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Changing Scenario of Agriculture in Baranda-Shibnagar Mouza of Murshidabad-Jiaganj C.D. Block, Murshidabad, West Bengal, India

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Abstract: ***Changing scenario of Agriculture is very imagining scenes. In the world the Agricultural change is a spatio temporal change. Changing means (i.e. changing scenario of Agriculture) what are the conditions at present day of Agriculture due to the past day. So in that point of view the changing scenario of Agriculture in Baranda-Shibnagar Mouza of Murshidabad-Jiaganj C.D. Block, Murshidabad, West Bengal is a very imagining scene. In this area all of the properties of Agriculture most of the portion are change like land are change from Paddy cultivated land to Cash crop cultivated land, Agricultural implement used change from ancient technology to modern technology, Agricultural credit system change from Mahazon to bank, Agricultural fertilizers and pesticides are change from organic fertilizers and pesticides to chemical fertilizers and pesticides, Agricultural cropping pattern change etc. The major objectives of the study area the agricultural conditions of Baranda-Shibnagar Mouza, Murshidabad, and West Bengal, assess the income status of farmers in this study area, identify the major problems of farmers in this study area, suggest effective's measures towards the agricultural development of this study area. The major problems are lack of modern technology, lack of uses of organic fertilizers and pesticides, lack of Agricultural credit system, lack of security of Agricultural labour etc. And suggestive measures of this study area are sufficient agricultural implements should be appointed in this area. Sufficient agricultural store of pesticide and fertilizer should be established here, some part of area are not electric supply, so that in this area are required this facilities, In this area, near about no agricultural commodities supplier market, so that this luck of condition is required fulfillment, farmers of in this area used local seed and their effect low production. If the farmers are used HYV (high yield verities) seed overcomplicates the production obviously will be high. So HYV seed used should be practice of the farmers, sufficient HYV seed should be management in this area, in this area has no skill farmers and their tillage is not scientifically method. So this luck of condition should be required fulfillment.***

Keywords: Agricultural implement, Agricultural credit system, Cash crop, HYV (high yield verities), Modern technology

1. Introduction

The word agriculture is a late Middle English adaptation of Latin *agricultūra,* from ager, "field", and *cultūra,*" cultivation" or "growing". Agriculture usually refers to the human activities, although it is also observed in certain species of ant, termite and ambrosia beetle. To practice agriculture means to use natural resources to "produce commodities which maintain life, including food, fiber, forest products, horticulture crops and their related services. So here I have discussed the changing agricultural scenario of Baranda-Shibnagar Mouza in Murshidabad-Jiaganj block, Murshidabad, west Bengal, India.

Agricultural cropping pattern changing in this surrounding Mouza from paddy cultivation to Mustard, Potato, Jute, white, vegetable, oilseed, and pulses. Here I have tried to explain the reasons behind why agricultural cropping pattern change in this surrounding Mouza. In this regards I have selected Baranda-Shibnagar Mouza, Murshidabad, and West Bengal.

Objectives

- To study the agricultural conditions of Baranda-Shibnagar Mouza, Murshidabad, and West Bengal.
- To assess the income status of farmers in this study area.
- To identify the major problems of farmers in this study area.
- To suggest effective's measures towards the agricultural development of this study area.

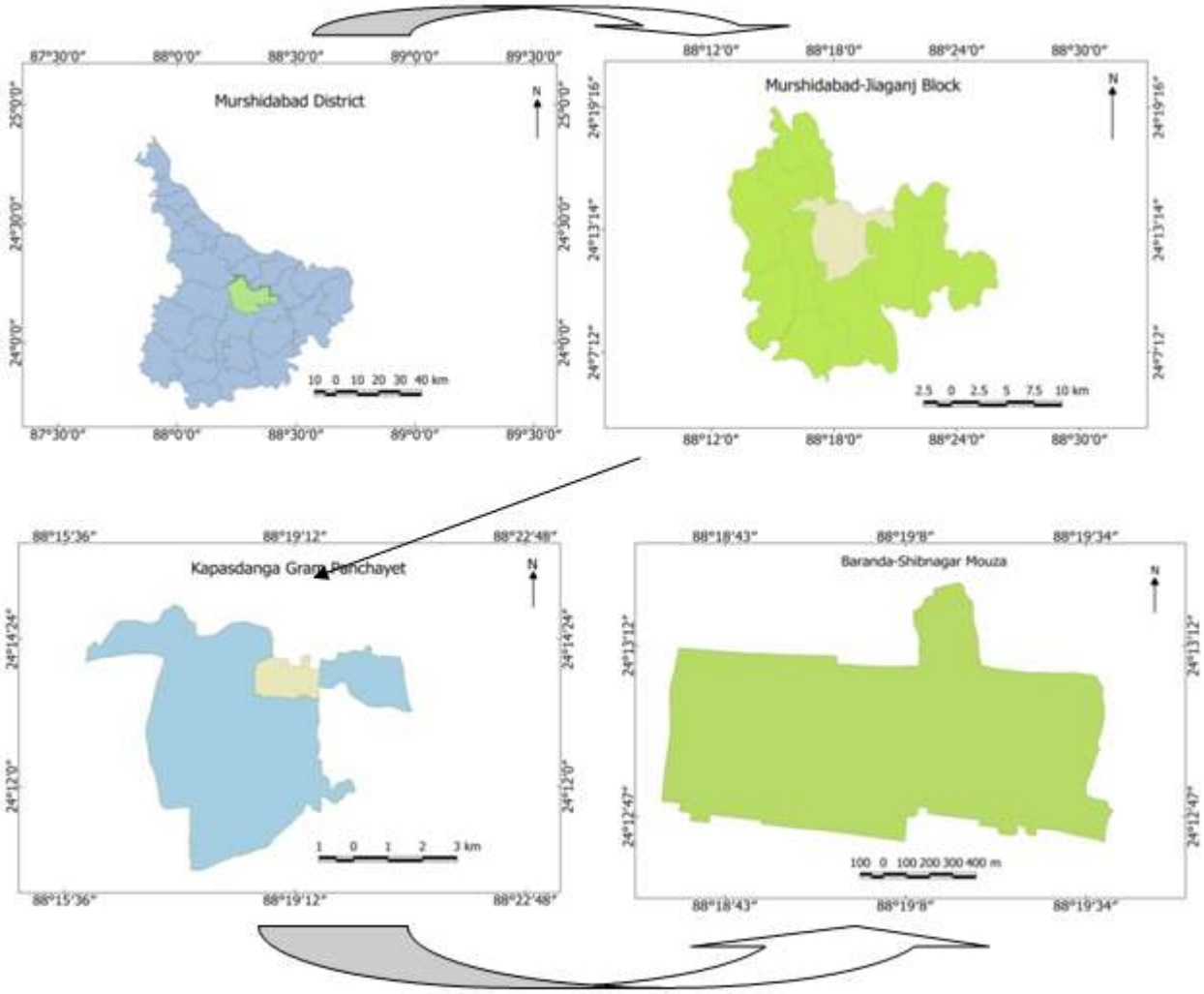
2. Significance of the study

In this area cropping pattern has been changed and effect on the farmers in this Mouza. Why cropping pattern change in this area and consequences that the changing life style, economic condition, farmers security and several change of the farmer's diurnal activity. The contribution of this Agricultural cropping pattern has been so important. In this regard the present study is so many significant and relevance.

3. Study Area

Baranda-Shibnagar Mouza in Murshidabad-Jiaganj block in Murshidabad district has been selected as a study area to investigate the agricultural copping pattern change. In this Mouza covers an area 258.708 Ha .It is 1.24% of the total area of Murshidabad-Jiaganj block. The Murshidabad-Jiaganj block is situated on the eastern bank of river Bhagirathi. This belongs to tropical monsoon climate and latitude $24^{0}9'0"$ and longitude $88\ ^{0}15'0"$.

Location Map



Source: NATMO

4. Database and Methodology

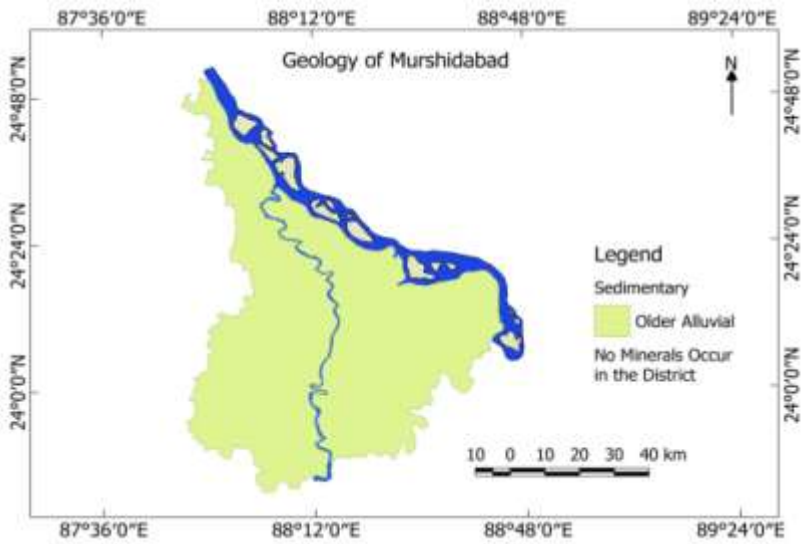
Primary Data: The Project is mainly based on primary data which have been collected from observations, household's survey through structured questionnaire and personal interviews.

Secondary Data: Secondary data have been collected from Agricultural Development office (A.D.O office), Krishi Proyukti Sahayak (K.P.S office), District Census handbook and Census of India (2001 & 2011).

Methodology
To satisfy the objectives of the Project, mainly descriptive statistics have been incorporated. Crop diversification index (Gibb's Martin, 1962), Crop Productivity index (Enyedi, 1964), Crop Combination (weaver's, 1954), Crop Diversification index (Bhatia, 1965), and Cropping Intensity have been used. Relevant cartographic techniques (using QGIS software) and presentation have been applied.

Physical Environment

Geology
Geologically the whole region has a monotonous features which is mainly originated from unconsolidated sedimentation rocks and whole the region covered by older alluvial because the district lines within the moribund deltaic part of Bhagirathi-Hugli river in most of the part of our study area. Older alluvial portion have been eroded and some never sediments have been deposited.

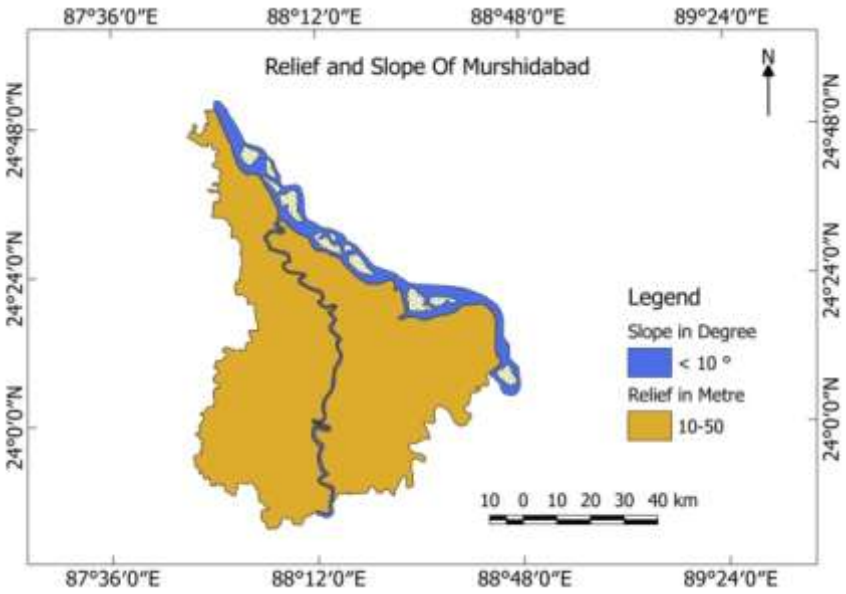


Source: NATMO

Topography

This river Bhagirathi following across the Murshidabad district and divided into two parts, the western part is known as "Rarh" which is substantially a continuation of sub-bindhaban and it is interspersed with numerous swamps and beds of old rivers. On the other hand, the eastern part is known as "Bhagri" and is covered with recent alluvial. Consisting sandy clay our study area is located within Bhagri part.

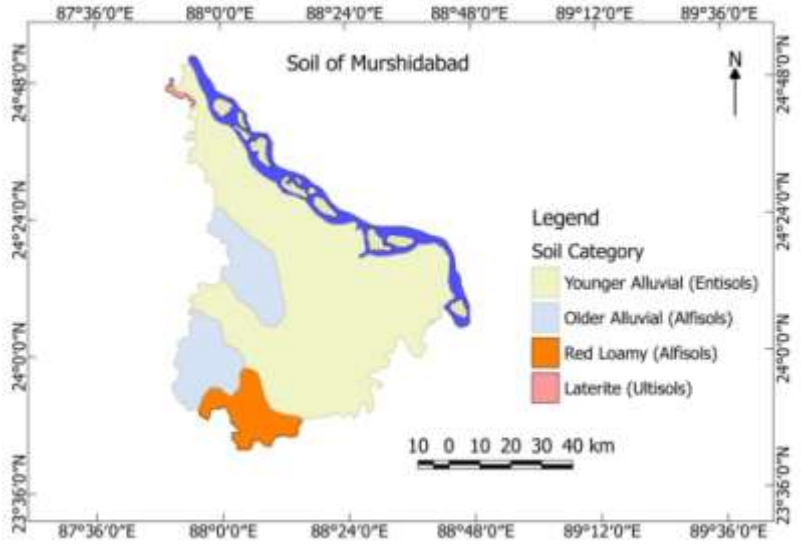
The Elevation of the district is from 10 mt-5mt about mean sea level highest elevation was found on the north-western side of the district and the lower study area. The elevation is found on the south-western side. On our study area the elevation is probably from 19mt to 25mt above the mean sea level and the slope is less than 10mt this is the case only for our study area but also for the whole district.



Source: NATMO

Soil

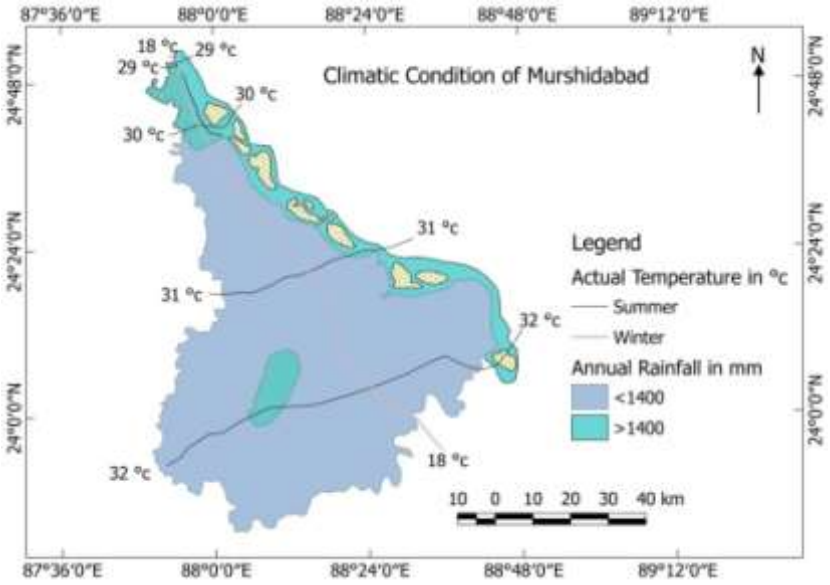
East to Bhagirathi the soil is alluvial and fertile. Our study area comes under this zone. In "Rarh" region the soil is hard grain which is comparatively less fertile than eastern side of this district. In particularly the district enjoys more or less than monotonous alluvial nature of soil whose chemical property varies from one region to another.



Source: NATMO

Climatic Condition

The district oppressively hot in summer, salt winter high humidity and good rain fall during monsoon seasons with the commencement of south-west monsoon humidity increases to 80% and rainfall is almost daily occurrence. The precipitation becomes heavy, where these are cyclonic disturbance. The annual rainfall of the district is 100mm. The mean annual temperature varies between summer and northern part and 32^0 c in southern part. The winter temperature varies between from the north to south which is 18^0 c in average. In our study area the mean annual summer and winter temperature are 32^0 c and 17^0 c respectively.



Source: NATMO

Land used Pattern

Table No. 1: Land use Pattern of Baranda-Shibnagar Mouza, Murshidabad District, West Bengal

2015-2016			
Winter Season		**Summer Season**	
Commodities	Area in Hectare	Commodities	Area in Hectare
Paddy	30	Paddy	45
White	20	Jute	35
Potato	13	Potato	0
Mustard	10	Mustard	0
Vegetable	17	Vegetable	9
Plantation land		13Ha	

According to Table No. 1, in 2014-2015 the winter season the paddy cultivation is high around of 30 Ha and then white cultivation is 20 Ha, Potato 13 Ha, Mustard 10 Ha, and the Vegetable is 17 Ha. The total cropped area is104 Ha in this Mouza.

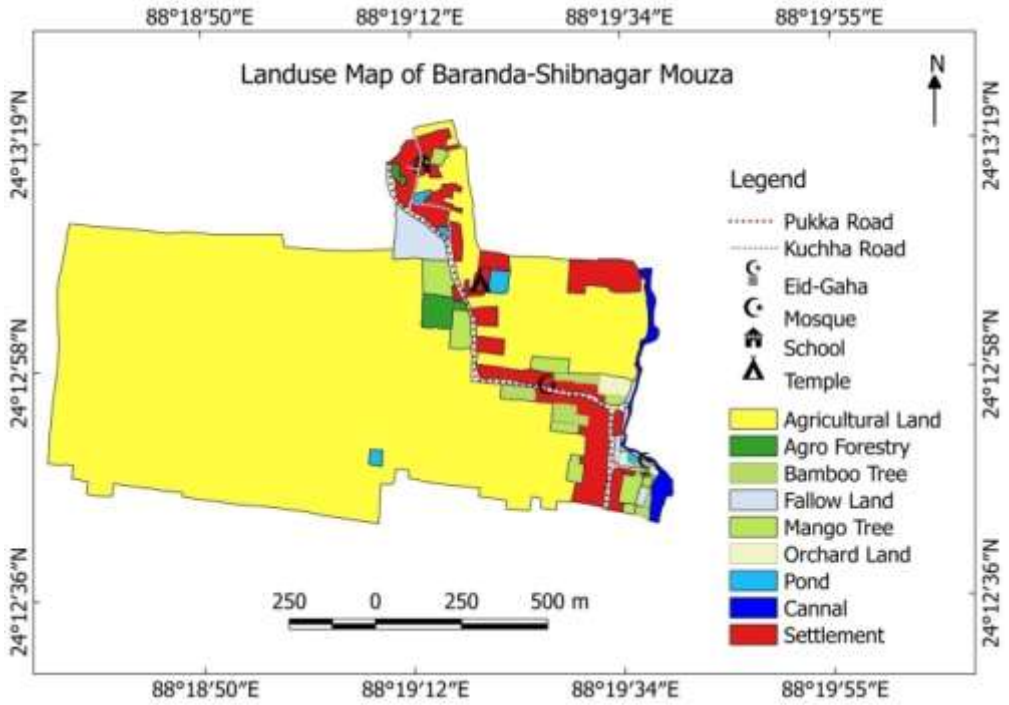
Whatever, the summer season are paddy 45 Ha, Jute 35 Ha, potato 0 Ha, Mustard 0 Ha, and vegetable 9 Ha, and both the seasons is 37 Ha mango plantation cultivated in this area. In this area that the summer season, Paddy cultivation increase than the winter season because the Jute and Potato is not cultivation in summer season, so that the Paddy cultivation has increase than the winter season.

Table 2: Land use Pattern of Baranda-Shibnagar Mouza, Murshidabad District, and West Bengal.

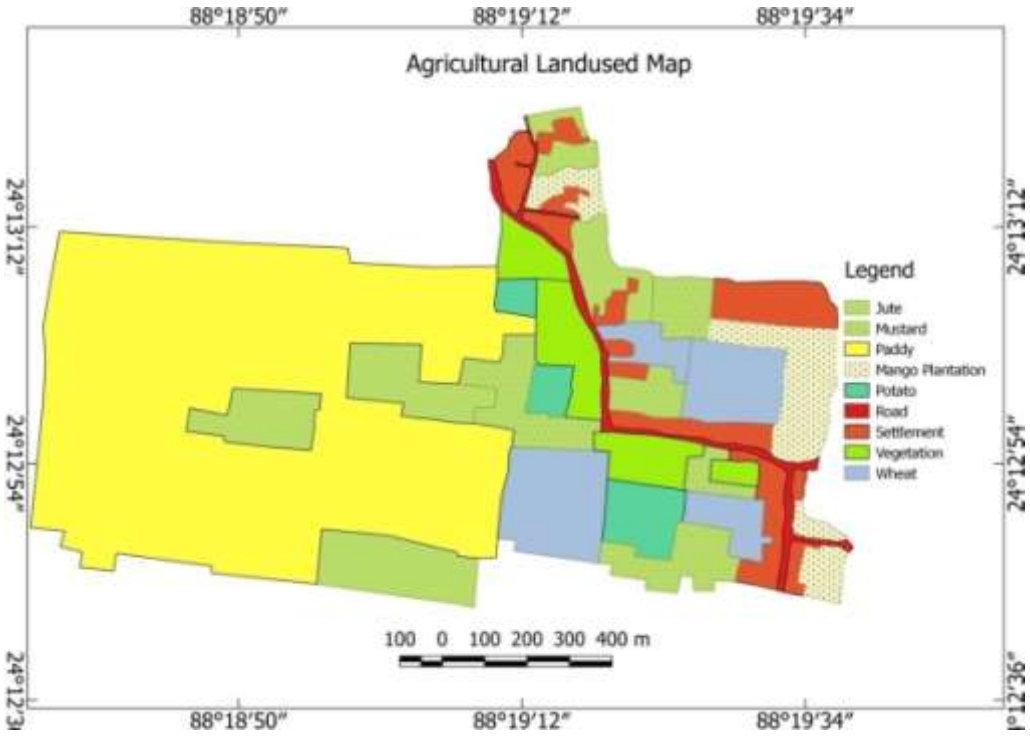
2001-2002			
Winter		**Summer**	
Commodities	Area in Hectare	Commodities	Area in Hectare
Paddy	45	Paddy	62
White	15	Jute	7
Potato	7	Potato	0
Mustard	9	Mustard	0
Vegetable	9	Vegetable	5
Plantation land		9 Ha	

According to the Table No. 2, we saw that the winter season, the Paddy is 45 Ha, White 15 Ha, Potato 7 Ha, Mustard 9 Ha, and the Vegetation is 9 Ha cultivated in this area.

Elsewhere, the summer season, that the paddy is 62 Ha, Jute 7 Ha, Potato 0 Ha, Mustard 0 Ha and The Vegetation was 5 Ha and the both season 25 Ha Mango plantation cultivation respectively. We saw that the 2014-2015, cash crop is increased than the 2001-2002 because the farmers are well benefit from the cash crop cultivation and their savings purpose obviously well.



In this land used map of Baranda-Shibnagar Mouza are mostly 90% area uses in the agricultural purpose and other hand 10% uses in the buildup purpose respectively. So in this Mouza are mostly usable for agriculture.



We show in this agricultural land used map that the paddy cultivation are approximately 50% and other are 50% land uses in agricultural purpose like are 10% mustard, 11% wheat, 12% jute, 9% potato, 8% vegetation respectively.

Diversification (Gibbs Martin, 1962):
I calculated the value of crop diversification is 0.73662

Table 2: calculation for crop diversification

Serial No.	Name of the Principle crop	Area under Principle Crops(Ha)	Percentage of the area under Principle Crops(X)	X2
1	Paddy	75	340.09	1162.13
2	Wheat	20	9.09	83.62
3	Potato	13	5.91	34.93
4	Mustard	10	4.55	20.7
5	Vegetable	26	11.82	139.71
6	Others	76	34.55	1193.7
7	Gross Crop Area	220	100	2633.8

Crop Diversification Index

$$= \frac{\sum X^2}{(\sum X)^2}$$

Source: Field survey (Author)

Crop Combination:
Here are calculated value of one crop combination is 2296.32, two crop combinations is 512.24, three crop combination value is 297.2, four crop combination value is 309.32, and also five crop combination value is 272.22 respectively. I apply the formula crop combination of Weaver (1954) that in this study area is applicable for five crop combination and these five crops are paddy, wheat, mustard, potato and vegetables.

Table: Calculation for crop combination

Serial No.	Name of the Principle Crop	Area under Principle Crops(Ha)	Percentage of the area under Principle Crops	Ranking
1	Paddy	75	52.08	1
2	Wheat	20	13.89	3
3	Potato	13	9.03	4
4	Mustard	10	6.94	5
5	Vegetable	26	18.06	2

Source: Field Survey and Calculated by Author

Crop Combination:

$$d = \frac{\sum d^2}{n}$$

Irrigation:

Table 3: Irrigation of Baranda-Shibnagar Mouza, Murshidabad District, and West Bengal

2015-2016		2001-2002	
Net Irrigated Area	Gross Irrigated Area	Net Irrigated Area	Gross Irrigated Area
80%	85%	56%	61%

Source: Field Survey by Author

According to the Table No. 3 the total net irrigated area was 80 % and the gross irrigated area was 85% in the 2014-2015. Elsewhere net irrigated area was 56% and gross irrigated area was 61% in the 2001-2002. So that the 2014-2015, the irrigation system was increased than the 2001-2002.

Irrigation Source

Table 4: Irrigation Source of Baranda-Shibnagar Mouza, Murshidabad District, and West Bengal

2015-2016			2001-2002		
Source Irrigation	No.	Irrigated Area(in Ha)	Source	No. of Irrigation	Irrigated Area(in Ha)
Deep Tube Well	1	25.52	Deep Tube Well	1	17.7
River Pump	9	13.03	River Pump	15	23
Shallow Tube Well	33	48.25	Shallow Tube Well	13	25
Pond	2	0.75	Pond	2	0.72
River	3	3.54	River	3	3.54
Trunk/Canal	2	1.77	Trunk/Canal	2	1.77
Total	50	92.86	Total	36	71.73

Source: Field Survey by Author

According to the Table No. 4 that the highest irrigated area was irrigated by the shallow tube well. The shallow tube well has 33 in this area and 48.254 Ha land irrigated by this sources. We found that the surrounding area has a 1 deep tube well and its intake capacity around 25.52 Ha cropping area. Almost 85% area or land has irrigated in this area.

Whatever, 2014-2015 the surrounding irrigation system has been rapidly increased than the 2001-2002, because in that case 2001-2002, the surrounding irrigation has no developed.

Implements:

Table 7: Implements used in agriculture of Baranda-Shibnagar Mouza, Murshidabad District, and West Bengal

2001-2002		2015-2016	
Implements	**Area in hectare**	**Implements**	**Area in hectare**
Plough	66	Plough	15
Tractor	13	Tractor	55
Hand Tractor	15	Hand Tractor	25

Source: Field Survey by Author

There are cultivation system are vagarious character. We show in 2001-2002, 66 hector agricultural lands are cultivated by the plough and 13 hector by the tractor, 15 hector by the hand tractor. Also other hand in 2015-2016, 15 hector are cultivated by the plough and 55 hector by the tractor, 25 hector by the hand tractor respectively. So in this area cultivate system are changed and changing system are vagarious character. Now-a-day most of the agricultural farmers are chose modern technological implements.

Cropping Pattern:

Table 8: Cropping pattern of Baranda-Shibnagar Mouza, Murshidabad District, and West Bengal

2015-2016	
Cropping system	**Area in Hectares**
Single cropping	1
Double cropping	22
Multiple cropping	79

2001-2002	
Cropping system	**Area in Hectares**
Single cropping	64
Double cropping	24
Multiple cropping	11

Source: Field Survey by Author

In 2001-02 years, 64 hectors are single cropping system and 24 hectors double cropping, 11 hectors are multiple cropping system in this agricultural area are respectively. Elsewhere in 2015-16, only 1 hectors single crop cultivate, 22 hectors are double crop and multiple crop are cultivate approximately 79 hectors respectively.

HYV'S Seeds:

Table 9: Seeds used in agriculture of Baranda-Shibnagar Mouza, Murshidabad District, and West Bengal

2001-2002	
HYV'S Seeds	Local Seeds
24	76

2015-2016	
HYV'S Seeds	Local Seeds
84	16

HYH's Seeds	
Commodity	**Verities**
Paddy	IR-36, Ratna, Minicate, Hutra, etc.
Jute	Mohan, Krisikalyan
Wheat	Penjamo-62, Pitic-62, Sonara-64
Potato	Anna, Obrien, Quinlan
Mustard	Boldar, Seti

Source: Field Survey by Author

In this table we show that in 2001-02 year, the HYV's seed are used 24% and 76% used local seed respectively. Elsewhere in 2015-16, HYV's seed are increased and become 84% and local seeds are gradually decreases and become 16% respectively. In this contradictory situation becomes because now-a-day, the farmer are modernize so they are choose HYV's seed for the HYV's seeds are used in agriculture and output is very well and profitable. The varies HYV's seeds are used in agriculture, following this table.

Fertilizers:

Table 10: Fertilizers used in agriculture of Baranda-Shibnagar Mouza, Murshidabad District, and West Bengal

Fertilizer(2001-2002)		
Commodity	NPK(kg) in Per Hectare	Organic/Bio(kg) in per Hectare
Paddy	150	200
Wheat	200	105
Jute	150	115
Potato	750	620
Mustard	320	210
Vegetable	210	460

Fertilizer(2015-2016)		
Commodity	NPK(kg) in Per Hectare	Organic/Bio(kg) in per Hectare
Paddy	410	0
Wheat	310	0
Jute	300	0
Potato	1340	0
Mustard	540	0
Vegetable	720	0

According to table no. 10, we show that in 2001-02, the organic/bio fertilizer are more used, on the other hand in 2015-16, the NPK fertilizer are more used, but organic/bio fertilizer are no used because NPK fertilizers are more fertile than the organic/bio fertilizers in that agricultural farmer senses. NPK fertilizers are more fertile in sort time but organic fertilizer is fertile in long term period.

Strategies for Development of Agricultural Cropping Pattern

The following suggestions are very important for future development of agricultural Cropping pattern...

1) Sufficient agricultural implements should be appointed in this area.
2) Sufficient agricultural store of pesticide and fertilizer should be established here.
3) Some part of area are not electric supply, so that in this area are required this facilities.

4) In this area, near about no agricultural commodities supplier market, so that this luck of condition is required fulfillment.
5) Farmers of in this area used local seed and their effect low production. If the farmers are used HYV (high yield verities) seed overcomplicates the production obviously will be high. So HYV seed used should be practice of the farmers.
6) Sufficient HYV seed should be management in this area.
7) In this area has no skill farmers and their tillage is not scientifically method. So this luck of condition should be required fulfillment.

5. Conclusion

The analysis presented above clearly indicates the agricultural cropping pattern is change between present day and previous one decade. The present day condition is better than the previous one decade because the present day tillage is a cash commodity (Vegetable, Jute, White, Potato, Chili, Brinjal, Chapter, Mustard act) and previous one decade, tillage was only paddy and jute. So proper planning, policy, scientifically method and skill farmers are very require for the development of the tillage. Not only the farmers but also K.P.S office, A.D.O office, B.D.O office and the G.P can play important role for future development of the tillage in this area.

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Photographs

Shallow Pump Machine

White Field

Bitter Guard Field

Electric Meter Box

Photographs

Chapter Field

Chili Field

Paddy Field

Brinjal Field