Perspectives Of Regional Agriculture, Cropping Pattern and Combination Region with Special Reference to Malda District, West Bengal

Intekhab Alam, Dr. Suruchi Pachori
Department of Geography, Dr. A.P.J. Abdul Kalam University, Indore (M.P.), India

Abstract
Agricultural region means an area of similar farming which may be contiguous or may comprise several separate tracts of country. Cropping pattern is defined as the spatial representation of crops rotations, or as the list of crops that are being produced in an area and their sequence in time. Crop combination refers to the aggregate of various crops grown/cultivated in an area at a given point of time. Crop combination is the analysis of the total percentage acreage area occupied by different crops in a given region in an agricultural year. In this article, perspectives of regional agriculture, cropping pattern and combination region with special reference to Malda district, West Bengal has been discussed.
Keywords: Agriculture, Cropping, Regional, Pattern, Malda

INTRODUCTION:

A farming region is a collection of adjacent or dispersed plots of land that use similar farming practices. The definition of a cropping pattern is the spatial representation of crop rotations, or the list of crops grown in a region and their production order throughout time. The term "crop combination" describes the collection of various crops that are grown or cultivated in an area at one particular time.
An area with homogeneity in relief, soil type, meteorological conditions, farming practises, crops produced, and crop associations is referred to as an agricultural region. India is a huge nation with a variety of geographical features that will inevitably result in regional variances in agriculture. The quality of agricultural land use and its cropping pattern are represented by an agricultural region. In general, it shows similarities in the types of crops that are grown, how they are combined, how they are grown, the average amount of inputs, and the direction of farming operations. The stability of physical, agro-climatic, and socio-cultural factors is the main source of similarities. Agricultural zones are determined using variables such as temperature, altitude, rainfall, and soils. Agriculture has become drought-proof thanks to the development of new farm technologies, and regional growth has become more balanced. A cropping pattern is the percentage of land that is being cultivated for different crops at various times. This shows when and how the crops were planted on a specific acreage. Altering the cropping pattern would result in:

- Change in the amount of land planted with various crops;
- Change in the order and timing of crops

In India, factors such as average rainfall, temperature, climate, technology, and the kind of agricultural soil are major determinants of cropping patterns. To get

the highest yield, many cropping patterns are used.

A dynamic concept is a cropping pattern that changes through time and space. It can be characterised as the proportion of land that is consistently used for a variety of crops. In other words, it refers to a yearly cycle of sowing and harvesting in a particular area. Rainfall, temperature, climate, soil type, and technology all have an impact on India's crop patterns.

Using the principal crops as the base crop and all other potential alternative crops as the alternative crops, cropping patterns in India can be shown. To classify crops, it is essential to understand their agro-climatic characteristics. For instance, grains like wheat, barley, and oats are grouped.

Indian agriculture is determined by the types of soil and climatic factors that control the complete agro-ecological environment for subsistence and the suitability of a crop or group of crops for production. The three distinct agricultural seasons in India are known as Kharif, Rabi, and Zaid. The Kharif season was inaugurated by the Southwest Monsoon, which permitted the cultivation of tropical crops such as rice, cotton, jute, jowar, bajra, and tur. Winter's arrival in October or November marks the start of the Rabi season, which lasts until March or April. Zaid, a brief summer farming season, starts after the crops for Rabi have been harvested.

PERSPECTIVE OF REGIONAL AGRICULTURE:

Land-Use Profile:

Land has historically been thought of as a particular region of the earth's surface. It is without a doubt the nation's most valuable resource, and since the dawn of time, man has relied on it to meet a variety of demands. [1] How land resources are used is a major indicator of how much and how much man has altered them. It is the systematic application of human control that shows a close connection between current ecological circumstances and man. It is the end result of a combination of natural origins and influences exerted on it by people in the past and those who are still in power today. [2]

An area's land use is the result of a combination of historical occurrences, the interaction of economic forces with the environment, and society's values. Land use is the total surface area of all developed and undeveloped land at a given period and location. [3]

The foundational resource of human society is land. Land usage refers to how people utilize the land. Land is primarily used for farming, forestry, pasture, etc. [4] The phrase "land usage" is often used to refer to a variety of uses for soil and land. For instance, arable land, pasture, orchards, fallow land, culturable waste, settlements, forests, water bodies, etc. Land use is the level of satisfaction that the farming community experiences with respect to the sort of agricultural development, the provision for future output, and the contribution to societal needs. [5]

The interaction between society, on the one hand, and the development of culture and resource management, on the other, is demonstrated by land use. The intensive use of land is dependent on factors like population density, economic success brought on by improved agricultural output, human settlement, etc. [6] On the other side, substantial land use is linked to a small population, dispersed settlement, a lack of transportation, and communication time. Only the methodical use of land can

enhance both economic and cultural development. [7]

CROPPING PATTERN AND COMBINATION REGION:

Cropping Pattern:

The timing and spatial arrangement of crops are referred to as the cropping pattern. Physical, economic, and social considerations are the causes of the variety in cropping patterns. It is a result of the variance in the physical environment's different elements, including relief, climate, vegetation, and soil. Cropping is impacted by economic factors through the comparative return that a farmer obtains from a certain crop or from a mix of crops.
We have examined the area under cultivation for each of the 13 crops separately at the block level during the duration of this section, from 1991–1992 to 2019–20. The acreage under cultivation for each crop varies from year to year.This is primarily due to the farmers' cyclical crop production practises, natural disasters, etc. We ignored the cyclical character in order to comment on the cropping patterns of the districts and their blocks, and we took into account the average area under cultivation for each crop at the block level from 1991–1992 to 2019–20.

The major crops for the other blocks are provided below:

Harischandrapur II: aman (36.2 percent), boro (22.3 percent) and wheat (12.0 percent. The other crops are having a share less than 10 percent individually.

Chanchal I: aman (33.6 percent), boro (16.9 percent), wheat (12.6 percent), Jute (10.5 percent and mustard (10.3 percent).

Chanchal II: aman (37.2 percent), boro (19.3 percent) and wheat (10.0 percent).

Ratua I: aman (22.4 percent), boro (16.3 percent) and wheat (13.9 percent).

Ratua II: boro (19.2percent), aman (18.4 percent), wheat (12.5percent) and mustard (10.2 percent).

Gazole: aman (58.7 percent) and mustard (12.0 percent).

Bamongola: aman (56.2 percent), mustard (13.0 percent) and boro (10.1 percent).

Habibpur: aman (70.7 percent), and boro (11.1 percent).

Old Malda: aman (39.3 percent), and boro (21.1percent).

English Bazar: mango (31.3 percent), boro (11.9 percent), mustard (11.2 percent), aus (11.0 percent) and aman (10.0 percent).

Manikchak: wheat (21.0 percent) kalai(13.4percent), aus (10.6 percent) and mango (10.2 percent)

Kaliachak I: wheat (20.2 percent), mango (15.6 percent), boro (11.0 percent) and mustard (10.8 percent)

Kaliachak II: wheat (20.8 percent), aus (18.2 percent), mango (12.8 percent) and gram (10.5 percent)

Kaliachak III: wheat (25.1 percent), aman (14.4 percent), kalai (10.3 percent), mustard (10.2 percent) and boro (10.1 percent)

Changing Cropping Patterns:

We now attempt to study the changes in cropping pattern after examining the pattern and realizing its significance. Given its significant contribution to agricultural

productivity, cropping pattern change is a major topic for agricultural geographers.
With the dynamics of agricultural productivity, the area under cultivation for different crops is bound to experience a shift. The causes for this shift can be

1) Increase in returns of any particular crop
2) Technological feasibility
3) Change of preference
4) Non-availability of resources.

In this section we attempt to analyze the changing cropping pattern of crop cultivation in the district. The objective of this section is to identify the cropping pattern in each region and analyze the changing nature of it.

Methodology:

To estimate the pattern of the shift at the block level we have considered the area under cultivation for individual crops. This analysis makes a comparative study between Period I (2001-2002 to 2004-2005) and Period II (2005-2006 to 2008-2009). The analysis is made at the crop group level viz. Cereals (Aus, Aman, Boro and Wheat), Pulses (Arhar, Gram, Kalai and Lentil), Oil-seeds (Mustard and Linseed) and Cash crop (Potato, Mango and Jute) as breaking these crop groups to individual crops makes the analysis complex and inappropriate to draw conclusions. Using the average area for Period I as base (=100) the average area for Period II is calculated.

Results:

The index value for Period II indicates whether the average area in absolute terms has increased or decreased at the block level for all crop categories because the index value for Period I is equal to 100.

For the district as a whole, it is noted that Period-II saw a rise in the area planted in cereals (102.9 percent of Period-I). Cash crops have shown a similar growth rate of 2.8%. The area under cultivation for pulses and oilseeds in Period II has decreased to 81.3 and 82.7 percent of Period I, respectively.

In Harishchandrapur I, we discovered that while the area under cultivation for cereals climbed to 104.2% of Period I in Period II, it decreased for pulses, oilseeds, and cash crops to 62.22%, 76.38%, and 86.32%, respectively. As a result, we discover that the area under the pulses has been severely damaged.

The area planted with grains in Harischandrapur-II rose by 16.5 percent from Period-I to Period-II. The move to cereals in the block can be seen in period-drop II's of pulses, oilseeds, and cash crops at 63.7 percent, 85.0 percent, and 95.3 percent, respectively. The various paddy crops can be used to illustrate the reasons for the increase in food prices.

The area planted with cereals and cash crops climbed to 114.1 percent and 112.7 percent of Period-I, respectively, in Chanchal-I. This gain comes at the expense of a 59.0 percent and an 84.1 percent reduction in pulses and oilseeds, respectively.

Pulses, oilseeds, and cash crops all experienced declines in Chanchal II, falling by 71.7 percent, 97.2 percent, and 66.0 percent, respectively. Only grains have seen a growth of 109.6% during that time.

Ratua-I exhibits an odd pattern, with declines of 99.2%, 82.88%, 83.68%, and 95.68% for each of the crop groupings of cereals, pulses, oilseeds, and cash crops, respectively.

The area of pulses and oilseeds has decreased to 82.0 and 81.4, respectively, in Ratua-II, while the area of cash crops climbed by 11.3 percent and the area of cereals remained the same.

The area used for cash crops has drastically decreased in Gazole. The fall in jute cultivation is the main cause of this drop. Pulses and oilseeds are down to 79.7 percent and 95.2 percent, respectively. Only the cultivation of grains rose in the block during Period II, reaching 108.5% of Period I levels.

A distinctive pattern of crop changes is seen in Bamongola. Here, the area used for cereals, pulses, and oilseeds has decreased to 85.0%, 74.30%, and 93.40%, respectively, while the area used for cash crops has climbed to 121.40%.

Cereals and cash crops are Habibpur's two main crop types, with an increase in area under cultivation of 126 percent and 141.5 percent, respectively. As a result of the poor base for cash crops, this significant increase in cash crops shouldn't be taken too seriously. The area has decreased to 76.8% and 93.33% for pulses and oil seeds, respectively.

While the amount of land planted in cereals, pulses, and oilseeds decreased in Old Malda to 81.2 percent, 76.6 percent, and 89.3 percent, respectively, a remarkable increase to 166.8 percent is seen for cash crops. The expansion of the mango and jute industries is to blame for this sudden increase.

The fall in the amount of land being cultivated for each of the major crop groupings in English Bazar is an odd trend. The percentages for cereals, pulses, oilseeds, and cash crops in Period-II are 91.1 percent, 73.4 percent, 74.5 percent, and 97.1 percent, respectively, higher than in Period-I. The urbanisation of the block is what is to blame for this deterioration.

Manikchak depicts a contrasting pattern of change, with the area cultivated for cereals, pulses, and cash crops increasing to 110.0 percent, 103.5 percent, and 117.7 percent, respectively, in these blocks. Three primary crop groupings have increased, but at the expense of oil seeds, which have decreased to 71.1. The efficient use of repeated cropping is the main cause of this increase.

Cash crop production has increased dramatically in Kaliachak-I. It has risen to 168.3 percent, mostly as a result of more land being covered by mango orchards. The area used for growing cereals has also expanded by 21.1%, whereas the areas used for growing pulses and oilseeds have decreased to 71.8% and 91.7%, respectively.

The trend has changed in Kaliachak-II, with an increase in pulses and cash crops (109.6% and 106.2%) and a decrease in cereals and oilseeds (73.6 and 82.8%).

Finally, a pattern can be seen in Kaliachak-III, which is characterised by a stunning increase in the area under cash crops to 218.8 percent. More land is now being used for jute farming, which has resulted in this phenomenal growth. There is a reduction to 75.4 and 79.4 percent for grains and pulses,

respectively. A notable aspect of this block is the sharp reduction in the area covered by oilseed, which fell to 43.8%. The decrease in mustard cultivation area is the main reason for this decline.

Cereals have increased in the Tal and Barind regions when we look at the change in relation to a broader domain, or region, as in Period II. 107.6 percent and 103.9 percent of the Period-I area are under cereal cultivation for the two blocks. For the Diara region, it has fallen to 90.2%. As a result, a little rise in the district as a whole's area under cereal cultivation is seen (102.9 percent of Period-I).

In all regions, less land has been used for growing pulses. Barind (76.6 percent of Period-I), Tal (74.1 percent of Period-I), and Diara (74.1 percent of Period-I) all see significant declines (89.4 percent of Period-I). As a result, the district's total area under cultivation has decreased by 19.7%.

We found a downward trend in the area being cultivated for oilseeds as well. Although the rate of decline varies by block, it is mild in Tal (15.3 percent) and Barind, while the decline of 34.6 percent is severe in Diara (6.4 percent).

For the district, there has been a little increase in cash crop cultivation of 2.8%. The breakdown by region is as follows: Tal experienced a 6.1 percent decline, Barind grew by 6.8 percent, and Diara experienced a 16.8 percent increase.

As a result, we discover that the district's cropping pattern has changed, with a little increase in the area planted in cereals and cash crops and a decrease in pulses and oilseeds. There has been a slight decrease of 1.9 percent in the total area under cultivation for all of these crop types when compared. This is mostly because of the flood, which reduced the area under cultivation.

We make the oversimplified assumption that the pattern of change within a region is identical throughout the blocks, which prevents this research at the region level from aiding in the investigation of the variables that have driven this shift. To get around this, a clustering strategy based on the composition of altered cropping patterns was used to group the blocks. In this direction, we examined the Period II indices and made an effort to categorise them according to commonalities in evolution.

According to the pattern of cropping pattern change, Cluster I, which includes Harishchandrapur II, Chanchal I, Ratua I, Ratua II, Habibpur, Manikchak, and Kaliachak I, exhibits a spectacular increase in the area under cereal and cash crop cultivation and a sharp decline in the cultivation of pulses and oil seeds. The conclusion that can be drawn from this change is that there is a reallocation of cultivable territory taking place in these blocks.

The blocks Harischandrapur-I, Chanchal-II, and Gazole exhibit a comparable pattern of change for cluster II. Here, the area used for growing pulses and cash crops has drastically decreased, while the area used for growing oilseeds has decreased just a little. In these blocks, the area used for cereal cultivation has slightly increased.

When compared to the previous clusters, Cluster III, which consists of Bamongola, Old-Malda, English Bazar, Kaliachak-II, and Kaliachak-III, exhibits a different

pattern of change in the area under grain agriculture. Here, the area used for cereal farming is declining. There has been a reduction in this cluster for oilseeds and pulses as well. The area of the cash crop in this cluster has significantly increased.

Growth Trends Analysis:

We discovered that cash crops have increased in area under cultivation over the period after examining the spatial distribution of various crop groups and illustrating the trend of area under cultivation for each crop group. However, it was impossible for the investigation to determine whether the rise or drop was statistically significant. Additionally, it was unable to pinpoint the specific crop that was responsible for the shift. We examined the growth trends in order to get around this and find the crops that are dragging and falling behind at the regional level. This section examines trends in growth rates for the main crops in Malda District from 1991–1992 to 2019–2020.

We go over the trend of area under cultivation for four crop groupings in the paragraphs that follow. Some intriguing trends are shown by the examination of Malda and its three regions.

Cereal: The land in Malda that is being used for cereal farming is not showing any discernible, stable pattern. However, the decrease of 13.7% is noteworthy for Australia. Over the same time period, a notable growth of 5.5 percent is seen for boro. Although the maximum area under cultivation in the district of Aman, which also happens to be the command, shows a modest increase, the growth rate is not appreciably higher. The slight reduction in wheat during that time, in comparison, is also not substantial.

When these growth rates are examined regionally, we discover that the aus decrease is most pronounced in the Diara and Barind regions and relatively low in Tal. Although growth is the overall trend for Aman, Tal's rise of 1.8% is noteworthy. Significant growth rates for boro are 6.3 and 9.3 percent for Tal and Diara, respectively.

Wheat growth rates over time were found to be negligible in all regions.

Pulses: For Malda as a district, the growth rates for the area under cultivation for pulses are found to be negligible. For specific crops, the growth rates of arhar, kalai, grain, and lentil are also negligible. In Malda district, there has been a slight but overall drop in the cultivation of pulses. Only arhar in the Diara region (26.0 percent) and kalai in the Barind region exhibit a considerable reduction according to the region-wise study (8.7 percent). Individual crops are declining across the region, although none of the drop rates are appreciably high.

Oilseeds: Over the course of the specified period, the district's oilseed crop area has generally decreased. All of the regions have noticed this trend. However, at the level of a specific location, the drop is not considerable. When we look at the two types of crops separately, both "mustard" and "linseed" are on the decline decreased. All of the regions have noticed this trend. However, at the level of a specific location, the drop is not considerable. When we look at the two types of crops separately, both "mustard" and "linseed" are on the decline. Again, the decrease for each region for

mustard is not very large. At the regional level, the linseed analysis remains unchanged.

Cash crops: For the district overall, no clear trend regarding the cash crop is apparent. When we look at each crop separately for the district as a whole, the study shows that mango has experienced significant growth (1.7 percent). For jute and potato, the change over time has been minimal and inconsequential. However, looking at each crop separately for the area reveals some fascinating information. For the Tal and Diara regions, jute's growth pattern is the opposite. Tal's decline (2.8%) is enormous, but Diara's situation is exactly the reverse, with a significant increase (14.3 percent).

Even though mango has had tremendous development at the district level, this increase has not been sustained at the regional level.

The aforementioned study is based on the physiographic divisions of areas, but because in this chapter we created clusters based on the shifting distribution of area under various crop groupings, we are now analyzing the relevance of this change in these clusters.

As a result, to wrap up this part, we see that there is a general tendency for the area under different crops to be declining. The three crops with the largest increase in cultivation are aman, boro, and mango. Policymakers need to take the decrease in area for pulses and oil seeds seriously because it contradicts the idea that as agriculture becomes more modernized, multiple cropping will become more common, leading to an overall increase in net area cropped, and farmers will tend to plant fewer cereal crops in order to grow a wider variety of crops. One could argue that as agriculture develops, productivity rises, keeping production unaffected in areas with less acreage planted in various crops. In addition, as cities grow and more land is used for other purposes due to urbanization, the amount of land planted in diverse crops is decreasing. We are now unable to support or argue against this theory.

Crop Combination Region:

The geographical study of agriculture that aims to choose several crops to be researched together in a region is known as "crop combination analysis." It is an analytical technique that J.C. Weaver invented to help define agricultural regions based on their multi-crop patterns.

There are primarily two methods we can use to determine crop combinations, namely statistical and semi-statistical. The latter is objective because the patterns of crop combinations are determined by calculating the actual crop percentages that deviate the least from the predicted distribution. The former is subjective because the patterns of crop combinations are set arbitrarily.

There are no challenging computations needed for the semi-statistical technique. There is a good risk of repetition in the presentation and perception of crop combination because it is an arbitrary choice strategy.

In order to determine crop combinations, the statistical method is more precise, scientific, and widely used than the semi-statistical method. Additionally, this strategy offers a broader range of applications and the ability to manage an

area's highly developed crop diversity or even agricultural redistribution.

Weaver's method compares the actual percentages of the cropped area that each type of field crop really takes up with theoretical distributions, where the cropped area is shared evenly among the component crops in each enumeration unit. The procedure's goal is to identify crop combinations that are determined by the closest similarity between the theoretical distributions and actual crop percentages.

This method of examining cropland occupancy by various crops with the aid of a common statistical procedure, particularly the least squares, has been refined by Doi (1959), Thomas (1963), Coppock (1964), Jasbir Singh (1974), and many others. The least-squares technique may be used as a substitute to get around this problem. It has been observed that the technique of the least deviation of actual percentages from the standard theoretical combination values is of little help for the identification of crop combinations in the enumeration units where the regional share of several crops is quite close to one another. In addition, the crops at the first or second ranks in the computed crop combination may have actual percentages that are significantly higher than the crops at the lower ranks; this variation in actual percentages is only displayed in the combination in a ranked format, without taking into account the relative importance of the crops or the percentage strength of each crop. The Weaver's method is mathematically correct, but it involves a lot of calculations. Furthermore, Weaver (1954) acknowledges that occasionally this method tends to indicate the lowest deviation for a crop combination that includes even a crop occupying as much as one percent of the total produced acreage. Doi has proposed a modified version of Weaver's method (1959).

Or the crucial value for all the elements at different ranks versus 50 is zero for all those crops that are included in the combination whose cumulative percentage is less than 50. As a result, the cumulative percentage begins above 50% and is made up of the higher ranks, such as the first, second, third, and so forth crops. Aman accounts for 33.87 percent of the first crop in Malda. When the following crop, boro, is added to the other two, the total yield of the first two harvests is 48.26 percent.

The significance of the crops shown by shading and their percentage of farmed land It is discovered that these five crops cover 75.4% of the land. The fact that jute accounts for only 5.76 percent of all farmed land suggests that the other crops are not particularly important. between 1993-1994 and 2000-2001.

As a result, we discover that the Barind region, which is less developed and has subpar irrigation systems, cannot implement multiple cropping. In contrast, the Tal region balances its crop production between the Kharif and Rabi seasons, growing aman and jute in the summer and boro, wheat, and mustard in the winter. The principal crops in the Diara region now include wheat, au, boro, mustard, and aman in addition to mango, gramme, and kalai. This analysis demonstrates that the crop combination can be made productive with suitable irrigation facilities and a blend of food crops and cash crops. The district's agricultural situation is probably going to become more stable as a result.

This analysis offers crucial details on the district's combination pattern in the 1990s but is unable to determine the type of change taking place there. To measure the shift, we split the 1991–1992–2019–2020 era into two subperiods: Period I, from 2011–2012 to 2014–2015, and Period II, from 2015–2016 to 2019–2020. Following that, the same crop combination analysis is carried out for the two periods.

Manikchak and Kaliachak-II are the only two blocks in Malda during Period I where aman does not appear as a substantial crop. Aman is one of the major crops in all other blocks, though its relative place in the hierarchy varies from block to block. Aman is not the most important crop in English Bazar, Kaliachak I, or Kaliachak III; in all other blocks, it is at the top of the hierarchy.

The many important crops grown in each block from 2011–12 to 2014–15. A closer view reveals that the blocks in the northern lowlands are primarily planted with aman, boro, jute wheat, and mustard, even though no clear pattern is yet apparent. Aman and mustard were the main crops in the western highlands of Barind, which were beset by irrigation problems, whereas in the southern section, i.e., Diara, agriculture had greatly expanded; the main crops included wheat, aus, mango, mustard, aman, boro, gramme, and kalai.

CONCLUSION:

An essential part of a nation's economy is agriculture. Following the various cropping patterns is crucial for a strong economy, and the cultivation is influenced by a number of elements. Thus, we can draw the conclusion that economic variables significantly influence the cropping pattern in Indian agriculture. Despite their extreme poverty, Indian farmers have the urge to alter their farming patterns. More land being cultivated has traditionally resulted in higher food output. However, all of the land that can be profitably farmed is already in use in a significant portion of the world, particularly in Asia. Most of the additional food requirements in the future will have to be met by increased output on already-farmed land. A sizable portion of this growth is probably the result of employing better crop cultivars to enhance the number of crops produced each year on a given plot of land. Such multi-cropping has the potential to worsen both land degradation and food production. Cropping systems are as old as agriculture itself in India. Farmers preferred mixed cropping to reduce the danger of complete crop failure, particularly in dry land conditions. First and second crops are mentioned in the Vedas as well, proving that successive cropping exists. A system is described as a collection of parts that are linked and communicate with each other. A cropping system is a collection of crop systems that together comprise the cropping operations of a farm system. A cropping system includes all the elements needed to produce a specific crop as well as the interactions between those elements and the environment. So, a cropping system typically refers to a combination of crops that are grown at different times and in different places. When crops are interplanted, combinations in space and time arise when they occupy distinct growth seasons. A cropping system typically refers to the combination of crops grown during a particular year when annual crops are being discussed.

- The district is primarily a cereal producing area with aman and boro as the primary crops for all the blocks of Tal and

Barind region. In Diara region wheat and mango assume greater importance.

- There is a definite pattern of the cropping pattern change in the district as it is found pulses arid oilseeds are losing the steam while cereals and cash crop are marginally growing.

- There is difference for sure in the change of cropping pattern between the regions, as it is found that the cereal cultivation is on the growth path in Tal and Barind, while it is not so for Diara; Diara shows a definite preference towards cash crops.

- There is no significant growth pattern observed for Malda district as a whole for the crops individually other than boro and mango increasing while aus declining.

- Further, Malda is found to be primarily a five-crop region, though there is wide regional variation as Diara is an eight cropped region against Barind a three cropped region and Tal a six cropped region.

- These differences itself highlight the regional variation in the cropping pattern, pattern of change and crop combination for the district.

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