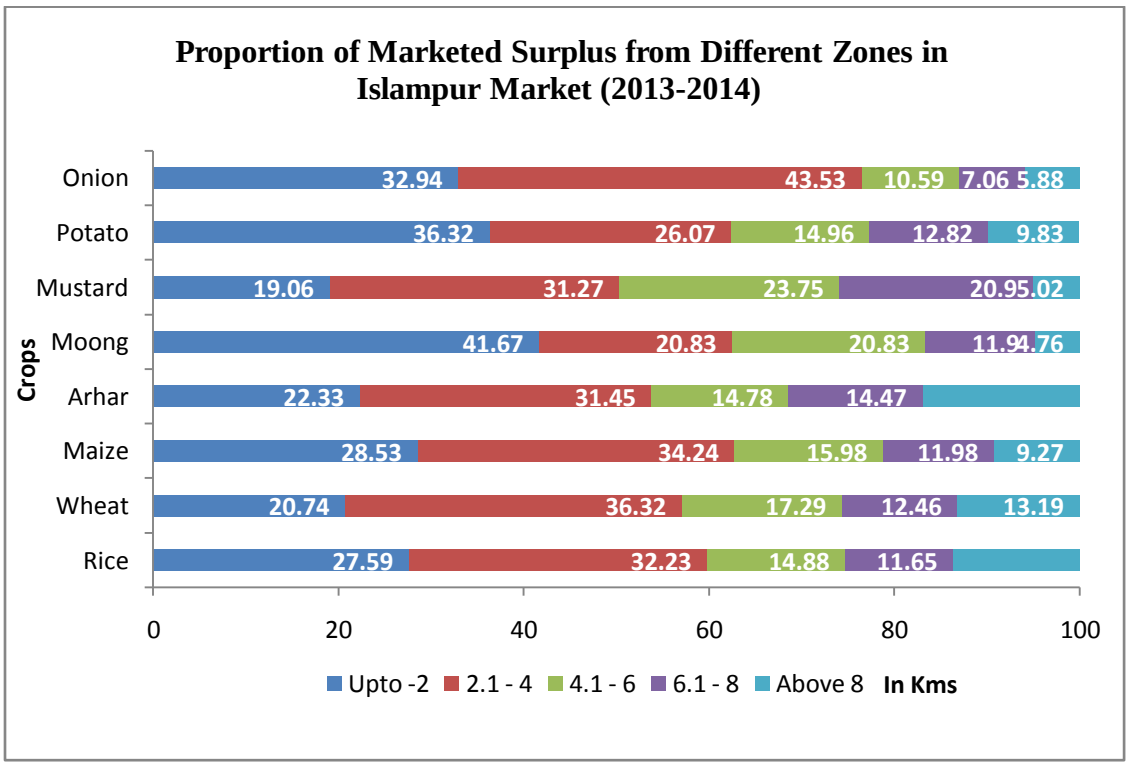
Table 6.11

Proportion of Marketed Surplus from Different Zones in Islampur Market (2013-2014)

Distance (Km)	Rice	Wheat	Maize	Arhar	Moong	Mustard	Potato	Onion
Up to -2	27.59	20.74	28.53	22.33	41.67	19.06	36.32	32.94
2.1 - 4	32.23	36.32	34.24	31.45	20.83	31.27	26.07	43.53
4.1 - 6	14.88	17.29	15.98	14.78	20.83	23.75	14.96	10.59
6.1 - 8	11.65	12.46	11.98	14.47	11.90	20.90	12.82	7.06
Above 8	13.66	13.19	9.27	16.98	4.76	5.02	9.83	5.88

Source: Field Survey. (In Quintals)

Figure 6.2 Proportion of Marketed Surplus from Different Zones in Islampur Market (2013-2014)



Source: Field Survey.

6.3.3 Proportion of Market Arrival in Rajgir Market

The arrival pa intern in Rajgir market is very close to hypothesise that with increasing distance from the market center the share of different crops declines in all direction except for Potato in which arrival is almost very low from the first zone, and there is no uniformity in arrival from each distance zone as we move from the market. Another marked feature of the market is that beyond the distance of 8 kilometers the share of different crops in marketed surplus declines sharply. Beyond the distance of 8 kilometers, no crop except Maize and Arhar share more than 10 per cent in the market arrival of agro-commodities. Moong arrival in the marketed share declines sharply from 12 per cent in the fourth zone to 4.76 per cent in fifth distance zone. In this market maximum proportion of marketed surplus comes from the first zone. Which constitute in between 10 and 60 per cent of total marketed surplus.

Table 6.12

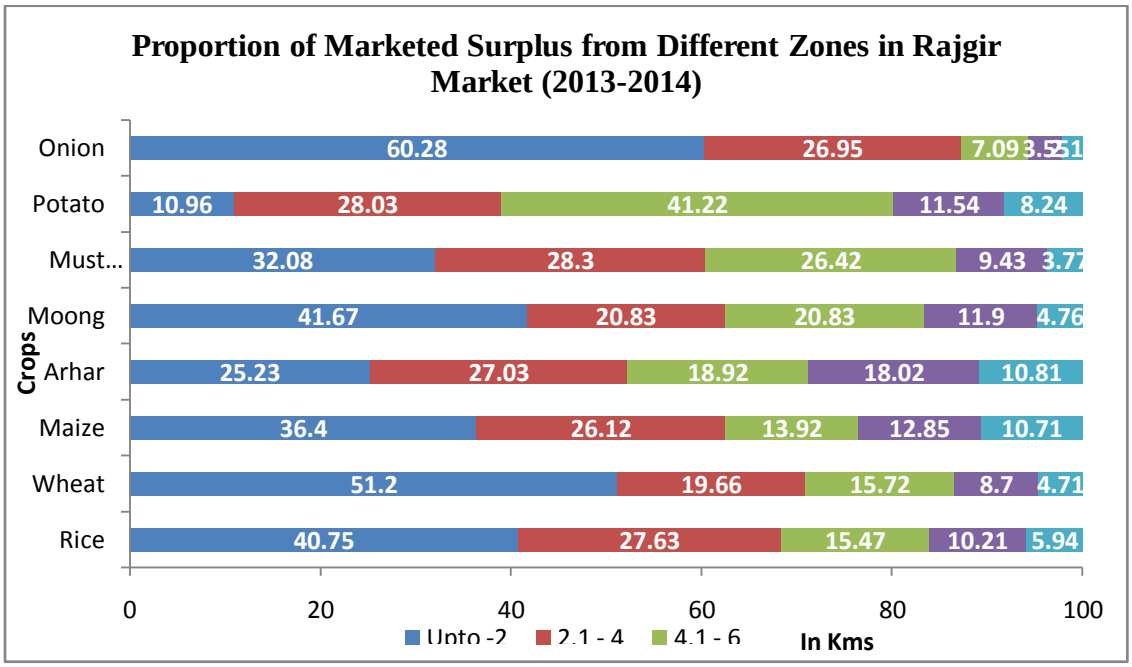
Proportion of Marketed Surplus from Different Zones in Rajgir Market

(2013-2014)

Distance (Km)	Rice	Wheat	Maize	Arhar	Moong	Mustard	Potato	Onion
Up to -2	40.75	51.20	36.40	25.23	41.67	32.08	10.96	60.28
2.1 - 4	27.63	19.66	26.12	27.03	20.83	28.30	28.03	26.95
4.1 - 6	15.47	15.72	13.92	18.92	20.83	26.42	41.22	7.09
6.1 - 8	10.21	8.70	12.85	18.02	11.90	9.43	11.54	3.55
Above 8	5.94	4.71	10.71	10.81	4.76	3.77	8.24	2.13

Source: Field Survey. (In Quintals)

Figure 6.3 Proportion of Marketed Surplus from Different Zones in Rajgir Market (2013-2014)



Source: Field Survey.

6.3.4 Proportion of Market Arrival in Hilsa Market

It is one of the important grain markets in the Nalanda district. In this market, arrival pattern is very much identical and the share of each different crops like Mustard Potato, Onion and Moong decreasing uniformly. Paddy marketed surplus is very much identical and contributes around 54.08 per cent from the first zone, 14.28 per cent from the second zone. Wheat and maize have similar kind of share in marketed surplus. Maize proportion in marketed surplus is almost uniform from first and second zones and starts declining from the third zone. Maize and Onion registered very sharp declining trend between first and second zone and their share in marketed surplus gradually decreasing from third to the fourth zone.

Potato has a reverse kind of share in marketed surplus rather. The first zone has 23.55 per cent, second zone 38.64 per cent, third zone 24.59 per cent while fourth zone share is 6.4 per cent in marketed surplus, but it is almost absent in the last zone Hilsa market.

Table 6.13

Proportion of Marketed Surplus from Different Zones in Hilsa Market

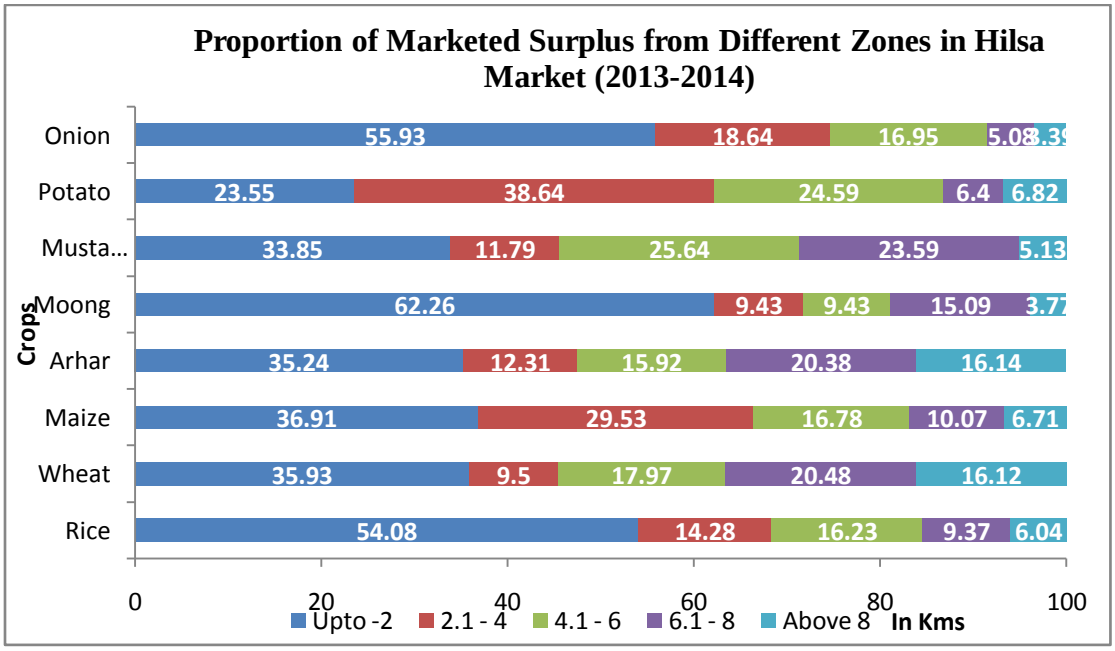
(2013-2014)

Distance (Km)	Rice	Wheat	Maize	Arhar	Moong	Mustard	Potato	Onion
Up to -2	54.08	35.93	36.91	35.24	62.26	33.85	23.55	55.93
2.1 - 4	14.28	9.50	29.53	12.31	9.43	11.79	38.64	18.64
4.1 - 6	16.23	17.97	16.78	15.92	9.43	25.64	24.59	16.95
6.1 - 8	9.37	20.48	10.07	20.38	15.09	23.59	6.40	5.08
Above 8	6.04	16.12	6.71	16.14	3.77	5.13	6.82	3.39

Source: Field Survey. (In Quintals)

From the above analysis, it has been discovered that all four regulated markets of the Nalanda district play very important role in the marketing of agro-commodities. Because a large proportion of marketable surplus around the hinterland of the market comes to these market centers. The proportion of market arrival from different zones in the market decreases as we move from the market centers. But it varies market wise

Figure 6.4 Proportion of Marketed Surplus from Different Zones in Hilsa Market (2013-2014)



Source: Field Survey.

and crop-wise. Except for Biharsharif all three regulated markets do not have very many ideal conditions for market arrivals from their hinterland. The hypothesis that as the distance increases the proportion of market arrival declines does not hold true in the case of Biharsharif market, but true concerning Islampur, Rajgir and Hilsa market. This fact supports the hypothesis that if the villages around the market area have better road linkages to the market center, the constraint of distant factor can be subdued.

CHAPTER -7

Conclusion

CHAPTER -7

CONCLUSION

The purpose of study is to examine the various aspects of regulated markets and their relationships in agricultural development. The study also aims to suggest improvements in smooth running of regulated markets for the development of agriculture in the study area in particular and the country in general. To understand the role of regulated markets, two regulated markets and six important crops of the study area have been selected.

It is realized through the study that efficient marketing enables the farmers to grow more agro-commodities from subsistence/semi-subsistence to market oriented. With the passage of time agro-marketing provides incentives to the farmers to grow farm produce for export. Therefore, streamlined movement of the producers' surplus through the regulated markets to the consumers would raise the income level of the farmers and promote the agriculture development and economic development of the study area.

The study highlights that the modernization, efficiency, and vigour of agro marketing are positively dependent upon the uniformity of marketing practices, uniform regulatory provisions, accessibility to bigger market centers, reduction of market margins and of course on post-harvest storage facilities. Regarding this, it is noted that structural changes in farming practice and marketing of agro-commodities lead to the effective integration of market centers. These market centers under uniform regulatory measures is being accessible to both small and big farmers; which also provide the better prospect for agricultural marketing. At the same time, this process enhances the overall efficiency of the system as well.

The findings of this study in coming paragraphs shows that according to general parameters of efficient agro-marketing, Nalanda district still has a very primitive marketing system. The greater transaction of agro-commodity at village level and in rural markets enough to prove the point that Nalanda has to go a long way before any

positive change can take place for a general lot of a great majority of marginal and small farmers.

As a large number of these farmers are at the disadvantageous position, they have no say in the bargain. This inherent unequal power balance between the producers and the intermediaries in the existing system is the real bane of the agro-marketing system in Nalanda which is reflected in, and furthered by, the overall inefficiency of this system. The agricultural products are marketed through two types of trading system; private trading system (informal agencies) and public trading system (formal agencies). In private trading, the commodities are primarily operated by private traders, like wholesale traders, village traders, itinerant traders, commission agents, etc. who purchase the agricultural surplus from the producers at a free rate by price agreement between them and producer sellers. Under the informal trading, it is found that the producer seller sells his produce at the village site to one and several types of intermediaries or brings it directly to wholesale market.

It is found from the survey that paddy has been purchased in the largest proportion by mills constituting 59.55 per cent, followed by periodic markets with 8.79 per cent of a total transaction performed through different informal marketing agencies. Similarly, rice has its share of 35.96 per cent, wheat 35.96 per cent, maize 25.73 per cent, pulses 51.29 per cent, potato, and onion 50.18 per cent respectively of the total transaction in the village markets. This finding shows the overwhelming importance of informal trading system in the marketing of agricultural commodities in Nalanda district.

At village level survey of the transaction of the agricultural commodities shows that paddy has recorded highest share of marketed surplus in regulated markets. While in the case of vegetables especially Potato and onion, they have been transacted in largest proportion at village market among different market agencies. The maximum transaction at village level is under taken especially by the small and marginal farmers. They have a very small size of marketable surplus which discourages them to sell their surplus in distant and specialized agricultural markets, to avoid unnecessarily transport and time costs. The purchase of agricultural produces by consumers directly

from growers/farmers house is another important agency of agricultural marketing channel in which the margin of commission agents to consumers' price is reduced. So both farmers and consumers get benefited. Besides, time of the consumers (usually agricultural and land fewer labourers) is saved in which they can earn more wages.

The study area experiences various methods of the transaction of Agro commodities at market and farm levels. Undercover, open auction, quotation on samples, private negotiation and close tender are important methods of transaction. The undercover and by quotation on sample methods are practiced only in periodic wholesale markets, whereas, the open auction is practiced in government control regulated markets. Moreover, in this study, various market channels of Agro commodities are also being identified. Marketing of agricultural commodities undergoes a change of ownership through time and space. The intermediaries are involved in the passing of commodities from producers to ultimate consumers which form marketing channels. Paddy/rice and wheat are having rather complex channels than maize, pulses, potato, and onion. It is due to spatiotemporal variations in their demand and supply.

Similarly, different types of marketing agencies dealing with agricultural commodities also show variation in their marketed surplus. Regulated and urban periodic markets have the highest proportion of marketed surplus in the study area. The analysis shows that the market centers which are well connected with roads and railways have a higher proportion of marketed surplus. Moreover, the market centers which are located in the eastern and northern parts of Nalanda district have higher marketed surplus of the agricultural commodities than that of the market
centers located on the western side of the district. It is because of well connectivity of eastern and northern parts as well as higher agricultural productivity in these regions. On the other hand, it is worth noting that the lower marketed surplus in the western part of the district is due to lower productivity of crops caused by the flood from rivers as well as lesser spatial connectivity among the markets. This supports the hypothesis that better spatial integration of market centers at different levels due to efficient transportation and other infrastructural facilities reduces unnecessary spatial unevenness of marketed surplus.

Seasonal arrival pattern is discussed by three main periods (1) post-harvest period (2) intermediate period and (3) pre-harvest period. The study of the seasonal pattern of marketing of selected crops indicates that the arrivals do not follow any definite pattern during an agricultural year. It is because most of the commodities have a different growing time during an agricultural year. Study reveals that average arrival of marketed surplus for the district 29.40 per cent. However, it was counted and constituted its 18.98 per cent during the intermediate period. The study arrives at the arrivals of marketed surplus of these commodities has been vary spatially and temporally, crop-wise and market-wise. Similarly, study finds that arrivals of marketed surplus of potato and onion are highest i.e. 57.42 Per cent and 55 as a whole during the post-harvest period is 51.62 per cent, and during the intermediate period, it is.47 per cent respectively, during post-harvest period. While during the intermediate period the shares of onion and potato are 14.11 per cent and 14.51 per cent of their overall arrivals respectively.

The largest proportion of the arrivals of the marketed surplus of potato and onion during the post-harvest period is because they are cash crop and of perishable nature as well. Hence the farmers immediately wish to sell them. Moreover, the highest arrival of marketed surplus of all agro-commodities during post-harvest period indicates that small and marginal farmers sell a large quantity of their surplus, particularly as distress sale, immediately after the crop harvest. The result further shows that seasonality of arrivals is found more pronounced in cash crops than in non-cash crops. It means that producer sellers lack storing facilities and consequently sell theirs produce in the market immediately after harvest. This supports the hypothesis that there is a wide fluctuation in the seasonal arrival of marketed surplus of different agricultural commodities.

The volume of marketed surplus of agricultural commodities in the sampled markets has improved well during the period 2004-2013 at an average annual rate of regulated and periodic markets is attributed to the fact that market regulation restricts malpractice in the transaction of agricultural commodities and thus becoming an

incentive for farmers to sell their produce there. That is why marketed surplus has increased sharply in regulated markets than the periodic markets. It supports the hypothesis that government intervention regarding regulation measure leads to greater market efficiency and consequent to it there is a rapid increase in the marketed surplus in the regulated markets in comparison to periodic market centers.

A Spatial analysis of the of marketed surplus of the agricultural commodities at the level of operational land holding indicates that the proportion of sales of all agricultural commodities i.e. Farmers with the lowest size of holding (up to 1 hectares) have an almost negligible presence in these market centers.

A further analysis of the marketing pattern shows that proportion of sale in the specialized market centers rises as the size of landholding increases. It is on account of the fact that the big farmers have a large marketable surplus and own means of transportation and therefore they do not find any difficulty in selling their produce in the main market centers. The poor farmers lack transportation facilities, and also they have a small quantity of surplus to sell in the main market centers. It supports the hypothesis that big farmers are more dominant in selling their produce in the regulated and urban market centers than the small one.

The overall proportion of marketed surplus of all selected commodities shows that regulated markets and periodic markets have their increased share. But a closer look at the situation reveals that big farmers mostly do the transaction in regulated markets. Small farmers are found almost negligible in these markets. Thus the advantage of regulated markets disproportionately goes to big farmers skewing the socio-economic equilibrium of the village as well as tilting power leverage in the agricultural marketing system in favor of big farmers and intermediaries.

The variables selected for analyzing the price behaviour of six important crops namely rice, wheat, maize, pulses, potato, and onion, are the wholesale purchase price and wholesale sale price in three different agricultural seasons. The wholesale purchase price refers to that which the wholesalers/commission agents pay to the producer sellers and other selling agencies; whereas the wholesale sale price refers to that which

the retailers and other traders pay to the wholesalers/commission agents. From the analysis of the data, it is found that there is a wide difference in the wholesale purchase and wholesale sale prices of agricultural commodities between post-harvest and lean periods. It is due to the seasonal character of the production and arrival patterns of these agricultural commodities, while their consumption is more or less uniform over different months of the year. It leads to seasonal fluctuations in their prices.

The seasonal behavior of the wholesale purchase price over the space constitutes the most important indicator of the efficiency of the marketing system. Spatially, the variations in price do not seem much. However, it varies market-wise. Spatial patterns of price structure of different crops show that regulated and urban periodic markets are having better price structure of the selected agricultural commodities than the smaller and inaccessible periodic market centers. Location and size of market centers play a decisive role in determining the price structure of different agricultural commodities. The result shows that there are not many spatial variations in minimum and maximum prices of the commodities both regulated and periodic markets. It shows that these markets are very much spatially integrated.

The Nalanda district is a deficit region of agricultural products, especially, of food crops. It is a consuming market where agricultural commodities are bought and sold by the traders belonging to places outside the district, especially from the terminal markets. Further, from the supply side, the crops of inferior quality are marketed here under a situation of compulsions, which are dumped on the market immediately after harvest. This leads to wide fluctuation in the prices. As a result, the seasonal variations of the wholesale sale price and wholesale purchase price are high. However, a market-wise comparison of price structure of different agro-commodities shows that traders' manipulative grip over the producer-sellers and itinerant traders is stronger in interior and smaller markets than their counterparts in regulated markets.

The costs of marketing are expenses incurred in bringing goods and services from producers to consumers. It is found that the costs of marketing of agricultural

commodities are high in the study area. The factors responsible for high costs of marketing are too many, and these make the agricultural marketing system highly exploitative in character and imperfect in nature. Analysis of the types and variations of costs indicates that the various markets charges; particularly among periodic markets are not uniform and they are mostly charged arbitrarily. These charges not only show large variation but the mode of their payment also differs, which is payable by the sellers in some instances and the buyers in other. The main drawback of these charges is that there is no uniformity or recognized rules as to which charges should be payable by sellers and which by buyers. However, in recent years, the Government of Bihar through the Bihar Agriculture Produce Markets Act, 1960 and its subsequent amendments therein, has made certain provisions under which each market charge has been defined and fixed. But it is practiced only in government controlled regulated markets.

The study highlights the price spread has been estimated by comparing the prices at different levels of marketing with the help of method of concurrent margin. While studying the various components of price spread attention has been focussed on producers' share in the consumers' price. It is hypothesized that larger the price spread the greater is the inefficiency in the marketing system, and vice-versa. The study indicates that higher marketing costs and price spread are largely on account of high handling and transportation costs, greater loading and unloading charges and high commission charges along with some unspecified charges by intermediaries. A further comparative analysis of price spread of regulated and periodic market shows that the producers'' share in consumers' price is higher in the regulated markets. It is because of regulatory measures introduced in these markets, and to this extent, this may be said as a positive gain of the establishment of the market yard. The study of the net price received by the producer seller through different marketing channels reveals the fact that the direct sale to consumer fetches the highest net price to producer seller. The sale performed through the Katcha arhatiya is the next profitable channel for the producer seller. The sale performed through the retailer is the third best channel and much more remunerative as compared to sale taken place through the wholesaler, the village merchant, and itinerant dealer. The most important factors which affect the

price spread are (a) multiplicity of intermediaries and their profit margin, (b) transport and storage costs (c) commission and brokerage charges, (d) handling costs, etc.

From the above discussion, it is clearly evident that agricultural marketing in Nalanda is varied regarding space and time concerning arrival and prices. Market arrival plays an important role in determining the price of agro-commodities as it represents supply side. However, the study area is having highly imperfect nature of market due to its oligopolistic tendencies, inadequate system of marketing, and lack of infrastructural facilities. The imperfect nature of the agricultural marketing system has been serving as a serious constraint on the development of the agricultural sector and has resulted in non-remunerative price to the farmers on the one hand and unreasonable price to the consumers on the other. The conditions, under which the farmers dispose of their produce and the price which they receive from them, have a significant bearing on their farm activities. It is now commonly believed that the improved marketing facilities contribute to the agricultural development by encouraging magnitude of production. The actual loss of products is caused by the inefficiencies in their movement from the farmers to the consumers, passing through various phases like-processing, storing and transportation of the agricultural products. The variation in the storage costs and losses are very high. Transportation and handling losses also vary with the nature of crop and technique of marketing.

The presence of various undesirable market charges and the exploitative behavior of the traders contribute to higher marketing costs and price spread. An efficient marketing system encourages an increase in agricultural production by reducing the marketing costs incurred by the producers and by lowering the prices paid by the consumers. This expands the market and subsequently brings higher returns to producers.

The need for an efficient marketing system calls for an improvement in existing marketing system. Since the recommendation of Royal Commission on Agriculture (1928), the central government has taken some measures to improve agricultural marketing in the country. Among such measures taken by the state government

mention may be made of Constitution of Agricultural Marketing Section of the Department of Agriculture in March 1935, the Agriculture Produce (Grading and Marketing) Act 1937, regulation of markets, throughout the state, the market development project introduced in 1973 to develop and modernize the agricultural markets in Bihar to take over the wholesale trade in the year 1974 etc. Some of these measures have attained partial success, while others are either completely withdrawn or are in the initial stages of implementation. Even after the establishment of the market yard at important places, it remains a dream to achieve the goal of the efficient marketing system.

Suggestions

The present study suggests that to promote the efficiency of agricultural marketing and optimal distribution as well as to augment marketable/marketed surplus, an integrated market development policy comprising the following measures should be applied to the marketing of agro-commodities.

(1) The government should take initiation to adopt the policy and to increase the agricultural production, to increasing marketable/marketed surplus. Although considerable progress has been made, particularly over the last two decades the production in the state has not yet attained the desired results as anticipated by the state government. A major reason for this disappointing position is that not enough attention has been devoted to providing the facilities and services which must be available to the farmers if agriculture is to develop. The past government policy is not found any more relevant or effective in the present situation, in assisting orderly distribution of marketed surplus and in providing better prices to the farmers for their produces.

The findings of this study indicate that the development of big urban and regulated market does not appear to be fruitful for the small and marginal farmers. A very large percentage of the farmers, particularly small and marginal, find it more convenient to sell its produce in villages and *haats.* It is thus, clear that rural primary)' markets including *haats* are more relevant. And

will continue to be so for many years for the great majority of the farmers. With this reality, the basic task of the government is to reorient the regulatory measures in favor of periodic markets by providing marketing and credit facilities which alone can protect the farmers from the exploitation of various intermediaries existing between them and the consumers.

(2) Since the farmers sell the largest proportion of their production during the three/four months immediately after the harvest, the stability of harvest price is an important issue for the agricultural production and the marketing decisions. The price which farmers receive during this period influences the proportion of harvested crops sold during this period, as well as their ability to finance next year's crop. The farmers should be assured of at least the minimum price after post-harvest on which they can survive as well as invest for the cultivation of a particular crop. This means that there should be an effort on the part of the government to stabilize prices, particularly during post-harvest period.

(3) Though seasonal fluctuations are not expected to be wiped out altogether from an agricultural market their effects can be minimized. Large seasonal fluctuation in price causes a hardship on consumers. This also leads to conservative storing plans for the following years. Seasonal price instability encourages speculations by those who are often not experts in market conditions, and this introduces a great degree of uncertainty into the production plans of the farmers, and the marketing plans of consumers. A financial help in the form of easy credit and aid to the farmer's particularly small and marginal ones, on the pledge of taking their produce for marketing, can also play an important role in minimizing their dependency on the intermediaries. Thus, a balanced program should be attempted to raise and stabilize harvest price while holding within limits the variability in seasonal price fluctuations.

(4) The present study indicates, the price spread is quite large on account of various undesirable marketing charges and arbitrary deductions made by the traders. It, therefore, becomes imperative that the efforts should be made to

increase producers' share in consumers' price, thereby causing a reduction in the wholesalers' and retailers' margins. However, it is encouraging to note that the trade margin has fallen after the establishment of the regulated markets due to the abolition of various undesirable market charges. Still, a large number of small and large farmers sell their crops in periodic markets. There is a need to strengthen this aspect with the help of the government to reduce the marketing margin in periodic markets too.

(5) Marketing cannot be divorced from a consideration of production process. Farmers need integrated assistance for their production activities. The problems faced by small farmers in marketing their output arise basically from the conditions under which they produce. They borrow even to meet their consumption needs. Their farm business income is far below the minimum, which is necessary for bare survival. As they Bonow mostly from the village money-lenders, they are bound to sell their commodities to them as they have taken a loan at the lower interest rates. The marketing system is dominated by the small farmers, therefore, government intervention is essential to protect the interest of the farmers by giving loan at the right time. The problems of production and marketing need to be tackled simultaneously through integrated agricultural policies. Any one-sided approach is not likely to yield many results.

(6) The organization of cooperative marketing requires additional preference for improving the marketing conditions. Because it will strengthen the bargaining power of the farmers at the first stage of marketing i.e. from the farm to wholesale market. Though cooperative marketing is not playing any important role in agricultural marketing in the study area; it is possible to inter-link cooperative credit and cooperative marketing to reduce the dependence of farmers on influential intermediaries and money lenders.

It needs appropriate measures to facilitate the marketing efficiency. Because, there is ample evidence to show that in spite of several measures, agricultural trade has neither

experienced a change in techniques of marketing nor the improvement in the marketing conditions of the majority of the farmers. This failure is mainly attributed to the non-adoption of an integrated market development policy and the lack of positive and facilitating role on the part of the government. The present study, overwhelmingly, shows that markets of Nalanda district are integrated spatially while temporal (seasonal) fluctuations are pronounced in the arrivals and prices of agro commodities, however, government controlled regulated markets show some positive impact on the improvement of the overall marketing system.

The need is to supplement the scheme of modernization of agricultural marketing through a well-designed 'integrated market development policy' comprising there. All the measures are suggested as above, in improving the existing structure of the market, it functions and performance. Any strategy for the overall development of agriculture appears ineffective, in the absence of an efficient integrated farming marketing system, in the study area in particular and the country in general.

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