Original Research Article

Land Size Class Categories Wise Change in Cropping Pattern in Malda District – A Block Level Analysis [Title unclear]

Abstract

Proportion of area under different crops and change therein remains a concern before policymakers, research thinktank, public policy analysts and, academia like geographers. As cropping pattern ~~really do~~determines food security, internal consumption demand and export of crops,~~therefore policy concerned is felt for~~ sustainable cropping arrangementis of prime importance. The present paper is an attempt to examine the pattern and extent of cropping across land size categories at block[???] in Malda district of West Bengal. The change in cropping pattern from 1995-96 to 2015-16 has been assessedthrough secondary sources of data.The data for 2015-16 has [was?]extrapolated based on previous years (2005-06 and 2015-16) interpolated data. Data were process in Excel spread sheets and results are shown through maps and tables. The maps were prepared in QGIS 2.18. The findings of the study show thatgross cropped area under cereals, pulses and vegetables noted negative growth while fibres, oilseeds and fruits area increase across land size classes but gain is maximum under marginal land size class. Total area under food crops decreased substantially over non-food crops. The study suggests policy intervention measure to boost up economically profitable crops for sake of development of the district.

Keywords: cropping pattern, land size category, food and non-food crops

Introduction: Cropping pattern means the proportion of area under various crops at a point of [in?] time. Cropping pattern ishowever, a dynamic concept as it changes over space and time. The cropping pattern of a region is closely influenced by the geo-climatic, socio-cultural, economic, historical and political factors (Husain M., 1996). The cropping pattern is influenced by the physical factors such as soil, climate; technological factors like irrigation, improved varieties of seeds, availability of fertilizers, and plant protection chemicals; institutional factors like land reform, consolidation of holdings, credit facilities, price structure, procurement policies, and storage facilities (Shafi, 2006). Climate plays a crucial role in determining the existing cropping pattern. From the time the crops are sown, till the produce is harvested and stored they are more or less at the mercy of the climate. Any abnormalities in the climate during the growing season, such as delay in the outbreak[onset?] of rains, dry spells or access[excess?] rains, too high or too low temperatures would seriously affect the growth and final yield of the crop. The cropping pattern varies from region to region due to the variation in the terrain, slope, temperature, amount and reliability of rainfall, soils, availability of water for irrigation, use of fertilizers, pesticides and mechanization.

Cropping pattern must ensure the greatest efficiency of manpower, fertilizers, irrigation and other inputs. It is a dynamic concept as no cropping pattern can be suitable for all times to come. A successful cropping pattern implies the most efficient use of arable land, consequent upon application of water resources, bio-chemical inputs and the like ~~so~~. In addition, it must offer the cultivators the possibility to maximize agricultural productivity per unit area in per unit of time. ~~No cropping pattern can be good for all times to come.~~[A repetition?] But there is often a tendency for the cropping pattern to stabilize over a period of time in the different agro-climatically homogeneous farming area (Singh and Sharma, 1985). Krishna (1972) in his studies has also stressed that cropping pattern of the country should logically be being[???]with the study of its climatic and soil conditions which constitute the regional and sub-terranean environment of crop plants. In most of the situations, the physical environment reduces the choice of enterprise, either by prohibiting the growing of certain crops altogether or by reducing their level of output to an unprofitable degree (Morgan and Munton, 1971).

Study Area [should be under Materials and Methods I think]

~~In the present study~~ Malda district of West Bengal ~~has been selected as study area. It~~ is located between 24°40'20" and 25°32'8" N latitudes and 87°45'50" to 88°28'10" E longitudes. It is bordered in the south by Murshidabad district, on the north by Uttar Dinajpur district. On the east, the district is bounded by Bangladesh, on the west by the state of Bihar, on the northeast by Dakshin Dinajpur district and, on the southwest Jharkhand state. Spreading over an area of 3733 sq.km with a population of 3988845 persons in 2011. The district covers 4.7 percent of the total area of the state and is home to 4.1 percent of the total state population. According to Agriculture

Location of Malda District [Consider proper placement of the maps, all of them; as they are consuming too much space within text. Place them as appendices after the text.]

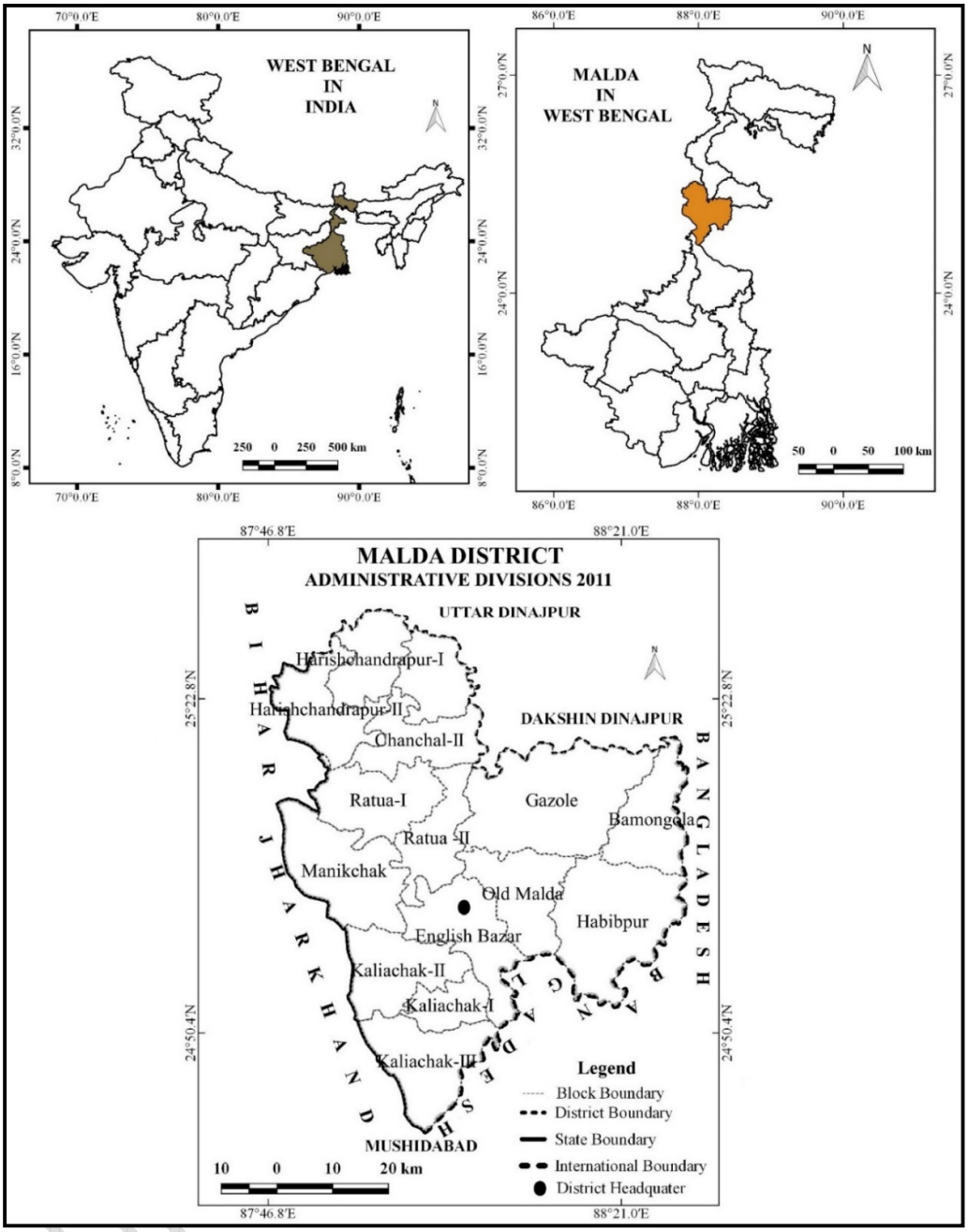

Figure: 1

Source: Base map sourced from Census of India 2011

Census 2015-16, class wise land size categories are 83.40 percent marginal (below 1 ha.), 12.65 percent small (1-2 ha.), 3.66 percent semi-medium (2-4 ha.), 0.29 percent medium (4-10 ha.) and about 0.00 percent large (above 10 ha.). There are multiple numbers of crops grown of different seasons in the district (see Annexure 7)

Objectives [send back to Introduction]

The overall objective of the study is to examine the extent~~and patter~~ of cropping pattern change across land size class categories at the block level from 1995-

96 to 2015-16.[Fine. But the rationale for the study is not made clear. Why did you have to do the work?]

Database and Methodology

The present work is based on secondary ~~sources of~~ data~~Secondary data is~~ obtained from Agriculture Census of India and Statistical Handbook of Malda.

Data for 2015-16 Agriculture Census and 2016-17 Input Survey are extrapolated. For extrapolation, data on Agricultural Census of 2005-06 and 2010-11 is interpolated first, and then an average of last three years is taken as the data for 2015-16. The same technique has been used for 2006-07 and 2011-12 input survey data to get 2016-2017 data. [Is this your own improvised technique? Otherwise cite reference.]

$$\textbf{Interpolation} = \frac{\text{Base year data} + (\text{Recent year data} - \text{Base year data})}{\text{Number years (here Five)}}$$

Here for Agriculture Census data, the base is 2005-06 and the recent year is 2010-11

Results and Discussion

Gross Cropped Area (GCA) is the total area sown once as well as more than once in a particular year. When the crop is sown on a piece of land ~~for~~ twice, the area is counted twice in GCA. This total area is also known as total cropped area or total area sown. The term "agricultural land use" denotes the extent of the gross cropped area during the agricultural year under various crops (Vaidya, B.C. 1997).

Increase in gross crop area is an indication of intensive cultivation process that isonly found when component of agriculture development increase substantially in a region. Along with physical environment, human infrastructure in the form of irrigation, machinery, HYV seeds, fertilizers, insecticide and pesticide, credit System, market infrastructure and socio-economic circumstances individually or combined ~~in all have been~~ impact positively in increase of gross cropped area in any region. Subsistence agriculture always is intensive in nature which ~~fetch~~can utilize thecropped area more than once - twice, and even thrice. Here cropping pattern under different crops categories has been explained at two points of times (1995-96 and 2015-16).

Change in Gross Cropped Area

Figure 2, based on Annexure 1 to 6 illustrate positive change in GCA under marginal land size category while other land size classes have recorded the negative change from 1995-96 to 2015-16 in the district. Under marginal class, ~~it is~~ Kaliachak-III noted maximum positive growth i.e., 27.26 percent. Manikchak (12.53%) in smallland size class and Kaliachak –III (0.14%) in semi-medium land size class also have found positive change. None of the blocks recorded negative growth in marginal land size class but ~~it is~~ Harishchandrapur-II (13.88%) in small, Ratua-I (16.73%) in semi-medium, Ratua –I (17.33%) in medium and Kaliachak-III (0.29%) in large land size class ~~locates~~recordedmaximum negative change in GCA over two decades. Increasing use of modern agricultural inputs for intensive cultivation is likely to be the reason behind substantial improvement in GCA under marginal land size classes in the district.

Change in GCA under Cereals

In 1995-96 there were six types of cereals, which increased to eight in 2015-16 (see Annexure -1 to 6). Paddy took maximum area among all cereals in both years. Gross cropped area under cereal crops ~~reports decrease substantially~~showed a substantial decreaseacross land size classes in the district (Figure 2). Low productivity, instability of price and market opportunities might have been ~~impact~~ ~~in~~responsible forsuch negative change. It appears in Table 3.10 that marginal (9.57%), small (9.53%), semi-medium (5.19%), large (31.19%) and all land size classes (9.29%) have recorded the negative change in the district. English Bazar with 25.45 and 25.82 per cent in marginal and small land size classes ~~finds~~ recorded maximum decrease among the blocks. Ratua-II (29.54%), Chanchal –II (31.28%), Kaliachak-III (19.45%), and English Bazar (23.90%) depicts negative change under semi-medium, medium, large and all land size classes respectively. The positive change traces across land size classes in Gazole block. Except marginal and all size category, Ratua –I have found positive change. Except medium class, same is true for Old Malda block.

Change in GCA under Pulses

According to Agriculture Census, there were four types of pulses which increased to seven in 2015-16 (seeAnnexure 1 to 6). Among all pulses, share of urad (black gram) and masure (lentils) were higher than other pulse crops in both the years.

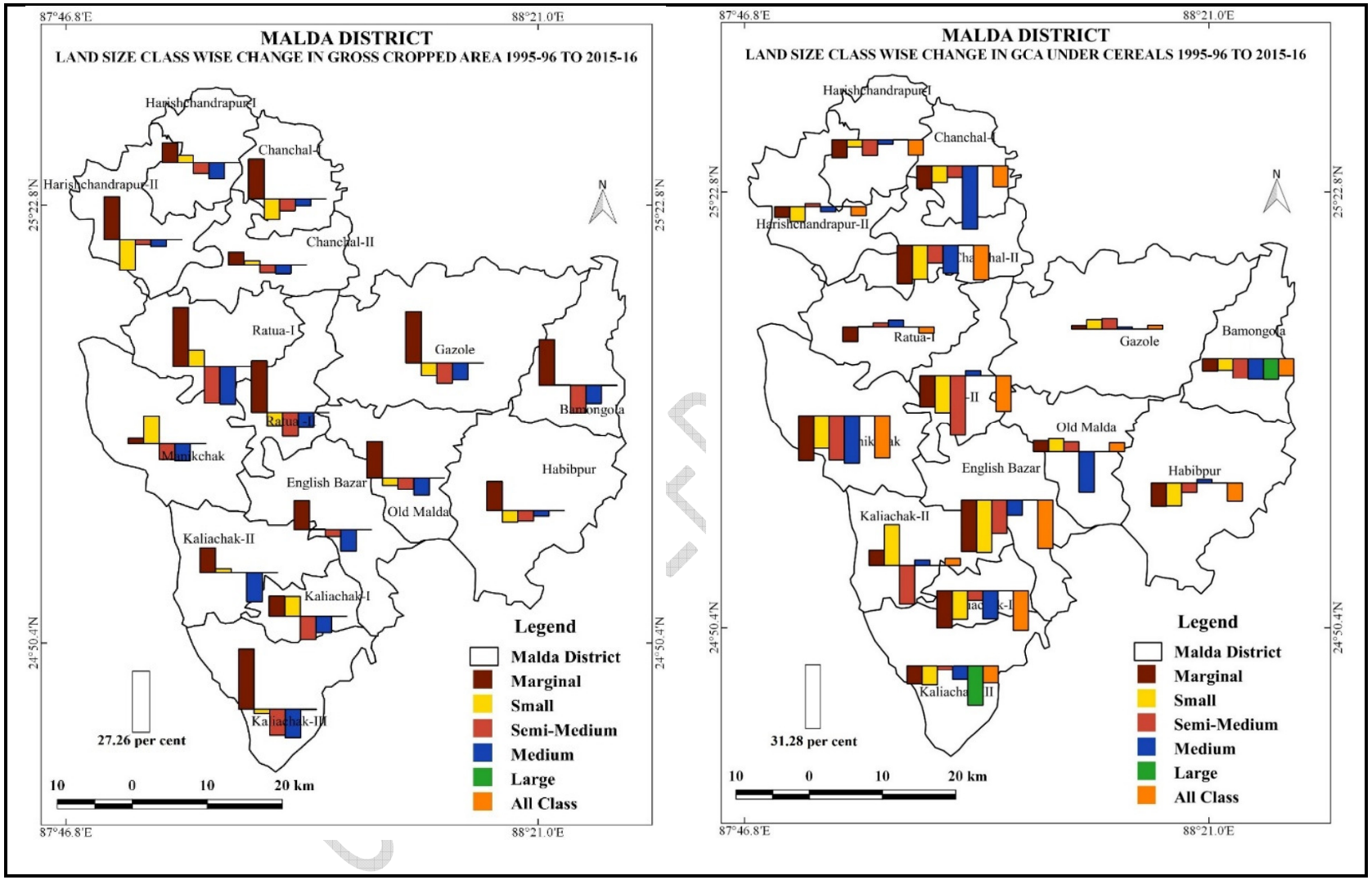

Figure: 2

Source: seeAnnexure 1 to 6

Figure 3 indicates that GCA under pulses decreased across the land size class category in the district. The maximum decrease is noticed under medium land size class category i.e., 4.84 percent area in the district. Among the blocks Bamangola and Chanchal-II noted an improvement in different land size class category from 1995-96 to 2015-16. Harishchandrapur-II also ~~finds~~showedpositive growth except medium land size class category. In terms of highest negative growth, the blocks are Kaliachak-III (12.26%) in marginal, Ratua-I (12.83%) in small, Ratua-I (17.54%) in semi medium, English Bazar (6.87%) in medium and Kaliachak-III (12.02%) in all land size classes in the district. Large land size category adds positively in the gross cropped area under pulses. Low productivity, diseases and climate variability are the reasons behind such negative change ~~though it is~~despite beinghigh value crops.

Change in GCA under Spices

In total spice crops, chilies' share remains maximum in total GCA in 1995-96 and 2015-16. There were four crops under spices raised to fifteen over two decades. Gross crop area under spices crop in the district shows a positive change only in marginal and all land size class category (seeAnnexure -1 to 6 and Figure 3) due to high profit and low cost of cultivation. Five blocks namely, Bamangola, English Bazar, Harishchandrapur-II, Kaliachak-III, and Ratua-II recorded the positive change in gross cropped area under the spice's crops (see Annexure 1 to 6) across different land size class category. Maximum positive change among the blocks was found under marginal land size class for English Bazar (1.64%) block. The maximum negative growth records wereunder small land size class in Chanchal – II (0.53%) block. In semi medium category maximum positive and negative change was recorded in Manikchak and Chanchal-II respectively. In all land size class category, English Bazar (1.01%) and Gazole (0.10%) ~~finds~~showedthe maximum and minimum change in the district.

Change in GCA under Oilseeds

In terms of share in total GCA under oilseeds, mustard is the number one crop in six and nine oilseeds of 1995-96 and 2015-16 respectively (see Annexure-1to 6). Figure 3 provides information on positive change in gross cropped area under oilseeds because of higher profit opportunity, family consumption and low inputs required. Except large category, other land size classes report an increase from 1995-96 to 2015-16. Bamongola is the most consistent block in the district which recorded growth under all land size class category.

Maximum growth in marginal (15.86%), small (17.06%) and all land size class (14.78%) was recorded under Habibpur while Bamangola block gains maximum under semi-medium (17.47%), medium

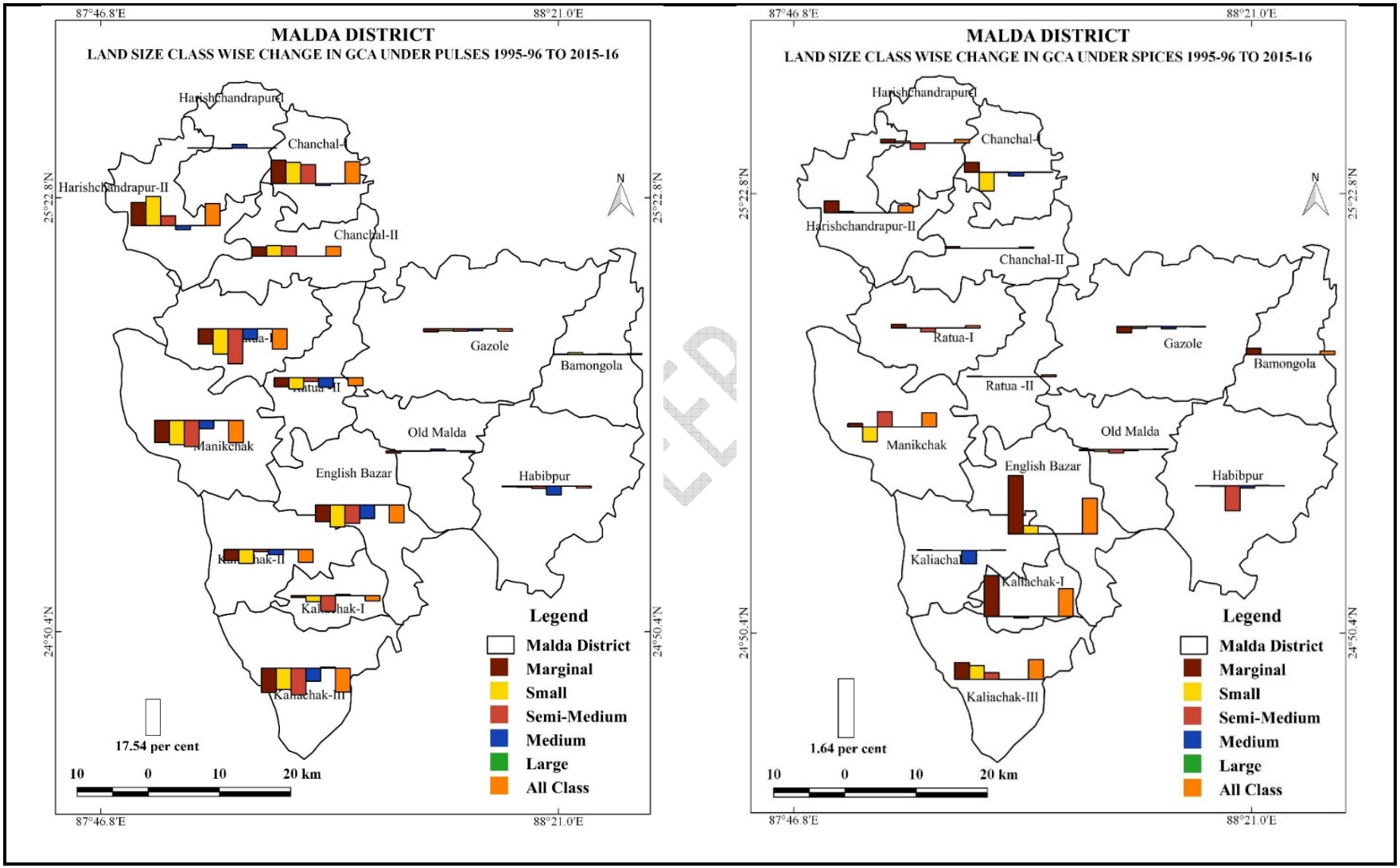
MALDA DISTRICT
LAND SIZE CLASS WISE CHANGE IN GCA UNDER PULSES 1995-96 TO 2015-16
87°46.8'E
88°21.0'E
25°22.8'N
24°50.4'N
N
Harishchandrapur-I
Chanchal-I
Harishchandrapur-II
Chanchal-II
Gazole
Bamongola
Old Malda
Manikchak
English Bazar
Habibpur
Kaliachak-I
Kaliachak-III
17.54 per cent
10 0 10 20 km
Legend
Malda District
Marginal
Small
Semi-Medium
Medium
Large
All Class
MALDA DISTRICT
LAND SIZE CLASS WISE CHANGE IN GCA UNDER SPICES 1995-96 TO 2015-16
Harishchandrapur-I
Chanchal-I
Harishchandrapur-II
Chanchal-II
Ratua-I
Ratua -II
Gazole
Bamongola
Old Malda
Manikchak
English Bazar
Habibpur
Kaliachak-I
Kaliachak-III
1.64 per cent
10 0 10 20 km
Legend
Malda District
Marginal
Small
Semi-Medium
Medium
Large
All Class

Figure :3
Source:see Annexure 1 to 6

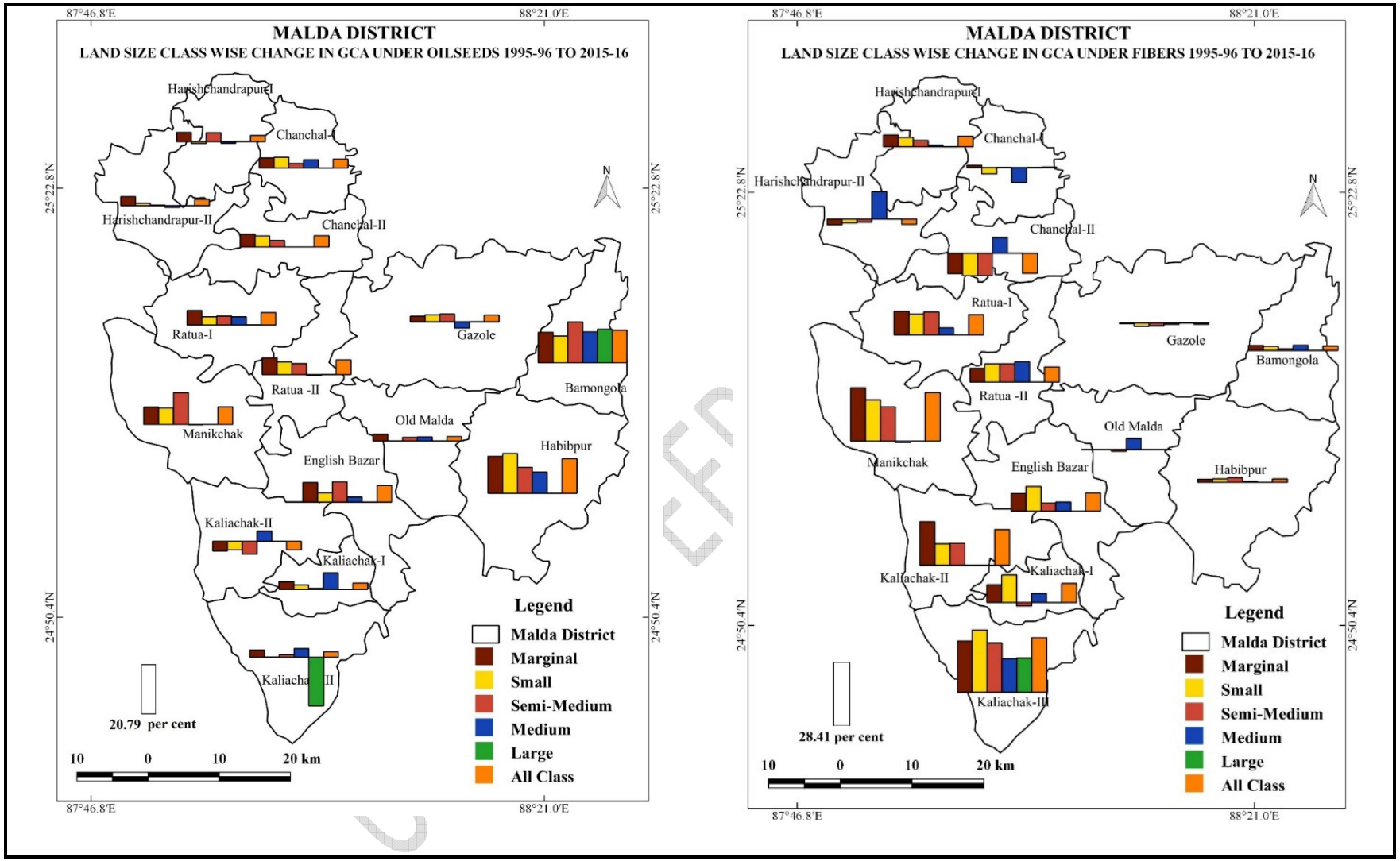

Figure :3

Source:see Annexure 1 to 6

(13.28%), and large (14.43%) land size among the blocks in the district. The maximum decrease is recorded in Kaliachak-II under marginal (4.16%), small (3.71%), semi-medium (5.46%) while Gazole (2.78%) in medium, Kaliachak-III (20.79%) in large and Kaliachak-II (3.64%) in all land size classes ~~have found the same~~showed same results.

Change in GCA under Fibers

Agriculture Census disclosed four types of fiber crops grown in the district for 1995-96 and 2015-16. In total fiber crops (jute, cotton, mesta and sun hemp) [Did you mean here *Crotalaria*? Is it a fiber crop?]area under jute was maximum in both census years. Annexure depict gross cropped area under fiber crops recording an increase under marginal (5.11%), small (4.09%), semi-medium (2.37%), large (7.06%), and all land size classes (4.57%) in the district. The reason behind overall growth in GCA underfibers are ~~it is~~their beingrisk free, durable and can be stored for long. The maximum increase was recorded for Kaliachak -III in small (28.41%), semi- medium (22.44%), medium (15.24%) large (15.59%) and all land size classes (24.87%) among the blocks in the district (Figure 3). In marginal land size class category, Manikchak block ~~is~~ recorded maximum increase that is 24.28 percent. Gazole is the only block which ~~founds~~showednegative change across different land size class categories in the district. The overall district scenario, Chanchal-I seems negative change under marginal (9.37%), small (10.31%) and semi-medium (10.24%) classes. Chanchal-I (6.79%) and Chanchal-II (9.28%) recorded negative change under medium and all land size classes respectively.

Change in GCA under Vegetables

Under vegetables, maximum numbers of crops were reported from 1995-96 (3 crops) to 2015-16 (25 crops) in the district (seeAnnexure 1 to 6). Though the number of crops increased,the share of vegetables in total GCA of the district decreased. In both the year potato was the number ~~of~~onecrops among vegetables. Annexure 1 to 6 illustrate negative growth in the gross cropped area under vegetables across different land size category in the district. In medium category except for Ratua-II and Old Malda category of Old Malda, all other blocks recorded negative changefrom 1995-96 to 2015-16 in the district. The reason ~~being in~~forthe decrease of GCA under vegetables are high risk, instability of price and some external causes such as market demand making vegetable cultivation less profitable to the farmers.The maximum and consistent decrease in percentage of GCA among the blocks was found in Bamangola under marginal (10.64%) class, small (9.09%), semi-medium (8.64%), in

all land size classes (8.80%) and English Bazar (8.80%) in medium in the district. The maximum increase in the district

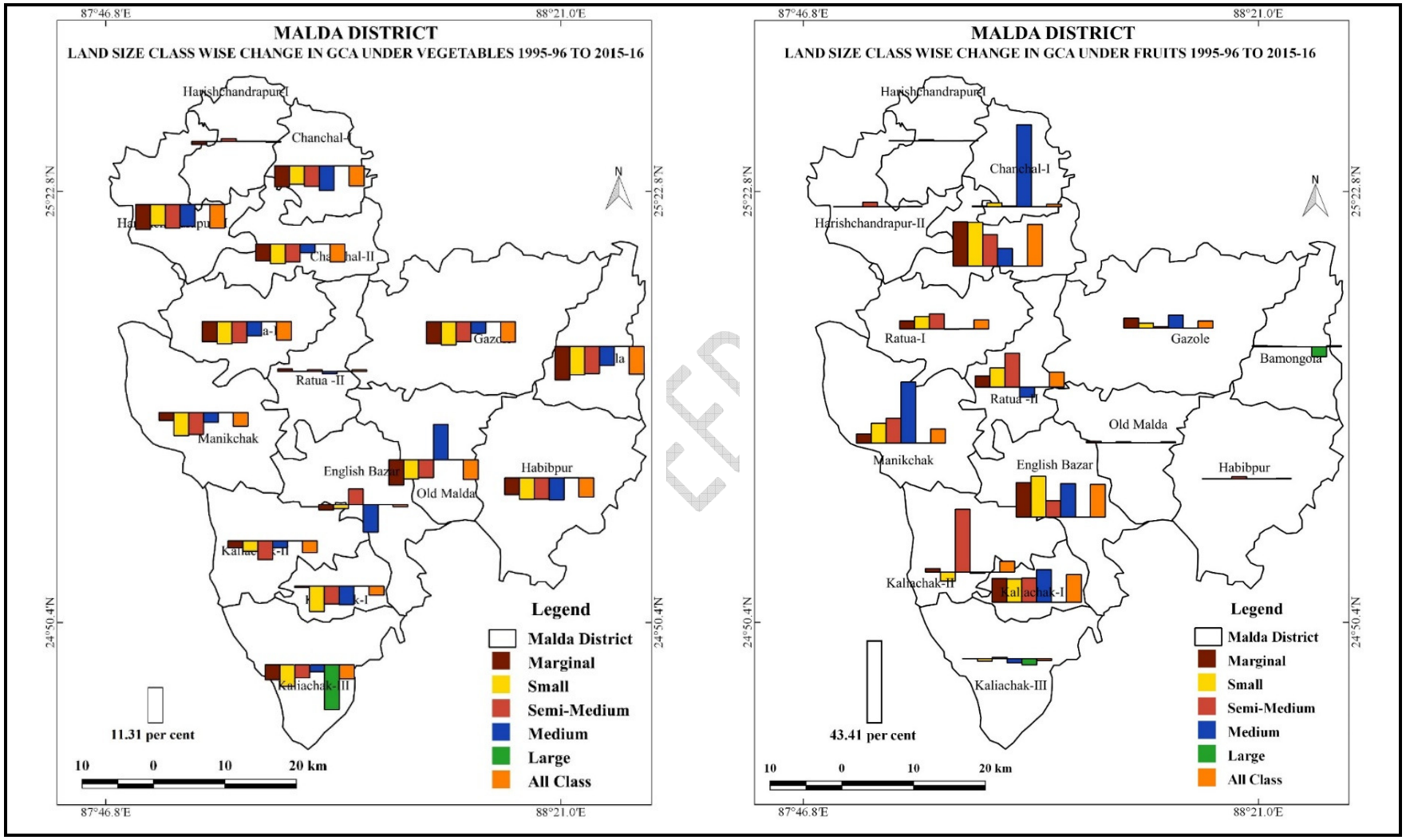

Figure :4

Source:see Annexure 1 to 6

reports under medium land size class category for Old Malda block that is 11.31 percent (Figure 4).

Change in GCA under Fruits

An increase of nine crops (4 to 13) was notedby 2015-16, with mango commanding maximum share of GCA among all the fruits in the district. Percentage of GCA occupied by varieties of fruits ~~seems~~showed increasing trends due to profit and consumption. Except for large land size class category, the district reported positive change in gross cropped area under fruits dominated by mango and litchi. Maximum percentage gain in descending order ~~is~~ follows from small class (6.74%), semi-medium (6.24%), all classes (5.76%), marginal (5.29%), and medium (4.56%) land size category from 1995-96 to 2015-16 inthe district (Annexture 1-6 and Figure 1). Along with fruits cultivation especially mango other crops such as oilseeds and other could be grown on same field therefore, fruits area in district have increased substantially from last two decades. In the block-wise scenario, Chanchal-I noted a positive growth under marginal (23.45%). The maximum increase among the blocks is found in Chanchal-I (43.41%) in medium category followed by Kaliachak-II (33.30%) in semi medium and Chanchal-I (22.13%) in all classes land size category in the district.

Change in GCA under Total Food Crops

Agriculture Census mentioned food crops are those which ~~are directly~~can be consumed directly. Therefore, cereals, pulses, vegetables, fruits and spices are counted under food crops. Except spices, all other food crops area reported a decrease in the district. Spices crops are grown for both consumption and marketing and that is why spices generate income to the farmer households. Figure 4 depicts that Gross cropped area under food crops is showing a decrease across different land class categories in the district. It showed maximum decline under large land size class (12.50%), followed by marginal (10.41%), all classes (10.20%), small (9.48 %), semi-medium (7.49%), medium (5.86%) in the district (See Annexure 1 to 6). Except Chanchal-I in marginal, small and semi-medium, Harishchandrapur-II in small and semi-medium, Manikchak in medium, Old Malda in small, Gazole in medium, Chanchal -I in medium and Chanchal -I all land size class category, all other blocks under different land size class categories have found negative change in gross cropped

area under food crops in the district. Market risk, low productivity, rainfall variability and lack of storage facilities have beenidentified as causes behind such decrease.

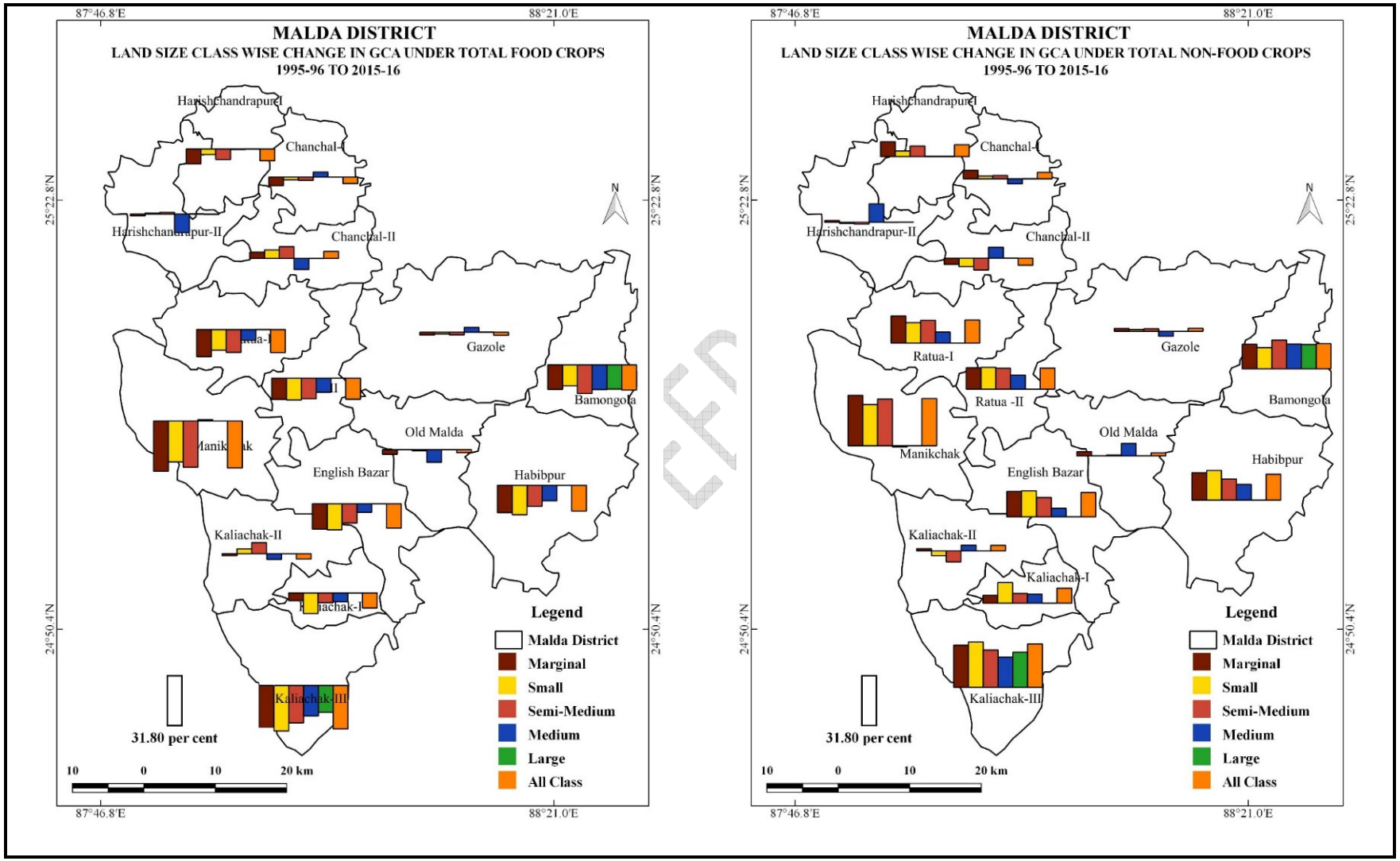
MALDA DISTRICT
LAND SIZE CLASS WISE CHANGE IN GCA UNDER TOTAL FOOD CROPS
1995-96 TO 2015-16
87°46.8'E
88°21.0'E
25°22.8'N
24°50.4'N
N
Harishchandrapur-I
Chanchal-I
Harishchandrapur-II
Chanchal-II
Gazole
Bamongola
Old Malda
English Bazar
Habibpur
Kaliachak-II
Kaliachak-III
31.80 per cent
10 0 10 20 km
Legend
Malda District
Marginal
Small
Semi-Medium
Medium
Large
All Class
MALDA DISTRICT
LAND SIZE CLASS WISE CHANGE IN GCA UNDER TOTAL NON-FOOD CROPS
1995-96 TO 2015-16
Ratua-I
Ratua -II
Manikchak
Kaliachak-I
31.80 per cent
10 0 10 20 km

Figure :1

Source:see Annexure 1 to 6

Change in GCA under Non-Food Crops

Agriculture Census has categorized non-food crops as fibers, oilseeds, floriculture, green fodder, drug and narcotics, bamboos and mulberry. From 1995-96 to 2015-16, area under non-food crops increased substantially because it generate new avenue for income and employment in the district. Gross cropped area under non-food crops exhibits positive change across different land class categories in the district. It experienced maximum gainunder large land size class (13.06%), followed by marginal (10.41%), all classes (10.20%), small (9.48 %), semi-medium (7.49%), medium (5.86%) and the district (Figure 5). Except for Chanchal -II in marginal, Chanchal -II, Harishchandrapur-II Kaliachak-II, and Old Malda in small, Chanchal -II, Harishchandrapur-II Kaliachak-II in semi medium, Chanchal-I, Gazole, and Manikchak in medium and Chanchal-II in all land size classes categories have ~~found~~notedpositive change in gross cropped area under non-food crops in the district. GCA under non-food crops increased likely because of profit opportunities and low risk of cultivation.

Conclusion

The ~~present~~ study on change in cropping patternbased on land size class categoriesfound that net sown area, net cropped area and total area of the district shrunk from 1995-96 to 2015-16. ~~Net sown area though~~Despite this decline, gross cropped area reportedan increase~~from 1995-95 to 2015-16~~during the time. Share of gross cropped area under cereals, pulses and vegetables noted negative growth while fibres, oilseeds and fruits area increase across land size classes but gain was maximum under marginal land size class. Total area under food crops decreased substantially over non-food crops. The amount of change in cropping pattern in land size classes found that marginal category at top followed by the semi-medium and small. Keeping in view of marginalisation of change in cropping pattern under food and non-food crops the study suggests a balance cropping pattern where crop pattern should be profitable and viable sustainable alternative option in present situation.[Perhaps you should have studied the population change as well, so as to relate the decrease in food crop land with an increase in population if applicable.] Here the government role is highly felt. [What exactly do you suggest the government to do here? Expound further.]

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Annexure - 1
Gross Cropped Area under Marginal Land Size Category in Malda District

Block	1995-96								2015-16							
	% of GCA	Cereals	Pulses	Spices	Oilseeds	Fiber	Vegetables	Fruits	% of GCA	Cereals	Pulses	Spices	Oilseeds	Fibre	Vegetables	Fruits
Bamangola	32.83	73.72	0.07	0.01	12.08	0.05	13.96	0.11	53.71	67.64	0.43	0.19	25.15	2.43	3.32	0.82
Chanchal-I	44.72	69.54	2.04	0.01	1.53	17.9	8.94	0.03	62.89	58.22	13.97	0.29	5.86	18.95	2.18	0.53
Chanchal-II	50.58	74.32	0.55	0.01	3.65	12.11	9.13	0.15	56.37	55.39	5.34	0.06	9.11	2.74	3.75	23.6
English Bazar	40.82	65.94	10.9	0.1	0.68	0.69	11.99	8.63	54	40.49	2.41	1.74	9.09	8.78	10.27	26.93
Gazole	32.39	73.95	1.66	0.19	9.34	3.44	11.03	0.01	55.66	75.74	0.05	0.01	11.69	3.12	4.04	5.33
Habibpur	32.82	86.18	0.43	0.01	3.69	0.24	9.46	0	45.99	74.63	0.01	0	19.55	1.64	4.16	0
Harishchandrapur-I	55.69	81.46	0.27	0.02	4.18	11.3	2.75	0	64.72	72.54	0.44	0.13	8.08	16.79	1.77	0.22
Harishchandrapur-II	39.52	79.03	1.01	0	0.82	9.76	9.3	0.05	59.07	73.72	12.68	0.33	4.72	7.1	1.39	0.04
Kaliachak-I	58.83	34.7	1.4	0	0.5	0.39	6.55	24.64	68.17	16.36	0.4	1.16	3.91	8.5	6.07	37.33
Kaliachak-II	51.64	35.68	6.65	0	4.39	0.32	7.43	6.95	62.98	43.37	1.05	0.02	0.23	20.24	5.19	8.83
Kaliachak-III	35.8	56.7	13.84	0.24	1.35	16.47	10.05	0.48	63.06	47.76	1.59	0.72	4.52	39.79	5.32	0.23
Manikchak	57.32	60.82	17.46	0.68	0.48	7.64	8.67	2.94	59.79	38.41	6.24	0.77	7.89	31.92	6.19	7.84
Old Malda	40.97	82.31	1.2	0.12	1.33	1.44	13.54	0.04	57.64	87.8	0.07	0.08	4.19	1.42	5.54	0.9
Ratua-I	33.71	63.48	15.11	0	0.97	8.97	10.37	0.98	60.52	56.19	7.35	0.11	7.27	19.73	3.95	5.34
Ratua-II	37.06	87.22	6.56	0.07	0.06	2.05	1.32	2.73	60.63	71.58	1.96	0.09	7.29	8.26	2.2	8.62
District	41.32	70.26	5.2	0.12	3.17	6.88	9.01	2.32	58	60.69	4.15	0.32	9.29	11.99	3.97	7.61

Source: Agriculture Census 1995-96 and 2015-16

Annexure - 2
Gross Cropped Area under Small Land Size Category in Malda District

Block	1995-96								2015-16							
	% of GCA	Cereals	Pulses	Spices	Oilseeds	Fiber	Vegetables	Fruits	% of GCA	Cereals	Pulses	Spices	Oilseeds	Fiber	Vegetables	Fruits
Bamangola	27.71	75.54	0	0	12.73	0	27.71	0	27.96	69.81	1.01	0	24.28	1.84	27.96	0.43
Chanchal-I	33.28	68.45	2.57	0.56	2.44	18.14	33.28	0.03	23.88	60.19	13.36	0.03	7.08	15.26	23.88	2.21
Chanchal-II	27.43	74.14	0.71	0	4.3	11.54	27.43	0.2	29.33	57.29	6.15	0	9.11	1.23	29.33	23.41
English Bazar	28.19	63.81	12.21	0.82	0.39	0	28.19	13.08	28.58	37.99	1.04	1.05	4.46	11.27	28.58	34.72
Gazole	33.17	77.46	1.21	0.05	8.03	3.19	33.17	0.21	27.3	82.14	0.08	0	11.09	1.71	27.3	2.99
Habibpur	34.82	85.78	0.66	0.02	4.11	0.06	34.82	0	29.46	74.48	0.03	0	21.17	1.75	29.46	0.07
Harishchandrapur-I	20.05	80.83	0.36	0	6.52	10.47	20.05	0	23.56	77.22	0.59	0.05	5.57	14.82	23.56	0
Harishchandrapur-II	39.53	78.56	1.89	0	0.37	10.12	39.53	0.09	25.65	71.19	16.6	0.03	1.54	8.27	25.65	0.08
Kaliachak-I	15.74	48.03	3.17	0	1.3	2.36	15.74	19.38	24.9	33.95	0.07	0	3.24	14.77	24.9	31.79
Kaliachak-II	19.13	50.48	7.28	0	3.84	3.55	19.13	14.03	20.98	70.62	0.25	0	0.13	13.34	20.98	9.14
Kaliachak-III	23.67	60.33	13.42	0.2	1.64	13.19	23.67	1.73	21.62	51	2.67	0.59	1.78	41.59	21.62	0.27
Manikchak	21.21	61.1	16.44	0.42	0.73	7.94	21.21	3.2	33.73	44.79	4.19	0.01	7.71	26.85	33.73	13.79
Old Malda	32.31	86	0.29	0.07	1.51	0.86	32.31	0	28.86	92.45	0.03	0.01	1.41	0.88	28.86	0
Ratua-I	18.81	60.98	18.45	0	1.22	8.58	18.81	1.29	26.31	61.31	5.62	0	4.8	18.03	26.31	7.92
Ratua-II	31.93	87.37	6.45	0	0	1.84	31.93	3.76	25.79	69.07	0.71	0	5.5	10.16	25.79	13.93
District	28.53	74.25	4.52	0.14	3.67	6.18	28.53	2	26.88	64.72	3.9	0.09	8.98	10.27	26.88	8.74

Source: Agriculture Census 1995-96 and 2015-16

Annexure - 3
Gross Cropped Area under Semi-Medium Land Size Category in Malda District

Block	1995-96								2015-16							
	% of GCA	Cereals	Pulses	Spices	Oilseeds	Fiber	Vegetables	Fruits	% of GCA	Cereals	Pulses	Spices	Oilseeds	Fiber	Vegetables	Fruits
Bamangola	26.5	80.69	0	0	8.63	0	10.68	0	13.86	70.84	0.11	0	26.1	0.78	2.04	0.16
Chanchal-I	17.32	71.99	1.54	0	2.51	15.64	8.22	0.11	11.81	66.29	11.22	0	4.49	15.78	1.61	0.62
Chanchal-II	16.78	72.25	0.68	0	5.38	11.26	8.96	1.47	13.18	63.5	5.89	0	8.2	1.02	3.26	18.16
English Bazar	17.83	63.46	10.01	0	1.42	0.35	8.76	15.69	14.69	47.01	0.63	0	10.12	4.01	13.77	24.44
Gazole	24.42	78.45	1.5	0	7.55	2.06	9.5	0.47	15.05	83.69	0.13	0	10.9	0.78	3.14	1.32
Habibpur	22.37	81.76	1.2	0.77	6.37	0.19	9.71	0	17.55	77.01	0.06	0.08	17.51	2.41	2.98	1.26
Harishchandrapur-I	16.12	88.29	0.3	0.19	1.57	8.95	0.71	0	11.14	80.46	0.02	0.01	5.34	11.84	1.62	0.74
Harishchandrapur-II	17.09	79.32	1.1	0	0.86	9.43	8.88	0.22	14.83	80.89	6.04	0	1.09	8.01	1.3	2.65
Kaliachak-I	17.01	49.89	8.77	0.04	2.09	1.78	6.28	18.69	6.34	44.98	0.83	0	2.68	0.17	0.59	31.46
Kaliachak-II	15.26	60.77	1.26	0	5.67	0	6.25	13.99	15.4	41.64	0.05	0	0.21	10.08	0.23	47.29
Kaliachak-III	25.31	58.41	16.13	0	1.32	13.46	5.83	1.07	13.33	56.35	2.69	0.19	2.48	35.9	1.6	0.39
Manikchak	12.88	62.8	15.72	0.31	0.51	7.41	7.93	4.58	5.56	40.71	2.44	0.75	14.2	23.06	0.96	17.84
Old Malda	16.46	86.18	0.35	0.11	0.6	1.44	11.29	0	11.26	91.07	0.04	0.01	2.12	0.56	5.59	0.6
Ratua-I	28.12	57.85	19.73	0.13	0.75	11.29	8.06	2.19	11.39	59.93	2.19	0.01	4.61	21.77	1.2	10.29
Ratua-II	23.44	90.43	2.15	0	0	1.56	1.75	4.11	12.64	60.9	0.14	0	4.8	9.92	2.31	21.96
District	20.3	73.58	5.39	0.12	3.64	5.72	8.01	2.59	13	68.38	2.31	0.03	9.05	8.09	2.92	8.83

Source: Agriculture Census 1995-96 and 2015-16

Annexure - 4
Gross Cropped Area under Medium Land Size Category in Malda District

Block	1995-96								2015-16							
	% of GCA	Cereals	Pulses	Spices	Oilseeds	Fiber	Vegetables	Fruits	% of GCA	Cereals	Pulses	Spices	Oilseeds	Fiber	Vegetables	Fruits
Bamangola	12.58	82.83	0	0	9.27	0	7.9	0	4.3	72.82	0.43	0	22.55	2.44	1.76	0
Chanchal-I	4.69	74.98	1.04	0.13	3.06	9.12	9.06	2.61	1.42	43.7	0.14	0.02	6.61	2.33	1.19	46.02
Chanchal-II	5.21	78.89	0	0	1.65	5.54	10.13	3.78	1.12	65.1	0	0	1.68	12.71	7.31	13.21
English Bazar	12.5	66.55	9.03	0	0	0	11.58	11.58	2.69	59.01	2.16	0	2.18	4.22	2.77	29.35
Gazole	9.76	79.26	1.58	0.09	8.64	2	8.36	0	1.98	80.32	0.52	0.03	5.86	1.37	4.68	7.02
Habibpur	9.52	81.63	4.78	0.07	3.83	0.15	9.53	0	6.98	83.45	0.28	0.01	13	0.8	2.47	0
Harishchandrapur-I	7.96	77.84	0	0	8.3	13.86	0	0	0.58	75.58	1.91	0	7.48	14.55	0	0
Harishchandrapur-II	3.59	67.79	3.57	0	1.26	15.67	11.71	0	0.43	65.16	1.45	0	0.51	28.13	4.75	0
Kaliachak-I	8.01	69.31	2.74	0	0	0	11.71	0	0.57	55.42	3.38	0	7.12	4.07	5.75	17.29
Kaliachak-II	13.96	57.45	16.18	2.31	0	0.1	12.94	4.67	0.64	60.21	13.43	1.92	4.48	0.08	10.74	3.88
Kaliachak-III	14.83	57.2	11.92	0	0.51	13.96	9.78	4.24	1.89	50.42	5.24	0	4.34	29.2	7.6	1.87
Manikchak	8.6	69.43	13.58	0	0.43	4.31	8.49	2.68	0.72	45.65	9.4	0	0.27	3.61	5.31	35.1
Old Malda	10.02	85.88	0.94	0.04	1.52	1.25	10.37	0	2.22	65.75	1.9	0.02	3.28	6.23	21.67	0
Ratua-I	19.1	62.18	13.03	0	0.59	12.83	8.31	2.29	1.77	65.62	7.69	0	4.18	15.98	3.75	2.15
Ratua-II	7.57	79.29	6.87	0	0.62	4.05	1.07	7.77	0.93	81.87	1.99	0	0.18	13.31	0.31	2.25
District	9.61	72.21	6.47	0.13	3.15	5.61	8.69	2.58	2.09	72.24	1.63	0.03	9.62	5.36	3.68	7.14

Source: Agriculture Census 1995-96 and 2015-16

Annexure - 5
Gross Cropped Area under Large Land Size Category in Malda District

Block	1995-96								2015-16							
	% of GCA	Cereals	Pulses	Spices	Oilseeds	Fiber	Vegetables	Fruits	% of GCA	Cereals	Pulses	Spices	Oilseeds	Fiber	Vegetables	Fruits
Bamangola	0.38	94.34	0	0	0.94	0	0	5.66	0.18	84.24	0	0	15.37	0	0	0.47
Chanchal-I	N. A	N. A	N. A	N. A	N. A	N. A	N. A	N. A	N. A	N. A	N. A	N. A	N. A	N. A	N. A	N. A
Chanchal-II	N. A	N. A	N. A	N. A	N. A	N. A	N. A	N. A	N. A	N. A	N. A	N. A	N. A	N. A	N. A	N. A
English Bazar	0.65	92.04	0	0	41.79	0	0	7.96	N. A	N. A	N. A	N. A	N. A	N. A	N. A	N. A
Gazole	0.26	89.94	0	0	34.91	2.37	2.37	5.33	N. A	N. A	N. A	N. A	N. A	N. A	N. A	N. A
Habibpur	0.47	95.43	0	0	40.61	0	0	4.57	N. A	N. A	N. A	N. A	N. A	N. A	N. A	N. A
Harishchandrapur-I	0.18	100	0	0	25	0	0	0	N. A	N. A	N. A	N. A	N. A	N. A	N. A	N. A
Harishchandrapur-II	0.27	100	0	0	0	0	0	0	N. A	N. A	N. A	N. A	N. A	N. A	N. A	N. A
Kaliachak-I	0.41	96.3	0	0	1.85	0	0	3.7	N. A	N. A	N. A	N. A	N. A	N. A	N. A	N. A
Kaliachak-II	N. A	N. A	N. A	N. A	N. A	N. A	N. A	N. A	N. A	N. A	N. A	N. A	N. A	N. A	N. A	N. A
Kaliachak-III	0.39	51.61	25.81	0	33.33	0	18.28	4.3	0.1	32.17	26.48	0	12.55	15.59	4.03	0.95
Manikchak	N. A	N. A	N. A	N. A	N. A	N. A	N. A	N. A	N. A	N. A	N. A	N. A	N. A	N. A	N. A	N. A
Old Malda	0.24	100	0	0	39.62	0	0	0	N. A	N. A	N. A	N. A	N. A	N. A	N. A	N. A
Ratua-I	0.26	100	0	0	14.74	0	0	0	N. A	N. A	N. A	N. A	N. A	N. A	N. A	N. A
Ratua-II	N. A	N. A	N. A	N. A	N. A	N. A	N. A	N. A	N. A	N. A	N. A	N. A	N. A	N. A	N. A	N. A
District	0.24	91.63	2.11	0	53.04	0.35	1.85	4.05	0.04	60.44	2.87	0	21.07	7.42	0.54	1.99

Source: Agriculture Census 1995-96 and 2015-16

Annexure - 6
Gross Cropped Area under All Land Size Classes in Malda District

Block	1995-96								2015-16							
	% of GCA	Cereals	Pulses	Spices	Oilseeds	Fiber	Vegetables	Fruits	% of GCA	Cereals	Pulses	Spices	Oilseeds	Fiber	Vegetables	Fruits
Bamangola	100	77.3	0.02	0	10.94	0.02	11.68	0.04	100	68.95	0.55	0.1	24.91	2.03	2.88	0.58
Chanchal-I	100	69.86	2.08	0.19	2.07	17.17	8.41	0.16	100	59.44	13.3	0.19	6	17.46	2.03	1.59
Chanchal-II	100	74.16	0.59	0	4.01	11.47	9.14	0.58	100	57.12	5.59	0.03	8.91	2.19	3.45	22.71
English Bazar	100	65.14	10.81	0.23	0.64	0.34	10.42	11.45	100	41.25	1.75	1.24	7.73	8.66	9.78	28.85
Gazole	100	76.77	1.46	0.02	8.38	2.88	9.82	0.19	100	78.78	0.08	0	11.29	2.35	3.34	4.12
Habibpur	100	84.66	1.09	0.01	4.43	0.16	9.47	0	100	75.62	0.04	0	19.21	1.75	3.37	0.31
Harishchandrapur-I	100	82.18	0.27	0	4.55	10.94	2.01	0	100	74.54	0.44	0.1	7.18	15.76	1.72	0.23
Harishchandrapur-II	100	78.55	1.46	0	0.66	10.03	9.16	0.09	100	74.1	12.66	0.2	3.35	7.62	1.63	0.44
Kaliachak-I	100	42.41	3.03	0	0.86	0.9	7.18	20.72	100	22.78	0.36	0.79	3.68	9.5	4.26	35.45
Kaliachak-II	100	45.38	7.28	0	3.87	0.86	7.8	9.06	100	48.93	0.81	0.01	0.23	17.1	3.99	14.79
Kaliachak-III	100	58.05	14.08	0.05	1.28	14.57	8.61	1.48	100	49.64	2.06	0.6	3.65	39.44	4.11	0.29
Manikchak	100	61.87	16.69	0.09	0.53	7.39	8.56	3.19	100	40.7	5.35	0.49	8.11	29.49	4.24	10.71
Old Malda	100	84.54	0.74	0.02	1.29	1.23	12.09	0.02	100	89.03	0.1	0.04	3.14	1.27	5.8	0.59
Ratua-I	100	61.27	16.6	0	0.88	10.26	9.13	1.62	100	58.13	6.31	0.07	6.26	19.45	3.21	6.53
Ratua-II	100	87.42	5.51	0	0.07	2.02	1.16	3.76	100	69.68	1.4	0.05	6.44	9	1.8	11.61
District	100	72.31	5.16	0.04	3.4	6.31	8.6	2.3	100	63.01	3.79	0.21	9.18	10.88	3.42	8.07

Source: Agriculture Census 1995-96 and 2015-16

Annexure – 7: Crop Listing

1995-96		2015-16			
Cereals	**Fiber**	**Cereals**	Coriander	Litchi	Other Tuber Crops
Wheat	Jute	Bajra	Fennel	Mandarin Orange	Other Vegetables
Paddy	Cotton	Barley	Fenugreek	Mango	Peas
Maize	Mesta	Jowar	Green Chilies	Miscellaneous fruits	Potato
Barley	Other Fiber	Maize	Garlic	Other Citrus	Pumpkin
Small Millet	**Total Oilseed**	Other Cereal	Ginger	Papaya	Radish
Other Cereals	Coconut	Paddy	Large Cardamom	Pineapple	Spinach
Total Fruits	Sesamum Till	Ragi	Other Condiments	Sapota	Sweet Potato
Banana	Rapeseeds&Mustared	Wheat	Radhuni	Guava	Tomato
Mango	Other Oilseeds	**Pulses**	Red Chili	Temperate fruits	Yam
Orange	Niger Seeds	Gram	Red yellow Chili	**Vegetables**	
Other Fruits	Linseeds	Horse gram	Turmeric	Beans	
Total Spices	**Total Pulses**	Masur	**Oilseeds**	Bitter Guard	
Chilies	Tur	Moong	Castor Seed	Bottle Guard	
Ginger	Masur	Other Pulse	Coconut	Brengle	
Cardamom	Gram	Tur	Groundnut	Cabbage	
Other Condiments	Other Pulse	Urad	Linseed	Capsicum	
Total Vegetables		**Fiber**	Rapeseed & Mustarded	Carrot	
Onion		Cotton	Safflower	Cauliflower	
Potato		Jute	Sesamum- Till	Colocasia	
Other Vegetables		Mesta	Soybean	Cucumber	
		Sun hemp	Sunflower	Drumstick	
		Spices	**Fruits**	Elephant Foot Yam	
		Beetle nut	Banana	Lady Finger	
		Black Cumin	Guava	Onion	
		Black Pepper	Jackfruit	Other Guard	

Source: Agriculture Census (for Malda only